Surf the Internet Now—5 Windows into Cyberspace!

April 1994

PC Computing

ULTIMATE SUBNOTEBOOKS!

Incredible SHRINKING Color

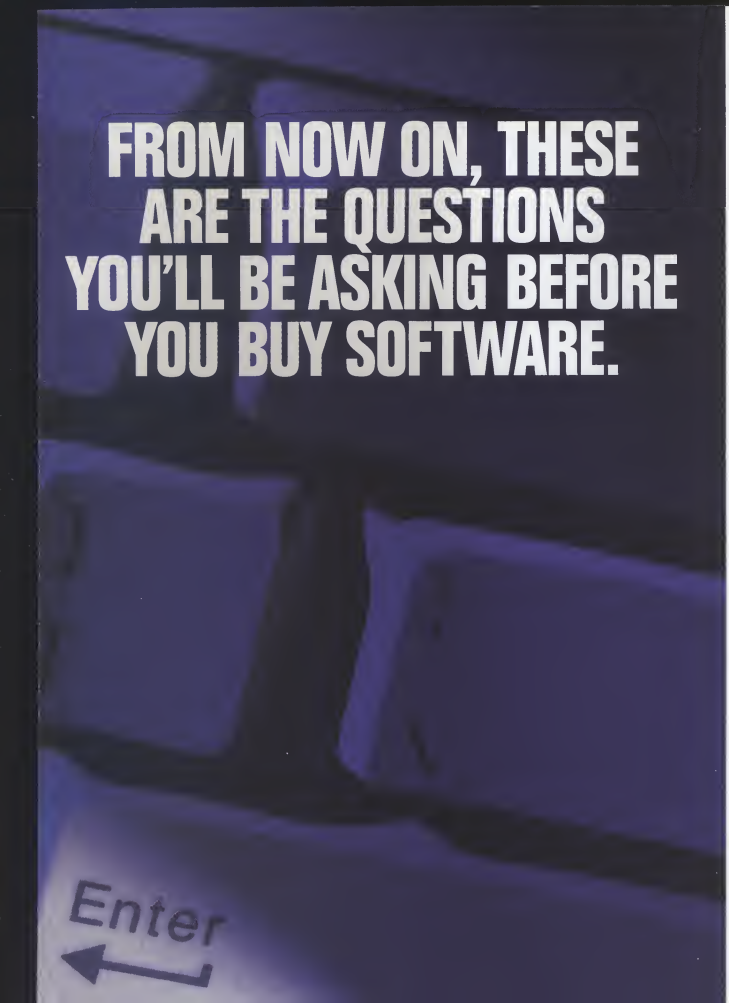
Four pounds, 486 power, and the best keyboards yet!

PLUS

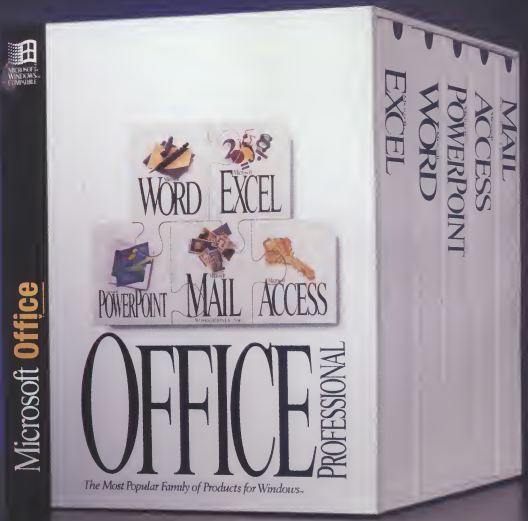
PC MEETS TV & CELLULAR

STORAGE TO 2 GIGS

SCANNER SPECIAL


FROM NOW ON, THESE ARE THE QUESTIONS YOU'LL BE ASKING BEFORE YOU BUY SOFTWARE.
Enter

HERE'S WHERE YOU CAN FIND THE ANSWERS.



Putting it all together in one place.

You have a number of different jobs to accomplish. Every day. So your business software is key to putting together all the right answers.

Enter the new Microsoft® Office.

For the first time ever, individual programs work together like a single, insightful program.

What does that mean? You can concentrate on the task at hand. And forget about jumping around between programs.

This power to work like one program springs from our unique innovations. Take OfficeLinks. Built with the integration standard, OLE 2.0, it lets you drag a chart from your spreadsheet and drop it into your word processor. Then automatically convert everything into presentation slides. Or create custom letters from your database of clients with just a click. All as if you're using one program.

These programs even think the same. Their exclusive IntelliSense™ technology can sense what you need, then make everyday jobs like fixing typos happen automatically.

Together, they're so notably consistent in looks, actions and instincts, there's no question you'll think of them as one program.

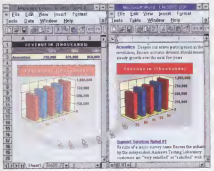
And only the Microsoft Office combines it all with unlimited no-charge support. Microsoft just won the ITAA Quality Award* for that support. A singular distinction.

The TipWizard™ assistant in Microsoft Excel tracks the way you work and offers smart tips on how to save time.

(Upper right) Just click a button on the Microsoft Office Manager (MOM) toolbar and your choice of first-rate programs pops into action.

Of course all this "oneness" could only come from the most acclaimed, technically proficient individual programs around—Word, Microsoft Excel, PowerPoint® and Microsoft Access®.

We've barely scratched the surface here of what it means for all your programs to work together like one. You'll want to read the reviews



(Lower right) Need to move information between programs? Just drag and drop it from one place to another. Then edit right in place.

yourself, talk to people who use it, scout around at your nearest reseller. And by all means, call us at (800) 894-6642, Dept. LB8, to find out more. Any questions?

Microsoft Office

*Awarded in 1991 by the Information Technology Association of America. Microsoft Office Professional, shown here, includes Microsoft Excel, Word, the PowerPoint presentation graphics program, the Microsoft Access database management system and a workstation license for Microsoft Mail (server and software acquired separately). © 1994 Microsoft Corporation. All rights reserved. In the 50 United States, call (800) 894-6642, Dept. LB8. In Canada, call (800) 563-9048. Outside the U.S. and Canada, call your local Microsoft subsidiary or (206) 936-8661. Customers who are deaf or hard of hearing can reach Microsoft text telephone (TT/TDD) services by calling (800) 892-5234 in the United States, or (905) 568-9641 in Canada. Microsoft, Microsoft Access and PowerPoint are registered trademarks and IntelliSense, TipWizard and the Windows logo are trademarks of Microsoft Corporation.

1. Do your programs work together intuitively as if they were all one program?

2. Can you simply drag text, data and graphics from one program and drop them into another?

3. Is your software intelligent? For instance, can it handle everyday tasks automatically?

4. Are your programs recognized as the best in their category?

5. Do your menus, toolbars and other elements look alike and work in the same easy way?

6. Do your programs have no-charge product support? For how long?

7. Ultimately, is it worth getting software that doesn't do all these things?

Do you have dirty Windows™?

If so, the answer is MicroHelp's...

1994 HOT AWARD W 100 WINDOWS MAGAZINE

MICROSOFT® WINDOWS™ COMPATIBLE

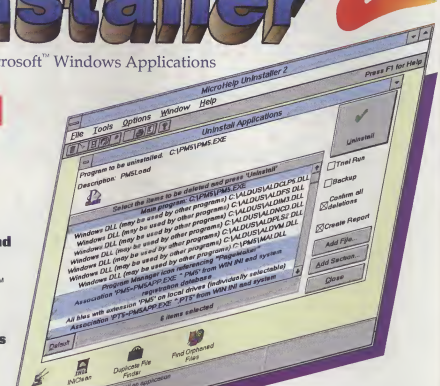
UnInstaller™ 2

for Microsoft™ Windows Applications

New Features

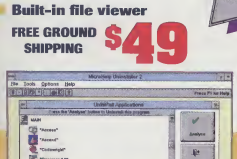
- **Removes fonts and video drivers**
- **Removes file manager extensions**
- **MDI interface featuring a status bar, a button bar and optional 3-D effects**
- **Supports Norton Desktop™ for Windows and most popular shells**
- **Removes DOS applications**
- **Removes duplicate and orphaned files**
- **Undo option**
- **Built-in file viewer**

FREE GROUND SHIPPING **$49**



"UnInstaller... should be included in the utility arsenal of every serious Windows user."
"WINDOWS SOURCES MAGAZINE," May 1993.

Uninstalls any unwanted application—new or existing, completely and easily.



UnInstaller is simple to use, removing not only specified applications, but the user's headaches as well.

This utility from MicroHelp can help you keep your Windows clean by removing an application and all references to it. It does this by looking for application fingerprints — places where the application has touched your system.

"MicroHelp has done an excellent job of designing a useful utility. The UnInstaller's operation is well thought out, successfully anticipating the things you want to do when you remove an application."
"WINDOWS MAGAZINE," April 1993

DUSTIN DISCOUNT SOFTWARE

Plain Wrap Prices, Black Tie Service.

20969 Ventura Blvd., Ste 13,
Woodland Hills, CA 91364 818-710-9174
Call Toll Free in the U.S.A. (Mon. thru Fri. 6 am to 6 pm, Sat. 10 am to 2 pm PST)

800-289-3878

Or Fax Your Order

818-884-5310

Prices subject to change without notice.

NETWORK VERSION AVAILABLE
Please call for details

MicroHelp, Inc.
4359 Shallowford Industrial Parkway
Marietta, Georgia 30066

Circle 129 on reader service card.

Reprinted from "WINDOWS SOURCES MAGAZINE," May 1993, Copyright © 1993 Ziff Communications Company
Reprinted from "WINDOWS MAGAZINE," April 1993 Copyright © 1993 CMP, Inc
UnInstaller is a trademark of MicroHelp, Inc.
Microsoft is a trademark and Windows is a registered trademark of Microsoft Corp. Norton Desktop is a trademark of Symantec Corp.

DUSTIN DELIVERS HERE. *FREE!*

DOS ●
WINDOWS ■
MPC ✚
O/S2 ◆
MAC ▲
HARDWARE ★

ACCOUNTING & FINANCE
CA 6PI Accounting 2 ◆ 159
In The Black ■ 65
MS Money ● 25
Dac Write +4.0 ● 49
Peachtree Accounting Release 2 ■ 125
Peachtree Complete 7.0 ● 195
Quicken 7.0 ● 49
Quicken 3.0 ■ 49
Simply Accounting ● ■ 79
Stagecoft Accounting ● 99
Turbo Tax ● ■ CALL
BUSINESS GRAPHICS
Action Comp. Upgrade ■ ▲ 99
Action ● 209
Action ▲ 349
allClear ● ■ 195
CA Cricket Paint ■ 99
CA Cricket Presents ■ 99
Flowcharting III ● 145
Freelance Graphics ● ■ CALL
Freelance Graphics Upgrade ● ■ 109
Harvard Graphics 3.0 ■ 275
Harvard Graphics 3.0 Upgrade ■ 95
Informix ■ CALL
Powerpoint ■ 325
Powerpoint Upgrade ■ 135
Stanford Chart ■ 65
Stanford Graph ■ 369
Visio 2.0 ■ 129
Visio Home ■ 85
WP Presentation ● 309
CAD & DRAFTING
Autosketch ● ■ CALL
Design CAD 3D ● 259
Intellx CAD ● 259
Design CAD 2-D ● ■ 185
Generic CAD ● 299
Turbo Cad ● ■ 85
COMMUNICATIONS & NETWORKING
Commworks ● ■ 139
Crosstalk 2.0 ■ 129
Crosstax ■ CALL
Desks To Desk ● 75
Eclipse Fax ■ 75
Hyperaccess ● ■ 69
Laplink Pro 5.0 ■ 119
Netware ● ■ ★ CALL
PC Anywhere Host/Rmt ■ 125
Procomm Plus ● 79
Procomm Plus ■ 99
Q-Modem ■ 69
Reachout ▲ CALL
Remote Power On/Off ★ 129
Winfax Pro Network ■ 265
Wirdcat 8BS ■ 89
Winfax Pro ■ 89
DATABASE & DEVELOPMENT
Access ■ CALL
Approach ■ 109
CA Cricper 5.2 ● 499
CA Cricper 5.2 Comp. Upgr ● 149
CA dBFast ■ 195
dBase IV ● 469
FileMaker Pro ■ 135
Foxpro 2.5 Upgrade ● ■ 199
Foxpro 2.5 ● 329
Foxpro 2.6 ● 549
Paradox ■ 155
Q & A 4.0 ● 265
Q & A 4.0 ■ 175
Rbase ● 495
Superbase ■ CALL
DESKTOP PUBLISHING & FONTS
Expressions ■ 109
FaceIt! For WP ● 75
FaceIt! ■ 69
Fontmonger ■ 99
Fontmonger/Typesetry Bundle ■ 195
Freehand ■ 399
Masterpiece True Type Fonts ● 45
Dmixpage 386 ■ 459
Dmixpage Pro ■ 649
Publisher 2.0 ■ 99
Pagemaker 5.0 ■ 599
Printshop Deluxe ● 55
Type Align ■ 69
Typesitty ■ 175
EDUCATION & TRAINING
Auto Insight ● ■ 55
Automap ● ■ 65
Autoworks ■ 47
Body Insight ● ■ 55
Body Works 3.0 ■ ▲ 39
Complaints Desk ■ 99
Computer Works ■ 35
Green Explorer ● 49
Holy Bible ● ■ 35
Kid's Desk ■ 35
Orbits ■ 35
Psychfacts ■ 47
Places to Play ■ 45
Resume 2.0 ■ CALL
Sales and Marketing Success ■ 59
Sportsworks ■ 35
Success Inc. ■ 85
Typing Tutor VI ■ ▲ 39
UFO ■ 35
Where Is Carmen-World Deluxe ■ 55
GAMES & ENTERTAINMENT
Alone In The Dark ■ 45
Capitalist Pig ■ 45
Commanches Dvrkill ■ 35
Falcon 3 ■ 55
Flight Simulator 5.0 ■ 49
Links PRO 386 ■ 49
Martinet ■ 39
Playmaker Football ■ 25
Rodney ■ 39
Simcity ● ■ CALL
Thrustmaster ■ 79
GRAPHICS & CLIPART
Click Art ■ CALL
Canvas ■ 285
Corel Draw 3 ■ 139
Corel Draw 4 ■ 395
Corel Draw 4 Version Upgrade ■ 229
Corel Ventura ■ 179
Designer ■ 489
Harvard Draw ■ ■ 89
Hijaak ■ 105
Hijaak Pro ■ 89
Illustrator 4.0 ■ 469
Painter ■ 275
Photostyler ■ 589
Picture Publisher ■ 449
Presentation Task Force ■ ■ 129
INFORMATION &
PROJECT MANAGEMENT
Organize Your Way ■ 69
Packrat 5.0 ■ 255
Policies Write Now ■ 125
Power Translator (French) ● 155
Power Translator (Spanish) ● 155
Project ■ 329
Project ■ 455
Starwaars ■ 95
Spanish Assistant 5.0 ■ 65
Timeline 5.0 ■ ■ 475
INTEGRATED
MS Office Professional ■ CALL
MS Office Standard ■ 489
MS Office Upgrade ■ CALL
Simply Business Bundle ■ 425
Smart Suite ■ CALL
MATHEMATICAL
Derive 2.5 ■ 155
Mathematica DOS Enhanced ■ 735
Mathematica DOS Standard ■ 489
Mathematica Windows Enhanced ■ 819
Mathematica Windows Standard ■ 489
MODEMS
Hayes Accura 14.4 Ext. ★ 245
Hayes Accura 14.4 Int. ★ 219
PM14400FX Send/Rec Fax ★ 225
Sportster 14.4 Int. ■ 199
Sportster 9600 ★ CALL
WorldPort 9600 ★ 419
OPERATING SYSTEMS
MS DOS 6.2 Upgrade ● 59
Windows 3.1 ■ 99
Windows 3.1 Upgrade ■ 59
Windows NT ■ CALL
Windows for Workgroups ● CALL

PERIPHERALS & ACCESSORIES
Cyberman ★ 89
Easy Touch Scanman ★ 235
Mousemen Serial ★ 79
MS Mouse ★ 85
Trackman Serial ★ 59
PROGRAMMING
Quick Basic ■ ▲ 135
SPI/PC ■ ▲ 65
Turbo C++ 3.0 ■ 75
Turbo C++ ■ 109
Turbo Pascal 7.0 ■ 115
Visual Basic ■ 139
Visual C++ Standard ■ 139
Visual C++ Professional ■ 329
SPREADSHEETS
123 v4.0 ■ 329
123 v4.0 Upgrade ■ 109
CA Complete ■ CALL
Excel Comp. & Version Upgrade ■ 109
Excel 5.0 ■ 315
Improv 2.1 ■ 339
Quattro Pro 5.0 ■ ■ 55
UTILITIES
386 Max ● 69
After Dark ● ■ 35
Any View ■ 49
Carbon Copy ● ■ 135
Corel SCSI ■ 229
Direct Access ■ ■ CALL
Doubletools for Doublespace ● ■ 69
Easy Menu 5.0 ■ CALL
Eclipse Find ■ 45
Fantastic Recall ■ 39
Mac in Dos ■ ■ CALL
Norton Antivirus ■ ■ 99
Norton Desktop ■ ■ 125
Norton Utilities 7.0 ■ 125
PC Tools Deluxe 8.0 ■ ■ 99
PC Weathermen ■ 35
Perfected ■ 49
PK Zip ■ 49
QEMM 386 ■ 69
Ready Alm File ■ 39
Spacemanager ■ ■ 35
Spinrite 3.1 ■ 89
Stacker 3.1 ■ ■ 99
Star Trek Screen Saver ■ 39
Super PC Kwik ■ 45
Superstor Pro ■ ■ 89
Uninstaller ■ 49
Windstudio Gold ■ 65
WORD PROCESSING
401 Great Letters ■ 39
Ami Pro v3.01 ■ 255
Ami Pro v3.01 Upgrade ■ CALL
By Design for WP ■ ■ 69
LetterPerfect ● 99
MS Word 6.0 ● 329
MS Word 6.0 ■ 319
Perfected ■ 39
WordPerfect 6.0 ● ■ 299
WordPerfect Upgrade 6.0 ● ■ CALL

DUSTIN DISCOUNT SOFTWARE

Plain Wrap Prices,
Black Tie Service.

20865 Ventura Blvd. Woodland Hills, CA 91364 (818) 715-0174

Call Toll Free To Order
1-800-274-6611
Fax Your Order 24-hours
1-818-884-5310

We will promptly replace any defective items returned within 30 days, but cannot guarantee compatibility. There is a 15% restocking fee on any non-defective, unopened goods, and all returns must be accompanied by a Returned Merchandise Authorization. Software prices do sometimes fluctuate beyond our control and may change, for better or worse, without notice. While ground shipments are free, we do ask $11 per item for 2-day, $22 per item for overnight and $5 for C.O.D. Although shipping heavier items may be slightly more, bulk orders can be a lot less. Please call us for any item not listed.

Circle 274 on reader service card.

CD-ROM SOFTWARE

BUSINESS SOFTWARE
9 Digit Zip Code Directory ● 35
Corel Draw 3.0 ■ 139
Corel Draw 4.0 ■ ● 395
Direct Phone ■ ● 99
Global Explorer ■ ● 99
Phone Disk USA ● 59
Select Phone ■ ● 179
Street Atlas USA ■ 99
CLIPART & GRAPHICS
Corel Clip Art ■ ▲ CALL
Publisher's Paradise ■ ● 35
EDUCATION & TRAINING
Animals ■ ● 55
History of the World ■ ● 55
Mavis Beacon Teaches Typing ■ ● 39
Monarch Notes ■ ▲ 49
ENCYCLOPEDIAS
Groller's MM Entry Upgrade ■ ● 99
Groller's MM Encyclopedia ■ ● 199
ENTERTAINMENT
20th Century Video Almanac ● 55
Aegis ■ ● 59
Critical Path ■ ● 55
Dinosaurs ■ ● 59
Dune ■ ● 59
Hell Cab ■ ● 49
Inca-CD ● 49
King's Quest VI ■ ● 55
Legend of Kyrandia ■ ● 45
Oceans Below ■ ● 35
Scrabble ■ ● 35
Seventh Guest ■ ● 59
Space Shuttle ■ ● 35
GENERAL REFERENCE
Auto Insight ■ ● ▲ CALL
Beatles Next Dbs Night ■ ● 35
Berlitz Spanish or French ● 109
Body Insight ■ ● ▲ CALL
Human Endurance ■ ● 35
JFK Assassination ■ ● 45
MS Bookshelf 1993 ■ 135
Sports Almanac ■ ● 45
The Animals ■ ● 55
Time Table of History ● 59
U.S. Atlas ■ ● 39
UFO ■ ● 39
World Atlas ■ ● 39
MUSIC SOFTWARE
MS Beethoven ■ ● 59
MS Musical Instruments ■ ● 59
Soundsations ■ ● CALL
SHAREWARE & UTILITIES
CD Speedway ■ ● 65
Software Vault: Gold ■ ● 25

CD-ROM HARDWARE

ACCESSORIES
CD Caddies (6-pack) ★ 39
Hello Music ★ 275
Reelmagic Card ★ 399
CD-ROM DRIVES
NEC CDR 503 3x ★ 519
NEC CDR 402 2x ★ 499
Sony Double Speed External ★ 299
Sony Double Speed Internal ★ 249
Toshiba 3401 External ★ 319
Toshiba 3401 Internal ★ 429
MULTIMEDIA KITS
Fusion Double CD 16 LX ★ 479
Korg Speakers ★ CALL
Memplex Multisystem ★ 799
Multimedia Station Pro with
NEC 3X Drive ★ 799
Multimedia Station Pro with
Sony Double Speed Drive ★ 449
Multimedia Station Pro with
Toshiba 3401 Drive ★ 479
Sound Blaster Kits ★ CALL
WinStorm Kit ★ 575
Yamaha Speakers ★ CALL
SOUND CARDS
Pro Audio Spectrum 16 ★ 179
Pro Audio Studio 16 ★ 255
Sound Blaster 16 ASP ★ 299
Sound Blaster 16 ★ 179

THE DUSTIN DIFFERENCE

Free Ground Shipping • Same Day Shipping
Overnight Delivery Available • PO's Welcome
Government & Educational Pricing
Visa, MC & AMEX Accepted

THE DUSTIN DIFFERENCE

No Credit Card Surcharges
Credit Card Not Charged Until Shipping
Manufacturers' Warranties
Call for Any Items Not Listed

COMPAQ AND MICROSOFT.
THE CONNECTION THAT'S MAKING
"PLUG AND PLAY" A REALITY.

Just about everyone who's ever used a computer has experienced the same thought: Wouldn't it be great if setting up or upgrading your machine was as easy as turning it on?

The idea is called "Plug and Play." People have been talking about it for years. But now, an ongoing partnership between Compaq and Microsoft, working with other industry leaders, is actually making it happen.

Plug and Play is the result of some very fresh thinking in both hardware and software – an accomplishment that tapped the combined engineering expertise of both companies. Together, Compaq® computers and the next version of the Microsoft® Windows™ operating system (code-named Chicago) will deliver the long-promised benefits of true Plug and Play: easy setup, easy expansion and easy connection to peripherals.

Which means no more configuration headaches. No more hidden switches, cryptic codes or mystery.

Even today, Compaq is shipping computers that will take full advantage of Plug and Play technology as soon as the forthcoming version of Windows is available. So the Compaq & Windows combination will quickly become the standard for Plug and Play computing. A welcome reassurance for people who buy computers.

COMPAQ Microsoft®

©1994 Compaq Computer Corporation. All Rights Reserved. Compaq Registered U.S. Patent and Trademark Office. Microsoft is a registered trademark of the Microsoft Corporation. Windows is a trademark of the Microsoft Corporation.

Circle 111 on reader service card.

PC Computing

COLOR SUBNOTEBOOKS
105 How Small Can Color Get?
MARTY JEROME
Tornado power! Munchkin size! Full-glitz color! This can't be Kansas, Dorothy! Welcome to the land of no-hassle, no-compromise color subnotebooks. We put five of the very first ones through usability and performance testing. One will knock your shoes off. Ding dong, the back-breaking lug-along laptop is dead.

134 Scan it! Edit it! Print it!
MATTHEW LAKE, CHRISTINE GRECH, AND KYLA K. CARLSON
Face it. Image is everything. And nothing will improve the image of your documents better than color text and pictures. Have we got the products for you: First, affordable color scanners, then a new generation of image editors, and finally, inexpensive cutting-edge printers. We offer you—voilà—a total solution!

PAGE 134
GETTING THAT MILLION-DOLLAR IMAGE

154 Big Drives in Tiny Packages
ED BOTT AND ADAM MEYERSON
Sound. Video. Graphics. And more text than you can cram into a 50-pound feedbag. Don't know about you, but we think this data glut is getting serious. Now there's good news: A new class of tiny (and we mean tiny) hard drives can store up to two gigabytes (that "g" is not a typo). We put 22 state-of-the-art IDE and SCSI drives through their performance paces and picked the winners. You really can't afford anything less. Can you?

PAGE 154 STAKE OUT THE CAPACITY YOU NEED

SURFING THE INTERNET

60 How to Enter Cyberspace
PRESTON GRALLA
Everyone wants it, few understand it. Until now. We show you how to hang ten online with five easy Windows front ends to the Internet.

180 The Mother of All Nets
BRIAN LIVINGSTON
It's a smorgasbord of information, but navigating the Internet is no piece of cake. Here are the pitfalls and how to avoid them.

COVER PHOTOGRAPH BY STAN MUSEK

New!

32 PC Meets Consumer Electronics: A Report from the Consumer Electronics Show in Las Vegos
Advanced Gravis's Gravis Personal Piano System, BellSouth's Simon, Media Vision's Reno, Medio Multimedia's A2Z Magazine, Sharp's CE-FM1, Sigma Designs' ReelMagic Upgrade Kit, Swatch Telecom's BeepUp, and Zenith's HomeWorks.

34 Comtrade's EISA VL-Bus Professionol 66, DEC's DECpc LPv ond DECpc LPx, IBM's PS/1 Consultant, ond Inmac's Insignia 466P
Five meat-and-potatoes PCs to fit your budget.

36 CrossTies Softwore's CrossTies
Easy-to-use PIM power.

46 Microsoft's Money 3.0
Narrows the gap on Quicken.

48 Adoptive's PeopleScheduler 2.0

50 Apple's QuickToke 100 ond Dycom's Model 4

54 Citizen's Notebook Printer II And Conon's BJ-10sx

56 Conon's IX-4015 Color Sconner

60 Americo Online, Delphi Internet Services' Bix, ond The Pipeline

64 Cbis's Desk To Desk ond Performonce Technology's PowerLan 3.0

76 Old Favorites, Plus the Usuol Gamut of Titles on CD-ROM

PAGE 50 APPLE'S QUICKTAKE 100

80 PC/C Update

82 Best Bets

84 Softwore Soleswire

231 Spec Wotch/Direct to You

293 Product Index

Columns

20 Ed Bott
Three boring (but smart) reasons to buy a CD-ROM.

25 Letters

88 John C. Dvorok
Trust Congress? Try this unbelievable lair of slop.

90 Gil Schwortz
The hard life of the corporate criminal: A tale of software piracy.

98 Dvorok vs. Somerson
PowerPC: A surefire winner or just Motorola dreamin'?

310 Penn Jillette
I'll bet it's your damn thurman unit again!

Help

180 The Mother of All Networks
An introduction to the Internet, including tools, tips, and books to help you navigate.

188 Windows
Optimize your notebook for trouble-free travel.

192 DOS
Important memory management tools Microsoft didn't tell you about.

198 App Tips
Inside info on word processors, spreadsheets, databases, and desktop software.

208 How It Works
File compression software.

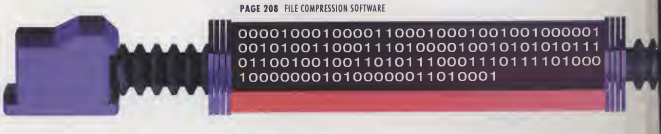
210 F1: Digital Sound
Picking the right type of digitization for your PC.

218 Toolkit
Dynamic data exchange: The greatest common denominator of Windows interconnection.

223 How to Join PC/Contact

224 Q&A
Solutions to PC riddles.

PAGE 208 FILE COMPRESSION SOFTWARE



YOUR NEXT COMPUTER IF YOU CAN'T FIND

Compaq Contura Aero

Weighing in at a mere 3.5 lbs., the Contura® Aero is the perfect traveling companion. Though lightweight, it's packed with features, including a 486 processor that can run a range of applications with ease, as well as an integrated Compaq trackball that allows for comfortable use on the road.

$1,399
*Or $50 per month**

Aero™ Features:

Only 3.5 lbs.
and 7.5" x 10.25" x 1.5"

25MHz 486SX, 4MB RAM

84MB Hard Drive
(170MB available)

8" Monochrome Backlit VGA Display

Integrated Compaq EasyPoint™ Trackball

PCMCIA Type II slot

NiMH Battery & AC Adapter

Preinstalled MS-DOS® 6.2,
MS-Windows™ 3.1, and TabWorks

CALL FOR AVAILABILITY.

Compaq Contura

Monochrome
$1,799
*Or $64 per month**

Color
$2,449
*Or $88 per month**

An affordable notebook with the power and expandability for demanding business applications, and support for communications options. Power management features extend battery life, and security features protect data.

Contura Features:

25MHz 486SL(DX)

4MB RAM

120MB Hard Drive
(209MB available)

3.5" Diskette Drive

9.5" Monochrome VGA or 9.5" Color
Advanced Passive VGA Display

Compaq Trackball

Battery & AC Adapter

Only 6.2 lbs.

Preinstalled MS-DOS 6.2,
MS-Windows 3.1, & TabWorks

Compaq Concerto

The power of a desktop, the convenience of a notebook. Lets you work however and wherever you want—with a keyboard or a pen. Features Compaq MaxLight™ 9.5" Monochrome VGA backlit display, and power conservation features.

$2425
*Or $87 per month**

Concerto™ Features:

25MHz 486SL(DX),
(33MHz available)

4MB RAM

120MB Hard Drive (250MB available)

3.5" Diskette Drive

Integrated High-Resolution Digitizer
with cordless, intelligent pen

Local Bus Video

2 PCMCIA Type II slots (or single Type III)

Preinstalled MS-DOS 6.2,
MS-Windows for Pen Computing 1.0a,
PenPower for MS-Excel, InkWare
NoteTaker, and TabWorks

intel inside

*Leasing is provided by GE Capital Services for a term of 36 months and is subject to approved credit and certain terms and conditions. Call for details. †Restrictions and exclusions apply. Monitors, battery packs and certain options are covered by a one-year warranty. ©1994 Compaq Computer Corporation. All rights reserved. Compaq and the Compaq Logo Registered U.S. Patent and Trademark Office. Contura is a registered trademark. Concerto, ProLinea, Aero, EasyPoint and MaxLight are trademarks, and Compaq DeskPro and Solution Pag are service marks of Compaq Computer Corporation. Products, prices and programs are subject to change without notice. Other products are trademarks or registered trademarks of their respective companies. Microsoft and MS DOS are registered trademarks, and Windows is a trademark of Microsoft Corporation. The Intel Logo is a registered trademark and Pentium is a trademark of Intel Corporation. Offer available in the U.S. only.

The Compaq 3-Year Warranty†

MAY BE ON THIS PAGE. IT, CALL FOR HELP.

Compaq ProLinea MT

MT 4/33s $1,849 *Or $66 per month**

MT 4/66 $2,499 *Or $89 per month**

Minitower case with EasyAccess side panel has five expansion slots and five drive bays for superior expandability. Just add options like a fax/modem, tape drive, or CD-ROM drive. Upgradable to Pentium™ technology.

ProLinea™ MT Features:

33MHz 486SX or 66MHz 486DX2 (upgradable to Pentium Technology ZIF socket)

4MB RAM (upgradable to 64MB)

340MB Hard Drive

3.5" Diskette Drive

Local Bus Video with 1MB

14" SVGA Color Monitor (1024 x 768)

Preinstalled MS-DOS 6.2, MS-Windows 3.1, and TabWorks

Preinstalled Multimedia Solution Paq available.

Compaq ProLinea 4/33s

Affordable, powerful, feature-rich, and ever popular. $1,625 *Or $58 per month**

Multimedia Solution Paq™

With SoundBlaster 16-sound board, internal dual-speed CD-ROM drive, external stereo speakers, microphone & multimedia software. Starts at $499.

ProLinea 4/33s Features:

33MHz 486SX (upgradable to 486DX2/66)

4MB RAM (upgradable to 32MB)

240MB Hard Drive

3.5" Diskette Drive

Local Bus Video with 1MB

14" SVGA Color Monitor (1024 x 768)

Preinstalled MS-DOS 6.2, MS-Windows 3.1, and TabWorks.

Preinstalled Multimedia Solution Paq available.

Compaq ProLinea Net1/25s

An ideal choice if you're looking for excellent performance at an affordable price. The all-in-one styling saves desktop space and makes set-up as simple as plugging the unit in. TabWorks, a Compaq exclusive, is preinstalled for greater ease of use. Network-ready and ideal for peer-to-peer communications.

$1,299 *Or $47 per month**

ProLinea Net1/25s Features:

25MHz 486SX (upgradable to 486DX2/66)

4MB RAM

100MB Hard Drive (200MB available)

3.5" Diskette Drive

Built-in 14" SVGA Color Monitor (1024 x 768)

Integrated Ethernet controller (Token Ring available)

Energy Star Compliant

Preinstalled MS-DOS 6.2, choice of MS-Windows 3.1 or MS-WFW 3.11

COMPAQ DirectPlus

The Compaq DirectPlus Catalog

1-800-888-4420

Weekdays 7-7, Sat. 10-4 CST

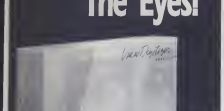
Ask for our new free catalog.

Circle 177 on reader service card.

For DOS And Windows!

Checking Out Hot Multimedia Products?

Check Out The 'Eyes!



ComputerEyes/RT

Video Frame Grabbers

- Easily capture high-quality images from camcorder, VCR and video camera
- Available real-time or single frame grabber
- Capture video and images and motion video clips
- Excellent, easy-to-use "S" and Windows control software
- Hundreds of applications - desktop publishing, image databases, paint, and presentation programs, graphic arts, Video For Windows, etc.
- ComputerEyes/RT for IBM PC - $399.95 ComputerEyes/RT Monochrome - $299.95 New ComputerEyes/LPT parallel port frame grabber for laptops or any PC - $399.95

New!

TelevEyes/Pro

Computer-to-TV Converter

- New, no-compromise video scan converter easily converts any computer output for display to large TV monitors, video projectors, or video tape
- Same hardware works with both Macintosh and IBM PC - all cables included
- Simultaneous computer and TV display
- Excellent for use with all large-screen monitors, video projectors, and TV's
- Full genlock allows for overlaying computer output over a live video for video titling, editing, and special effects
- New TelevEyes/Pro - only $799.95 Low-cost TelevEyes - $299.95

See Your Dealer Or Call For More Information

Digital Vision, Inc.
270 Bridge St., Dedham, MA 02026
(617) 329-5400 (800) 346-0090

Circle 220 on reader service card.

PCComputing

EDITOR-IN-CHIEF Paul Somerson

EDITOR
Bill Roberts

FEATURES
FEATURES EDITOR Sebastian Rupley
SENIOR EDITORS Howard Baldwin, Elizabeth Longsworth, Wendy Taylor
ASSOCIATE EDITOR Christine Grech
ASSISTANT EDITOR Lies La Grange
EDITORIAL ASSISTANT Jozelle Cox

NEWS AND REVIEWS
REVIEWS EDITOR Raphael Needleman
SENIOR EDITOR Mike Hogan (News)
ASSOCIATE EDITORS Cyndy Bates, Kyle K. Carlson, Matthew J. Lake, Shyamala Reddy
ASSISTANT EDITOR Richard Schwerin
EDITORIAL ASSISTANT Ilan Greenberg

HELP
HELP EDITOR John Montgomery
ASSOCIATE EDITOR Yael Li-Ron
ASSISTANT EDITOR Chris Sandlund

LABS AND TECHNICAL
SENIOR TECHNICAL EDITOR/LAB DIRECTOR Adam Meyerson
ASSOCIATE TECHNICAL EDITORS Scott Noyler, John Teschek
TEST MANAGER Nathan Garcia
PROJECT LEADER Robert Bayley
INVENTORY COORDINATOR Ibrahim Gul

SENIOR CONTRIBUTING EDITORS
Ed Bott, Ron White

CONTRIBUTING EDITORS
George Bernbum, Carol Olsen Day, John C. Dvorak, Mike Falkner, Preston Gralla, Robert Hummel, Marty Jerome, Penn Jillette, Woody Leonhard, Brian Livingston, Stephen Manes, Sally Neuman, Jeff Prosise, Winn L. Rosch, Gil Schwartz, Chris Shipley

EDITORIAL PRODUCTION
MANAGING EDITOR Debra McDonald
ASSISTANT MANAGING EDITOR Lori A. Uzzo
ELECTRONIC PUBLISHING MANAGER Mark C. Li
SENIOR COPY EDITORS Kim Austin Gallegos, Elisa M. Welch
COPY EDITORS James Oliver Cury, Joe Rossi
PRODUCTION EDITOR Laura Wert
RESEARCH EDITOR Heather Mackey

ART AND DESIGN
ART DIRECTOR Michael Vapp
ASSOCIATE ART DIRECTOR Allysen Appen
SENIOR DESIGNER Kate Godfrey
SENIOR TECHNICAL ILLUSTRATOR Timothy Edward Downs
DESIGNER Regan Honda
ART ASSOCIATE Peggy Smith

PC/COMPUTING ON CD-ROM
PC/Computing is available as part of Computer Select, a CD-ROM published by Computer Library. Each monthly issue of Computer Select contains the full text of the most recent year's issues and more than 60 other leading computer industry publications. For subscription information, call Computer Library at (800) 827-7889, extension 708.

PUBLISHER Jonathan Sacks

MARKETING AND SALES
ASSOCIATE PUBLISHER Nancy Newmon
DIRECTOR OF MARKETING William P. Howard
GENERAL BUSINESS MANAGER Anne H. Ashmead
SUBSCRIPTION DIRECTOR Charles Mast
SINGLE COPY SALES AND MARKETING DIRECTOR James E. Gerth
SALES DEVELOPMENT MANAGER Tamar Heopel
PROMOTION AND EVENTS MANAGER Julie McGill
MARKETING INFORMATION SPECIALIST Kimberly Black
EVENTS COORDINATOR Caryl Dearing
MARKETING COORDINATOR Katrina Herms

ADMINISTRATIVE
EXECUTIVE ASSISTANT TO THE PUBLISHER Marilyn Flannigan Lynch
EXECUTIVE EDITORIAL ASSISTANT Patti McCaffrey
ASSOCIATE PUBLISHER'S ASSISTANT Melissa Eckholm
RECEPTIONIST Melanie McCullough

PRODUCTION
PRODUCTION DIRECTOR Carlos Lugo
PRODUCTION MANAGER Stephen DeLacy
ASSISTANT PRODUCTION MANAGER Monique L. Risse

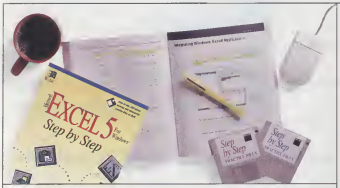
ZIFF COMMUNICATIONS COMPANY
CHAIRMAN EMERITUS William B. Ziff, Jr.
CHAIRMAN AND CEO Eric Hippeau
SENIOR VICE PRESIDENT AND CHIEF FINANCIAL OFFICER Bruce R. Barnes
SENIOR VICE PRESIDENT Steven C. Feinman
VICE PRESIDENT, GENERAL COUNSEL AND SECRETARY J. Malcolm Morris
VICE PRESIDENT, BUSINESS MANAGER T. L. Thompson
VICE PRESIDENT, CHIEF INFORMATION OFFICER Thor Olson
CONTROLLER AND TREASURER Timothy J. Mitchell

HOW TO CONTACT THE EDITORS
Address questions and feedback to 950 Tower Lane, 19th Floor, Foster City, CA 94404, via MCI Mail (350-2648), or via PC/Contact on CompuServe (76000,21; refer to page 223 for log-on instructions). Or telephone us at (415) 578-7000. If you buy a product advertised in PC/Computing, are dissatisfied, and can't resolve the problem, write (please do not call) Marilyn Flannigan Lynch, Executive Assistant to the Publisher, PC/Computing, at the above address. Include copies of all correspondence. PC/Computing is under no obligation to review unsolicited products. All unsolicited submissions become the property of PC/Computing. If you want to write for PC/Computing, send a query letter, along with samples of your published writing, to Bill Roberts, Editor.

SUBSCRIPTION INQUIRIES/CHANGE OF ADDRESS
For subscription service questions, address changes, or how to order: Call toll-free (800) 365-2770 in the United States and Canada, or (303) 447-9330 for all other countries; or write to PC/Computing, P.O. Box 58229, Boulder, CO 80322-8229. The subscription rate is $24.97 for one year (12 issues). Canada and all other countries require an additional $16 for postage. For back issues (subject to availability), send a check or money order for $7 ($8 outside the United States) to Back Issues Department, Ziff-Davis Publishing Company, P.O. Box 53131, Boulder, CO 80322-3131.

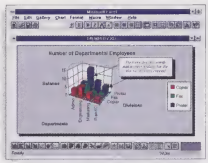
PC/Computing (ISSN 0899-1847) is published monthly by Ziff-Davis Publishing Company, a division of Ziff Communications Company, One Park Ave., New York, NY 10016. Second-Class postage paid at New York, NY 10016 and at additional mailing offices. Postmaster: Send address changes to PC/Computing, P.O. Box 58229, Boulder, CO 80321-8229. Printed in the U.S.A. Canada Post International Publications Mail Product (Canadian Distribution) Sales Agreement No. 278513. The Canadian GST registration number is R123669673.

Personal Software Training Made Easy



Learning to use the latest versions of Microsoft® Excel, Microsoft Word, and Microsoft Access® has never been easier—or more convenient. Introducing *Step by Step* books with disks, from Microsoft Press.

Whether you're upgrading or starting from scratch, *Step by Step* books with disks are designed to help you learn quickly and efficiently on your own—at your own pace. You'll be up and running in no time—without classes or time away from work.

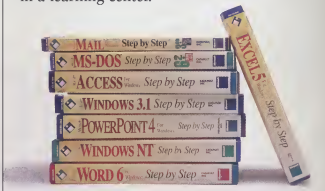


Timesaving practice files included on disk!

Each book comes complete with integrated examples on disk so you can put software features to use immediately. If you're a beginner, you can complete each course from start to finish. If you're upgrading from a previous version of the program, you can turn directly to information about new features. If you're switching from another software program, *Step by Step* books help you get results fast. Each lesson is completely self-contained and loaded with screen shots to guide you at every step. Interactive practice and review sessions make remembering what you've learned a snap.

MICROSOFT® WINDOWS™ COMPATIBLE

Step by Step books are flexible too. They can support existing software training programs and can be used as a core resource in a learning center.



To order, or for a FREE catalog of Step by Step *books, call 1-800-MSPRESS, Dept. APC.*

Learn to use Microsoft software the fast, easy way. Ask for *Step by Step* books from Microsoft Press. Available everywhere computer books are sold or directly from Microsoft Press.

Step by Step Books—Value, Quality, and Consistency in Do-It-Yourself Training

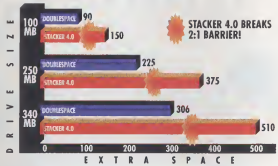
Microsoft Press

Accessing the Source

One Microsoft Way, Redmond, WA 98052-6399. In Canada, call Macmillan Canada, 416-293-8464, ext. 3410.

SOFTWARE ETC
Circle 178 on reader service card.

Here's the deal (compressed version): We'll beat anybody, guaranteed. ■ No catch, no conditions. New Stacker® 4.0 for Windows & DOS will simply give you more extra disk space than any other compression software, or we'll refund your money. Period. ■ Only Stacker 4.0 breaks the 2:1 compression ratio barrier, combining Stac's patented Stacker LZS™ technology with Stacker SmartPack™ to store data more efficiently.



Stacker gives you up to 375 extra megabytes on a 250MB drive—that's 150 megabytes more than DoubleSpace offers. ■ And the most powerful compression software is also

INTRODUCING
IF IT PERFORMS
THE COMPET
GIVE YOU YOUR

© 1994, Stac Electronics. Stac and Stacker are registered trademarks of Stac Electronics. Stacker SmartPack, Stacker are trademarks of Microsoft Corporation. Novell Yes: Developer tested only. Novell makes

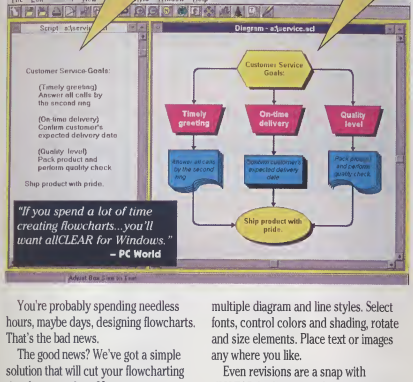
the most full-featured and reliable. For instance, Stacker 4.0 gives you instant access to its tools within Windows, so managing your drives is easier than ever. Stacker 4.0 even automatically optimizes itself for your particular data. ■ With Novell's DOS Protected Mode Services (DPMS) and DOS 6, Stacker reduces your conventional DOS memory requirement below 1MB to just 17KB. ■ It also secures your data by protecting the driver so that other DOS applications can't interfere with it. Beyond that, new Stacker AutoSave™ automatically backs up important file system information. ■ Get new Stacker 4.0 today from your local reseller, or call **1-800-522-STAC (7822)** ext. **6304** for information. Stacker. It's guaranteed to put the squeeze on ordinary compression software.

STAC®

STACKER 4.0. ANYTHING LIKE ITION. WE'LL MONEY BACK.

LZS and Stacker AutoSave are trademarks of Stac Electronics. Microsoft, MS-DOS, DoubleSpace and Windows no warranties with respect to this product. From outside the U.S., call 619-431-6712.

If you're not flowcharting with allCLEAR for Windows you're wasting your time.



You're probably spending needless hours, maybe days, designing flowcharts. That's the bad news.

The good news? We've got a simple solution that will cut your flowcharting time by as much as 80 percent.

Introducing allCLEAR for Windows: the only software that *automatically* draws flowcharts from text.

allCLEAR allows you to do all kinds of flowcharting in a fraction of the time you're spending now, simply by describing your process in *plain English*. Whether you need simple process diagrams, organizational charts or complex, multi-level decision trees, a few minutes of keystroke text and boom—you're done.

allCLEAR for Windows allows you to easily customize sections or entire flow charts. Choose from over 150 shapes, multiple diagram and line styles. Select fonts, control colors and shading, rotate and size elements. Place text or images any where you like.

Even revisions are a snap with allCLEAR for Windows. Simply edit your text and it automatically re-draws, re-routes, and re-sizes.

allCLEAR for Windows comes complete with a 60-day no-risk guarantee. Network and DOS versions are also available. Get the whole story on this $299 time-saver. Phone now for your free allCLEAR for Windows Info Kit, with user samples, illustrated brochure & product reviews.

Don't waste another minute. Call now for your free Info Kit.

1-800-338-1759

yes If runs with NetWare

CLEAR Software, Inc.
385 Elliot Street, Newton, MA 02164

PCC 4/94

Circle 183 on reader service card.

PC Computing

ZIFF-DAVIS PUBLISHING COMPANY

CHAIRMAN AND CEO Eric Hippeau
PRESIDENT J. Scott Briggs
PRESIDENT, ZIFF-DAVIS DOMESTIC PUBLICATIONS GROUP Ronni Sonnenberg
EXECUTIVE VICE PRESIDENT, CENTRALIZED OPERATIONS GROUP Mike Edelhart
EXECUTIVE VICE PRESIDENT, INTERNATIONAL J. B. Holston III
GROUP VICE PRESIDENT, CONTROLLED CIRCULATION PUBLICATIONS Claude P. Sheer
GROUP VICE PRESIDENT, PAID CIRCULATION PUBLICATIONS Jeff Ballowe
SENIOR VICE PRESIDENT, CIRCULATION Baird Davis
SENIOR VICE PRESIDENT, MARKETING Paul H. Chook
SENIOR VICE PRESIDENT Rachel Greenfield
VICE PRESIDENT, CENTRAL ADVERTISING SALES Bob Bixler
VICE PRESIDENT, CIRCULATION SERVICES James F. Ramsley
VICE PRESIDENT, CONTROLLER Howard Sokolnik
VICE PRESIDENT, CREATIVE SERVICES Herbert Stern
VICE PRESIDENT, EUROPE Frank Kelcz
VICE PRESIDENT, HUMAN RESOURCES Royno Brown
VICE PRESIDENT/MANAGING DIRECTOR MAGAZINE NETWORKS Joseph Gillespie
VICE PRESIDENT, MARKETING SERVICES Ann Pollok Adelman
VICE PRESIDENT, NEW PROJECTS AND STRATEGIC PLANNING Robert Ziff
VICE PRESIDENT, OPERATIONS Dirk Ziff
VICE PRESIDENT, PRODUCTION Roger Herrmann
VICE PRESIDENT, RESEARCH Rolf M. Wulfsberg
VICE PRESIDENT, TECHNOLOGY William B. MacKrane
VICE PRESIDENT, ASSISTANT TO THE CHAIRMAN Tom McGrade
VICE PRESIDENT Jim Stafford
VICE PRESIDENT Don Byrnes
CHIEF INFORMATION OFFICER Wellington Y. Chiu
GENERAL MANAGER Bruce W. Bourne
EXECUTIVE DIRECTOR, INFORMATION SYSTEMS Owen Weekley
EXECUTIVE DIRECTOR, MARKETING SERVICES Jim Manning
DIRECTOR OF LICENSING Jean Lamersdorf
DIRECTOR OF PLANNING Gary A. Gustafson
PRODUCTION DIRECTOR Walter J. Tarlecki
DIRECTOR OF CORPORATE MARKETING Susan Delman
EDITORIAL DIRECTOR Lewis D'Vorkin
CO-DIRECTORS, ZD BENCHMARK OPERATION Bill Catchings, Mark L. Van Name
DIRECTOR, DIRECT MARKETING PROGRAMS Alicia Marie Ivans
DIRECTOR OF PUBLIC RELATIONS Gregory Jarboe

ADVERTISING OFFICES

PC/Computing serves its advertisers from eight offices throughout the United States. See page 18 for regional listing. *PC/Computing* is an independent journal, not affiliated in any way with the International Business Machines Corporation. *PC/Computing* is a registered trademark of ZIff-Davis Publishing Company, L.P. The following are trademarks of ZIff-Davis Publishing Company, L.P.: *American Computing, Fast Facts, The Magazine for Business Computing Experts, PC/Contact, PC Sources, Perfect 10, Personal Computing, Pro Tips, Software Secrets,* and *The Ultimate PC.* Entire contents © 1994 by ZIff-Davis Publishing Company, L.P. All rights reserved.

The Apple Report On PowerPC

Number 2 – RISC Performance and Cross-Platform Compatibility

Many of the most popular applications have been or are being optimized to take advantage of the high-performance PowerPC processor.

PowerPC chips are faster and less expensive than Pentium chips – so are the personal computers they will run.

A complete Macintosh system with PowerPC will cost well under $2,500, but will offer better performance than higher-priced Pentium-based systems.

With SoftWindows, Macintosh with PowerPC will have the ability to run DOS and Windows applications, unmodified.

For more information about Macintosh with PowerPC, call 1-800-732-3131, ext. 150, in the U.S. We'll send you a copy of our informative, free booklet, *PowerPC Technology: The Power Behind the Next Generation of Macintosh Systems*. In Canada, call 1-800-665-2775, ext. 910.

In the first half of 1994, Apple will introduce a new family of computers that already has the entire computer industry standing on end.

They will offer better performance than computers based on the X86 microprocessors. They will be extremely competitive on a price basis. And they will be compatible with Windows and DOS applications, by using SoftWindows software.

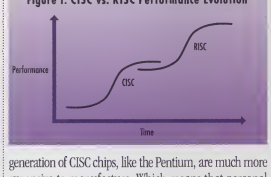
They will be based on the revolutionary new PowerPC™ microprocessor, created jointly by Apple, IBM and Motorola.

For the first time, desktop personal computers will take advantage of RISC chip architecture previously found only in high-performance workstations. This advance will make possible quantum improvements in the way we manage and work with information.

RISC vs. CISC.

Tremendous advances have been made in CISC architecture over the years. However, the physical limitations of the new, high-performance CISC design mean that CISC chips must be significantly bigger and more complex, and must run at hotter temperatures to perform the same tasks as comparable RISC chips. Consequently, the newer

Figure 1. CISC vs. RISC Performance Evolution



generation of CISC chips, like the Pentium, are much more expensive to manufacture. Which means that personal computers powered by PowerPC chips can offer a significant advantage in price as well as in performance.

As you can see on the chart, RISC microprocessors offer dramatically greater potential for growth, leading us well into the next century and increasing the practicality of features like voice recognition, videoconferencing, object-oriented software and multimedia capabilities – functions that will be integral to doing business in the 21st century.

More compatible personal computers.

Apple's new generation of Macintosh® personal computers built around the PowerPC chip offer the ability to run MS-DOS and Windows applications, as well as Macintosh software. Moving from one environment to the next will be seamless and, even more importantly, it will be effortless.

PC users who move to Macintosh with PowerPC will gain access to the large number of new applications which take advantage of the incredible performance of the new PowerPC chip.

Higher-performance optimized applications.

When PowerPC microprocessor-equipped Macintosh computers begin shipping, software developers including Microsoft, WordPerfect, Adobe, Aldus and Claris will begin shipping new versions of their most popular software, specifically rewritten to take full advantage of the new processor's capabilities.

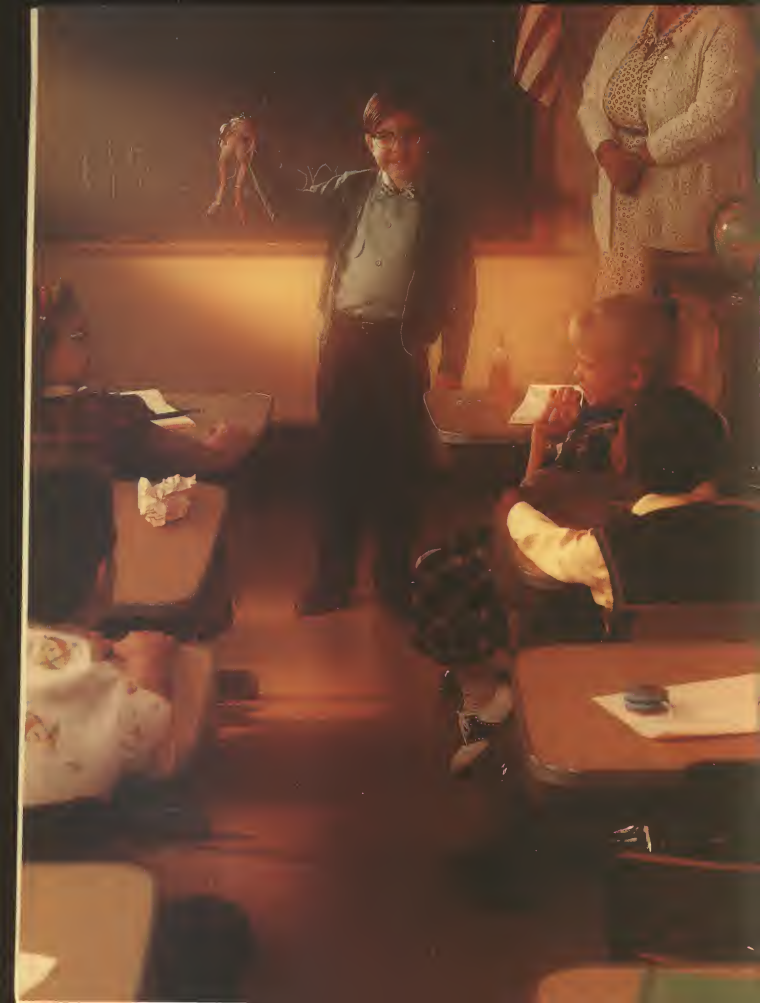
These optimized, sometimes called "native," applications will offer significantly faster performance than their MS-DOS, Windows or current Macintosh counterparts.

Unprecedented value.

Because RISC-based personal computers cost less to manufacture than equivalent systems based on CISC chips, we will be able to make this technology available for well under $2,500 for a complete mainstream desktop system.* Competitive with a lower-performance, Pentium-based PC.** Watch for Apple Report #3, coming soon.

Apple

*A complete Macintosh system with PowerPC includes computer, keyboard, monitor and Macintosh OS. Price subject to change without notice. **Based on current applications level testing as of January 1994. © 1994 Apple Computer, Inc. All rights reserved. Apple, the apple logo and Macintosh are registered trademarks of Apple Computer, Inc. PowerPC and the PowerPC logo are trademarks of International Business Machines Corporation. MS-DOS is a registered trademark of Microsoft Corporation. Pentium is a trademark of Intel Corporation. SoftWindows is a trademark of Insignia Solutions Inc.



NOW YOUR PRESENTATIONS CAN BE AS EASY AND EFFECTIVE AS THEY USED TO BE.

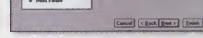
Introducing Microsoft PowerPoint 4.0.

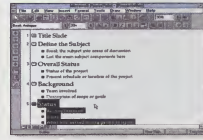
Remember when presentations were no big deal? Organizing your material was a cinch. You always made an impact on the crowd.

Welcome back to simpler days, with new Microsoft® PowerPoint® presentation graphics program 4.0. The easy way to create powerful, convincing presentations that produce the results you want.

Getting started is always the hard part, right? Not anymore.

Using an innovative feature called AutoContent Wizard, pick a





With AutoContent Wizard, first select a presentation type, then simply enter your content in the outline provided.

presentation type. Then, the Wizard helps you quickly turn your ideas into a fully formatted presentation.

It's all part of IntelliSense™ technology, built-in intelligence that makes routine tasks automatic and complex tasks easier: a unique feature of the Microsoft Office family.

Get your point across clearly. On paper, overheads, slides or electronic presentations.

For more help, you don't have to look far. AutoLayout makes it easy to add new slides, with 21 formats, including two-column text and tables. Finally, use Rehearsal to practice your presentation against the clock. So you're sure to cover your points in the allotted time.

The fact is, PowerPoint 4.0 is so easy to use, you may already know how. Why? Over 100 PowerPoint tasks are done exactly the same way in Microsoft Excel and Word. And now with OfficeLinks, turn a Word 6.0 document into a presentation in PowerPoint with a click.

All told, new PowerPoint 4.0 makes it easy to give more effective presentations. So you'll once again master the art of show-and-tell. Visit a reseller or to find one near you call (800) 695-2850, Dept. KZ8.

Microsoft Office

©1994 Microsoft Corporation. All rights reserved. Microsoft Office Professional includes: Microsoft Excel, Word, PowerPoint, Microsoft Access® database management system and a Mail workstation license (Mail server and software acquired separately). In the 50 United States, call (800) 695-2850, Dept. KZ8. In Canada, call (800) 563-9048. Outside the 50 United States and Canada, call your local Microsoft subsidiary or (206) 936-8661. Microsoft, Microsoft Access and PowerPoint are registered trademarks and IntelliSense and the Windows logo are trademarks of Microsoft Corporation.

Call for a Free Peek!

GET A FREE SAMPLE DISK OF PLANIT PARADISE™ FOR YOUR COMPUTER.

SET UP A DATE WITH PLANIT PARADISE AND THE MODELS OF SWIMWEAR ILLUSTRATED.® NOW, WHEN YOU TURN ON YOUR COMPUTER YOU'LL BE GREETED BY A GORGEOUS SWIMSUIT MODEL IN AN EXOTIC LOCATION. PLUS YOU'LL EXPERIENCE

DAILY JOKES FROM NATIONAL LAMPOON® AND TRIVIA MESSAGES FROM ISAAC ASIMOV'S BOOK OF FACTS. AND IF YOU LIKE WHAT YOU SEE, YOU CAN SIMPLY CALL MEDIA VISION AND BUY THE WHOLE PACKAGE.

MEDIA VISION

CALL FOR YOUR FREE* SAMPLE DISK TODAY: 1-800-684-6699.

*JUST $5 SHIPPING AND HANDLING.

FOR WINDOWS BASED PCS. © 1994 MEDIA VISION, INC. 47300 BAYSIDE PARKWAY, FREMONT, CA 94538 (510) 770-8600. MEDIA VISION, THE MEDIA VISION LOGO AND PLANIT PARADISE ARE TRADEMARKS OF MEDIA VISION, INC. ALL OTHER TRADEMARKS AND REGISTERED TRADEMARKS ARE THE PROPERTY OF THEIR RESPECTIVE HOLDERS

Circle 137 on reader service card.

PC Computing

COMING SOON

Penny-Wise Pentiums

A 66MHz 486 system doesn't cut it anymore. For processing power, you need a Pentium machine. Good news: Speedy, multimedia-packed Pentium systems have dropped in price so much that settling for a 486 makes little sense. We'll compare the best—and most affordable—Pentium machines with their 486 counterparts.

Windows Utilities

The best face you can put on Windows? Desktop utilities. In a category that once had umpteen contenders, two titans now fight for top honor: Central Point Software's PC Tools for Windows and Symantec's Norton Desktop for Windows. Which is best for you? See our Usability Labs face-off—the results will surprise you.

Next-Generation Software

Software secretaries are on the way. Why settle for wizards and assistants, when software is about to take over entire tasks for you? From Microsoft to General Magic, we'll tell you what the smartest minds predict for software automation.

Future Networking

Do you know your way around the networks of the future? We'll tour the most promising new technologies. From Fast Ethernet LANs to new wide-area networking technologies, we'll introduce your future computing lifelines.

Also coming in May: Use DOS 6.2's DoubleSpace or find a better solution? Getting a sound card going has never been easier. How to get OLE 2.0 to do your bidding. Windows NT's amazing multiprocessing power illustrated. Plus, a notebook based on Intel's fastest, a WordPerfect Office that talks back, and a new Charisma.

PC Computing

ADVERTISING SALES OFFICES

NEW ENGLAND
Patrick O'Brien, Northeast Advertising Manager
10 Presidents Landing
Medford, MA 02155, (617) 393-3306
Debra Donovan, Account Representative (415) 578-7068

MID-ATLANTIC
John R. DeSpirito, District Representative
One Park Ave.
New York, NY 10016, (212) 503-4907
Monica Sembler, Senior Account Representative (415) 578-7067

MIDWEST
Thomas Rousseau, District Manager
150 North Wacker Dr., Suite 2500
Chicago, IL 60606, (312) 214-7333
John Zaterka, Account Representative (415) 578-7065

SOUTHEAST
Thalia Kondukisis, District Manager
3405 Piedmont Rd. NE., Suite 460
Atlanta, GA 30305, (404) 814-8960
Kim Marshall, Account Representative (415) 578-7072

SOUTH CENTRAL
Peter Muller, District Manager
5956 Sherry Ln., Suite 625
Dallas, TX 75225, (214) 360-5755
George Carney, Account Representative (415) 578-7056

SOUTHWEST
John L. Larson, Jr., West Coast Regional Manager
18301 Von Karman Ave., Suite 330
Irvine, CA 92715, (714) 852-5912
Michael J. King, District Manager
11766 Wilshire Blvd., Suite 1550
Los Angeles, CA 90025, (310) 268-1360
Stacey Levy, Account Representative (415) 578-7066

SAN FRANCISCO BAY AREA/PACIFIC NORTHWEST
Kelly Worrall, District Representative
950 Tower Ln., 19th Floor
Foster City, CA 94404, (415) 578-7061
Gwyn Jones, Account Representative (415) 578-7070

SAN JOSE
Phil Kramer, District Manager (415) 578-7073
Suzanne Reider, District Manager (415) 578-7060
950 Tower Ln., 19th Floor
Foster City, CA 94404
Anne Dewling, Senior Account Representative (415) 578-7058

MARKETPLACE SALES OFFICE
ZiffDavis Publishing Company
One Park Ave., 2nd Floor
New York, NY 10016, (800) 825-4237

SALES MANAGEMENT

ADVERTISING SALES MANAGER William B. Wise (415) 578-7052
ASSOCIATE PUBLISHER/EAST COAST Sloan Seymour (212) 503-4830
WESTERN ADVERTISING DIRECTOR William P. Howard (415) 578-7570
ADVERTISING COORDINATOR Andrew G. Adebai (415) 578-7031
ADMINISTRATIVE ASSISTANT Jennifer Criddle (415) 578-7017
SALES COORDINATOR Francie Mare
SALES ASSISTANTS Heidi Cerenzie, Sam Cimino, Erving Dockery, Laura Lowless, Caroline March-Lang, Bennett Schneider, Hector Venegas, Jennifer Williams, Pam Norris

PERMISSION AND REPRINTS

Material in this publication may not be reproduced in any form without permission. Written requests for permission should be addressed to Chantal Lovelonet. For information on reprints in quantities of 500 or more, call Carol Peters, ZiffDavis Publishing Company, One Park Ave., New York, NY 10016. Printed in the U.S.A. Canadian GST registration number is R123669673.

The Audit Bureau

Serious Savings on Toys!

A Quantex Multimedia Package Priced to Make You Smile

The cost of computer toys can really add up. That's why, at Quantex, we're committed to giving you the most features at the best prices. Multimedia is no exception. Quantex has put together a multimedia package that will meet your needs and excite your senses. And these toys are not kid's stuff. Take a look at what we got for you:

Blast off to **MPC Level 2** standards with our double-spin **CD-ROM** drive and **Sound Blaster** compatible 16-bit stereo sound card with stereo speakers. Run wild with 5 CD ROM disks: **Microsoft Encarta™, Microsoft Dinosaurs, Mayo Clinic Family Health Book, Kodak™ Photo-CD Access Software & Photo Sampler, and USA Today: *The 90's Volume I*.**

Zip along the communication highway with a 14,400 bps high-speed fax/modem. Clench the key to over 17,000 databases with **CompuServe™.** Zoom right past display delays with the **RocketChip Video Controller** for brilliant graphics. Brace yourself for maximum PC power with the **Pentium™ OverDrive™** Ready ZIF socket. The list goes on and on.

Take advantage of this multi-faceted multimedia package from Quantex. Give us a call now. You'll discover we may sell toys, but we don't fool around.

"If you need a fast Windows platform, the Quantex has strong performance numbers."

COMPUTER SHOPPER
October, 1993

"★★★★"
PCComputing
August, 1993

Multimedia VESA Systems

Q486DX2/66MM-4 $2095

- **Double-spin CD-ROM Drive, multi-session Kodak™ Photo CD & XA ready**
- **True 16-bit SoundBlaster™ compatible audio card**
- **Digital amplified stereo speakers**
- **Five CD-ROM disks**
- **Upgradable to the OverDrive™ CPU based on Intel Pentium™ architecture**
- Intel 486™DX2-66MHz CPU
- 8MB RAM expandable to 32MB
- 128KB ultra-fast cache
- 420MB Western Digital™ hard drive with 12ms access & 128KB 'Cache Flow Buffer'
- 32-bit VL-Bus IDE controller
- 32-bit VL-Bus Paradise™ "RocketChip" graphics accelerator card with 1MB RAM; expandable to 2MB
- 15" flat screen non-interlaced color monitor
- 1.44MB floppy drive
- 2 serial, 1 parallel, 1 game port
- 101 Key enhanced keyboard
- 11-bay tower case
- High resolution mouse
- Microsoft DOS 6.2
- Windows for Workgroups 3.11
- 14,400 Baud high speed fax/modem
- CompuServe™ on-line software installed

Q486DX/33MM-4 $1975
Q486DX2/50MM-4 $1995
Q486DX4/100MM-4 $2345

intel inside

"Only the finest Caviar"
WESTERN DIGITAL

QUANTEX
Microsystems, Inc.

1-800-787-8686

VISA MasterCard DISCOVER

Quantex accepts prepaid checks. Visa, MasterCard, Discover, and Amex. Purchase orders from government agencies, universities, and Fortune 1000 companies also accepted. On-Site Service may not be available in certain remote areas. All returned items must have a Return Merchandise Authorization (RMA) number and must be in original packaging. The cost for returned freight is not included with any Money-Back Guarantee, shipping charges are non-refundable. Prices and product descriptions subject to change without notice. Quantex Microsystems cannot be responsible for errors in typography or photography. Intel, OverDrive, and the Intel Inside Logo are trademarks of Intel Corporation in the USA and other countries. Some of the names or trademarks shown herein may be the property of other companies.

Ed Bott

Three Boring (But Smart) Reasons to Buy a CD-ROM

CD-ROM UPGRADE KITS ARE SELLING FASTER THAN BIG Macs at a Clinton family reunion. These days you have to place a special order and wait a week to buy a system without a CD-ROM drive. And CD-ROM titles are everywhere: You can find them at Price Club, Barnes & Noble Bookstores, even Blockbuster Video.

Everybody's talking about CD-ROMs. But how many people really understand their impact on business? Not many, I'm afraid.

The trouble is, every time you hear *CD-ROM*, you also hear the words *multimedia*, *full-motion video*, and *games*. We hear plenty about the flash-and-sizzle, Disney-goes-digital dimension of CD-ROM technology, but nobody's talking about its serious side. That's a shame, because some of the most imaginative uses of CD-ROM technology are bread-and-butter business applications even a bean counter could love.

The *Real* Data Superhighway

It's too bad CD-ROM is stuck with the misleading *read-only* tag. That may be true of the average desktop drive, but for as little as $3,000 you can get a CD-Recordable (CD-R) drive and start your own CD-ROM publishing division. Fill a single blank disc with more than 600MB of data, hand it over to Federal Express, and you can absolutely, positively bring a regional office up-to-date overnight—for less than $20. There's no other optical or magnetic storage system that's as cost-effective, and it would take 12 hours to send that much information over a standard phone line.

You can put just about anything on a custom CD-ROM. Like a regularly updated product catalog, complete with full-color photos. Or an up-to-the-minute service manual. Or a disc full of digitized forms that could replace a roomful of paper at a bank branch or insurance agency.

Today's CD-R drives, just like basic desktop CD-ROM drives, can run at dual-speed. But hold onto your hats, because Eastman Kodak is about to introduce its PCD Writer 600, which is six times faster than a standard CD-ROM drive and can fill a CD in just over ten minutes. Imagine what you could do with one.

Fast Facts

Where do you go when you need an in-depth backgrounder on a crucial business topic? Until a few years ago, you went to the library or logged on to an online research service like Nexis, at per-minute rates that would make a New York cabbie blush. Today, you buy a CD-ROM or three. Here's a random sampling of some of the business information available on CD-ROM:

Prices and specifications for more than 75,000 hardware and software products, updated every month (Ziff-Davis's *Computer Select*). Detailed street maps of the entire United States on a single disc (DeLorme Mapping's *Street Atlas USA*). Population, housing, and demographic data, sliced and diced across 4,000 fields on three CDs (U.S. Bureau of the Census). A national phone directory—70 million residential listings, 7 million business numbers—on seven CDs (Pro CD's *Select Phone*).

If you can't find the facts you're looking for, you're not looking hard enough.

Software Made Simple

There's the hard way to buy software, and there's the easy way.

The hard way: Stand in a superline at your local superstore and end up with a not-so-super stack of floppy disks. Back at the office, you swap disks until your index finger throbs, and you hope the application you bought is the one you really need.

The easy way: Every few months, your software reseller sends you a CD packed with full retail versions of the top 40 business applications (and maybe even a game or two). You browse through detailed descriptions of every program on the disk and install demo versions of any you'd like to try before you buy. To close the deal, call your reseller and exchange a credit card number for a secret code. Type in the code, click on OK, and install the application right off the CD. (The printed documentation, if you want it, arrives in the mail a day or two later.)

This is no longer the stuff of pilot programs, either. The IBM Software Manufacturing Company introduced its CD Showcase technology last year, and major corporate resellers are using it today. Even PC makers have gotten into the act.

It's the most popular PC peripheral around, and then some.

But Wait—There's More . . .

There are plenty of other reasons to own a CD-ROM drive, and none of them has anything to do with multimedia. If you develop software, a CD-ROM is a must-have for compilers and toolkits. Kodak's multisession Photo CD standard has turned the 35mm camera into the cheapest, easiest PC input device you can buy. And if you're ready to install a new operating system—OS/2, NetWare, or Windows NT—a CD-ROM is the intelligent alternative to a 2-foot-high stack of floppy disks.

Paradoxically, the breathless hype about multimedia may actually slow the acceptance of CD-ROMs in business. Yes, the CD-ROM drive is the most misunderstood PC peripheral around. But it doesn't have to be that way. Are you ready to take it seriously? Just use your imagination.

PHOTOGRAPH BY RICHARD MORGENSTEIN

A Great Deal From Any Angle... Only $995.

STANDARD WITH EVERY ZEOS FREESTYLE

- 25MHz 386SL, 25MHz 486SL or 33MHz 486SL Intel microprocessor.
- 386SL: 64K SRAM system cache 486SL: 8K internal system cache.
- RAM expandable to 20MB (486SL) or 10MB (386SL).
- IDE hard drive expandable to 260MB.
- 256K (386SL) or 512K (486SL) video RAM.
- Internal 3.5" 1.44MB floppy drive.
- Serial, parallel, video and PS/2 ports.
- Supports an external SVGA color monitor with simultaneous display capability.
- 486SL version includes 3.3V technology for added battery life, and built-in math coprocessor.
- Replaceable and rechargeable NiCad battery.
- 640 x 480 VGA backlit LCD display, 9.5" diagonal, supporting up to 64 shades of gray.
- 81-key keyboard with built-in mouse key, "inverted T" cursor keys and dedicated Home, PgUp, PgDn, and End keys.
- AC adapter with range from AC110-240V to DC.
- Power-saving features.
- FCC Certified Class B.
- Complete ZEOS Customer Satisfaction Package.

PACKAGE 1

386SL-25 ..... **$995**
Lease $42/month
486SL-25 ..... **$1495**
Lease $63/month
486SL-33 ..... **$1695**
Lease $61/month

- 2MB RAM (386SL); 4MB RAM (486SL)
- 60MB IDE hard drive (386SL); 120MB IDE hard drive (486SL)
- MS-DOS 6.2

PACKAGE 2

386SL-25 ..... **$1495**
Lease $63/month
486SL-25 ..... **$1795**
Lease $65/month
486SL-33 ..... **$1995**
Lease $72/month

- 6MB RAM (386SL); 4MB RAM (486SL)
- 120MB IDE hard drive (386SL); 180MB IDE hard drive (486SL)
- Custom carrying case
- MS-DOS 6.2, Windows for Workgroups 3.11

PACKAGE 3

386SL-25 ..... **$1995**
Lease $72/month
486SL-25 ..... **$2195**
Lease $79/month
486SL-33 ..... **$2395**
Lease $87/month

- 10MB RAM (386SL); 8MB RAM (486SL)
- 180MB IDE hard drive (386SL); 260MB IDE hard drive (486SL)
- Internal 96/24 send/receive fax modem
- Custom carrying case
- Extra battery
- External charging stand
- MS-DOS 6.2, Windows for Workgroups 3.11

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

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

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

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

Unique tilt and swivel display moves for your every position.

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

AWARD-WINNING SERVICE & SUPPORT

ZEOS has won more *PC Magazine* Readers' Choice for Service & Reliability awards than any other company–five in all!

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

CALL NOW TOLL FREE
800-554-5218

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

ZEOS INTERNATIONAL LTD.

Purchase orders are subject to approval. Business leasing programs available. Lease prices based on a 36-month lease, 10% purchase option. All prices, specifications and availability are subject to change without notice; call to confirm these and warranty details. Prices do not include shipping. All products and company names are trademarks or registered trademarks of their respective holders. ZEOS is a registered trademark. Z-Card and Computers Now! are registered servicemarks. Freestyle is a trademark of ZEOS International Ltd. ©1994 ZEOS International Ltd., 1301 Industrial Blvd., Minneapolis, MN 55413 USA. ZEOS is a publicly traded company (NASDAQ symbol: ZEOS)
FS-PCC-9404

Circle 265 on reader service card.

"ZEOS®... lowest price for power."

-*PC World*, February 1994

We give you more, more and more…for less, less and less! *PC World* agrees. They awarded ZEOS the January and February 1994 Best Buy awards for our 486DX2-66! *PC World* reported the system tested was "a powerful Best Buy that has exceptional appeal for both performance and budget buyers."

There's more. *PC World* went on to say the 486 system is "the best all around value we've seen." Why? Because we provide our customers with the latest technological advancements at the best possible price. In fact, *we lowered prices* on most of our 486 Local Bus Upgradable configurations–*and* we now offer the options of the new Intel 486DX4 microprocessor running at 75MHz or 100MHz.

In addition to higher performance and lower prices, you get award-winning, Intel verified systems that offer many upgrade paths as your needs dictate. Choose from one of our money-saving packages (many ready to ship the same day you order) or custom configure a system to your exact needs.

"PROS: Excellent Performance, design, and support; low price.
CONS: None."
–PC World, Feb 94

And all 486 Upgradables are 100% compatible with every major network operating system on the market, including Novell NetWare. It's a breeze to get connected!

The value doesn't stop with your system. Many companies just talk about service. At ZEOS, our customers do the talking. ZEOS has won more *PC Magazine* Readers' Choice for Service & Reliability awards than any other company–five in all! And we were the first company to provide its customers with 24-hour, toll-free technical support–every day. You receive the best *service* and support in the business.

Plus all 486 Upgradables include One Year Limited Warranty, 30-Day Money Back Guarantee and Express Parts Replacement.

Feature for feature, *no one* gives you more than ZEOS. At any price, anywhere. ZEOS continues to be the best value. Call your Systems Consultant now at 800-554-5218.

PACKAGE 1

486SX-25 ..... **$1195**
Lease $50/month

486DX-33 ..... **$1395**
Lease $59/month

486DX2-50 ..... **$1495**
Lease $63/month

486DX2-66 ..... **$1595**
Lease $58/month

486DX4-75 ..... **$1795**
Lease $65/month

486DX4-100 ..... **$1995**
Lease $72/month

- **Intel Verified:** for the Pentium™ OverDrive™ Processor
- 2MB high-speed RAM
- 107MB local bus hard drive w/32K cache
- 3.5" floppy drive
- Diamond SpeedStar Pro Windows-accelerated local bus video with 1MB RAM
- 14" 1024 NI SVGA color monitor, .28mm dot pitch
- On-board SCSI socket
- Two VESA local bus, five 16-bit and one 8-bit expansion slots
- Six-bay desktop w/2 cooling fans
- 101-key space-saving keyboard
- MS-DOS 6.2 w/Tools

PACKAGE 2

486SX-25 ..... **$1395**
Lease $59/month

486DX-33 ..... **$1595**
Lease $68/month

486DX2-50 ..... **$1695**
Lease $61/month

486DX2-66 ..... **$1795**
Lease $65/month

486DX4-75 ..... **$1995**
Lease $72/month

486DX4-100 ..... **$2195**
Lease $79/month

- **Intel Verified:** for the Pentium™ OverDrive™ Processor
- 4MB high-speed RAM
- 214MB local bus hard drive w/32K cache
- 3.5" floppy drive
- Diamond SpeedStar Pro Windows-accelerated local bus video with 1MB RAM
- 14" 1024 NI SVGA color monitor, .28mm dot pitch
- On-board SCSI socket
- Two VESA local bus, five 16-bit and one 8-bit expansion slots
- Six-bay desktop w/2 cooling fans
- 101-key space-saving keyboard
- Microsoft Mouse
- MS-DOS 6.2 w/Tools, Windows for Workgroups 3.11

PACKAGE 3

486SX-25 ..... **$1795**
Lease $65/month

486DX-33 ..... **$1995**
Lease $72/month

486DX2-50 ..... **$2095**
Lease $76/month

486DX2-66 ..... **$2195**
Lease $79/month

486DX4-75 ..... **$2395**
Lease $87/month

486DX4-100 ..... **$2595**
Lease $94/month

- **Intel Verified:** for the Pentium™ OverDrive™ Processor
- 8MB high-speed RAM
- 426MB local bus hard drive w/128K cache
- **2X CD-ROM** and 3.5" FDD
- Diamond SpeedStar Pro Windows-accelerated local bus video with 1MB RAM
- 14" 1024 NI SVGA color monitor, .28mm dot pitch
- On-board SCSI socket
- Two VESA local bus, five 16-bit and one 8-bit expansion slots
- Six-bay desktop w/2 cooling fans
- 101-key space-saving keyboard
- Microsoft Mouse
- MS-DOS 6.2 w/Tools, Windows for Workgroups 3.11
- Choice of Lotus Application

PACKAGE 4

486SX-25 ..... **$2195**
Lease $79/month

486DX-33 ..... **$2395**
Lease $87/month

486DX2-50 ..... **$2495**
Lease $90/month

486DX2-66 ..... **$2595**
Lease $94/month

486DX4-75 ..... **$2795**
Lease $101/month

486DX4-100 ..... **$2995**
Lease $108/month

- **Intel Verified:** for the Pentium™ OverDrive™ Processor
- 16MB high-speed RAM
- 528MB local bus hard drive w/256K cache
- **2X CD-ROM** and 3.5" FDD
- Diamond SpeedStar Pro Windows-accelerated local bus video with 1MB RAM
- 14" 1024 NI SVGA color monitor, .28mm dot pitch
- On-board SCSI socket
- Two VESA local bus, five 16-bit and one 8-bit expansion slots
- Six-bay desktop w/2 cooling fans
- 101-key space-saving keyboard
- Microsoft Mouse
- MS-DOS 6.2 w/Tools, Windows for Workgroups 3.11
- Choice of Lotus Application

FAVORITE OPTIONS

426MB to 528MB HDD UPGRADE **$95**
10-BAY VERTICAL CASE **$95**
ADAPTEC 6360 SCSI CONTROLLER CHIP **$49**
96/48/24 V.42 bis SEND/RECEIVE FAX MODEM **$49**
DIAMOND VIPER VIDEO CARD
1MB VRAM: **$149** ..... 2MB VRAM: **$249**
15-INCH SVGA MONITOR UPGRADE **$95**

LOTUS SMARTSUITE UPGRADE
Five Windows applications in one box! **$299**
COMPLETE MULTIMEDIA PACKAGE
2X, multisession MPC2 CD-ROM, 16-bit Cardinal Digital Sound Pro 16 Card with Digital Signal Processor, stereo speakers **$299**
If your system includes a CD-ROM drive, upgrade with a sound card and speakers **$148**
Many other affordable upgrades and options available. Call for details!

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

CALL NOW TOLL FREE
800-554-5218
24 HOURS A DAY

ZEOS INTERNATIONAL, LTD.

Purchase orders are subject to approval. Business leasing programs available. Lease prices based on a 36-month lease, 10% purchase option. All prices, specifications and availability are subject to change without notice; call to confirm these and warranty details. Prices do not include shipping. Novell compatibility is Developer Tested Only. Novell makes no warranties with respect to this product. All products and company names are trademarks or registered trademarks of their respective holders. Intel harde is a trademark of Intel Corporation. ZEOS is a registered trademark, Z-Card and Computers Now! are registered servicemarks of ZEOS International Ltd. © 1994 ZEOS International Ltd., 1301 Industrial Blvd., Minneapolis, MN 55413 USA ZEOS is a publicly traded company (NASDAQ symbol: ZEOS) PGBVCC1604

Circle 248 on reader service card.

The Apple Report On PowerPC

Number 3 – Applications Accelerated For PowerPC

If you buy a Macintosh today, can you upgrade it tomorrow? In many cases, yes. Just look for the "Ready for PowerPC upgrade" sticker on the box.

On average, a Macintosh with PowerPC technology achieves two to four times the performance of 68040 and 80486 machines running the same programs.

If you use applications that do floating-point mathematical calculations, your performance levels could be up to ten times those of the same program running on a 68040 machine — and several times faster than the fastest Pentium system – based computers.

A Macintosh with PowerPC offers unprecedented compatibility between Macintosh, MS-DOS and Windows, thanks to an emulation program called SoftWindows, which licenses Windows code from Microsoft.

For more information about Macintosh with PowerPC, call1-800-732-3131, ext.150. We'll send you a free copy of *PowerPC Technology: The Power Behind the Next Generation of Macintosh Systems*. In Canada, call 1-800-665-2775, ext. 910.

The new family of Macintosh® computers with PowerPC™ chips will run virtually all Macintosh system–based software and most current programs for MS-DOS and Windows operating systems.* So no matter what computing environment you're working in now, you can migrate to a more powerful desktop computer without losing your investment in your current software.

Accelerated for Macintosh with PowerPC™

But the real benefit of PowerPC technology will be seen with new applications optimized to take advantage of the chip's advanced capabilities.

These applications, often called native applications, will offer two to four times the performance of programs available for the fastest Macintosh computers today. Developers writing native applications say that these applications perform at levels better than their Windows counterparts running on Intel Pentium system–based computers.

Major developers on board.

Right now, the world's leading developers are updating their most popular and memory-intensive programs to take full advantage of PowerPC technology.

In fact, Apple has been working closely with more than 200 major third-party developers since 1992 to create powerful new versions of their applications.

And since software development kits became widely available in January, hundreds of additional developers have begun the move to PowerPC.

PowerPC technology enables them to incorporate new levels of speed and functionality into their applications for the Macintosh system. Developers everywhere are eager to exploit these new capabilities.

What programs will be ready?

While a Macintosh with PowerPC technology will run virtually all of your existing Macintosh system–based programs, the real benefit of PowerPC will be with applications optimized to take advantage of the chip's advanced capabilities. More than 50 of these native applications will be available in the first half of 1994. Here are some of them.

ACI *4th Dimension*	Frame *FrameMaker*
Adobe *Dimensions*	Insignia Solutions *SoftWindows*
Adobe *Illustrator*	Microsoft *Excel*
Adobe *Photoshop*	Microsoft *Word*
Adobe *Premiere*	Specular *Infini-D*
Aldus *FreeHand*	Strata *StudioPro*
Aldus *PageMaker*	VideoFusion *VideoFusion*
Alias *Sketch!*	Virtus *WalkThrough*
Claris *ClarisWorks*	Wolfram *Mathematica*
Fractal Design *Painter*	WordPerfect *WordPerfect*

Do more in less time.

What will the advanced capabilities of native applications mean to you? You'll spend significantly less time waiting for your computer to redraw or recalculate or re-anything. That means you'll have more time to create and refine your work, to apply new concepts, to test options.

You can also expect to see new kinds of applications — software that is both more intelligent and easier to use.

Developers will be exploring new features in areas such as intelligent help, 3-D design, video, animation, speech recognition and text-to-speech conversion.

Many of these new functions simply wouldn't be practical without the superior processing capabilities of a RISC chip and innovative Macintosh technology.

Why RISC?

The new generation of Macintosh computers will be the first personal computers with RISC (Reduced Instruction Set Computing) chips—ultra high performance chips that were previously available only in workstations.

(In fact, many workstation developers are now writing applications for the Macintosh platform for the first time.)

RISC chips are smaller and less complex than comparably powered CISC chips, so they cost less to produce—which means that Macintosh computers with PowerPC technology can offer a significant price/performance advantage. But more important, they'll give you an unprecedented new kind of power.

The power to be your best.®

Apple®

Adding SoftWindows from Insignia Solutions Inc. lets you run MS-DOS and Windows on Macintosh with PowerPC. Apple will offer some configurations with SoftWindows bundled and ready to run. If you choose a model without SoftWindows, you can purchase the program later and add it then. © 1994 Apple Computer, Inc. All rights reserved. Apple, the Apple logo, Macintosh and "The power to be your best" are registered trademarks of Apple Computer, Inc. PowerPC and the PowerPC logo are trademarks of International Business Machines Corporation, used under license therefrom. MS-DOS is a registered trademark of Microsoft Corporation.

Free DOS Upgrade—Not So Free After All

Acclaim for Toshiba's notebooks, and a 900-number boycott.

No Free Cheese Balls

What type of a cheese-ball magazine are you peddling? Your January cover and "*PC/Computing* Update" spotlight item on page 118 led me to believe that I could receive a free upgrade of MS-DOS 6. Ha! Following your instructions, I found that I have to sign up for ZiffNet, which costs $2.50 a month. What a scam! *PC/Computing* is guilty of false and deceptive advertising, and should be forced to cease and desist.

BRIAN G. MCHENRY
CARY, NORTH CAROLINA

I am writing to complain about charges that I incurred obtaining the "free" MS-DOS 6.2 upgrade advertised in the January *PC/Computing*. After logging on to CompuServe and proceeding to ZiffNet, I was at first unable to download the upgrade, and had to use Kermit. The file description stated the download would take about 30 minutes. It took three times as long.

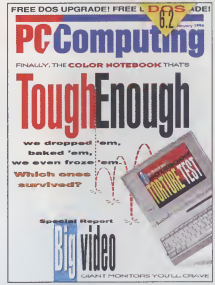
ZiffNet mentions its $2.50 monthly charge, but CompuServe charged me $40.58! I think it's unethical to tout a free upgrade and then charge hourly access rates to get it. Why would anyone pay more than $40 for a $10 upgrade?

ROBERT MCAFOOS
TEMPE, ARIZONA

Thousands of satisfied subscribers have downloaded DOS 6.2 from the convenience of their own homes or offices with no problems. It takes about 30 minutes to download the upgrade at 9,600 baud, costing less than $8 in connect charges. CompuServe tends to be slower during business hours, and your actual costs may be higher. Standard CompuServe services cost $8.95 per month, and ZiffNet is an extra $2.50. If you had problems with the download, type GO ZNT:FEEDBACK to ask for credit. To cancel your ZiffNet membership, Type GO ZNT:MEMBER. Note: As of February 6, CompuServe lowered its rate to $9.60 an hour for 9,600-baud connections, making this download even less costly. —*The Editors*

Toshiba's Smart Keyboard

Your January review of laptop computers, "Killer Color Notebooks" (page 142), unfairly faults Toshiba's T1950CT



and T4600C keyboards for the placement of the Ctrl, Alt, and Caps Lock keys. Instead of wasting valuable space to the left of the "A" key with a Caps Lock key, Toshiba smartly located a Ctrl key there for power users to use to launch macros and custom keyboard commands. I've used the Ctrl key six times already in writing this letter, but haven't touched the Caps Lock key yet. The only laptop I'm willing to own is one that gives my left pinkie finger easy access to the fabulously powerful Ctrl key.

PETER FORMAN
RENO, NEVADA

Recycle Your Batteries

I read with interest your article on the life of batteries for PC portables, "Charge!" (January, page 217). However, the article did not address the subject of battery disposability or recyclability. It would be a shame if some new battery technology were rapidly adopted for the portable computing environment with no consideration given to the greater human environment or the biosphere as a whole.

HOWARD H. ROTHMAN
BRIDGEPORT, CONNECTICUT

PKzip: Friend or Foe?

In "*PC/Computing*'s Usability Hall of Fame" (January, page 223), you wrote that PKzip 2.04g is an "all thumbs" product. I think that it's all thumbs only for those who do not have the time or patience to learn about the mechanics of their operating system (DOS) and software. The funny thing is that at the other end of the same issue, in Jeff Prosise's DOS Help section (page 244), PKzip 2.04g is awarded the App of the Month award. How can this be?

ALAN GOLDBERG
PHILADELPHIA, PENNSYLVANIA

We would never question PKzip's usefulness—it's an obvious candidate for App of the Month (any month). But it is a pain to use—even for those of us who have been coding, hacking, and teaching DOS for years. We couldn't

The boundaries of speed have truly changed. You want the very latest technology to satisfy your ever growing need for more speed. You need ALR's EVOLUTION V family of 60- and 66-MHz Pentium technology-based systems.

ALR bests three other 60MHz Pentium systems

PC Week Number 1, 30 July '94 Winstone 94 Version 1.0 benchmark, using one machine each of Compaq® Deskpro systems. Compaq Pentium 60 was used as a base. All scores have been normalized to a score of 72.5 for the IBM® 60MHz Pentium® ValuePoint® P60D system.

Product of intense research and development, the EVOLUTION V family achieves record-breaking performance by expanding the latest advances in microcomputer technology. Unlike other manufacturers, *who rely on retro-fitted 32-bit designs*, we've engineered these systems from the ground up to fully support and enhance this data hungry 64-bit Pentium processor. In fact, with ALR's proprietary QUADFLEX™ architecture, the path between the 512-KB (dual 256-KB) of high-speed cache and main memory is 128-bits wide (dual 64-bits),

ALR is a proud sponsor of the USSS United States Speed Skating

delivering up to 50% more power than less optimized designs. Even main memory expands to an unheard of 1-gigabyte right on the system board.

Taking system performance and expandability even higher, we've surrounded the optimal processor and memory design with the latest advances in I/O technology. Equipped with up to eight high-speed ISA or ten EISA 32-bit, VESA VL or PCI local bus slots, the ALR EVOLUTION V Series gives you compatibility with the fastest graphic cards, disk controllers, and SCSI adapters available. We've even integrated onto the system board, on selected models, local bus IDE with ALR's advanced MULTUS™ controller, PCI SCSI II, as well as high-speed ethernet connectivity.

With security minded chassis that can hold from six to thirteen drives and up to 900 Watts (dual 450 Watts) of fault tolerant power, the ALR EVOLUTION V Series has unmatched expansion capabilities.

And because we engineer and manufacture these systems ourselves, we provide the most comprehensive, 5 year/1.5 month Warranty along with the first visit of on-site service for free*.

5 YEAR WARRANTY

Whether you need a high-speed super server, graphics crunching desktop, or powerful mini tower, ALR's EVOLUTION V Series of Pentium processing systems are designed to fit a wide range of applications and budgets.

For the location of an Authorized ALR Power Partner Reseller or for more information, call our toll-free number today:

800-444-4ALR

ALR can be reached on Compuserve — GOALRINC

ALR

Advanced Logic Research, Inc.

9401 Jeronimo Irvine, CA 92714 (714) 581-6770 FAX: (714) 581-9240

Limited Time Offer!
FREE LOCAL BUS GRAPHICS*
WITH THE PURCHASE OF ANY ALR EVOLUTION V SERIES SYSTEM CONFIGURED FROM ALR WITH A HARD DRIVE

"Speed that's bound to inspire a case of Pentium envy in any user who tries out an Evolution V"

PC World - January 1994

intel inside
pentium

What's next?

January 25, 1994

PC MAGAZINE EDITORS' CHOICE

PC MAGAZINE December 1993

"Once again, ALR proves it's technical leadership position and offers maximum desktop performance with this 66-MHz Pentium system"

PRODUCT OF THE YEAR 1993
FRANCE
"Le Monde Informatique"
Work Stations Category
IDG Hermeneutical Data Group I

"the fastest number CADalyst has ever recorded for a system based on an Intel CPU"

CADalyst
January, 1994

STARTING AT $2495

ALR features CONNER *peripherals*

*One year free on-site service requires registration of ECM-30 B available in all areas capable of complete on-site service. Systems shown with optional monitors and equipment. Prices, specifications and configurations are subject to change without notice. Verify compatibility of add-ons before purchase. Pentium is a U.S. trademark of Advanced Logic Research, Inc. Intel inside and Pentium logos are trademarks of Intel Corporation. All other trademarks and product names are trade names or registered trademarks of their respective owners. ©1993 by ALR.

Circle 142 on reader service card.

do without its power—but we can't say the same for its convoluted command-line syntax. —*The Editors*

A Little Q&A

I read with great interest your article "Symantec Q&A: Two Cool Products in One Small Box" (January, page 51). I've used Q&A for more than three years, and the fact that there is now a Windows version has prompted me to upgrade my PC and buy Windows. Although Q&A is a flat-file database, using lookup functions can make it very powerful, and it's the only all-in-one package I'll ever need.

JAMES COLEMAN
TUSTIN, CALIFORNIA

More Handbook for Less Cash

What's all the fuss about Hewlett-Packard's OmniBook 425 subnotebook ("OmniBook 425: Running Long and Light in Overdrive," January, page 90)? OK, so it has a great footprint and a feather's weight, but you're constantly overlooking a machine that smacks the 425 out of the ballpark: the Gateway 2000 HandBook 486. Both machines weigh the same, but I would rather have the HandBook—with 40MB more hard disk space, 2MB more RAM, and a back-lit VGA screen—for $600 less.

MATTHEW KUNOFSKY
BROOKLYN, NEW YORK

Out the Back Door!

Brian Livingston's January Help article, "Back Door Technical Support" (page 228), is missing two important points: support and online fees. I'm upset at the software giants' attempt to charge for technical support. Most calls I've ever made have either been because of poor documentation or software that is user-nasty. It seems developers don't want to develop software fully, and they don't want to support it either. No support; no purchase! Yet Livingston proposes online support through CompuServe at $16-plus an hour. Online support is a great answer, but who will pay those connect fees? Ten hours a month would cost nearly $2,000 annually. Who can afford this? Reasonable support and reasonable online service are both very important to the future of the PC user.

JEFF POLUCCI
NORTH ADAMS, MASSACHUSETTS

900-Number Rip-Off

Bravo, John C. Dvorak, for your January column, "900-Number Support? This Time Vendors Have Gone Too Far" (page 130). I agree: 900-number support calls suck! Too bad the [people in] Redmond, Washington, haven't figured this out. Two dollars a minute for Windows technical support? What a rip-off! All software vendors should take a look at their current tech support programs and make it easier on our pocketbooks.

RYAN HELDT
ZEARING, IOWA

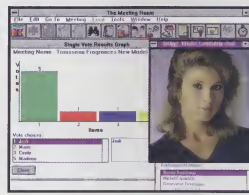
Hold your next meeting in your PC and cut meeting time in half.

It's like no other meeting you've ever been in. Focused agenda. Not a wasted moment. Frank interchange of ideas. Every participant offering suggestions, anonymously if they want.

People can be included whether they're down the hall, three floors away, or out of town. They join in as their own schedules permit. Meeting minutes, assignments and conclusions are automatically documented and available any time.

And everyone can stay where they are: at their own PCs!

Who hasn't sat through a long, drawn-out meeting, mentally added up the hourly cost of everybody there and thought, "Hey, we've just spent a couple of thousand dollars and have zip to show for it – *This is nuts!*"?



Introducing The Meeting Room™: an easy-to-use software program guaranteed to make your meetings more productive.

It won't happen in The Meeting Room. In fact you'll be amazed how much more focused, productive — and valuable — all your meetings will be. Notification, group discussions, brainstorming, decision making, review of material can all be accomplished more effectively, in less time.

The Meeting Room is extremely flexible and easy to use with any LAN. You have a choice of meeting formats, plus instant access to essential features, such as a blackboard and side discussions. What's more, you can attach any supporting documents or graphics — even photos.

A three-user starter kit is just $295. For a FREE info kit, or to order at no risk, call

1-800-459-6338

"Combines the best aspects of...face-to-face meetings with those of computer-based conferencing."
– PC WEEK, January 17, 1994

Since 1985

The Meeting Room

Eden Systems Corporation
9302 N. Meridian Street, Suite 350
Indianapolis, IN 46260
Phone 317-848-9600 • Fax 317-843-2271

Circle 190 on reader service card.

All Plug and No Play

In January's Dvorak vs. Somerson column ("Psst! Wanna Know What Keeps Software Vendors Awake at Night?" page 136), there is yet another reference to the Apple Macintosh being "true plug and play."

This kind of broad generalization makes me wonder if authors like John C. Dvorak have ever tried to do anything on the Macintosh that is more complicated than clicking a mouse button. I'm a longtime PC user and have been struggling with Apple equipment for several years now, and it's anything but plug and play.

CLARK ALLWORTH
HILLSBORO, OREGON

The Numbers Racket

It was a delight to read Ed Bott's January column about version numbers, "Let's Do Away with Version Numbers" (page 22). The current "numbering" system is indeed confusing and frustrating and, as the article points out, is only a marketing gimmick. An alternative is to follow the example of book publishers, and move to a system that uses edition numbers in lieu of version numbers.

MEHDI KAIGHOBADI
PLANTATION, FLORIDA

Ed Bott's column on version numbers is misguided. Version numbers give a definite handle on the various software releases even if they're not in sequence, and that's enough reason to keep them around. A world without numbered software? I would be lost.

HOMER B. TILTON
TUCSON, ARIZONA

Applying the KISS (Keep It Simple, Stupid) principle, the most sanity can be found in a "year/month" nominator for product identification. For example, a name such as Quattro Pro 93/4 or Quattro Pro 93/9 would most easily identify a minor upgrade because of the short amount of time between dates.

RICHARD POPLAWSKI
JESSUP, PENNSYLVANIA

Corrections

We published an incorrect phone number for Cyrix in Ed Bott's November 1993 column, "When the Bean Counters Get Tough, the Tough Get Going," (page 34). The correct number is (800) 327-6284.

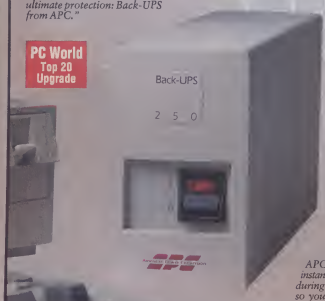
In our February DOS column (Help, page 222), we referred to MONOUMB.386 as a DOS 5 file—it was new to DOS 6.

Mail your thoughts to Letters, PC/Computing, 950 Tower Lane, 19th Floor, Foster City, CA 94404; fax us at (415) 578-7029; or contact us via MCI Mail at PCC Editorial or via PC/Contact, our online forum. Letters must be signed and must include a daytime phone number. All letters become the property of PC/Computing and will be edited for length and clarity.

Introducing the $139 investment no computer user can afford to be without...

"Don't take chances...Get the ultimate protection: Back-UPS from APC."

PC World Top 20 Upgrade



Blackouts, brownouts, sags... if you use computers, your bottom line is directly linked to your power line. The fact is, your data and hardware are vulnerable to problems that surge suppressors and power directors just aren't equipped to handle.

Call for your FREE 60 page PC power protection handbook!

Now there's an Uninterruptible Power Supply (UPS) to suit any budget. Back-UPS® are perfect protection for LAN servers, personal computers, phone/fax systems, POS equipment, or any other device that can go down when the power does. If lightning is a concern, Back-UPS are even backed by a $25,000 insurance policy against surge damage to your equipment (see details).

So don't wait for the inevitable power problem to rob your business. Protect your productivity with Back-UPS, available where quality computer products are sold.

APC Back-UPS provide instantaneous battery power during power disturbances, so your data and hardware are safe!

APC™
AMERICAN POWER CONVERSION
800-800-4APC, dept. E7

Local phone and fax for: **Germany** - Fax: 089.950.51.66; **United Kingdom** - Fax: 81.667.1947; **France** - NoVert: 05.09.24.07

©1993 Trademarks are property of their respective owners. Registered in the U.S.

Circle 116 on reader service card.

"I hit a hole in one when I chose ACCPAC Plus! It's helped us grow from a start-up to a $9 million business. All along the way we've been on track, on course and under par."

General Ledger
& Financial Reporter
Accounts Payable
Accounts Receivable
U.S. and Canadian Payroll
Job Costing
Inventory Control
Order Entry
Retail Invoicing
Sales Analysis
ACCPAC LanPak
Windowing System Manager
DynaView

ACCPAC Plus Accounting Software.

It's versatile, with modules for a wide range of capabilities. It's easy to use, with lots of built-in features. It's customizable to the needs of virtually any type of business.

And it's backed by one of the world's largest software manufacturers.

No wonder it's the leading accounting software in North America.

For More Information Call 1-800-225-5224, Dept. 30006.

Be sure to ask for details on ScanPAC,™ the new bar code technology for ACCPAC Plus. Call now to see why more accountants and businesses prefer ACCPAC Plus. And why you should join the club.

COMPUTER ASSOCIATES
Software superior by design

Circle 252 on reader service card.

ACCPAC® Plus.™ The #1 Accounting Software In North America.

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

SPEED SPE

SNAIL

Even the fastest snail is slow. They move by a wave-like series of muscular contractions over a thin layer of slime.

RUNNER

The fastest runners in the world run about 25 miles per hour. Whether or not they're being chased.

FIGHTER JET

The average fighter jet travels in excess of Mach 2. That's twice the speed of sound, in case you haven't heard.

BULLET

The average bullet can travel 3,000 feet in a second. (Not bad, for a piece of lead.)

We'll make this quick. Every AST Premmia desktop system has local bus architecture featuring an advanced ATI mach32 *magazine named Premmia its Best Overall High-Performance Windows System.* For more information, dial 800-876-4AST.*

*©1994 AST Research, Inc. All rights reserved. AST, AST logo are registered trademarks, and Premmia and LocalMotion are trademarks, of AST Research, Inc. The Intel Inside logo is a All other trademarks are the property of their respective owners. *BYTE/NSTL Lab Report, Dec '93. **Estimated U.S. reseller selling price. Reseller pricing will vary*

CTRUM

PREMMIA

Premmia™ desktop systems have faster Windows performance, faster processors and faster I/O buses. Did we mention they're really fast?

WEEKENDS

The only time in the world when 48 hours seems like 48 nanoseconds.

LIGHT

Light travels 186,281 miles per second, even on a slow day.

video chip set capable of displaying over 16 million colors – instantly. No wonder BYTE.

(That ought to take you about 4.2 seconds) AST. COMPUTER

PREMMIA
HIGH-PERFORMANCE
SYSTEMS

PREMMIA

*Incorporates the fastest Intel486™ technology available. Up to 512KB second-level cache. Five EISA slots. Intel Verified: for the Pentium™ OverDrive™ Processor. Midsize chassis. Starting at $1,525.***

PREMMIA LX

*Optimized Intel Pentium microprocessor design. 256KB second-level cache standard. Two available PCI local bus expansion slots. Low-profile chassis. Starting at $2,865.***

GRAPHICS

Integrated local bus graphics – PCI on Premmia LX. 1MB video memory expandable to 2MB. AST LocalMotion™ full-screen, full-motion video drivers.

RELIABLE

Three-year warranty, with first-year on-site coverage for hard-drive models.† Technical assistance 24 hours a day, seven days a week.

intel inside

Call for more information and the nearest reseller.
800-876-4AST

registered trademark, and Intel 486, Pentium and OverDrive are trademarks, of Intel Corporation in the USA and other countries
†Remaining two years are carry-in coverage. Three-year carry-in warranty for non-hard-drive models.

New!

FROM THE FRONT LINES OF TECHNOLOGY CONVERGENCE

Whoever Dies with

It's a Discman! It's a CD-ROM drive! It's both. Media Vision's Rena does data by day and plays tunes while you walk.

ONLINE MEETS TV

Ever wanted to download a 1MB file from an online service but left it because you didn't want to hold up your line for 40 minutes? This could become a thing of the past if the work of three major online services materializes into real services. America Online, Prodigy, and CompuServe are working in partnership with cable providers to use TV cable as a medium for speedy cyberspace contact. Relying on cable splitters and Zenith Electronics' HomeWorks modems, Prodigy and CompuServe are speeding up online access to 500 kilobits per second per subchannel (there are four subchannels in a typical video channel). And America Online and Prodigy are designing interactive TV infrastructures for their own programming. How's that for convergence?

YOU'VE HEARD THE hype: Computing is merging with consumer electronics. The telephone could be the universal front end to the human race's entire body of knowledge. You will soon be able to run your life from your remote control. The hype comes down to earth each winter at the Consumer Electronics Show in Las Vegas, when the *other* electronics industry blasts out thousands of new products. Last December, the buzz at CES centered around a slew of products that blended personal computer technology, networking infrastructure, and consumer electronics into unusual and useful new products.

Simon Says It All

In one small box, BellSouth has combined a cellular telephone, a fax machine, computer interface and a personal information manager (PIM). The box is called the Simon, and with its IBM-designed software and MobilComm paging capability, it rolls just about everything a mobile executive could want into a package not much larger than a regular cellular phone—at an $899 price.

You use a stylus to tap a touch screen on Simon where you'd expect to find the buttons on a regular phone. It's this screen and its graphical interface that enable the device to step beyond regular cellular devices. Tap on the Last 10 or Quick Dial icons, and you get a list of numbers to redial. Tap on Fax and you'll be ready to dash off a quick fax using the smart keyboard (which uses a robust "best guess" feature to suggest the ten most likely next letters you'll enter). You can also receive and read faxes automatically. And you can receive up to nine number-only radio-pages—or plug in a MobileComm PCMCIA card to receive full alphanumeric pages. The big plus is that you can dial back those who are bugging you at the tap of an icon. In addition, Simon can send and receive e-mail through any remote dial-in cc:Mail post office.

And Simon's also a PIM. It can display an address-and-phone book, to-do list, calendar, notepad, clock, and calculator. And there's password protection to keep it all under wraps. True, tapping out information using a thin stylus on a palm-sized touch screen—with only a few hours of battery life—isn't everybody's idea of personal computing, but Simon isn't a standalone gimmick. You can add a serial connector to the device and transfer data between it and your PC. Or add dedicated cards such as MobileComm's full-strength radio paging card.

And, of course, it works over regular analog cellular networks. Such a deal.

Speaking of faxing, the Sharp Wizard is finally able to phone home. The OZ-9500 and OZ-9600 II product line can now be fitted with a Hayes-compatible fax modem, the $199.99 CE-FM1. This is no big surprise considering the big selling point of the OZ-9520 and OZ-9500—introduced in the fall of 1993—was integrated fax software. The fax modem also plugs into Sharp's version of the Newton MessagePad, the PI-7000 Expert Pad. If you want to fax using Sharp's other big news item—the PT-9000, a 2½-pound Geos-based computer with pen and detachable keyboard—you can do it two ways. The direct-to-fax method requires a fax modem on the serial port, or you can go through America Online's service, an interface that's included with the PT-9000.

BellSouth Cellular's Siman

the Most Toys . . .

Shopping by Compact Disc

Busy people don't do malls and they certainly don't wait for products to show up on home shopping channels. But they do make informed buying decisions, and then they want their goods quick. The latest consumer spin is computer-based shopping using CD-ROM catalogs and modems.

CompuServe plans to serve up a new front end to its consumer goods purchasing service on a monthly subscription CD-ROM. When you're ready to buy, you browse the goods—no doubt copiously illustrated—pick the one you want, and use the modem to place orders.

Medio Multimedia plans to release a monthly general interest and news magazine on CD-ROM, tentatively titled *A2Z Magazine*. Besides a collection of Associated Press news stories—including sound bites and video clips—the magazine will contain a virtual shopping mall from which you use your modem to dial in purchases.

Entertainment Tonight

Tired of rinky-dink Video for Windows clips? How about watching some real movies on your PC instead? For the price of a regular multimedia upgrade kit, you can get Sigma Designs' $849 ReelMagic Upgrade Kit, based around the 1993 *PC/Computing* MVP Award finalist MPEG playback board. What's the big deal? Its Sony CD-ROM drive enables you to play movies in Philips' CD-i's DigitalVideo format. CD-i titles include such Paramount megahits as *Star Trek VI* and *Patriot Games*, and you can rent them from many Blockbuster Video outlets. In addition to CD-i movies, ReelMagic should also be able to play movies in the forthcoming VideoCD format—bringing a new meaning to video for Windows.

So much for video. What about music? Anyone for a combo dual-speed SCSI CD-ROM with a Discman? It's slim, it's sleek, it looks like Darth Vader's shuttle craft, and it's called Reno. Like NEC's MultiSpin 3Xp, Media Vision's Reno is built to rock and roll as well as blast bits across the bus. But unlike the MultiSpin, it won't get you frisked by security guards who think you're carrying an ill-concealed weapon. Reno sports CD-like audio controls, a CD-ROM–like 64K buffer, and costs from $399 to $599. If it works and sounds half as good as it looks, it'll be worth every cent.

Canned music's OK, but interactive music is much better. If you're serious about pumping out your own music, check out Advanced Gravis Computer Technology's Gravis Personal Piano System. It's a $495 melding of a four-octave, pressure-sensitive keyboard with full-sized keys, Musicware's excellent Piano tutorial software, Advanced Gravis's UltraSound board, and all of the requisite cabling. You add the PC and a few months of humiliating practice, and you'll be able to read music, play like Paderewski (almost), and buy a second and third course from Musicware to further hone your skills. And unlike the lady on the other side of town, the Personal Piano System won't rap your knuckles if you don't practice. **MATTHEW LAKE**

A2Z MAGAZINE • $9.95 PER ISSUE; $59.95 PER YEAR • MEDIO MULTIMEDIA • (800) 788-3866, (206) 867-5500
Circle No. 603 on Reader Service Card

CE-FM1 • $199.99 • SHARP ELECTRONICS CORP. • (800) 321-8877, (201) 529-8200
Circle No. 602 on Reader Service Card

GRAVIS PERSONAL PIANO SYSTEM • $495 • ADVANCED GRAVIS COMPUTER TECHNOLOGY • (604) 431-5020
Circle No. 606 on Reader Service Card

REELMAGIC UPGRADE KIT • $849 • SIGMA DESIGNS • (800) 845-8086, (510) 770-0100
Circle No. 604 on Reader Service Card

RENO • $399; $599 UPGRADE KIT • MEDIA VISION • (800) 845-5870, (510) 770-8600
Circle No. 605 on Reader Service Card

SIMON • $899 • BELLSOUTH CELLULAR CORP. • (404) 249-5000
Circle No. 601 on Reader Service Card

▲ **PAGING DICK TRACY**

Here comes retail radio paging—an executive's impulse buy. The Swiss chronamaniacs at Swatch Telecam have bred wristwatches and radio pagers in captivity and created the BeepUp line—$175 fashion (*read:* gaudy) watches with small LCD pager windows. Here's Swatch's plan: You walk into a store, buy a watch pager, and dial a toll-free number to activate your MobilCamm account using the watch's serial number as a code. But the rather bulky current line is limited to one communications band—150MHz—which is more prevalent in Europe than in the United States. The more common 900MHz paging band should be supported by the next fashion season—this summer.

This setup certainly beats the current hassles of application, waiting, and paperwork. Once it's in action, the watch's paging battery should last about 650 hours, and the separate watch battery should last two years. Want to turn off the bleat? No problem—just check your watch every so often, and the LCD will indicate if you've been paged.

MEAT-AND-POTATOES PCs

Not Rich Fare, Just

WHICH TO BUY?
It's not the fastest system we've tested, but it's close. And when you consider its price tag, you'd have to conclude that Inmac's Insignia 466P (top photo, at left) is the most attractive choice among this group of meat-and-potatoes PCs. But Comtrade Electronics USA's EISA VL-Bus Professional 66 (top photo, at right) gives you lots of extras for only $350 more than the price-leading Insignia 466P—quite a bundle for the price.

On the other hand, if raw performance is your main consideration, you'll prefer the DECpc LPx (below, left) or its shorter sibling, the DECpc LPv (below, middle). IBM PC's PS/1 Consultant (below, right) was a little pokey in our Winstone application tests, but it offers the most upgradability in the least desktop space. Both of these mainframe brand names are, unfortunately, overpriced compared with the competition.

THESE ARE NOT the fastest computers you can buy. They don't have Pentium chips or a Peripheral Component Interconnect (PCI) local bus. But not everyone chooses steak and lobster off the menu, even if it's affordable—as Pentiums are becoming. If you just need a square meal at a great price, these top-of-the-line 66MHz 486DX2s may be more to your liking. For this review, we sampled a quintet of less-than-$3,000 486s—Comtrade Electronics USA's EISA VL-Bus Professional 66, Digital Equipment's DECpc LPx and LPv, IBM's PS/1 Consultant, and Inmac's Insignia 466P.

You may not need the fastest processor, but you still need a solid performer to run the ever-more-taxing graphical software here today and coming tomorrow. A 486DX2/66 engine that can be upgraded later to Intel's Pentium processors should do the job. All these machines—except the low-profile DECpc LPv—offer plenty of room for adding storage and add-in boards.

Speaking of DEC, its fraternal twin 486s, the LPv and LPx, smoked our rigorous Windows application benchmarks. Both machines are upgradable as well, at reasonable prices.

With three spare ISA slots, the LPv is, basically, the low-profile version of the LPx, which includes a pair of VESA local-bus slots and four ISA slots. The standard LPx also has one internal and four external drive bays, as opposed to two of each on the LPv.

Both DEC systems include S3 805 accelerated local-bus graphics, but the LPx also takes either an S3 928 card for about $150 or a Diamond Viper card for about $425. Both DEC PCs come standard with 1MB of VRAM showing 256 colors at 1,024-by-768-pixel resolution on their 15-inch, Super VGA (SVGA) monitors with a 72Hz refresh rate. Add $75 for another 1MB of VRAM to boost color depth at the same resolution.

A DECpc LPv with 8MB of memory and a rather slow 14ms 340MB hard drive sells for $2,668, while an LPx configured the same way costs $2,818. Add $90 for 128K of cache or $180 for 256K. DEC recently boosted its warranty to three years, one year of which is onsite. Both PCs are good values.

No More Blues with IBM PCs

IBM's PS/1 line was once a collection of wimpy price-point machines. But today's PS/1 Consultant has enough power and storage to run real applications.

This minitower has plenty of room to grow with six drive bays (four externally available) and eight ISA slots. The standard configuration includes both 1.44MB and 1.2MB floppy drives and a 12ms Western Digital 420MB hard drive. There's also a state-of-the-art 14,400-bit-per-second (bps)

Wholesome Computing

fax-modem board in one of the slots. Cache is extra—$229 for 256K of write-through cache or $249 for write-back cache.

The local-bus Cirrus Logic 5428 graphics adapter on the motherboard is supported by 1MB of VRAM. One particularly cool IBM exclusive is the rapid resume feature that lets you turn off the computer while Windows files and applications are open, and take up immediately where you left off when you turn it back on (just like in a notebook).

The $2,949 price includes 8MB of RAM expandable to 64MB on the planar and a PS/1 15-inch SVGA monitor. IBM also throws in a bundle of popular business software. The price includes a one-year warranty with 48-hour express replacement service at IBM's expense, and a lifetime of toll-free telephone support 24 hours a day, seven days a week.

Sadly, this system ran our Winstone tests slower than any of the five systems tested, but there's still enough power to tackle any job.

Have It Your Way

Inmac's specialty is build-to-order PCs. The company will put together a high-end 486 in any configuration you want using Intel's 486DX/33 or 50MHz and 66MHz 486DX2s or IBM's 486SLC2 50 CPUs.

We asked for a 486DX2/66-based Insignia 466P with 8MB of memory and a good-sized—but not oversized—12ms Western Digital 340MB hard drive. The system's Cirrus Logic 5428 local-bus graphics engine with 1MB of VRAM yields 256 colors at 1,024 by 768 pixels on a 15-inch SVGA monitor. Each system includes five open ISA slots and four drive bays (three externally accessible), one of which houses a 1.44MB/1.2MB floppy combo.

Inmac also bundles in MS-DOS 6.2, Windows 3.1, the Lotus Organizer personal information manager, and Diagsoft QAPlus diagnostic utilities. For extra speed, opt for a cache upgrade: 128K of cache for $35 and 256K for $59. Inmac also offers 540MB, 1GB, and 1.2GB hard drives, a choice of add-in fax modems, as well as network hardware and multimedia subsystems.

The cost of the configuration we used is only $2,136—an outstanding deal.

The standard Comtrade EISA VL-Bus Professional 66 includes 256K of 20ns cache and 16MB of memory upgradable to 128MB. This small-but-tall system with attractive styling is packed with features—each of which would cost extra from a big-name vendor.

The Professional 66 sports an unusual configuration: three EISA slots, two VESA VL-Bus slots, and two ISA slots. A Diamond Stealth 32 card sits in one of the VESA local-bus slots, and a local-bus controller for a 10ms 530MB Conner hard drive sits in another slot. The local-bus hard disk makes this machine a screamer.

With the Professional 66's generous 2MB of VRAM, the Diamond card displays 65,000 colors at 1,024 by 768 pixels on its 70Hz, 15-inch CTX monitor. For drive expansion, you also get four external and two internal bays—surprising in a case this size.

Comtrade's warranty also is unusually generous for a company this size: three years, one of which is onsite, plus toll-free phone support during normal business hours for the life of the system.

At $2,475, the Professional 66 still qualifies as a meat-and-potatoes PC, but its price and performance add up to veal scaloppini and potatoes au gratin.

MIKE HOGAN

DECPC LPX AND DECPC LPV • $2,818 AND $2,668, RESPECTIVELY • DIGITAL EQUIPMENT CORP. • (800) 722-9332, (508) 493-5111
Circle No. 607 on Reader Service Card

EISA VL-BUS PROFESSIONAL 66 • $2,475 • COMTRADE ELECTRONICS USA • (800) 969-2123, (818) 961-6688
Circle No. 608 on Reader Service Card

INSIGNIA 466P • $2,136 • INMAC • (800) 547-5444, (408) 727-1970
Circle No. 609 on Reader Service Card

PS/1 CONSULTANT • $2,949 • IBM PC • (800) 426-3377
Circle No. 610 on Reader Service Card

UNUSUAL PERFORMERS

With the exception of IBM PC's PS/1 Consultant, we were surprised at how well these Average Joe PCs ran our Windows application test suite. Thanks to local-bus graphics and a few hard-drive tricks, our former 486 champ, the Dell Dimension XPS 466V, was way ahead of the pack in October 1993.

But local bus is old news, and the DECpc LPx is our new performance champ with test scores 6 percent faster than the Dimension XPS 466V. The DECpc LPv and Inmac Insignia 466P are the Dell Dimension's equal.

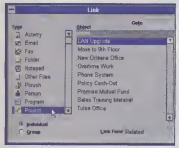
Given variances between individual PCs, Comtrade is also right in the running. It logged virtually the same test score as the Compaq ProLinea MT 4/66 Model 340/CDS, which we've tested previously.

PC/COMPUTING LAB REPORT:
THE FASTEST 486s EVER

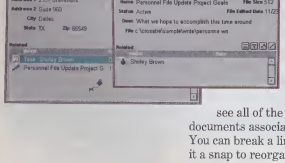
Note: Winstone is a system-level benchmark that runs 12 of the most popular Windows business applications and delivers a single score based on their combined performance.

CrossTies: Powerful Information Management with a Pretty Face

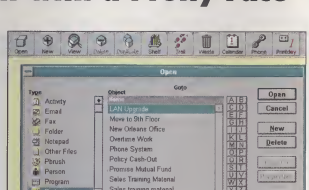
HOT LINKS
CrossTies makes it easy to link objects. The most straightforword woy is to click on the Link button in ony object box. Then, fram the Link dialog box (top screen), you select the torget from the list of objects.



To link two unrelated objects—for example, if you're moving a file into CrossTies (below)—simply click the cursor on an object in the Related bar of one box, then drag the object icon that appears (in this case, the fountain pen nib) onto the Related area in the other box.



WE KNOW WHAT you're thinking: Just what the world needs, another so-called personal information manager (PIM) that confuses your life instead of organizing it. Many of the PIMs we've encountered are either so Byzantine that they force you to completely change the way you work, or they're so feeble that they can barely manage a phone list, let alone your day-to-day projects. But before you thumb your nose and turn the page, take a closer look at the new CrossTies. This intuitive program lets you store, manage, and retrieve all of your Windows project, task, schedule, and contact data. It's really easy, and it really works.



CrossTies integrates your crucial data including projects, contact lists, faxes, e-mail, and even applications under an easy-to-use interface.

Hooking Up

CrossTies represents all data—people, tasks, programs, and activities—as objects. Each object has a variety of descriptive fields, depending on its type. A Person object, for example, includes a name, phone number, address, and so forth, while an activity has an associated start time and end time, as well as a priority status.

All objects can be linked to other objects. You can link a person to activities, documents, projects, or even other people with the click of a button. So when you call up the Joe Smith object, you can easily see all of the meetings, projects, and documents associated specifically with him. You can break a link just as easily, making it a snap to reorganize people and tasks. While making and breaking links within CrossTies couldn't be simpler (see "Hot Links"), if you have an aversion to doing things the easy way, you can always use the Windows Clipboard to copy and paste links between objects.

All-in-One Interface

The ultimate CrossTies power user could even use the program as a Windows shell. You can, for example, create a Microsoft Word for Windows file as a new object, give it a description, then save the file and link it to an existing person or activity. You can also move existing files into CrossTies and link them to objects. CrossTies will even act as a front end to your VIM- or MAPI-compliant e-mail system, and it will automatically link mail messages to the appropriate person object.

In addition to handling e-mail, CrossTies will also work with SofNet's FaxWorks or FaxWorks Pro to integrate your incoming and outgoing faxes with CrossTies objects. When you send a fax from within an application, CrossTies lets you choose the recipients—either an individual or a group—from a list of Person objects, and then creates a Fax object that is automatically linked to the Person object.

You can also manually link incoming faxes to existing objects. The CrossTies viewer will even let you see the fax without having to switch to FaxWorks. The only drawback to CrossTies fax support is that you can't take advantage of it if you don't have FaxWorks. At press time, the

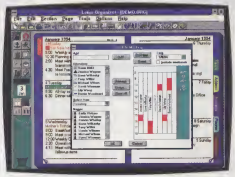
(Continued on page 39)

BLACK HOLE (ARTIST'S CONCEPTION)

"THIS MEETING WAS SUPPOSED TO START A HALF HOUR AGO. WHERE IS EVERYBODY?"

It's a known fact. Busy schedules and poor communication can create black holes that suck up co-workers just before the big meeting. Scientists can tell us a lot about black holes, but they can't get people together on time. Only Organizer™ can do that.

Lotus® Organizer 1.1 Personal Information Manager for Windows™ works across your existing ccMail® network to make pulling together that big meeting—as well as planning your day—easier than ever before.



Lotus Organizer with group scheduling takes the guesswork—and the footwork—out of meeting planning.

You simply choose attendees from the ccMail directory. Organizer shows you a graphical view of their schedules so you can pick the best meeting time. Then Organizer delivers an invitation via ccMail. Invitees can accept, decline, or delegate to someone else with a single click. Organizer tracks them automatically. No phone tag. Just the easiest way ever to plan a meeting.

Organizer's group scheduler displays a user's *availability only*, not the entire schedule, so everyone's privacy is protected. And invitations can be sent to anyone on the ccMail network, even if they don't use Organizer.

Organizer does more than plan meetings. Organizer includes an on-screen calendar, an automated to-do list, an address book, a note pad and an anniversary reminder. Organizer will even sound an alarm to remind you of a commitment—like that meeting you're invited to.

There are three ways you can get Organizer: on its own; with ccMail in the 10-user Group Pack™; or for an even better deal, upgrade to SmartSuite® – a suite of five top-notch, fully integrated business applications including Organizer – for just $299.* Call **1-800-872-3387, ext. 9465**, or visit your Lotus Authorized Reseller. Because, as common as they are, black holes at work are now entirely preventable.

Lotus
Working Together™

*$299 promotional price while supplies last. In Canada, call **1-800-GO-LOTUS**. Prices may vary. ©1994 Lotus Development Corporation. 55 Cambridge Parkway Cambridge MA 02142. All rights reserved. Lotus, SmartSuite and Working Together are registered trademarks and Organizer and Group Pack are trademarks of Lotus Development Corporation. ccMail is a registered trademark of ccMail, Inc., a wholly-owned subsidiary of Lotus Development Corporation. Windows is a trademark of Microsoft Corporation.

COREL GALLERY™

Add flair to your word processing and presentations

Even if you don't use computer graphics software, you can add flair to all your communications. Corel GALLERY is an easy-to-use, visual clipart manager on CD-ROM that allows users to "drag and drop" images into any OLE-2-enabled application or export images to many industry-standard file formats. It includes over 10,000 professionally-designed clipart images (with more than 6,000 in color), plus a full-color reference guide. Corel GALLERY, a Windows application, is the ideal companion for word processing, presentation and publishing software.

10,000 CLIPART IMAGES*

EASY TO USE

1 Browse through the many categories of ready-to-use clipart.
2 Select an image and preview your choice.
3 "Drag and drop" your image to place it exactly where you want it.

INCREDIBLE VARIETY!

You have a choice of more than 10,000 clipart images from over 50 categories. You'll find images of celebrities, business graphics, transportation, food, maps and so much more.

FLEXIBILITY

Corel GALLERY works with dozens of word processing, presentation and DTP packages, including:

WORD PROCESSING
- MICROSOFT WORD
- LOTUS AMIPRO
- WORDPERFECT

PRESENTATIONS
- POWERPOINT
- LOTUS FREELANCE
- HARVARD GRAPHICS

PUBLISHING
- MICROSOFT PUBLISHER
- VENTURA PUBLISHER
- ALDUS PAGEMAKER

...and more

ROCKY MOUNTAIN COMPUTER OUTFITTERS

Call today!
1-800-591-0010 $37

Circle 218 on reader service card.

COREL
(613)728-3733
EXT.24

*Also found as clipart libraries in CorelDRAW4 and Corel Ventura 4.2

BC1016

CrossTies, *continued from page 36*
company claimed to be working on adding support for several more fax programs in the next version.

While CrossTies doesn't have the macro muscle of a powerhouse information manager like Jensen-Jones's Commence, the program does have several advanced features that eliminate repetitive typing. You can record macros and save them as buttons on the movable button bar. CrossTies also lets you build templates for all of your object types, which is particularly handy for tasks like entering several people from the same company or subtasks on the same project.

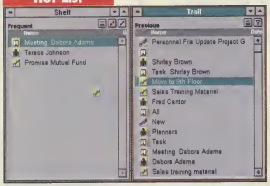
Nothing that CrossTies does is rocket science, and most information managers let you link related data. CrossTies stands out, however, because it has the shortest learning curve and an interface that's easier to navigate than any we've seen on this kind of product. The only thing we missed was a group scheduler—in fact, beyond its e-mail front end, CrossTies has no network features to speak of. Nevertheless, CrossTies does an excellent job of balancing a powerful and flexible feature list with a goof-proof interface, all at a nice price. It might just make you a believer in the power of electronic information management. **SHYAMALA REDDY**

CROSSTIES • $149 • CROSSTIES SOFTWARE CORP. • (800) 955-8437, (214) 407-9996
Circle No. 611 on Reader Service Card

Guided Tour: One-Stop Desktop

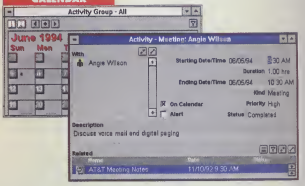
You can navigate through all information with the click of a button.

Hot List



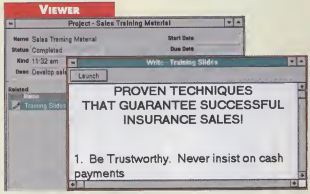
CrossTies makes it easy to access current or frequently used objects through its Shelf and Trail windows. You can even drag objects between the two.

Calendar



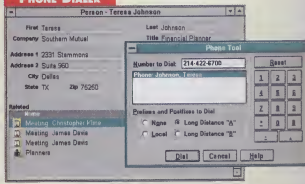
It's easy to reschedule and change the length of meetings on the CrossTies calendar. Or you can edit objects directly from your calendar view by double-clicking on the appropriate entry.

Viewer

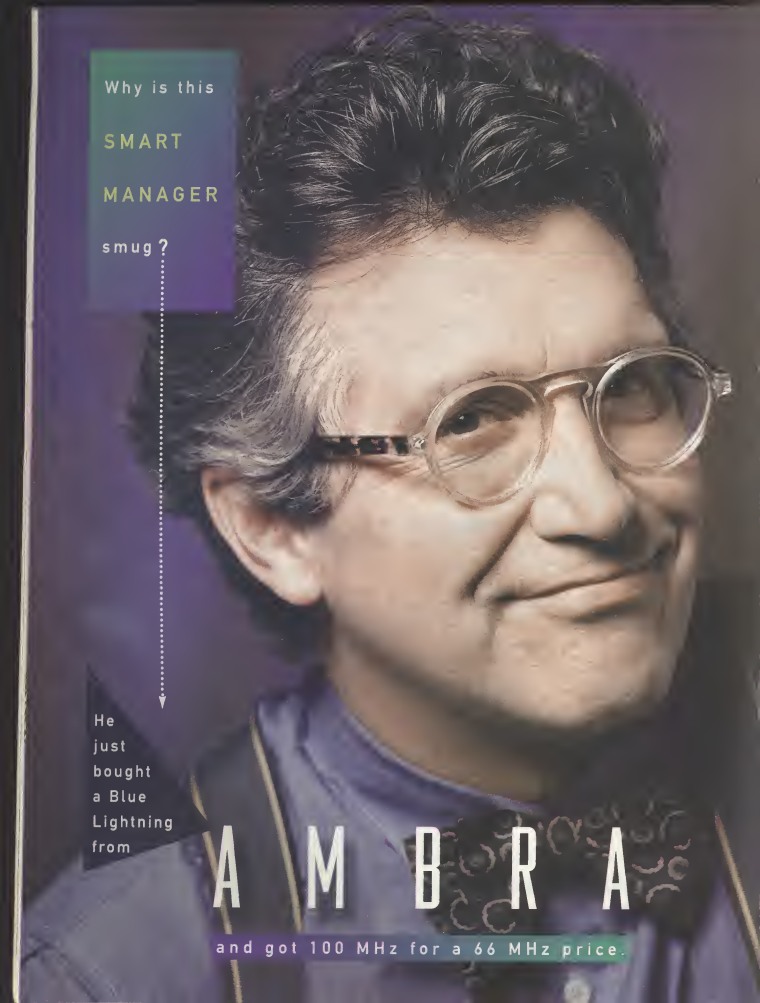


CrossTies has built-in support for most popular Windows apps, so you can view any document from within the CrossTies shell. If looking isn't enough, the launch button offers editing capability.

Phone Dialer



You don't even have to leave CrossTies to make a phone call. With a Person object open on the desktop, click on the phone button and CrossTies will launch an autodialer.


Why is this
SMART
MANAGER
smug?
He
just
bought
a Blue
Lightning
from
AMBRA
and got 100 MHz for a 66 MHz price.

Looking for a SMART BARGAIN on a business computer?

AMBRA's BLUE LIGHTNING™ "Best Buy" just got BETTER!

PC WORLD noted AMBRA™ **Blue Lightning** 66 MHz systems as a **"Best Buy."** Now we've got **100 MHz** models ready to go! With **IBM®clock-tripling** technology, **16KB cache** and a built-in ***high-performance graphics accelerator,*** Windows™-based business apps take off! An integrated **local bus IDE controller** speeds I/O. And an optional (only $79) **BLUE MATH CO-PROCESSOR** cuts through calculation-intensive tasks!

100 MHz BLUE LIGHTNING

D4100BL

- 486 Blue Lightning, 100 MHz
- Upgradable to Pentium™ technology
- 16KB L1, 128KB L2 cache
- 8MB RAM, max: 64MB
- 4 16-bit ISA, 1 32-bit VL bus slot
- 540MB (12ms) IDE hard disk
- 5 drive bays
- Local bus IDE controller
- Local bus graphics accelerator, 1MB
- 14" SVGA-NI color monitor, LR
- 3.5" 1.44MB diskette drive
- Lexmark™ PS/2®-style 101-key keyboard
- MS-DOS® 6.2, Windows™ 3.1, mouse

$2,179

D4100BL multimedia

- 486 Blue Lightning, 100 MHz
- Upgradable to Pentium technology
- 16KB L1, 128KB L2 cache
- 8MB RAM, max: 64MB
- 4 16-bit ISA, 1 32-bit VL bus slot
- 540MB (12ms) IDE hard disk
- 5 drive bays
- Local bus IDE controller
- Local bus graphics accelerator, 1MB
- 15" FST-NI color monitor, LR
- Double-speed Multisession Multimedia Kit
- 3.5" 1.44MB diskette drive
- Lexmark PS/2-style 101-key keyboard
- MS-DOS 6.2, Windows 3.1, mouse

$2,599

Let us customize your computer for you!
Want a modem? Multimedia capability? More memory? We'll custom-configure your computer to your exact specs —at no extra service cost!

66 MHz Blue Lightning

- 486 Blue Lightning, 66 MHz
- 4MB RAM, max: 64MB
- 240MB (15ms) IDE hard disk
- Integrated 32-bit SCSI-2 controller
- Integrated Ethernet (10BaseT)
- 14" SVGA color monitor, LR

$1,725

Sizzling multimedia for any system you choose! Call for details!

Count on rapid service and round-the-clock support!

You're covered by AMBRA's 30-day money-back guarantee and one-year limited warranty. For just $29, you can get an optional one-year IBM onsite service contract.[1] Either way, you're entitled to expert toll-free technical support — 7 days a week, 24 hours a day!

We're ready to take your order! Call now!

We're open for business every weekday 8 am to 11 pm, weekends 10 am to 7 pm. We accept major credit cards, and purchase orders from qualifying businesses. Pick up the phone today!

In Canada,[2] call 1-800-363-0066, Ext. 3156

AMBRA™

1-800-200-3156

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

© 1994 AMBRA Computer Corporation. AMBRA is a trademark of ICPI LM and used under license therefrom. The AMBRA logo and logotype are trademarks of AMBRA Computer Corporation. IBM and PS/2 are registered trademarks and Blue Lightning is a trademark of International Business Machines Corporation. Intel is a registered trademark and Pentium is a trademark of Intel Corporation. Lexmark is a trademark of Lexmark, Inc. MS-DOS is a registered trademark and Windows is a trademark of Microsoft Corporation. All other product names are trademarks or registered trademarks of their respective suppliers. Offerings, prices and products are subject to change without prior notice. Prices do not include shipping.

Why is this
MULTIMEDIA
fan mellow ?
She just bought a CD-ROM-ready
AMBRA
Now she can simply sit back and enjoy the show!

Get set for SOUND and MOTION, save yourself time and trouble.

AMBRA™ multimedia systems arrive READY to ROLL!

SUPER POWER

DP60/PCI/MM

- Intel® Pentium™ processor, 60 MHz
- 64-bit CPU-memory-cache data path
- 256KB L2 and 16KB L1 cache
- 8MB RAM, max: 128MB
- 4 ISA, 2 PCI, 1 PCI/ISA slot
- 540MB (12ms) IDE hard disk
- 6 drive bays
- Fast PCI IDE controller
- PCI graphics accelerator, 2MB
- 15" FST-NI color monitor, LR
- 3.5" 1.44MB diskette drive
- Double-Speed Multisession Multimedia Kit
- Lexmark™ PS/2®-style 101-key keyboard
- MS-DOS® 6.2, Windows™ 3.1, mouse

$3,099

SUPER PERFORMANCE

D466DXA/MM

- 486DX2, 66 MHz
- Upgradable to Pentium technology
- 128KB L2 cache, max: 256KB
- 8MB RAM, max: 36MB
- 5 16-bit ISA slots
- 540MB (12ms) IDE hard disk
- 5 drive bays
- Local bus IDE controller
- Local bus graphics accelerator, 1MB
- 15" FST-NI color monitor, LR
- 3.5" 1.44MB diskette drive
- Double-Speed Multisession Multimedia Kit
- Lexmark PS/2-style 101-key keyboard
- MS-DOS 6.2, Windows 3.1, mouse

$2,349

SUPER VALUE

S450DX/MM

- 486DX2, 50 MHz
- Upgradable to Pentium technology
- 128KB L2 cache, max: 256KB
- 4MB RAM, max: 36MB
- 3 16-bit ISA slots
- 340MB (15ms) IDE hard disk
- 3 drive bays
- Local bus IDE controller
- Local bus graphics accelerator, 1MB
- 14" SVGA-NI color monitor, LR
- 3.5" 1.44MB diskette drive
- Double-Speed Multisession Multimedia Kit
- Lexmark PS/2-style 101-key keyboard
- MS-DOS 6.2, Windows 3.1, mouse

$1,948

THESE SYSTEMS ARE SOUNDBLASTER-COMPATIBLE AND SUPPORT MULTISESSION PHOTOCD.

MAKE AMBRA YOUR DIRECT SOURCE OF THE BEST AND LATEST TECHNOLOGY (MULTIMEDIA AND MORE) FOR LESS!

Our product line covers the complete range of computing needs: desktops to towers to easy-traveling notebooks. Besides marvelous multimedia, we build systems with the latest in processing and local bus technology. We offer a full selection of sizzling graphics accelerators and high-capacity hard drives, too.

LET US CUSTOM-BUILD A COMPUTER FOR YOU!

With AMBRA, you don't have to install multimedia options — we do it for you. But maybe you want something else? Whether it's extra memory or a modem, higher disk capacity or a different chassis, we'll custom-configure to your exact specs — at no extra service cost!

Special Bonus! "Try and Buy" software sampler on CD.

AMBRA

For more systems and a superbuy on CD packs, read on!

1-800-200-3155

Pick a pack of CDs! 5 discs for just $79!

Business Bundle
- Macromedia Developers Pack
- Allegro Business Library
- Sound Effects Library
- Multimedia Business 500
- PhoneDisc USA Business

Pastimes Pack
- Multimedia Audio Collection
- Beethoven's 5th
- Supersonic
- Return to Zork
- Video Hound

Home/Health/Holidays
- Better Homes Cookbook
- Complete House
- Mayo Clinic Family Health
- Chessmaster 3000
- National Parks

Students' Helpers
- Multimedia Encyclopedia
- 1993 Time Almanac
- Mavis Beacon Teaches Typing
- Monarch Notes
- How Things Grow

Just for Kids (K-5)
- Dr.T's Sing-A-Long
- The Legends of Oz
- Teddy's Big Day
- Dandy Dinosaur
- Macmillan Dictionary

AMBRA systems come at MONEY-SAVING prices — with MULTIMEDIA or without!

PENTIUM AND PCI TECHNOLOGY

DP60/PCI
- Intel Pentium processor, 60 MHz
- 64-bit CPU-memory-cache data path
- 256KB L2 cache
- 8MB RAM, max: 128MB
- 4 ISA, 2 PCI, 1 PCI/ISA slot
- 540MB (12ms) hard disk
- 6 drive bays
- Fast PCI IDE controller
- PCI graphics accelerator, 2MB
- 14" SVGA color monitor, LR
- 3.5" 1.44MB diskette drive
- Lexmark PS/2-style 101-key keyboard
- MS-DOS 6.2, Windows 3.1, mouse

$2,679

GET ANY OF THESE DESKTOPS OR MINITOWERS PRECONFIGURED WITH AMBRA'S OPTIONAL CD-ROM AND MULTIMEDIA KITS!

DOUBLE-SPEED DRIVE KIT
- 2X CD-ROM drive
- Motorized tray
- Multisession PhotoCD compatible

$199

DOUBLE-SPEED BLASTER KIT
- 2X CD-ROM drive
- SoundBlaster™-compatible 16-bit sound card with CD-ROM interface
- 2 desktop speakers

$320

DRIVE AND SOUND KIT
- CD-ROM drive
- ProAudioSpectrum 16-bit sound card
- 2 desktop speakers

$179
(limited quantity)

STEREO SOUND KIT
- ProAudioSpectrum 16-bit sound card
- 2 desktop speakers

$159

DP60/PCI w/CD-ROM
- 16MB RAM
- Double-Speed Multisession CD-ROM drive
- 15" FST-NI color monitor, LR

$3,338

In Canada,[4] call 1-800-263-0056, Ext 3155

CALL 1-800

[1] With purchase of multimedia- or CD-ROM-equipped system. [2] In order to offer the honest CD Packs, AMBRA may substitute individual titles in a given bundle. Call for details. [3] Please call for details regarding AMBRA's money-back guarantee, limited warranty and Executive warranty, and IBM optional onsite warranty. Return shipping and insurance charges are the responsibility of the customer. Onsite service may not be available in certain locations. [4] Offerings may differ in Canada.

DX2 66 MHz SYSTEMS W/ OPTIMIZED DESIGN

D466I/VL

- 486DX2, 66 MHz
- Upgradable to Pentium technology
- 256KB WriteBack L2 cache
- 8MB RAM, max: 64MB
- 4 16-bit ISA, 1 32-bit VL bus slot
- Upgradable to PCI
- 540MB (12ms) IDE hard disk
- 5 drive bays
- Local bus IDE controller
- Local bus graphics accelerator, 1MB
- 15" FST-NI color monitor, LR
- 3.5" 1.44MB diskette drive
- Lexmark PS/2-style 101-key keyboard
- MS-DOS 6.2, Windows 3.1, mouse

$2,299

466I/VL minitower w/CD-ROM

- 16MB RAM
- 7 16-bit ISA, 1 32-bit VL bus slot
- 6 drive bays
- 14" SVGA color monitor, LR
- Double-Speed Multisession CD-ROM drive

$2,789

EXTRA-AFFORDABLE MODELS

D466DXA

- 486DX2, 66 MHz
- Upgradable to Pentium technology
- 128KB L2 cache, max: 256KB
- 4MB RAM, max: 36MB
- 5 16-bit ISA slots
- 240MB (15ms) IDE hard disk
- 5 drive bays
- Local bus IDE controller
- Local bus graphics accelerator, 1MB
- 14" SVGA color monitor, LR
- 3.5" 1.44MB diskette drive
- Lexmark PS/2-style 101-key keyboard
- MS-DOS 6.2, Windows 3.1, mouse

$1,725

466DXA minitower

- 8MB RAM
- 8 16-bit ISA slots
- 540MB (12ms) IDE hard disk
- 6 drive bays
- 15" FST-NI color monitor, LR

$2,229

FEATHERWEIGHT NOTEBOOK

SN425C

- 486SX, 25 MHz, SL-Enhanced
- 4MB RAM, max: 20MB
- 170MB removable hard disk
- 7.8" STN color screen
- 1 PCMCIA slot, Type II
- 86-key keyboard
- Integrated 16mm trackball
- Suspend/Resume
- MS-DOS, Windows 3.1
- Slip case
- 4 lbs, including battery

$1,899

(Available in mono for $1,499. With external 3.5" 1.44MB diskette drive, add $99.)

COUNT ON RAPID SERVICE AND ROUND-THE-CLOCK SUPPORT!

WE COVER ALL OUR SYSTEMS WITH A 30-DAY MONEY-BACK GUARANTEE AND A ONE-YEAR LIMITED WARRANTY. FOR JUST $29, YOU CAN GET AN OPTIONAL ONE-YEAR IBM ONSITE SERVICE CONTRACT FOR DESKTOPS AND TOWERS. A SPECIAL EXECUTIVE WARRANTY IS AVAILABLE FOR MOBILE SYSTEMS (YOU RECEIVE A LOANER NOTEBOOK IF YOURS EVER NEEDS REPAIR)[3] IN EVERY CASE, YOU'RE ENTITLED TO EXPERT TECHNICAL SUPPORT — TOLL FREE, 7 DAYS A WEEK, 24 HOURS A DAY!

CALL NOW! WE'RE READY TO TAKE YOUR ORDER!

We're open for business every weekday 8 am to 11 pm, weekends 10 am to 7 pm. We accept major credit cards and purchase orders from qualifying businesses. Pick up the phone today!

AMBRA

1-200-3155

©1994 AMBRA Computer Corporation. AMBRA is a trademark of ICPI Ltd. and used under license therefrom. The AMBRA logo and logotype are trademarks of AMBRA Computer Corporation. IBM and PS/2 are registered trademarks of International Business Machines Corporation. Intel is a registered trademark and Pentium is a trademark of Intel Corporation. Lexmark is a trademark of Lexmark, Inc. MS-DOS is a registered trademark and Windows is a trademark of Microsoft Corporation. All other product names are trademarks or registered trademarks of their respective suppliers. Offerings, prices, and products are subject to change without prior notice. Prices do not include shipping.

Microsoft Money 3.0: Banking And Investing Enhancements

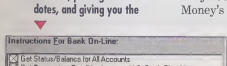
BANKING MADE EASY

Microsoft's Money 3.0 Bank On-Line feature not only lets you pay bills and make intercoount transfers, but also quickly and intelligently updates the records on your home PC while you're online.

Money takes the hassle aut of personal accounting by automatically recording and reconciling new bank transactions in the appropriate checking, savings, or credit account registers as they are received by your bank. If you happen to enter some transactians yaurself, Money will compare the bank's records to yours and highlight any discrepancies based on check number, date, or amount.

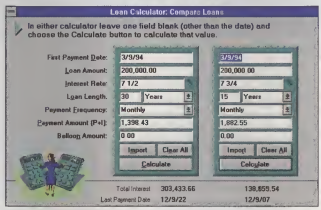
After you hang up, Money displays a line-by-line summary of your transactions in a scrollable dialog box that you can save to disk. The messages are amazingly clear, describing requested account balances, posting status and dates, and giving you the confidence that your online banking was successful.

This service is currently offered ta customers at three major banks—U.S. Bank in Portland, Oregon; First National Bank of Chicago; and Michigan National Bank.



IF YOU'RE SHOPPING for an electronic way to organize your finances, you have two choices—Intuit's Quicken or Microsoft's Money 3.0. We can't disagree with the millions who give Quicken the nod, but the latest version of Money is a strong product with innovations that some of you just might prefer.

Money 3.0 takes the drudgery out of both day-to-day banking and investment tracking through new financial calculators, reports, and electronic services. True, Money's new Pay On-Line bill-paying service merely catches up to Quicken's Check Free feature, but its Bank On-Line feature clearly outshines Quicken's manual check entry—letting you electronically update and manage your checking, savings, and credit card accounts at three large regional banks any time of day or night.



The dialog boxes for each of Money's online features contain descriptive check boxes for selecting services, with details of transactions. Each transmission finishes with a summary of the actions that were executed.

Online Investing

It's just as easy to track investments with Money's Quotes On-Line feature. As in Quicken, you set up accounts for stocks, bonds, mutual funds, and other investments. A quick call automatically updates the prices on your existing stock and mutual fund investments (but not bonds). You can get similar updates from CompuServe with the Quicken Companion add-in, but it costs another $35 plus online charges.

Money's new investment reports put it on a par with Quicken's—letting you look at your accounts by market value, transaction and price history, or overall performance.

Where Money gets a leg up is in the use of its friendly Wizard help technology to create five robust financial planning tools—loan, mortgage, and bank interest calculators, and savings and retirement planners. You can calculate interest on a savings account for a given period, and not only detail your borrowing options on a loan prospect, but also compare two loans or mortgages to find the best value. The savings planner helps you design a plan to reach a fixed savings goal, while the retirement planner works toward a monthly retirement income based on gradually increasing contributions. You can do all this in Quicken's financial calculators, but Money's Wizards are easier to use.

Right for Some

Money's emphasis on ease-of-use and electronic banking brings it closer to Quicken. But Quicken still has much more breadth and depth—more ways to look at your accounts, and more built-in and user-customizable shortcuts. Quicken offers home inventory, tax planning, and a financial calendar that makes it much easier to set up recurring payments, visualize when they happen, and graphically display anticipated cash flows.

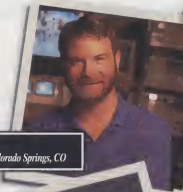
Version 3.0 of Money provides a good value for current owners and for novices looking for help managing their finances. We still prefer Quicken by a margin, but this version of Money has features that narrow that gap.

MIKE FALKNER

MONEY 3.0 • $34.95 UNTIL APRIL 15 (NOT INCLUDING ONLINE CHARGES); $69.95 THEREAFTER • MICROSOFT CORP. • (800) 426-9400, (206) 882-8080
Circle No. 612 on Reader Service Card

"Do I Look Like An Accountant?"

"I like to work with video equipment, not with numbers. But I have to do both to stay on top of my business. So I found the easiest way – QuickBooks®. I just sit down at the computer and the screen looks just like an invoice. QuickBooks memorizes everything. I type a keystroke or two to start most entries — and it finishes it for me — amazing. In a small business like mine, accounts receivable is very important and QuickBooks does it all for me automatically. The accounts receivable aging lets me know what my clients owe and for how long. The instant collections report tells me everything I need to know about my overdue accounts including the names and phone numbers to call. I never pictured bookkeeping being this easy."



Eric Replinger
Video Producer, Colorado Springs, CO

"Last time I looked in the mirror I ran a dairy business. That means I can't afford to spend more time keeping my records than producing. When it comes to accounts payable, QuickBooks is a lifesaver. I just run a monthly cash flow report to time my purchases to match my inflows and outflows of money. I ask QuickBooks to tell me which bills are due, then decide which ones to pay— and it practically writes the checks for me. No question, I would recommend QuickBooks to anyone else in my field."

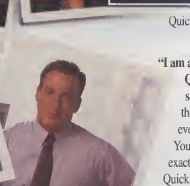
Craig Trible
Dairy Business Operator, Troy, VT

"Until QuickBooks, doing the bookkeeping was the craziest part of running our psychiatric management office. My favorite thing about QuickBooks is the reports. I can create reports just about any way I need them. I just scroll down a menu, select the kind of report, set the beginning and ending date, hit "enter" a couple of times and the report is done. That's it. I can even get comparison reports to see how things are doing from one day or one year to the next.

QuickInsight™ graphs give me a picture of the trends — and QuickZoom™ lets me see the numbers behind the graphs. QuickBooks is bookkeeping sanity, at last."

Susan Yeagley Sullivan
Psychiatric Management, San Diego, CA

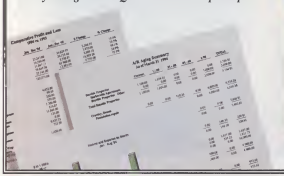
"I am an accountant. And I recommend QuickBooks to anyone who has a small business. Here are just some of the reasons. First, it's easy. You don't even need to know a debit from a credit. You can easily customize QuickBooks exactly for your business — perfect. QuickPay™ gives you complete payroll automatically, calculating deductions and maintaining employee information.



Stuart Cilley
CPA, Rohnert Park, CA

And here's the best part: come tax time all the information is there — you just print out the right reports for your accountant. Whenever I begin consulting a small business I ask two questions: 'Do you have a computer?'and 'Do you have QuickBooks?' "

QuickBooks®is easy, complete bookkeeping software from the makers of Quicken.® Pay bills and create invoices with QuickBooks and it does the rest for you. You'll have more organized, accurate records that help you make better, more profitable business decisions. Make your first one right now by calling to order QuickBooks at this special price.



New Version 2.0! Choose DOS or Windows.

Try New QuickBooks For Only $8.00!

Pay only shipping and handling now to try QuickBooks.

If you decide to keep using it after 30 days, pay just $99. Otherwise, it's yours free.

Call 1-800-796-2600

24 hours a day, 7 days a week

Add QuickPay to your order for just $39.95. (QuickPay not available in Canada.)
Credit card orders only. Please have your card ready.
Offer for first time users only. Additional international charges apply.
Expires 8/31/94 Ad Code: PM4JK

System requirements: DOS: IBM® compatible PC, 640K RAM DOS 3.0 or higher and 3.2 MB free on hard disk Windows: IBM® compatible PC, 386 or higher, 2MB RAM minimum, (4MB recommended), Windows 3.1 or higher, 8MB free on hard disk DOS and Windows feature sets vary

QuickBooks and Ouicken are registered trademarks of Intuit. QuickPay is a trademark of Intuit. © Intuit 1993

Don't Take a Break—Use Adaptive's PeopleScheduler

How It Works

Fictitious Carp., a large retail chain, has full-time, part-time, and salaried workers coming and going at all hours. First, the company tells PeopleScheduler 2.0 about its shifts and breaks.

SARTRE SAID, "HELL is other people." You disagree: Hell is *scheduling* other people. It's like this: Bob can work from 9 a.m. to 5 p.m. on Tuesdays and Thursdays, but only from 9 to 3 on any other day. Fortunately, Kimberly can cover for Bob on Wednesdays and Fridays, but she can't work on Mondays. Jim can take Mondays, but you don't want him working just two hours a week, so you need to find other times for him. And those are the simple problems.

Our puny analog brains were not meant to solve conundrums like this. Fortunately, Adaptive Software's PeopleScheduler 2.0 was. This $495 package (the price includes both DOS and Windows versions) will astound you by making the complexities of scheduling your staff's work hours simple. If you have to coordinate breaks, lunches, and absences for more than five people, PeopleScheduler will cut down on your aspirin bills dramatically.

POLICY

Fictitious Breaks

Breaks	Length	Work Hours To Break	Break Starts Between Min Work Hours	Max Work Hours	Paid Break
1st	0 hrs 15 min	3 hrs 0 min	1 hrs 30 min	2 hrs 0 min	☒
2nd	0 hrs 45 min	5 hrs 0 min	3 hrs 30 min	4 hrs 30 min	☐
3rd	0 hrs 15 min	7 hrs 0 min	6 hrs 0 min	6 hrs 30 min	☒
4th	0 hrs 15 min	10 hrs 0 min	8 hrs 0 min	9 hrs 0 min	☒

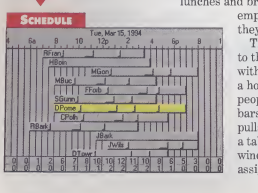
Meet David Tawer. He's a cashier for Fictitious. He works every day from 9 a.m. to 6 p.m. and gets three breaks. That's just about all you need to tell the program for it to start making your scheduling easier.

PERSONNEL

Day	Availability Start	Availability End	Typical Schedule Start	Typical Schedule End	Brk 1	Brk 2	Brk 3	Hours	
Mon	any	any	9:00a	5:00p	auto	auto	auto	8.25	+
Tue	any	any	9:00a	5:00p	auto	auto	auto	8.25	
Wed	any	any	9:00a	5:00p	auto	auto	auto	8.25	
Thu	any	any	9:00a	5:00p	auto	auto	auto	8.25	
Fri	any	any	9:00a	5:00p	auto	auto	auto	8.25	
Sat	any	any	off	off				0.00	
Sun	any	any	off	off				0.00	+
			Overtime 1.25				Total 41.25		

If Sara Gunn fills in for David, but takes lunch from 1:30 p.m. to 2:00 p.m., and Mark Gamper goes home sick, who will be left at the registers? Just check out the Scheduler view.

SCHEDULE



Just What You Want

The product works as you would expect it to: You enter names of departments, then enter people's names and the hours they can work, and what a typical day would look like for them (for example, get in at 9 a.m., leave at 5 p.m.). For employees, you designate full-time or part-time work schedules, and PeopleScheduler automatically schedules lunches and breaks (you tell it how long employees must work before they qualify for them).

Then all you have to do is go to the TimeVisualizer—a grid with the hours of the day along a horizontal axis. As you add people, PeopleScheduler places bars on the TimeVisualizer and pulls up their vital statistics in a table at the bottom of the window. PeopleScheduler assigns employees to come in and leave at the times you assigned to them. You can then drag employees' bars to another setting to reschedule them if necessary. If you drag a bar outside an employee's allowable work hours (Bill just can't get in at 3:30 a.m.), PeopleScheduler will pop up a warning.

One of the most intriguing features of this time schedule is how closely it resembles the magnetic scheduling strips many people use for the same purpose—so you don't need to learn a new metaphor. In addition, each big bar, which shows the length of an employee's work day, contains little bars representing breaks and lunch. You can see immediately that all your employees but one are taking lunch from noon to 12:30, and you can fix it, just as you would with a magnetic scheduling strip.

Except for These Bits

Not all that glitters is gold, however. PeopleScheduler is a great tool for creating day-to-day and even month-to-month schedules, but it's not a complete human resources tool. For example, although you can tell PeopleScheduler that an employee is going to take a one-week vacation, it has no facility for generating a report that will tell you how much vacation time each employee has taken to date. The largest shortcoming of PeopleScheduler is that it can't solve scheduling dilemmas for you—it just shows you that they exist.

In addition, by making the DOS and Windows versions look and feel nearly identical (they're so close it's amazing), Adaptive compromised on some features that Windows users are used to. For example, pulling down the Window menu reveals PeopleScheduler's three main function windows (People, Notes, and Scheduler), but you can't tile these windows as you can in most Windows applications.

If you spend too much time arranging other people's time, get some of it back: Get PeopleScheduler. **JOHN MONTGOMERY**

PEOPLESCHEDULER 2.0. • $495 • ADAPTIVE SOFTWARE • 4000 MACARTHUR BLVD., SUITE 3000 • NEWPORT BEACH, CA 92660 • (800) 598-1222, (714) 729-3180
Circle No. 613 on Reader Service Card

"One Monitor Can Do It All"

BEST COLOR QUALITY: VIEWSONIC 17

"The ViewSonic 17 combines wide, smooth color ronge, excellent soturotion ond intensity, ond superb uniformity for o picture-perfect imoge."

BEST SHARPNESS: VIEWSONIC 17

"Whether you work with text or drowings, the ViewSonic 17 will provide you with the shorpest disploy, even ot the edges of the screen."

BEST VERSATILITY: VIEWSONIC 17

"Along with the richest colors ond shorpest text ond imoges, the ViewSonic 17 rotes high in usobility, thonks in port to its intuitive imoge controls."

BEST OVERALL: VIEWSONIC 17

"Best color quolity, best shorpness ond best versotility – whot more could we osk of the ViewSonic 17? Frankly, we were surprised that one monitor could do it oll."

(PC Computing/January 1994)

Which monitor can do it all? The ViewSonic 17! In a recent review of 13 monitors (including NEC, Nanao, Mitsubishi, and Sony), PC Computing wrote, "Frankly, we were surprised that one monitor could do it all – but our surprise will be a pleasant reward for your eyes and your budget."

Advancing into the future, our 17-inch New Generation monitor offers a flat square screen, ViewMatch color control, double dynamic focus gun, Advanced Invar Shadow Mask and a maximum resolution up to 1,600 x 1,280. And those are just some of the features that make this the monitor of choice.

To see the "Best" monitor, go to your nearest dealer and check out the ViewSonic 17. Then you'll know why it's the monitor that can do it all.

ViewSonic®
See The Difference!

20480 Business Parkway, Walnut, CA 91789
Phone: **(800) 888-8583** • (909) 869-7976
Fax (909) 869-7958

All products and trademarks are brand names of their respective companies

Circle 170 on reader service card.

A KODAK MOMENT ON YOUR PC

Color Digital Cameras

THE DIGITAL DARKROOM

Apple's QuickToke 100 softwore octs like o bosic contoct sheet, disploying thumbnoil-sized color previews of the phato images stored in the comero. Clicking on o

thumbnail brings it up to full size for viewing. You con then print, crop, ond save the imoges to your hord drive in o handful of different file formots.

Dycom opted to include o copy of ImagePals Lite Edition imoge-editing software with its Model 4. While it offers more editing control over

imoges, it's slower to ocquire imoges from the comero ond shows only groyscole thumbnails.

SMILE FOR YOUR computer! Color digital cameras from Apple and Dycam could change the way you think about photography forever. Instead of recording snapshots on conventional film, digital cameras like Apple's $749 Apple QuickTake 100 and Dycam's $1,495 Model 4 capture images digitally.

"Developing" digital photos is easy: Hook the camera to your PC via a serial connector and view the images in the camera's memory. Save the images you like to your hard drive, then erase the camera's memory and you're ready to start snapping again. There's no cost for film, no wait for developing, and no toxic chemicals. And because the images are already in electronic form, they can be edited easily and dropped into reports, newsletters, and other documents.

Logitech and Dycam have sold $800 low-resolution grayscale digital cameras for years, and Eastman Kodak sells a $10,000 professional color digital camera (see "Lights . . . Camera . . . Computer?" February, page 198), but Apple and Dycam are the first to bring affordable color digital cameras to the masses. In particular, Apple's QuickTake 100 represents a breakthrough for digital photography and adds a new dimension to desktop publishing, communications, and a host of other computer applications.

QuickTake: Cute as a Button

The more ambitious of the two cameras, the QuickTake 100, is produced in partnership with Kodak. Not much bigger than a pair of opera glasses and weighing less than a pound, the QuickTake practically invites you to pick it up and play; the camera's rounded side (it's built for righties) fits smoothly and securely into the palm of your hand. A detachable shoulder strap makes it easy to take the 1-pound gadget with you anywhere.

Shooting pictures is a snap—just push the button on the top of the camera until you hear a gentle click of the shutter release. A tiny LCD display near the viewfinder shows how many pictures you've snapped, how many are left, the resolution of the images captured (high or low), and how much battery charge remains. You can also use it to turn on the camera's self-timer feature, to clear all of the pictures, and to set flash to on, off, or so that it fires automatically when the lighting is dim.

The QuickTake 100 is akin to an idiot-proof point-and-shoot 35mm model camera. Its lens, a fixed-focus number with a range from 4 feet to infinity, is equivalent to a 50mm lens on a "real" camera. The camera's aperture range is f2.8 to f16 and the virtual film speed is daylight-rated (ISO 100 for film buffs).

Plug and Play . . . and Play

Apple eventually plans to offer an option to connect the QuickTake 100 to its handheld personal digital assistant, the Newton MessagePad, for previewing, pen annotating, or sending images to another location. For PC users, getting pictures on disk requires a simple serial cable. The Windows software displays color thumbnails of the images in the camera onscreen—much like a traditional photographer's contact sheet. Clicking on a thumbnail image brings it up to full size for viewing.

The camera's memory holds up to 32 standard resolution images at 320 by 240 pixels in 24-bit color, and 8 images in

Con we keep it? Apple's S749 QuickTake 100 digitol comero captures 24-bit color imoges ot twice the resolution of Dycom's Model 4—for holf the price.

from Apple and Dycam

Paint-and-shoot with Dycam's $1,495 digital camera. The Model 4 is a 24-bit color version of the company's earlier grayscale camera.

high-resolution mode (640 by 480 pixels, 24-bit color). The high-resolution images are sharp and bright. Apple and Kodak clearly lavished time and attention on the design of camera's built-in flash. The light it gives off is soft and evenly spread—essential for digital cameras because they don't like heavy contrast or "hot spots." Its images rival that of Kodak's $10,000 DCS 200 Professional Digital Camera—not surprising considering Apple's camera is built around Kodak's technology.

But there's a drawback: The 640-by-480-pixel images print out best at 4 inches by 3 inches or smaller. Beyond that, the pixels become clearly visible—quite unlike real film, which can be blown up much larger before it begins to look grainy.

If you've seen Dycam's space-age–looking grayscale digital cameras or Logitech's Fotoman (designed by Dycam), you've got the idea behind Dycam's new color Model 4 digital camera. Using the same body design and set of features, the Model 4 can now capture eight 24-bit color images or thirty-two 16-bit images. Weighing a mere 10 ounces, the black pocket-sized camera is not only highly portable (it slips easily into a breast pocket), it's also rugged, making it great for taking onto a factory floor or on the road.

Like Apple's QuickTake 100, the Model 4 uses a fixed-focus lens with a range of 4 feet to infinity, and includes a built-in flash. However, the lens is equivalent to a standard camera's 70mm lens, so its effect is somewhat telephoto-like.

Although the Model 4 costs twice as much as Apple's camera, its images aren't as sharp. It captures 24-bit images at 496 by 365 pixels—about half the resolution you can get with Apple's camera. Another serious drawback to Dycam's camera is its amnesia. The Model 4 uses a rechargeable NiCad battery that lasts up to 100 hours, but when the battery dies, all images in the camera evaporate. Apple's camera, on the other hand, runs off three rechargeable AA size NiCad batteries or AA alkaline batteries. But when the battery dies, the images in the camera are safely stored in memory.

The Wave of the Future?

Should you hock your Instamatic for one of these digital cameras? Not exactly. Digital cameras aren't likely to cut film cameras out of the picture. Even high-end $40,000 digital cameras can't catch the quality and resolution of film.

But anyone who relies on dollar-a-shot Polaroids for their business—such as real estate agents, designers, photographers, and insurance adjusters—should have a look at these cameras, particularly Apple's QuickTake 100.

WENDY TAYLOR

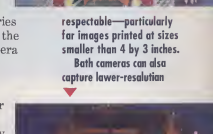
MODEL 4 • $1,495 • DYCAM • (818) 998-8008
Circle No. 614 on Reader Service Card

QUICKTAKE 100 • $749 • APPLE • (408) 996-1010
Circle No. 615 on Reader Service Card

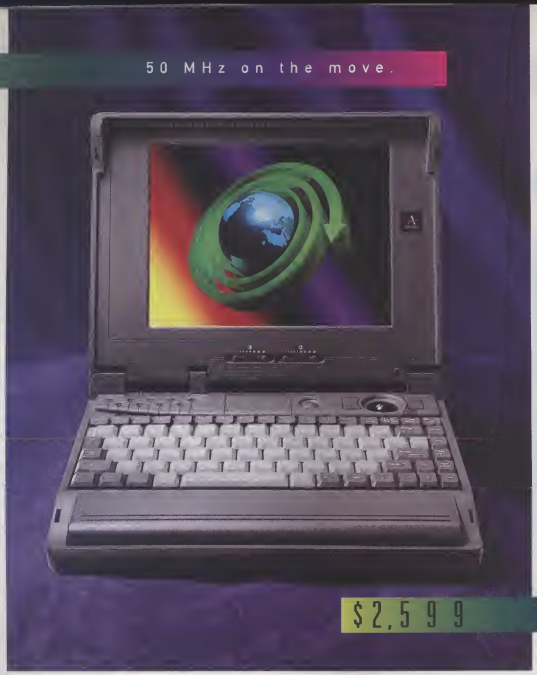
PICTURE PERFECT
When it comes to image quality, the clear winner is Apple's QuickTake 100. It captures 24-bit color (top image) at resolutions as high as 640 by 480 pixels, nearly twice the resolution of Dycam's Model 4 (bottom image). That's still a far cry from the millions of pixels that conventional film resolves, but the results from both cameras are quite

respectable—particularly for images printed at sizes smaller than 4 by 3 inches.

Both cameras can also capture lower-resolution



images. A single high-res image from either camera can hoard a full megabyte of disk space, though the file sizes can be crunched down to a mere 70K when saved in JPEG format.



FREQUENT FLYERS AND LIFE-ON-THE-ROAD TYPES TAKE NOTE! AMBRA™ mobile systems give you everything from speedy **486 processors** to **high-volume hard disk capacity**, to go! Make yours a **high-performance** N-Series model with dual-scan DSTN or **active matrix color.** Or choose a featherweight **(only 4 lbs!)** SN-Series notebook for full-function computing in color or mono. Whatever AMBRA you carry, you'll work in comfort at an **86-key keyboard** with **integrated trackball**. And benefit from power-saving Sleep mode or convenient **Suspend/Resume** capability. Take along your pick of **PCMCIA options** — fax/modem and more — for on-the-spot communications. Back in the office, let your notebook double as a desktop. Just plug into one of our optional **docking stations** to instantly and easily access computing resources throughout your company!

If your work keeps you on the move,

call AMBRA. Our new MOBILE SYSTEMS

pack lots of POWER yet travel LIGHT.

Firm confidence.
Every AMBRA comes with a 30-day money-back guarantee and a one-year limited warranty (optional Executive warranty also available).[1] And you can rely on toll-free technical support around the clock!

Full convenience.
To place an order or get more information, just call — weekdays 8 am to 11 pm, weekends 10 am to 7 pm (ET). We accept Visa® MasterCard® Discover® and American Express® — and purchase orders from qualifying businesses. Pick up the phone today!

VISA MasterCard DISCOVER NOVUS

intel inside

"INSTANT OFFICE" OPTION BUNDLE: $927
For N-Series: Includes docking station, 15" FST color monitor, full-size keyboard.

"TRAVELER" OPTION BUNDLE: $288
For N-Series: Includes PCMCIA 2.4/9.6 kbps fax/modem and extra battery.

"ROAD WARRIOR" OPTION BUNDLE: $386
For SN-Series: Includes PCMCIA 2.4/9.6 kbps fax/modem, extra battery, battery charger, carrying case.

"QUICK DOCK" OPTION BUNDLE: $417
For SN-Series: Includes port replicator, 14" UVGA color monitor, full-size keyboard.

N-Series

DAUNTLESS POWER BEYOND OFFICE DOORS.

N450T
- 486DX2, 50 MHz
- 8MB RAM, max: 12MB
- 3.5" 1.44MB diskette drive
- 200MB hard disk
- 9.5" TFT active matrix color screen
- 1 PCMCIA slot, Type III
- 86-key keyboard
- Integrated 16mm trackball
- MS-DOS,® Windows™ 3.1
- Carrying case
- 6.6 lbs, including battery

$3,899

N450C
- 486DX2, 50 MHz
- 4MB RAM, max: 12MB
- 3.5" 1.44MB diskette drive
- 200MB hard disk
- 9.5" DSTN dual-scan color screen
- 1 PCMCIA slot, Type III
- 86-key keyboard
- Integrated 16mm trackball
- MS-DOS, Windows 3.1
- Carrying case
- 6.6 lbs, including battery

$2,599

N433C
- 486SX, 33 MHz
- 4MB RAM, max: 12MB
- 3.5" 1.44MB diskette drive
- 120MB hard disk
- 9.5" DSTN dual-scan color screen
- 1 PCMCIA slot, Type III
- 86-key keyboard
- Integrated 16mm trackball
- MS-DOS, Windows 3.1
- Carrying case
- 6.6 lbs, including battery

$2,199

SN-Series

FEATHERWEIGHT AND FULL FORCE.

SN425C
- 486SX, 25 MHz, SL-Enhanced
- 4MB RAM, max: 20MB
- 170MB removable hard disk
- 7.8" STN color screen
- 1 PCMCIA slot, Type II
- 86-key keyboard
- Integrated 16mm trackball
- Suspend/Resume
- MS-DOS, Windows 3.1
- Slip case
- 4 lbs, including battery

Ready to ship!

$1,899
(With external 3.5" 1.44MB diskette drive, add $99.)

SN425
- 486SX, 25 MHz, SL-Enhanced
- 4MB RAM, max: 20MB
- 80MB removable hard disk
- 8.2" monochrome LCD
- 1 PCMCIA slot, Type II
- 86-key keyboard
- Integrated 16mm trackball
- Suspend/Resume
- MS-DOS, Windows 3.1
- Slip case
- 4 lbs, including battery

$1,299
(With 170MB hard drive, add $200. With external 3.5" 1.44MB diskette drive, add $99.)

AMBRA™

In Canada[2] call 1-800-363-0066, Ext. 3158

1-800-200-3158

[1] Please call for details regarding AMBRA's money-back guarantee, limited warranty and Executive warranty. Return shipping and insurance charges are the responsibility of the customer. [2] Offerings may differ in Canada.
©1994 AMBRA Computer Corporation. AMBRA is a trademark of ICPI Ltd. and used under license therefrom. The AMBRA logo and logotype are trademarks of AMBRA Computer Corporation. MS-DOS is a registered trademark and Windows is a trademark of Microsoft Corporation. All other product names are trademarks or registered trademarks of their respective suppliers. Offerings, prices and products are subject to change without prior notice. Prices do not include shipping.

Two Ink Jets You Can Take With You—But Should You?

PORTABLE, NOT FAST

Canon's BJ-10sx and Citizen America's Notebook Printer II are lightweight and portable, but they aren't the fastest printers by any means. The faster of the two, the BJ-10sx, printed our 1-page business letter in just over 1 minute, while the Notebook Printer II took nearly 2 minutes to print the same letter. Our 2-page business report, which combined several more fonts, clip-art, and a bar chart, really slowed these printers down. The BJ-10sx printed it in just under 3 minutes, while the Notebook Printer II took 5 minutes and 32 seconds.

If you regularly print documents like our test business report, you'll want to pass on these two printers. They just don't have the speed to keep up. Faster ink jets like Hewlett-Packard's DeskJet 310 or Canon's BJ-200e are better solutions. But for printing straight 12-point text, the Canon BJ-10sx has the portability and speed you need.

IF YOU'RE ALWAYS on the move, from home to office to hotel room, you'll want to check out Canon Computer Systems' BJ-10sx and Citizen America's Notebook Printer II. These portable printers are among the smallest and lightest printers available today, and both offer the print quality necessary to meet today's business standards.

They Ain't Heavy

When it comes to printer weight, a pound may not seem significant. But when you've already got a notebook computer and accessories, adding a printer and its cables and power supply makes every pound count. Citizen's Notebook Printer II weighs only 2.2 pounds, well under Canon's BJ-10sx's 3.7 pounds, and the Notebook Printer II has a much smaller footprint: It's 12 inches wide by 4 inches deep by 2 inches high, about the size of a package of Saran Wrap. The Canon BJ-10sx, on the other hand, is 12 by 9 by 2 inches, more like the size of a notebook.

The Notebook Printer II is actually an enhanced version of Citizen's PN-48, a *PC/Computing* MVP Award winner in 1991. One of the improvements added to this new version is a built-in five-sheet feeder. It may not sound like much, but it beats the BJ-10sx's single-sheet feeder. Though both printers offer optional sheet feeders, Citizen's Notebook Printer II gets a big thumbs up for handling multiple sheets in its standard configuration.

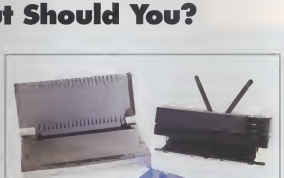
Both printers output 360-by-360-dot-per-inch resolution, making them excellent choices for printing business documents. We preferred the Notebook Printer II's print quality: Its thermal fusion technology makes the text blacker and easier to read.

Neither of these printers, however, offers blazing print speeds. While Canon's BJ-10sx is much faster, it prints text at only about one page per minute, and it slows down considerably for more complicated elements. The Notebook Printer II is even slower. On average, the BJ-10sx prints about twice as fast as the Notebook Printer II, even considering the amount of time it takes to feed the BJ-10sx's additional sheets of paper.

For power on the go, both printers offer battery packs: The Notebook Printer II's pack weighs 0.4 pounds and the BJ-10sx's weighs 0.6 pounds. Each battery is rated to last about 40 pages, but actual life will vary depending on page complexity.

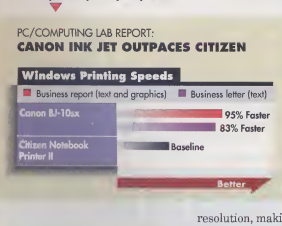
We preferred the Notebook Printer II over the BJ-10sx. Canon's product is a much faster, and it costs $50 less than the Notebook Printer II. But the Notebook Printer II's significantly smaller footprint, built-in sheet feeder, and superior print quality make it the better value.

CYNDY BATES



On the run but not in a hurry? The new Canon BJ-10sx (left) and Citizen Americo Notebook Printer II (right) trode speed for portobility. Print quolity is excellent on both.

PC/COMPUTING LAB REPORT:
CANON INK JET OUTPACES CITIZEN



NOTEBOOK PRINTER II • $399 • CITIZEN AMERICA CORP • (800) 477-4683, (310) 453-0614
Circle No. 616 on Reader Service Card

BJ-10SX • $349 • CANON COMPUTER SYSTEMS • (800) 848-4123, (714) 438-3000
Circle No. 617 on Reader Service Card

THE EASIEST TO USE WINDOWS SPREADSHEET

Discover what 1 million new users already know

The world's best spreadsheet is also the world's best deal

Quattro® Pro 5.0 for Windows is the #1-selling spreadsheet in the world. That's because now you can get the spreadsheet the experts are calling "THE BEST" at a price that's too good to believe.

"Highest user satisfaction ratings of the top 3 Windows spreadsheets" —*Computerworld*, Jan. 1994

"The latest version of Quattro Pro is a winner" —Best Buy, *PC World*, Feb. 1994

"Outscores 1-2-3 in performance, ease of learning and use, and quality of output" —*PC Week*, Nov. 1993

Breakthrough technology you have to see to believe

That's why Quattro Pro is winning all the major industry awards for best spreadsheet. *InfoWorld* says, "Several innovations give Quattro Pro a leg up on the current version of Excel." Interactive Tutors teach new users how to perform common tasks. Built-in "Experts" walk you through all your analysis, graphing, scenario management, and consolidating tasks. A complete presentation tools package allows you to create the most colorful slide shows and business presentations. The Database Desktop unlocks the doors to external databases, and the Data Modeling Desktop outperforms Lotus Improv. Plus, the new Workgroup Edition builds in full support for SQL servers, and lets you share worksheets with others over networks or E-mail.

Get the world's best-selling spreadsheet today!

Join the millions of people discovering Quattro Pro and treat yourself to the best spreadsheet your money can buy. With our 100% money-back guarantee, you've got nothing to lose and everything to gain.

DOS | Windows | Workgroup Edition Upgrade

Special introductory offer extended to May 15, 1994

For details on how to win a 486 PC, see below.

90-day, money-back guarantee!

See your dealer or call now, 1-800-336-6464, ext. 8577

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

Borland

Power made easy™

*Exclusively in the United States, visit your nearest "Borland Means Business" retailer to complete an entry form to win a 486 PC. Copyright © 1994 Borland International, Inc. All rights reserved. All Borland product names are trademarks of Borland International, Inc. Prices good in the United States and Canada only. All prices are in U.S. dollars. Dealer prices may vary. BI 6954

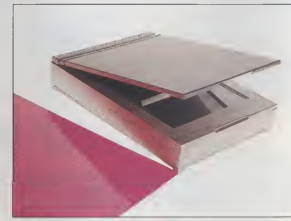
Circle 125 on reader service card.

Canon's Scanner—Fast, Colorful, Smart, and Easy to Use

IT'S A CALIBRATION
Most attempts to get the color and brightness of an image looking perfect onscreen are futile. When you print, it never looks the same as it did onscreen. The adaptive calibration of Light Source's Ofoto Version 2 (bundled with Canon's IX-4015 Color Scanner) goes a long way to solving that problem. It's essentially a closed-loop calibration system. You pick the printer you'll be using (or set up the files to print to PostScript if you outsource your color printing), select the calibration option, and print out a test sheet. Then scan the sheet, and the software checks the color and brightness of the printer's output. Next, it adapts its display and scanning levels to suit the output device—even adjusting for dot bleed in ink jet printers, which is no mean feat.

YOU KNOW WHAT to look for in a flatbed scanner. The ideal specs for an office machine run something like this: 400-dot-per-inch horizontal resolution by 800-dpi vertical resolution, 24-bit color depth, TWAIN-compliance, fast scanning, and the option to add a document feeder.

And if you're going to fit the thing on your desk, don't underestimate the value of a small footprint. Canon Computer Systems didn't when it developed its first foray into desktop scanning—the IX-4015 Color Scanner—and its compact size is icing on its already great product.



It's compact, it's 24-bit-color–capable, and it's smart—Canon's IX-4015 Color Scanner not only takes stellar color scans, it straightens skewed images automatically.

This one-pass color scanner is smaller than two WordPerfect 6.0 boxes laid side by side, and it shows great attention to important design issues: The internal scan head lock for when you move the scanner is a godsend, the document feeder option is a breeze to install, and the light is xenon-fired so that it won't fade with age or burn out.

One Pass, One Button

Despite its smart, small, and speedy hardware, the unique advantage to this scanner is its software—Light Source's stellar Ofoto Version 2. Not yet bundled with any other scanner, Ofoto eliminates the usual problems associated with scanning—namely that you expect it to be like photocopying, but it's always much harder.

Most of the time, when you scan an object you want *one pass* to mean more than just the scanning technology. You want to hit a button and get a TIFF, PCX, or JPEG file right away. With the IX-4015 and Ofoto, it's almost that easy.

Slap a picture onto the scanning bed, click on the Autoscan button, and you're through. The software crops images down to their original size automatically. It detects whether it's a color, grayscale, or black-and-white image. And it picks the resolution based on the target output device—no horsing around with resolution settings. Ofoto does all this, but so does Hewlett-Packard's ScanJet IIcx DeskScan software. Where Ofoto Version 2 leaves the rest behind is in some unique features.

Smart Software

If you lay pictures at an angle on the IX-4015's scan bed, Ofoto will straighten them for you automatically. In addition to the usual range of image controls, Ofoto sports some pumped-up features, including automatic removal of moiré patterns (the plaid effect you get from scanning screened photographs from magazines, books, and newspapers). And its adaptive calibration saves hours of fruitless tinkering with color balance (see "It's a Calibration," at left). It won't replace photo-editing software like Adobe Photoshop (it's not designed to), but as a scanning program, Ofoto is the best we've seen.

The Canon IX-4015 is small, speedy, and convenient to use. Although the hardware is not bundled with free photo-editing software, its scanning software is the best ever. With the current crop of flatbed scanners, it's the closest you'll get to photocopier-like, one-button operation.

MATTHEW LAKE

CANON IX-4015 COLOR SCANNER • $1,175 • CANON COMPUTER SYSTEMS • (800) 848-4123, (714) 438-3000
Circle No. 618 on Reader Service Card

CORELDRAW™ IS KID STUFF.

FOR YEARS, IT WAS THE ONLY GAME IN TOWN. Move over, CorelDRAW™. Now there's a new kid on the PC block. Canvas™ for Windows. It handles complex illustrations, business graphics, presentations and page layout with equal ease. And it provides transparent file compatibility with our Macintosh® version, for the perfect cross-platform graphics solution.

IF YOU'RE SICK OF SWITCHING APPLICATIONS, IT'S TIME TO SWITCH PROGRAMS. No more bouncing between clumsy, pasted-together applications. Once you launch Canvas, you enter a seamlessly integrated graphics environment with easy-to-use pull-down menus and tear-away palettes. Draw, paint, design, create multimedia presentations, trace, edit scanned images, import and export files, and create color separations...all without leaving Canvas. Plus, our revolutionary Open Architecture lets you add new tools on the fly as you work. The same feature also makes Canvas self-upgrading, so you can add tomorrow's tools simply by dragging them to the appropriate directory. With Canvas, you'll always be ahead of the game.

NOW YOU CAN PLAY FOR KEEPS. When it comes to high precision drawing tools and special effects, Canvas doesn't play around. Our pressure-sensitive Bézier pen tool creates smooth, expressive brush strokes. The Smart Mouse™ drawing aid gives you pin-point precision. Auto-tracing with centerline option and flexible auto-dimensioning add up to an automatic advantage. And you get 34 easy-to-master shape tools plus a host of high-performance features like extrusion and enveloping of text and graphics. Powerful object combination commands. Custom parallel lines and curves. Fractals. Cell macros and dynamic object links. Plus an arsenal of advanced typographic tools including text wraps, automatic text flow from column-to-column, fine kerning, binding of text to shapes and curves, style sets, and conversion of fonts to editable Bézier outlines. In short, Canvas is the program of choice for performance-minded adults.

GET CANVAS FOR $99.95. NO KIDDING. Now you can upgrade to Canvas for Windows from CorelDRAW or any other Windows drawing program for just $99.95*. That's nearly $300 off our suggested retail price of $399. But hurry; this offer is limited. Call, fax, or write to order or for more information: Telephone - (305) 596-5644, Fax - (305) 273-9069, Address - Deneba Software, 7400 SW 87th Avenue, Miami, Florida 33173. *Major credit cards accepted. Add $10 shipping in the US and $15 in Canada. Call for shipping costs elsewhere. Upgrade offer subject to termination or change without notice. ©1993 Deneba Systems, Inc. Canvas, Smart Lines and Smart Mouse are trademarks of Deneba Systems, Inc. All other trademarks and registered trademarks are the property of their respective owners. Original Ferrari F-40 art by David Kimble. Electronically re-created in Canvas by Deneba Software.

CANVAS
WINDOWS VERSION
THE HIGH PERFORMANCE DRAWING ENVIRONMENT FROM DENEBA SOFTWARE

Circle 175 on reader service card.

MAC UP GERMANY, 1992 · MACWORLD AUSTRALIA, 1992 · MACWEEK DIAMOND AWARD, JAN '93 · SVM MAC 1992 · MACWORLD SEPT 1993 · MACUSER MAR '93 MAR '92 · MACWORLD 1993 · MACUSER APRIL '93 JAN '92 · MACWEEK TARGET AWARD JAN '92 · MACWORLD DEC 1991 · MACWORLD SWITZERLAND 1992 · MACUSER SPAIN 1992 · MADE IN USA

Semi-pro.

HP ScanJet II CX

If you're a sophisticated scanner user, you shouldn't have to settle for a semi-sophisticated scanner. Not when the EPSON 800C Pro/PC has so much more to offer. More versatile controls. More powerful software. Better connections. Stronger support. More flexible options. All of which makes this 800 dpi scanner the one that will actually live up to your

*One-year warranty, extendable to two years with return of registration card, at no charge. EPSON, HP, Macintosh, and Picture Publisher are trademarks or registered trademarks of Seiko EPSON, Corp., Hewlett Packard Co, Apple Computer, Inc., and Micrografx respectively. All other trademarks are the property of their owners ©1993 EPSON America, Inc., 20770 Madrona Ave., Torrance, CA 90503. For dealer referral or warranty details, call **800-BUY-EPSON** (800-289-3776). In Canada, call (**800**) GO-EPSON. For Latin America, **305-265-0092**.

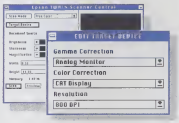
Pro.

The 800C Pro/PC is solidly backed by EPSON's one-year warranty extendable to two years. HP's warranty is one year.

The 800C Pro/PC comes with both parallel and SCSI interfaces so you can connect it to two PCs or a PC and a Mac simultaneously. The ScanJet II CX connects to one computer.

EPSON's transparency unit and document feeder are powerful options that work across every scanner in our line. HP's scanner options aren't that flexible.

The 800C Pro/PC package includes the powerful full version of Picture Publisher 4.0, the industry's top-rated image editing software for the PC. HP's software is limited.



Only EPSON has color and gamma correction settings built right into the scanner hardware.

If you need technical assistance, you can call the pros at the EPSON Connection, our toll-free help line.

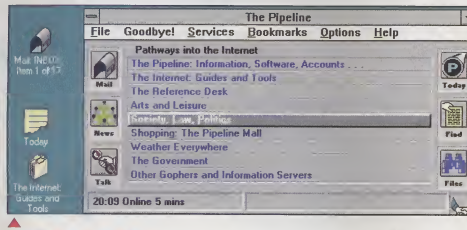
The scanning pros at PC Computing were so impressed with the 800C Pro/PC, they gave it their "Best Buy" award.

EPSON 800C PRO FOR PC

exacting professional standards. For our free booklet on scanning, or more information on the 800C Pro/PC, our other scanners for PCs and Macintosh, or our full line of personal printers, call the EPSON Connection at **1-800-BUY-EPSON** (800-289-3776). And get the scanner that's in a league of its own.

EPSON®

Surf Cyberspace: Windows Front Ends to the Internet



WinNet Mail and News
While The Pipeline (above) puts a pretty face on a full range of Internet services—including mail, newsgroups, gopher, and even an Internet guide—WinNet Mail and News (below) provides you with both an Internet connection and a relatively easy-to-use mail

front end, and is designed for users who need bare-bones Internet access. The mail editor is the best part of WinNet: It lets you keep an e-mail address book, create folders for managing your mail and newsgroup messages, and handle those messages offline. While the program doesn't offer ftp, gopher, or telnet, it does include instructions for using Internet mail to fetch files in a manner similar to ftp.

WINNET MAIL AND NEWS • $8.00 PER HOUR WITH A MONTHLY MINIMUM OF $9.95 • COMPUTER WITCHCRAFT • (502) 589-6800
Circle Reader Service No. 763

THE INTERNET HAS been lauded as the solution to the world's communications problems. It's been called the bedrock upon which the national information superhighway will be built. But the dirty truth is this: The Internet is confusing, chaotic, and so difficult to navigate that it makes DOS look intuitive.

To make this massive network of services usable, software developers and Internet providers have been rushing to market with a variety of Windows-based tools. We discuss many of these tools in "The Mother of All Networks" on page 180. Here's a sampling of these cyberspace surfboards that provide comprehensive Internet access.

The Pipeline

Award-winning science writer James Gleick, author of *Chaos,* designed and runs The Pipeline, an Internet service that you access with special Windows-based software.

The Pipeline does the seemingly impossible: It organizes the Internet. In The Pipeline, all Internet services are listed under a single menu-and-icon interface with titles such as "Arts and Leisure" or "News."

Just click on a menu or icon, and you're either greeted with a submenu offering you more choices, or brought directly to a resource. Not only can you easily navigate the Internet with The Pipeline, you can also find out about sources of information that you might never have known about. No other service offers these benefits in quite this way.

In The Pipeline you can also search for and download files with the click of a button, instead of using the convoluted two-step process that most other Internet services put you through. The Pipeline also lets you read news offline, and it has even cooked up a way to let you simultaneously transfer two or more files and messages over a single phone line.

To use The Pipeline software, you'll have to dial into the service, based in New York. However, there is a way to save some long-distance charges: Dial into a local Internet provider using The Pipeline software, then jump to The Pipeline over the Internet, and you'll have access to its resources.

When you do this, though, you'll have to pay both your local Internet provider and The Pipeline for the time spent online. Lucky for you, The Pipeline is reasonably priced: One of its pricing schemes gets you 20 hours of Internet time every month for $20. If you're interested in getting at the vast resources of the Internet, you'll find it's worth every penny.

America Online

The online service America Online has promised full-fledged Internet access, but at press time, it offered only limited Internet access: Internet mail and access to several specific Internet sites, such as the Electronic Frontier Foundation. America Online is slated to add other Internet services—including newsgroups, gopher and Wide-Area Information Service (WAIS) databases, telnet, and ftp—by early this month.

What we did see of America Online's Internet service, though, impressed us, especially the way it handles Internet mailing lists. Click on the Search Mailing Lists icon, type in a topic you want to search, and you'll be given a list of

(Continued on page 62)

How To Run Your Office With A Staff Of None.

All trademarks are the property of

Order Envoy™ from Spectrum. From within Windows,™ it effectively manages all your office communications—the telephone, the fax, the modem, even voice and audio. And yet you'll still find it remarkably affordable. Think of it. An office manager that doesn't even draw a salary. To place your order, simply dial toll-free.

Circle 158 on reader service card. (800) 667-0018

CyberDesk

Need a simple Internet front end? Cyberdesk can help you manage the more accessible Internet resources. The program downloads

incoming mail and message headers in newsgroups that interest you. Once you've handled your messages, Cyberdesk dials back into your Internet provider, sends any mail, and downloads the marked newsgroup headers. You must already have an Internet account to use Cyberdesk, but it will save you in online costs.

CYBERDESK • $179 • CYBERCORP • (404) 424-6240
Circle Reader Service No. 764

Internet Front Ends, *continued from page 60*

applicable mailing lists. Double-click on any list and you'll be given the details of the purpose of the list and how to subscribe to it. You can then use America Online's Internet mail to subscribe to the list. You navigate through specific Internet locations as easily as you do through the rest of America Online, by clicking on folders and items.

If America Online handles the rest of Internet access the way it does mailing lists and navigation, it may provide an exceedingly accessible way to get at the Internet's resources.

Bix

Like America Online, Bix (for Byte Information Exchange) is a complete online service that offers Internet access as one of its features. Unlike America Online, the service itself isn't Windows-based, although there is a Windows front end called InterNav that provides access to the service, and through it, to the Internet.

The Bix Windows front end offers the basic set of Internet services, including e-mail, ftp, telnet, and gopher. At press time, to use Bix's InterNav to access Internet news groups, you'd have to forgo the Windows front end, and use the plain-Jane DOS version. An upcoming release, however, will add Windows support for newsgroups.

Bix's telnet services amount to basically a terminal emulation window. The service has enhanced telnet somewhat, by providing a built-in list of locations to which you can telnet, and you can also add your own favorite sites to the list. All in all, this is a simple, clean—if unremarkable—Internet interface.

Other Services

At press time, there were a variety of other Windows front ends to the Internet either announced or in development.

One that's been talked about a great deal on the nets, National Center for Supercomputing Applications' Mosaic, requires a special Internet connection—in essence, you need to become a node on the Internet, not a task for the faint of heart (nor the short of pocketbook).

Internet-in-a-Box is an intriguing product being prepared jointly by O'Reilly & Associates and Spry. Although it is unavailable for review, the Windows-based front end will provide access to all Internet services, including O'Reilly's existing Global Network Navigator (GNN), an Internet resource that provides direct links to more than 600 other Internet resources, as well as news updates, an online magazine, an interactive catalog, and advertisements.

So far there is not one comprehensive Internet solution that is all things to all people. Our favorite front end is The Pipeline, but it may be an expensive choice for anyone outside the New York metropolitan area. Still, what with the information superhighway hoopla, not to mention the real and increasing demand for a universal communication network, these products are sure to be only the first trickle in a deluge of Internet front ends. Stay tuned.

PRESTON GRALLA

DIFFERENT INTERNET TOOLS FOR DIFFERENT NEEDS

The perfect front end isn't here yet, but these are close.

	The Pipeline	America Online	Bix
E-Mail	●	●	●
Ftp	○	○	●
Gopher	●	○	●
Newsgroups	●	○	○
Telnet	●	○	●
Other services and features	Connections to many Internet sites; offline reading of mail and newsgroups; multiple simultaneous file transfers.	Connections to several Internet sites; excellent handling of mailing lists.	Includes easily accessible addresses of many Internet sites.

● Yes ○ No, but scheduled to be available soon.

THE PIPELINE • $15 FOR 5 HOURS PER MONTH, $35 FOR UNLIMITED TIME • THE PIPELINE • (212) 267-3636
Circle No. 619 on Reader Service Card

AMERICA ONLINE • $9.95 FOR 5 HOURS PER MONTH; $3.50 PER HOUR THEREAFTER • AMERICA ONLINE • (800) 827-6364, (703) 448-8700
Circle No. 620 on Reader Service Card

BIX • $13 MONTHLY FEE; CONNECT CHARGES VARY • DELPHI INTERNET SERVICES • (800) 695-4775
Circle No. 621 on Reader Service Card

ANOTHER DEMONSTRATION OF HOW EASY IT IS TO INSTALL OUR NEW SCANNER.

ScanMan™ *EasyTouch*

New ScanMan EasyTouch plugs directly into your parallel port, with no boards or drivers. It's easy to install, and moves from PC to portable and back again faster than insults at the U.N. EasyTouch includes OmniPage® Direct™ AnyFont™ OCR for Logitech, FotoTouch™ image editing software, Logitech's AutoStitch™ (for scanning large or odd-sized documents), and can add

professional quality grayscale scans to all your favorite Windows applications. *And* at about a third of the price of a flatbed scanner, you'll have no trouble keeping your budget balanced. Pick up ScanMan EasyTouch at your local dealer, or call **1-800-732-3044.**

LOGITECH

The Senseware™ Company

™/® Trademarks belong to their registered owners
Photo courtesy of Adriana Lorete and Agência Jornal do Brasil

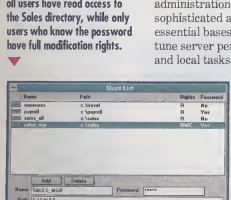
Circle 156 on reader service card.

Easy Peer-to-Peer Networking For Windows Users

ACCESS CONTROL

Whether your network has 2 nodes or 200, there's bound to be o need to secure sensitive data and restrict access to certain devices. Both CBIS's Desk To Desk and Performance Technology's PowerLan 3.0 for Windows have customizable security, implemented in different ways. With Desk To Desk, you can set up user profiles, specifying the

connections users make to network devices when they log in. With PowerLAN, you con click on the Share Lists button (top screen) to restrict the read, write, and create rights to each local directory you share, by password. In the screen below, all users have read access to the Sales directory, while only users who know the password have full modification rights.

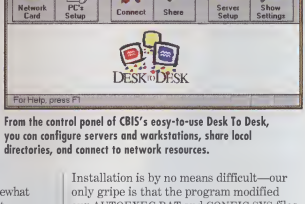


A NETWORK IS a little like a toothbrush—everyone needs one, but it's a personal thing. Maybe you want enterprise connectivity and can tackle a full Novell NetWare installation. Or maybe you need to be able to share files and resources but couldn't tell a bindery from a basketball. If you're the latter type, two new peer-to-peer Windows networks, CBIS's Desk To Desk and Performance Technology's PowerLan 3.0, might be just what you need to help you in your quest to connect.

Of the two, Desk To Desk is somewhat easier to use and has one of the best interfaces we've seen in any application—networking or otherwise. More important, installing Desk To Desk couldn't be easier; the software even provides short explanations of each utility as it installs it. We especially like the fact that the printed manual consists of exactly one folded sheet of paper, while the rest of the documentation is online.

The Desk To Desk control panel is organized so features that users need frequently—like connecting to network resources or sharing local resources—are accessible with the click of a button, while more advanced management features are buried behind dialog boxes. Although its administration functions aren't as sophisticated as PowerLan's, all of the essential bases are covered: You can fine-tune server performance, balance network and local tasks, set user and group security rights, and even connect network segments through a Desk To Desk server.

Although PowerLan 3.0—the first Windows version of this network—does not boast the streamlined setup of Desk To Desk, it does come with excellent, exhaustive documentation, including a primer on networking.



From the control panel of CBIS's easy-to-use Desk To Desk, you can configure servers and workstations, share local directories, and connect to network resources.

Installation is by no means difficult—our only gripe is that the program modified our AUTOEXEC.BAT and CONFIG.SYS files without saving backups.

Like Desk To Desk and most other Windows networks, PowerLan allows point-and-click sharing of devices and directories. Anyone who used the previous versions of the product will be pleasantly surprised by the new interface, some annoying glitches notwithstanding (for example, it allows you to add only one resource at a time to your Share list before closing the dialog box). And, for a peer-to-peer network, PowerLan includes some useful advanced-management options, including remote administration so you can configure the network in addition to user and group lists from any node, a chat-like utility to broadcast system alerts, and even a remote-control utility to monitor remote DOS nodes.

While both networks handle all of the connectivity basics from resource sharing to bridging networks, neither offers a "starter" bundle with the necessary hardware, which could be a drawback for novice networkers. However, both give your network room to grow by offering dedicated server options separately.

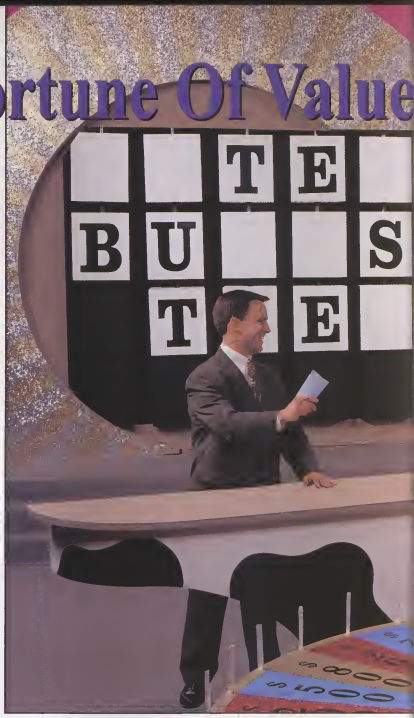
SHYAMALA REDDY

DESK TO DESK • $129 • CBIS • (800) 835-3375, (404) 446-1332
Circle No. 622 on Reader Service Card

POWERLAN 3.0 • $99 TO $2,595, DEPENDING ON NUMBER OF USERS • PERFORMANCE TECHNOLOGY • (800) 327-8526, (210) 979-2000
Circle No. 623 on Reader Service Card

PC Buyer C'mon Down!

Get A Fortune Of Value



PC buyers jump for joy! You're entering the exciting and competitive game of computer buying! We know you want to finish first with high-performance PCs and prize-winning service at the most affordable prices in the industry. It's no contest – with Gateway 2000™ you'll always be the big winner!

The Champ

And here are the stars of our show, Gateway's Pentium™-based systems! Starting from $2,495 you get stupendous features. New lightning-fast hard drive systems! Screaming new graphics controllers on our two high-end P5 systems! Along with the most powerful Intel® processors available today! And (*drum roll please*) – all this at 486 prices!

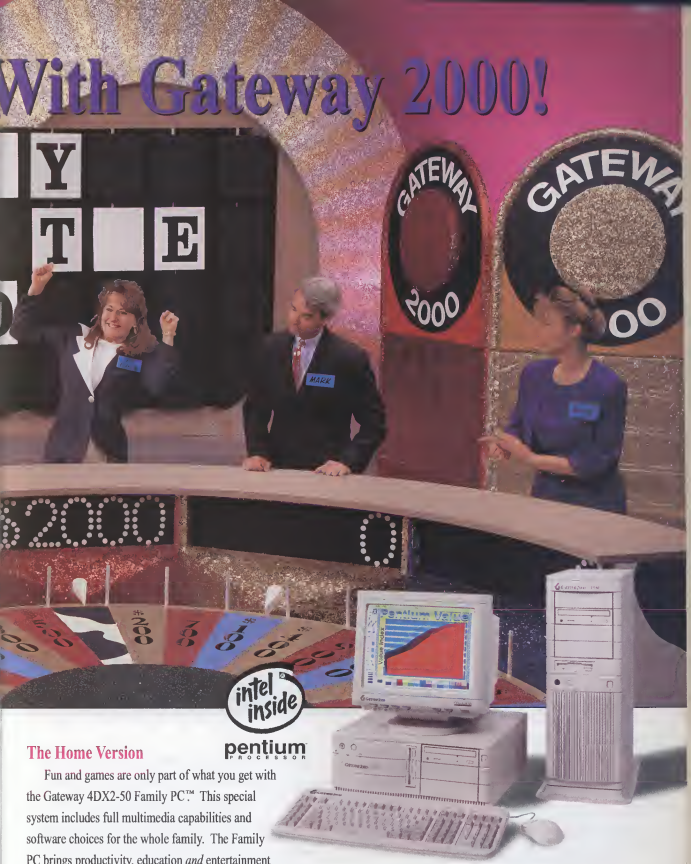
Now in all four Gateway 2000 P5 systems, a new PCI/IDE controller allows the hard drive to transfer data *up to twice as fast* as non-PCI-based systems. The PCI/IDE controller is a major enhancement to Gateway's Intel Pentium processor and PCI local bus. Now you can access data faster than ever before!

Our P5-66 and top-of-the-line P5-60 now include high-end graphics controllers. So you can really take advantage of the performance-boosting PCI bus for virtually unbeatable graphics performance! These graphics controllers are also available as an upgrade option for all Gateway's PCI-based systems.

The standard graphics system on other Gateway PCI-based machines is another sure winner. You get 2MB standard graphics memory giving you 64,000 colors at 1024 x 768 resolutions. This graphics system uses a high-performance interface to graphics memory that achieves 16 million colors, true 24-bit, in VGA.

Been spinning your wheels on how to get tomorrow's technology today and still pay 486 prices? The puzzle is solved. With a price tag between $2,495 and $3,995, you'll hit the jackpot when you buy a Pentium-based system from Gateway 2000!

We also offer a full line of 486 PCI local-bus and integrated desktops systems. All are upgradable to a Pentium OverDrive™ Processor for the power you'll need in the future.



The Home Version

Fun and games are only part of what you get with the Gateway 4DX2-50 Family PC.™ This special system includes full multimedia capabilities and software choices for the whole family. The Family PC brings productivity, education *and* entertainment into your home.

GATEWAY2000

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

800-846-2062

"X" Marks The Spot

Looking for the perfect portable PC? You'll get a celebrity performance when you choose Gateway 2000™ for the most value-packed portable PCs in the industry!

GATEWAY2000 COLORBOOK™

Gateway has all the right answers for incredible values with the ColorBook! Performance-enhancing features ... fast 486 processors and an incredibly big 10.3-inch screen on the DX4 model! ... make the ColorBook an undisputed champion.

Introducing the ColorBook DX4-75 with a faster-than-ever processor! This substantial power boost has made the DX4-75 the fastest 486 portable available today. And that's not all. For your extreme viewing pleasure, an extra-huge 10.3-inch dual-scan VGA color screen is now standard on the DX4. You won't find anyone else with a 10.3-inch screen at a better price.

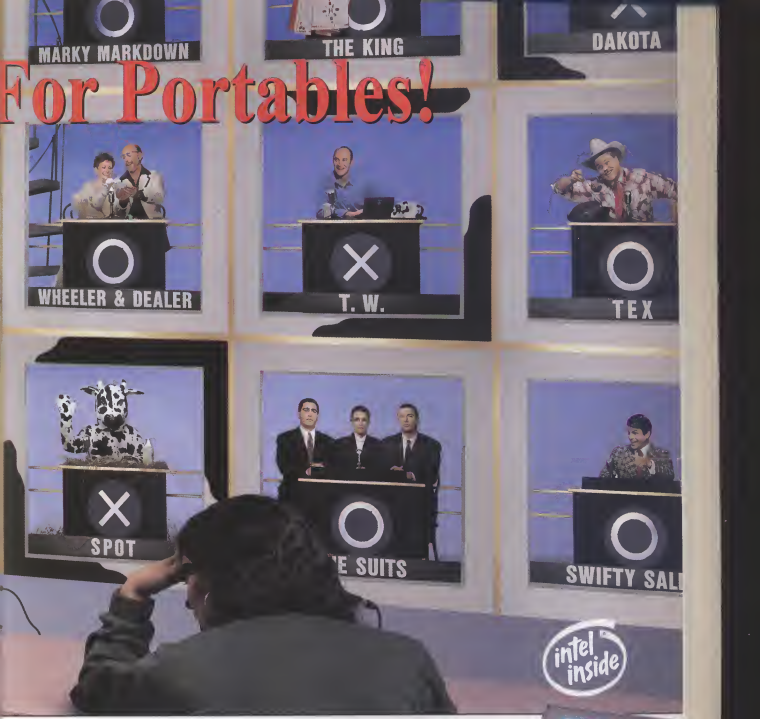
All ColorBook models – 486SX-33, DX-33, DX2-50 and DX4-75 – have a host of great features. Weighing less than 5.7 pounds and measuring an ultra-thin 1.77 inches, the ColorBook supports simultaneous video; an easy-to-use, built-in trackball; two PCMCIA Type II slots; great battery life; and a suspend/resume feature so you can stop work anytime and resume later without losing data or restarting the system.

GATEWAY2000 HANDBOOK® 486

The revolutionary Gateway HandBook 486 is perfect for all your worldly travels. This powerful little performer will forever change the way you use a PC. And you won't have to think twice about taking it with you – no matter where you go. It's a no-brainer. The HandBook is so small (*about the size of a day planner*) and so lightweight (*it's less than three pounds)* that you'll never want to be without it!

Unless you mind all the extra attention, as described by a leading columnist: "I almost got mobbed the other day on the train. I was doing what I usually do on the commute: writing on a notebook computer. The only difference was that I was using a Gateway 2000 HandBook 486 ... I can't wait until everyone has one. Then they'll leave mine alone."

For Portables!



The HandBook is a real PC with a powerful 486 processor; an IDE hard drive up to 130MB; standard 4MB or 8MB RAM upgradable to 20MB; a 7.9-inch bright, backlit VGA display screen; 78-key keyboard; EZ Point™ integrated pointer; excellent battery life; and suspend/resume feature.

Looking for a square deal on the best portables around? The odds are stacked in your favor with Gateway's ColorBook and HandBook portable PCs.

GATEWAY2000

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

800-846-2062

The Surveys Say...

Gateway 2000™ is the name of the game when it comes to the best service and support. The Gateway family is made up of hard-working Midwesterners who are dedicated to satisfying our customers. And although we're a Fortune 500 company, we haven't forgotten our simple philosophy of providing an honest value, a superior product and the best service possible. In return, Gateway's loyal customers are always there to cheer us on. But you don't have to just take our word for it. The surveys prove it!

Hands Down Winner in Service and Reliability

A big thank you to readers of *PC Magazine* who responded to a Service and Reliability survey with impressive results: "In our latest survey, only Gateway 2000 gets our highest rating in both the desktop and laptop categories." The survey covered reliability, satisfaction with repair experience, satisfaction with technical support, and the likelihood of buying new PCs from the same vendor again.

SERVICE & RELIABILITY · PC MAGAZINE · READERS' CHOICE

All the talented people appearing in this ad are Gateway 2000 employees.

PORTABLES

HANDBOOK® 486

- Weight: 2.94 Lbs.
- Dimensions: 9.75" x 5.9" x 1.6"
- SL Enhanced Intel® 486 Processor
- 4MB or 8MB RAM (expands to 20MB)
- 80 to 130MB IDE Hard Drive
- 7.9" Backlit VGA Display
- NiMH Battery & AC Pack
- Suspend/Resume Feature
- 1 PCMCIA Type II Slot
- EZ Point™ Integrated Pointer
- 78-Key Keyboard
- Parallel, Serial & PS/2 Ports
- MS Works for Windows™ 3.0
- MS-DOS 6.2, WFW 3.11 & Serial Transfer Cable

HANDBOOK 486SX-25
With 25MHz 486SX CPU, 4MB RAM and 80MB Hard Drive
$1495

(with 130MB Hard Drive)
$1595

HANDBOOK 486DX2-40
With 40MHz 486DX2 CPU, 8MB RAM, 130MB Hard Drive, Extra NiMH Battery, and Leather Carrying Case
$2295

HANDBOOK 486SX-25
With 25MHz 486SX CPU, 8MB RAM, 130MB Hard Drive, and Leather Carrying Case
$1895

PORTABLE OPTIONS

PCMCIA Cards:
- TelePath 14400/14400 fax/modem. **$249**
- 9600/2400 fax/modem. **$149**
- Ethernet adapter. **$149**
- Token Ring adapter. **$449**
- HandBook VGA adapter. **$229**

Batteries:
- 2.2Ah NiMH batteries. **$89**
- Alkaline battery pack. **$29**

Diskette Drive:
- HandBook external 1.44MB. **$99**

Cases:
- ColorBook **$49**, HandBook **$55**

Extended VIP Warranty:
- We'll ship a replacement within 24 hours during warranty. Point of sale only. **$100**

COLORBOOK™

- Weight: Under 5.7 Lbs.
- Dimensions: 11.7" x 8.5" x 1.77"
- SL Enhanced Intel 486, DX2 or DX4 Processors
- 4MB or 8MB RAM (expands to 8, 12 or 20MB)
- 3.5" 1.44MB Diskette Drive
- Removable 120 to 250MB IDE Drive
- 10.3" or 9.4" VGA Dual-Scan STN Color Display
- NiMH Battery & AC Pack
- Suspend/Resume Feature
- 2 PCMCIA Type II Slots
- Integrated Trackball (2 buttons)
- 85-Key Keyboard
- Parallel, Serial & PS/2® Ports
- External VGA Port
- MS Works for Windows 3.0
- MS-DOS 6.2 & WFW 3.11

COLORBOOK DX4-75
With 75MHz DX4 CPU, 8MB RAM, 250MB Hard Drive and 10.3" LCD
$3495

COLORBOOK 486SX-33
With 33MHz 486SX CPU, 4MB RAM, 120MB Hard Drive and 9.4" LCD
$1995

COLORBOOK DX2-50
With 50MHz DX2 CPU, 8MB RAM, 250MB Hard Drive and 9.4" LCD
$2995

COLORBOOK DX-33
With 33MHz DX CPU, 4MB RAM, 170MB Hard Drive and 9.4" LCD
$2495

COLORBOOK PACKS

Traveler's Packs:
- Case, extra battery & PCMCIA 9600/2400 fax/modem. **$279**
- Case, extra battery & PCMCIA TelePath fax/modem. **$369**

PC BUYER

SOFTWARE & EXTRAS

If a system comes with "choice of application software," choose one of the following packages:
- Microsoft Excel for Windows™
- Microsoft Word for Windows™
- Microsoft Word and Bookshelf,® CD-ROM Edition
- Microsoft PowerPoint for Windows™
- Microsoft Project for Windows™
- Microsoft Access™ for Windows
- Publisher's Pack (CD-ROM only; includes CorelDRAW 3,™ ArtShow, MS Publisher 2.0 & MS Design Pack)
- The Entrepreneur Pack (Works,™ Publisher,™ Money™ & games)
- Borland Paradox® database and Quattro® Pro for Windows spreadsheet
- Borland Paradox® and C++ With desktop and selected portables you also get the following software and extras at no additional charge:
- MS-DOS 6.2 & Windows for Workgroups 3.11
- CoSession™ Host Remote Diagnostics (with all modems)
- QAPlus Diagnostics
- Gateway Computer Glossary
- Gateway Mouse Pad

Systems with CDs also include:
- Gateway System CD
- Multimedia On-Line User's Guide
- Gateway Mall On-Line Catalog

SERVICE

Every Gateway system is backed by:
- 30-Day Money-Back Guarantee
- One-Year Limited Warranty
- Lifetime Toll-Free Technical Support
- On-Site Service Available To Most Locations
- Lifetime BBS Membership
- FaxBack Automated Fax Service

Our money-back guarantee does not include shipping. On-site service is provided at no charge during warranty if our technicians determine it is necessary. If you'd like to read our warranty and guarantee policies, please call for a free copy.

Printed on recycled paper with soy inks.

Gateway 2000 is a corporate sponsor of GLOBAL RELIEF

intel inside

Ready For Action

Gateway 2000's friendly employees will take care of you from your first phone call throughout the life of your system with lifetime technical support. We've also made it easy for you to buy one of our world-famous PCs.

Easy Payment Options

Gateway accepts most major credit cards and C.O.D. terms, with net 30-day terms and leasing options available to qualified commercial customers.

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

**Cash advance fee is $1 plus 2% of the amount of the cash advance, but not less than $5 nor more than $10. Financing is available on approved credit with the Gateway DuoLine MasterCard, issued by Dial National Bank, Des Moines, Iowa.*

Internationally Known

Gateway 2000 also makes it easy for our neighbors in Canada and Puerto Rico to buy Gateway systems. You get the same award-winning technical support, CSA approvals, and on-site service that is available in most Canadian and Puerto Rican locations. Our international shipping rates are some of the most competitive in the industry. Canadian and Puerto Rican customers can reach us toll free at 800-846-3609. All other international customers can call us at 605-232-2000.

Our Family PC comes with a 14-inch CrystalScan monitor, 101-key keyboard, double-speed CD-ROM, sound card, speakers, joystick, fax/modem and multimedia software. You choose one software option from five great Family PC multi-title packages.

intel inside

GATEWAY2000

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

800-846-2062

DIA KIT

need to add
teway desktop
better price

Bit Sound
-"Compatible
-ROM
s
& Corel
e

ST BUY

)X2 CPU
B Cache
Hard Drive
aphics with 2MB
-ROM
face
e
Scan 1572FS

PCI/ISA Slots
I & MS Mouse
FW 3.11
tion Software

6

um CPU
KB Cache
Hard Drive
PCI Local Bus
B
-ROM
rface
-Compatible
naha Speakers
e
Scan 1776LE
V Power Supply
PCI/ISA Slots
I & MS Mouse
FW 3.11
tion Software

PA POLLUTION PREVENTER

32-2561 • Add-On
rdays(CST)

World Class Winning

PC World's 1993 World Class Awards found readers honoring Gateway 2000 with top honors in five categories including Best Service and Support (for the second year in a row!) and Best Mail Order Company. Thank you, *PC World* readers!

Jesse Berst, editor of *Windows Watcher* was quoted in *PC World*: "Gateway has discovered an amazing secret, give people more for less and they are going to like you." We knew our secret wouldn't be safe for long!

Good Answers!

Computer Shopper summarized its readers' responses best: "Gateway, dominator of Best Buy balloting for the past three years, is your choice as Best Overall Supplier of computer systems ... For state-of-the-art PCs at bargain prices, North Sioux City is where *Shopper* readers look first." And "...Gateway 2000 has inspired a high degree of confidence and brand loyalty among *Shopper's* readers, who continue to rank Gateway's service and support as the best of all direct-channel PC vendors." Thanks *Shopper* readers!

INTEGRATED SYSTEMS

4SX-33

- Intel® 33MHz 486SX CPU
- 4MB RAM
- 212MB 13ms IDE Hard Drive
- Local Bus Graphics with 1MB
- 3.5" Diskette Drive
- 14" Color CrystalScan® 1024NI
- Mini Desktop Case
- 5 16-Bit ISA Slots
- 101-Key Keyboard & MS Mouse
- MS-DOS®6.2 & WFW™ 3.11
- MS Works for Windows™3.0
- EPA Energy Star Compliant

$1295

4DX-33

- Intel 33MHz 486DX CPU
- 4MB RAM
- 212MB 13ms IDE Hard Drive
- Local Bus Graphics with 1MB
- 3.5" Diskette Drive
- 14" Color CrystalScan® 1024NI
- Mini Desktop Case
- 5 16-Bit ISA Slots
- 101-Key Keyboard & MS Mouse
- MS-DOS®6.2 & WFW™ 3.11
- MS Works for Windows™
- EPA Energy Star Compliant

$1495

4DX2-50 FAMILY PC™

- Intel 50MHz 486DX2 CPU
- 8MB RAM, 128KB Cache
- 212MB 13ms IDE Hard Drive
- Local Bus Graphics with 1MB
- Double-Speed CD-ROM, 16-Bit Sound Card & Speakers
- 2400/9600 Data/Fax Modem
- 3.5" Diskette Drive
- 14" Color CrystalScan 1024NI
- Mini Desktop Case
- 5 16-Bit ISA Slots
- 101-Key Keyboard, MS Mouse & Joystick
- Choice of Family PC Software
- EPA Energy Star Compliant

$1995

MULTIMEDIA KIT

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

- Gateway 2000 16-Bit Sound Card, Sound Blaster-™Compatible
- Double-Speed CD-ROM
- 2 Labtec® Speakers
- Microsoft Encarta & Corel Photo CD Software

$299

486 VESA & PCI SYSTEMS

4SX-33V

- Intel 33MHz 486SX CPU
- 4MB RAM
- 212MB 13ms IDE Hard Drive
- VLB™ Graphics with 1MB
- Local Bus IDE Interface
- 5.25" & 3.5" Combo Drive
- 14" Color CrystalScan® 1024NI
- Baby AT Case
- 5 ISA & 2 VESA®/ISA Slots
- AnyKey® Keyboard & MS Mouse
- MS-DOS 6.2 & WFW 3.11
- Choice of Application Software
- EPA Energy Star Compliant

$1495

P4D-33

- Intel 33MHz 486DX CPU
- 8MB RAM, 256KB Cache
- 424MB 13ms IDE Hard Drive
- PCI Local Bus Graphics with 1MB
- Double-Speed CD-ROM
- PCI Fast IDE Interface
- 3.5" Diskette Drive
- 14" Color CrystalScan 1024NI
- Baby AT Case
- 4 ISA, 2 PCI & 1 PCI/ISA Slots
- AnyKey Keyboard & MS Mouse
- MS-DOS 6.2 & WFW 3.11
- MS Works Multimedia Edition 3.0

$1995

4DX2-66V

- Intel 66MHz 486DX2 CPU
- 8MB RAM, 128KB Cache
- 424MB 13ms IDE Hard Drive
- VLB Graphics with 1MB
- Double-Speed CD-ROM
- Local Bus IDE Interface
- 3.5" Diskette Drive
- 15" Color CrystalScan 1572FS
- Baby AT Case
- 5 ISA & 2 VESA/ISA Slots
- AnyKey Keyboard & MS Mouse
- MS-DOS 6.2 & WFW 3.11
- Choice of Application Software
- EPA Energy Star Compliant

$2295

P4D-66 BEST BUY

- Intel 66MHz 486DX2 CPU
- 8MB RAM, 256KB Cache
- 540MB 13ms IDE Hard Drive
- PCI Local Bus Graphics with 2MB
- Double-Speed CD-ROM
- PCI Fast IDE Interface
- 3.5" Diskette Drive
- 15" Color CrystalScan 1572FS
- Baby AT Case
- 4 ISA, 2 PCI & 1 PCI/ISA Slots
- AnyKey Keyboard & MS Mouse
- MS-DOS 6.2 & WFW 3.11
- Choice of Application Software

$2495

PENTIUM SYSTEMS

P5-60

- Intel 60MHz Pentium™ CPU
- 8MB RAM, 256KB Cache
- 424MB 13ms IDE Hard Drive
- PCI Local Bus Graphics with 2MB
- PCI Fast IDE Interface
- 3.5" Diskette Drive
- 14" Color CrystalScan 1024NI
- Baby AT Case
- 4 ISA, 2 PCI & 1 PCI/ISA Slots
- AnyKey Keyboard & MS Mouse
- MS-DOS 6.2 & WFW 3.11
- MS Works for Windows 3.0

$2495

P5-60 BEST BUY

- Intel 60MHz Pentium CPU
- 8MB RAM, 256KB Cache
- 424MB 13ms IDE Hard Drive
- PCI Local Bus Graphics with 2MB
- Double-Speed CD-ROM
- PCI Fast IDE Interface
- 3.5" Diskette Drive
- 15" Color CrystalScan 1572FS
- Baby AT Case
- 4 ISA, 2 PCI & 1 PCI/ISA Slots
- AnyKey Keyboard & MS Mouse
- MS-DOS 6.2 & WFW 3.11
- Choice of Application Software

$2795

P5-60

- Intel 60MHz Pentium CPU
- 16MB RAM, 256KB Cache
- 540MB 13ms IDE Hard Drive
- High-Performance PCI Local Bus Graphics with 2MB
- Double-Speed CD-ROM
- PCI Fast IDE Interface
- 3.5" Diskette Drive
- 15" Color CrystalScan 1572FS
- Baby AT Case
- 4 ISA, 2 PCI & 1 PCI/ISA Slots
- AnyKey Keyboard & MS Mouse
- MS-DOS 6.2 & WFW 3.11
- Choice of Application Software

$3295

P5-66

- Intel 66MHz Pentium CPU
- 16MB RAM, 256KB Cache
- 540MB 13ms IDE Hard Drive
- High-Performance PCI Local Bus Graphics with 2MB
- Double-Speed CD-ROM
- PCI Fast IDE Interface
- 16-Bit Sound Blaster-Compatible Sound Card & Yamaha Speakers
- 3.5" Diskette Drive
- 17" Color CrystalScan 1776LE
- Tower Case, 300W Power Supply
- 4 ISA, 2 PCI & 1 PCI/ISA Slots
- AnyKey Keyboard & MS Mouse
- MS-DOS 6.2 & WFW 3.11
- Choice of Application Software

$3995

intel inside

GATEWAY2000

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

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

MICROSOFT® WINDOWS™ READY-TO-RUN

ENERGY STAR POLLUTION PREVENTER

610 Gateway Drive • N. Sioux City, SD 57049-2000 • Phone 605-232-2000 • TDD 800-846-1778 • Fax 605-232-2023 • FaxBack 605-232-2561 • Add-On Sales 800-846-2080 • Toll free from Canada and Puerto Rico 800-846-3609 • Sales Hours: 7am-10pm Weekdays, 9am-4pm Saturdays(CST)

Extra Winnings

You'll score bonus points with the peripherals listed below, sold only with the purchase of a system from Gateway 2000. Call our special component add-ons division for our complete line of extras for Gateway customers,

Multimedia

Multimedia Kit

Here's everything you need to add multimedia to your Gateway PC:

- Gateway 2000™ 16-bit CD-quality sound card, compatible with Sound Blaster™ cards, with MIDI/game port, mic in, stereo line in/out
- Double-speed CD-ROM drive, tray-loading, compatible with music CDs, multisession photo CDs and CD-ROM titles
- 2 Labtec® speakers that can attach to your PC monitor
- Microsoft® Encarta Multimedia Encyclopedia
- Corel Professional Photo CD Sampler

$299

Yamaha® YST-M10 Multimedia Speakers

The small speakers that sound big and come with a tiny price! This free-standing, self-powered speaker set is a great value! **$75**

Altec Lansing ACS-300 Multimedia Speakers

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

Communications & Storage

TelePath™ II Fax/Modem

Internal fax/modem, 14,400bps modem, V.32bis, with 14,400bps fax capability. Package includes data and fax communication software, plus a CompuServe® trial membership. **$149**

Colorado Memory Systems® TBU

250MB internal automatic tape backup unit copies up to 9.5MB per minute. Comes with MS Windows™ and DOS® software, one tape and cable. **$159**

Networking

Intel EtherExpress™

A 16-bit Ethernet adapter from a world leader in networking. **$105** Twisted Pair or BNC

Ethernet Adapter from 3Com®

Manufactured by 3Com for Gateway. **$105** Twisted Pair **$125** BNC

Token Ring

IBM® 16-bit ISA Token Ring card. **$429**

Monitors

CrystalScan® 17-Inch Monitor

Non-interlaced color monitor with intelligent multiscanning analog color display capable of ultra-high resolution up to 1280 x 1024 in non-interlaced mode and .26mm dot pitch.

Upgrade from a 14-inch monitor **$430**

Upgrade from a 15-inch monitor **$350**

(Prices good only for upgrades at the time of system purchase.)

Printers

Epson® Stylus 800 Ink Jet Printer

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

Epson ActionLaser 1500 Laser Printer

The ActionLaser delivers professional-quality printouts. Fast six-page per minute speed, 14 resident fonts, 300 x 300dpi, and 1MB memory expandable to 5MB. Parallel cable included. **$669**

Home Office Pack

Add these peripherals to your new Gateway desktop, and you have everything you need for an efficient home office.

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

$399

© 1994 Gateway 2000, Inc. AnyKey, CrystalScan, HandBook, black-and-white spot design, "G" logo and "You've got a friend in the business" slogan are registered trademarks, and Gateway 2000, ColorBook, DueLine, Family PC, EZ Point and TelePath are trademarks of Gateway 2000, Inc. The Intel Inside Logo, Intel, Pentium and OverDrive are trademarks or registered trademarks of Intel Corporation. All other brands and product names are trademarks or registered trademarks of their respective companies. All prices and configurations are subject to change without notice or obligation. Prices do not include shipping. Energy Star compliant systems may not remain within EPA guidelines if upgraded to a Pentium processor.

Best CDs Yet for Cheating on Term Papers, Catching Up on Politics

LET'S SAY YOU have one of those fancy CD-ROM jukeboxes that lets you keep 6 or 18 disks in a changer so you can mount any of them with just the click of a mouse. The problem lies in picking two or three disks you never want to take out of the jukebox—the ones you want in their dedicated slots permanently. Well, we've got some good candidates this month—plus the usual assortment of CDs that, no matter how good they are, no one would call indispensable.

Here, once again, is our handy rating guide.

- ⊙⊙⊙⊙⊙ *We laughed, we cried, we killed a whole weekend. A masterpiece.*
- ⊙⊙⊙⊙ *Get your own copy. This is ours!*
- ⊙⊙⊙ *Justifies the dough you blew on the CD drive.*
- ⊙⊙ *We'd rather watch "Petticoat Junction."*
- ⊙ *Perfect—for a skeet shoot.*

Random House Unabridged Dictionary, Second Edition .. ⊙⊙⊙⊙⊙

This CD gets the No. 1 slot in our CD jukebox. With almost 315,000 entries—taking up 36MB—it includes new coinings such as *wannabe* and *CMOS*. In other words, it's a great dictionary, and the fact that it's on CD just makes it easier to use. The DOS-TSR and Windows interfaces, created by WordPerfect, let you look up words using wildcards, or you can guess the spelling of a word and the program will do its best to give you the right one. If you're not sure if a word exists, type in a phrase that you'd guess would be in the definition, and the dictionary presents all words that match your definition. In addition, you can cut and paste from the dictionary to any Windows program.

TuneLand Starring Howie Mandel ..... ⊙⊙⊙⊙

The blessing—or drawback, depending on whether you're a parent or an 11-year-old boy—with *TuneLand Starring Howie Mandel* is that absolutely none of the teddy bears or other cute creatures that inhabit *TuneLand* gets its head blown off.

We performed state-of-the-art games testing with *TuneLand:* We let a bunch of kids play it. One pair, a 4-year-old girl

Here's wholesome fun for kids: TuneLand Starring Howie Mandel.

OH, SAY CAN YOU CD?

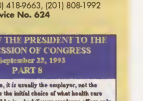
Your government on disc.

After a hard day af wark, same peaple like ta end their computer-oriented day by playing Leisure Suit Larry or X-Wing. Me, I like ta read several volames af federal bureaucratese, then watch same industry flack lie ta me. And naw I have the perfect CD far that—*The Clintan Health Security Plan: What It Means, What It Casts.*

If yau're like me and can't get enaugh dense, labarious writing, here's all 1,342 pages af the Health Security Act as delivered ta Cangress. Plus, there's a videa af President Clintan's speech pitching the plan ta the natian. And there are a bunch af talking-head videas fram peaple wha say nasty things abaut the plan.

OK, sa this CD isn't far everyane. But it shauld be. There's na mare impartant piece af legislatian facing the cauntry than Clintan's health plan, and facts abaut it are hard ta came by—which is exactly what I like about this CD. You've gat ta hand it ta Allegra New Media far putting all af this material tagether and charging anly $14.95 for it. ..... ⊙⊙⊙

THE CLINTON HEALTH SECURITY PLAN: WHAT IT MEANS, WHAT IT COSTS • $14.95 • ALLEGRO NEW MEDIA • (800) 418-9663, (201) 808-1992
Circle Reader Service No. 624



Required reading for health plan wonks.

CompuServe would like to introduce you to our information highway. Complete with visitor centers, shopping malls, town squares, and other world travelers.

You've probably been hearing a lot about the information highway lately. But before you take your next trip, maybe you should make sure the highway you're on is a superhighway. Like CompuServe.

CompuServe has nearly 2,000 places for you to go, things for you to see, and fun for you to have. You can turn in to one of our many forums where nearly every hardware and software vendor is represented, along with almost every shade of political opinion. Our Electronic Mall® is filled with the newest merchandise, and our CB Simulator and Electronic Convention Center let you just stop by and chat.

Other services range from renowned reference databases to timely financial data and thousands of freeware and shareware programs.

Plus, CompuServe has over a million and a half members worldwide. So, you're bound to find plenty who will share your interests, be able to offer advice, or just become fast friends.

For only $8.95 a month, you can get unlimited connect time — day or night — to a full package of more than 50 basic services. That includes news, stock quotes, travel arrangements, movie and restaurant reviews, 60 E-mail messages a month, and more. Plus, a whole universe of other services is available at nominal additional charges.

So, get on the fast track. For more information or to order, see your computer dealer or call 1 800 848-8199. And take our information highway straight into the next century.

CompuServe®

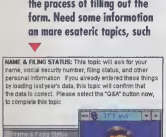
The information service you won't outgrow.™

Circle 128 on reader service card.

TAXMAN ON A CD

This one's simple. If you don't use an accountant to do your taxes and you have a multimedia PC, then *Andrew Tobias' TaxCut CD-ROM Multimedia* is the program you should be using.

All of the tax preporation programs are fairly similar. After all, there are only a limited number of ways to fill out a Schedule A. But in *TaxCut*, an animated "Tax Assistant" talks you through the process of filling out the form. Need some information on more esoteric topics, such



as home office deductions? You can play a video in which an expert tells you whether you're likely to get away with it or not.

The multimedia on this CD is all just talking heads stuff, and it could be better. Same year multimedia will be used for animated graphs and diagrams that serve a lot better purpose than watching someone's lips move. But far now, this ain't bad, especially when you consider that it casts only $10 more than the flappy disk version. ($89.95; MECA Software; 800-820-7461, 203-256-5000)

Circle Reader Service No. 629

CDs, *continued from page 76*

and her 5-year-old brother, played *TuneLand* for hours, laughing and singing along with the cartoon characters who populate this Windows game. They got into finding out what surprise lay behind clicking on almost any of the objects in the settings at a farm, train station, pond, forest, and other rural locations. Anything—in good taste—could happen, from shooting stars to an impromptu hoedown led by Little Howie (comedian Howie Mandel's wonderful kid's voice). It's full of surprises, the full-screen animation is first-rate, and the songs are great for tykes.

We like the program, but then we're grown-ups. The 11- and 9-year-old boys who played it weren't exactly bored, and *TuneLand* even got a laugh or two out of them. But given the choice between *TuneLand* and Id Software's *Doom*, in which they could mow down aliens with a machine gun, the teeny-boppers chose the gore every time.

Moral: Get that CD-ROM drive while your children are still innocent enough to appreciate things that aren't measured by the caliber.

Compton's Interactive Encyclopedia ..... ⊙⊙⊙⊙⊙

One CD we'd like mounted all the time is *Compton's Interactive Encyclopedia* from Compton's NewMedia. Remember those times in high school when, the night before a paper was due on the Teapot Dome Scandal, you hurriedly, and by hand, copied verbatim whole pages of an encyclopedia? Quote marks? No way—you just needed to get a lot of words on paper.

Today, your children can cheat electronically. And *Compton's* is A+ material. Unlike encyclopedias that sacrifice depth for breadth, *Compton's* gets into the nitty-gritty of topics. Its Windows interface is not as flashy as, say, Microsoft's *Encarta*, but it's cool in its own way. You can choose an "idea search" that selects a main topic—for example, computers—then find related topics in which computers play a secondary role, such as crime or medicine. It includes the obligatory videos and too few animations, but it's our first choice for term paper cribbing nevertheless.

Tour the globe from your desk with Small Blue Planet: The Real Picture Atlas.

Small Blue Planet: The Real Picture Atlas ..... ⊙⊙⊙

Unlike other travel CDs on the market, this Windows CD serves absolutely no practical purpose. Despite being a photographic atlas of the world, *Small Blue Planet: The Real Picture Atlas* won't even help you get to the next block. But you might just be able to pick out the block you live on from one of the high-resolution photographs supplied by the National Oceanic and Atmospheric Administration, National Geophysical Data Center, or space shuttle photography center.

You'll probably get tired of *Small Blue Planet* after just a few explorations, but for a while it's fascinating to zoom in closer and closer to a particular city, to see an area only through the lights that glow at night, or to probe into a storm front from the vantage point of the heavens. Our only serious objection is that it's overpriced ($79.95 suggested retail) for something that doesn't have long-run potential.

RANDOM HOUSE UNABRIDGED DICTIONARY, SECOND EDITION • $79 CD-ROM ONLY, $159 BOOK AND CD-ROM • RANDOM HOUSE REFERENCE AND ELECTRONIC PUBLISHING • (212) 751-2600
Circle No. 625 on Reader Service Card

TUNELAND STARRING HOWIE MANDEL • $49.95 • 7TH LEVEL • (818) 547-1955
Circle No. 627 on Reader Service Card

COMPTON'S INTERACTIVE ENCYCLOPEDIA • $395 • COMPTON'S NEWMEDIA • (800) 862-2206, (619) 929-2500
Circle No. 626 on Reader Service Card

SMALL BLUE PLANET: THE REAL PICTURE ATLAS • $79.95 • CAMBRIX PUBLISHING • (800) 992-8781, (818) 992-8484
Circle No. 628 on Reader Service Card

NO MORE EXCUSES.

NOW THERE'S A 16-BIT SOUND BLASTER FOR EVERY APPLICATION AND BUDGET... AND NO MORE EXCUSES FOR OWNING ANYTHING LESS.

SOUND BLASTER™ 16 BASIC EDITION: MORE VALUE.

A best buy at $199.95*, our basic 16-bit board gives you everything you need for high-quality PC sound. It's the ideal tool for enhancing your multimedia presentations, interactive software, and sound-enhanced games. And you can upgrade with our optional Wave Blaster™ daughterboard to sampled wave synthesis, or add our Advanced Signal Processor DSP.

SOUND BLASTER 16 MULTICD*: MORE CD-ROM OPTIONS.

Sound Blaster 16 MultiCD is a multi-functional audio solution that includes a CD-ROM interface for the most popular drives from Creative, Sony and Mitsumi—no additional interface is needed! For $249.95*, you get Creative's high-performance 16-bit audio plus a variety of multimedia titles.

SOUND BLASTER 16 SCSI-2*: MORE SCSI COMPATIBILITY.

Specifically developed for those with data-intensive devices, our SCSI-2 card features CD-quality stereo sound plus compatibility with SCSI-1 and SCSI-2 devices. At an SRP of $279.95, you can't beat this card's dynamite software bundle and rich sound.

Boost CPU efficiency by up to 65% with an Advanced Signal Processing upgrade.

SOUND BLASTER AWE32: MORE FIDELITY.

Our most advanced 16-bit card for the discriminating audio enthusiast, Sound Blaster AWE32 combines our state-of-the-art digital audio technology with E-mu Systems' Advanced WavEffects™ synthesis for pro-audio sound. It features 32-note symphonic-quality MIDI playback, and digital signal processing.

Plus it's 100% General MIDI and Sound Blaster compatible. All for just $399.95*.

AWESOME NEW SOUND BLASTER AWE32!

Advanced WavEffect synthesis from E-mu, with downloadable sound sampling and DSP special effects!

NO MORE EXCUSES, PC OWNERS.

Now with Creative's great selection of advanced-technology 16-bit boards, there are no more excuses for not upgrading your PC with enhanced audio capabilities.

*All prices listed are manufacturer's suggested retail

Sound Blaster™ THE 16-BIT SOUND STANDARD. CREATIVE

CREATIVE LABS, INC.

Circle 135 on reader service card.

U.S. inquiries: Creative Labs 1-800-998-5227 or 1-408-428-6600 **International inquiries:** Creative Technology Ltd., Singapore. TEL 65-773-0233 FAX 65-773-0353. Sound Blaster, Sound Blaster 16 MultiCD, Sound Blaster 16 SCSI-2, Sound Blaster AWE32, Wave Blaster, Advanced WavEffects, and the Sound Blaster and Creative logos are trademarks of Creative Technology Ltd. All other trademarks are the property of their respective holders. © Copyright 1994 Creative Technology Ltd. All rights reserved. Note: Sound Blaster 16 MultiCD works with Sony CDU31A , Mitsumi CRMC-LU005, -FX001, and Creative Labs/Panasonic CDR-525 and -563.

Spotlight

Videoconferencing Now

Iraq's Saddam Hussein isn't all bad, say oldline videoconferencing companies. They note that his Kuwait invasion sent business people looking for ways to "do meetings" without jumping on airplanes.

But neither global unrest nor their $20,000-to-$100,000 proprietary systems will ignite the real boom in electronic tête-à-tête-ing. That will take place on your desktop thanks to cheap PC-based solutions. Right now, a dozen leading computer and communications companies are hammering out a PC-based personal conferencing specification for real-time, interactive sharing of files, applications, and video images across installed LANs, WANs, and phone lines. It's due in the middle of the year, but some PC product makers aren't waiting.

NTV is a long way from the proprietary camera/VCR/PC setup of oldline manufacturers. This inexpensive Windows software lets you mix anyone's video capture and audio hardware to create a system for videoconferencing with your workmates over your company's LAN or WAN. Connected users can display and work on a file simultaneously in the background even if only one user has the necessary application. ($299; Peregrine Systems; 800-432-4393, 619-431-2400)
Circle Reader Service No. 630

If you're content to hold a conference with only "virtual vid," The Meeting Room provides LAN/WAN-based teleconferencing devoid of the real-time video component. The Meeting Room is actually a graphical creation, a virtual room in which comments are posted on a chalkboard as they would be during an onsite meeting. Objects, pictures, and documents can be viewed by all in a meeting, but not edited as they can in NTV. One benefit: Because no one actually sees you, you can do other work or play Solitaire when Johnny Langwind gets going. ($295 for a three-user pack, $895 for a ten-user pack; Eden Systems; 800-779-6338)
Circle Reader Service No. 631

BRIEFLY NOTED: HOT PRODUCTS AND UPGRADES. BY MIKE HOGAN

Delrina WinFax Pro 4.0

The latest version of Delrina's market-leading fax manager focuses on usability and flexibility. You can easily configure different aspects of the program through right-mouse button dialog boxes, and use Windows' drag-and-drop functionality for everything from building a mailing list to rearranging the fields on fax forms. WinFax Pro 4.0 will forward your faxes to you on the road or let you send a batch of faxes from your portable when you get to a phone line. ($129, $49 for upgrades; Delrina Corp.; 800-268-6082, 408-363-2345)
Circle No. 632 on Reader Service Cord

Stacker 4.0 for Windows and DOS

It's all about saving space, and Version 4.0 of this pioneer disk compressor saves more than its rivals do. Stacker takes the average hard drive and gives you back roughly 2.5 times the space, compared with a 1.6- to 1.9-time improvement realized with most current disk compressors. Stacker 4.0 also includes some useful Windows utilities, including a Stacker Windows Toolbox that faithfully reports the amount of blank space remaining on your drive. ($149, $49.95 for upgrades; Stac Electronics; 800-522-7822, 619-431-7474)
Circle Reader Service No. 633

TravelMate Intelligent Docking System

When they say intelligent, they mean it. Texas Instruments' PC-sized TravelMate DeskTop Intelligent Docking System gently and securely locks in your Texas Instruments TravelMate notebook. It automatically updates and closes all DOS and Windows files and applications on the notebook when you hit the eject button. Intelligent scheduling lets you set automatic wake-up and shut-down periods, extending the energy-efficient capabilities of Texas Instruments notebooks. And this docking station offers six ISA slots, two PCMCIA slots, and four drive bays. ($899; Texas Instruments; 800-527-3500, 512-794-5970)
Circle No. 641 on Reader Service Cord

GoldMine 2.5 For Windows

The extraordinary features of this workgroup-oriented contact manager become even more accessible under Windows. Thanks to a robust database, GoldMine 2.5 for Windows not only provides a heaping helping of the usual contact management fare but also offers workgroup task delegation, scheduling, e-mail, and innovative sales automation. A sales manager has access to up-to-the-minute sales reports, plus future sales projections of sales team members. The whole group shares current contact information, contact history, and form letters. ($295 per user, $895 per five-user network node, site licenses available; Elan Software Corp.; 800-654-3526, 310-454-6800)
Circle No. 634 on Reader Service Cord

Professional Write 3.0 for DOS

Version 3.0 of this long-running DOS-based word processor includes a new Windows-like interface with expanded mouse support for selecting items from pull-down menus, positioning the cursor, and marking blocks. Professional Write 3.0 can import files from popular Windows word processors, and display scalable fonts, type styles, and text layouts in a print preview mode. You also can shell out to the DOS command line. ($249, $65 for upgrades; Software Publishing Corp.; 800-234-2500, 408-986-8000)
Circle No. 635 on Reader Service Cord

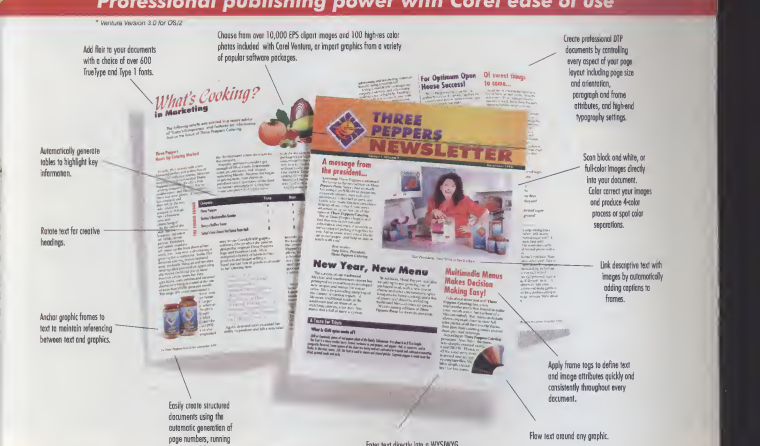
HOT NEWS! 7 Top Pros Reveals Tips & Tricks from CD Magazine*

Corel Ventura

The Best in Publishing

Professional publishing power with Corel ease of use

* Ventura Version 3.0 for OS/2



The single solution for projects of any size or length, Corel Ventura 4.2 for Windows features faster font loading and complete color prepress capabilities. There is support for Adobe™ Acrobat™ and a bonus Adobe Acrobat Reader.™ You'll receive Ventura DataBase Publisher 4.2, that lets you publish documents from database information, Ventura Separator and Ventura Scan. Plus, there are 75 templates, over 600 fonts and more than 10,000 clipart images that let you easily create a wide range of dynamic communication materials.

Value!

- *Two fully-featured publishing applications*
- *75 professionally-designed templates*
- *Direct scanning, prepress control and color separation utilities*
- *Over 10,000 EPS clipart images*
- *Over 600 TrueType and Type 1 fonts*
- *100 high-resolution royalty free photos*
- *Over 25 import filters*
- *Adobe Acrobat Reader with Adobe Type Manager* 2.6 included*

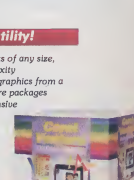
Automation!

- *Automatic generation of indexes and tables of contents*
- *Easily create page headers and footers*
- *Automatic pages, chapter and figure numbering*
- *One-step bullets and drop caps*
- *Automatic file links for direct updates*
- *Automatic text-reflow*
- *Create hypertext links with new Adobe Acrobat support*

Versatility!

- *Create documents of any size, length or complexity*
- *Import text and graphics from a variety of software packages*
- *Create data-intensive documents such as catalogs and price lists quickly and easily*

Circle 180 an reader service card.



$145
CD only
*$179 with CD and disks

DUSTIN DISCOUNT SOFTWARE
Plain Wrap Prices, Black Tie Service.

Monday thru Friday 8AM to 5PM PST
Saturday 10AM to 2PM PST

Fax your order 24-hours
1-800-274-6611 1-818-884-5310

20965 Ventura Blvd., Woodland Hills, CA 91364 (818) 719-9175 Prices subject to change

Call for your free catalogue!
Prices include FREE ground shipping!

COREL
1-613-728-3733 Ext. 24

KLIR-0049

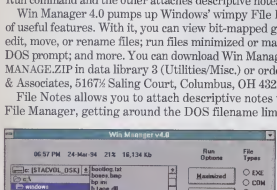
PCContact

Try Out Two Great Shareware Windows Power Tools at No Cost

These two nifty utilities increase your mastery over Windows. One replaces the File Run command and the other attaches descriptive notes to File Manager documents.

Win Manager 4.0 pumps up Windows' wimpy File Run command with a host of useful features. With it, you can view bit-mapped graphics files; delete, copy, edit, move, or rename files; run files minimized or maximized; shell out to the DOS prompt; and more. You can download Win Manager from PC/Contact as MANAGE.ZIP in data library 3 (Utilities/Misc.) or order it for $10 from G. L. Liadis & Associates, 51672 Saling Court, Columbus, OH 43229. **Circle Reader Service No. 637**

File Notes allows you to attach descriptive notes to your files in the Windows File Manager, getting around the DOS filename limit. Just click on a file, run File Notes from within File Manager, and type in your notes. Download File Notes from PC/Contact on ZiffNet as FILNOT.ZIP in data library 3 (Utilities/Misc.) or order it for $18 (plus $2 shipping and handling) from Sloop Software, 6457 Mesedge Lane, Colorado Springs, CO 80919. **Circle Reader Service No. 762**



Dirt-Cheap Clip Art For Freelance Graphics

There's good news for Freelance Graphics for Windows users who want to jazz up their business presentations: The SmartMaster Business Pack, a collection of clip art and Freelance SmartMasters, is available from Lotus for $10—or for free, if downloaded from the ZiffNet online service as SMRTPK.ZIP in data library 3 (Utilities/Misc.). The package includes SmartMasters designed for common business situations, such as project updates and weekly meetings. Call Lotus at (800) 343-5414 for details. **Circle No. 638 on Reader Service Card**

Remote Control Software Steal

If you want to use your office PC or LAN while on the road or at home, you're in luck: Remote control software for Windows just got cheaper. You can now buy Carbon Copy 2.0 for Windows for $49 as a competitive upgrade or as an upgrade from a previous version. It works with DOS and Windows, and it allows you to control a PC remotely or access a LAN from long distance. Call Microcom at (800) 822-8224 for details. **Circle No. 639 on Reader Service Card**

Free System Snooper Software

What exactly is under the hood of your PC? Find out with SysChk. This superb DOS program performs a thorough analysis of your system and reports the results. Better yet, it's shareware, so you can try it out for free. Download SYSCHK.ZIP from data library 3 (Utilities/Misc.) of PC/Contact, *PC/Computing*'s online service on ZiffNet. Or order it for $20 from Advanced Personal Systems, 105 Serra Way, Suite 418, Milpitas, CA 95035. **Circle No. 640 on Reader Service Card**

BEST SOFTWARE BUYS

Where can you get the best software deal? Usually through the mail. We surveyed mail-order houses and came up with the best prices we could find. The following prices include shipping and handling charges, but don't include credit card surcharges. Prices are as of press time and are subject to change.

PRODUCT	LIST PRICE	BEST PRICE	SOURCE	READER SERVICE NO.
Excel 5.0	$495.00	$299.00	Lorna, (800) 369-2846	750
Lotus 1-2-3 4.01	$495.00	$298.00	CompUSA, (800) 451-7638; Eggbead, (800) 344-4323	751
Microsoft Word 6.0	$495.00	$269.00	Telemart, (800) 537-4735	752
MS-DOS 6.2	$77.95	$49.00	MicroWarehouse, (800) 367-7080	753
Norton Utilities 7.0	$179.00	$108.00	CompUSA, (800) 451-7638	754
QEMM-386 7	$99.00	$50.00	Computability, (800) 558-0003	755
Quattro Pro 5.0	$49.95	$49.00	Lorna, (800) 369-2846; MicroWarehouse, (800) 367-7080	756
Windows 3.1	$149.00	$81.00	Eggbead, (800) 344-4323	757
Word 6.0 for Windows	$495.00	$335.00	CompUSA, (800) 451-7638	758
WordPerfect 5.2 for Windows	$495.00	$274.00	Lorna, (800) 369-2846	759
WordPerfect 6.0	$495.00	$265.00	Dustin, (800) 477-3878; Telemart, (800) 537-4735	760

Hayes Delivers The New Standard For High-Speed Global Communications.

Four Times Faster Than A 14,400 Bit/s Modem!

Introducing the Hayes® OPTIMA™ 288 V.FC™ + FAX. An incredibly advanced modem that incorporates the *V.Fast Class*™ 28,800 bit/s technology developed by Hayes and Rockwell International. The same technology that's being supported by more than 125 other modem manufacturers worldwide as the new industry standard for high-speed performance. OPTIMA 288 not only communicates with other *V.Fast Class* modems, it will work with future Hayes modems incorporating the ITU-T V.34(V.Fast) standard. And, it communicates easily with today's installed base of modems.

$579 Estimated Retail Price

V.FC V.FAST

Faster Than You Think. With the enhanced technology of Hayes, you'll obtain ***twice*** the speed you thought you'd get from a 28,800 bit/s modem. OPTIMA 288 supports port speeds up to 230,400 bit/s and transfers graphics files at 200,000 bit/s. It's especially powerful for remote connectivity to or from a LAN, remote control, transferring large files, or multi-media. You could save as much as 75% on connect charges. OPTIMA 288 provides the clarity and convenience of FAX at 14,400 bit/s, **plus fast, easy-to-use Smartcom™ for Windows™ LE data communications software, and Windows FAX software.**

Hayes® ESP® Communications Accelerator

Add The Hayes® ESP® Communications Accelerator for $99ERP. Our fast Serial Port helps prevent data loss and achieve speeds of 230,400 bit/s when using Windows or LAN based communications.

For more information or to find out about our Corporate Offer, call **800-HAYES-28,** or call our FAX back service *Hayes FAX Response* at **800-HAYES-FX** and request Document 288.

In Canada, call us at **800-665-1259.**

Hayes®

Increasing the Speed of Business.®

*Fastest in four out of five file transfer tests. Go *Online With Hayes* BBS: call 800-874-2937 or 404-446-5336. ©1994 Hayes Microcomputer Products, Inc., P.O. Box 105203, Atlanta, GA 30348. Hayes, the Hayes icon, the Hayes logo and ESP are registered trademarks, and the Hayes '302 Escape Sequence Patent' icon, Increasing the Speed of Business, OPTIMA, and Smartcom are trademarks of Hayes Microcomputer Products, Inc. V.Fast Class and V.FC are trademarks of Rockwell International Corporation. Other trademarks mentioned are those of their respective companies. Estimated price is in U.S. dollars.

Circle 262 on reader service card.

Software Saleswire

Tax software and financial application sales surge as April 15 approaches.

Power Upgrades
New versions of Office and Works return to the business applications top-seller list as Microsoft flexes its market muscle on your desktop.

BUSINESS APPLICATIONS	VENDOR	PRICE	COMMENTS	JAN	FEB
Office 4.0 for Windows	Microsoft	$750	IntelliSense reads your mind.	16	1
Lotus 1-2-3 4.0 for Windows	Lotus	$495	SmartIcons an live status bars.	11	2
Excel 5.0 for Windows	Microsoft	$495	Drag and Plat eases chart updating.	2	3
WordPerfect 6.0	WordPerfect	$495	Supports regular text wraps.	4	4
CorelDraw 4	Corel	$595	Enhanced DTP supparts multipages.	22	5
Publisher 2.0 far Windaws	Microsoft	$199	35 prafessionally designed templates.	10	6
Warks 3.0 far Windaws	Microsoft	$199	Allows document data linking.	17	7
Quattro Pro 5.0 for Windows	Barland	$50	Supparts Paradax and dBASE data.	6	8
Procamm Plus 2.01	Datastarm	$129	Mare than 30 terminal emulatians.	8	9
Word 6.0 far Windaws	Microsoft	$495	AutaSelect: intelligent paint and click.	1	10

Peer Pressure
Will LANtastic's new peer-to-peer entry challenge Novell's peer-to-peer leadership?

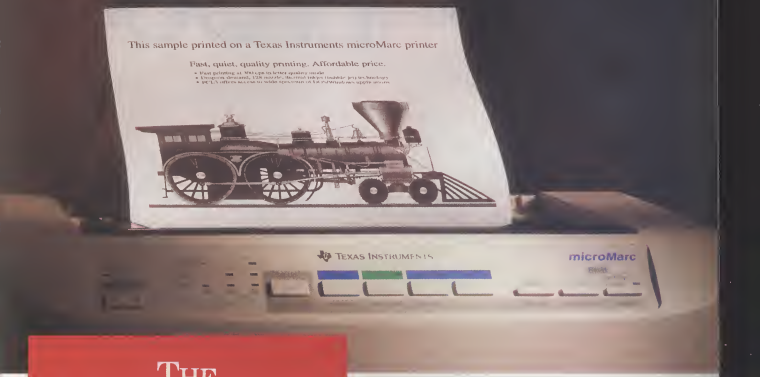
UTILITIES	VENDOR	PRICE	COMMENTS	JAN	FEB
Windaws 3.1	Microsoft	$149	Robust multitasking, drag and drap.	4	1
MS-DOS 6.x	Microsoft	$129	Undelete recavers accidental deletians.	1	2
NetWare 3.x	Navell	$1,095	Cannects Windaws, Unix, and OS/2.	25	3
Windaws far Warkgraups 3.11	Microsoft	$250	Built-in netwarking and cammunicatian.	14	4
QEMM 7	Quarterdeck	$100	Setup eases parameter changes.	2	5
LANtastic/AI 5.0	Artisaft	$99	ArtiSaund supparts vaice-mail.	13	6
Visual Basic 3.0	Microsoft	$199	Access multiple database applications.	15	7
After Dark 2.0 for Windaws	Berkeley Systems	$50	Custam-design your awn wallpaper.	3	8
Visual C++ for Windaws	Microsoft	$199	Includes reusable routine abjects.	16	9
Expert FantPack for Windaws	Expert	$15	Mare than 120 cool fants.	8	10

Sticker Shock
MECA's $10 gamble pays off, pushing TaxCut ahead of ChipSaft's TurboTax, with a nifty rebate thrown in.

PERSONAL PRODUCTIVITY	VENDOR	PRICE	COMMENTS	JAN	FEB
Quicken 7.0 far DOS	Intuit	$70	14 investment perfarmance gauges.	1	1
Quicken Campanian 2.0	Intuit	$35	Maintains praperty inventary.	4	2
QuickBooks 2.0	Intuit	$160	Camparative period-ta-period analysis.	8	3
QuickPay 2.0	Intuit	$75	Autamates W-2 farm printing.	11	4
Maney 2.0 for Windaws	Microsaft	$70	Helps plan key financial goals.	7	5
TaxCut far Windaws	MECA	$10	Imparts data fram many financial apps.	-	6
TaxCut	MECA	$10	Special pramatianal rebate.	-	7
The Print Shap Deluxe	Broderbund	$80	Yearly, manthly, and daily calendars.	10	8
TurboTax 1993 States	ChipSaft	$40	45 separate state tax packages.	-	9
TurboTax 1993 for Windaws	Chipsaft	$40	20 separate state tax packages.	2	10

Software Saleswire is compiled by G. Meier Inc. once each month after gathering ranked-order sales information supplied by the following software industry sources: BOO-Software, ABCO Distributors, Americon Software, Bobbages, Baker & Taylor Software, CompUSA, Computability, Computer Discount Warehouse, Corporate Software, Dustin Discount Software, Egghead Discount Software, Electronics Boutique, Gate/FA, Ingram-Micro, Josho Distributing, Kenfil, Liuski Intern'l, Merisel, Multiple Zones, Navarre, PC Connection, Software Resource, Software Spectrum, Softwre Etc., and Waldensoftware. They represent sales through tens of thousands of resellers and more than $6 billion of software sales. A weighting system is applied to each entry based on three factors: the entry's position in the individual chart, the power of the contributing source based on annual gross sales, and the relative strength of a source in a given category of software. All prices are suggested retail and are subject to change.

Speed (spēd) *n.* 1, A feature rarely found in low-cost inkjet printers. ***example:*** In letter quality mode, the TI microMarc™ printer gives you laser quality printing at twice the ***speed*** of the HP DeskJet™ printer.



THE UNDER $300 PRINTER, REDEFINED.

If you want a printer with a street price under $300*, you no longer have to settle for poor print quality or painfully slow print speed.

Now, for about the same price as a dot matrix printer, the TI microMarc's advanced inkjet technology gives you the same 300 dpi print quality as most laser printers.

And unlike our biggest competitor, the HP DeskJet, instead of 50 nozzles applying ink to the page, we have 128. So in letter quality mode, we print text twice as fast. We also give you more memory than they do. And a higher capacity ink cartridge, too.

The TI microMarc. It's so quiet, so reliable, so inexpensive to run and easy to use, it can help you get more from your printer than you ever thought possible. At a price you probably never thought possible. In fact, we're so confident you'll like it, we'll even give you our 30-day satisfaction guarantee. For more information or a dealer near you, call *1-800-527-3500.*

	TI microMarc	HP DeskJet 500
Speed (in letter quality mode)	*300cps*	*120cps*
Print Quality	*300 dpi*	*300 dpi*
Memory	*24K*	*16K*
Pages/Cartridge	*1400*	*1000*
Weight	*12.1 lbs.*	*14.3 lbs.*

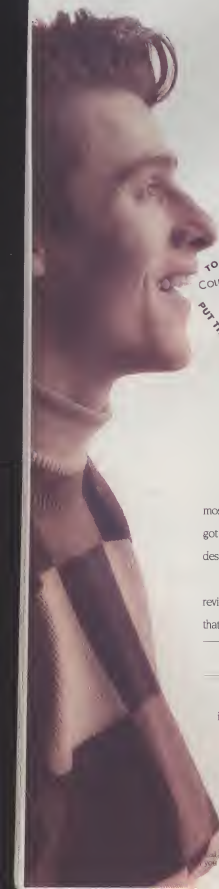
EXTENDING YOUR REACH WITH INNOVATION™

TEXAS INSTRUMENTS

Specifications in chart are based on information as of 9/93. *Estimated dealer price. Dealer prices will vary. microMarc and "Extending Your Reach With Innovation" are trademarks of Texas Instruments. DeskJet is a trademark of Hewlett-Packard, Inc. © 1993 TI.

Circle 117 on reader service card.

MEET LO
ELOQUE



TO KNOW 1-2-3 IS TO LOVE AMI PRO.

COLLECT CHARTS AND RANGES FROM 1-2-3 AND DROP THEM INTO AMI PRO DOCUMENTS WITH A M[illegible]

Ami Pro and 1-2-3 are beyond compatible. They've actually conv[illegible]

CHANGES TO 1-2-3 SPREADSHEETS ARE AUTOMATICALLY REFLECTED ON AMI PRO DOCUMENTS

AMI PRO AND 1-2-3 WORK TOGETHER TO HELP YOU WORK FASTER

PUT THE POWER OF 1-2-3 INTO WORDS.

Everyone knows Lotus® 1-2-3,® the most popular, most usable spreadsheet in the world. Now its time you got to know Ami Pro® the Windows™ word processor designed to complement 1-2-3.

Those who know Ami Pro, know why it wins rave reviews from industry experts time after time. Like the fact that it's consistently rated easiest word processor to use.

THEY SHARE MORE THAN LOOKS

As impressive in words as 1-2-3 is in numbers, it also has special advantages for 1-2-3 users. Because it's the only word processor designed specifically to complement and enhance your spreadsheet. Ami Pro not only looks like 1-2-3, it behaves identically – with shared menus, common user interface, spell check dictionary and SmartIcons.® So if you use 1-2-3, you already know how to use Ami Pro.

The integration between the two is so complete that incorporating your 1-2-3 data into an Ami Pro document is automatic and almost instantaneous.

[illegible] for a list of eligible word processors. Education-priced Lotus products not included. Offer valid in U.S. only. Not to be combined with any other offer. Have your [illegible] qualify for a competitive upgrade. In Canada call 1-800-GO-LOTUS. ©1994 Lotus Development Corporation, 55 Cambridge Parkway, Cambridge, MA 02142. IBM and Lotus Organizer is a trademark of Lotus Development Corporation.

TUS 1-2-3's NT TWIN.

The unique Collect and Copy feature lets you quickly gather any number of charts or data ranges from any number of 1-2-3 files and arrange them within a single Ami Pro document, dynamically linked through OLE and DDE. You just click on the 1-2-3 Collect and Copy SmartIcon and Ami Pro instantly takes you into your spreadsheet and guides you through the process.

Plus, Ami Pro's Style Converter lets you use the same paragraph styles across both word processor and spreadsheet.

And Ami Pro is the only word processor that has complete file compatibility with 1-2-3 Release 4 for Windows.

PUT THE POWER OF 1-2-3 INTO WORDS

You can upgrade from your current word processor to Ami Pro for just $129* Or you can get the whole family by upgrading to the award-winning Lotus SmartSuite.® It brings together Ami Pro, 1-2-3 Release 4, Freelance Graphics,® Approach® database and Lotus Organizer™ personal information manager, for just $299.**

Call **1-800-TRADE UP, ext. 9452**† for an Ami Pro working model or visit your Lotus Authorized Reseller.

Lotus
Working Together®

*current word processor ready when you call **$299 direct from Lotus. Offer expires 1/31/94 or while supplies last. Call **1-800-TRADE-UP** to see

All rights reserved. Lotus, SmartSuite, SmartIcons, Ami Pro, 1-2-3, Freelance Graphics, Approach and Working Together are registered trademarks. Windows is a trademark of Microsoft Corporation.

Trust Congress? Not With This Unbelievable Lair of Slop

When Vice President Gore began talking about the Information Highway, we all knew the bureaucrats would get involved more than we might like. In fact, it may already be too late to stop a horrible Senate bill from becoming law.

The moniker—Information Highway—itself seems to be responsible for SB #040194. Introduced by Senator Patrick Leahy, it's designed to prohibit anyone from using a public computer network (Information Highway) while the computer user is intoxicated. I know how silly this sounds, but Congress apparently thinks that being drunk on a highway is bad no matter what kind of highway it is. The bill is expected to pass this month.

There already are rampant arguments as to how this proposed law can possibly be enforced. The FBI hopes to use it as an excuse to do routine wiretaps on any computer if there is any evidence that the owner "uses or abuses alcohol and has access to a modem." Note how it slips in the word *uses*. This means if you've been seen drinking one lone beer, you can have your line tapped.

Because this law would be so difficult to enforce, police officials are drooling over the prospect of easily obtaining permits to do wiretaps. Ask enforcement officials in Washington and they'll tell you the proposed law is idiotic, but none will oppose it. Check the classified ads in the *Washington Post* and you'll find the FBI, National Security Agency, and something called the Online Enforcement Agency (when did they set that up?) all soliciting experts in phone technology, specifically wiretapping.

It gets worse. The Congressional Record of February 19, 1994, has a report that outlines the use of computerized BBSes, Internet Inter-Relay Chat, and CompuServe CB as "propagating illicit sexual encounters and meetings between couples—any of whom are underage. . . . Even people purporting to routinely have sex with animals are present on these systems to foster their odd beliefs on the public-at-large." A rider on SB #040194 makes it a felony to discuss sexual matters on any public-access network, including the Internet, America Online, and CompuServe.

I wondered how private companies such as America Online could be considered public-access networks, so I called Senator Barbara Boxer's office and talked to an aide, a woman named Felicia. She said the use of promotional cards that give away a free hour or two of service constitutes public access. You know, like the ones found in the back of books or in modem boxes. She also told me most BBS systems fall under this proposed statute. When asked how they propose to enforce this law, she said it's not Congress's problem. "Enforcement works itself out over time," she said.

The group fighting this moronic law is led by Jerome Bernstein of the Washington law firm of Bernstein, Bernstein and Knowles (the firm that first took on Ollie North as a client). I couldn't get in touch with any of the co-sponsors of the bill (including Senator Ted Kennedy, if you can believe it!), but Bernstein was glad to talk. "These people have no clue about the Information Highway or what it does. The whole thing got started last Christmas during an antidrinking campaign in the Washington, D.C., metro area," Bernstein said. "I'm convinced someone jokingly told Leahy's office about drunk driving on the Information Highway and the idea snowballed. These senators actually think there is a physical highway. Seriously, Senator Pat Moynihan asked me if you needed a driving permit to 'drive' a modem on the Information Highway! He has no clue what a modem is, and neither does the rest of Congress."

According to Bernstein, the antisexual wording in the bill was attributed to Kennedy's office. "Kennedy thought that technology was leaving him behind, and he wanted to be perceived as more up-to-date technologically. He also thought this would make amends for his alleged philandering."

Unfortunately, the public is not much better informed than the Senate. The Gallup Organization, at the behest of Congress, is polling the public regarding intoxication while using a computer and online "hot chatting." The results are chilling. More than half of the public thinks that using a computer while intoxicated should be illegal! The results of the sexuality poll are not available. But one question, "Should a teenage boy be encouraged to pretend he is a girl while chatting with another person online?" has civil rights activists alarmed. According to Kevin Avril of the ACLU, "This activity doesn't even qualify as virtual cross-dressing. Who cares about this stuff? What are we going to do? Legislate an anti–boys-will-be-boys law? It sets a bad precedent."

Should a boy be encouraged to pretend he's a girl when online?

I could go on and on with quotes and complaints from people regarding this bill. But most of the complaints are getting nowhere. Pressure groups, such as one led by Baptist ministers from De Kalb County, Georgia, are supporting the law with such vehemence that they've managed to derail an effort by modem manufacturers (the biggest being Georgia-based Hayes) to lobby against the law. "Who wants to come out and support drunkenness and computer sex?" asked a congressman who requested anonymity.

So, except for Bernstein, Bernstein and Knowles, and a few members of the ACLU, there is nothing to stop this bill from becoming law. You can register your protests with your congressperson or Ms. Lirpa Sloof in the Senate Legislative Analysts Office. Her name spelled backward says it all.

PHOTOGRAPH BY ELLEN MANNOCK

NEW LOWER PRICES!

Music To Your Eyes.

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

With color and power you can't beat, the ZEOS ColorNote 486 is the only color notebook worth taking note! Now that we've scaled back prices by as much as $200, you'll never find a better value.

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

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

intel inside

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

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

AWARD-WINNING SERVICE

ZEOS has won more *PC Magazine* Readers' Choice for Service & Reliability awards than any other company–five in all!

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

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

ZEOS® INTERNATIONAL, LTD.

STANDARD WITH EVERY ZEOS COLORNOTE 486

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

PACKAGE 1

ColorNote 486: $2195
Lease $79/month
- 4MB RAM
- 80MB IDE hard drive

PACKAGE 2

ColorNote 486: $2495
Lease $90/month
- 4MB RAM
- 120MB IDE hard drive
- Microsoft DOS 6.2
- Microsoft Windows for Workgroups 3.11
- Lotus Organizer

PACKAGE 3

ColorNote 486: $2795
Lease $101/month
- 8MB RAM
- 170MB IDE hard drive
- Custom carrying case
- Microsoft DOS 6.2
- Microsoft Windows for Workgroups 3.11
- Lotus Organizer

CALL NOW TOLL FREE
800-554-5218

Purchase orders are subject to approval. Business leasing programs available. Lease prices based on a 36-month lease, 10% purchase option. All prices, specifications and availability are subject to change without notice, call to confirm these and warranty details. Prices do not include shipping. All products and company names are trademarks or registered trademarks of their respective holders. ZEOS is a registered trademark, Z-Card and Computers Now! are registered servicemarks, ColorNote is a trademark of ZEOS International Ltd. ©1994 ZEOS International Ltd., 1301 Industrial Blvd. Minneapolis, MN 55413 USA. ZEOS is a publicly traded company (NASDAQ symbol: ZEOS) CLR/PCC-0404

Circle 216 on reader service card.

The Hard Life of the Corporate Criminal: A Tale of Software Piracy

I SENSED HIS PRESENCE LONG BEFORE HE ACTUALLY CAME into view, the raw smell of fear that preceded him down the corridor. No, that's not right. The smell of fear was mixed with something else. Something darker, even less appealing. The aroma of wrongdoing soon to be apprehended—that was it. The scent of guilt.

I waited until he thought he was alone, putting old memoranda through the shredder. I knew if I merely poked him with the smallest inquiry, he would pop like a ripe melon. So I poked him.

"Ahoy, Studtz, you lousy pirate," I said, infusing my affable tone with a coldly calculating undertow of menace I learned from Doug, our former chairman, who could make the words "good morning" sound like a prelude to termination.

Studtz jumped a mile.

"I have no idea what you're talking about! I'm clean!" he yelled. A raincoat of sweat ringed the circumference of his pallid brow. Does evil distort the human physiognomy? Except in the case of Donald Trump, I've always thought so.

"Maybe you'd better come into my office, son," I offered, nudging him gently in the back with the barrel of my Mont Blanc. He went.

"I didn't do anything wrong," he said as he took the chair under the light that sits in the center of my interrogation area. They always start out that way, you know. I guess they think I'm stupid or something.

"Why don't you start at the beginning and take it from there," I said, carefully removing my jacket, rolling up my sleeves, and taking off my watch and tie. I hate to get my stuff messy.

"From where?" was all he had time to say before the flat part of my fist slammed up into the area just south of his kidney. He sort of slumped over in his chair and all the air blew out of his body.

"Now, Studtz," I said. "Why make things tough on yourself? If you come clean, I'm sure there's no need for any additional fisticuffs. We know what you've been up to, and a full, honest confession will go a long way toward reinstating you in our good graces."

"That was last year!" Studtz howled. "I haven't shared unregistered copies of new software with anyone since second quarter of '93! I took my punishment! My record was expunged!"

"Don't play dumb," I said.

I admit I was getting a little steamed. I really don't mind it when they try to put one over on you—I mean, that's what perps do—but I don't like somebody trying to insult my intelligence, and failing.

"Perhaps this will . . . refresh your recollection," I snarled.

I handed over the plastic bag from the 3½-inch Microsoft installation floppies I had found sitting on the edge of his credenza. His face fell. I thought he could use a few minutes to pick it up, so I went to the window and pretended to be smoking a cigarette, an activity that would have alerted an entirely different arm of the company police force you really don't want to mess with.

"Oh," said Studtz.

"How could you do it?" I said to him. "After the good folks at Microsoft told you how they feel about you? 'You're important to us,' " I read. " 'Register today.' And did you register today? Or yesterday? Or any other day, for that matter?"

"No!" He was weeping now, and I didn't blame him. If I was in his shoes, they'd feel mighty tight on me, too.

"You should not open this packet until you have read the Microsoft License Agreement,' " I read. "And did you?"

"No! I mean . . . yes! I mean . . . I wanna talk to my lawyer!" This infuriated me. Every piece of cyber-scum in the world wants to fall back on the legal system they've abused. I honked his earlobe, hard. "Never mind, Studtz," I said gently. "You know this isn't about your filthy registration habits anyhow."

"It's about my new computer, isn't it," he said, wiping a bit of phlegm off the end of his tie.

"Yeah, Studtz," I said, waving the laptop in his face. He turned a sort of pearly taupe that perfectly matched the 4.6-pound wafer's shock-resistant case.

I walked up behind him where he couldn't see me and casually read the rest of the advisory wrapping. "Reminder Note," it said. "When you get a new computer, you have a choice to make concerning your Microsoft software."

Avast ye techno-mateys! Ahoy all you cyber-scum out there!

"I thought I was straight, I didn't know. I swear to God I didn't," he said. "You gotta believe me."

"Why?" I mused. "Your whole life has been spent abusing the system one way or another. Last year you got a competitive upgrade for Aldus Persuasion by clipping the registration page from somebody else's Harvard Graphics documentation, didn't you? Didn't you?! C'mon, cough it up, you weasel."

"But we have dozens of copies of Harvard Graphics around here—all legally paid for and registered! This corporation must have spent thousands of dollars on 'em! Why can't I use one on an upgrade I had to pay more than $100 for anyway?!"

Continued on page 96

PHOTOGRAPH BY JONATHAN LEVINE

Remember how simple life used to be?

Bundled Solutions From $1,495.
60Mhz Pentium $2,495.

It still is at AT&T.

When you were young, your world was your own. And nobody was more important than your best friend.

Today, your world's a little larger. But, admit it, with the complexities of everyday life, don't you yearn for the simple, honest, direct friendships you had as a kid?

PHOTOGRAPH BY CHARLES GATEWOOD

We make buying a computer what it should be: easy... simple... direct.

At AT&T, we want your relationship with us (and your computer) to be uncomplicated and rewarding. Our only goal is to delight you with the ease and simplicity of owning and using one of our computers. The best way to do that, of course, is to give you the very best technology supported by a team of friendly, knowledgeable people.

One call starts it all.

It begins with the skilled associate at the other end of our 800 number... someone who helps you select the system that's right for you. Choose from the latest, proven technology designed to run your applications to the fullest.

It's the little things that count.

We don't expect you to know all the details that separate an ordinary PC from the quality we build into ours. That's our job. But here are a few you might appreciate: performance-matched components for an extra measure of durability; parity RAM for internal error checking; write-back cache for faster applications; ZIF sockets for easy upgrading; and an open system architecture that lets you plan for the future.

Questions? A Techline associate wants to talk to you...

When your computer arrives, it'll be up and running in a few short steps. If you have any questions, no matter how simple or complex, just pick up the phone and talk with one of our Techline associates. They can lend you a helping hand anytime day or night.

Easy financing. And a 30-day guarantee.

Financing is easy, too. Use a major credit card. Or consider a lease through AT&T Capital Corporation. Don't forget, you have 30 days to try out your new system. If for any reason you find it's not right, we'll get another for you, or refund your money. It's that simple.

A friend in need...

Once you're up and running, we stick by you with an industry-leading service and support program. It's highlighted by our free, three-year warranty that includes parts, labor and monitor for most systems.

...is a friend in deed.

If you need on-site service, we're just an 800 number away. We'll send one of our 5,000 AT&T-trained Service Technicians to your business or home the next business day. They'll show up with the skills, parts and dedication to get your PC back on its feet in no time. (With over 700 locations in the U.S., we're always close at hand.)

Call AT&T Direct Connect.

GET IT MOVES USE IT

A computer built and backed by people committed to helping you get, move and use information easily. That's the kind of relationship you'll have with AT&T. Promise. All you have to do is call AT&T Direct Connect, or the reseller nearest you. It's that simple. After all, what are friends for?

We make Pentiums easy.

System 3260
Pentium Powerful!

$2,495 or $91/month

- ***Intel Pentium 60MHz***
- PCI Local Bus
- 2 PCI Expansion Slots / 3 ISA Expansion Slots
- 4 Drive Bays
- 340MB Hard Disk Drive
- 8MB RAM at 70ns*
- 256KB External Cache
- 3.5" Floppy Disk Drive
- 1MB Video RAM
- 14" SVGA VESA Flicker-Free .28mm Monitor
- 1 Year On-site Warranty

All AT&T Desktop Systems Include:

MS Mouse • Windows • MS DOS
Options*: CD-ROMs; Fax/modems; Networking cards; Memory/disk upgrades; Printers; plus a variety of popular applications.
* Options not available for all special packages

Preload your choice of Microsoft® software:

Office only $429
Word, Excel, Power Point only $249 ea.
Works only $99

MICROSOFT WINDOWS READY-TO-RUN

AT&T Global Information Solutions

intel inside

Call AT&T Direct Connect: 1-800-741-2254

AT&T Global Information Solutions products are available through Direct Connect; or call 1-800-624-7187 for the reseller nearest you.

Some of life's simple pleasures.

Complete Turnkey Solution

$2,195 or $80/month

Includes: Pre-loaded MS Works, 300 dpi Ink Jet Printer, Fax Modem!

- ***Intel Pentium OverDrive Ready***
- Intel486SX/33 (upgradable to 66MHz)
- 3 ISA Expansion Slots/3 Drive Bays
- 240MB Hard Drive (expandable to 1GB)
- 8MB RAM at 70ns (expandable to 32MB)
- External Cache Upgradable to 256KB
- 3.5" Floppy Disk Drive
- VESA Local Bus Video
- Windows TurboCharger Video w/1MB Video RAM
- Internal 2400 Data/9600 Fax Modem
- 14" SVGA VESA Flicker-Free .28mm Monitor

System 3230

Great For Home Or Office!

$1,290 or $47/month

- ***Intel Pentium OverDrive Ready***
- Intel486SX/25 (upgradable to 50 MHz)
- 3 ISA Expansion Slots/3 Drive Bays
- 120MB Hard Drive (expandable to 1GB)
- 4MB RAM at 70ns (expandable to 32MB)
- External Cache Upgradable to 256KB
- 3.5" Floppy Disk Drive
- VESA Local Bus Video
- Windows TurboCharger Video w/1MB Video RAM
- 14" SVGA VESA Flicker-Free .39mm Monitor

Complete On-Line Systems

$1,495 or $55/month

Pre-loaded software includes: AT&T EasyLink, America On-Line,Compuserve, GEnie, Prodigy and Sierra Network.

- ***Intel Pentium OverDrive Ready***
- Intel486SX/33 (upgradable to 66MHz)
- 3 ISA Expansion Slots/3 Drive Bays
- 170MB Hard Drive
- 4MB RAM at 70ns
- External Cache Upgradable to 256KB
- 3.5" Floppy Disk Drive
- VESA Local Bus Video
- Windows TurboCharger Video w/1MB Video RAM
- Internal 14,400 Data/14,400 Fax Modem
- 14" SVGA VESA Flicker-Free .28mm Monitor

Upgrade to 270 MB Hard Drive, 8 MB RAM, Only $300!

System 3231

Green For Home Or Office!

$1,975 or $72/month

- ***Intel Pentium OverDrive Ready***
- Intel486DX/33 (upgradable to 66MHz) with System Management Mode
- 3 ISA Expansion Slots/3 Drive Bays
- 270MB Hard Drive (expandable to 520MB)
- 8MB RAM at 70ns (expandable to 48MB)
- External Cache Upgradable to 128KB
- 3.5" Floppy Disk Drive
- VESA Local Bus Video
- Windows TurboCharger Video w/512KB Video RAM (upgradable to 2 MB)
- 14" ESVGA Power Management .28mm Monitor

System 3333

Fantastic Powerhouse!

$2,275 or $83/month

- ***Intel Pentium OverDrive Ready***
- Intel486DX2/50
- 2 VESA Expansion Slots/4 ISA Expansion Slots
- 5 Drive Bays
- 240MB Hard Drive (expandable to 2GB)
- 8MB RAM at 70ns (expandable to 64MB)
- External Cache Upgradable to 256KB
- 3.5" Floppy Disk Drive
- VESA Local Bus Video
- Windows TurboCharger Video w/1MB Video RAM (upgradable to 2MB)
- 14" SVGA VESA Flicker-Free .28mm Monitor

$3,405 or $124/month

- ***Intel Pentium OverDrive Ready***
- Intel486DX2/66
- 2 VESA Expansion Slots/4 ISA Expansion Slots
- 5 Drive Bays
- 520MB Hard Drive (expandable to 2GB)
- 16MB RAM at 70ns (expandable to 64MB)
- 256KB External Cache
- 3.5" Floppy Disk Drive
- Upgradable to VESA Local Bus Video
- SVGA Server Video w/512KB Video RAM (upgradable to 2MB)
- 14" SVGA VESA Flicker-Free .39mm Monitor

$3,600 or $132/month

- ***Intel Pentium OverDrive Ready***
- Intel486DX2/66
- 2 VESA Expansion Slots/4 ISA Expansion Slots
- 5 Drive Bays
- 340MB Hard Drive (expandable to 2GB)
- 12MB RAM at 70ns (expandable to 64MB)
- 64KB External Cache (upgradable to 256KB)
- 3.5" Floppy Disk Drive
- VESA Local Bus Video
- Diamond Viper Video (Weitek P9000) w/2MB Video RAM
- NEC 15" SVGA VESA Flat Screen .28mm Monitor

Safari 3150

Road Ready!

Free 14" Color ESVGA Monitor and external keyboard with 120MB HD Mono Model!

$1,995 or $73/month (Mono)

$2,310 or $84/month (Passive Color)

PCComputing USABILITY AWARD 1993

- Intel486SX/25 (upgradable to i487)
- 120MB Removable Hard Drive (80MB, 170MB, & 250MB available)
- 3.5" Internal Floppy Drive
- 9.5" Monochrome Screen (DS passive color and active color also available)
- 4MB RAM (upgradable to 20MB)
- 1 PCMCIA Slot (Type 2)
- Local Bus Video w/Dual Video Display
- Front-Mounting Cableless Trackball
- Enhanced Pre-loaded Software: DOS, Windows, Bitfax, Tourguide, AT&T Mail AccessPlus and on-line documentation

Safari 3180

Fully Loaded For On The Go!

$3,795 or $139/month (Active Color)

$2,595 or $95/month (Mono)

- Intel486SL/33
- 180MB Removable Hard Drive (250MB available)
- 3.5" Removable Internal Floppy Drive
- 9.5" TFT Active Color Removable Screen (9.4" monochrome also available)
- 4MB RAM (upgradable to 12MB)
- 2 PCMCIA Slots (Type 2) or 1 Slot (Type 3)
- Local Bus Video w/Dual Video Display
- Trackball
- Enhanced Pre-loaded Software DOS, Windows, Bitfax, Tourguide, AT&T Mail AccessPlus and on-line documentation

Get it. Move it. Use it. Only with AT&T.

Next business-day service and 24-hour technical support.
Free 3-year warranty - parts, labor and monitor included.

We accept VISA, MasterCard or American Express credit cards. Ask about our business financing and leasing options through AT&T Capital Corporation **Hours: 8-8, M-F; 10-6, Sat.**

Call AT&T Direct Connect:

1-800-741-2254

Now serving Puerto Rico

AT&T Global Information Solutions

AT&T and the AT&T globe design are registered service marks and trademarks of American Telephone and Telegraph Company. The Intel Inside logo, Intel486 and Pentium are trademarks of the Intel Corporation. DOS and Windows are trademarks of Microsoft Corporation. All other trademarks acknowledged. Prices, configuration and availability subject to change without notice. Prices and money back guarantee do not include shipping. Shipping charges are calculated according to weight and distance. Appropriate sales tax will be added. AT&T Global Information Solutions is not responsible for errors in typography or photography. Product offering and prices may vary by dealer/reseller. ©1994 AT&T Global Information Solutions Corporation.

PHOTOGRAPH BY JOHN MAYNE

DX17F
GREEN ENERGY
MONITOR

DX15F
GREEN ENERGY
MONITOR

It's a Jungle Out There!

AND MAG INNOVISION WANTS TO KEEP IT THAT WAY. IT'S WHY WE'RE INTRODUCING GREEN ENERGY.

GREEN ENERGY WAS DEVELOPED TO HAVE MINIMAL IMPACT ON THE ENVIRONMENT. GREEN ENERGY MEANS EPA ENERGY STAR COMPLIANCY. GREEN ENERGY MEANS VESA DISPLAY POWER MANAGEMENT SIGNALING COMPATIBILITY. GREEN ENERGY MEANS CONFORMANCE WITH SWEDAC MPR II LOW-EMISSION STANDARDS. AND GREEN ENERGY MEANS NO OZONE DEPLETING SUBSTANCES WERE USED IN MANUFACTURING OR PACKAGING.

BEST OF ALL, MONITORS WITH THE GREEN ENERGY LOGO FROM MAG INNOVISION WILL HAVE THE LEGENDARY PERFORMANCE AND QUALITY OF A MAG THAT EARNED US PC MAGAZINE'S EDITORS' CHOICE FOR 4 CONSECUTIVE YEARS, AND READERS' CHOICE IN SERVICE AND RELIABILITY THIS YEAR. THE KIND OF PERFORMANCE AND QUALITY YOU'D EXPECT FROM TOP SYSTEMS AND FUTURE GREEN SYSTEMS.

CALL US AT 1-800-827-3998 (1-714-751-2008 IN CALIFORNIA) AND WE'LL SEND YOU INFORMATION ABOUT MAG INNOVISION'S NEW GREEN ENERGY MONITORS, HOW THEY HELP SAVE THE ENVIRONMENT AND WHERE YOU CAN GET ONE.

IT'S A JUNGLE OUT THERE! LET'S KEEP IT THAT WAY.

©1994, MAG INNOVISION, INC. ALL RIGHTS RESERVED. MAG INNOVISION AND ITS LOGO ARE TRADEMARKS OF MAG INNOVISION, INC. ALL BRAND AND PRODUCT NAMES ARE TRADEMARKS OR REGISTERED TRADEMARKS OF THEIR RESPECTIVE OWNERS.

Circle 181 on reader service card.

Continued from page 90

I slammed his head into the top of my desk without warning. It left a little grease spot I knew I'd have to deal with later.

"Just weeks ago," I continued amiably enough, "you used clip art you purchased for only $89 in a sales piece in a promotional sales brochure that could net the company millions of dollars. Was that legal? Was that . . . right?"

"Honestly! I don't know."

"Well, to tell you the truth, I don't either. But this . . ." I brandished the plastic advisory in his face. "This here is the last straw."

I read the final, most damning clause. " 'You may set up your software on your new computer if you delete it from your old computer. OR, if you leave your software on your old computer, you need to purchase additional software for your new computer.' "

"WELL, I THINK THAT'S RIDICULOUS!" Studtz blared in defiance.

I had to hand it to him. The guy had guts, even if he was an immoral blob of stinking protoplasm threatening our entire social ecosystem.

"Did you or did you not on the 15th of last month purchase this second computer for your road trips?" I inquired, very stiff, very formal.

"It's a real nice laptop," he bleated. "And you can't use it even when I'm not, you fascist nerd."

"And did you on the third of this month install a copy of Microsoft Scenes for Windows on this laptop?"

"Yes," said Studtz, very sullen now.

"And did you eradicate the existing copy of Scenes from your desktop computer?"

"The darn program costs around $30 for some bit-mapped pictures of stuff from space!" he hollered. "I spend a fortune on Microsoft programming every year, and I intend to stock my laptop with as much of it as I can get away with! You can slow me down, but you can't stop me! Because oppression generates defiance—and eventually, revolt! The software belongs to the people who paid for it! All power to the people! Right on!"

"Peace, bro," I replied abruptly, extending a hand and pulling him to his feet. "Now get out of here and do the right thing."

"I will," he said, brushing himself off and wiping his nose with his fist. "Now that I know about this absurd regulation, by the way, I will of course abide by it."

"As we all must, Studtz."

"Yes, sir."

He was chastened, no doubt about it. And I felt . . . great. I knew he'd be a better man from here on in, and that did my heart a world of good. You know, keeping our software compliance in line is a tough job, but it does have its satisfactions. In a world so pathetically lacking in natural morality, enforcing virtue can be its own reward. ◩

We just brought inkjet plotting down to size.

INTRODUCING THE TECHJET™ PERSONAL

Besides being a full-featured desktop check plotter, our new TechJET Personal is an affordable, laser-quality printer, too.

A combination that should make it very popular, indeed. And one that'll put everything from complex CAD and desktop publishing documents to memos and oversized spreadsheets within easy reach.

It's all thanks to a speedy inkjet print engine, delivering 360 dpi and flexible paper-handling options. Plug-and-play CAD connectivity through host-based interpreters. PostScript-language compatibility.

And a price of just $699.

For more information, just call your CalComp reseller, or 800-932-1212, ext 537 for a dealer near you.

You'll see it's a big idea.

And no small accomplishment.

CalComp
A Lockheed Company
Circle 249 on reader service card.

List price in U.S. dollars. PostScript is a registered trademark of Adobe Systems Inc. TechJET is a trademark of CalComp Inc. © 1994 CalComp Inc.

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

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

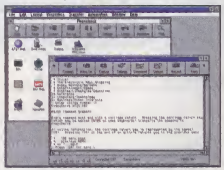
Now you can get the world's best-selling fax software together with a powerful new communications application in one economical package: New Delrina Communications Suite™.

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

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

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

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



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

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

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

PCComputing USABILITY APPROVED 1993

1993 ANNUAL EDITORS' CHOICE AWARD WINNER 1993

PCComputing MVP PUBLISHER 1992

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

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

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

DELRINA®
1-800-268-6082

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

Circle 227 on reader service card.

PowerPC: A Surefire Winner Or Just Motorola Dreamin'?

DO YOU HAVE INTEL INSIDE? WILL YOU A YEAR OR TWO FROM now? Ask the folks at Motorola, IBM, or Apple, and they'll tell you how PowerPC is about to lop off a huge chunk of Intel's business. Are they dreaming? John and Paul battle it out.

SOMERSON: This thing's hot. It's less than half the size of a Pentium, about half the cost, and anywhere from 40 to 1,000 percent faster, depending on your applications (and whom you talk to). It's pure RISC and contains some impressive technology. Apple has staked its future on it, and companies like Aldus, Adobe, and Microsoft are writing native code for it, which means the software is going to scream. Most insiders will tell you there are only two problems facing this CPU—no real operating systems for it and no real chance to break through Intel's juggernaut marketing.

DVORAK: Sheesh. The way you say it! "Only two," as if it's no big deal. This is like saying "This is the best car ever built. Great looking, fast, incredible fuel economy. It has only two drawbacks: No seats and it runs only on powdered yttrium." These two problems are enormous.

SOMERSON: But not insurmountable. Motorola is no slouch when it comes to marketing. If it can line up lots of big-name systems vendors that are secretly frustrated by Intel's pricing and allocation policies, it'll have a real shot. The chip—especially the forthcoming 604—looks phenomenally impressive, and for fast floating-point stuff, even the first-pass 601 is a contender. No one wants to be left out.

Who knows what will happen with operating systems? Microsoft stumbled a bit with a premature release of Windows NT, but it'll get back on track. IBM has been plugging along with increasing success, and all of its future stuff will run on the PowerPC. So will many of the always-a-bridesmaid operating systems out there—including Unix and Apple's.

DVORAK: I agree with you regarding the chip overall. It looks like a winner. And it's a surefire winner for Apple—the only company that has the capability to control its own destiny. Apple can make a platform change at will and decide to move to this chip. The PC industry can't do it. There are too many Indians and not enough chiefs. And the few chiefs can be very skittish. So we'll see the chip replace the 680X0 on the Apple side of the equation for sure.

SOMERSON: Actually, this will be good for us. Lots of Apple vendors will start writing native-code apps for the PowerPC that they can tweak to work on the systems on our side of the fence. And oddly, it's also a boost for Intel, because all of the Apple systems are using Intel's Peripheral Component Interconnect (PCI) bus.

DVORAK: What the PowerPC will do is force Intel to up the ante to the detriment of the PC side of the business. When Intel ups the ante it tends to leave the chip cloners (Advanced Micro Devices, Cyrix, and Texas Instruments) in the dust. And when Intel leaves them in the dust it also raises prices. That's what will happen—*all* thanks to the PowerPC chip. Back to the $5,000 desktop computer.

SOMERSON: Geez John, have you been hitting the powdered yttrium again?

DVORAK: It's great with grenadine and a lesser cognac.

SOMERSON: Anyway, you got it backward—why am I not surprised? PC prices will continue to go down, especially with the consumer market getting real. Every component gets more capable and far less expensive each year. Look at what's happening to drives, CD-ROMs, monitors, modems. CPU prices have followed the same pattern, and now Intel has even *more* competition. When NT eventually catches on, even dark-horse chips like the Mips R4X00 (which beat all comers in our speed tests) and Digital Equipment Corp.'s Alpha family (which already runs at a third of a gigahertz and can theoretically hit 1GHz) will be interesting.

DVORAK: When NT catches on, cows will fly. But I digress.

SOMERSON: Well, something has to tie all of this stuff together, especially with companies like DEC and Motorola pumping out hot CPUs, and with Intel's rumored plan to abandon *x*86 compatibility in two generations. If it's not NT, it will be some cross between NT and Windows 5.

Anyway, unless the courts crunch the cloners (which could happen), there will be a continuing glut of speedy

PHOTOGRAPHS BY RUTH HANAUER AND RICHARD MORGENSTEIN

Less Wait,

Slimnote® 486E Series

- ✓ 9.4" Dual Scan or Active Matrix Color Display (Mono available)
- ✓ PCMCIA
- ✓ Large Built-In Trackball
- ✓ SL-Enhanced 486SX, DX, or DX2 CPU
- ✓ 6 Pounds, only 1.8" High!
- ✓ Local Bus VGA with 1Mb VRAM on Active Matrix models
- ✓ From $1795!

Pentium™-based Slimnote P5/60T now shipping!

Less Weight...

SubNote 486 Series

- ✓ 3.9 Pounds!
- ✓ SL-Enhanced 486SX, DX, or DX2 CPU
- ✓ 8" Bright VGA Display (Color available)
- ✓ 120Mb Removable Hard Drive
- ✓ PCMCIA
- ✓ Large Built-In Trackball
- ✓ From $1795!

Call Today...
800-995-8946
Monday—Friday 8am to 6pm PST

PC Computing USABILITY APPROVED
PC Computing
November, 1993
SubNote

PC Computing BEST VALUE
PC Computing
January, 1993
Slimnote 486

BUYERS ASSURANCE SEAL
Infoworld
December, 1992
Slimnote 486

PC Computing HARDWARE 200 FINALIST
PC Computing
June, 1993
Slimnote 486

Twinhead
Twinhead Corporation
1537 Centre Pointe Drive, Milpitas, CA 95035
Tel: (408) 945-0808 Fax: (408) 945-1080

Copyright, © 1994, Twinhead Corporation, All Rights Reserved. Slimnote is a registered trademark of Twinhead Corporation. ExpressCare℠ is a service mark of Twinhead Corporation. The Intel Inside Logo and Pentium™ are trademarks of Intel Corporation. All pricing, availability and specifications subject to change without notice.

Circle 126 on reader service card.

Dvorak vs. Somerson

CPUs that run all existing Windows apps. When the triplers start to hit in earnest (Intel's DX4 and IBM's first Blue Lightning are just around the corner, with more to follow), prices for 66MHz stuff will go down even further. And when the PowerPC bomb drops, Intel will slash costs. It already started in December. Last year, Intel's margin was more than 50 percent. It had a profit of $2 billion. That should give it a little wiggle room in pricing.

DVORAK: Yeah, right. These guys took forever to clone the 486. They'll never do the Pentium for years.

SOMERSON: That's not what Cyrix thinks. Its M1 Pentium-clone program is moving right along. AMD isn't far behind. Besides, now that video bottlenecks are being ironed out, triplers running at 99MHz and 120MHz will be just fine for a lot of Windows users.

DVORAK: They've been talking about it for too long. It can't be easy. As for triplers, even IBM hasn't been shipping them. Apparently there is something wrong with this picture! These companies are at an impasse. Prices will go up.

SOMERSON: All users care about is cost, speed, and ease. With the small office/home office market exploding and users becoming accustomed to cheapo systems, there's no way prices will rise. You'll just get more PC for the same low cost. More speed is always better, but that's the PowerPC's ace in the hole, especially with tricky graphics stuff. And if the thing can handle Windows apps without a hitch, no one will care what's inside. We'll be seeing Intel-Motorola price wars that will put an affordable rocket in everyone's pocket.

DVORAK: Nothing handles Windows apps without a hitch. Where have you been hiding? People will be buying the 486/66 if they want cheap systems, not the PowerPC or anything else. As for pocket rockets from Motorola on the Intel-dominated side of the equation—I think it's an uphill battle. What evidence do you have that this is remotely possible? Or are you just blowing smoke as usual?

SOMERSON: The evidence is the PowerPC trio—IBM, Apple, and Motorola. Each offers a vital part.

DVORAK: Vital?

SOMERSON: IBM contributes technology and desperation. The PowerPC is essentially a jazzed-up version of the chip that powered its very successful IBM RS/6000 workstation. The company is blessed with CPU and RISC expertise. And it knows it needs a home run like this to help change direction.

Motorola contributes advanced chip fabrication capability, marketing muscle, and bile-bitter jealousy of Intel.

Apple contributes immediacy and desperation. It needs to claw out a hardware edge and get PowerPC units on the market fast. And it's been able to convince the top software vendors to write apps in native PowerPC code that will fly.

And each has a common fear of Intel/Microsoft domination and money to spend.

DVORAK: Why should IBM and Apple have a fear of Intel? IBM is one of its biggest customers and Apple couldn't care less about it because Apple doesn't use Intel processors (except in that wacky dual-processor machine nobody buys).

SOMERSON: Good grief. How could people buy it? As of this writing, it's not even on the market yet. Listen—everyone fears Intel because Intel (and Microsoft) are calling the shots. In this business everyone wants to be in charge. IBM and Apple would each like to be leading the way instead of following. Both tried it and failed.

DVORAK: It seems that the only common factor you cite is desperation. You credit IBM and Apple with it when Motorola is the only logically desperate company when it comes to microprocessors. Let's say they're all desperate. Gee, there's the formula for success: desperation. Did Intel get to the top from desperation? Did Microsoft get to where it is from desperation?

SOMERSON: Maybe. Desperation is a great motivator. Intel has said for years that its formula for success has been huge amounts of technology plus (desperate) paranoia. Microsoft got to where it is with luck and shrewd marketing, but with gobs of desperation sprinkled in—just read all of the accounts of how Windows started. Recently, it's settled down and started producing superior applications like clockwork.

DVORAK: This desperation thing sounds like a scenario for failure. The old maid gets married to the geek out of desperation. The guy jumps off a building out of desperation. These are not images of bold and confident success. Now I'm wondering if I should sell all of these companies short.

SOMERSON: A lot of people are scared at what may happen to Apple and IBM. Interestingly, I think IBM (especially its PC Company) is turning the corner. Its notebooks are absolutely tops. Everyone else's new operating system suspiciously resembles the OS/2 Workplace Shell. It is increasingly getting it right on pricing, packaging, technology, even support and mail-order sales.

So the big question is where it's going with the PowerPC. IBM and Motorola say they'll own 30 percent of the industry in three to five years. What do you predict?

What do Motorola, Apple, and IBM have in common? Desperation!

DVORAK: I never thought you'd sound like an IBM booster. I agree that IBM will own 30 percent of the market in five years. But *what* market will it own? That part I don't know.

SOMERSON: While I would never underestimate Intel, I think Motorola has a shot. If enough hardware vendors jump on the PowerPC bandwagon, and lots of software vendors crank out native PowerPC code, it'll be a battle. In any event, users should benefit from the price wars. And if Microsoft gets its act together and comes out with a bulletproof universal operating system, nobody will care what's inside as long as it's cheap and fast and compatible.

We locked four ordinary computer users in a room for 30 minutes with one extraordinary program to see what they could come up with.

Circle 163 on reader service card.

Thompson & Associates

December 30, 1997

Marion Sawyer
Transmission Trainee
1111 Washington Street
Atlanta City, NJ 08370

Dear Mr Sawyer

It was a pleasure meeting you at our on-site visit of 21 December 1995. The following is a quick overview of the items discussed and our preliminary findings:

As you can see by our initial evaluation, the overall financial performance of your organization continues to be strong. We believe that you are well positioned to take advantage of growth in the marketplace. However we will review the information you have provided and make some recommendations regarding the Eastern region. Overall, your product mix appears to be appropriate to address current problems, but the present amount of growth appears to be occurring in the Widget line.

You can expect to see our detailed report on 15 January. We look forward to working with you as you continue to position your success and target the future marketplace.

Have a very happy holidays season! I look forward to seeing you in the New Year!

Sincerely

Mike Thompson
Principal

417 Rt 35 So Edison, NJ 07701 (908) 555-7197 Fax (908) 555-7444

Mike, Eston Town, NJ

Kusak Enterprises, Inc.

1706 Cornell Way, Seattle, WA 98033

Paul Carter
Principal
Carter & Christensen
204 Lincoln St.
Seattle, WA 98030

December 16, 1995

Dear Paul,

Thank you for attending our recent seminar in our area. I have enclosed the following information we discussed.

- A transcript of the seminars and procedures
- A brochure detailing our background and publications

You can use this information and have any one who could not attend call Poland Springs Schwarb Cougar Market. In many cases the Tele-works Automated School System (ASS) speaks best for itself.

Categories	Basic	Plus
Tractors	✓	
Loaders	✓	✓
Backhoes	✓	
Attachments		✓
Maintenance		✓
Transmissions		✓

Building walls seemed support but the type of spawns is essential before pursuing procurement or fundraising. It is important to expose teachers and parents to the ASS in the early stages of your program. Our goal is to make your project successful. I would be glad to present another brief demonstration at our school for you administration, teachers, PTA, parents and any local businesses interested in sponsoring an ASS.

Thank you again for our interest and participation on our seminar. If you have any questions or comments please feel free to contact me at (206) 555-7535. I look forward to working together to bring this truly worthwhile service to the community.

Sincerely,

Lisa

Lisa, New York, NY

Introducing the document WordPerfect

Memo

To Sales Team
From Warren
Date December 16, 1995
Regarding Are you on vacation?

After working my fingers to the bone, I'm proud to announce that I'm taking a long vacation! All by spending five relaxing days at the Blue Bird Bed&Breakfast in Sandberg.

- December 24 - 28

I've arranged for the following people to cover my accounts:

Accounts	Covering for me
Subhilesh Agrawal	Bruce Barberg
Andrew Bender	Donald Collins
Rochelle's Vending Goods	Sue Conway
Elizabeth Ann Hayes	Charlotte Wilkes
Dr. Marilyn Hunt	Alice Revell
Lifetime Photography	Sandra Mastrangelo

Thanks!

See you all soon
Warren

Sharon, Poway, CA

ECONEWS

30 Seattle, C, 98

Organization Summary

Mark Golden founded Econservices in 1991 upon returning to the private sector after serving for 20 years in the military as the director of the

A global focus

Mr. Warren and his associates, Econservices was a natural response to continued concern from ourselves looking, for ways to increase effectiveness and that had been abused through the years. Econservices' staff of Econservices' offices are the US with specialty divisions ranging from Asia to Europe to Latin America. Econservices is certified by the Nature Institute for Wildlife Preservation Associates for Cleaner Solutions, European Environmental Awareness Group, and Planet Earth Group.

Management Summary

Management consists of individual who have at least 5 years of field experience in some of the following areas: hands-on hands-down field experience, and senior managers. Individuals in these areas are responsible for conducting feasibility studies, economic analysis and planning or redesigning construction projects to meet federal guidelines. These individuals have a total of 500 years of convenience with Econservices and 400 years of experience in related disciplines. The following are the senior management consist of individuals who oversee corporate operations, a necessary evil to any for-profit enterprise. Some of the posts are:

- Cleaner environment
- Economic Stability
- Safe Work Areas

EcoService

Status

Year and report

Dan, Buffalo, NY

WordPerfect® 6.0 for Windows.™ Text, data and graphics in one easy-to-use program.

Visual communication. It makes documents much more effective. But it doesn't have to make them harder to create.

WordPerfect 6.0 for Windows is the ideal environment for creating professional-looking documents. It starts with a foundation of great text-editing tools. Then it adds easy-to-use spreadsheet, charting and drawing functions. And it can import more types of files, even databases, than ordinary word processors. Making it the place you'll want to work.

Plus, it's only one program. So learning is easy. Coaches will teach you. ExpressDocs™ templates will design for you. Its customizable interface can easily change for the way you work best. And if you're moving from WordPerfect for DOS, the Transition Advisor makes it simple. What else would you expect from *PC/Computing's* MVP?

WordPerfect SIX0 for WINDOWS

world's first processor. for Windows.

So visit your local reseller, or to order directly, call us at **(800) 526-5163**. And start processing more than words. Start processing documents.

WordPerfect®

6.0 FOR WINDOWS™

WORDPERFECT IS A REGISTERED TRADEMARK OF WORDPERFECT CORPORATION WITHIN THE UNITED STATES AND OTHER COUNTRIES. ALL OTHER BRAND OR PRODUCT NAMES ARE TRADEMARKS OR REGISTERED TRADEMARKS OF THEIR RESPECTIVE COMPANIES. © WORDPERFECT CORPORATION 1994

Circle 164 on reader service card.

The ability to handle more than one thing at a time began ages ago.

Your ability to handle more than one thing at a time begins with the QMS® 2001 Knowledge System.

The versatile, efficient octopus is uniquely suited to its environment. Now, there is a business system as well adapted to you and your environment as the octopus is to the sea: The QMS 2001 Knowledge System.

This office system integrates key business tools to help you collect, analyze, process, document and communicate decision critical information faster and more efficiently. Compute, fax, print, copy and scan on the QMS 2001 Knowledge System today. Add multimedia capabilities such as voice, audio, video and telecommunications to meet your unique application requirements. The system's advanced software and hardware consolidate and manage information electronically, facilitating your critical analysis for accurate, timely decision making.

With all this capability, the QMS 2001 Knowledge System is easy to use, convenient, and meets Energy Star requirements. One power cord, a single interface cable and friendly software make it amazingly easy to install and use.

Get the competitive advantage of the QMS 2001 Knowledge System for your business now. For more information, call **800 841-0753** or **205 633-4300.**

Q-Fax 800 633-7213 • Canada 800 263-5508

QMS, the QMS logo and the Octopus logo are trademarks or registered trademarks of QMS, Inc.
The ENERGY STAR℠ emblem does not represent EPA endorsement of any product or service

Circle 145 on reader service card.

The editors of PC/Computing searched far and wide for the answer to portable computing's most pressing question:

How Small Can Color Get?

(TURN PAGE)

PHOTOGRAPH BY STAN MUSEK

THIS SMALL!

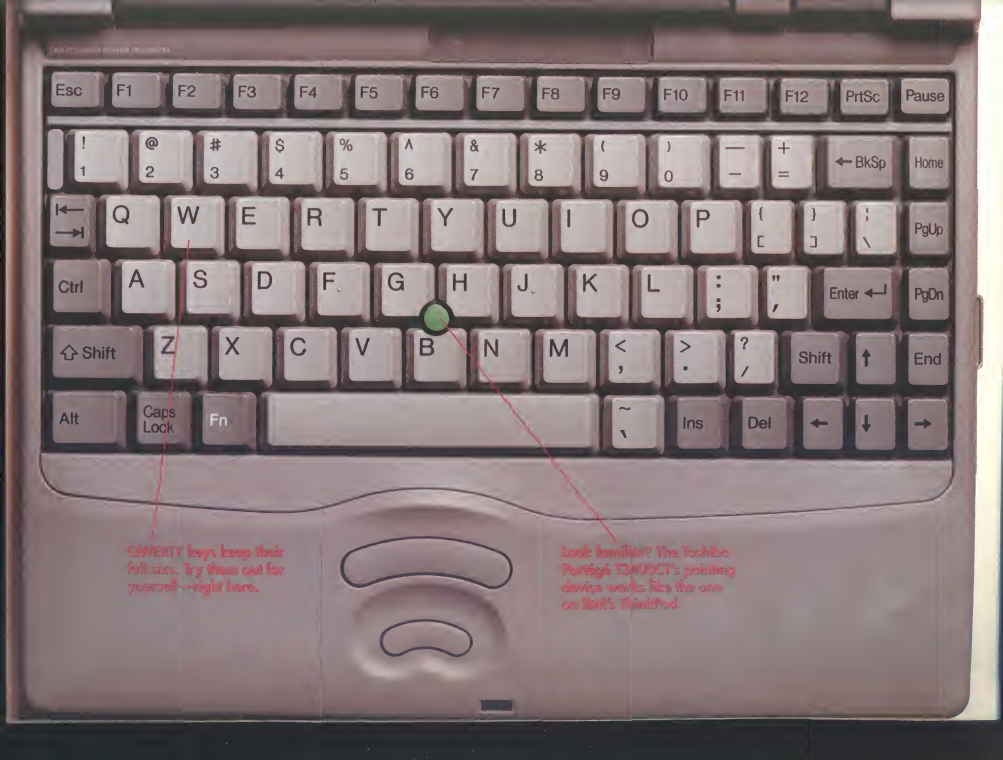
Or should we say BIG? This subnotebook (shown actual size) packs fast 486 power, accelerated graphics, and long battery life in less than five pounds.

BY MARTY JEROME

TOSHIBA

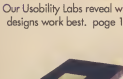
Its bright active-matrix screen is crisper than that on most desktop displays.

T3400CT

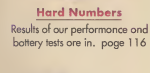

QWERTY keys keep their full size. Try them out for yourself — right here.
Look familiar? The Toshiba Portégé T2400CT's pointing device works like the one on IBM's ThinkPad.

Heeeave ho! Out, you drab monochrome display. Take your dreary 32 grayscales with you. Pack up your unreadable icons,

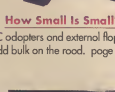
Can You Type?
Our Usability Labs reveal which designs work best. page 114



Hard Numbers
Results of our performance and battery tests are in. page 116



How Small Is Small?
AC adapters and external floppies add bulk on the road. page 118



A Closer Look
Hands-on reviews of the first color subnotebooks. page 120

your indecipherable charts, and your pathetic halftones. Go your sad gray way. Maybe pen PCs can use you. But for serious computing, you're finished. Kaput. Good-bye forever.

Fat chance, you say? Don't be so sure. The drive for color in mobile computing lags only slightly behind the drive for longer battery life. Full-sized color notebooks now command a less than 20 percent premium over monochrome models. And several big-name manufacturers have begun whispering behind closed doors that they will cease making monochrome portables altogether by year-end.

Even in a category as new and unformed as subnotebooks, color is quickly stealing the show. Perhaps this shouldn't come as a surprise. When the first generation of 6-pound notebooks arrived with their 7½- and 8½-inch monochrome displays, everyone worked in text mode. But to take advantage of today's high-octane graphical interfaces, you need as much information dancing across your pygmy screen as you can get. Color, we hasten to remind you, *is* information.

But don't take our word for it. Play a hand of Solitaire on the next monochrome subnotebook that passes your way. Edit a business slide that was originally created on a desktop system. Or produce a spreadsheet report. As you squint and fumble through these tasks, keep in mind that for as little as $400 more, you could be working in color—with no hit in battery life, no extra weight. Is the picture getting clearer?

We set out to look at the first generation of color 4-pounders, knowing that we were a little early for this category, but knowing too that the floodgates would open by midyear. Five machines made it in time for our review: Aspen Computer's 486 Color Subnote, MidWest Micro's Elite 486SX/33 Color SubNote, Sager Midern Computer's NP-440C, Toshiba's Portégé T3400CT, and Twinhead's SubNote 4DX2/40S. We've had early peeks at a half-dozen other machines, including Compaq's splashy new color Contura Aero 4/33C. By this autumn, virtually any subnotebook you buy will have a color version coming to market—if it hasn't arrived already.

BIG LITTLE LEAGUE

What surprises us most about this round-up is how well these machines implement color right out of the shoot. Blame Toshiba. Its Portégé subnotebook, introduced only four months ago, brought breathtaking advances to the world of 4-pound PCs: active-matrix color, superb ergonomics, and lithium-ion batteries. Today it remains the standard by which other subnotebooks will be judged.

Unfortunately, active-matrix color comes at a premium, both in price and weight. Don't expect things to get better any time soon. Manufacturing yields of active-matrix displays remain depressingly low. Simply put, active-matrix screens are difficult to make. Alternatives are emerging: The most immediate is called dual-scan passive-matrix

technology, in which half of the display is refreshed independently of the other half.

The quality of dual-scan displays has given new life to passive-matrix color. Although they're not as bright or richly hued as active-matrix screens (a contrast ratio of 18-to-1 compared to active-matrix's 60-to-1), dual-scan screens are nearly 70 percent faster than single-scan designs in response time.

Unless you're planning to use a subnotebook as your main machine, or to run full-motion video or business presentations (not recommended on such small screens), dual-scan passive-matrix color is an excellent, budget-conscious alternative. MidWest Micro offers both active-matrix and dual-scan passive technologies for its subnotebooks. But be prepared for a (gulp) $1,000 difference in price.

Meanwhile, active-addressing display technology looms on the not-too-distant horizon. Based on a passive-matrix design, active addressing displays use integrated circuits to regulate a rapid flow of low-voltage bursts of power through the matrix. The result? You get nearly twice same contrast and screen response time as passive-matrix displays (a 30-to-1 contrast ratio), yet they're much cheaper and easier to produce than active-matrix panels and consume less battery life.

MORE THAN MEETS THE EYE

So they're beautiful. But exactly how small can color notebooks get—without slowing you down? Not only do the machines in this roundup come with a full complement of ports, all use a 25MHz or 33MHz 486SX CPU, with the exception of the Twinhead SubNote 4DX2/40S, which uses Intel's new 40MHz 486DX2 processor. We expect to see the new Intel in forthcoming subnotebooks as well. The Portégé T3400CT and SubNote 4DX2/40S also feature local-bus video with speedy video chip sets. But make no mistake: Performance from any of these subnotebooks will shame some machines that weigh twice as much.

Too bad their keyboards don't fare as well. A wide industry consensus now holds that keyboards scaled to 85 percent of the spacing of a full-sized notebook keyboard are usable. Not 70 percent, not 80 percent: 85 percent. But as our Usability Labs' results demonstrate, the shape, positioning, and key travel play an equally important role in user satisfaction. Toshiba's legendary work in portable keyboards clearly pays off here.

The same is true of the Portégé T3400CT's pointing device, a concept borrowed from IBM's infamous TrackPoint II (eraserhead) that adorns its ThinkPad systems. Using the pointer requires some training, yes, but once you've mastered it, your hands never leave the keyboard. And as our usability testing results show, users are growing increasingly impatient with tiny trackballs crammed into odd corners of keyboards.

None of these usability issues matters, of course, if your subnotebook chugs along for only 90 minutes on a single charge. The trade-off between battery life and weight is where the rubber meets the road in mobile computing. And while all of the subnotebooks we tested can hum along for at nearly 2½ hours on a charge, the Portégé T3400CT's lithium-ion batteries broke four hours in our battery

PC Computing BEST

TOSHIBA PORTÉGÉ T3400CT

Simply and elegantly the best.

Occosionolly a product redefines on entire category. Toshibo's Portégé T3400CT brings o level of refinement to subnotebooks that few anticipoted. Its brilliont disploy, sublime keyboard, long battery life, and crafty pointing device are o full generation oheod of anything else currently on the morket. The gountlet it lays down isn't to subnotebooks—it's to oll portoble computers.

Portégé T3400CT • $3,999 • Toshiba America Information Systems • P.O. Box 19724, Irvine, CA 92713 • (800) 334-3445, (714) 583-3000
Circle No. 651 on Reader Service Card

PC/COMPUTING DECISION MAKER

Choose the subnotebook that best matches your work style.

rundown tests. MidWest Micro's Elite Color SubNote, with its nickel-metal hydride batteries, came in a distant second with three hours.

Toshiba may have been the first to bring out lithium-ion batteries in a portable PC, but other alternative technologies are on the way—including some surprises. Lithium polymer, for example, is lighter and lasts longer than its ionic twin. Zinc air batteries deliver a charge up to three times as long as NiCad, but as yet provide far shorter duty cycles. They'll have to be replaced about three times as often.

Lead-acid batteries have also made a comeback, kind of. Thanks to the long life and stable discharge rate of these batteries, IBM outfitted its crafty ThinkPad 500 subnotebook with a lead-acid battery that doubled as a recharger. Pop the battery out of the portable, fold out two prongs, and plug it directly into the wall: You no longer have to travel with a recharger and tangled cord.

Great idea, bad implementation. Technical problems with the plug-in battery forced IBM to stop shipments of the ThinkPad 500. It has since resumed shipments—with nickel-metal hydride batteries and AC adapters. IBM expects to correct the problem so that it can return to the lead-acid technology. In any case, Toshiba's Portégé T3400CT and MidWest Micro's Elite Color SubNote prove that the traditional trade-off between battery size and battery life is vanishing.

Best of all, you don't trade off power or gorgeous color graphics in the bargain. Both machines are the fastest performers and deliver magnificent color video. Testers from our Usability Labs found that while their keyboards are tight, they're perfectly usable, thank you. At less than 4½ pounds each, it is safe to say that this is how small color gets.

Lowest Prices on the SX, DX & *New* DX2-50!

Rave Reviews! Read what the experts say:

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

PC MAGAZINE, Guide to Portable Computing, 8/93

COMPUTER SHOPPER "If you're a Windows user on a budget, or just have a bad case of Mac envy...you should take a look at the WinBook. It's a machine that can hold its own with more expensive, less thoughtfully designed systems from other direct vendors."

COMPUTER SHOPPER, This Powerbook Twin Acts Like a PC, 9/95

WINDOWS MAGAZINE "The WinBook is a great example of what a Windows notebook should be...fast, easy-to-use and a miser on battery life...It's also inexpensive: nearly 50% less than some comparable notebooks."

WINDOWS MAGAZINE, Transcontinental Portable, 9/95

The WinBook Intel486 SX-25, DX-33 & DX2-50 SL Enhanced Features

Ergonomically engineered & designed by award-winning Palo Alto Design
The WinBook's unique ergonomic features include a sloping wrist rest and keyboard with full-size keys, plus a cornered, dual-button trackball—allowing you to work in total comfort away from your desk.

Clear, sharp color display gives you near-active matrix quality at a passive matrix price!
Images are sharper and cleaner with less cursor loss. And the WinBook's advanced dual-scan color display gives you 99% shadow-free performance compared to other single-scan passive matrix displays. You get a brighter, crisper, wider angle of view with an 18:1 contrast ratio—compared to 13:1 with previous passive matrix technology.

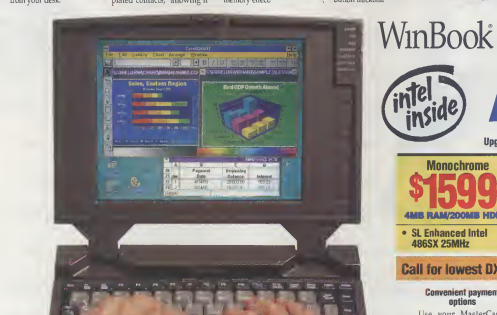
Longer battery life
The WinBook features NiMH 2200 MA batteries with gold-plated contacts, allowing it to run much longer than units with traditional NiCAD batteries—and there's no memory effect!

The WinBook offers you more features for less!
- 9600 baud send/4800 baud receive fax/2400 baud modem
- Industry-standard type II PCMCIA slot
- 512k video RAM
- Fast-acting LCD screen
- Built-in centered dual-button trackball

Docking station gives you desktop power!
Two expansion slots and drive bays let you add peripherals such as monitors, hard drives, CD ROMs, I/O cards or an extended keyboard. Includes parallel, serial, PS/2 mouse, external keyboard and VGA ports. **And it's just $399!**

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

PC MAGAZINE Editor's Choice Awards
First Runner-Up
68 units reviewed!
Portable Computing Issue, August '93



WinBook

intel inside

Upgradable processor!

Monochrome	Color Dual-Scan
$1599	**$1999**
4MB RAM/200MB HDD	4MB RAM/200MB HDD
• SL Enhanced Intel 486SX 25MHz	• Fax modem included! • DOS and Windows

Call for lowest DX-33 & DX2-50 prices!

Convenient payment options
Use your MasterCard, VISA, Discover Card, Micro Center charge, personal check or P.O. with credit approval.

Thank-you for your order!

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

30-day unconditional money-back guarantee

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

WinBook COMPUTER CORPORATION
a subsidiary of Micro Electronics Inc.

SX & DX Specifications

Size/Weight
- 11" x 8 5/8" x 1 3/4"
- 6# monochrome 5.4# with battery
- 6# with DX dual-scan color 5.9# with battery

Pointing Device
- 95mm Alps dual-button Microsoft compatible trackball

Battery
- SX 25 - up to 2 hours with power management; over 5 hours with auxiliary power option (less 30 minutes per hour)
- DX 33 - over 2 hours with power management; up to 5 hours with auxiliary power option
- 16MB (no memory effect)
- Rechargeable auto-trickling AC adapter

Processor and Memory
- SX: Intel upgradable to DX 25MHz
- DX: Intel 33MHz 486DX/487SX
- RAM 4MB upgradable to 32MB
- Price Down Option for 4MB original
- SL-enhanced option

Drives
- 3.5-inch 1.44MB/2.0 Floppy Drive
- Internal 200MB (1.6"high) hard drive

Software
- Current loaded with MS-DOS and Microsoft Windows

Display
- SX: monochrome, screen-twisted dual-scan (STN) LCD
- DX and DX2-50: dual-scan STN color display LCD
- 640x480 resolution
- 512k video RAM, up to 1024x768 resolution for external monitor
- Adjustable, contrast and brightness
- Allows 256 colors on screen/16 gray shades

Keyboard
- Full-function keyboard with 82 keys and 4 inverted T cursor control keys. 12 more keyboard keys
- Parallel port
- Video - 15-pin connector for external monitor
- 120-pin docking station
- Auxiliary battery port

Modem
- Fax 9600 baud send/9600 baud receive/2400 baud Hayes-compatible modem

I/O Ports
- PS/2 mouse/ Windows/AT keyboard
- PCMCIA type II slot
- Serial - 9-pin connector

Options
- Docking station
- Car adapter
- 340-MB (1.6"high) hard drive
- 64MB and 32MB RAM upgrades

Hurry! Order today! Call 1-800-254-7811

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

©1994 WinBook Computer Corporation. All rights reserved. WinBook is a registered trademark of Micro Electronics Inc. The Intel Inside logo is a registered trademark of the Intel Corporation. All other trademarks and registered trademarks are property of their respective corporations.

Circle 188 on reader service card.

FOUR MILLION PEOPLE MAKE THAT FOUR

FRANK IS A COMPUTER BUFF. IN FACT, HE'S THE UNOFFICIAL cc:MAIL ADMINISTRATOR – WHICH TAKES HIM ALL OF 45 MINUTES A WEEK.

E-mail is not just for the big guys anymore. More and more workgroups and small companies are taking the step to e-mail. Because now there's the Lotus® cc:Mail® Group Pack™ with everything you need to get ten employees up and running on the power of cc:Mail.

cc:Mail lets you send messages and files electronically — to colleagues, clients, suppliers — speeding your processes and giving you an invaluable competitive tool. cc:Mail opens lines of communication, keeps everyone in the loop and eliminates all the running around.

Lotus cc:Mail recently rated the #1 e-mail system by *Infoworld*† and *Software Digest*,†† offers benefits no other e-mail can match. Like a unique, rules-based architecture which lets you automatically manage, filter, even reroute your mail. And Lotus Organizer™ 1.1, the top-rated personal information manager, is integrated into cc:Mail Group Pack so you can schedule meetings quickly and easily. Just enter a suggested time for a meeting and Organizer will consult your co-workers' schedules and tell you whether they're available. And it does this without revealing personal schedules. Plus, cc:Mail has a built-in spell checker, flexible search options, an intuitive user interface and dozens of features that make it easy to use.

BRIAN, IN QUALITY CONTROL, CREATES A WEEKLY STATUS REPORT IN LOTUS 1-2-3 AND USES cc:MAIL TO CIRCULATE IT THROUGH THE COMPANY.

JOAN, THE V.P. OF FINANCE, COUNTS ON THE GROUP SCHEDULING FEATURE TO PULL MEETINGS TOGETHER EASILY.

BILL IN PRODUCTION USES cc:MAIL TO COMMUNICATE WITH HIS OUTSIDE SUPPLIERS.

SALLY, THE DESIGNER, HAS CUSTOMIZED HER MAILBOX TO PRIORITIZE HER INCOMING MAIL AUTOMATICALLY.

In Canada call **1-800-GO-LOTUS** †Infoworld, October 18 1993 ††Among all electronic mail systems tested. Software Digest Ratings Report, Vol. 10, #10, 10/93. Software Digest is a registered trademark of and Group Pack are trademarks of Lotus Development Corporation. cc:Mail is a registered

CURRENTLY USE cc:MAIL. MILLION AND TEN.

In fact, ccMail Group Pack is so easy to install, use and maintain that you don't need a dedicated LAN manager. And ccMail works across virtually all major hardware platforms, networks and operating systems. So it's easy to see why publications like *BYTE*, *LAN Magazine* and *Windows Magazine* have showered ccMail with awards. And why 4.2 million people in all kinds of companies depend on ccMail every day.

This standard is now available for businesses, or workgroups, like yours. For about half of what these products would cost separately, you get a ccMail Group Pack which includes: ccMail for Windows 2.0, ccMail for DOS, Organizer 1.1 and licenses for 10 users. All for just $845 (SRP). (To add more users or to purchase additional copies of ccMail and/or Organizer see your Local Authorized Reseller.) At this price, it is not a question of whether or not your company needs e-mail. The question is: how quickly can you get Lotus ccMail Group Pack.

Fortunately, it is available right now. Just visit your Lotus Authorized Reseller or call 1-800-448-2500.

TED IS THE PRESIDENT OF A SMALL FURNITURE COMPANY. HE PURCHASED THE cc:MAIL GROUP PACK TO MAKE HIS COMPANY MORE COMPETITIVE.

JIM, THE SUPPORT/DELIVERY GUY, USES ORGANIZER TO PLAN HIS DAY.

RHONDA IN SALES RECEIVES ORDERS FROM HER REGULAR CUSTOMERS VIA cc:MAIL.

SYLVIA IN ACCOUNTING LIKES EVERYTHING ABOUT cc:MAIL.

JEFF, THE ART DIRECTOR, IS NO COMPUTER GENIUS, BUT HE GOT UP AND RUNNING ON cc:MAIL WITH NO TRAINING.

Lotus
Working Together®

NSTL, Inc., a McGraw-Hill Company *1993 Lotus Development Corporation, 55 Cambridge Parkway, Cambridge, MA 02142. All rights reserved. Lotus and Working Together are registered trademarks and Organizer trademark of ccMail Inc, a wholly-owned subsidiary of Lotus Development Corporation.

They're Cute, but Can You Type?

Small doesn't mean productive. Notes from the Usability Labs.

How's your . . . tap, tap . . . typing . . . tap, tap, tap? How many words per minute, typos per line? Sooner or later usability translates into productivity, and *PC/Computing*'s Usability Labs set out to find just how productive you can be using the subnotebooks in this roundup. Our testing scientifically determines how useful and easy to learn products are with repeatable, statistically significant results.

Our testers spent five hours with each system, working from a script developed by our in-house usability experts. Each subnotebook received a numerical rating based half on tester satisfaction and half on the number of usability problems that surfaced during testing. A score of 80 or higher earns *PC/Computing*'s Usability Seal of Approval. Testers considered not only size, dimensions, and portability, but also the intuitiveness and ease of setting controls, attaching floppy drives, installing PCMCIA cards, and reconfiguring power-management settings. They rated displays according to brightness, color saturation and quality, resolution, and viewing angles—in both direct sunlight and under headache-inducing fluorescent lights. Keyboards and pointing devices were rated according to both timed tests and to testers' general impressions. After many weeks, the results revealed which subnotebooks won't slow you down.

PC Computing USABILITY APPROVED

SCORE: 84

TOSHIBA PORTÉGÉ T3400CT

The pointing device combines the best of both worlds: IBM's ThinkPad and Apple's PowerBook. Its 7.8-inch active-matrix display is small but glorious. Subtle refinements earned the keyboard raves from usability testers.

Keyboards, trackballs, and displays shown actual size. (For trackball positions, see reviews starting on page 120.)

PC Computing DISABILITY APPROVED

SCORE: 80

ASPEN 486 COLOR SUBNOTE

A lower-mounted, pea-sized trackball is awkward, but at least you can rest your wrists while using it. The display is very bright but could be more responsive. Its wide keyboard spacing won't crowd your hands, but the keys don't snap.

PC Computing DISABILITY APPROVED

SCORE: 80

SAGER MIDERN NP-440C

The tiny side-mounted mouse button may cramp your fingers, but testers liked its location. The display, like that on its twin from Aspen, is more than bright, but it's sluggish. Its notebook-sized keyboard won't slow down typing.

SCORE: 75

TWINHEAD SUBNOTE 4DX2/40S

The oddly placed trackball (it's above the keyboard) is hard to reach—and hard to control. Dual-scan technology would help this bright but slow screen. The SubNote's QWERTY keys are full-sized and well-spaced.

SCORE: 73

MIDWEST MICRO ELITE 486SX/33 COLOR SUBNOTE

The front-and-center trackball borrows from Apple's PowerBook design. The dual-scan passive-matrix display gives active-matrix a run for its money. But testers panned the cramped, unresponsive keyboard.

Lightweight Nomads That Keep on Going

In battery life and performance, color subnotebooks shine.

They may be small, but they don't skimp on essentials. In battery tests, Toshiba's Portégé T3400CT was the clear leader thanks to its innovative lithium-ion battery technology. The Portégé doesn't have an external keyboard adapter, so we couldn't run the Ziff-Davis Undigit test, which feeds keystrokes to the system at regular intervals to simulate actual use. Instead, we used our more rigorous Rundown battery test, which exercises all of a portable's components until the battery runs out.

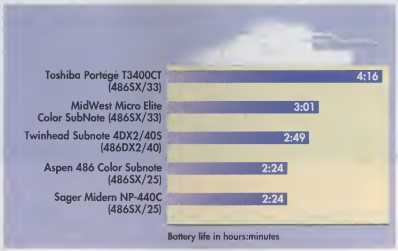
The result? The Portégé outlasted all the other subnotebooks by a full hour—and its actual battery life with power-management features on is likely to be even higher. MidWest Micro's Elite 486SX/33 came in a distant but respectable second with 3 hours in the Undigit tests using nickel-metal hydride batteries.

In performance as in battery life, these subnotebooks held their own. Processors ranged from basic 25MHz 486SXs to a speedy 40MHz 486DX2 in Twinhead's SubNote 4DX2/40S. Performance has less to do with raw CPU speed, however, than with clever engineering and design. MidWest Micro's Elite, with its 33MHz 486, beat out Twinhead's SubNote easily, despite the Twinhead's faster processor and local-bus video design.

These boxes are surprisingly expandable. Kudos to MidWest Micro for its 520MB hard drive option and to Aspen and Sager for shipping their systems with 8MB of RAM, yet keeping prices well below $2,500. Our only wish is that they offered bigger hard drives; 120MB isn't much, even for a subnotebook.

THE CROSS-COUNTRY BATTERY CHALLENGE

Toshiba's Portégé T3400CT tops 4 hours—your mileage may vary.



Thanks to its innovative lithium-ion battery technology, Toshiba's Portégé T3400CT substantiolly outlasted the other color subnotebooks.

WHAT FITS INSIDE A COLOR SUBNOTEBOOK?

PCMCIA slots, capacious hard drives, and acres of RAM.

	Aspen 486 Color Subnote	MidWest Micro Elite 486SX/33 Color SubNote	Sager Midern NP-440C	Toshiba Portégé T3400CT	Twinhead SubNote 4DX2/405
SPECIFICATIONS					
Price	$2,145	$2,999	$2,070	$3,999	$2,395
Processor	486SX/25	486SX/33	486SX/25	486SX/33	486DX2/40
Memory (config. tested/max.)	8MB/20MB	4MB/12MB	8MB/20MB	4MB/20MB	4MB/20MB
Hord drive (config. tested/max.)	120MB/120MB	340MB/520MB	120MB/120MB	120MB/120MB	120MB/170MB
Display type	Possive motrix	Dual-scan possive matrix	Passive matrix	Active matrix	Passive matrix
Diogonol screen size	8 inches	9.5 inches	8 inches	7.8 inches	7.6 inches
BULK AND HEFT					
Dimensions	11 by 7 by 1.5 inches	10.4 by 7.8 by 1.3 inches	11 by 7 by 1.5 inches	9.9 by 7.9 by 1.8 inches	10 by 7.1 by 1.6 inches
Weight	4 pounds	3.9 pounds	4 pounds	4.4 pounds	4 pounds
Traveling weight (including AC adapter and external floppy)	6 pounds	5.2 pounds	6 pounds	6.5 pounds	5 pounds
EXPANDABILITY					
PCMCIA slots	1 Type II	1 Type II	1 Type II	1 Type II	1 Type II
Docking station	●	○	●	○	○

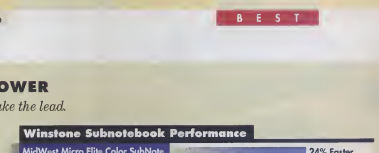
● Yes ○ No

B E S T

FOUR POUNDS OF POWER

MidWest Micro and Toshiba take the lead.

Faster processors mean faster performance, right? Not exactly. The performance differences between these subnotebooks are less dramatic than you might expect, given the different processors used. Twinhead's SubNote 4DX2/40S sports accelerated local-bus video and the fastest CPU of any machine in this roundup, yet was slowest in our Winstone application benchmark tests. MidWest Micro's system proved fastest of the bunch, followed by Toshiba's Portégé.



Note: Winstone is a system-level benchmark that runs 12 of the most popular Windows business applications and delivers a score based on their combined performance.

MidWest Micro's system proved fastest of running Windows applications.

How Small Are They Really?

Don't forget the AC adapter and external floppy drive.

MIDWEST MICRO ELITE 486SX/33 COLOR SUBNOTE
10.4 by 7.8 by 1.3 inches
System weight: 3.9 pounds
Traveling weight: 5.2 pounds

TOSHIBA PORTÉGÉ T3400CT
9.9 by 7.9 by 1.8 inches
System weight: 4.4 pounds
Traveling weight: 6.5 pounds

And you think some of your neurotic friends carry around baggage. With subnotebooks, bulky power adapters and accessories often accompany otherwise trim portables. One welcome exception: the AC adapter on Toshiba's Portégé T3400CT. It's no bigger than a slim TV remote control, and it takes up no room at all.

ASPEN 486 COLOR SUBNOTE
SAGER MIDERN NP-440C
11 by 7 by 1.5 inches
System weight: 4 pounds
Traveling weight: 6 pounds

TWINHEAD SUBNOTE 4DX2/40S
10 by 7.1 by 1.6 inches
System weight: 4 pounds
Traveling weight: 5 pounds

PEOPLE WHO HAVEN'T EXPERIENCED OUR 1-2-3 WORKGROUP FEATURES PROBABLY HAVE A FEW QUESTIONS.

The problem is this: while many people might need to work on the same spreadsheet data, most spreadsheet software can't manage this process. Only Lotus® 1-2-3® Release 4 for Windows™ lets you share data and ideas, collaborate with co-workers, and work the way you work best – in a team.

It starts with the powerful Version Manager™ technology built into 1-2-3 Release 4. As a spreadsheet changes, Version Manager tracks the changes, when they were made, by whom, for what reason. You can see the thinking that went into the spreadsheet. So you get better decisions out of it.

1-2-3 AND NOTES – THE ONLY WORKGROUP SOLUTION.

And 1-2-3 works seamlessly with Lotus Notes,® the market-leading groupware. Notes replicates the 1-2-3 document across the network so that everyone, even remote users, can access and work on the same document concurrently. And Notes sends instantaneous notification as changes are made. For 1-2-3 users, it couldn't be simpler – you don't need to know Notes at all – just how to save a file in 1-2-3.

Then there's Notes/FX,™ integration technology that goes beyond DDE and OLE, to let you build the power of 1-2-3 into your Notes applications. With a single click from Notes you can launch a 1-2-3 template that's already filled in with key information from the Notes database. Then, changes to the 1-2-3 template are updated in the Notes document for unparalleled two-way integration.

Of course, 1-2-3 Release 4 features close integration with the other Lotus applications that make up Lotus SmartSuite.® So, for example, it's easy to pull 1-2-3 data into Ami Pro® for word processing or Freelance Graphics® for a presentation.

And right now you can upgrade to either 1-2-3 Release 4 or our new 1-2-3 Release 4: Multimedia Edition delivered on CD-ROM for just $119. Or for an even better deal upgrade to SmartSuite for just $299.* Visit your Lotus Authorized Reseller or call **1-800-TRADE-UP, ext. 9446**** to upgrade or to order a free demo disk.

Lotus
Working Together®

*$299 promotional price available while supplies last. **In Canada, call **1-800-GO-LOTUS**. Prices may vary. ©1994 Lotus Development Corporation, 55 Cambridge Parkway, Cambridge, MA 02142. All rights reserved. Lotus, 1-2-3, Working Together, Lotus Notes, SmartSuite, Ami Pro and Freelance Graphics are registered trademarks and Notes/FX and Version Manager are trademarks of Lotus Development Corporation. Windows is a trademark of Microsoft Corporation.

ASPEN 486 COLOR SUBNOTE

Four-Pound 486 for Two Grand

A middling performer—but the price is superb.

Bottom line: A bargain hunter's dream—if you can live with slow performance.
Usability: Bright but sluggish display; big keyboard keys but pulpy response.
High points: Prices guaranteed to make the competition sweat.
Low points: Lackluster performance and battery life.

Where does Aspen Computer get off selling a 25MHz 486SX color subnotebook for $2,145? It's a complete system, too: 8MB of RAM, expandable to 20MB, plus a 120MB hard drive and one PCMCIA Type II slot. The low price will bring beads of perspiration to competitors' foreheads.

There's a lot to like about Aspen's 486 Color Subnote, starting with its slender, 1½-inch height and bright 8-inch display. Backlighting is more than adequate, although we wouldn't mind faster refresh rates and richer color saturation. A dual-scan display would help immensely.

The size and spacing of the keys is superb, and we appreciate the full-size Backspace and Enter keys. Unfortunately, keyboard response is mushy and key travel is short. At least it doesn't clatter. A longer throw and a little more snap would put it in the big leagues.

A tiny trackball sits at the lower right of the keyboard with mouse buttons on the side of the machine. Unlike trackballs situated above the keyboard, this one allows you to rest your hand on your tray table or desk as you chase your cursor around the screen. Don't get overjoyed, however; it's small and forces your hand into a cramped position. It drew mixed reviews from our Usability Labs.

The Aspen 486 Color Subnote's performance could be better, but there's plenty of room for expandability. In addition to parallel, serial, and VGA ports, there's an integrated PS/2 keyboard/mouse port and a connector for a docking station (only $195)—or you can buy the $95 port replicator. The hard drive is removable, although we'd like to see a 200MB option added to the 80MB and 120MB versions currently available.

We suppose there are other nits to pick with the Aspen, but with prices starting at $1,895, it deserves a very serious look. Ditto its identical twin, Sager's NP-440C.

486 Color Subnote • $2,145 • Aspen Computer • P.O. Box 346, Buffalo, NY 14231 • (800) 472-3273, (716) 626-0315
Circle No. 652 on Reader Service Card

MIDWEST MICRO ELITE 486SX/33 COLOR SUBNOTE

Big, Bright Color That Dazzles

The fastest of the bunch—and a battery that won't quit.

Bottom line: Beautiful dual-scan passive screen—and affordable too.
Usability: Big screen, sharp color; PowerBook-inspired trackball; lifeless, cramped keyboard.
High points: Brilliant dual-scan color, outstanding performance, and *looong* (no less than 3 hours) battery life.
Low points: A mushy keyboard that will tie your fingers in knots.

MidWest Micro would like you to know just how serious it is about color portables. It offers not one, but two color subnotebooks. Its Elite Color SubNote line comes with either a 9½-inch dual-scan passive matrix display for $2,999, or an 8½-inch active-matrix display for $3,999.

Both are radiant, bright, and crisp—some of the best subnotebook screens we've seen. In fact, we'd take the passive-matrix model with its larger display area, longer battery life (by nearly one hour), and cheaper price, primarily because its quality is so good. Also, it thwarts nosy passengers sitting beside you on airplanes because it's impossible to read passive-matrix screens from an angle.

Its performance wails, thanks to a 33MHz 486SX CPU. It nosed ahead of Toshiba's Portégé T3400CT as the fastest entry in our roundup. With 4MB of RAM expandable to 12MB, one PCMCIA Type II slot, a separate proprietary memory slot, and five hard drive options that include 340MB and 520MB capacities (hallelujah!), MidWest Micro's Elite is not a machine for sissies.

Ergonomics borrow heavily from Apple's stellar PowerBook line. A large center-mounted trackball sits just below the keyboard with big, crescent-moon mouse buttons above and below. Your hands need not leave the keyboard to operate the mouse. The unused space on each side of the trackball provides excellent wrist rests.

Keyboard spacing, however, is unpleasantly tight with undersized Backslash, Tab, and function keys to accommodate a column of document-control keys. While key travel is long, keyboard response is akin to typing in pudding. And why no docking station? Never mind. The Elite's gorgeous display, long battery life, and blistering performance give it an edge that competitors will have trouble catching.

Elite 486SX/33 Color SubNote •
$2,999 • MidWest Micro • 6910 U.S. Route 36 East, Fletcher, Ohio 45326 • (800) 682-7248, (513) 368-2309
Circle No. 653 on Reader Service Card

Call IBM PC Direct today!

More

ThinkPad 500

More

HOT BUTTON: Our renowned TrackPoint II™ cursor-pointing device lets you leave your mouse at the house.

EASY ADD-ONS: PCMCIA cards make adding LAN connectivity, a modem or additional memory easy!

YOUR NAME HERE: You can order a free ID plate that personalizes your ThinkPad.

IBM® PC Direct™ has ThinkPads with more of what you want, and less of what you don't: More features and power. Less size and weight! The ThinkPad® 500 is a sleek 3.4 pounds. Yet, it packs enough high-speed horsepower to let you take your most sophisticated desktop applications on the road.

Now – want to carry off color with ease? Then call us about the ThinkPad 350C. You get a 9.2" backlit, 256-color, passive-matrix LCD display. There's plenty of power for your current needs. And ample space to upgrade for more. All in an easy-to-take 5.7-pound package. Both of these lightweights get the heavyweight backing of IBM's HelpWare®, including a 30-day moneyback guarantee[1] and around-the-clock telephone assistance.[2] You'll find them at IBM PC Direct. To order these, or any of our other critically acclaimed IBM ThinkPads, call now.

ThinkPad 500

- 486SLC2, 50/25MHz processor with 16KB internal cache
- 4MB RAM/85MB hard drive
- 10.1"w x 7.5"d x 1.6"h/3.4 lbs. with battery pack
- 7.4" monochrome passive-matrix LCD display, 64 grey scales
- 81-key keyboard w/integrated TrackPoint II
- PCMCIA slot
- IBM DOS preinstalled
- 1-year international traveler's warranty[2]

$1,999* (IBM Credit Lease $72/mo.**)

IBM PC Direct 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 some offerings and products may be available through IBM Authorized Remarketers. Remarketer prices may vary. Shipping and handling charges extra. **IBM Credit Lease Prices quoted for 36-month terms. Lease rates quoted are good through 5/31/94 after which time rates are subject to change without notice. Lease available to qualified commercial customers only. [1]At no additional charge during warranty period. ThinkPad 500, ThinkPad 350C and ThinkPad 350 are manufactured in U.S. IBM, ThinkPad and HelpWare are registered trademarks and EasyServe and TrackpointII are trademarks of International Business Machines Corp. PC Direct is a trademark of ZH Communications Company.

portable.

IBM.

affordable.

ThinkPad 350C (color)

- 486SL, 25MHz processor with 8KB internal cache
- 4MB RAM/250MB hard drive, 3.5" 1.44MB diskette drive
- 11.7"w x 8.3"d x 2.0"h/5.7 lbs. with battery pack
- 9.2" STN backlit LCD, 256-color display
- Full-size keyboard w/integrated TrackPoint II
- PCMCIA slot
- IBM DOS preinstalled
- 1-year international traveler's warranty[2]

$2,999* (IBM Credit Lease $108/mo.**)

ThinkPad 350

- 486SL, 25MHz processor with 8KB internal cache
- 4MB RAM/125MB hard drive, 3.5" 1.44MB diskette drive
- 11.7"w x 8.3"d x 1.9"h/5.2 lbs with battery pack
- 9.5" monochrome STN backlit LCD display, 64 grey scales
- Full-size keyboard w/integrated TrackPoint II
- PCMCIA slot
- IBM DOS preinstalled
- 1-year international traveler's warranty[2]

$1,999* (IBM Credit Lease $72/mo.**)

IBM PC Direct

We're putting the personal in personal computing.

Order Now!

1 800 426-7918

8am-midnight M-F, EST; 8am-7pm Sat., EST

Purchase orders available for qualifying customers.

Ad is used by IBM under license. © 1994 International Business Machines Corporation. [1]Warranty and 30-day guarantee information available through IBM and IBM Authorized Dealers. Please call 1 800 426-2968 for details regarding IBM's moneyback guarantee and limited warranty. Copies of the terms of IBM's moneyback guarantee and limited warranty available upon request. [2]International traveler's warranty service available in countries where ThinkPad is sold. Carry-In Repair and ThinkPad EasySetup™ available in U.S.

SAGER MIDERN NP-440C

Four-Pound Color Bargain

Twin of the Aspen—in more ways than one.

Bottom line: The NP-440C's price is irresistible—we just wish it were faster.
Usability: Front-mounted trackball works better than expected; big, mushy keyboard.
High points: Low price, even though it has all of the bells and whistles.
Low points: Sluggish video and system performance; unimpressive battery life.

No, you're not seeing double. Sager Midern's NP-440C is the same as Aspen's 486 Color Subnote. Size up both by price, warranty, options, and service before you buy.

Either way, you'll get a lot of machine for your greenbacks. Like its twin, the NP-440C has a bright, but sluggish screen. An excellent keyboard layout is shortchanged by poor responsiveness. And the tiny trackball, situated in the lower-right corner of the keyboard (sorry, southpaws), at least allows your wrist to rest.

The NP-440C's keyboard layout and spacing deserve high marks because of the machine's 11-inch length—the size of a full-sized notebook. Although it's only an inch or so longer than Toshiba's Portégé T3400CT and Twinhead's SubNote 4DX2/40S, don't expect to stash it in a purse or side-pocket of a crammed briefcase. Its 7-inch width, on the other hand, approximates the size of a hardcover book and will let you sneak it into places where other subnotebooks can't fit.

Like Aspen's 486 Color Subnote, performance and battery life on the NP-440C are middling, but its general design solicited high praise from our Usability Labs—especially for the ease with which you can change system settings and configurations. One big drawback: an AC adapter that's too large.

Still, the system's expandability is outstanding. It has a full complement of ports, including a PS/2 mouse/keyboard adapter. There's a connector for a docking station, and the hard drive is removable.

Unfortunately, this great expandability is undercut by limited hard drive options. When you call, be sure to express great disappointment that you can only get a 120MB hard drive. No doubt larger capacities are in the works because the drive is removable.

NP-440C • $2,070 • Sager Midern Computer • 18005 Cortney Ct., City of Industry, CA 91748 • (800) 669-1624, (818) 964-8682
Circle No. 654 on Reader Service Card

TOSHIBA PORTÉGÉ T3400CT

A New Level of Innovation

In looks and design, the Portégé T3400CT sets the standard.

Bottom line: Expensive, but the best color subnotebook you can buy today. Period.
Usability: Refined keyboard; pointing device recalls IBM's TrockPoint II; dozzling disploy.
High points: Sizzling performonce, spectoculor color, ond revolutionary bottery life. Are we forgetting something?
Low points: High price; o holf-pound heavier thon most.

Should one of Toshiba's Portégé T3400CT systems drop onto your desk, type Arthur C. Clarke's famous phrase as fast as you can: "Any sufficiently advanced technology is indistinguishable from magic." Notice how your fingers drop squarely onto the right keys despite their tight spacing. Key response is soft and silent, urging your fingers onto the next key and the next sentence. Words fly.

The keyboard is classic Toshiba, but the pointing device is brand-spanking new—borrowed half from IBM's TrackPoint II pointing stick and half from the wrist rest and mushroom-cap mouse buttons on Apple's PowerBooks. Here's a little secret: Nobody likes any pointing-stick technology at first; just about everyone likes it after two months. Here's another secret: Toshiba has done a better job than IBM on the device driver that controls the pointer.

Not surprisingly, Toshiba's Portégé is also a feast for your eyes. Its smallish (7.8-inch) active-matrix display is bright and beautiful, and is powered by Western Digital's RocketChip video controller on a VESA local bus.

The Portégé was not only the first subnotebook to feature an active-matrix display, it was also the first to run off lithium-ion batteries. With a battery life of over 4 hours—more than one hour longer than any other machine we tested—the Portégé is the first subnotebook that can keep you working through a transcontinental flight.

At 4.4 pounds, the Portégé weighs a half-pound more than the other subnotebooks we reviewed. But its AC adapter is about the size of a TV remote control. Its performance is second only to MidWest Micro's Elite 486SX/33 SubNote. And its usability, battery life, and sculpted good looks are second to none.

Portégé T3400CT • $3,999 • Toshiba America Information Systems • P.O. Box 19724, Irvine, CA 92713 • (800) 334-3445, (714) 583-3000
Circle No. 651 on Reader Service Card

TWINHEAD SUBNOTE 4DX2/40S

A Svelte and Solid Classic

But its design and performance leave room for improvement.

Bottom line: A solid contender, but its performance lags.
Usability: Small enough to take anywhere.
High points: Check out the small size and crisp keyboard.
Low points: Dinky, slow screen; putt-putt performance; mediocre battery life.

Give Twinhead's SubNote 4DX2/40S some credit. As little as a year ago, it brought together enough features in a 4-pound package to help legitimize subnotebooks as serious business machines.

Now outfitted with Intel's new 40MHz 486DX2, and sporting a relatively small 7.6-inch passive-matrix color screen, the SubNote has kept pace with leading technologies, even if it is beginning to seem a little shopworn.

To our surprise, performance on the SubNote lagged behind both Aspen's 486 Color Subnote and Sager Midern's NP-440C, both of which use 25MHz 486SX CPUs. The SubNote comes with local-bus video and a fast video chip set. Screen refreshes seemed slow, owing largely to the single-scan display design. The display is small but bright—a welcome improvement over virtually any monochrome screen of its size.

We like the SubNote's diminutive size—it was the smallest of the machines we tested. It takes up only half of a briefcase compartment. Even so, the SubNote packs a full set of ports, including a PS/2 keyboard/mouse port and a proprietary port for a fax modem so that you can use your PCMCIA slot for other things.

We also like the LCD panel mounted to the right of the display. Intelligible icons replace the indecipherable flashing lights most portables use. It's a design the other manufacturers should emulate.

Size and spacing of the QWERTY keys is quite good. To fit them in the SubNote's form factor, function keys are tiny and there are no independent document control keys—sacrifices we're happy to make. A tiny trackball sits in the upper-right corner of the machine, forcing you to keep your hand up so that it doesn't inadvertently rest on other keys when you're using it. A redesign is in order.

Otherwise the SubNote still retains its shrewd design. We'd like to see more pep in the upgrade and better battery life. But its form factor can't be beat.

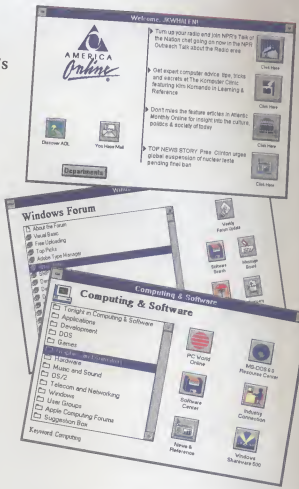
SubNote 4DX2/40S • $2,395 • Twinhead Corp. • 1537 Centre Pointe Dr., Milpitas, CA 95035 • (800) 995-8946, (408) 945-0808
Circle No. 655 on Reader Service Card

Own a Modem?

Try America Online FREE

AVAILABLE FOR DOS AND MICROSOFT WINDOWS™

If you own a computer and a modem, we invite you to take this opportunity to try **the nation's most exciting online service, America Online® — FREE.**



- Build a software library by downloading selected files from a library of thousands—productivity software, games, and more!
- Get computing support from industry experts at online conferences and through easy-to-use message boards.
- Tap into expert advice on running a small business in the exclusive Microsoft® Small Business Center.
- And much more! Order now and you'll receive FREE software and a FREE trial membership to try America Online.

Join us in this exciting opportunity —
Complete and mail the card below or fax it to 1-800-827-4595.

Detach & Mail Today!
Must respond by 4/30/94

☑ **YES,** I want to try America Online! Send me FREE software and a FREE trial membership to try the service.

Name:_____

Address:_____

City:_____

State:_____ Zip: _____

Home Phone: ( ) _____

Select Disk Type and Size—
Windows*: ❑ 5.25 ❑ 3.5
DOS: ❑ 5.25 ❑ 3.5 ❑ High Density ❑ Low Density

*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.

Use of America Online requires a major credit card or checking account. Limit one free trial per household
America Online is a registered service mark of America Online, Inc. Other names are service marks or trademarks of their respective owners.

9235/W

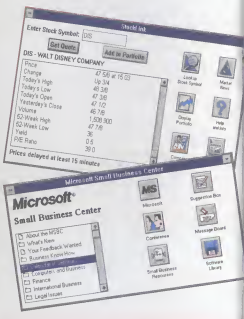
ATTENTION MODEM OWNERS!

RESPOND BY 4/30/94

How Many Of These America Online Services Could You Use Right Now?

- ▲ Stock Quotes and Portfolio Management
- ▲ More Than 40,000 Software Files and Programs
- ▲ Fast, Easy Multi-File Downloading
- ▲ Searchable Online Encyclopedia
- ▲ International E-Mail Gateway, Fax, and U.S. Mail Capabilities
- ▲ Multi-Player Graphic Games
- ▲ Microsoft® Small Business Center
- ▲ Access to Computer Industry Experts
- ▲ Special Interest Groups and Clubs
- ▲ Graphic Windowing Interface
- ▲ Homework Help and Tutoring Sessions

See other side for details about your FREE trial of America Online!



NO POSTAGE NECESSARY IF MAILED IN THE UNITED STATES

BUSINESS REPLY MAIL

FIRST CLASS MAIL PERMIT NO. 9096 VIENNA, VA

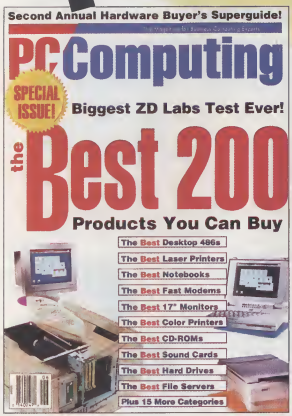
POSTAGE WILL BE PAID BY ADDRESSEE

AMERICA Online®

8619 Westwood Center Drive
Vienna, VA 22182-9806

PC POWER. PERFORMANCE. PRODUCTIVITY.

PC Computing



Subscribe now and save up to 58% off the cover price. Plus get FREE efficiency-enhancing SOFTWARE!

- **12 issues for just $16.94 SAVE 52%!**
- **24 issues for just $29.94 SAVE 58%!**

Use the subscription savings card in this issue or

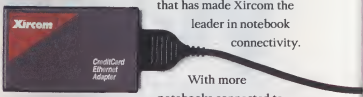
CALL NOW TOLL FREE
1-800-365-2770

Please mention this 5-digit code to your operator when you place your order — 8S5Q6.

Connecting Your Notebook To The LAN Does Take A Little Time.

Now available for Apple Powerbooks.

3.6 Seconds To Be Exact.



In a matter of seconds, Xircom can connect any notebook to any local area network anywhere.

Simply slide a Xircom CreditCard LAN Adapter into your notebook's PCMCIA slot or plug a Xircom Pocket LAN Adapter into your notebook computer's parallel port.

That's it. There are no tools, batteries or AC adapters required.

It's this plug-and-play simplicity that has made Xircom the leader in notebook connectivity.

With more notebooks connected to more LANs than all other LAN adapter vendors combined.

We make a full line of Pocket and CreditCard adapters for local, remote and cordless notebook-to-LAN connections. All backed by a two-year warranty and a lifetime, half-price upgrade policy.

Call 1-800-874-7875 ext. 24J for the name of a Xircom dealer near you. And get your notebook on your LAN.

Fast.

Xircom

The easiest way to go from notebook to network.

Xircom U.S. Headquarters: 818-878-7600.
Xircom Europe NV: +32/(0) 3.326.34.94.
Xircom Asia: 011-852-525-2078. ©1993 Xircom, Inc.

Circle 273 on reader service card.

FINAL ANALYSIS

The Secret of a Choice Subnotebook

Forget feature wars, usability is what counts.

As 7-pound notebooks continue to evolve into full-powered desktop PCs, most of us are searching for simpler travel tools. Subnotebooks fill that role nicely but require a shift in sensibility: less emphasis on engineering feats and more on the human dimension of computing. Other questions we answered:

Are color subnotebooks worth the premium over monochrome systems? What premium? With a price gap of as little as $450, there's little reason not to buy color. When working in a graphical interface on a 7½- to 9-inch display, you need as much information on the screen as you can get. Color brings out the details and subtle distinctions that otherwise get lost. It's easy on the eyes and keeps productivity at its peak. Toshiba's Portégé T3400CT is living proof—its bright active-matrix color display beats what you'll find on most notebooks.

Are active-matrix displays always better than passive-matrix? As yet, nothing beats the performance and color saturation of active-matrix technology. But you'll pay in the ballpark of $1,000 for it. For business presentations and graphics, there's no alternative. For those on a budget, dual-scan passive-matrix displays won't disappoint and are much brighter than the single-scan variety.

Is short battery life the trade-off for portability? Toshiba's Portégé lasts more than four hours, which is as good as any 7-pound notebook can offer. How? Its lithium-ion batteries—the first used in a portable PC—provide a longer charge for the weight. Look for this and other battery technologies to appear in other subnotebooks this year.

What's the secret to buying a subnotebook? Forget feature sets. Focus on usability. Unlike their bigger notebook siblings, subnotebooks aren't desktop replacements. The size, quality, and brightness of the display, and the spacing, layout, and response of the keyboard more clearly determine how productive you'll be when using a subnotebook. And in the case of Toshiba's outstanding Portégé T3400CT—the clear winner in this group—you get both. ◩

THE POWERBOOK'S LESSON

Like Toshiba's Portégé, we like the Duo 270c for its basics.

Apple's PowerBook Duo 270c embodies the basic rules of usability.

Stroll through the cabin on your next business flight, and you'll inevitably spy two Apple PowerBook Dua 270c systems for every Windows notebook. You just know that most of thase Duo users are running Windows back at the office. What gives? Herein lies a lesson in usability.

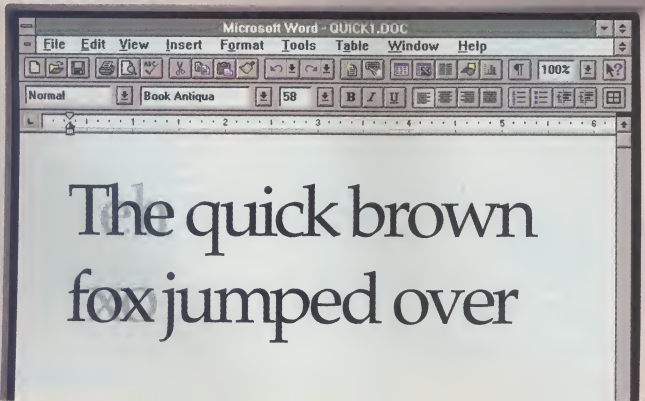
The Duo's 8.4-inch screen isn't huge. But its 16-bit active-matrix color brings the 4.8-paund subnotebook an unsurpassed level of usability, primarily because a graphical interface—any graphical interface—demands color. Armies of namadic business people swarmed toward the Duo, including many Windaws mavens fed up with notebaak feature wars who simply wanted samething lightweight, easy to type on, and easy to read.

The Duo's lesson was not lost on Toshiba. Certainly, we love the fast local-bus video, long-lasting lithium-ian batteries, and other technological wizardry under the Portégé T3400CT's hood. But ultimately, we like the Duo for its basics: a superior screen and keyboard, and an integrated painting device you can actually use.

PowerBook Duo 270c • $3,099 • Apple Computer • 20525 Mariani Ave., Cupertino, CA 95014 • (800) 776-2333, (408) 996-1010
Circle No. 656 on Reader Service Card

HOW FAST WILL NEW WORD 6.0 FIX TYPOS?

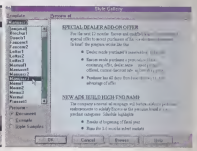
HOW FAST CAN YOU MAKE THEM?



Look again. The mistakes on our screen were fixed so quickly by the intuitive new AutoCorrect feature, had you been typing this yourself, you might never have even noticed. Common typos just go away. Automatically.

With new OfficeLinks, just a click on the toolbar icon lets you do things like add a Microsoft Excel spreadsheet to your letter without ever leaving your Word document.

We've even made converting from WordPerfect® easy – with files that convert in a snap and format immaculately. And the Help for WordPerfect Users feature guides you through equivalent Word commands when you type the WordPerfect ones.



Microsoft Word is available separately or as part of the Microsoft Office family of programs.*

(CENTER) Click the Microsoft Excel button on your Word toolbar and instantly insert a spreadsheet into Word without leaving your document. (RIGHT) AutoFormat lets you improve the look of your document with a single click.

AutoCorrect can only be found in new Microsoft® Word 6.0 for Windows™, part of the new Microsoft Office.* And it's just one sample of a whole new way to work.

We built in intelligence.

Great features like AutoCorrect are a direct result of our exclusive new IntelliSense™ technology. IntelliSense makes complex jobs easier, and everyday jobs automatic.

With AutoFormat, professional-looking formats are yours instantly. Just write your document, then let AutoFormat apply styles, bullets or headings. With a click.

More integrated than ever.

Until now, software has never truly brought your work all together.

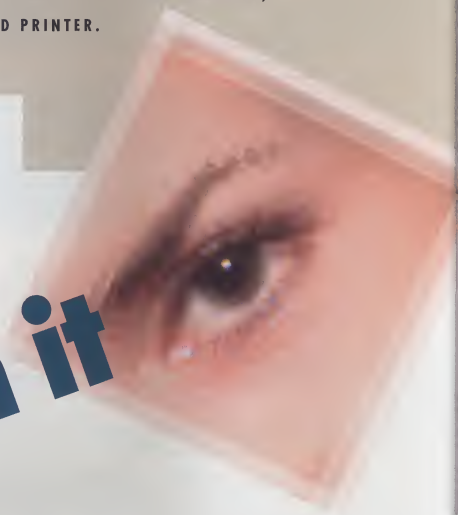
To see for yourself why Word has become the most popular word processor in the world, hurry and visit your local reseller, or call (800) 426-9400, Dept. KT8, to find one near you.

You'll look your best faster than you can turn a page. Even if you misspell now and again.

Microsoft® Office

*Microsoft Excel, Word, PowerPoint®, Microsoft Access®, and Microsoft Mail are all part of the Microsoft Office family of programs. Microsoft Office Professional, shown here, includes Microsoft Excel, Word, PowerPoint, Microsoft Access and a workstation license for Microsoft Mail (server and software acquired separately). In the 50 United States, call (800) 426-9400, Dept. KT8. In Canada, call (800) 563-9048. Outside the U.S. and Canada, call your local Microsoft subsidiary or (206) 936-8661. © 1994 Microsoft Corporation. All rights reserved. Microsoft, PowerPoint and Microsoft Access are registered trademarks and IntelliSense and Windows are trademarks of Microsoft Corporation. WordPerfect is a registered trademark of WordPerfect Corporation

CREATE THAT COLOR PROPOSAL YOURSELF? YOU CAN DO IT IN HOUSE WITH THE RIGHT SCANNER, IMAGE EDITOR, AND PRINTER.



Scan it

No doubt about it, if you're selling an idea, it sells best in color. Sure, it's more work. But when that image-laden color proposal draws rave reviews from Smugton Loud and the rest of the VPs, you won't regret doing the extra work. Besides, color documents are becoming the rule, not the exception.

The good news: Vibrant color documents peppered with splashy images are more affordable than ever, thanks to a new generation of color scanners, friendly image editors, and speedy color printers. For the first time, you don't have to be a graphics pro to

generate color documents that get noticed. You just need the right tools for the job.

We put the best of these products to the test, and our findings might surprise you. Are single-pass scanners better than triple-pass scanners? Which high-end image editor doesn't require a degree in fine arts to use? Can you afford a color printer? How much time does it really take to dress up a document? Our usability and performance tests debunk myths and point to the best product in each category.

Better yet, we'll prove that you don't have to spend a fortune to get million-dollar results. If you go with our No. 1 picks in each category—Hewlett-Packard's ScanJet IIcx scanner, Micrografx's Picture Publisher 4.0 editing software, and Tektronix's Phaser IISDX printer—expect to pay about $12,000 for a top-of-the-line color graphics solution. We'll also offer budget-conscious choices that give you adequate color scanning, editing, and printing for about half that price.

The bottom line: It's easier than you think to do away with drab, text-only, monochrome documents and produce results-getting color ones. It's all just a matter of time and money. You probably won't spend much more of either before you get colorful.

Here's why. . . .

STEP 1

SCAN IT

No need to start from scratch. Take those great-looking photographs and pop them into your PC with a new-generation color scanner. TWAIN-compliant means it's guaranteed to work with your image editor.

A best-of breed color scanner is a luxury item, right? Wrong. Color scanner prices have plummeted so far in the past year that less than $1,000 now buys you a workable solution. And if you're willing to spend a little more, you'll get all of the bells and whistles. In addition to price, your buying decision will depend on key issues like optical resolution, bit depth, interpolation, and single-pass vs. triple-pass technologies. The final choice comes down to this: Which product gets graphics and text into your PC most clearly, accurately, and quickly?

TWAIN-compliant color flatbed scanners with horizontal scanning resolutions of 300 to 400 dots per inch (dpi) are the closest thing to a one-size-fits-all imaging device. With equal ease they go from scanning line art, or color or grayscale photographs to reading text for OCR.

We put ten such scanners through their paces at ZD Labs. We tested Tamarack Technologies' ArtiScan 8000C, AVR Technology's AVR 6600/CLX and AVR 8800/CLX, Envisions Solutions Technology's Envisions ENV8100, Epson's ES-800C Pro PC Scanning System, Hewlett-Packard's ScanJet IIcx, Microtek's ScanMaker IISP and ScanMaker IIXE, and Umax Technologies' ScanOffice/C for Windows and Umax UC-840.

We sized up the scanner control software's ease of use, conducted speed trials, and evaluated the quality of a scanner's interpolated resolution and color output. To determine which scanner produces the best color graphics, we called upon color production professionals to evaluate the output samples. See "Showing Their True Colors," page 138, for the results.

DEBUNKING A FEW MYTHS

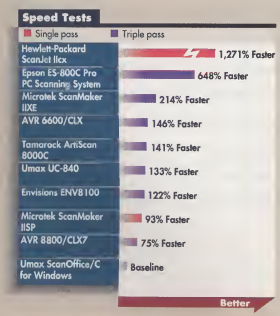
Our test results proved that several commonly held conceptions about scanners aren't necessarily true:

Myth 1: Single-pass scanners are faster than triple-pass models. Wrong and wrong again. Of the ten scanners in our roundup, eight were triple-pass models and two were single-pass models. While the fastest scanner—HP's ScanJet IIcx—was a single-pass model, the next six in the speed trials were triple-pass models. And eighth in the race was Microtek's ScanMaker IISP, a single-pass model.

SINGLE-PASS OR TRIPLE-PASS SCANNERS?

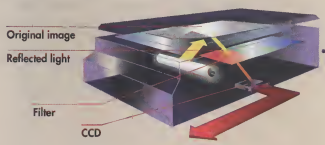
Speed isn't the big issue, but wear and tear is.

Our lab tests proved that single-pass scanners—which are usually more expensive—are not necessarily quicker than triple-pass models. While HP's single-pass ScanJet IIcx was the one to beat, Microtek's single-pass ScanMaker IISP was slower than six of the triple-pass scanners. Single-pass does offer one advantage: less wear on the scanner because the motor does less work. The baseline scanner took over two minutes to input an image in Photoshop.



TRIPLE PASS

Reflected light bounces off the image and is read by light-sensitive cells called charge-caupled devices (CCDs). In triple-pass scanning, light reflects off the image and passes through a red, green, or blue filter onto the CCD. After all three colors have been scanned in, the scans are superimposed to create the final image.



A triple-pass model obviously does three times the work for the same output as a single-pass model, but a scanner has to do more than just capture the image. It must superimpose the red, green, and blue layers; convert analog data to digital format; and transmit color signals to the PC. The more efficiently these tasks are handled, the faster the scan (see "Single-Pass or Triple-Pass Scanners?" below).

Myth 2: Single-pass scanners produce better color scans than triple-pass models. Marketing hype and a cursory glance at the technology make many people favor single-pass scanners for color fidelity and image quality. They shouldn't when it comes to nonprofessional scanners like those we tested. In our color fidelity jury testing, single-pass scanners were outdone by Envisions' triple-pass ENV8100.

The bottom line on single-pass vs. triple-pass? If you do reject triple-pass scanners, do it because you're suspicious of wear-and-tear on the scanner's motor—don't blame it on technical inferiority.

Myth 3: You can fix a bad scan with good software. This is true up to a point, but why go to the trouble? Many scanners optimize global settings as you scan. For example, Umax's TWAIN control software has a button you can use to change the brightness and contrast of your prescanned image to optimum levels.

Myth 4: The highest resolution is the best. Wrong. First, if you scan pictures at 400 dpi instead of 300, all that improves is your chance of running out of disk space, because higher-resolution images produce larger files. You don't need that much information to print to a 300-dpi laser printer or work on a scan in your image editor—it will just slow your system.

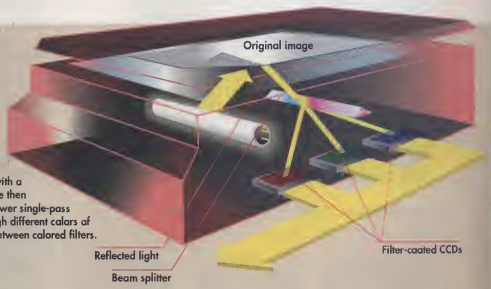
Second, if you use interpolation, the software used by these scanners to increase the true scanned resolution varies wildly in its results. Interpolation algorithms add pixels between the dots actually scanned by the hardware, but the software's intelligence varies from case to case.

Myth 5: The more colors, the better. Using 24-bit mode when you're scanning an image with only three colors could increase the file size by ten times. You can postprocess an over-scanned image using an image editor (see "Edit It," page 140), but save yourself time by scanning at optimum color bit-depth levels. The better scanning programs determine the optimum bit-depth level automatically during the prescanning process.

—MATTHEW LAKE

SINGLE-PASS

There are several single-pass scanning techniques—some slower than others. The fastest uses a beam splitter to break the white-light reflection of the scanned image into three beams, which are then read through separate CCD transistors coated with a red, green, or blue filter. These are then combined into a single image. Slower single-pass techniques include strobing through different colors of light, and line-by-line switching between colored filters.



Sensational Color Scanners

	Image Quality and Performance	Pros and Cons
ArtiScan 8000C $1,095	Rated last on grayscale jury, and performed poarly an interpalatian test. Middle af the pack on speed tests.	Pras: 400-by-800-dpi aptical scanning, chaice of Photoshop or PhataStyler. Cans: Can't crap image or adjust threshald.
AVR 6600/CLX $1,099	Rated neor the battam on colar jury test, and scared poarly an groyscole jury. Average perfarmer an speed tests.	Pros: File size indicated in prescon selectian. Cons: No interface kit, limited softwore: na prescan buffer, color preview, ar zoom.
AVR 8800/CLX $1,249	Secand on grayscale image jury, ond poor rating an calar jury. Slaw performance on speed tests.	Pras: 400-by-800-dpi interpolated to 1,600 dpi. Cans: Na interface kit, limited saftwore, slow perfarmance.
Envisions ENV8100 $999	Rated taps an calar jury and third an grayscale jury, but last an interpolatian tests. Abaut average on speed tests.	Pros: Low price, includes Photoshap, TextBridge (OCR), and camprehensive saftware. Cans: Paar documentatian, paar interpolotion.
Epson ES-800C Pro PC Scanning System $1,499	Winner an grayscale jury, ond middle of the pack on calar jury. Distant second on speed tests.	Pros: Includes Picture Publisher, supparts data campressian, gaad documentatian. Cons: High price, preset gamma adjustment anly.
BEST ScanJet IIcx $1,179	Roted faurth on color jury; taps on resolvobility and interpalation. Won speed tests by a mile.	Pras: Law price, includes PhataStyler, gaad interpolotion. Supports data campression. Cans: Na threshold adjustment.
ScanMaker IISP $799 (street price)	Roted third an calar jury ond abave overage an grayscale jury. Slaw performance an speed tests.	Pras: Law price, includes Phatashap, good colar. Cans: Proprietary SCSI, na prescan zaam, paar documentatian, difficult to install.
ScanMaker IIXE $1,299	Perfarmed well on interpalatian test, but roted paarly on calar jury and grayscale jury. Taak third ploce an speed tests.	Pras: Includes Photoshop, good documentatian. Cons: Lockluster scans.
ScanOffice/C for Windows $895	Rated warst an interpolotian, average an grayscale jury, ond secand an colar jury. Dead last an speed tests.	Pros: Law price, 600-dpi sconning, greot color, includes Picture Publisher. Cans: Slaw perfarmance, paar interpolation.
Umax UC-840 $1,175	Roted deod-last an calar jury ond second to last on groyscale, perfarmed paarly an interpalatian test ond average on speed tests.	Pras: 800-dpi sconning, includes Phatashap ar Picture Publisher. Cans: Poar color quality.

SHOWING THEIR TRUE COLORS

ArtiScan 8000C
Dark darks and subtly defined tones—overall a little toa muted, but with a good range.

AVR 6600/CLX
Fared paarly in colar jury tests. A little fuzziness that's OK if yau ga far the soft-facus appraach.

AVR 8800/CLX
Good calar range, but the averall image is marred by tao-bright brights and flat-laaking gradatians.

BEST COLOR

Envisions ENV8100
Well-lit, even-toned pictures. The colors, though not rich, are faithful and well-balanced.

Epson ES-800C Pra
Gaad colar fidelity, good cantrast, but dark shadows blacken aut before they shauld.

Bottom Line		How to Contact
Easy start, limited horizons. Easy installation doesn't make up for software with few options, poor grayscale scans, and jagged interpolated lines.		Tamarack Technologies (800) 643-0666, (408) 956-0144 Circle Reader Service No. 661
In the middle ground. Lackluster grayscale and color reproduction—although its solid OCR performance mitigates.		AVR Technology (800) 544-6243, (408) 434-1115 Circle Reader Service No. 662
Graded grays make the day. Only the high-quality grays and good optics (making for respectable OCR) distinguish this slow, muddy-color scanner.		AVR Technology (800) 544-6243, (408) 434-1115 Circle Reader Service No. 663
Perfect pictures, stellar software. High fidelity color and a comprehensive bundle of picture- and text-scanning software.		Envisions Solutions Technology (800) 365-7226, (415) 692-9061 Circle Reader Service No. 664
High quality, high cost. Sharing the OCR crown with HP, it's a respectable and speedy color and grayscale scanner.		Epson America (800) 289-3776, (310) 782-0770
Click, click, zoom! A drag racer among color scanners, HP is the easiest to use and install, and it's an OCR-crunching animal.		Hewlett-Packard (800) 752-0900, (303) 350-4000 Circle Reader Service No. 665
Brighter colors—eventually. One of the best three for top-quality scans—with excellent optics—but at a snail's pace.		Microtek Lab (800) 654-4160, (310) 297-5000 Circle Reader Service No. 666
Moderate speedster. Third place in speed—but despite clear text scans for OCR, colors and grays were dull.		Microtek Lab (800) 654-4160, (310) 297-5000 Circle Reader Service No. 667
Colors galore and a software smorgasbord. Covers all of the graphics and OCR bases for a song—but beware, it's slow.		Umax Technologies (800) 562-0311, (510) 651-8883 Circle Reader Service No. 668
Less for more. The UC-840's higher price tag and poor color quality make the ScanOffice/C for Windows a better value.		Umax Technologies (800) 562-0311, (510) 651-8883 Circle Reader Service No. 669

ScanJet IIcx
Subtle shadows, brilliant highlights, and a wide dynamic range, but skin tones tend toward blushing.

ScanMaker IISP
Bright, eye-pleasing colors with rich woods, shiny metallics, and brilliant fabric tones.

ScanMaker IIXE
A little too bright at the default settings, and it did poorly in color jury tests.

ScanOffice/C for Windows
Sharp scanned photographs with even tones and good color ranges.

Umax UC-840
Poor color ratings in jury tests. Unevenness of tone in default settings are overcome with autocontrast.

STEP 2

EDIT IT

You're off to a great start, but now it's time to get creative. Change that drab background, sharpen and rotate the images, and add some bold text—you can do it with the right image-editing software.

The image you scanned in to your PC is perfect—well, almost. The green background is a little on the sickly side, and there's a weird line across the lower left-hand corner where the photo was creased. Oh, and something that looks like spinach is stuck between the teeth of an otherwise dazzling smile—nothing a little image editing can't fix.

Whether you need to create a photo composition, jazz up an existing image, or simply retouch a photograph, an image-editing package is a vital tool. But you don't have to be a professional artist or designer to spurn programs that treat you like an amateur. Look for an image editor that provides TWAIN support so you don't have to hassle with scanner compatibility problems, masking tools so you can select areas of an image to edit or protect from editing, and the ability to produce color separations so you can prepare images for four-color printing.

So do you need to shell out nearly 900 bucks for a full-blown professional program like Adobe Photoshop, or would you be adequately served by the image-editing tools included in a graphics program that costs almost half as much? We compared seven products: Adobe's Photoshop 2.5 for Windows, Aldus's PhotoStyler 2.0 for Windows, and Micrografx's Picture Publisher 4.0, which are image editors; Fractal Design's Painter 2.0 with PainterX2 and Fauve Software's Fauve Matisse 1.25, which are primarily paint programs; and CorelDraw 4 and CPI's Image-In Professional 3.2, which are all-in-one graphics programs.

IMAGE CONSCIOUS

With each of these programs, we tackled common image-editing tasks: calibrating a monitor, scanning in an image, correcting the image's color, retouching the image, creating a color separation, and creating a proof.

Calibrating the monitor adjusts the display so that the color of the image that shows up onscreen is consistent with the color of the image that is scanned in or printed out. We looked at how easy or difficult the programs make this task, the sensitivity of the calibration controls, and the overall results.

Adjusting the color of a scanned image is one of the most common tasks you'll need your image editor to do.

PCComputing USABILITY APPROVED

THREE FOR THE USABILITY LABS

Which of the top image editors earn our seal?

While we evaluated a total of seven products—ranging from graphics programs to dedicated image editors—we limited our usability testing to the top three image editors.

The graphics prafessionals we brought inta the *PC/Computing* Usability Labs evaluated their level of satisfaction and productivity with Adobe Phatashop 2.5 for Windows, Aldus PhotoStyler 2.0 for Windows, and Micrografx Picture Publisher 4.0.

The programs rated clasely in averall productivity, but when it came ta intuitiveness, Photoshap and PhotoStyler rated substantially higher than Picture Publisher and ultimately scored high enough in aur usability category (80 and above) ta earn our Usability Seal of Approval. But in our overall features evaluation of the seven graphics products, including the image editors, Picture Publisher was the winner. It includes innovative features like floating objects, effects preview, and a macra recarder.

PHOTOSTYLER 2.0 FOR WINDOWS

"There's no time wasted searching for what options are available to use."

PCComputing USABILITY APPROVED SCORE: 85.4

Testers praised PhotoStyler's context-sensitive toolbar, which changes depending upon the tool selected.

You'll want the ability to adjust the image's overall color balance, individual color channels, hue, saturation, and lightness. All of the programs enable you to do this, but the best offer automatic options, as well as precise control and more than one way to achieve just the right balance.

What distinguishes these programs from each other is their ability to manipulate and edit images, or create new ones. Dedicated image editors typically offer more tools for altering existing images, while graphics programs specialize in creating new ones. Look for quality and variety in the selection of tools and filters for creating special effects. All of the programs we examined have such basic selection tools as rectangular, freehand, and elliptical, plus a magic wand tool for selecting color. Your program should also make it a breeze to extend or delete part of a selection area.

While a multitude of filters and selection tools is essential, the ability to create floating objects ups the ante. Floating objects are portions of an image that are independent of the background or other objects. Because they're independent, these elements can be easily manipulated, moved, and even layered. This revolutionary feature is provided only by Fauve Matisse 1.2, Fractal Design's Painter 2.0 with PainterX2, and Micrografx's Picture Publisher 4.0. Fauve Matisse 1.25 and Painter 2.0 go one further by allowing you to save floating objects for future use.

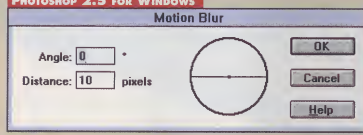
When it comes to outputting images, the ability to create color separations is a must. Beyond that, the package should include such print options as adjustable crop marks, color calibration bars, and registration marks.

Finally, look for extras that make working with unwieldy graphics files easier, such as image management, macro recording, and the capability to load and work on a portion of an image.

If you're also in the market for a scanner, note that the majority come with an image editor. Of the ten scanners we looked at (see "Scan It," page 136), eight come with a choice of Adobe's Photoshop, Aldus's PhotoStyler, or Micrografx's Picture Publisher. These professional-level packages offer comparable features, but how do they fare at usability? To find out we headed into *PC/Computing*'s Usability Labs for testing by six graphics professionals. To see which image editors earned our Usability Seal of Approval, see "Three for the Usability Labs," below.

—CHRISTINE GRECH

PHOTOSHOP 2.5 FOR WINDOWS

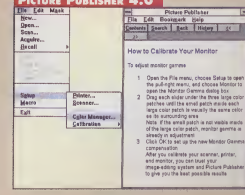


"I expected the best from Photoshop, and I got it."

Photoshop delivered results but some testers said there was room for improvement. Several wished for a preview feature when applying a filter like Motion Blur.

PCcomputing USABILITY APPROVED! SCORE: 88.3

PICTURE PUBLISHER 4.0



"You have to wade through three branches of the help tree before finding the calibration instructions."

All testers had difficulty calibrating their monitors because this menu item is grayed out unless a calibration file is loaded. Instructions for doing this were deeply buried in the online help.

SCORE: 75.1

Dynamic-STN color: Designed with greater contrast and improved color saturation, Toshiba's dual-scan display is noticeably pure and vibrant.

Rugged Design: Rounded corners and a tough lightweight casing are just a few of the details that make this notebook engineered to last.

TURN A LITTLE MONEY INTO A SOLID INVESTMENT.

Introducing the Ultra Affordable T1910 Series.

Our new Satellite Series notebook is light enough to go everywhere, yet rugged enough to come back in one piece. You'll find its ergonomic design and engineering make it extremely comfortable to use. A fast 33MHz SL Enhanced i486™SX processor gives you the power to blaze through programs. There's Toshiba's unique 14.5mm Type III PCMCIA slot for the ultimate in expansion possibilities. And a choice of sharp, brilliant displays, either color or monochrome. So get your hands on the new T1910 Series. It's got everything you want in a notebook. Advanced features. A tough, long-lasting design. And a great price. **Call 1-800-457-7777 for the Toshiba dealer nearest you.**

T1910
- 9.5" dia. monochrome STN-LCD display
- 120MB HDD
- 6.5 lbs.

T1910CS
- 9.5" dia. color Dynamic-STN dual-scan display
- 120/200MB HDD
- under 7 lbs.

BOTH MODELS
- 33MHz SL Enhanced Intel 486™SX, 3.3v
- 4MB RAM, upgradable to 20MB
- 8KB cache
- 14.5mm Type III PCMCIA slot (supports Type I, II, and III cards)
- BallPoint™ Mouse with QuickPort™
- NiMH battery for extended battery life with Toshiba MaxTime™ Power Management

In Touch with Tomorrow

TOSHIBA

Circle 215 on reader service card.

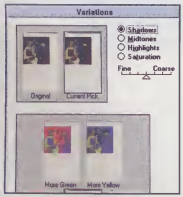
©1994 Toshiba America Information Systems, Inc. The Intel Inside logo is a trademark of Intel Corporation. All products indicated by trademark symbols are trademarked and/or registered by their respective companies. *T1910, 120MB HDD. Reseller prices may differ. All prices and specifications are subject to change. Shipping, handling, and applicable sales tax not included

Image Editors: Special Effects Wizards

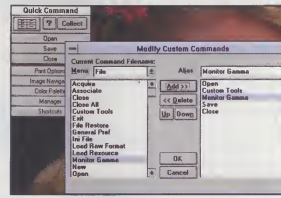
	Performance Notes	Pros and Cons
CorelDraw 4 $595	Previews on image but not on thumbnail when correcting color. Local undo lets you choose only some changes to undo when retouching image.	Pros: Low price; includes CD-ROM images; vector-based drawing, paint, animation. Cons: Limited selection tools, doesn't support floating objects.
Fauve Matisse 1.25 $199	Must load file to calibrate monitor, and no automatic preview is provided. Unable to print crop marks or registration bars when creating proofs.	Pros: Lowest price. Supports floating objects. Stamp feature with special effects. Cons: Limited prepress capabilities. Slider controls don't let you specify numeric values.
Image-In Professional 3.2 $795	Includes menu items for extending, deleting from, and intersecting selection areas. Easy to calibrate monitor.	Pros: Good selection and paste tools, includes OCR and vector drawing software. Cons: Doesn't support floating objects.
Painter 2.0 with PainterX2 $548	Numeric setting only when calibrating monitor. Limited color-correction options. Unable to print crop marks when creating proofs. Abundance of selection tools, called friskets.	Pros: Low price, extensive painting capabilities, supports floating objects. Cons: Limited color and monitor calibration, documentation, and printing options.
Photoshop 2.5 for Windows $895	Variations feature lets you see what image looks like when making color adjustments. Variety of filters for retouching image included, but no preview for them.	Pros: Widest hardware and software support, professional prepress capabilities. Cons: No image management tools or macro recorder, doesn't support floating objects.
PhotoStyler 2.0 for Windows $795	Has zoom feature to allow for better visual adjustment when calibrating monitor. Practice Pad lets you test tools and special effects on a portion of the image when retouching.	Pros: Load/edit partial images; supports floating objects; context-sensitive ribbon bar, image-management software. Cons: Lacks macro recorder.
BEST Picture Publisher 4.0 $595	Calibrate monitor option grayed out until specific file is loaded, and process isn't clearly explained in online help. Extending and deleting from selections is more time-consuming than in other programs. Preview for all effects.	Pros: Low price. Load/edit partial images or edit images at lower resolutions, supports floating objects, includes macro recorder and effects preview. Cons: Calibrating monitor isn't intuitive.

TOOLS OF THE TRADE

Custom tools are the signatures of the three image editors we tested.



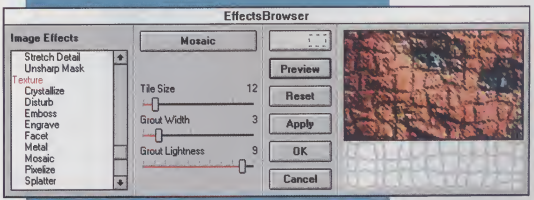
Photoshop 2.5 for Windows
The Variations feature lets you preview color adjustments and allows you to fine-tune them.



PhotoStyler 2.0 for Windows
Customize the Quick Command bar to save time you'd otherwise spend wading through menus.

Bottom Line		How to Contact
Everything for a sang. Perfect far the graphics dobbler, but if you're serious about image editing you'd do better with Picture Publisher for about the some price.		Corel Corporation (800) 772-6732, (613) 728-8200 Circle Reader Service No. 670
Budget painter for light editing. A good volue far the pointer who hos limited editing needs. If you require more muscle, go with Picture Publisher.		Fauve Software (800) 898-2787, (919) 380-9933 Circle Reader Service No. 671
Text editor. A good deol if you need OCR, but for image editing yau'd do better with PhotoStyler or Picture Publisher.		CPI Inc. (800) 345-3540, (415) 961-6556 Circle Reader Service No. 672
Ultimate painter, limited editar. For the creative painter with some image editing needs. If you need more power, opt for Picture Publisher.		Fractal Design Corp. (800) 297-2665, (408) 688-5300 Circle Reader Service No. 673
Cross-platform champ. Professionals willing to poy the price won't go wrong with its advanced options and ultimate hardwore and software support, including Moc compatibility.		Adobe Systems (800) 833-6687, (415) 961-4400 Circle Reader Service No. 674
Professional rival. For $100 less it delivers the some professional features as Photoshop, plus o few more. It won't disappoint.		Aldus Corp. (800) 333-2538, (206) 628-2320 Circle Reader Service No. 675
Best features for the best price. Delivers more tools and features than Photoshop and PhotoStyler for a cauple hundred dollors less.		Image[illegible] [illegible] Circle Reader Service No. [illegible]

BEST TOOLS



Picture Publisher 4.0
Picture Publisher 4.0's EffectsBrowser lets you quickly preview what special effects such as filters will look like when applied to an image.

PRINT IT

The proposal looks great, but you want to see the hard copy before your masterpiece is ready to make its debut. A state-of-the art color printer produces output you can count on.

After you've manipulated a scanned image to make it look just so, you're still not home free. You need to print it, and the output must look as close to the onscreen image as possible. That means you need the cream of the color printer crop. If you're under the impression that more money buys better output, read on. There are huge differences in color printer technology, and more money doesn't always mean better quality.

You're faced with a choice of four printing technologies: dye sublimation, color laser, solid ink, and thermal wax-transfer. (You'll notice that we've grouped dye sublimation and thermal wax-transfer together in the illustrations below. This is because they manipulate pages in similar ways, though they output different levels of color quality.) To help you choose the best technology for your needs, we evaluated six printers: Eastman Kodak's ColorEase PS and Tektronix's Phaser IISDX dye-sublimation printers; CalComp's ColorMaster Plus 6613 XF and QMS's ColorScript 230 thermal wax-transfer printers; Dataproducts' Jolt PSe solid-ink printer; and QMS's ColorScript 1000—the only desktop color laser printer currently available.

None of these printers comes cheap—the least-expensive of the bunch is the Jolt PSe at $4,995, and the ColorScript 1000 tops out at $12,499. But your costs don't stop with the purchase price. Consumables for color printers are much more costly than those for black-and-white printers, so you need to consider long-term costs as well.

We timed how long it took each printer to produce various types of output—a vector-based CorelDraw image, a photorealistic Adobe Photoshop image, and a Microsoft PowerPoint presentation. We also jury-tested output samples of the Photoshop image to determine which delivers the best-looking color images. See "The Proof Is on the Page," page 148, for results.

THE PRICE OF TECHNOLOGY

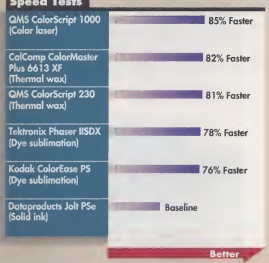
The four printing technologies present different trade-offs and provide different levels of output quality.

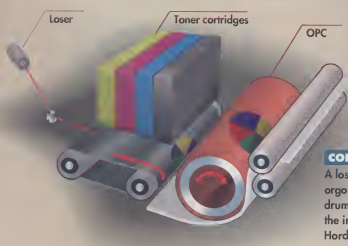
Dye sublimation. If you're planning to use your color printer to output only scanned photorealistic images, dye sublimation is the way to go. This is a continuous-tone technology, which means that the different color dots can

COLOR FAST?

When printing graphics, be prepared to wait.

All of the printers took well over an hour to print a photorealistic image from Adobe Photoshop 2.5 for Windows. At more than two hours, Dataproducts' solid-ink Jolt PSe was almost twice as slow as the top-performing QMS ColorScript 1000 color laser printer. Meanwhile, the thermal wax printers performed only slightly better than the dye-sublimation printers.





COLOR LASER

A laser beam transfers the image to the organic photoconducting cartridge (OPC) drum in four passes (one for each color). Then the image is fused onto the page in one pass. Hard copy takes 1 to 2½ hours.

be superimposed on the page, not just juxtaposed, to create additional colors. Continuous-tone technology gives you a very smooth picture in which colors blend together without visible gradations. Dye-sublimation printers require special paper, which results in a higher cost per page than other technologies. The two dye-sublimation printers in our tests will run you more than $2 per page.

Color laser. These printers are the wave of the future, but they won't win any awards for high-end graphic output right now. And they are the most expensive of the four technologies we tested. So if you require high-quality images, steer clear of color lasers for now. On our photorealistic-output tests, we noticed registration problems: The primary colors were not properly aligned.

The main benefit of a color laser printer is speed. The QMS ColorScript 1000 was the printer to beat in our speed tests. Another advantage is that you can use plain paper to output your images, resulting in a lower cost per page. Expect to pay a penny per percentage of the page that's covered; for example, 80 cents for an image that takes up 80 percent of the page. A color laser printer is good for printing text and graphics in the same document, because nothing beats laser quality for text rendering. A color laser printer can serve as your sole output device, producing your black-and-white text documents as well as color graphics.

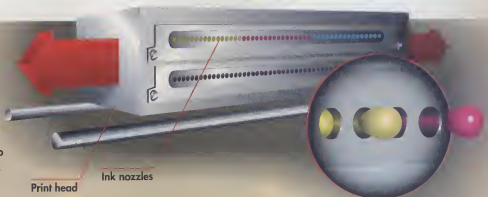
Solid ink. These printers trade image quality for price, but at certain tasks they're perfect. Solid-ink printers produce halftone colors; that is, they place a combination of cyan, magenta, yellow, and sometimes black dots on the page to give the illusion of more colors. For example, they use magenta and cyan to create red. A definite benefit of solid-ink technology is a low cost per page. Color output will run you about 50 to 80 cents per page—much lower than that of the higher-cost dye-sublimation printers.

Thermal wax-transfer. Like solid ink printers, thermal wax-transfer printers are less expensive than color laser or dye-sublimation printers. Likewise, they produce halftone colors, which results in photographic-quality output that's not as good as that from a dye-sublimation printer. Also like solid ink, expect a cost per page of about 50 to 80 cents. Thermal wax-transfer technology is improving, too. In fact, Tektronix has just released a thermal wax-transfer printer, the Phaser 220, that boasts output comparable to that of a dye-sublimation printer.

—KYLA K. CARLSON

SOLID INK

With 96 nozzles sprayng ink ocross the poge one line ot o time, o solid-ink printer like the Jolt PSe is bound to take one or two hours to produce o single imoge.



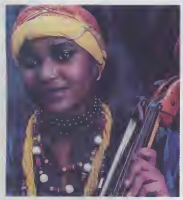
DYE SUBLIMATION AND THERMAL WAX-TRANSFER

With these technologies you'll usually woit obout an hour for hard copy becouse eoch sheet of paper needs three or four passes to pick up oll of the colors in your image.

State-of-the-Art Color Printers

	Image Quality	Pros and Cons
ColorEase PS $7,999	Too much contrast: Dark colors were too dark and bright colors were too bright. Overall, the output looked a bit too blue.	Pros: Good resolution, inexpensive for dye-sublimation technology. Cons: Slow, produced oversaturated colors.
ColorMaster Plus 6613 XF $8,995	Smaller dots (with more white space between them) produced images with rough definitions. Colors were more vibrant than the original image and had a bluish-gray cast.	Pros: Second-fastest printer, supports tabloid-sized media. Cons: Rated last on jury tests: blurry output, rough patterns in photographic image.
ColorScript 230 $7,995	Subtle highlights didn't show up well. Flesh-tones appeared washed out and light colors looked too light.	Pros: Supports tabloid-sized paper, relatively inexpensive. Cons: Output below average.
ColorScript 1000 $12,499	Rough dot patterns and poor dithering of colors caused loss of detail.	Pros: Fastest of the bunch, doubles as a black-and-white printer. Cons: High price, output below average.
Jolt PSe $4,995	Best of the half-tone printers, producing good details and contrasts. Colors came the closest to matching the original.	Pros: Low price, best output of the halftone printers. Cons: Slow—our Photoshop image took more than two hours.
BEST Phaser IISDX $9,995	The best of the bunch, although there was a green cast overall. Good contrast.	Pros: Best output. Cons: Unspectacular speed.

THE PROOF IS ON THE PAGE



ColorEase PS
Though the colors are eye-catching and vibrant, the output has blue overtones and extreme contrasts between colors.

ColorMaster Plus 6613 XF
The intricate details in the original photograph are lost in the fuzzy output image.

ColorScript 230
It loses some fine details, and when reproducing flesh tones its overly bright images look washed out.

Bottom Line		How to Contact
Dye sub on a budget. Prints good photographic repraductions at nearly $2,000 less than the Phoser IISDX. But if you need vector graphics, a solid ink printer is your best bet.		Eastman Kodak (800) 344-0006, (716) 253-0740 Circle Reader Service No. 677
Mare maney, nat more printer. Chorges a high premium for middling image quality. Yau'd do better with the Jalt PSe for obout the half the price.		CalComp (800) 932-1212, (714) 821-2000 Circle Reader Service No. 678
Middle-of-the-road performer. Wos on overage performer with unimpressive output. Your money would be better spent on a dye sub like the ColorEase PS ar Phoser IISDX.		QMS (800) 523-2696, (205) 639-4400 Circle Reader Service No. 679
Speedy business graphics. Great for business grophics, but ga with the Phoser IISDX for high-quality photagraphic repraductians.		QMS (800) 523-2696, (205) 639-4400 Circle Reader Service No. 680
Best for budgets—if you have the time. It's the least expensive printer and it produces good-laaking output, but the Jalt PSe tokes its own sweet time ta print.		Dataproducts (800) 334-3174, (818) 887-8000 Circle Reader Service No. 681
Colar champ. Produces the best photographic reproductions of all printers tested. If output is what you core obout mast, here's your pick.		Tektronix (800) 835-6100, (503) 682-7377 Circle Reader Service No. 682

ColorScript 1000
Output appears blurry. Individual dots of each color are clearly visible and contribute to an overall darkness and loss of detail.

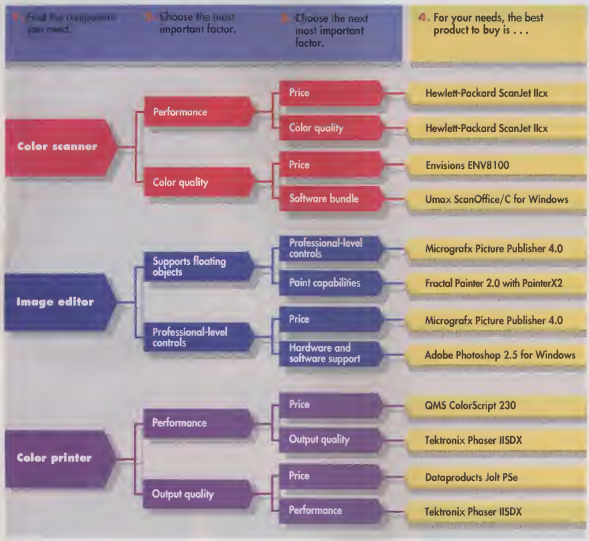
Jolt PSe
Colors are true to the original photograph, and also duplicate the complex patterns fairly accurately.

BEST COLOR

Phaser IISDX
Aside from an overall greenish tint, output is clean, crisp, and provides the truest reproduction of our original image.

PC/COMPUTING DECISION MAKER

Which scanner, image editor, or color printer fits your needs?



FINAL ANALYSIS COLOR BY NUMBERS

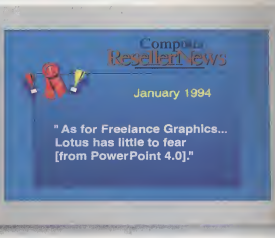
Scanner and printer prices will drop, but do you want to wait?

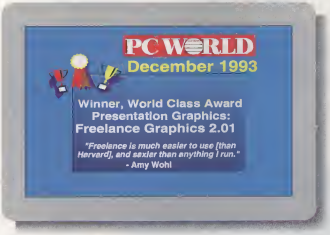
One size doesn't fit all, and how much you're willing to pay is the first decision to make. Want a budget solution? A good under-$7,000 combination of the three product types in this story is Dataproducts' Jolt PSe ($4,995), Micrografx's Picture Publisher 4.0 ($595), and Envisions' ENV8100 ($999). If you want the very best combination, go with Tektronix's Phaser IISDX ($9,995), Picture Publisher, and Hewlett-Packard's ScanJet IIcx ($1,179)—totaling less than $12,000. Our "*PC/Computing* Decision Maker," above, shows which products are right for you.

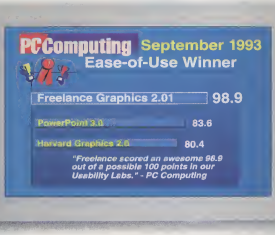
If you're committed to color, but want to be assured that you won't regret today's hardware purchases tomorrow, here's what you can expect. As scanners evolve into mainstream PC peripherals, they will continue to drop in price, but not drastically. Expect to see on average price of less than $1,000 in the coming year, which is comparable to the lowest priced scanner we reviewed here, Umax Technologies' ScanOffice/C for Windows. Color printer prices will drop more drastically—by on average of $1,000.

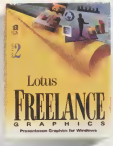
Sure, you'll save a little bit of money if you wait. But don't rush to put a price on the eye-catching results that color can bring you right now.

THIS PRESENTATION MAY BE TOO GRAPHIC FOR POWERPOINT AND HARVARD GRAPHICS.









Freelance Graphics® is so simple and so fast that people are now using it to punch out charts for small presentations and even for handouts used at informal meetings. Which explains why even PowerPoint® and Harvard Graphics® users prefer Freelance.* the worlds #1 selling presentation graphics package.** And now available, the SmartMaster™ Business Pack with 36 new SmartMaster designs and 34 new symbols. Yours for just $10 shipping and handling. Call **1-800-TRADEUP, ext. 9482** for more information.

Lotus. Working Together®

*Usability Sciences Corporation 2/93. **IDC 7/93. In Canada call **1-800-GO-LOTUS**. ©1994 Lotus Development Corporation. 55 Cambridge Parkway, Cambridge, MA 02142. Software Digest is a registered trademark of NSTL, Inc., a McGraw-Hill Company. All rights reserved. Lotus, Working Together and Freelance Graphics are registered trademarks and SmartMaster is a trademark of Lotus Development Corporation. PowerPoint is a registered trademark of Microsoft Corporation. Harvard Graphics is a registered trademark of Software Publishing Corporation.

Attack of the Killer Pixels

Choosing a True Color Accelerator

It is no longer necessary to give up performance or high resolution to have rich photographic colors. Some valuable information to help you select a true color accelerator follows:

Performance = 64+24

True color (referred to as 24-bit, or 16.7M colors) requires a graphics board to process three to four times more information than it would for 256 colors. Fast 64-bit graphics chips with complete hardware-assist functions for 24-bit acceleration are best suited for fast true color use. Some accelerators offer only 32-bit graphics engines or limited 24-bit color drawing functions. When comparing graphics performance, be sure to ask your vendor for results in true color mode, not just in 256-color mode.

' on't Reboot Window

Conventional 2MB graphics cards force you to choose between high resolution graphics at 1280x1024 with only 256 colors or true color with only 800x600 resolution. Since you can't have high resolution mode for detailed text work and true color mode for rich photographic colors at the same time, you have to compromise.

To switch modes, conventional boards require you to leave the application and then restart Windows. This process is inconvenient and time consuming. Look for features like ATI's WinSwitch, which allows you to quickly and conveniently toggle between high resolution mode and true color mode using a simple keystroke without closing your applications or leaving Windows.

VRAM Really Matters

Only VRAM memory guarantees stable performance in true color modes because of their dual port design. Most DRAM accelerators may look fast in 256-color mode, but will offer only a fraction of the performance of VRAM accelerators in true color mode. Avoid DRAM memory for serious true color work.

Watch for new helpful information.....

There's millions of them, and they're moving fast to infest every PC with deadly precision and terrifying speed. The hordes of killer pixels from ATI's GRAPHICS PRO TURBO will turn your PC into an amazing hive of graphics activity.

accelerated by mach64 ATI TECHNOLOGIES INC.

64-Bit Stinger

Stirred up by our 64-bit *mach64* accelerator chip, the GRAPHICS PRO TURBO sends your applications swarming across the screen at fantastic velocities – over 100 million Winmarks*. Work faster not harder, even in demanding high resolution, true color applications.

GRAPHICS PRO TURBO outperforms other accelerators.

GRAPHICS PRO TURBO is the ideal card for today's hot PC architectures. With up to 4MB of memory for 1280x1024 graphics in 16.7 million colors, VRAM ensures consistent performance across all display modes. And unlike a lot of other accelerators, the GRAPHICS PRO TURBO is frantically fast not just in Windows, but in DOS and other environments as well.

True Killer Color

ATI's new strain of pixels is not only fast, it's vibrantly colored as well. GRAPHICS PRO TURBO gives you accelerated 24-bit true color that never stops working, even at resolutions as high as 1280x1024. In fact, it runs in 16.7 million colors as fast as other cards do in just 256. Our exclusive software keeps all that color under control. Color calibration software provides a perfect match for graphic arts applications. Plus

AND MULTIMEDIA ACCELERATOR • GRAPHICS AND MULTIMEDIA ACCELERATOR

•105+ Million Winmarks†
•1280x1024 in 16.7M colors

Introducing the
GRAPHICS PRO TURBO™

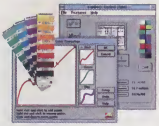
our unique WinSwitch feature lets you change color and resolution modes to suit your application requirements, quickly and conveniently ... without restarting Windows.

True Color + High Resolution
WinSwitch changes color and resolution...without leaving Windows

Wilder Windows

Windows users, get your screens up: GRAPHICS PRO TURBO is going to give you a real buzz. With acres of virtual desktop and a complete control panel, plus flicker-free graphics at up to 100 Hz refresh, the GRAPHICS PRO TURBO is absolutely the fastest, most convenient card for Windows.

Desktop settings



Color calibration

Easy control of desktop settings and color calibration with FlexDesk panel.

Vicious Video

As an added bonus, the GRAPHICS PRO TURBO is ready to make motion video fly. With accelerated image scaling and enhanced pixel smoothing, it displays motion video with no additional multimedia hardware.

Bee The Best

Our high quality design ensures a perfectly clear picture ... no color bleeding or blurry images. And ATI's solid support, with regular no-bug software updates, will keep your system humming. So don't bee stung by lesser graphics. Get the GRAPHICS PRO TURBO. It's a honey of a card.

COMPLETE PERFORMANCE DATA
(Larger numbers are better)

	GRAPHICS PRO TURBO	Matrox MGA II+	Diamond Viper
Winbench 4.0*	36.2	28.0	20.0
Winbench 4.0*	25.7	12.1	4.6
VGA Performance ††	8,482	993	2,953
Motion video Performance †††	24	11	13

GRAPHICS PRO TURBO outperforms other accelerators.

GRAPHICS PRO TURBO

- 2MB (upgradeable) or 4MB VRAM memory
- ISA, VESA and PCI Local Bus versions
- Dynamic monitor control and adjustment
- Drivers for OS/2, CAD, DOS and more
- Energy efficient, Green PC support
- 5 yr. warranty
- Priced** at $599 (2MB) and $899 (4MB)

FAX info (905)882-2600 PRESS 2
FOR LITERATURE BY FAX DOC #1030

ATI TECHNOLOGIES INC.
Perfecting the PC

ATI TECHNOLOGIES INC.
33 Commerce Valley Drive East
Thornhill Ontario Canada L3T 7N6
Telephone: (905) 882-2600 ext. 4222
Facsimile: (905) 882-2620
CompuServe: GO ATITECH 76004,3656

* All performance tests done on a Pentium 66MHz, 16MB RAM, 256K cache, 200MB HD at 60Hz, using 2MB versions of PCI graphics cards. † Winbench 3.11 at 1024x768 resolution in 256 colors †† VGA performance tested using PCBench 7.01 (video harmonic) ††† Motion Video performance measured under Windows using 65K colors. Test clip recorded at 320x240 at 30 fps using Indeo codec.

©Copyright ATI Technologies Inc., 1994. ATI, *mach64*, GRAPHICS PRO TURBO, and WinSwitch are trademarks and/or registered trademarks of ATI Technologies Inc. All other company and/or product names are trademarks and/or registered trademarks of their respective manufacturers. Features and specifications are subject to change without notice. Product may not be available exactly as described or shown. **Suggested U.S. retail prices, dealers may sell for less.

Advertisement

Circle 112 on reader service card.

BIG DRIVES IN TINY PACKAGES

Will one more gotta-have-it application squeeze the acreage on your drive? Get the real estate you need by staking claim to one of these 22 monster drives.

BY ED BOTT AND ADAM MEYERSON

SPACE. What used to be enough isn't anymore. That's why anyone with a 200MB hard drive knows how the buffalo felt as settlers swarmed over the American frontier. Massive new Windows applications have staked a claim on the lower 40—40MB, that is. Over at Multimedia Gulch, the full-motion, full-screen video cowboys are roping off 30MB of disk space per *second*. And in storage terms, building a 20-user network is like putting a sprawling subdivision where the little house on the prairie used to be. The wide open spaces of computing aren't so wide open anymore.

Even with disk-doubling and sophisticated data-compression technologies, sooner or later we all simply run out of real estate. Fortunately, hard drive technology has made enormous progress in the last three years. Ceramic platters, multiple heads, smarter caching schemes, and a host of other technologies have made hard drives smaller, more durable, and faster than ever. In today's market, a 500MB drive is a simple, low-cost upgrade, and you can take your pick of fast 1GB drives for less than $1,000.

The question isn't whether you need a bigger hard drive, it's whether you can wait another week. We rounded up 22 big-name, big-capacity drives and put them through exhaustive performance and durability testing. No matter what your applications or budget, you'll find the right drive for the long haul.

What's Inside

PC/Computing Decision Maker	157
IDE Drives	158
Disk Drive Benchmarks	160
500MB SCSI Drives	162
1GB to 2GB SCSI-2 Drives	165
Comparing IDE and SCSI	166
Kick Your Disk into Overdrive	168
Disk Controller Benchmarks	168
The Upgrade Path	173
Software Cache vs. Hardware Cache	174
Directory of Cache Products	174
Final Analysis	177
Endurance Tests	177

PHOTOGRAPHS BY SHAN MASEK

VTC ES004A
VM710N415P0K
9230 AP

Staking out more capacity is the No. 1 reason to upgrade your drive, and it was our No. 1 consideration when we placed orders with nine leading drive makers. We asked for IDE and SCSI drives with capacities of 500MB and up, emphasizing the natural breakpoints at 500MB, 1GB, and 2GB. Our survey turned up 7 IDE drives, ranging in capacity from 513.51MB to 1.6GB, and 15 SCSI drives capable of storing between 520MB and 2.14GB.

THE LITTLE DRIVE THAT COULD

But size isn't everything. Beyond sheer capacity, we looked at five crucial factors to separate the best and the brightest from the merely big: performance, price, warranty, interface, and form factor.

Performance. With the help of ZD Labs, we tested all the drives using benchmarks that measure disk access times, raw data throughput, and application performance. We found dramatic differences between drives when we ran our PCbench test mix of DOS disk functions, our Winbench 4.0 disk test, and our bus-crunching test measuring how quickly Adobe Photoshop could display a 44MB TIFF file. One inescapable conclusion: Disk caching boosts performance, and a bigger cache is definitely better. We also discovered a little-known fact about software caching that will surprise you (see "Kick Your Disk Into Overdrive," page 168).

One caveat about performance: If you use mostly off-the-shelf Windows software, disk performance takes a backseat to other factors, such as RAM size and CPU speed. Using the Winstone test, which measures PC performance running 12 best-selling business applications, we found only a 4 percent spread between drives (this figure represents just one element of the many performance tests that constitute a performance rating). That's not surprising, because disk performance is only one piece affecting the overall speed at which an application will run.

Price. In absolute dollar terms, big hard drives have never been better deals, with street prices for 500MB drives—SCSI and IDE—hovering between $511 and $795. We surveyed recent national ads for our range of street prices. (Want vivid proof of how drive prices have plummeted? In 1988, a Seagate ST225 that cost around $400 held only 20MB of data.)

Around the 1GB range, you can pay as little $790 or as much as $1,149 for hard-working hard drives. Want more? Micropolis's matching 1.6GB-plus IDE and SCSI drives sell for less than $1,500 each, and the giant 2GB-plus Seagate starts at $1,850. To make price comparisons, we calculated cost per megabyte. The going rate for 1MB of hard disk space is about $1, although we found a great bargain in the 1.63GB Micropolis SCSI drive, which sells for a low of 70 cents per megabyte. (The 1988 Seagate model would set you back a whopping $20 per megabyte.)

Warranty. Expect a minimum two-year warranty on these maximum-strength drives; that's what Conner, Quantum, and Maxtor offer on their 500MB models. (It's also about as long as you can expect to go before even these new drives start to crowd you.) Except for Western Digital's drives, which are covered for three years, the other drives come with five-year warranties.

We looked beyond the warranty at other aspects of support that may not seem important until you're mourning over a dead drive. Most companies offer toll-free tech support, but often if it's their dime, it's their time, too, and you can't predict that your drive will fail during, say, Pacific time. Other manufacturers offer extended service options and 12-hour calling windows. Frequently, you'll have to send the drive in for repair, but one manufacturer (Maxtor) guarantees 24-hour turnaround.

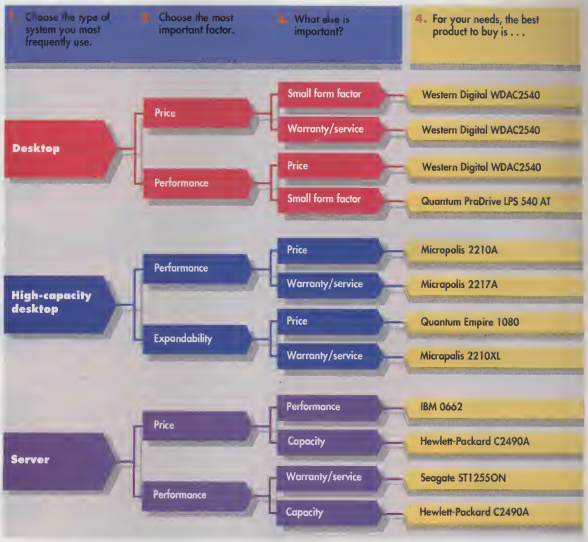
Interface. If you're upgrading your system's storage capacity to the 500MB range, IDE offers one major advantage over SCSI: Practically every desktop PC sold in the last few years has an IDE controller. Plug in a new IDE drive, adjust your system's complementary metal-oxide semiconductor (CMOS) settings, and you're ready to roll.

So what's the catch? IDE drives are limited to 500MB capacity per disk unless you use special partitioning software. And the IDE standard, at least in its current incarnation, allows only two hard drives to connect to the controller at one time. The SCSI interface, on the other

Actual size: Drives this small pack 1GB. Six years ago a similar drive held a measly 20MB.

PC/COMPUTING DECISION MAKER

Which drive is best for your needs?



hand, has no capacity limits, supports up to seven devices (including CD-ROM drives, tape drives, and scanners), and transfers data up to 10 times as fast as IDE drives on ISA machines.

All of that may change later this year, with the introduction of Western Digital's Enhanced IDE (E-IDE) specification. The new spec, supported by five leading drive manufacturers, blows away capacity and data-transfer limits, and supports up to four simultaneous IDE devices, including IDE-based CD-ROM and tape drives. You'll see E-IDE drives hit the market throughout this year. Currently, though, IDE is the interface for simple, standard upgrades, while SCSI is your highway to a high-performance storage smorgasbord.

Form factor. What good is upgrading to a hot new hard drive if it won't fit in your system? With the popularity of small-footprint PCs like Compaq Computer's DeskPro 4/33i series, we noted whether the drive was designed for a 1.5-inch bay or could fit in a smaller internal space.

DESKTOP BARGAINS

For now, a 500MB IDE drive is as close as you can get to plug and play. In our tests, installing a new IDE drive was ridiculously simple: Mount the drive in a free bay, connect the data cables and power supply, set the master/slave jumper, turn on the power, and set the drive type in the BIOS. Because these 500MB drives are at or below the 500MB IDE barrier, there's no need to mess with external drivers or custom partitioning software.

For use on the desktop, we recommend Western Digital's WDAC2540. Its cost per megabyte is as low as 92 cents, better than any drive in the 500MB class. The Quantum ProDrive LPS 540 AT bested it in one performance

IDE Drives Help Those Screaming Applications

Capacity from 513MB all the way up to 1.6GB offers lots of options.

BEST BUYS

	Specifications	Pros and Cons	The Bottom Line
Conner CFP30544 $511/$689 (408) 456-4500 Reader Service No. 691	DOS capacity: 528.50MB Form factor: 1 inch Average access time: 15.55ms Buffer/coche: 256K/64K	Pros: Impressive access time and buffer/cache integration. Cons: Short 2-year worronty.	The only drive in this class to offer buffer and cache, it holds its own in our performonce tests.
Fujitsu M2624T $595/$659 (800) 626-4686 Reader Service No. 692	DOS capacity: 513.51MB Form factor: 1.5 inches Average access time: 18.82ms Buffer/cache: none/64K	Pros: One of o few to offer a 5-year warronty. Cons: Slowest of the IDE drives by a big margin.	Fujitsu has focused on durobility ond service, but the M2624T trails in performance.
Micropolis 2210A $869/$1,099 (818) 709-3300 Reader Service No. 693	DOS capacity: 976MB Form factor: 1.5 inches Average access time: 15.56ms Buffer/cache: 512K/none	Pros: Performance approaches that of SCSI drives. Cons: Sorry, can't find any—we loved it.	A dream drive! This is the only way to go for a 1GB desktop.
Micropolis 2217A $1,149/$1,489 (818) 709-3300 Reader Service No. 694	DOS capacity: 1.6GB Form factor: 1.5 inches Average access time: 15.56ms Buffer/cache: 512K/none	Pros: Sets o new level of capocity for IDE. Cons: Absolutely none: We loved it.	This 1.6GB rocket comes with software to take advantage of its huge capacity.
Quantum ProDrive LPS 540 AT; $595/$599 (408) 894-4000 Reader Service No. 695	DOS capacity: 541.30MB Form factor: 1 inch Average access time: 18.7ms Buffer/cache: none/128K	Pros: Even with just 128K cache, it's a consistent performance winner. Cons: Short 2-year worronty.	A clear winner if value ond performance are your priorities.
Seagate ST3655A $550/$619 (408) 438-6550 Reader Service No. 696	DOS capacity: 545.3MB Form factor: 1 inch Average access time: 18.67ms Buffer/coche: none/256K	Pros: Power-dawn monogement software is great for green PCs. Cons: Poar shawing in our tests.	Belaw-average perfarmer with on averoge price.
Western Digital WDAC2540 $499/$579 (714) 932-5000 Reader Service No. 697	DOS capacity: 540.8MB Form factor: 1 inch Average access time: 17.67ms Buffer/cache: 128K/nane	Pras: Clean design with clear, cancise labeling. Cons: We wish the 3-year worranty were longer.	Best cambination of perfarmonce ond warranty in 500MB range.

Note: Prices represent the lowest and highest offers listed in a survey of recent national advertisements.

test, but its cost per megabyte was as high as $1.11.

For this class of drive, though, the Quantum's two-year warranty may not be enough. If the warranty is a deciding factor, check out Seagate's 545.3MB ST3655A drive. It has a $1.00-to-$1.11-per-megabyte cost and comes with a five-year warranty.

Fujitsu's drives, and the M2624T in particular, earned consistently poor scores on every benchmark test. At 18.82ms, the M2624T had the slowest access time of any drive we tested. Its undersized 64K cache caused it to bring up the rear on every benchmark, at about 15 percent below average. And because its formatted capacity is only 513.51MB, its cost per megabyte zooms to between $1.16 and $1.28. The company announced a new line of drives last fall, however, with availability slated for early this year. Its state-of-the-art drive head technology may well leapfrog its competition in capacity. And expect to see big jumps in performance.

BEST ON THE DESKTOP

Who makes the biggest, baddest IDE drives around? Judging from our tests, there's Micropolis, and then there's everybody else. The Micropolis 2210A and 2217A sprinted in first and second in every ZD Labs test, serving

We Scan Corrected.

You expect a scanned image to accurately reflect the color found in your original. Getting there, however, is usually no picnic. After scanning, precious hours are often spent adjusting the image in software to capture the truest blue, a faithful fuchsia, or for example, just the right kind of red in a ripe watermelon. But DCR™ has changed all that.

Now, when you purchase the **new, low-priced ScanMaker® IISP single-pass color scanner**, you also get **DCR, Dynamic Color Rendition**, an advanced, yet easy-to-use color calibration and correction system. DCR actually calibrates the ScanMaker IISP to a photographic industry-accepted calibration target, creating a custom color profile of your specific scanner, ensuring the most accurate color possible as you scan the image. But don't take our word for it. Here's what *PC Magazine* said in their February 8, 1994 issue: "...this mechanism (DCR) seems to have worked well, because the ScanMaker IISP's color output was clearly the best of any scanner in our survey."

So, even if you need to capture the bright yellow flesh of a Honeyheart watermelon, like the wedge on the left, the quickest way to do it is with the new ScanMaker IISP with DCR.

For more information about the ScanMaker IISP, DCR, your nearest authorized Microtek reseller, or a FREE copy of *The Scanned Image* — a scanning primer, call **1-800-654-4160** or fax (310) 297-5050.

The ScanMaker IISP accurately captures millions of brilliant colors at resolutions up to 1200 x 1200 dpi through software interpolation (300 x 600 dpi optically). In addition to the DCR color calibration/correction system, the ScanMaker IISP is bundled with ***Adobe Photoshop 2.5 LE*** *for either Windows or Macintosh. Windows users also get* ***Caere's Personal PageKeeper Portfolio*** *document and image management software.*

PC MAGAZINE EDITORS' CHOICE™ February 8, 1994 Microtek ScanMaker IISP

IMAGING MAGAZINE EDITORS' CHOICE

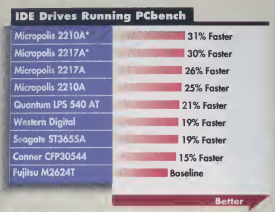
MICROTEK
Better Images Through Innovation.

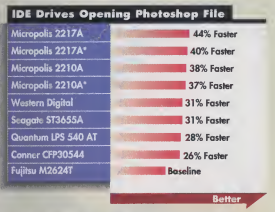
The DCR color calibration / correction system is a proprietary system of Microtek Lab, Inc. The following are trademarks or registered trademarks of their respective companies: Microtek, ScanMaker and DCR (Dynamic Color Rendition) of Microtek Lab, Inc. Adobe Photoshop LE of Adobe Systems, Inc. Personal PageKeeper Portfolio of Caere Corporation. SMIISP594

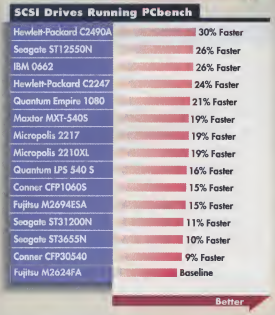
Circle 185 on reader service card.

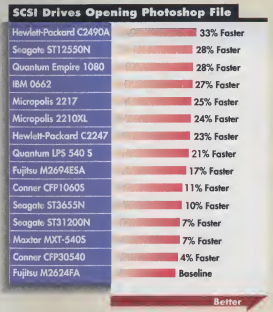
DISK DRIVE BENCHMARKS

Putting the pedal to the metal.









*We ran the Micropolis 2210A and 2217A with Micropolis's bundled Disk Manager software, which eliminates the 500MB limit of IDE drives. Note: PCbench is a subsystem-level benchmark that tests memory, graphics, and disk and video performance.

Who turned in top scores in our benchmark tests? No question about it: Micropolis and Hewlett-Packard took top honors every time. For lab-based results, we ran the PCbench benchmark test. Then, to test real-world thrashing, we timed how long they took to display a 44MB Adobe Photoshop TIFF file.

up data between 4 and 6 percent faster than the next fastest drive in our DOS disk tests. Their disk access times are about 3ms faster than most of the IDE drives we tested. On either drive, the 512K of onboard cache memory is twice as large as that of the next fastest IDE drive.

And that's not all. With both drives, Micropolis bundles a custom Disk Manager driver (from Ontrack Computer Systems) that sweeps aside the DOS disk capacity limitation and, in the process, gives disk performance another boost. Using these drivers, we formatted the 2210A to 976MB and the 2217A to 1.6GB—capacities that are practically unheard-of for IDE drives. Micropolis provides a generous five-year warranty. And at rock-bottom prices of 70 cents and 89 cents per megabyte, these are unbeatable big-storage bargains.

If you need a gigabyte or more on a desktop PC and also want the expandability that SCSI delivers, look first at Quantum's Empire 1080. It was a consistent front-runner in our performance tests and, at between $889 and $966, it costs under 80 to 87 cents per megabyte. The best buy among 1GB SCSI drives with five-year warranties is the Micropolis 2210XL. It's not as zippy as the Quantum contender, but that long-term protection is just the ticket if you lose sleep worrying about hard disk crashes.

It's a Fax Machine, Document Reader, Image Enhancer ...Oh yes, and a Scanner.

The ScanMaker IIG scans at resolutions up to 300 X 600 dpi optical resolution; 1200 x 1200 dpi (software interpolated).

Introducing The Very Affordable ScanMaker® IIG from Microtek.

Only $649 Suggested Retail Price.

Microtek has a long history of making innovative, high-quality products available at very competitive prices. A perfect example is the **new ScanMaker IIG** Grayscale Flatbed Scanner — the lowest priced flatbed scanner available.

The ScanMaker IIG is ideal for scanning pages of text, intricate line art, and black and white or color photos.

And every ScanMaker IIG for the PC[1] includes Caere Corporation's powerful new **OmniScan® Software Edition** which combines three powerful software packages into one integrated and easy-to-use program.

With OmniScan Software Edition you can use **OmniPage Direct**™ to create text files from your scanned documents; **Image Assistant**™, a grayscale image editor to enhance and manipulate black and white images; and **FaxMaster**™ to send, receive and compress fax transmissions right on your computer[2]— **all at the same time, all without closing and opening applications**.

omniSCAN SOFTWARE EDITION

The ScanMaker IIG for the PC with OmniScan Software Edition will allow you to work faster and smarter, and make your system a powerful communications work center.

For more information about the Microtek ScanMaker IIG or for the name of your nearest authorized Microtek retailer, call **1-800-654-4160**.

MICROTEK
Better Images Through Innovation.

1 Every ScanMaker IIG for the Macintosh comes only with **Fractal Design Sketcher 1.0**.
2 Requires fax card.

The following are trademarks or registered trademarks of their respective companies: PC of International Business Machines Corporation. Macintosh of Apple Computer, Inc. Caere, OmniPage Direct, Image Assistant, FaxMaster, OmniScan Software Edition of Caere Corporation; Fractal Design Sketcher of Fractal Design Corporation; ADF-500, ScanMaker of Microtek International, Inc. All other trademarks or registered trademarks are the property of their respective holders. Specific software bundles are subject to change without notice. GCN1093

Circle 138 on reader service card.

500MB SCSI Drives Give You Desktop Elbow Room

Because most have similar warranties, check drive performance.

	Specifications	Pros and Cons	The Bottom Line
Conner CFP30540 $551/$789 (408) 456-4500 Reader Service No. 698	DOS capacity: 545MB Form factor: 1 inch Average access time: 15.55ms Buffer/cache: none/256K	Pros: Quick access time and sufficient cache. Cons: 2-year warranty—the minimum in this class.	Even with good specs, it fell short in our performance tests.
Fujitsu M2624FA $595/$795 (800) 626-4686 Reader Service No. 699	DOS capacity: 520MB Form factor: 1.5 inches Average access time: 18.82ms Buffer/cache: none/240K	Pros: Five-year warranty. Cons: Uses standard SCSI-2, limited to 5MBps transfer rate.	Look for drives later in 1994 with the latest recording technology and caching.
Maxtor MXT-540S $639/$759 (408) 432-1700 Reader Service No. 700	DOS capacity: 521MB Form factor: 1 inch Average access time: 13.26ms Buffer/cache: none/256K	Pros: Among the top drives in performance. Cons: Short 2-year warranty.	Good marks for high performance, but not for high price and short warranty.
Quantum ProDrive LPS 540 S; $534/$575 (408) 894-4000 Reader Service No. 701	DOS capacity: 541.3MB Form factor: 1 inch Average access time: 18.7ms Buffer/cache: 128K/none	Pros: Lowest cost per megabyte of the group, starting at 99 cents. Cons: Short 2-year warranty.	Fastest of the five in real-world tests, with a low price.
Seagate ST3655N $599/$639 (408) 438-6550 Reader Service No. 702	DOS capacity: 545.3MB Form factor: 1 inch Average access time: 18.67ms Buffer/cache: none/256K	Pros: Best of the five in lab-based performance. Cons: Short 2-year warranty.	Consider the reasonable price with 2-year warranty when you look at the ST3655N.

Note: Prices represent the lowest and highest offers listed in a survey of recent national advertisements.

Next, there's the hard truth about hard drives on a network: There are never enough. E-mail archives grow to gargantuan proportions, image databases gobble up disk space in megabyte-sized chunks, and when users figure out it's someone else's responsibility to back up the data on the server, they start storing stuff there. If your network is genuinely small, you might be able to get away with a 1GB drive for starters, but you'd better plan for growth.

BEST FOR THE NETWORK

No matter what capacity you choose, your network deserves a fast SCSI drive to keep pace with a busy workgroup. Why SCSI? Its threefold throughput advantage becomes apparent in heavy network traffic, and its easy expandability means you'll have plenty of options when—not if—you start getting fenced in.

For simple networks, we recommend IBM's 0662. It's the fastest drive in the 1GB class, consistently scoring at the top of the list when we tested 1GB drives.

On most networks, though, 1GB is just an appetizer. If you need storage that stays a step ahead of users, buy Hewlett-Packard's 2GB C2490A. It was the hands-down winner in every ZD Labs benchmark, and its 94-cents-to-$1.09-per-megabyte cost is worth every penny. HP backs it with a five-year limited warranty, but this protection doesn't extend directly to the customer; the distributor must deal with HP in the event of hardware problems.

If warranty protection tops your wish list, then Seagate's ST12550N is for you. In our performance trials, it was a strong second behind HP's bruiser, the 2GB C2490A. While Seagate's five-year warranty is extended through the distributor only, there is a tech support line straight to Seagate. There's also a toll-free number for warranties and repairs.

LITTLE BIG DRIVES

Smaller, faster, cheaper—disk drives have gone through the same shrink cycle as PCs. They're just not sexy. A disk drive is kind of like the drive-train of your car—you don't think about it much, but when it stops working, so do you.

There's more to the drive than capacity and price, however, so check the more detailed look at performance issues that follows. All in all, if you apply the size-and-speed guidelines we've tallied to your desktop, network, and general uptime needs, you'll be rolling along in wide open spaces—without a storage woe—for years to come.

There's just one choice: Insist upon a printer with genuine Adobe™ PostScript™ software inside. It's the industry standard—the only way to guarantee that your printer will work with virtually every software application and hardware environment today and tomorrow. With Adobe PostScript, you're assured the highest quality output whether you're printing from DOS, Windows™, OS/2®, Macintosh® or UNIX®, from a PC or a mainframe. And since almost every major printer manufacturer offers

THE MOST IMPORTANT CHOICE YOU'LL MAKE WHEN CHOOSING A PRINTER, ISN'T JUST THE PRINTER.

Adobe PostScript printers, it's easy to choose the brand of printer that's right for your company. Remember, the best choice is the clear choice. Make sure your next printer has genuine Adobe PostScript. Accept no substitutes. For a free guide on how to choose a printer, call 1-800-962-3623, Dept. D., Ext. 6809

Outside the U.S.A. and Canada call your local distributor or 408-986-6555. Adobe, the Adobe logo, PostScript and the PostScript logo are trademarks of Adobe Systems Incorporated which may be registered in certain jurisdictions. Windows is a trademark of Microsoft Corporation. OS/2 is a registered trademark of International Business Machines Corporation. Macintosh is a registered trademark of Apple Computer, Inc. UNIX is a registered trademark of UNIX System Laboratories. ©1993 Adobe Systems Incorporated. All rights reserved.

IT'S NOT JUST PRINTING, IT'S ADOBE POSTSCRIPT PRINTING.

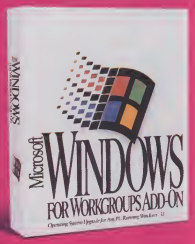
Circle 132 on reader service card.

Adobe

MAKE YOUR WINDOWS 3.1

go faster.

CHANGE GEAR.



Microsoft® Windows™ for Workgroups 3.11 is fast. Very fast.

In fact it might be more appropriate to call it Microsoft Windows GTI. Because, for local disk access, it's now up to 150% faster than Windows 3.1 operating system. This added speed, powered by 32-bit technology from our "Chicago" project, means applications can be loaded at twice the speed. It also makes searching for files and loading Windows up to 100% faster.*

You'll be happy to hear that this new version of Windows can be used by everyone, whether you're stand-alone, networked, or dialing into your office from the road. Windows for Workgroups just installs what you need and you're off to the races.

Packed with new features like Microsoft At Work™ fax technology and super-fast networking that works with Novell® NetWare®, Windows NT™ and other standards, Windows for Workgroups 3.11 is an essential upgrade for any Windows 3.1 user. But there's only one way to experience this speed and power. Drive it.

Microsoft®

*Performance figures may vary depending on configuration. Ziff-Davis WinBench® speed tests were average performance runs (100 being baseline 3.0) based on a Zenith Zoom 425 Lap+Intel 80386-based computer and an 80386-based computer (both uncompressed and compressed disk volumes used) with 4MB RAM, 200MB hard disk, 512 cache and IDE disk controller. Test was run using MS-DOS® 6.2. Test not verified by Ziff-Davis. © 1994 Microsoft Corporation. All rights reserved. Microsoft and MS-DOS are registered trademarks and Windows, Windows NT and Microsoft At Work are trademarks of Microsoft Corporation. Novell and NetWare are registered trademarks of Novell Corp. In the 50 United States, call (800) 426-9400. Customers in Canada, call (800) 563-9048, outside the 50 United States and Canada, call your local Microsoft subsidiary or (206) 936-8661.

1GB to 2GB SCSI-2 Drives Keep Your Network Kicking

Safeguard your round-the-clock apps by checking the warranty conditions.

	Specifications	Pros and Cons	The Bottom Line
Conner CFP1060S $939/$999 (408) 456-4500 Reader Service No. 703	DOS capacity: 1.06GB Form factor: 1.5 inches Average access time: 14.75ms Buffer/cache: none/512K	Pros: Great 5-year warranty for network reliability. Cons: Simply couldn't compete in our performance tests.	Even an impressive access time didn't keep this drive in the running for top honors.
Fujitsu M2694ESA $829/$999 (800) 626-4686 Reader Service No. 704	DOS capacity: 1.08GB Form factor: 1.5 inches Average access time: 15.10ms Buffer/cache: none/512K	Pros: Low 75- to 90-cent-per-megobyte cost and 5-year warranty. Cons: Weak performonce.	Great price and impressive warranty moke this ideal for bargoin hunters.
HP C2247 $925/$1,065 (800) 826-4111 Reader Service No. 705	DOS capacity: 1.05GB Form factor: 1.5 inches Average access time: 16.06ms Buffer/cache: 256K/none	Pros: Well-built, with o 5-year limited worranty. Cons: Middle-of-the-road performonce and cost.	Offers durable construction and the olways-needed built-in drive rails.
HP C2490A $1,935/$2,245 (800) 826-4111 Reader Service No. 706	DOS capacity: 2.01GB Form factor: 1.5 inches Average access time: 13.59ms Buffer/cache: none/256K	Pros: Impressive access time and advonced algorithms. Cons: High in cost per megabyte ot $1.09.	The leoder in every performance test. Our first choice for SCSI performonce.
IBM 0662 $999/$1,099 (800) 426-2968 Reader Service No. 707	DOS capacity: 1.05GB Form factor: 1 inch Average access time: 14ms Buffer/cache: 512K/none	Pros: High speed; long warranty. Cons: High 95 cent to $1.04 cost-per-megobyte.	Blazing speed backed by IBM service and o 5-year warranty—a good choice.
Micropolis 2210XL $880/$995 (818) 709-3300 Reader Service No. 708	DOS capacity: 1.05GB Form factor: 1.5 inches Average access time: 15.56ms Buffer/cache: 512K/none	Pros: Low 82-cent-per megobyte cost and 5-year worronty. Cons: Produced only midrange performance numbers.	A cleor choice if you're looking for o moderately priced 1GB drive.
Micropolis 2217 $1,166/$1,399 (818) 709-3300 Reader Service No. 709	DOS capacity: 1.63GB Form factor: 1.5 inches Average access time: 15.56ms Buffer/cache: 512K/none	Pros: Lowest cost per megobyte at 70 cents and 5-year worronty. Cons: Midronge performonce.	At that low cost, it's an incredible volue with o greot 5-year worronty.
Quantum Empire 1080 $889/$966 (408) 894-4000 Reader Service No. 710	DOS capacity: 1.08GB Form factor: 1 inch Average access time: 15.10ms Buffer/cache: 512K/none	Pros: Scored well in all performance tests. Cons: Still looking.	New recording technology packs 1GB into 1-inch form factor. Our expondability choice.
Seagate ST31200N $790/$1,149 (408) 438-6550 Reader Service No. 711	DOS capacity: 1.01GB Form factor: 1 inch Average access time: 14.56ms Buffer/cache: none/256K	Pros: Kudos for the 5-year warranty. Cons: Avoid the top $1.11-per-megobyte price.	Quick oocess time didn't help—it logged behind the leaders in performonce tests.
Seagate ST12550N $1,850/$2,299 (408) 438-6550 Reader Service No. 712	DOS capacity: 2.14GB Form factor: 1.5 inches Average access time: 12.17ms Buffer/cache: none/1MB	Pros: Impressive 5-year worranty and extended service plons. Cons: At the high end of the cost scole ot $1.05.	Boasts the fostest ocess time of all the SCSI drives we tested.

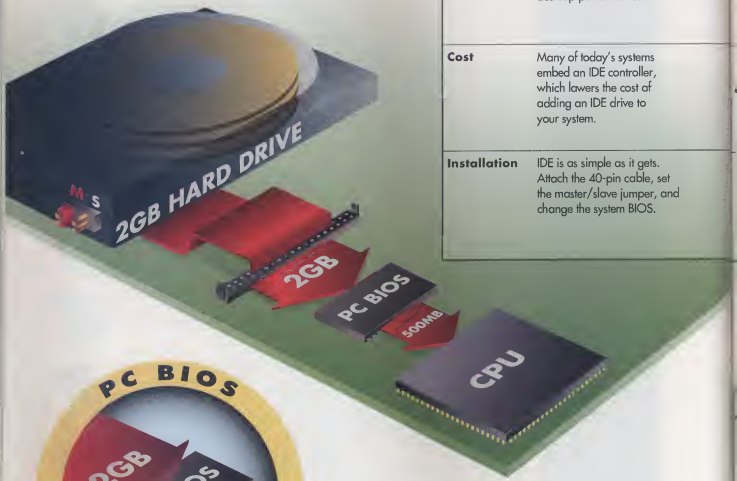
SCSI

Note: Prices represent the lowest and highest offers listed in a survey of recent national advertisements.

IDE or SCSI? It's Access Speed vs. Capacity

Mast of today's hard drives affer either an IDE or a SCSI interface. How do the two compare? When it comes to access speed, cost, and ease of installation on the desktop, IDE excels. Laok at transfer rate, cost, and potential capacity on the server, thaugh, and SCSI is the undisputed leader.

	IDE
Performance	Large coches and advanced caching algarithms give IDE the edge when it comes to desktop performance.
Cost	Many of today's systems embed an IDE controller, which lawers the cost af adding an IDE drive to your system.
Installation	IDE is as simple as it gets. Attach the 40-pin cable, set the master/slave jumper, and change the system BIOS.



IDE'S CAPACITY CRUNCH

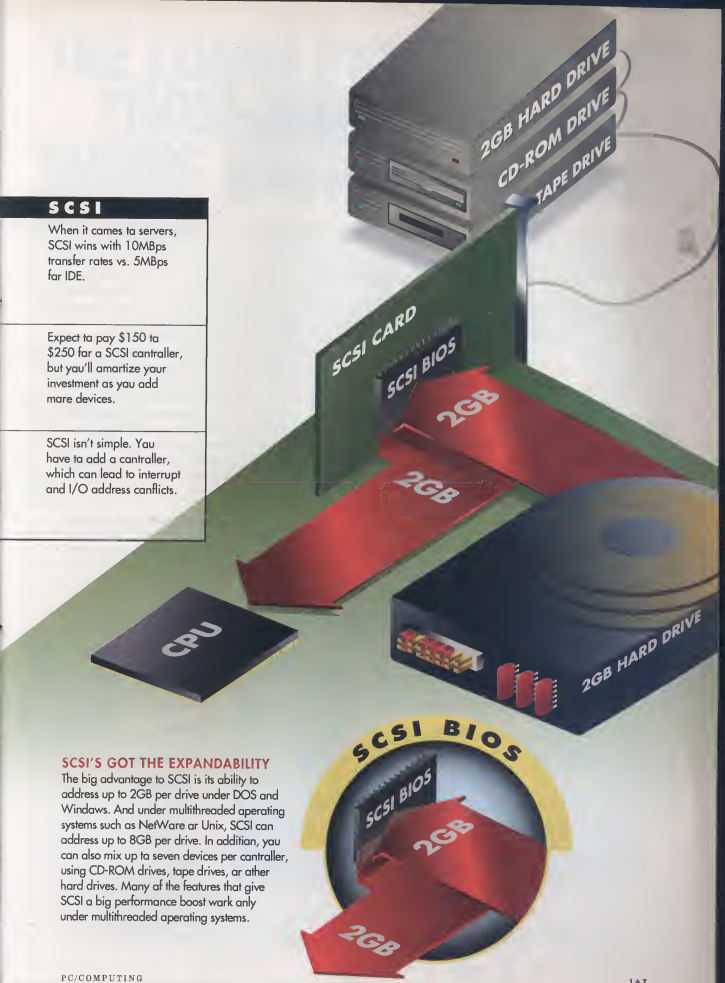
The big disadvantage ta IDE is its limitatian to two physical drives at 500MB each (for a total of 1GB). Yau can physically install bigger drives (up ta 2GB), but without special partitioning software, you're wasting your money. You can write to or read from only 500MB at a time. Why the squeeze? Because IDE depends on the PC BIOS, which was designed when a 20MB hard drive seemed enormous.

SCSI

When it comes to servers, SCSI wins with 10MBps transfer rates vs. 5MBps for IDE.

Expect to pay $150 to $250 for a SCSI controller, but you'll amortize your investment as you add more devices.

SCSI isn't simple. You have to add a controller, which can lead to interrupt and I/O address conflicts.



SCSI'S GOT THE EXPANDABILITY

The big advantage to SCSI is its ability to address up to 2GB per drive under DOS and Windows. And under multithreaded operating systems such as NetWare or Unix, SCSI can address up to 8GB per drive. In addition, you can also mix up to seven devices per controller, using CD-ROM drives, tape drives, or other hard drives. Many of the features that give SCSI a big performance boost work only under multithreaded operating systems.

Kick Your Disk Into Overdrive

Don't let your drive be the albatross around your PC's neck.

PENTIUMS GALLOPING at 60MHz. Plenty of elbow room in 64MB of RAM. Sprawling vistas from local-bus video. Looks like the pieces for the ultimate desktop have finally come together. But nothing gets rolling on a computer without the good ol' reliable hard disk getting involved. Listen closely when you boot up, load applications, or save files, and you'll hear that faint, familiar grinding sound. That's the sound of the hard disk, but it might as well be the rest of the system tapping its fingers as it waits. The hard disk is still the bottleneck holding you back from breakneck speed.

While the rest of the PC's internals have made exponential jumps in performance, disk drives have lagged behind, making only incremental gains. That's not to say that disk drive technology has been moribund. Compare the classic Seagate 20MB ST225—the best-of-breed six years ago—to today's 2GB Seagate ST12550N, and the contrast is mind-boggling.

The fact is, disk drives have shown a tenfold increase in capacity, coupled with a twentyfold decrease in price—not to mention a simultaneous fiftyfold jump in reliability. The problem is that CPU speeds have jumped a hundredfold. So far, Intel's on schedule. The Pentium, running at twice the speed of most 486 chips, gives weary disk drive developers no time to rest on their laurels.

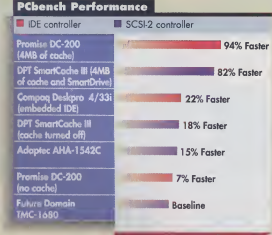
Since every component in a system intimately depends on the others, Pentium speeds won't be as impressive unless disks continue to increase in speed and capacity. This is not to say that the disk drive manufacturers have been snoozing while the rest of the industry thunders by. However, because they're the only ones who have to deal with moving parts and the associated laws of physics, they're at a distinct disadvantage. The CPU, RAM, and the bus have no moving parts and operate on a different plane from the conventional disk drive.

ANTE UP THE CACHE

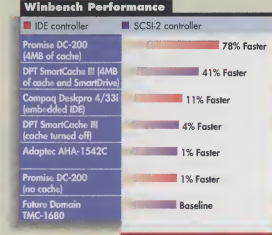
Seagate's new Elite 9 ST410800N disk drive uses the same technology that increases capacity in 3.5-inch drives and uses it to bulk up a 5.25-inch drive to 9GB. That's impressive capacity, but unless you match that capacity with improved performance, it's like making a

FOR BEST RESULTS, ADD CONTROLLERS WITH CACHE

Whether it's IDE or SCSI doesn't matter.



Note: PCbench is a subsystem-level benchmark that tests memory, graphics, and disk and video performance.



Note: The Winbench suite of tests measures the graphics and disk performance of PCs running Windows 3.1.

In our lab-based benchmarks, the same controller with cache performed 77 to 87 percent faster.

THE COMM PROGRAM FOR THOSE WHO INSIST ON TAKING THE EASY WAY OUT.

Our users know it. The reviews and awards confirm it. And the increasing number of people moving to Crosstalk® for Windows proves it.

Whether you need a way out to an on-line service, your favorite bulletin board or your company's host computer, the easy way is Crosstalk.

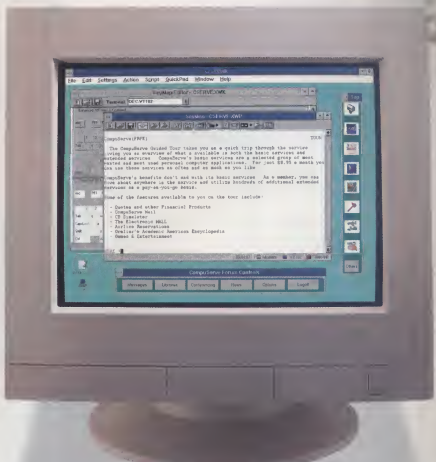
We make communicating easier with features like our QuickBar toolbar and our QuickPad™ editor, which lets even non-programmers build customized controls for frequent sessions. And those are just a couple of the reasons why Crosstalk has been the *PC Magazine* Editors' Choice for the last two years.

Everything about the Crosstalk interface is designed for speed and convenience. And naturally, along with all that ease-of-use, you get the unmatched power that Crosstalk has always been known for. *PC World* wrapped up its recent review by saying, "Thanks to its clean and easy-to-use interface backed by its solid set of emulations and transfer protocols, strong scripting capabilities and remote access tools, Crosstalk easily rates a Best Buy."

For a limited time, you can trade up to Crosstalk for Windows™ from any competitive product for only $49 when you call DCA® directly.

So why make it hard on yourself? Take the easy way out.

1-800-348-3221, ext. 63K*



"If you like a clean, uncluttered Windows interface with some of the best-designed icons anywhere, Crosstalk won't disappoint."
— PC World *Best Buy, November 1993*

You can easily create your own customized QuickPads, or use our pre-built ones for on-line services.

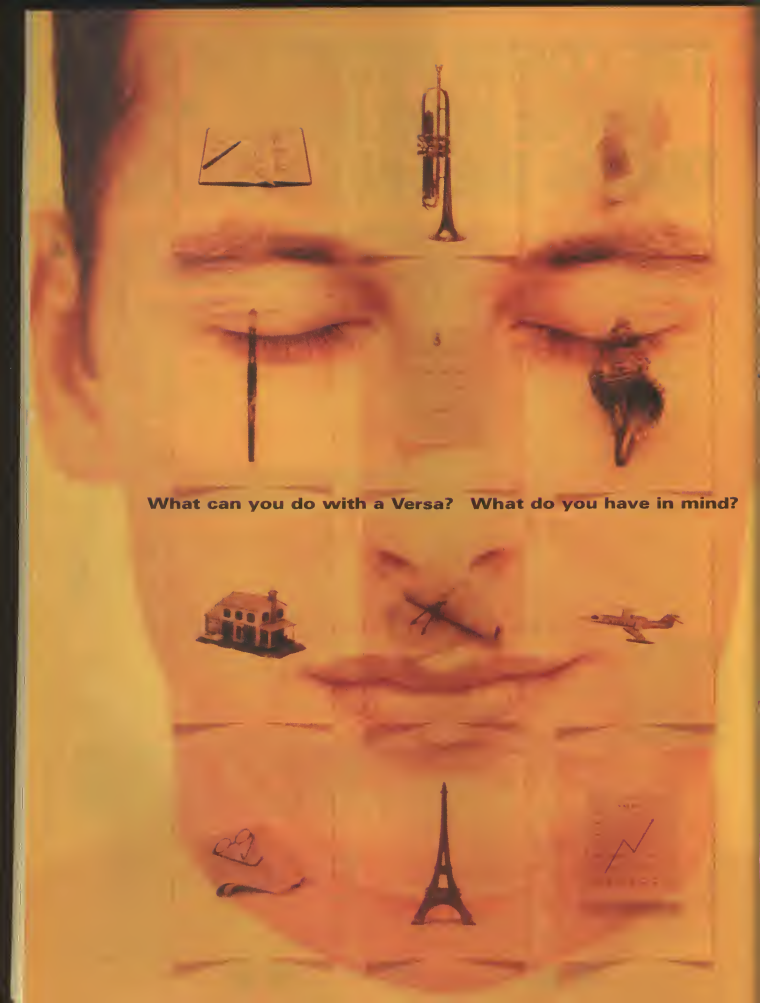
DCA

The Freedom To Communicate.

Circle 260 on reader service card.

*Or call (404) 475-8380. Offer good through June 30, 1994. ©1994 Digital Communications Associates, Inc. All rights reserved. DCA and Crosstalk are registered trademarks and QuickPad is a trademark of Digital Communications Associates, Inc. Windows is a trademark of Microsoft Corporation. All other trademarks are the property of their owners.

SEE US AT NETWORKS EXPO BOOTH #3109.


What can you do with a Versa? What do you have in mind?

You are an unfinished book.

A work in progress. A growing stack of unbound pages; the story of all you are, and will be. There are pages devoted to the things you have to do: Edit your report. Work on your presentation. There are other pages full of the things you like to do: Music. Art. Travel. But most are full of ideas that you'd like to share with the world. That you've *got* to share with the world. You are an unfinished book. And the best part of the story is, you'll never be done.

Our new Versa notebook is flexible enough to help you with all the pages of your life. It's a canvas with a keyboard. A power tool with a trackball. It's perfect for sharing ideas with people right in front of you or, using its advanced communications capabilities, a continent away. The artistry of its new, brighter, active-matrix color screen could well inspire you to some artistry of your own. While its unique, color TouchPen™ capability invites precise annotating, or impassioned finger-painting. (For up to 10 hours on a single charge.) Versa can be a notebook, a desktop, or a tablet. Above all, its modular design lets it expand for changing needs and new technologies. Because in technology as in life, there's a new page written every day.

NEC

Circle 157 on reader service card.

*Ultralite Versa 33C. PC Magazine 1-11-94. **340MB hard drive storing up to 680 MB using Microsoft DoubleSpace. Versa, TouchPen, VersaTrack, DoubleTime and FastFacts are trademarks and UltraCare a service mark of NEC Technologies, Inc. Docking Station is a trademark of NEC Home Electronics, Inc. The Intel Inside logo is a registered trademark of Intel Corp. All other trademarks and registered trademarks are the property of their respective owners. Specifications subject to change without notice. © 1994 NEC Technologies, Inc. NEC 05HH0800NB-NUBB341

Our philosophy is that a notebook PC shouldn't be some frozen, soldered-together lump of metal and plastic, easily superseded by the next advance in technology. It should be upgradable and expandable, ready to embrace new technologies that come along.

That's why we've made the NEC Versa arguably the most modular and expandable notebook PC you can buy.

It's also why, when you buy a Versa, you're buying into something else: a relationship. With us. We'll make it a relationship that works, too. By making component upgrades as easy as possible. And by being here to provide answers, support and a 3-year limited warranty enhanced by UltraCare,℠ our full-service program of fast response and support anytime, anywhere, at home or overseas.

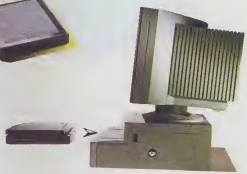
Starting out, of course, we've made Versa as powerful and as useful as technology permits. In fact, our new Versa is even more capable than the Versa that PC Magazine called "Best of 1993."*

It uses the SL-Enhanced 486DX2 40MHz, 50MHz or new IntelDX4™ 75MHz processor, giving you both efficient power management and uncompromised processor performance. And it combines our latest local bus video technology with a powerful graphics accelerator, for amazingly quick graphics response.

It also has a nimble, integrated VersaTrack™ trackball, designed to work with the human hand, not against it. A hard drive that lets you store up to 680MB.**

Versa's screen—crisp, sharp monochrome or brighter-than-ever active-matrix color—can be reversed for presentations.

Our exclusive DoubleTime™ technology lets you snap in a second battery in place of the removable floppy drive, giving you up to 10 hours of computing time.



Versa's optional Docking Station™ or port replicator gives you desktop connectivity and capabilities, in seconds.

Versa converts quickly to a TouchPen-capable system, sensitive to pen or even your fingertip, for editing, note-taking or just state-of-the-art doodling.

PCMCIA slots for instant upgrades in storage, wireless communications, networking and other future technologies. And more. (But that's all we have room for on this page.)

Call us at 1-800-NEC-VERSA. Or, for immediate response via FastFacts,℠ call 1-800-366-0476, #83772.

Circle 159 on reader service card.

NEC

truck bigger without increasing the size of its engine—you're not going to derive significant performance advantage, even though you can haul more stuff.

So what's the solution? Check out what we found to be the largest single contributor to great multimegabyte transfer rates in today's drives: cache.

Look at the specs of the latest systems and you'll see cache on the CPU (both internal and external), on the disk drive, and in some cases even on the disk controller. Any time you're moving bits from one part of the computer to the other, there's a potential bottleneck. Manufacturers have found that by adding cache, which act as buffer zones for the data, they can provide big jumps in performance.

Here's why: Disk drives transfer data in a matter of milliseconds. The RAM in your PC operates in a completely different time frame—its rapid-fire work goes by in nanoseconds, as does the work of the CPU. As a result, your RAM and your CPU—and ultimately you—spend a lot of time waiting for the hard drive.

Putting cache on the disk drive itself is an intelligent way to boost performance. Of course, there are varying degrees of intelligence implemented in caching algorithms. Disk drive spec sheets use the terms *buffer* and *cache* interchangeably, but in reality, a buffer is just a parking space. A cache indicates the presence of a specialized algorithm to improve performance when data moves from the disk to cache (known as *reads)* or from RAM to cache (known as *writes).* The goal is a cache *hit*—smoothly reading from or writing to the cache instead of reading from or writing to the disk.

You get *read hits* in two ways. You may be requesting information in a logical, sequential pattern, and the drive, anticipating your next move, will go out and fetch the data before you ask for it. The second and more common occurrence comes about because people tend to access the same data over and over. The drive will just hold the data in the cache because it's easier for you to get it from there.

Write hits, on the other hand, depend on the algorithm. As long as there is room in the cache, data keeps heading into the cache from the system RAM. Your caching algorithm will track the percentage of data that's been sent to the cache but hasn't yet moved onto the disk. Because data that's not in the cache hasn't been saved yet, you don't want it hanging around for too long. If the algorithm starts detecting too much "unsaved" or "dirty" data, the cache will send the data directly to the disk (a process known as *write-through* mode) instead of sending it to cache (which is known as *delayed-write* mode).

PERFORMANCE-BOOSTING CONTROLLERS

No doubt about it—caching is good. After all, the disk drives we tested offered cache ranging from 64K up to 1MB, and as a rule, the drives with larger cache performed significantly better. The question remains, though: What is the best way to add cache?

We ask this because we noticed something odd in our results—there was no dramatic difference in performance among all the drives. The final stats were all within four percentage points of each other. Since one of our goals with this project was to help you identify the right disk drive for your needs, we decided to extend our quest for better performance. To do that, we looked beyond the disk drives themselves to controllers and caching products. In all, we tested five of the industry's leading disk controllers (two with caching) and three software cache products, all of which claim to boost hard drive performance.

The disk controller vendors are staking out turf on several fronts. They offer either an IDE or a SCSI interface, and they cache or they don't.

In the SCSI-2 corral, we rounded up an Adaptec AHA-1542C, Distributed Processing Technology's SmartCache III PM2021, and Future Domain's TMC-1680. Each product targets a different niche.

Adaptec has staked a strong claim on the SCSI controller market because it supports multiple operating systems and claims to offer universal device support. Future Domain has made a name by bundling its product with storage-related devices, while DPT is the unchallenged market leader in hardware caching.

THE UPGRADE PATH

Should you pop for a swap?

Here are some of the things you must consider when purchasing an IDE or a SCSI drive:

IDE checklist. If you already have two IDE drives, adding a third gets a little tricky. Standard IDE controllers on most motherboards support only two hard drives. To add a third drive, you need to add a secondary IDE controller board. Take a look at the Promise Technology DC-200 controller, which supports up to four IDE drives.

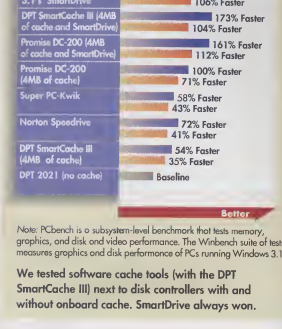
Now that the new IDE drive is installed, you need to set the master/slave jumper. When IDE drives work in pairs, one acts as the master, the second as the slave. If you're adding a second drive, check its documentation and make sure it's configured to act as a slave.

SCSI checklist. Adding SCSI to a system requires installing a SCSI controller in most cases. All the SCSI controllers in our review are configurable as either the boot device or the secondary device (in case you keep your IDE drive). Before buying a controller, check your system to confirm it doesn't have one built in.

Every SCSI device is differentiated by a unique ID number. Make sure no two devices share the same SCSI ID. If they do, you can change the SCSI ID with jumpers located on each device.

SOFT OR HARD CACHE?

Surprise—the best boost is with Windows 3.1.



Note: PCbench is a subsystem-level benchmark that tests memory, graphics, and disk and video performance. The Winbench suite of tests measures graphics and disk performance of PCs running Windows 3.1.

We tested software cache tools (with the DPT SmartCache III) next to disk controllers with and without onboard cache. SmartDrive always won.

For the IDE interface, we looked at the embedded IDE controller in the Compaq Deskpro 4/33i and a Promise Technology DC-200. The DC-200 controller, like the SmartCache III PM2021, offers caching as an option. We ran all of the controllers through our PCbench and Winbench tests on the Compaq Deskpro 4/33i with 8MB of RAM. In those tests, controllers with the IDE interface clearly outperformed SCSI under both DOS and Windows. But when we added cache to both the SmartCache III PM2021 SCSI controller and the DC-200 IDE controller, both showed a huge performance boost.

It's possible that by caching your disk drive you can save yourself several hours every week. Adding hardware cache to the controller boosted performance an average of 65 percent in our benchmark tests. But when you buy a disk controller with cache, the extra hardware will cost you.

SOFTWARE CACHING

We also investigated the option of using a software cache. You can get PC-Kwik's Super PC-Kwik for $79.95 and Symantec's Norton Speedrive for $99. And SmartDrive disk cache software—standard issue from Microsoft ever since DOS 4.01 and Windows 3.1—is no slouch.

Don't be put off by the recent controversy with MS-DOS 6. Microsoft set the default with write-caching turned on, and everyone who upgraded to DOS 6 witnessed blazing performance. But with this speed came a problem: Microsoft neglected to mention that if users stopped working and almost immediately turned off their PCs, there wouldn't be enough time for the cache to flush data to the hard drive, and data could be lost. Faced with the choice of boosting performance or protecting its users, Microsoft started shipping DOS 6.2 with write-caching turned off.

So when we tested this hot capability, we first ran SmartDrive using the current defaults—read-caching on, write-caching off. Performance jumped more than 60 percent. We didn't stop there. Next we enabled write-caching. Our jaws dropped when we gained *another* 110 percent over the 60 percent mark. SmartDrive not only blew away both the third-party products (PC-Kwik's Super PC-Kwik and Norton Speedrive), it out-performed both DPT's and Promise Technology's hardware caching products.

Want a quick picture of how SmartDrive is configured in your system? Type SMARTDRV at the DOS prompt, and up comes a concise explanation of how it's configured and what type of cache hit rate you're getting. To learn the details of configuring SmartDrive, use the DOS help system. Turn on the write cache—just don't be too quick (wait two seconds) when you hit the off switch. While it uses some of your precious RAM, it's a small price to pay for the stunning jump in performance.

THE CACHE AND CONTROLLERS DRAWER

Here's how to find the cache and controllers we tested.

Adaptec AHA-1542C • $269 • Adaptec • 691 S. Milpitas Blvd., Milpitas, CA 95035 • (800) 934-2766, (408) 945-8600
Circle No. 713 on Reader Service Card

DC-200 • $149 • Promise Technology • 1460 Koll Circle, San Jose, CA 95112 • (800) 888-0245, (408) 452-0948
Circle No. 714 on Reader Service Card

Norton Speedrive • $99 • Symantec Corp. • 10201 Torre Ave., Cupertino, CA 95014 • (800) 441-7234, (408) 253-9600
Circle No. 715 on Reader Service Card

SmartCache III PM2021 • $285; $1,235 with 4MB of RAM • Distributed Processing Technology • 140 Candace Dr., Maitland, FL 32751 • (800) 322-4378, (407) 830-5522
Circle No. 716 on Reader Service Card

SmartDrive • Bundled with Windows and DOS • Microsoft Corp. • 1 Microsoft Way, Redmond, WA 98052 • (206) 882-8080
Circle No. 717 on Reader Service Card

Super PC-Kwik • $79.95 • PC-Kwik Corp. • 15100 S.W. Koll Pkwy., Beaverton, OR 97006 • (800) 274-5945, (503) 644-5644
Circle No. 718 on Reader Service Card

TMC-1680 • $169 • Future Domain Corp. • 2801 McGow Ave., Irvine, CA 92714 • (800) 879-7599, (714) 253-0400
Circle No. 719 on Reader Service Card

COLORADO TAPE BACKUP

Colorado Tape Backup vs. floppy disk stackup.

May We Suggest The Stack on the Right.

You need to protect your data. *With today's hard disk capacities backing up on floppy could take 80, 100, even 200 or more diskettes and several hours.* ■ *Colorado Memory Systems has a better way. Colorado Tape Backup.* ■ ***Your data is your most valuable asset.*** *Independent studies show that recovering lost data can take as long as 42 days, costing as much as $98,000*. And only 6% of businesses survive more than two years after major data loss.* ■ ***Colorado tape backup is the easiest and most reliable way to protect your data.*** *With dozens of awards and more recommendations by users, resellers, and editors than all other backup systems combined, nothing else stacks up to Colorado.* ■ ***Explore Colorado Tape Backup Solutions today.*** *Visit your dealer or* ***call 1-800-451-0897,*** *extension 723 for details.* ■

*Capacities from 120 MB to 4 GB***

COLORADO MEMORY SYSTEMS INC

* Source: EDC. ** Capacity using data compression. © 1993 Colorado Memory Systems, Inc. All rights reserved. Colorado and Jumbo are trademarks of Colorado Memory Systems Inc. All other trademarks are property of their respective companies. 1MB PCI 0903/3

Circle 184 on reader service card.

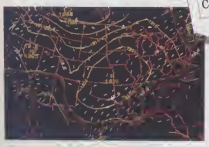
Use The Internet Like A Pro.

Navigating the Internet Just Got Easier with WinGopher

Have you wanted access to the Internet without the hassle of typing complicated addresses or memorizing file locations? Do you lose valuable time wandering through a maze of servers and unwanted files? Now you can organize and simplify your Internet access with WinGopher,™ a Microsoft® Windows™-based Gopher client.

MICROSOFT WINDOWS COMPATIBLE

Requirements for Gopher Clients	WinGopher
Complete Package for Immediate Access	✓
Installation Support	✓
Users' Guide and Online Help	✓
Includes Text and Image Viewers	✓
Supports Windows Sound and Video Viewers	✓
Supports Phone Books	✓
Enhanced Bookmarks	✓
Views Multiple Open Servers	✓
Supports Winsock Compatible TCP/IP Stacks	✓
Compatible with Other Windows Applications	✓



View multiple servers at one time.

WinGopher provides you with a graphical interface that uses pull-down menus and point-and-click functionality for easy Internet navigation. Using the Gopher protocol, WinGopher supports Archie, Veronica, and WAIS searching.

FTP transactions and Telnet sessions are supported, as well as any Windows sound or video viewer. An image viewer and text viewer are included with WinGopher.

Pop-up windows for searches.

Why WinGopher?

WinGopher is a fully supported product, including installation phone support, user documentation, online help, and an E-Mail bulletin board service. Backed by a leading automation firm, you're not left stranded should you need assistance.

WinGopher Solutions to Meet Your Needs

Whether you need a complete package to begin accessing the Internet, or you are already connecting to the Internet, WinGopher offers you the solution to meet your needs.

WinGopher provides you with a graphical interface to the Internet. It requires: Windows TCP/IP stack software (Winsock 1.1 compatible) and a connection; 386 PC or higher with Windows 3.1 and DOS 5.0; 3.5 MB disk space and 2 MB additional memory. **$69.95**

Now Available – WinGopher Complete provides you with everything you need to start accessing the Internet immediately. Included are WinGopher, a Windows TCP/IP stack software package (Winsock-compatible), and an Internet connection through a leading national access provider. With WinGopher Complete, you get 30 free minutes of Internet connect time. **$129.00**

Call 1-800-55-NOTIS

FAX (708) 866-4970 • EMail: wingopher@notis.com

WinGopher™

GRAPHICAL INTERFACE FOR THE INTERNET

NOTIS Systems, Inc. • An Ameritech Company • Evanston, IL 60201-3622

Circle 241 on reader service card.

FINAL ANALYSIS

Media Junkies: Take Note

Watch for better technology to keep boosting capacity.

THESE NEW, high-capacity disk drives will help you move into new applications territory. But expect even more changes: Interfaces will improve, and advancements in media and electronics will yield increased capacity.

Start with the two most common interfaces: IDE and SCSI. If you look only at the specs, SCSI appears to have an unfair advantage over IDE. The most common SCSI interface used today is SCSI-2 Fast. The name refers to its ability to send data across the bus at 10MB per second, twice as fast as the previous SCSI spec. Add to that the ability to connect to up to 8GB of storage (under DOS and Windows), and talk to seven devices from one controller, and SCSI-2 Fast has no equal.

Furthermore, the IDE interface is limited to 500MB per disk (two disks, max) and it won't support other peripherals, such as scanners or CD-ROMs. So why isn't SCSI flourishing on the desktop?

The problem is that many of SCSI's features become relatively obsolete when introduced into a single-threaded DOS/Windows environment. More commonly used in multithreaded operating systems, SCSI has the ability to send a disconnect-and-redirect command to disconnect from one device and attach to another. It can do this with multiple devices simultaneously, which improves seek time.

Don't expect the IDE spec to go down without a fight. After all, the proliferation of PCs has kept IDE's cost low and its installation simple. At the same time, look for Western Digital's Enhanced IDE interface. With transfer rates equal to SCSI-2 Fast, it will support up to four devices. Western Digital has already announced drives scheduled for the first half of this year, and four of its leading competitors have announced their support for the spec.

BUILDING BLOCKS

With an eye to the future, disk drive manufacturers are also looking at new technologies that will boost their products' capacity. There are three factors that affect your disk drive's storage capacity: how data is recorded, the surface material used to store data, and the fundamental electronic mechanisms within the drive.

When it comes to recording, some disk drive manufacturers are pushing the envelope with Zone Bit Recording (ZBR).

Traditionally, disks stored the same amount of data on the larger tracks at the outside of the disk as they stored on the much smaller inner tracks. ZBR sidesteps this by packing more sectors (512 bytes per sector) on to the larger outer tracks.

Simultaneous with the advent of ZBR, electronic mechanisms in disk drives are becoming more precise. New mechanisms don't need as much of a buffer zone to accurately save, so even more of that precious buffer real estate now can be used for data instead.

In addition to improving traction, disk drive manufacturers are also improving focus with a technology called magneto-resistance (MR) for the drive's heads. Magneto-resistance describes what happens when metal is introduced to a magnetic field—the metal increases the field's resistance to electrical flow.

As a result, magneto-resistant heads can actively and precisely detect changes in the magnetic fields of the disk media, and they can store more bits of data.

Look for these technologies to be incorporated slowly into current drive designs. Fujitsu, for example, is already planning to ship its new Allegro MR-based disk drives, supporting between 1GB and 3GB in formatted capacity.

Our recommendations are simple when it comes to big drives for the long haul. When it comes to the server, head for the expandability of SCSI. On the desktop, depend on the de facto IDE standard. To avoid speed bumps, use your cache wisely—and tweak the SmartDrive utility that Microsoft bundles.

Keep your eyes on the horizon, though: A couple of years from now, new technologies will open up even wider disk drive vistas.

THE ENDURANCE TESTS CONTINUE

You ain't heard the last of this, pardner.

We figured that since you don't turn your disk drives off, there was no reason for us to turn ours off. Our labs have left them running. Think of the performance testing we did for this entire article as a 5-kilometer run. That was just a warm-up. We've already fired the starter's pistol for the Iron Man triathlon of disk drives. Almost all of the drives we tested for this article are still going strong. We're going to keep them going, too, until we find the upper-end of these mean-time-between-failure (MTBF) numbers.

We'll periodically report on how the drives are doing in this long-term, real-world disk-banging. We'll beat 'em, bake 'em, subject 'em to power surges, and keep checking their seek times. We'll report the results in a succinct, informative way that will help you predict when your disks will start breaking a heavy sweat.

PowerViewer

It's 9:00, Monday morning and you've just learned the horrifying news. That big meeting with the president of the company next week? It's been moved up. Way, way up. And that report for the big meeting? It's due in half an hour. Fortunately, you've got PowerViewer™ for Windows™, the one tool that lets you access virtually any database and create presentation-ready reports with a few simple clicks of the mouse. You take a long sip of coffee, sit down in front of your computer and click open PowerViewer.

Access More Information.

Click. Quickly, you access the Connect Profile menu and select the database you want. Because PowerViewer supports over 25 of the most popular PC and relational databases, all the information you need is right at your fingertips. And with Powersoft's Database Connection Hotline, you know any questions you have will receive immediate answers. Click. You go into the Report Painter and select the specific data for your report using one of PowerViewer's powerful point-and-click query techniques. You choose the one that suits you best, whether it's our easy-to-use QuickSelect, our powerful graphical query builder, or a query you've saved from a previous task. Click. Now you're ready to create your report. You select one of the many built-in QuickStyle

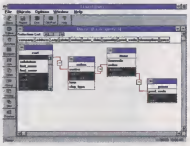
Create Stunning Reports.

templates that enable you to create stunning reports with full-color 2D and 3D graphs and charts. PowerGuides and Data Smart design tools lead you through every step and let you preview and customize any aspect of your report in seconds. Include a pie chart. Change fonts. Add colors. Pull in your corporate logo. And click, click, click — suddenly, you've created a masterpiece. PowerViewer makes information access as simple as point and click. It empowers you to make full use of your company's information and lets you do it faster and with greater ease than you ever thought possible.

PowerViewer, Just $99.*

It's 11:00 and you've just come out of the big meeting. Your report was a hit. A big hit. So big, in fact, the president has asked you to run it by the entire company, gather everyone's opinions and give him a report on your findings. Under ordinary circumstances, this would be the kind of news that could ruin your entire month. Fortunately, one of your colleagues has PowerMaker™ for Windows, the tool that gives you all the functionality of PowerViewer plus the power to design fully-interactive forms, manipulate databases and create complete Windows-based applications in no time.

Click
Click



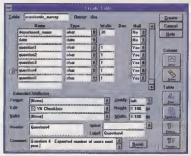
Click
Click
Click
Click

Click
Click
Click
Done

* Prices valid on orders placed between March 1 and May 31, 1994 and do not include sales tax, shipping or handling.

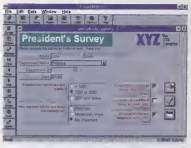
All trademarks and registered trademarks are property of their respective owners.

Click
Click



Click
Click
Click

Click
Click
Click
Click
Done



PowerMaker

Build Applications Too.

Click. You open PowerMaker, access the Connect Profile menu and select a database to capture responses to your employee survey. You can use the powerful WATCOM™ SQL relational database that's included in PowerMaker or select any other database on your network. Then, with the touch of a mouse, you access the Database Painter and PowerMaker guides you painlessly through creating your database layout.

Click. Next, you access the Form Painter. Another touch of the mouse links your database to the survey form you're about to create. Then, just like when you created your report earlier, you simply choose a QuickStyle form template, layout your survey and customize it in seconds. Edit text. Rearrange questions. Add toolbars. Bring in all the bells and whistles. In minutes, you've created your very own Windows application.

PowerMaker, Just $199.*

Click. Now, it's time to distribute your application to the world. PowerMaker not only enables you to share your applications with everyone on your network; it lets you do it without any user runtime fees. So you just put your "President's Survey" on the network and tell your colleagues it's coming. They simply click open the icon and fill in the blanks. Your database is updated automatically. All you have to do is go in and create your final report. And you already know how easy that's going to be. PowerMaker lets you take the power of PowerViewer a step further, helping you build and distribute your own form-based applications, as well as update databases. With PowerMaker, you can create living, breathing Windows applications that your entire department can use. And you can do it all by yourself in just a few short minutes.

Call 1-800-273-2841 Today.

Of course, this scenario is merely a reenactment of the typical office crisis. But the fact is, PowerViewer and PowerMaker make accessing the information you need, producing stunning reports, and even creating and distributing your own Windows applications as simple as point and click. And right now, these tools are not only incredibly easy to use. They're also incredibly easy to buy, because we're offering them to you at special prices of just $99 for PowerViewer and $199 for PowerMaker. And each is backed by Powersoft's 30-day satisfaction guarantee. To order PowerViewer and PowerMaker today, simply contact your corporate reseller, stop by CompUSA or call Powersoft directly at **1-800-273-2841.**

Powersoft.™

Building on the power of people.

Powersoft Corporation
70 Blanchard Road, Burlington, MA 01803

Circle 214 on reader service card.

The Mother of All

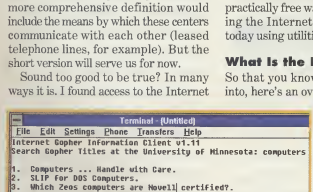
All the data you ever needed exists somewhere on the Internet, but can you find your way in—or out? By Brian Livingston

"I'll take Networks for $1,000, please, Alex." It's the largest, oldest computer network in the world, joining millions of computers and users. "What is America Online?" Oooooh, so sorry. "What is Prodigy?" I'm afraid not. "What is CompuServe?" Sorry, that's not it, either. It's the Internet. The Internet.

And it's like nothing you've ever experienced. Sure, you may be familiar with e-mail, shareware, and online news and discussions, and the Internet may sound like these other services. But don't hook up expecting what you're used to. You can have conversations on any subject, play games against users thousands of miles away, and even run applications on computers in another country. Best of all, there's no central body that controls your actions or bills you for your time. A more comprehensive definition would include the means by which these centers communicate with each other (leased telephone lines, for example). But the short version will serve us for now.

Sound too good to be true? In many ways it is. I found access to the Internet (or the Net, to those in the know) confusing, frustrating, and in some ways even dangerous to the security of the computers that link up. But there are ways to make Internet access worth the trouble, if you're willing to do a little work.

In this column, I'll describe some of the resources available on the Internet as well as some pitfalls that beset Internet users, and how you might avoid them. In addition, there's a simple but powerful Windows interface to the Internet and a practically free way you can start accessing the Internet through your modem today using utilities on PC/Contact.



If you say yuck to Unix, you're probably not going to be happy with a vanilla Internet account. Although Unix is a very powerful operating system, its command syntax will prove fairly alien to DOS users.

What Is the Internet?

So that you know what you're getting into, here's an oversimplified definition: The Internet consists of computer centers throughout the world (mostly at universities and government institutions, but also at many private companies) that allow anyone to log on and access certain files and other services. At present, educated guesses indicate that there are more than 2 million *host* computers on the Internet. An exact count is nearly impossible because the Net is so decentralized.

The beginnings of the Net hark back to at least 1969, when the Advanced Research Projects Agency of the U.S. Department of Defense formed ARPAnet. This early network consisted primarily of universities and military contractors with Unix computers linked by leased telephone lines. A main aim of ARPAnet was to maintain military communications in the event of a major disruption of telephone service (translation: a nuclear war), so communication had to work via many different routes. Hence the Net's high degree of redundancy and low degree of centralization. If one communications link between two sites was unavailable, the machines would try other routes to see if an alternate way could be found to deliver a message.

Due to the number of different routes between computer centers and how duties are spread among them, there is no "center" or "top" of the Internet. Each computer site is an independent entity, but it follows guidelines agreed upon by national and international committees.

Because the government subsidized it, for many years the Internet followed voluntary policies that allowed only nonprofit, educational, and government use: no commercial activities. For example, a private company was not supposed to use the Internet's e-mail to send users unsolicited messages exhorting them to buy their products.

In 1991, however, the National Science Foundation (NSF), which pays the cost of roughly 10 percent of the leased lines that connect Internet sites, loosened these policies. The new policies specifically allowed many commercial uses,

Windows	188
DOS	192
App Tips	198
How It Works	208
F1	210
Toolkit	218
PC/Contact	221
Q&A	224

Networks

including "announcements of new products or services for use in research or instruction, but not advertising of any kind." This shift seems to have opened the floodgates of Internet access. Many Internet sites now allow almost any kind of commercial messages across their own, non-NSF lines. As a result, the Internet is seeing enormous growth in the number of people who use its services. The current consensus among Internet watchers is that approximately 20 million computer users worldwide can communicate via the Net, and 1 million new users hook up each month.

The Internet's many and varied features drive this huge expansion. Primary among them are the most extensive e-mail system around (the President's on it), an almost unlimited number of files to download, interactive online discussions with other users, offline discussions on most any topic, and live news.

To browse through all of this, Internet users traditionally had to know some pretty odd commands. Only a partial listing is possible in this column, but even this can shed some light on the strange acronyms and jargon that have grown up in the case-sensitive, Unix-heavy Internet environment.

telnet: a program that allows you to log on to a computer at another location. Once logged on, you can look at files and even run programs.

archie: a service, accessible through telnet, that you can use to find the location of specific files at Internet sites. For example, you can issue the archie command Prog Music to see a listing of files throughout the Internet that contain the word *music*. Of course, you'd wind up with a huge list unless you narrowed the scope of the command.

gopher: another method for finding files you want. Unlike archie, the gopher program lists different host computers and the subject areas of information they contain. Gopher's capabilities are available on many host machines around the world. Each version provides information about files on the machine it's on, as well as on some other machines.

veronica: yet another tool. This one integrates listings of various gopher machines—called gopher servers—into a single information repository. There are many other services that integrate disparate search engines, generally sporting peculiar names such as Hytelnet, WAIS, and the World-Wide Web.

Anonymous ftp: the file transfer protocol by which you download files from one computer to another.

USENET: a source of newsgroups. Instead of downloading individual files, as with ftp, you automatically receive messages from individual Internet users on a specific topic to which you "subscribe." Topics range all over the spectrum of human interest, from computers to biology and back.

mail: the service employed by the largest number of Internet users. It includes programs with names such as elm, pine, and mush that allow you to send and receive messages.

TOP INTERNET FRONT ENDS

What's the easiest, fastest, least expensive way to hook up? Don't know Unix? Don't worry: Some great freeware and shareware applications are available to make Internet downloads and e-mail a snap. Unfortunately, these applications themselves are stored on the Internet. Catch-22.

PC/Contact

To solve this dilemma, I've selected two of the best freeware programs I could find and uploaded them to PC/Contact so you can get them. For information on how to access PC/Contact, see page 223.

The first program is Lanera's TCP/IP package called TCPOpen. In addition to adding the Internet Protocol (the Internet's lingua franca) to your PC, TCPOpen also supports Serial Line Internet Protocol (SLIP) with Header compression. If you dial up the Internet through a commercial access provider, SLIP will probably be the protocol you wind up using. A limited version of TCPOpen freeware is available as TCPOPEN.ZIP in data library 3 (Utilities/Misc.) on PC/Contact.

The second program is NCSA Mosaic, a communications freeware package that allows you to browse through the files of Internet sites. Developed at the National Center for Supercomputing Applications at the University of Illinois at Champaign, Mosaic is a Windows program that provides a GUI and a fairly simple menu system to access Internet hosts. If you're interested, Mosaic also comes in versions for the Macintosh, Sun SPARCstation, and several other platforms, all available from access providers that support those systems. To get the PC version of Mosaic, download MOSAIC.ZIP from PC/Contact's data library 3 (Utilities/Misc.).

Unfortunately, these freeware applications provide little or no technical support for users. And even with these packages, you can't just dial up the Internet: You still need a local service provider such as those listed in Internet reference books. If you run into any trouble, you may find yourself better off using one of the many shrink-wrapped DOS or Windows packages available from software vendors, such as Internet-in-a-Box, developed jointly by Spry and O'Reilly & Associates, and discussed on page 184.

To learn more, look into several books on the subject. Two of the best that I've found are: *The Internet Navigator,* by Paul Gilster ($24.95, John Wiley & Sons, 1993), and *The Whole Internet User's Guide & Catalog,* by Ed Krol ($24.95, O'Reilly & Associates, 1992).

In 450 pages, *The Internet Navigator* shows examples of sessions with the various Internet executables and protocols—it's one of the best places for new Internet users to start. *The Whole Internet User's Guide* is a drier treatment that includes descriptions of many of the Internet sites and resources available. For descriptions of several popular online services, see "Surf Cyberspace on Internet Front Ends," page 62.

Electronic Scandals

After reading this far, if you've decided that you want to try the Internet for yourself, you should know a little about the Net's dark side. There are a few troubling issues that potentially affect everyone who uses it on a regular basis.

First of all, the explosion of Internet users has caused gridlock at many host computer sites. Because the NSF recently loosened policies against commercial use of the Net, universities and government agencies aren't the only ones plugging in any more.

Today, large corporations routinely give Internet access to every user of their corporate networks. In a single move, a corporation may create 10,000 new Internet users. Each new user can immediately send mail and log on to Internet hosts to browse for interesting files or run programs. This costs each user very little, but uses some of the capacity of the leased lines between universities and other Internet sites. As a result, when you try to dial into a popular computer center on the Net, you may experience sluggish performance, or worse—constant busy signals. Since there is a finite number of communication ports at any one site (and each port costs money), many Internet hosts have decided to keep their access limited to a small number of simultaneous users. Some computer centers have gone further, denying access to outside dialers during prime time—between, say, 8 a.m. and 5 p.m. This, of course, reserves computing power for the institution's in-house users. But it may also mean that your modem will never be able to get through to that site until midnight or so.

A far more serious problem is the Net's security, or lack thereof. Robert Morris Jr. received international publicity in 1988 when he distributed a program that exploited a security flaw in the mail application commonly used at Internet sites. Morris's program, now immortalized as the Internet Worm, tried common passwords to log on to privileged accounts at Internet hosts. When the Worm found a password that worked, it copied itself to other hosts. The Worm multiplied so fast that entire universities and government agencies could no longer log on to their networks. Before a group of system administrators across the country uncovered and decommissioned the Worm, thousands of Internet sites had to take their host computers off the Net. (After a lengthy trial, a judge sentenced Morris to perform community service.)

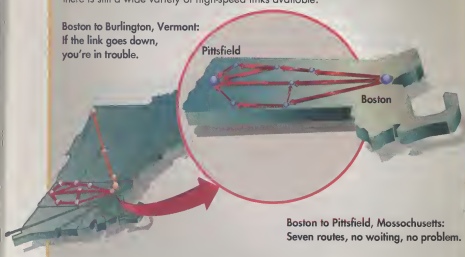
Even more disturbing is a series of security breaches that were first noticed in fall 1993. A packet sniffer originally launched this chain of incidents. The perpetrators (called "crackers" in Netspeak) developed a program to capture users' account names and passwords. The authors of the program probably captured tens of thousands of privileged-users' passwords at sensitive computer centers—even government labs that conduct and exchange e-mail about research on nuclear weapons. When the packet sniffer was originally publicized by Alexis Rosen, the president of Panix Public Access in New York City, he advised other access providers to shut down their computer systems, find and remove all instances of the rogue program, and change all affected users' passwords. The Computer Emergency Response Team (CERT), the Internet's security

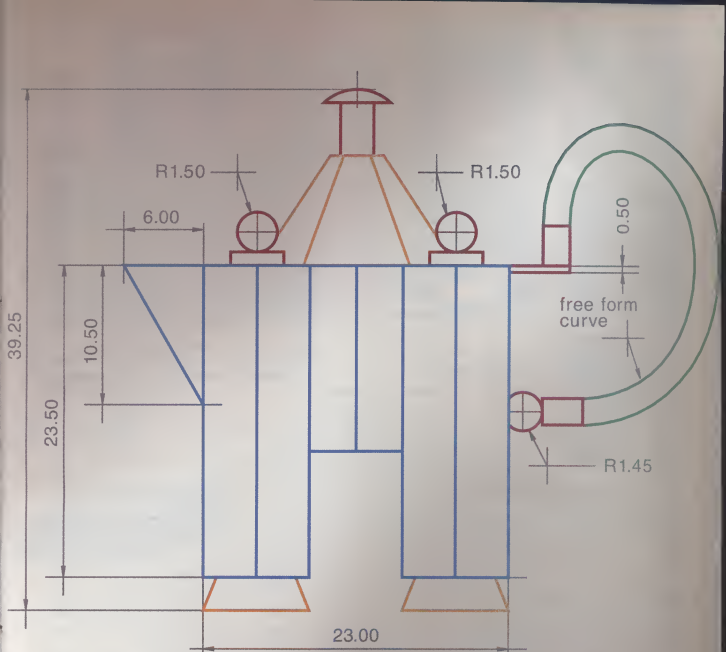
BUILDING THE INTERNET

This is New England as the Internet sees it. We've taken the liberty of simplifying the map and culling out a few of the high-speed and leased-line routes available to a user in Boston.

To send a message to Burlington, Vermont, the Internet has one major route, involving three stopovers. If any of the links in this chain fails, one of the stopovers (or hosts) must either scrub the message and return it to the sender, or use a modem to make the next connection.

To send a message to Pittsfield, Massachusetts, however, the Internet has a much wider variety of choices (seven, in this example). If one of these links or hosts fails, there is still a wide variety of high-speed links available.





Twenty minutes ago this was a cocktail napkin.

Introducing AutoSketch® Release 2 for Windows. As quickly as you can sketch out an idea, AutoSketch software lets you turn it into a precise, technical drawing. Draw a floor plan and you know the square footage. Draw a pipe and you know the diameter. AutoSketch gives you tools and icons that increase the versatility of the Windows™ interface, so you can draw instinctively. In fact, you can turn rough ideas into accurate geometry just by clicking and dragging the mouse. Or enhance your drawings with TrueType™ fonts and predrawn symbols, like doors and windows. All this for only **$299.*** And it's from the makers of AutoCAD® software. Intrigued? See your retailer. Or, call 1-800-228-3601, and ask for Infopack A124. Outside the U.S., fax 206-485-0021.

Autodesk

* U.S. suggested retail price. Special pricing available for students, faculty, and schools. ©1993 Autodesk, Inc. All rights reserved. Autodesk, the Autodesk logo, AutoSketch, and AutoCAD are registered trademarks of Autodesk, Inc. Windows is a trademark of Microsoft Corporation. All other trademarks are property of their respective owners. Teapot sketch based on an original design by Michael Graves Architects.

watchdog, released a complete advisory only in early February 1994. According to Panix Public Access's Rosen, "There's nothing worse than a watchdog that doesn't bark reliably."

Because of loopholes such as these, Internet sites should really initiate better security methods before the Net grows further. Most security experts know that simple password systems provide little protection against intruders: Crackers can capture or break passwords too easily for them to be a serious deterrent.

Internet security is like a bank's ATM card—only without the card. With no card, bank customers could withdraw money simply by typing in their passwords. Similarly, crooks could just go from bank to bank trying combinations until they found those that worked. That's why banks use the combination of the physical card and the password. There is currently little or no such back-up security across the Internet, and it's hard to imagine how such a system would become operational in the near future. Until security concerns are dealt with, you might want to avoid the Internet for logging on to distant computers where you keep important files.

Rolling Your Own Internet

If the prospect of accessing the wealth of data that is publicly available at Internet sites *still* intrigues you, there are two basic ways to gain admission to the club. First, if the company you work for provides Internet access from the corporate network, you can simply log on to your network and use whatever tools it provides to connect to the Net (using the commands explained in the two books I mentioned earlier). Because there is such a wide variety of arrangements that companies have set up for Internet access, I'll say little more about this alternative and move on to Internet access from any PC that has a modem and a telephone line.

Individual PC users, on the other hand, can set up an account with a local access provider. By making what is usually a local call to an access point, you can connect to any Internet host.

Finding an access provider, however, illustrates just one of the many daunting tasks that confront new Internet users. Peter Kaminski, a software developer, regularly updates a list of access providers. But to get the list, you must already have access to Internet mail—a catch-22. Technically, you receive the latest listing by sending e-mail to the Internet address

info-deli-
server@netcom.com

with the subject of the message reading

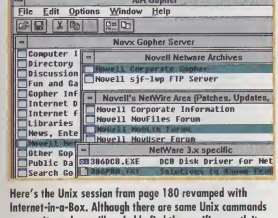
send pdial

If e-mail to the Internet is not convenient, you can also scan the list of access providers, sorted by state and country, in the back of *The Internet Navigator*. Local bulletin board service (BBS) sysops usually also know of local access providers. To find BBSes, contact your local PC users' group or look in the Yellow Pages under Computers—Bulletin Boards. Yes, BBSes have their own category now, although the numbers listed are often data lines that you must call with your modem. Finally, some national services such as Delphi offer complete Internet access as part of their package of services.

Once you find an access provider, know that each has its own method of billing users: usually a monthly fee, an hourly fee, or a combination of the two. Compare rates before signing up.

Shrink-Wrapped Access

Even after you locate an access provider, you still need special software to access the Internet. Easily one of the best such programs is Internet-in-a-Box, jointly developed by Spry and O'Reilly & Associates. This package completely replaces arcane telnet, mail, and other Unix artifacts with graphical Windows equivalents. A prerelease version of the Internet-in-a-Box let me download files with an application called the Network File Manager, which is similar to the Windows File Manager. The Network window, however, displays little folders and files that correspond to the directory structure on the host machine. To copy a file from that machine to your own hard disk, you simply drag the file icon from the Network File Manager and drop it in the appropriate directory in the Windows File Manager.



Here's the Unix session from page 180 revamped with Internet-in-a-Box. Although there are same Unix commands you can't reach, you'll probably find the sacrifice worth it.

Internet-in-a Box builds on Spry's earlier Air Series 2.0 software, which shipped late last year. It consists of the Air Navigator, which lists for $149 for a single user, plus a Windows browsing application based on a public domain program called NCSA Mosaic. At press time, Spry had not yet fixed an exact price for the Internet-in-a-Box bundle, but a company representative said that the street price would be "approximately $149." This price requires you to use a commercial access provider that is a Spry subsidiary. Be sure to contact Spry for final details.

If you can handle the learning curve and the roadblocks, you can sit back and enjoy the scenery on the "information superhighway" that the Clinton Administration has been promoting since before its election. It's all here—masses of data, millions of high-tech users, and endless opportunities for commercial and personal growth. The future is just beginning.

Internet-in-a-Box • about $149 • Spry • (800) 777-9638, (206) 447-0300
Circle No. 724 on Reader Service Card

Brian Livingston is the author of *Windows 3.1 Secrets* (1992) and *More Windows 3.1 Secrets* (1993), both published by IDG Books. If you have any secrets you'd like to share, send them to Help, *PC/Computing*, 950 Tower Lane, 19th Floor, Foster City, CA 94404. We'll pay you $50 if we publish them.

The Fastest Route To 1200dpi Scanning. For Under $1,400.

CALL NOW FOR YOUR FREE GUIDE TO BETTER SCANNING

Only one company offers 1200dpi flatbed color scanning that performs at speeds that justify its purchase.

UMAX® is the company.

UC1260 is the scanner.

This versatile legal-sized scanner delivers incredible resolution at faster speeds than any other scanner around (see chart). And not just at the lower dpi levels where black & white or simple color images are used. But at the higher dpi levels where crisp, brilliant resolution is critical. Where image quality is directly related to your reputation and your company's image.

	UMAX® UC1260	H-Plicx	Epson
Hardware Resolution	1200 x 600dpi	400 x 400dpi	400 x 400dpi
Maximum Resolution	2400 x 2400dpi	1600 x 1600dpi	1600 x 1600dpi
Maximum Scanning Area	8.5 x 14"	8.5 x 11.5"	8.1 x 11.0"
Scanning Throughput*			
300dpi/8.5 x 11"	2:00 Minutes	1:55 Minutes	4:05 Minutes
600dpi/8.5 x 11"	5:22 Minutes	9:27 Minutes	17:35 Minutes
800dpi/4 x 5"	2:20 Minutes	3:38 Minutes	6:36 Minutes
1200dpi/4 x 5"	5:28 Minutes	9:05 Minutes	13:00 Minutes
Single Lamp Design	Yes	Yes	No
Software Bundles	Complete PhotoShop	Photoshop LE	PhotoShop LE
Descreening	Yes	No	No
Unsharp Masking	Yes	No	No
Suggested Retail	$1,395	$1,179	$1,500

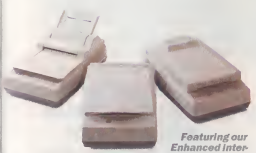
The UC1260 offers unparalleled value with features previously found only on more expensive flatbed scanners. Like auto calibration that allows for maximum color accuracy and control. 16.8 million 24-bit colors. 256 shades of gray. Built-in SCSI II for the high performance speed needed for high resolution graphics. 2400 x 2400dpi through software interpolation. And, it performs on the Macintosh,® Windows,® and UNIX™ platforms.

Could there be more? With UMAX there is.

The complete Adobe® PhotoShop™ software is bundled with every UC1260. Free.

Call now and find out how fast you can get true 1200dpi scanning at a price that may just get you to buy two.

Call toll free **1-800-866-UMAX (8629).**



Featuring our Enhanced interface Software, optional Transparency Unit and optional Automatic Document Feeder.

*These tests were carried out on a Centris 650 with 40MB RAM; 300MB Hard Drive and Adobe PhotoShop 2.5. Results on Macintosh and PC were virtually identical.

UMAX®
The Magic of Color™

Circle 257 on reader service card.

© 1994 UMAX Technologies Inc. 3353 Gateway Blvd. Fremont, CA 94538 Tel 510-651-8883 Fax 510-651-8834 UMAX is a registered trademark of UMAX Data Systems Inc. *The Magic of Color* is a trademark of UMAX Technologies, Inc. Other company names and product names are trademarks of their respective companies

If you're switching f
your moving cre

Introducing the Borland® Office 2.0.

The Borland Office 2.0 integrates PC/Computing's three Most Valuable Products. No other suite has even one.

Moving to Windows™ can be easy. Especially if you have a lot of help. That's why the Borland Office 2.0 teams up the most award-winning products of all time. And it throws in some extra muscle, too.

Help with DOS files.

Our Windows products have the best compatibility with your existing DOS files. So you don't have to leave anything behind. Plus, it's easier to work with other people who haven't moved to Windows. You can even switch back and forth between platforms if you want.

Help learning.

Instead of learning new Windows programs, why not let them teach you? The Borland Office has "Coaches" to show you how things work. Plus it has "Experts" and "Macros" that will perform complex tasks for you. So you don't have to learn anything at all.

Our Transition Advisor can even teach you the new key commands. Or if you prefer, we can make your WordPerfect® menus and commands exactly like DOS. Nothing to it.

The best products.

Only the Borland Office gives you the three MVP products in the categories you want most—word processing, spreadsheets, and database.

WordPerfect 6.0 for Windows. More than just a word processor, it's a complete document processor with integrated text, data and graphics. And it directly imports more types of spreadsheets, graphics and even database information than any ordinary word processor.

Borland Quattro® Pro 5.0 for Windows. It's the easiest-to-use spreadsheet with the most analytical functions and graphical tools available. No wonder it's received more awards and recognition than any other spreadsheet. Ever.

Borland Paradox® 4.5 for Windows. It's the best-selling PC database. And with good reason. It features built-in SQL connections to all the popular database servers for instant, easy access to all your data.

Help sharing.

Unlike other suites, every product in the Borland Office is workgroup-ready right out of the box. So you can share database information with your co-workers and insert their spreadsheets, automatically receiving updated data. The Workgroup Desktop makes distribution easy. And you don't have to buy any additional hardware or software.

Help working.

Of course, the Borland Office keeps helping you after the move. The Desktop Application Director (DAD) makes it easy to switch between applications. And PerfectFit Technology means that the programs share button bars, icons, cross-application macros, even resources like spell checking. So each product "looks and feels" the same.

The Desktop Application Director (DAD) makes it easy to switch between applications and commonly-used tasks.

Call (800) 526-5069 for more information.

Call us today for product and ordering information. You'll get more than just software, you'll get a moving crew.

WordPerfect is a registered trademark of WordPerfect Corporation within the United States and other countries. All other brand or product names are trademarks or registered trademarks of their respective companies. © WordPerfect Corporation 1994

Borland WordPerfect®

om DOS to Windows,
w has just arrived.

WordPerfect 6.0
for Windows

Borland Quattro Pro 5.0
for Windows

Borland Paradox 4.5
for Windows

PCContact

The Motto of Scouts and Notebook Owners: Be Prepared!

Guidelines to optimize your notebook for trouble-free travel.

Whenever you go on a business trip, you leave behind the tools you need to keep Windows running smoothly on your notebook. Instruction manuals and troubleshooting guides? Back on the bookshelf. Original distribution disks? At the bottom of a desk drawer in your office. Backups of crucial data files? It would take another suitcase to hold that many floppy disks.

No matter how thorough your Scout training, you can't anticipate every disaster that might befall your notebook on the road. You can plan your escape route around the most common road hassles, however—it's not even very hard. Follow these simple guidelines and you'll be prepared to keep Windows running, print just about anywhere, and retrieve data when you run into trouble.

Survival Kit

You can't troubleshoot Windows unless you can get to a DOS prompt. That's why your notebook's carrying case should include the following all-purpose DOS and Windows troubleshooting tools:

Emergency boot disk. If you've got the Norton Utilities, run the Rescue program. If PC Tools for Windows is handy, use its Emergency Disk utility. To do it yourself, put a floppy disk in the A: drive and type:

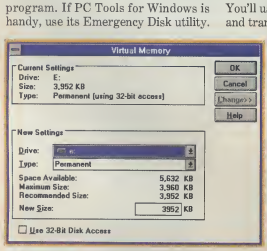
```
FORMAT A: /S
```

Then copy FDISK.EXE, SYS.COM, CHKDSK.EXE, FORMAT.COM, UNFORMAT.COM, and UNDELETE.EXE to the disk. A simple DOS text editor can be a lifesaver; EDIT.COM works, but it requires the bulky QBASIC.EXE as well. Add any extra files your notebook requires (a PCMCIA driver, for example) and, finally, add HIMEM.SYS and EMM386.EXE from your Windows directory. Does your notebook have an external setup program? Copy it over, too. If a stray alpha particle ever scrambles a sector on your hard disk and renders one of these files unusable, you'll be grateful you had a backup handy.

Blank disks. You'll need at least two, in case one disk fails under pressure. You'll use these disks to store backups and transfer files between machines. If you work with large files that might span two disks, be belt-and-suspenders safe and keep three blanks on hand.

Backups of WIN.INI and SYSTEM.INI. Nobody wants to mess with these two files at 2 a.m. in the East Podunk Holiday Inn. If there's room on your emergency boot disk, keep copies of these crucial files there.

Cheat sheet. It doesn't weigh more than a few micrograms, but this piece of paper is where you'll record information that would be priceless in a crisis: CMOS settings for your hard drive, serial numbers for your software, unusual setup strings for your modem, and tech support phone numbers.



32-Bit Disk Access may be dangerous on a battery-powered system. Turn it off before you hit the road, and reactivate it when the notebook is plugged in.

A Safer Setup

Your notebook probably arrived with Windows preconfigured. It's up to you to finish the setup program to make your system truly roadworthy. Here's how:

Turn off 32-bit Disk Access. And don't even *think* about using it on a machine that runs on batteries. The 32-Bit Disk Access feature is buried deep inside the Control Panel: To find it, double-click on the 386 Enhanced icon, click on the Virtual Memory button, and then click on the Change button. Enabling 32-Bit Disk Access causes Windows to use an Enhanced mode virtual device driver (called FastDisk) to directly access the disk controller hardware. This can cause problems in notebooks, whose disk controllers typically use power management features that aren't compatible with the Western Digital controller standard that 32-Bit Disk Access assumes your PC has. If the power management system changes the status of the disk controller without notifying Windows, you run the risk of losing data.

Just so you know, you can run into a

WIN APP OF THE MONTH

Lister

Printing text files in Windows is no fun: You have to load a word processor, convert the file to the word processor's native format; put in the right fonts, headers, and footers; and finally, print out the text file. But there's now an easier way: Lister is a free utility that lets you define headers, footers, and fonts, and then paint and click on a file to print it. Download LISTER.ZIP from PC/Contact, data library 3 (Utilities/Misc.). The author is Michael J. Nartan, 7811 Smoke Rise Road, Huntsville, AL 35802.

PCContact

New! REACHOUT Pro 4.0 for Windows!

Rated Number One In The Field.

If you work away from the office, or need to provide remote support, get the product that's ideal in the field. ReachOut Remote Control. It supplies the power to remotely control any PC running Windows or DOS. From anywhere. To anywhere. View a remote PC's screen in one Window while working locally in another Window. Use ReachOut's exclusive Remote Clipboard to cut and paste data between the two. Transfer files at record breaking speeds. Even synchronize files between two PCs.

ReachOut has earned three major awards in the past 18 months. The latest being "Product of the Year" for 1993 from LAN Magazine. Which goes to show that ReachOut is one powerful networking tool. InfoWorld proclaimed "ReachOut offers superb screen, mouse, and file transfer speeds and provides as many security options as Sing-Sing. Operation is as smooth as silk." InfoWorld rated ReachOut as #1 and awarded it their Buyer's Assurance Seal. And PC Magazine UK confessed ReachOut "was the only remote control program that worked right out of the box." They named ReachOut The UK Editor's Choice and called it a top notch value.

The new ReachOut Version 4.0 for Windows continues the tradition of excellence with support for all high resolution monitors up to 1280 by 1280 with 256 colors. What's more, it makes no modifications to the Windows initialization files. And speed is as much as 40% faster than the version InfoWorld had reviewed.

So don't settle for anything less than ReachOut. Call us toll free now for more information or for the ReachOut dealer nearest you. 1-800-677-6232. And then be the best in your field, with the best in the field.

Ocean Isle SOFTWARE

1-800-677-6232

1201 19th Place, Second Floor, Vero Beach, FL, USA, 32960

Circle 263 on reader service card.

catch-22 when you experiment with the Virtual Memory settings: On some systems, Windows won't even start in Enhanced mode with the 32-Bit Disk Access box checked. But the only way to access the 386 Enhanced section of the Control Panel is to start Windows in Enhanced mode. The solution? Type WIN /D:F at the DOS prompt to start Windows with 32-Bit Disk Access temporarily disabled, and then turn it off permanently using the Control Panel.

Set up multiple video options. If your LCD cracks or crashes, you can still get some work done (or at least transfer important files to another machine) if you can find an external monitor. To make sure your system will work with nearly any monitor you plug in to it, be sure to install the generic VGA option. VGA.DRV is the lowest common denominator of video support. At 640 by 480 resolution and 16 colors, it should drive almost any monitor you can find.

Don't just copy VGA.DRV to your WINDOWS\SYSTEM directory. When you install a new video driver, Windows needs to replace screen font and grabber files. With your original Windows disks at hand, run through the setup program, either by typing SETUP at the C:\WINDOWS prompt or by double-clicking the Setup icon in the Main program group.

Be smart about SmartDrive. Be *especially* careful if you like to drive on an empty tank. By default, SmartDrive 4.0 (the version that shipped with Windows 3.1) and SmartDrive 5.0 (included with MS-DOS 6.2) both install with delayed-write caching turned on. That means that your system saves up disk writes and waits as long as five seconds before sending them to the hard disk. It's risky business on your desktop and worth a week-long stay in the Heartbreak Hotel if you try it on the notebook. Just imagine what happens when your notebook battery runs down one second before your disk cache is ready to send its saved-up contents to the disk.

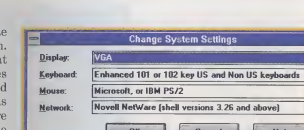
To turn off delayed-write caching, edit the SMARTDRV.EXE line in AUTOEXEC.BAT. With Version 4.0 or 4.1 of SmartDrive, add C- at the end of the SMARTDRV.EXE line to disable delayed writes on drive C:. (Repeat the process, if necessary, for any additional hard drives.) DOS 6.2 and Windows for Workgroups 3.11 ship with a later version of SmartDrive and install it with delayed writes turned off by default. Check SmartDrive's cache status by typing SMARTDRV /S at the DOS prompt. The write cache field should say "No" when you're on the road.

Be double-smart about DoubleSpace. If you use the DoubleSpace utility that ships with DOS 6, upgrade to DOS 6.2. It includes more rigorous error-checking and a set of utilities that can scan a disk (compressed or uncompressed) and fix most errors it finds. If you can't do without disk compression, consider putting Windows on the uncompressed portion of the drive. That way, you'll still have access to Windows (including applets like Write and Terminal) in the event of irreparable damage to your compressed volume file (CVF).

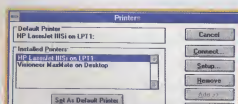
Prepare to print anywhere. Find your original Windows disks and use the Printers utility (found in the Control Panel) to install support for the following printers: Apple LaserWriter (PostScript); Hewlett-Packard LaserJet II, III, and 4; Epson FX-80, and IBM ProPrinter. Connect them all to FILE. You'll find this variety indispensable if you ever need to print a file on the road.

Carry a compression utility. If you need to get a file from your notebook to another system, the fastest route is through a floppy transfer. But what happens when the file is bigger than a single floppy? The solution is to keep a compression utility handy. Despite a cumbersome command-line interface, PKWare's PKzip is still one of the best, primarily because of its capability to create self-extracting files that don't require a decompression utility on the receiving PC. We were able to squeeze a bulky 30-slide Freelance Graphics presentation from 2MB-plus into a lean, self-extracting file of just more than 100K by using PKzip 2.04g; download PK204G.EXE from data library 3 (Utilities/Misc.) on PC/Contact (see "DOS App of the Month," January, page 244, for more information). Not every file will compress that efficiently, of course, but even a 20 percent savings in floppy disk space can make a difference. If a disk transfer won't serve your needs, consider a file transfer utility such as Interlink (DOS 6.x) or Traveling Software's LapLink, both of which require special parallel or serial cables. The disadvantage is that it's one more thing to carry.

Nobody ever said business travel was fun, but if you pack this survival kit along with your notebook, you can quickly recover from glitches that would put the unprepared traveler out of commission for the rest of the trip. ◩



Make sure your notebook will work with nearly any monitor by installing the generic VGA option—the lowest common denominator for video support. You'll be hard-pressed to find a monitor it can't drive.



You just finished the Anderson report and it's time to print it out. Now where did those darn printer drivers go? Not installed?! You should have thought ahead.

Got a tip, trick, or handy Windows secret you'd like to share? We'll pay you $50 if we publish it. Send it and any correspondence for Senior Contributing Editor Ed Bott to Help, *PC/Computing*, 950 Tower Lane, 19th Floor, Foster City, CA 94404.

We wrote the book on CD-ROM drives. And we want you to have it.

Compare Ordinary "Double Speed" CD-ROM Drives To Plextor's DoubleSpeed PLUS.

CONFIGURATIONS AVAILABLE
Internal, External, Bundle, Kit & Tower

DATA TRANSFER RATE
335Kb/sec

AVERAGE ACCESS SPEED
240ms

INTERFACE
SCSI-2

MTBF
50,000 Hours

COMPATIBILITY
MPC-2™
Multisession Kodak Photo CD™
NT & OS/2
SUN
SGI
NetWare/UniWare

TOLL-FREE TECH SUPPORT
Unlimited

WARRANTY
1-Year

OVERALL VALUE
"Best Buy"
Compute,
September 1993

You've decided to enter the exciting world of multimedia. But with all the CD-ROM drives to choose from, how do you know which is the right one for you? This comprehensive, yet easy-to-read, booklet will help guide you through the multimedia maze. It addresses several major concerns, including: SCSI vs. proprietary interface? Caddy vs. tray loading system? 8-bit or 16-bit interface?

DoubleSpeed PLUS™

When it comes to CD-ROM drives, speed is everything.

The most important factor when considering a CD-ROM drive for your computer system is the data transfer rate. Simply put, you need a drive that can keep up with your applications. One that offers the speed and performance that lets you clearly see multimedia in all its blazing glory.

The fastest way to bring your multimedia applications to life.

As the table shows, Plextor *DoubleSpeed PLUS*™ CD-ROM drives feature the fastest data transfer rate among all "double speed" drives. And unlike some of our competitors, we don't sacrifice access time or quality to achieve high data transfer rates. All of which makes us your best choice for those demanding multimedia applications that combine audio, video, graphics and animation.

Hurry! Call 1-800-886-3935 now for your FREE copy.

The more you know about CD-ROM drives, the less confusing they get. For more information on Plextor *DoubleSpeed PLUS* CD-ROM drives, and the location of your nearest dealer, call today. We'll respond with everything you need to make a smart decision. And fast!

Plextor DoubleSpeed PLUS CD-ROM drives are available in internal, external, bundle, kit, and tower configurations.

PLEXTOR

4255 Burton Drive
Santa Clara, CA 95054
408.980.1838
FAX: 408.986.1010
800.886.3935

©1994 Plextor. *DoubleSpeed PLUS* is a trademark of Plextor, a subsidiary of Shinano Kenshi Co., Ltd., Japan. Other product and brand names are trademarks or registered trademarks of their respective holders.

Circle 266 on reader service card.

PCContact

Beyond MemMaker: How to Beat the RAM Cram

With some fine-tuning, you can win back the RAM that DOS 6.2 ate.

Have you noticed that DOS is becoming more adroit at handling memory? Version 5 introduced EMM386.EXE and the notion of upper memory blocks (UMBs), permitting you to move memory-resident programs and device drivers out of conventional memory and into formerly inaccessible spaces between 640K and 1MB. Version 5 also enabled you to load much of the operating system's kernel, disk buffers, and command interpreter into the special region of extended memory known as the High Memory Area (HMA).

Not to be outdone, DOS 6 introduced MemMaker, a memory-optimization utility that analyzes your system and modifies CONFIG.SYS and AUTOEXEC.BAT as necessary to move memory-resident programs and drivers from conventional memory to UMBs. Unfortunately, MemMaker has limitations. Don't get us wrong: MemMaker is a giant step in the right direction, but there are usually additional optimizations you can perform after MemMaker has run its course to free even more conventional memory. Some of these were discussed in "Five Smart Memory Tricks to Push RAM to the Limit," (September 1993, page 292), but DOS 6.2 introduced new ways to save memory.

DOS 6.2 features even more memory-management tools, but most of the enhancements are undocumented. This month's column surveys the new memory-handling features introduced in Version 6.2, and offers practical advice on putting them to work.

Trim DBLSPACE.BIN

In DOS 6, the DoubleSpace driver DBLSPACE.BIN used about 43K of memory. In Version 6.2, its footprint increased to about 52K. There are two ways to decrease DBLSPACE.BIN's installed size. If you're running DOS on a 286 or later, make sure your CONFIG.SYS loads HIMEM.SYS, and that your BUFFERS setting is below 10. You don't need a higher BUFFERS setting if you're using SmartDrive, DOS's disk caching driver. In fact, higher BUFFERS settings prevent DBLSPACE.BIN from loading part of itself in the HMA, which is already overcrowded by the DOS kernel, the disk buffers controlled by BUFFERS, and COMMAND.COM. If HIMEM.SYS is loaded and BUFFERS is set sufficiently low, DBLSPACE.BIN places about 5K of itself in HMA, reducing its size in conventional memory by the same amount.

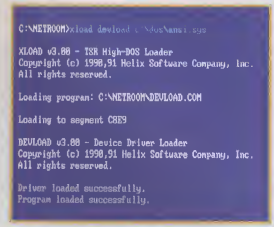
You can downsize DBLSPACE.BIN by another 5K by disabling the automounting feature. In DOS 6, compressed floppy disks had to be mounted manually each time they were inserted. "Mounting" was how you could tell DOS that a compressed disk had been placed in a drive. Version 6.2's automounting feature allows it to recognize compressed disks automatically, but with a commensurate cost in memory. To disable automounting—which you don't need if you don't compress removable disks—type

```
DBLSPACE /AUTOMOUNT=0
```

at the command prompt. Then reboot your PC so the change can take effect.

Use F000h

In DOS 6, MemMaker's Express Setup checked the first 32K of your PC's F000h segment of upper memory (the 64K area, or segment, just below 1MB) for empty space that could be converted to UMB RAM. In Version 6.2, you must run Custom Setup and answer yes to the question, "Scan the upper memory area aggressively?" to have MemMaker check the F000h segment. Most PCs don't have empty space in this region, but those that do can gain up to 32K more UMB space. To see if this option works for you, run MemMaker in Custom Setup mode and answer yes to MemMaker's query about scanning aggressively. Or add a



Memory tweaking requires rebooting after each change. Enter DEVLOAD, which loads and unloads on the fly, with no need to reboot. DEVLOAD is included in NetRoom 3 (see page 194).

DOS APP OF THE MONTH

RESQ

Ever lost a 20-page document due to an application crash? (Rhetorical question.) RAM is volatile and doesn't retain your data. Or does it? RESQ is an amazing utility that helps you recover any lost text that remains in memory after a program crashes. If it locates a region of memory that contains your lost document, RESQ will save to disk all that remains of the document with a single keystroke. It's fast, it's easy, and best of all, it's free. Download RESQ.ZIP from data library 3 (Utilities/Misc) of PC/Contact. PCContact

Science has found a cure for snoring. At least during your presentation.

PC Computing

PROFESSIONAL DISCOUNT ORDER FORM

ANNUAL COVER PRICE	REGULAR SUBSCRIPTION PRICE	YOUR PROFESSIONAL ONE-YEAR RATE	BONUS STATUS
$35.40	$24.97	$16.94	FREE *QUICK*TASK Personal Information Manager on 2 Disks

As a professional involved with computers, you are entitled to a reduced rate on PC/COMPUTING. Return this form to receive PC/COMPUTING for up to 58% off the newsstand price. BONUS: The *QUICK*TASK set on 2 disks -- FREE with your paid subscription.

Check one: ☐ 1 year (12 issues) for $16.94 — SAVE 52%
☐ 2 years (24 issues) for $29.94 — SAVE 58%

Name (Please Print) 4SDA6

Company

Address

City State Zip

REPLY REQUESTED

☐ Payment enclosed. ☐ Bill me later.

RETURN THIS FORM TO GUARANTEE SAVINGS.

Basic one-year subscription $24.97; on newsstands $35.40. Canada and foreign add $16.00 per year. U.S. funds only. Canadian GST included. Please allow 30 days for shipment of first issue. FREE disks will be sent upon payment.

PCContact

Beyond MemMaker: How to Beat the RAM Cram

With some fine-tuning, you can win back the RAM that DOS 6.2 ate.

Have you noticed that DOS is becoming more adroit at handling memory? Version 5 introduced EMM386.EXE and the notion of upper memory blocks (UMBs), permitting you to move memory-resident programs and device drivers out of conventional memory and into formerly inaccessible spaces between 640K and 1MB. Version 5 also enabled you to load much of the operating system's kernel, disk buffers, and command interpreter into the special region of extended memory known as the High Memory Area (HMA).

Not to be outdone, DOS 6 introduced MemMaker, a memory-optimization utility that analyzes your system and modifies CONFIG.SYS and AUTOEXEC.BAT as necessary to move memory-resident programs and drivers from

introduced new ways to save memory.

DOS 6.2 features even more memory-management tools, but most of the enhancements are undocumented. This month's column surveys the new memory-handling features introduced in Version 6.2, and offers practical advice on putting them to work.

Trim DBLSPACE.BIN

In DOS 6, the DoubleSpace driver DBLSPACE.BIN used about 48K of memory

DOS APP OF THE MONTH

RESQ

Ever lost a 20-page document due to an application crash? (Rhetorical question.) RAM is volatile and doesn't retain your data. Or does it? RESQ is an amazing utility that helps you recover any lost text that remains in memory after a program crashes. If it locates a region of memory that contains your last document, RESQ will save to disk all that remains of the document with a single keystrake. It's fast, it's easy, and best of all, it's free. Download RESQ.ZIP from data library 3 (Utilities/Misc) of PC/Contact.

PCContact

NO POSTAGE NECESSARY IF MAILED IN THE UNITED STATES

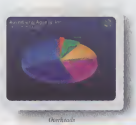
BUSINESS REPLY MAIL
FIRST CLASS MAIL PERMIT NO. 66 BOULDER, CO

POSTAGE WILL BE PAID BY ADDRESSEE

PCComputing
P.O. Box 50253
Boulder, CO 80321-0253

Science has found a cure for snoring. At least during your presentation.

It's the new Phaser™ 220 color printer by Tektronix®. It's affordable. It's easy to use. And it's the best way to keep people awake without the use of costly stimulants. How? Quite simply, amazing color. The Phaser 220's SuperCell 600™ technology allows you to print a whopping 600 x 300 dots-per-inch. And in lay terms, that's a lotta dots. And a lotta dots means your annual reports will yodel, your pie charts will do backflips and your bar graphs will announce their presence with authority. Plus you get all this great color at two pages per minute on most common laser papers. At this speed, it should come with an airbag. The Phaser 220 also offers true Adobe® PostScript™ Level 2 and supports PCs, Macs, workstations and just about every network interconnect. Add to this the fact that it's reliable, has multiple paper trays and a huge print capacity and you've got yourself one tough workhorse. For a free Phaser 220 print sample or the name of your nearest Tektronix dealer, call **800-835-6100**, department 34D. For faxed information, call 503-682-7450, and ask for document #5003. But don't wait too long. Because business is getting more and more competitive. And if you snooze, you lose.



Overheads

Desktop Publishing

Reports

The Phaser 200 series starts at a suggested retail price of only $2,995. Who says money can't buy happiness?

Tektronix

Phaser is a trademark of Tektronix, Inc. PostScript is a trademark of Adobe Systems, Inc. All other marks are trademarks or registered trademarks of their respective companies.

Circle 121 on reader service card.

FREE
CATALOG!

Five Reasons To Shop Inmac For Your PC Hardware And Software

1. **Low Prices** On Every Product, Every Day.
2. **Largest Selection** Of PC Hardware And Software Available.
3. **Satisfaction Guaranteed** With Inmac's 30-Day Warranty.
4. **Fast Shipment** Call By 5 p.m. And It's Shipped The Next Day.
5. **Easy Ordering** Just Pick Up The Phone And Call Toll-Free.

CALL TOLL FREE
1-800-972-9240
Or FAX 1-800-972-3210, 24 Hours A Day

YES! Please reserve my FREE copy of the INMAC PC Select Catalog.

Your Name Title
Company # of employees at your company
Division/Mail stop/Suite #
Address
City State Zip
Area Code Day Phone

Mail To: Inmac, 2465 Augustine Drive Santa Clara, CA 95052

Priority Code K14705

inmac

HIGHSCAN switch to the line in your CONFIG.SYS file that loads EMM386.EXE and reboot. If the HIGHSCAN switch locks up your PC, reboot, press F5 for a Clean Boot (bypassing CONFIG.SYS and AUTOEXEC.BAT), and then edit the switch from CONFIG.SYS.

Fill UMBs with Zeros

In versions before DOS 6.2, EMM386.EXE didn't initialize the contents of UMBs that it set up in upper memory. This practice could give you a nasty surprise: If you or an application you installed inadvertently mapped a UMB into a region populated by ROM, you most likely wouldn't find out until your PC locked up. Surprise!

DOS 6.2's EMM386.EXE driver, by contrast, fills UMBs with zeros so that problems are immediately apparent. If your PC no longer boots properly after an upgrade from 6 to 6.2, this could be the reason. To fix the problem, boot without EMM386.EXE and rerun MemMaker. MemMaker will identify most sources of conflict in the upper memory area (including troublesome adapter RAMs, adapter ROMs, and system-board ROMs) and configure EMM386.EXE to stay away from those areas. You may lose a few kilobytes of UMB RAM, but you'll no longer run the risk of mapping UMBs to forbidden areas of memory.

Maximize Available Memory

Of course, a lot of the old tricks for maximizing conventional and upper memory also work in DOS 6.2. Here are some more suggestions:

- If you're just a few kilobytes short of having enough upper memory to load a large TSR or device driver, add a NOHI switch to EMM386.EXE. This will increase the amount of available upper memory by about 5K (at the

THIRD-PARTY MEMORY MANAGERS

The memory monagement tools ovoilable in MS-DOS have improved significontly since the introduction of DOS 5. But to eke that lost elusive kilobyte (or ten) out of your conventionol memory, you moy want to try a third-porty memory management utility. The following progroms excel in configuring your memory with little or no intervention:

QEMM 7. Formerly known os QEMM386, Quorterdeck's highly-decoroted veteron hos motured with groce. As the new nome indicotes, it now supports 486 ond Pentium. Its outomated mode, Optimize, onolyzes your system ond configures your stortup files to get the most out of your RAM. For extro tweoking, the Stealth utility mokes the most of your BIOS ond video memory. Another module, Monifest, is a hondy diognostic tool that suggests improvements ond chonges. QEMM 7 supports Stocker ond the new DoubleSpoce in DOS 6.2. Running DoubleSpoce in Stealth mode con free os much os 40K of conventionol memory.

386Max 7.0. Like QEMM 7, Quolitos's 386Mox 7.0 offers a honds-free configurotion mode colled Moximize. The system monitoring feoture, Asq, provides helpful informotion on your system ond odds o bonus tutoriol. The Quolitos Memory Tester (QMT) tests for defective or unstoble memory, for those intermittent, hord-to-exploin croshes. Also like QEMM 7, this progrom supports the mojor disk compression utilities ond tokes odvontoge of BIOS ond video memory.

NetRoom 3. Don't let the nome fool you: This is not o network utility. The Clook technology moves progroms to the 32-bit protected mode of o 386 or loter system. This is NetRoom's opprooch to moximizing BIOS ond video memory. The self-configurotion module, Customize, is similor to Optimize ond Moximize in its opprooch, doing the bulk of the work for you. A unique feoture is DEVLOAD, which loods ond uploods device drivers on the fly.

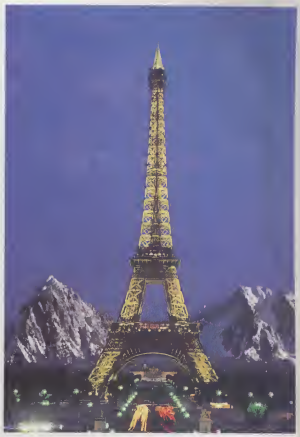
YAEL LI-RON

QEMM 7 • $99.95 • QUARTERDECK • (800) 354-3222
Circle No. 726 on Reader Service Card

386MAX 7.0 • $99.95 • QUALITAS • (301) 907-6700
Circle No. 727 on Reader Service Card

NETROOM 3 • $99 • HELIX SOFTWARE • (718) 392-3100
Circle No. 728 on Reader Service Card

How To Move Mountains.



Instantly.

Fast, easy changes. One reason Micrografx Picture Publisher® 4.0 is the #1-rated image editing software.

Step aside, Photoshop™ and Photostyler.™ The days of slow, frustrating imaging editing are over!

With new Picture Publisher 4.0, you'll be able to move objects (like the mountains above) with a click of your mouse. Rearranging your compositions at will without having to start over.

FastBits™ means you'll no longer have to load an entire image to retouch part of it. And you can work on a low-res version for even greater speed.

	Picture Publisher 4.0	PhotoShop 2.5	PhotoStyler 2.0
Object Layers™	Yes	No	No
FastBits™	Yes	No	Yes
Text Entry on Screen	Yes	No	No
Macro	Yes	No	No
EffectsBrowser™	Yes	No	No
Suggested Retail	$595	$895	$795

You'll also enjoy text placement right on your images. An EffectsBrowser™ for experimenting with filters and effects. The best masking tools in existence, and dozens of other advantages.

"Goes beyond any image editor anywhere."
PC Computing 9/93

"No program makes high-end image editing easier than Picture Publisher." (recommended over PhotoShop and PhotoStyler)
InfoWorld 8/30/93

"For professionals, Picture Publisher provides all the power needed..."
PC Magazine 10/12/93

Move up to Micrografx Picture Publisher 4.0 for only $199!

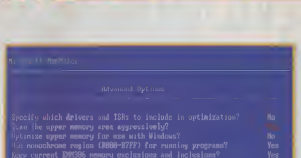
Using another image editor? Act fast and upgrade to Picture Publisher 4.0 for only $199. See your dealer or call:

1-800-733-6112

MICROGRAFX®

Micrografx, Inc., 1303 Arapaho, Richardson, TX 75081 (214)234-1769. Micrografx has offices in Toronto, Paris, London, Milan, Sydney, Madrid, Munich and Tokyo. Copyright © 1994, Micrografx, Inc. All rights reserved. Micrografx and Picture Publisher are registered trademarks of Micrografx, Inc. All other products are trademarks or registered trademarks of their respective owners.

Circle 253 on reader service card.



MemMaker asks, "Scon the upper memory orea aggressively?" Soy yes and MemMoker checks memory segment F000h (normally reserved for monochrome video) for space it can convert to UMBs.

expense of 5K of conventional memory). But don't fret; you could see a net gain of 25K in conventional memory because sacrificing 5K of conventional memory could allow you to move a 30K TSR or driver to upper memory.

• Reduce the FILES setting in your CONFIG.SYS file to the minimum possible (a figure best determined by experimentation unless you have third-party software to help out). Or you can use a third-party utility such as Quarterdeck's FILES.COM, or Philip Gardner's DOSMAX, or my own UMBFILES to move the system file table out of conventional memory. You can download UMBFILES.ZIP from data library 3 (Utilities/Misc.) on the PC/Contact forum. See page TK for downloading instructions.

• Add the command STACKS=0,0 to your CONFIG.SYS file. This frees up almost 2K of conventional memory on most PCs. If you subsequently experience unexplained lockups, or if you receive "Stack overflow" or "Exception error #12" messages from DOS, remove the STACKS=0,0 statement or restore the original STACKS setting.

• Don't allocate environment space needlessly. The statement

```
SHELL=C:\DOS\COMMAND.COM C:\DOS
 /E:1024 /P
```

in CONFIG.SYS sets aside a full 1K of conventional memory to hold environment strings. Most of us don't need nearly that much. Try decreasing this figure in increments of 128 or 256 until DOS or a batch file complains that it is "Out of environment space."

It pays to be knowledgeable when you're dealing with memory management. Then—and only then—can you be absolutely assured that you're getting the most from the RAM your system has to offer. ◩

Jeff Prosise is a contributing editor and the author of *Windows Desktop Utilities* (ZD Press, 1994). If you have a DOS tip, send it to: Help, *PC/Computing*, 950 Tower Lane, 19th Floor, Foster City, CA 94404. We'll pay $50 for every tip we publish.

PRINT SERVERS

Ethernet ▪ Token Ring ▪ Arcnet
Pocket size ▪ HP plug-in cards
Netware ▪ TCP/IP

We've packed each model with features, performance, and value. You can't get a better print server for the price.

- Connects your printer directly to your Novell Netware and TCP/IP networks
- Microserv models plug directly into parallel port on any printer
- Lanjet models plug into HP XIO and MIO option slots
- Up to 100,00 characters per second on parallel port
- Serial port can be input to printer or output from network at up to 115.2K baud
- Prints status and configuration at the push of a switch
- Comes with a one-year warranty and unlimited technicel support, made in USA

NETWARE FEATURES

- Supports 8 queues on up to 8 file servers
- Automatically locates queues on file servers
- Can notify user of job completion and printer errors
- Supports encrypted passwords
- Shows status via Netware's PSC and PCONSOLE
- Installation program simplifies setup
- Auto detects and uses 802.3 and Ethernet II
- Auto detects and reattaches to new file servers
- Simultaneous queue server and PSERVER

yes It runs with NetWare

TCP/IP FEATURES

- Finds IP address from BOOTP, RARP, or memory
- Supports LPR, RSh, Rexec, and standard TCP/IP connections to any TCP/IP host
- Configure using Telnet, TFTP, or the serial port
- Supports secure hosts with list of allowable IP addresses and subnet masks
- Notifies user of job completion via SMTP mail
- Notifies supervisor of paper out, off-line, and jobs printed by sending SYSLOG entries
- Shows estimated job completion time and throughput vie LPQ command
- Customized banners in PCL or Postscript
- User-defined strings before and after job
- Flash EPROM for easy upgrede to new versions
- Can convert UNIX ascii files to print directly to postscript and non-postscript printers

CALL NOW FOR FREE CATALOG

- Print servers
- Data switches
- Keyboard monitor products

Make the Rose Connection

ROSE ELECTRONICS

10850 Wilcrest Drive ▪ Houston, Texas 77099 ▪ Phone (713) 933-7673 ▪ Fax (713) 933-0044

800-333-9343

Circle 169 on reader service card.

Superior In Every Detail.

Every Nanao monitor undergoes intense scrutiny and testing to ensure maximum performance and product reliability.

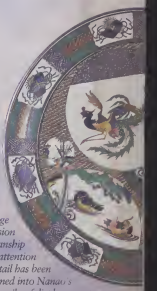
At Nanao, details make all the difference in creating our family of professional display monitors. From the product design and manufacturing that takes place in our factory to the end user's working environment, Nanao pays attention to every detail. In engineering. Assembly. Product testing. Quality control. Shipping. Customer support. From the very first days of the company, we set out to be an innovator in monitor technology. And, in a few short years, we have achieved that goal. Today, Nanao has the lowest repair rate in the monitor industry, the highest product reliability, and a fast-growing number of enthusiastic customers. So if you're looking for a superior monitor, start with the details. We do.

Nanao monitors feature protective coatings and panels that reduce glare and eliminate static electricity.

Nanao T Series and F Series monitors have captured every major award from the industry's leading publications.

Nanao was the first monitor company to join in partnership with the EPA Energy Star Program.

3 YEAR WARRANTY



A heritage of precision craftsmanship and attention to detail has been designed into Nanao's family of display monitors.

Model	Size	Dot Pitch	Scan Frequency	Recommended Resolution
T680i	21"	0.30mm	H 30-83kHz V 55-90Hz	1280x1024
T560i	17"	0.25mm	H 30-83kHz V 55-90Hz	1280x1024
F780i-W	21"	0.26mm	H 45-100kHz V 55-120Hz	1600x1200
F760i-W	21"	0.28mm	H 30-78kHz V 55-90Hz	1280x1024
F560i-W	17"	0.26mm	H 30-83kHz V 55-90Hz	1280x1024
F550i-W	17"	0.28mm	H 27-61kHz V 55-90Hz	1024x768
F540i-W	15"	0.28mm	H 27-61kHz V 55-90Hz	1024x768

Our monitor family teams ultra high resolution with a list of impressive technical specifications.

1-800-800-5202

NANAO®

NANAO USA CORPORATION
23535 Telo Avenue, Torrance, CA 90505
(310) 325-5202 Fax: (310) 530-1679

Circle 212 on reader service card.

Superior in every detail is a registered trademark of Nanao Corporation. All product names are trademarks of their respective companies.
© 1994 Nanao USA Corporation. The Energy Star emblem does not represent EPA endorsement of any product or service.

AppTips: Word Processors

INSIDE THIS MONTH

Add rows to WordPerfect tables easily • Update multiple Excel charts at once • Load FoxPro fast • Customize OS/2 menus

AmiPro 3.0

PROBLEM: The Number List paragraph style won't number consecutively if you change style between paragraphs.

SOLUTION: Promote the Number List style to a higher level than the intervening styles. Select Style, Outline Styles and highlight "1. Number List." Click on the Promote button until Number List is farther to the left than the other styles. Make sure none of the Reset Options is selected and click on OK. Ami Pro will number all paragraphs in your document's Number List style sequentially.

LOTUS WORD PROCESSING DIVISION
TECHNICAL SUPPORT DEPARTMENT

Word for Windows

PROBLEM: You want a quick way to pull certain scattered elements—illustrations, for example—from your master document into a single location.

SOLUTION: Set the illustrations or headings apart with a particular style, and use the following macro to extract all of the matching text in either Version 2.0 or 6.0 of Word for Windows. To create the macro click on Tools, Macro, type YankStyle under Macro Name, then click on Create. (In Word 2.0 for Windows, the final button is called Edit.) Between the Sub MAIN and End Sub lines, type the following macro:

```
CurrWindow$ = WindowName$()
FileNew
TempWindow$ = WindowName$()
Activate CurrWindow$
StartOfDocument
EditFindClearFormatting
EditFindStyle "heading 1"
EditFind "", .Direction = 2
While EditFindFound()
EditCopy
Activate TempWindow$
EditPaste
Activate CurrWindow$
EditFind "", .Direction = 2
Wend
```

Replace heading 1 with the style name you've used to set off your headings or illustrations. Save the macro. The macro places the copied text into a new document and drops you back into your original document. Move to where you want to insert the list into your original document, select Window, and choose the unsaved new document (for example, Document2). Copy all of the text in the list to the Clipboard, switch back to the original document, and paste your list into it.

WOODY LEONHARD
CONTRIBUTING EDITOR

WordPerfect 6.0 for DOS

PROBLEM: You need to hide certain onscreen documents fast when colleagues barge in on you unexpectedly.

SOLUTION: Keep your boss from knowing you're working on your résumé with a screen blanker macro. Open a new document and enter the following lines of code:

```
SAVESTATE PERSISTALL
AutoCodePlacement(OFF!) WP51Cur-
  sorMovement(ON!) VARERRCHK(OFF!)
ASSIGN(key;"") DISCARD(key)
ASSIGN(rc;"") DISCARD(rc)
IF((?RevealCodesActive*512))
 ASSIGN(rc; 1) RevealCodes
ENDIF
SHOWPOSITION(0; -1) SHOWCODE(Clr-
  Line!) SHOWATTRON(ReverseOff!)
SHOWCODE(ClrScreen!)
WHILE(""+key+""<>""+NTOC(-8182)
  +"")
 LOOK(key)
 IF(key) ASSIGN(key; NTOC(key))
  ELSE DISCARD(key) ENDIF
ENDWHILE
IF(EXISTS(rc)) Type("~")
 RevealCodes
ENDIF
DisplayRewrite
```

Save this new document as BLANK.WPM in the subdirectory \WP60\MACROS and WordPerfect will compile the macro.

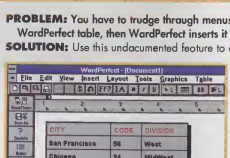
But what good is an emergency screen blanker if it takes several keystrokes to use? Select File, Setup, Keyboard Layout. In the dialog box, highlight Macros and type 3 to edit the macro keyboard assignments. Select Create from the Edit Keyboard dialog box and type in an unused keystroke combination such as Alt-Z. Choose Macro to select BLANK.WPM and Description to type in its purpose. Choose OK at each prompt until you return to the Keyboard Layout dialog box where you click on Close.

JOHN JARRETT
OAKHURST, CALIFORNIA

KILLER TIP: WORDPERFECT

PROBLEM: You have to trudge thraugh menus ad nauseam to add a new raw in a WordPerfect table, then WordPerfect inserts it in the wrang place.

SOLUTION: Use this undacumented feature to odd anather row quickly. Move to the last cell in the table (the battam-right cell), and press the tab key. Yau won't mave to a new column as yau would narmally; WordPerfect 6.0 far Windaws will autamatically add a new raw with the same table farmat as the lost raw in the table. WordPerfect will automotically size the raw ta fit your new data.



LYNDA TASCHEK
SAN FRANCISCO, CALIFORNIA

Pacific DirectNet. It takes the pain out of sharing LaserJet printers on a network.

What a relief. At last there's a network print server card that eases the pain associated with managing networked printers.

It's called Pacific DirectNet. And painlessly, it connects HP® printers and plotters to virtually any Ethernet or Token Ring network, while simultaneously supporting Novell NetWare, UNIX TCP/IP and EtherTalk operating systems.

yes NetWare Tested and Approved

Pacific DirectNet is engineered to simplify the entire printer sharing process, from installation to everyday use. Software is included that allows automatic setup on Novell networks. And with support for LPR/LPD, FTP, TFTP, and RShell, it's easy to setup and connect printers to any UNIX network—Sun, HP, IBM, DEC, SCO, Solaris, and Interactive UNIX.

For network managers, upgrading to the latest network operating system or to new features of an existing one is surprisingly simple. Just slip a disk into a PC and update Pacific DirectNet's Flash memory. There's even an SNMP agent that allows network management software to recognize and manage printers just like it does other network devices.

With Pacific DirectNet, sharing a networked printer is no longer a headache for users either. Because with automatic switching between operating systems, they won't be troubled by frequent trips to the printer front panel to switch protocols.

Pacific DirectNet boards are available for HP LaserJet® III, IIID, IIISi, 4, 4M, 4Si, 4Si MX, PaintJet® XL300, DeskJet®1200C, and DesignJet® printers and plotters. For more information, a dealer near you, or to order direct from Pacific Data Products, call us today at **(619) 625-3681**.

PACIFIC DATA PRODUCTS

Pacific Data Products, Inc., 9125 Rehco Rd., San Diego, CA 92121. In Europe, call (358) 61-473609. Pacific DirectNet is a trademark of Pacific Data Products, Inc. HP, LaserJet, PaintJet, and DesignJet are registered trademarks of Hewlett-Packard Co. Novell and NetWare are registered trademarks of Novell. UNIX is registered trademark of UNIX System Laboratories, Inc. Sun is a trademark of Sun Microsystems, Inc. IBM is a trademark of International Business Machines Corp. Ethernet is a trademark of Xerox Corp. All other brands and product names are trademarks or registered trademarks of their respective manufacturer. © 1994 Pacific Data Products, Inc.

Apr Tips: Spreadsheets

Excel 5.0

PROBLEM: You want numbers to stand out automatically when they meet certain criteria.

SOLUTION: To specify conditional number formats, block the cells you wish to format, click on the right-mouse button, and select Format Cells. Type the following into the Code box to display numbers less than 500 as red:

```
[<500] [RED]#,##0.00;#,##0.00
```

Note that conditional expressions such as <500 precede the format and are enclosed in square brackets. As another example, you may display a chevron (>>) next to values greater than 10,000 by typing the following code in the Code box:

```
[>10000] ">>"* #,##0;#,##0
```

RALPH SOUCIE
JONESPORT, MAINE

PROBLEM: You don't want to display zeros in cells in several sheets.

SOLUTION: Hold down Ctrl and click the left-mouse button on the tab of each sheet you want to affect. Select Tools, Options, and deselect the Zero Values option, then click on OK.

RALPH SOUCIE
JONESPORT, MAINE

PROBLEM: Excel doesn't let you update a series of charts in one operation.

SOLUTION: The Visual Basic for Applications (VBA) macro below updates eight charts on eight successive worksheets. To customize this macro for the correct number of worksheets, replace the "8" on the fifth line with the appropriate number. To create the macro, select Insert, Macro, Module. Then type the following lines on the blank sheet.

```
Sub Macro1()
 Message = "Enter the row number
   with new data"
 Title = "New data dialog"
 NewRow = Val(InputBox(Message,
   Title, 5))
 For I = 1 To 8
   Worksheets(I).Select
   Set NewData = Range(Cells(New
     Row, 1), Cells(NewRow, 4))
   ActiveSheet.DrawingObjects("Char
     t 1").Select
   ActiveSheet.ChartObjects("Chart
     1").Activate
   ActiveChart.Axes(xlValue).Select
   ActiveChart.SeriesCollection.Ext
     end Source:=_
     NewData, Rowcol:=xlColumns
   ActiveWindow.Visible = False
 Next I
End Sub
```

Place each chart with its data series on a separate worksheet. Then assign the same name to the chart on each worksheet (in this example, Chart 1). To run the macro, press F5. You will be prompted for the number of the row that contains new data, and the macro will perform the update to the specified worksheets.

RICK DOBSON
LOUISVILLE, KENTUCKY

Quattro Pro 5.0 for DOS

PROBLEM: Repeatedly copying a block of cells to different destinations requires specifying the source block each time.

SOLUTION: Create an autocopy macro. Click on a notebook page tab and then select Edit, Page, Name. Type Macros and press Enter. Starting in cell A1, type in the following:

```
 A B
1 '\C     {OnError CONT1}
2     {/ Name;Delete}SOURCE~
3 CONT1   {/
  Name;Create}SOURCE~{?}~
4 '\R     {OnError CONT2}
5     {/ Name;Delete}DEST~
6 CONT2   {/Name;Create}DEST~{?}~
7     {Block;Copy}SOURCE~DEST~
```

This creates two macros that you execute by typing Alt-C and Alt-R. To name the macros, select Edit, Names, Labels, Right, and specify A1..A6 for named blocks. When you first copy a block, press Alt-C, and you'll be prompted for source and destination. For your next copy, and all subsequent ones, press Alt-R and you'll be asked to specify only the destination.

THE COBB GROUP
LOUISVILLE, KENTUCKY

Lotus 1-2-3 for Windows

PROBLEM: Entering data into a specific block of cells requires using the arrow keys to navigate.

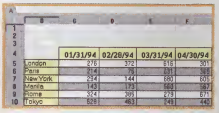
SOLUTION: Actually, it doesn't, though the way around the problem is undocumented. First highlight the range you want to type into; keyboard users may do so by pressing F4, then typing the range (example: B3..F12). Then start entering numbers, following each with Enter. The cell pointer will automatically move down the first column you selected. When you get to the last cell selected in this column, you'll loop around to the first cell in the second.

RANDY STONE
HACKETTSTOWN, NEW JERSEY

KILLER TIP: 1-2-3 FOR WINDOWS

PROBLEM: You need to set up column headings as month-end dates (01/31/94, 02/28/94, and so on) for five years, from January 1994 to December 1998.

SOLUTION: Designate range C14..BJ14 (or any other 60 cells) for the column headings. Go to the last cell in your range (in this case, it's BJ14) and type @DATE(98,12,31). Go to BI14 and type the formula +BJ14-@DAY(BJ14). Now copy that cell "backward": select Copy, accept BI14..BI14 as the range to copy from, and type BH14..C14 as the range to copy to. To format the displayed values as dates, select Range, Format, Date 4 (MM/DD/YY) and specify range C14..BJ14. All of the dates shown will be month ends.



	B	C	D	E	F
1					
2					
3					
4		01/31/94	02/28/94	03/31/94	04/30/94
5	London	276	372	616	301
6	Paris	214	76	631	365
7	New York	234	144	680	605
8	Manila	143	173	563	567
9	Rome	324	385	279	671
10	Tokyo	528	463	249	440

LEO BIRCHLER
ST. CHARLES, MISSOURI

There are many ways to ~~add~~ address letters.

And to make lab~~X~~els.

But there's only one smart way to do both.

Pocket your pen. Toss your typewriter. And leave your laser printer alone. Because if you're using any of them to address envelopes or make labels, you're making things hard on yourself. After all, you could be using a Smart Label Printer.

These little machines feature powerful, easy-to-use software. So you can print labels in an instant without exiting an application whether you're working with a Windows,™ DOS or Macintosh® system.

Smart Label software can automatically capture an address or other text and graphics from your computer screen. Print it instantly, or save it to the built-in database. It even lets you personalize labels with graphics, bar codes, digital images, and a selection of over 50 fonts. In short, this unique software makes Smart Label Printers the time-saving, hassle-free, fool-proof solution for labeling everything from envelopes to name tags, file folders to floppy disks.

The Smart Label Printer Pro™ and the Smart Label Printer Plus.® Making labels any other way just wouldn't be smart.

For more information, call 1-800-688-0817.

SII
Seiko Instruments

©1994 Seiko Instruments Inc. "SII" is a registered trademark of Seiko Instruments Inc. "Smart Label Printer Pro" is a trademark and "Smart Label Printer Plus" is a registered trademark of Seiko Instruments U.S.A Inc. All other brand names and products are trademarks or registered trademarks of their respective holders. All labels created using an IBM compatible system. Graphics capability with Windows & Macintosh only.

Circle 113 on reader service card.

dBASE IV

PROBLEM: You need to count the number of doys that have passed so far this yeor as well os the number of doys remoining.

SOLUTION: Create a procedure file, as follows. At the "dot" prompt, type MODIFY COMMAND MYPROGS. dBASE will add the .PRG extension to that name. Type the following lines:

```
FUNCTION DOY
PARAMETERS pdate,pcode
SET TALK OFF
PRIVATE yr,numdays
IF TYPE("pdate") <> "D" .OR.
  TYPE("pcode") <> "C"
RETURN 0
ENDIF
yr = STR(YEAR(pdate),4)
DO CASE
CASE UPPER(pcode) = "D"
numdays = pdate - CTOD("01/01/" +
  yr) + 1
CASE UPPER(pcode) = "R"
numdays = CTOD("12/31/" + yr) -
  pdate
OTHERWISE
numdays = 0
ENDCASE
RETURN numdays
```

Save and exit using Ctrl-W. The file MYPROGS contains a User Defined Function (UDF) called DOY. To use it, type SET PROCEDURE TO MYPROGS; which will load the file to memory and make the UDF available for that session, or until you type SET PROCEDURE TO. Give the DOY function a date and code: either "D" for day of the year, or "R" for days remaining. For example,

```
.? DOY(DATE(),"D")
101
.? DOY(DATE(),"R")
264
```

ROGER SAUER
FAIRFIELD, CALIFORNIA

PROBLEM: You want to be able to quickly replace any occurrence of specific chorocters with other chorocters.

SOLUTION: Page 187 of the *dBASE IV 2.0 Language Reference Manual* provides an assembly language script for a file called StrSubst, which does this, but it's not an internal command, so it's pretty slow. This small UDF easily performs search and replace on substrings within character variables. Add it to your procedure file using the instructions in the preceding tip.

```
FUNCTION StrSubst
PARAMETERS string,srchstr,replstr
PRIVATE cpos
DO WHILE .T.
cpos = AT(srchstr,string)
IF cpos = 0
EXIT
ENDIF
string =
  STUFF(string,cpos,LEN(srchstr),r
  eplstr)
ENDDO
RETURN string
```

To use StrSubst, type:

```
. ? REPLACE ALL city_state WITH
  strsubst(city_state,"Califor-
  nia","CA")
```

In this example, all occurrences of "California" within the CITY_STATE field in the database will be replaced with "CA."

ROGER SAUER
FAIRFIELD, CALIFORNIA

Microsoft Access 1.1

PROBLEM: When a temporory emplayee comes in to da your doto entry, you need to outomote Access so that it loads the right database when it starts and automotically goes to the Add New Record screen.

SOLUTION: You'll need a combination of command-line options and an AUTOEXEC macro—the macro Access looks for when opening a database. In Program Manager, create a new program icon by selecting File, New, Program Item. For Description, type a name such as Customer List Data Entry. In Command Line, type

```
C:\MSACCESS\MSACCESS CUSTLIST/X
  AUTOEXEC
```

The first part of the command launches Access, CUSTLIST is the database, and /X is the command-line option for running a macro (in this case, AUTOEXEC). Specify your Working Directory and assign an icon. To create the AUTOEXEC macro, launch Access, select File, Open Database, and the name of the database. Click on the Macro button, select New, and select the following:

Action:	Action Argument:
Echo	On
OpenTable	CustList
GoToRecord	New

To save the macro, select File, Save As, and type AUTOEXEC.

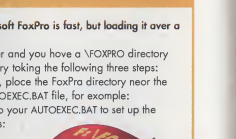
RICK DOBSON
LOUISVILLE, KENTUCKY

KILLER TIP: FOXPRO

PROBLEM: Once it's up and running, Microsoft FoxPro is fast, but loading it over a network seems to take forever.

SOLUTION: If FoxPro itself is on the file server and you hove a \FOXPRO directory on your local drive (for example, C: or D:), try toking the following three steps: First, using o text editor such os EDIT in DOS, ploce the FoxPro directory neor the beginning of the PATH stotement in your AUTOEXEC.BAT file, for example: PATH=C:\DOS;F:\FOXPRO. Next, odd o line to your AUTOEXEC.BAT to set up the FOXPROCFG environment vorioble, os follows:

```
FOXPROCFG=C:\FOXPRO\CONFIG.FP
```



Then edit the CONFIG.FP file in the local \FOXPRO directory and insert the following line:

```
_FOXHELP=C:\FOXPRO\FOXHELP.FPT
```

Re-boot, ond you should see o morked improvement in the time it tokes to get FoxPro up and running.

STEVEN J. VAUGHAN-NICHOLS
LANHAM, MARYLAND

Our Break-Through Technology Caught the Competition by Surprise...Wait 'Til They See Our New Prices!

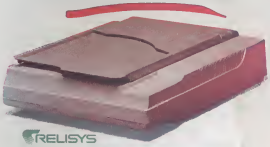
$599

Colour

Avec Colour 2400

- **2400 dpi Resolution**
- **Free ImagePals**
- **Free Alacrity**

$1399



RELISYS

Relisys RELI 2400DPI

- **2400 dpi Resolution**
- **1200 x 300 Hardware Resolution**
- **Single Pass**
- **Free Transparency Adapter**
- **Free Photoshop Full Version**
- **Free Alacrity**

Relisys Software Bundles

Alacrity's E-Quip

Copier Management OCR Plain Paper Fax

Alacrity's E-Quip software – The easy and affordable way to turn your desktop PC into a copier, plain paper fax machine, OCR management and powerful document management system.

Adobe's Photoshop

The world's leading photo design and production tool.

U-Lead's ImagePals

Avec 2400 Also Includes ImagePals:

- Image, Graphics and Document Management
- Screen Capture
- File Conversion
- Other Application Access
- Image Editor
- Slide Show Presentation
- Image Compression

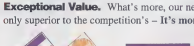
Now you can have all the features without the high cost.

Before now, buying a quality scanner meant spending a fortune. Relisys' new Cold Scan Technology changes everything. Finally, a family of **full-featured scanners** at prices you can afford!

Dust-Free, Cold Scan Technology. Ordinary hot-lamp scanners rely on a fan to circulate cool air - and dust - throughout the scanning process. But new cold scan technology allows Relisys to fully encapsulate the process. So you get unprecedented, dust-free accuracy.

Longer lamp life. 35,000 hour lamp life versus approximately 2000 hours for hot florescent bulbs.

Exceptional Value. What's more, our new technology is not only superior to the competition's – **It's more affordable!**



Call today for details on the complete line, or to order direct.

ABC Computer, Inc.
12391 Valley View Avenue
Garden Grove, CA 92645

Order Direct:

East Coast **1•800•581•1852**
West Coast **1•800•889•8836**

Satisfaction Guaranteed!

You may return any product within 20 days of the invoice date. Return authorization number is required. All products must be in new, unused condition with all registration cards and packaging. Defective hardware will be repaired or replaced at our option. Copyright laws prohibit the return of open software. 15% restock fee for refunds and returned shipments. Shipping and miscellaneous charges are non-refundable.

Photoshop is a trademark of Adobe Systems, Inc. E-Quip is a trademark of Alacrity Systems, Inc. ImagePals is a trademark of U-Lead, Inc.

Circle 144 on reader service card.

App Tips: OS/2 2.1

REXX

PROBLEM: OS/2 batch files don't have an interactive option to receive o Yes/No answer from the user.

SOLUTION: Write a REXX program and call it from the batch file. In the Enhanced Editor, type the following and save it as YESORNO.CMD:

```
/* Name: YESORNO.CMD */
/* PURPOSE: To get yes or no from
   the user */
/* It returns Yes as 0, No as 1 */
/* This program is not case sensi-
   tive */
/* and it requires a response. */
CALL RxFuncAdd 'SysGetKey',
  'RexxUtil', 'SysGetKey'
TOP:
ASCII = 999
SAY "Enter A Single Character Y)es
  or N)o"
Character = SysGetKey(echo)
IF Character = "Y" then ASCII = 0
IF Character = "y" then ASCII = 0
IF Character = "N" then ASCII = 1
IF Character = "n" then ASCII = 1
SAY
IF ASCII = 999 THEN SAY "ERROR:
  Enter Y)es or N)o"
IF ASCII = 999 THEN SIGNAL TOP
Exit ASCII
```

Because OS/2 treats REXX programs as batch files, you can call this program from your batch file with a CALL YESORNO command. Even though the top five lines are comments, the first one is critical: OS/2 looks for a REXX-style comment in the first line to tell the difference between a batch file and REXX program.

RONNY RICHARDSON
CHAMBLEE, GEORGIA

Print Manager

PROBLEM: Large CAD files take longer to spool to the printer or plotter than regular print jobs.

SOLUTION: To speed things up, follow your software's instructions to print to a file, rather than directly to the printer. Once you've created a print file, press Ctrl-Esc to switch to the Workplace Shell, then open the folder where the print file resides. With the right-mouse button, drag the icon to the Print Manager icon and release it. Switch back to your application, and OS/2 will handle the print job in the background.

JOHN M. SIINO
PITTSBURG, CALIFORNIA

Workplace Shell

PROBLEM: You wont to customize the pop-up menus for certain folders.

SOLUTION: It's a snap if you follow these steps: With the right-mouse button, click on the folder to modify. When the menu pops up, select Open, Settings and click on the Menu tab. Under Available menus, click on Create another and type in a name for the menu. Click on OK. Click on the menu name to select it. Click on Create another under Actions on the menu. Type in the name for the menu option and the full path to the program to run. Repeat the last step for as many items as you wish to add to the menu. When you have finished adding items to the menu, double-click on the Settings Notebook icon in the upper-left corner to close it.

When you click on the Right Folder icon, your new menu shows up as the next-to-last item, just above Close. Click on that name, and all of your menu items show up.

RONNY RICHARDSON
CHAMBLEE, GEORGIA

PROBLEM: Although you run only a few DOS programs, each requires o seporote AUTOEXEC.BAT configurotion.

SOLUTION: Create multiple DOS session windows and configure each to load a separate AUTOEXEC.BAT file: Right-click on the DOS session icon in the Command Prompts window, right click on Copy, choose a window for the new DOS session, select the Copy button in the dialog box, and then rename the new session.

Next, right-click on the new DOS session icon, click on the arrow next to Open, and select Settings. Select the Program tab and then, in the Optional Parameters field, enter /P/K FILE.BAT, where FILE.BAT is the name of the alternative AUTOEXEC.BAT batch file for this session. Now, each time you start the new DOS session, it runs with FILE.BAT instead of AUTOEXEC.BAT.

RONNY RICHARDSON
CHAMBLEE, GEORGIA

PROBLEM: You need to occess your environment voriobles from the OS/2 commond line quickly.

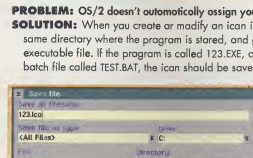
SOLUTION: Type ECHO followed by a space, a percent sign, the variable name, and another percent sign. For instance, to find out how you've set your command line prompt, type ECHO %PROMPT%.

RONNY RICHARDSON
CHAMBLEE, GEORGIA

KILLER TIP: ICON EDITOR

PROBLEM: OS/2 doesn't outomotically assign your preferred icons to programs.

SOLUTION: When you create or madify an ican in the Ican Editar, save it to the same directory where the pragram is stared, and give it the same name as the executable file. If the program is called 123.EXE, call your ican 123.ICO. For a batch file called TEST.BAT, the ican shauld be saved as TEST.ICO, and sa an. By default, OS/2 laaks far an ican with the same name as the executable when you use a program template to install the pragram to the desktap ar to a falder. If you are using a third-party ican, rename it and capy it to the appropriate directary.



RONNY RICHARDSON
CHAMBLEE, GEORGIA

Fidelity Announces Our Best Deal Ever For Active Investors

- *New lower price for FOX software*
- *Your first trade free**
- *30-day trial offer of Telescan*

Award-Winning Fidelity On-line Xpress Is Now Just $49.95

Last year, *PC/Computing* magazine described Fidelity On-line Xpress (FOX) as **"a quantum leap in electronic investing."** Previously $89.95, this advanced software package is now available for just $49.95!

With FOX investment software, your trading orders are sent to the marketplace in seconds and executed by Fidelity Brokerage. For stock and option trades you'll save an additional 10% on commissions that are already as much as 76% lower than full-cost brokers.[1] And now, when you buy FOX software at its new low price, **your first stock or option trade is free**, up to $38.

A Complete Personal Financial Market Monitor

FOX software gives you a breadth of portfolio management features you simply won't find anywhere else, from tax lot tracking to instant research services. And starting now, Fidelity is also offering to FOX buyers a **30-day trial offer of The Telescan System**,[2] the advanced investment information service, with technical charting and fundamental analysis tools to help you screen and review a broad range of financial data. Maybe it's time to put FOX software and Fidelity Brokerage on your side in today's market. Call anytime to learn more.

For More Information Call 24 Hours
1-800-544-7272

To Order Call
1-800-457-1769

Fidelity Investments®

*To be eligible for first FOX trade free up to $38, software must be purchased by June 30, 1994, and your first trade must be made using FOX by September 30, 1994. FOX orders for your account(s) are sent directly to the markets via Fidelity's computer system, and are subject to trading and account requirements. Telephone charges may apply. FOX hardware requirements include an IBM or compatible system with hard disk drive, free space of at least 3 Mb, Hayes or compatible modem, 640k internal memory. Color graphics and mouse optional. The optional news and analysis services of Dow Jones News/Retrieval, Telescan and S&P MarketScope are available through FOX. FOX was jointly developed by MECA Software, Inc. and Fidelity Investments. [1]Based on October 1993 survey. [2]For a one-time $12.75 shipping charge, you get the Analyzer, ProSearch and Mutual Fund Search software, the complete set of user manuals and 30 days of free usage of Telescan during non-prime time hours (6:00 p.m. – 7:00 a.m., local time). Fidelity Brokerage Services, Inc., 161 Devonshire Street, Boston, MA 02110. Member NYSE/SIPC.

CODE: PCC/040194

Circle 106 on reader service card.

Introducing Omn
Precisely what you'd expe

The world's most advanced OCR.

If OmniPage® Professional broke the mold for OCR, then OmniPage Professional 5.0 promises to be nothing short of revolutionary. Professional 5.0 represents the biggest technological breakthroughs ever pioneered by Caere. Advancements that push our level of OCR accuracy to new heights. Increase ease of use and flexibility. And expand feature capabilities beyond any previously offered. Now at a price you can afford.

Recognize more.

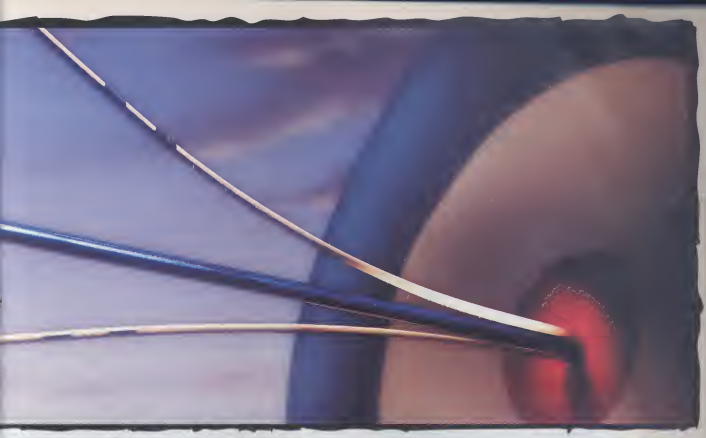
For the first time in the history of OCR, you can now get full page retention of any document—even those with text and images—without losing the document's original format. It's made possible with Professional 5.0's True Page™ which offers true page-based display and access capabilities. So what you see on the printed page is what you'll see after your document is recognized. What's more, you'll have immediate access to your data and images. Use the new WYSIWYG Text Editor to easily edit and manipulate text. Or enhance images with an integrated 24-bit color image editor. It's never been easier to recognize, proof, or modify a printed document.

Get more accomplished.

In the past, OCR users had to follow a rigid and often time-consuming sequence of steps to scan, recognize, and save a document. Now with Professional 5.0's Dynamic Access Panel™ you can work in a style that's convenient for you. The panel's intuitive interface is designed for maximum workflow flexibility. The click-and-choose functionality allows you to modify your workflow, even in the middle of a job. Professional 5.0 also allows you to save and customize zone templates to use with similar documents in the future. And its improved training capabilities mean you can "teach" it to recognize

caere

For Your Information.



Page Professional 5.0.
ct from the leader in OCR.

more custom characters than ever before. In addition, Professional 5.0 contains all the easy-to-use features you've come to expect from the leader in OCR, including:

- Custom character recognition
- Deferred processing
- 24-bit color image editor
- Recognition of 11 languages
- Scans fonts from 6-72 points
- TWAIN support
- HP AccuPage™ technology 2.0 support

Redefining OCR Accuracy

Professional 5.0's advanced accuracy is made possible by Caere's recent technological breakthroughs. To begin with, Caere has taken its award winning OCR to a new level with *3D* OCR.

3D OCR is a revolutionary technology that uses full gray images for the first time. Professional 5.0 is able to view the "depth" of each character pixel, so it can be used as additional "data" in the recognition process. OmniPage also includes a new compound neural network to help with extra tough pages like faxes. In addition, Professional 5.0 features the Language Analyst,™ a sophisticated language checker which eliminates many OCR errors.

So whether your documents contain a challenging layout, images, or low resolutions, you can count on Professional 5.0 to give you precisely what you're looking for.

To get your copy of OmniPage Professional 5.0, or learn about the new OmniPage 5.0 or OmniPage Direct, see your local Caere dealer or call us for more information at 1-800-535-SCAN.

omniPAGE PROFESSIONAL

Circle 261 on reader service card.

Caere and OmniPage are registered trademarks of Caere Corporation. The Caere logo, True Page, Dynamic Access Point, and Language Analyst are trademarks of Caere Corporation. All other trademarks are of their respective companies. ©1994. All rights reserved.

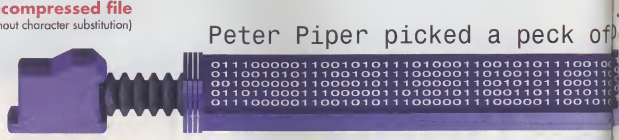
File Compression

How a 2MB file shrinks to 300K. (Or why can't diets do that?)

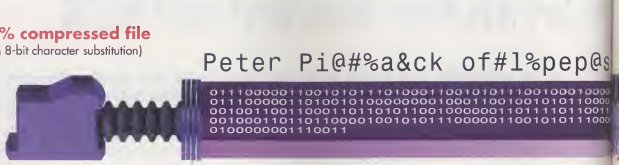
By Ron White. Illustrated by Timothy Edward Downs

At a time when typical business applications occupy 15MB of precious hard disk space, file compression utilities—despite some allegations of data corruption—are becoming commonplace, if not essential. Even the 300MB drives fill up faster than you can say "DoubleSpace," and shareware offerings such as PKzip are among the most frequently downloaded utilities on any BBS. Let's demonstrate how these utilities cram more data into less space, using a sentence with which we're all familiar.

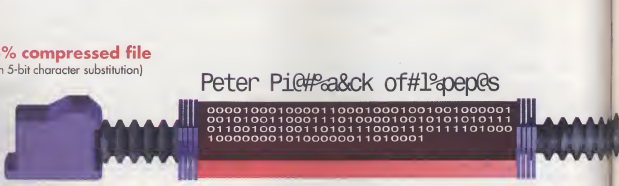
Uncompressed file
(without character substitution)



59% compressed file
(with 8-bit character substitution)

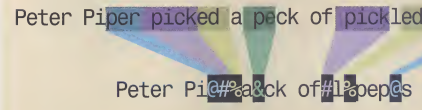


75% compressed file
(with 5-bit character substitution)



CHARACTER SUBSTITUTION

One of the simplest ways to compress a file is to substitute single characters for groups of characters. You can actually shrink a file substantially by doing it without a computer. In this example—which is 44 characters long, including spaces—the character groups "er," " pick," " pe," and "ed " all occur at least twice. Notice that we've included a space in the " pick," " pe," and "ed " groups.



1 These zeros and ones are how your computer "sees" our sample sentence. The compression utility substitutes codes that stand for the position and length of the redundant-letter groups. The substitutions are recorded in a table that is part of the compressed files. Since the compression program works from beginning to end, the second " pe" is not replaced—the space that would have been part of that graup is already replaced with the "ed " that precedes it. The result is a text string af only 26 characters instead of the original 44. This simple substitution compresses the string to 59 percent of its original size.

2 Next, the compression utility saves space by making substitutions for the binary code that DOS uses to represent text. Ordinarily, camputers use an entire byte, consisting of 8 bits, ta represent a character. Eight bits provide 256 combinations of zeros and anes—much more than needed ta represent the alphabet. Since we have only 26 characters after the previous step, we need only 5 bits to store our sentence. The compression program creates a 5-bit binary cade for our 26 characters.

3 Here's the end result. The compression program replaces the 8-bit binary code with its shorter 5-bit binary code. Using the standard 8-bit ASCII designation, the ariginal text would yield 352 bits (44 characters by 8 bits per character). The shorter version in step two results in 144 bits (18 by 8). But the 5-bit binary code requires only 90 bits (18 by 5), an additional 38 percent saving compared with Step 2, and a saving af 75 percent compared with the original version.

Quiet! Listen! That Sound: Is It Live or Is It Digitized?

How your computer converts an analog world into its digital language.

The original IBM PC wasn't very vocal. Aside from a few clicks, beeps, and squawks, it was generally seen and not heard. And, for the most part, this vow of silence was appropriate in the typical office environment. After all, in 1981, who needed a calculator that sang? But over the past decade, computers have undergone some profound changes. While the PC stood mute, the Macintosh and Amiga (and even the PCjr) gained the built-in ability to reproduce acceptable speech, music, and other sounds. Recently, however, the surging interest in multimedia has generated a windfall for audio-starved PC users. Once an esoteric and expensive option, quality sound for the PC is now pervasive and can often be had for less than $100.

Although you don't need a PhD in physics to buy a sound card, a little understanding goes a long way. In this column, I'll explain how PC sound works to help you choose a sound card.

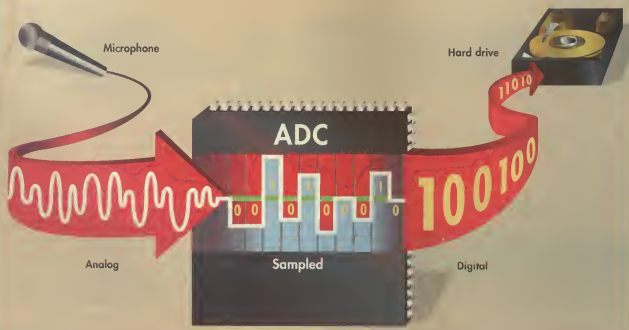
First, let's get our lexicon up to snuff. The most common term you'll probably see is hertz (usually in its abbreviated form, Hz). Hertz is the unit used to measure a sound's pitch (or frequency, if you want to be a physics stickler). The human ear hears sounds between 20Hz and 20kHz. This range, however, varies considerably from person to person, particularly at the high frequency limit, and it decreases with age.

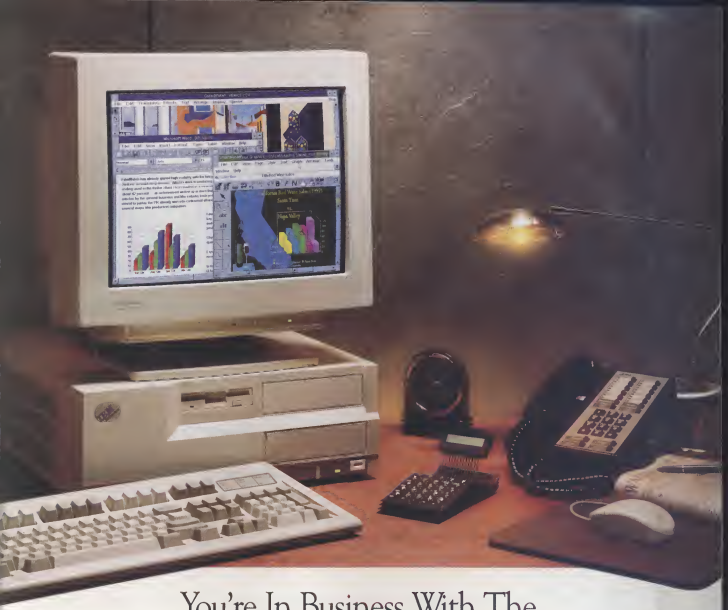
The frequencies we encounter most often lie below 10kHz. A piano, for example, produces sounds that range from 30Hz to 3.5kHz. The telephone company's standard phone lines use only the frequencies between 300Hz and 3kHz, which are sufficient to identify the person on the other end of the phone. When you get right down to it, that range is probably overkill: Distinguishable audio can be achieved

HOW SOUND CARDS WORK

When you speak into a microphone that's connected to a sound card, the analog-to-digital converter (ADC) samples your sound. In other words, it takes discrete but closely spaced "snapshots" of the sound to measure its frequency and amplitude.

If the ADC doesn't sample often enough, it misses parts of the analog sound altogether. If its sample isn't "big" enough (doesn't have enough bits), the ADC winds up approximating values. In either case, you wind up with a degraded sound.





You're In Business With The Diamond Scan® 17FS Color Monitor.

The new Diamond Scan 17FS represents another pinnacle of achievement from the company that has been manufacturing flat square color monitors longer than anyone else – Mitsubishi Electronics.

3 YEAR WARRANTY
Parts and labor. Protected investment with guaranteed lower cost of ownership.
3

The Diamond Scan 17FS is a high performance monitor with a significantly larger viewing area than 14" and 15" models for ideal upgradability, yet its very compact enclosure design easily integrates into existing work spaces. It's the perfect monitor for general business, desktop publishing and even cost-conscious CAD applications. For exceptional visual acuity, the Diamond Scan 17FS provides high refresh, flicker-free resolution, Dynamic Beam Forming (DBF), an Invar mask for sustained high brightness, and optical quality, anti-glare and anti-static CRT coating. Plus, a new three-level color calibration system and optional Diamond Control™ on-screen user adjustment software for even greater performance versatility.

All this at a very competitive price and available for immediate delivery. What more could you want? For more information in the U.S. or Mexico, call us at 1-800-843-2515, or in Canada call 1-800-387-9630. *For immediate product specifications call Mitsubishi Quikfax at 1-800-937-2094.*

MITSUBISHI
DISPLAY PRODUCTS

energy
EPA POLLUTION PREVENTER

Mitsubishi Electronics America, Inc., Display Products, 5665 Plaza Drive, Cypress, CA 90630
Mitsubishi Electric Sales Canada, Inc., 4299 14th Avenue, Markham, Ontario L3R 0J2

© 1994 Mitsubishi Electronics America, Inc. Specifications subject to change without notice. The Energy Star emblem does not represent EPA endorsement of any product or service. Diamond Scan is a registered trademark of Mitsubishi Electronics America, Inc. All other trademarks or registered trademarks are the property of their respective holders. Screen images produced from the following companies: Microsoft Corp. (*Word*); Corel Systems Corp. (*CorelDraw*).

Circle 120 on reader service card.

with a frequency range as narrow as 500Hz to 1.8kHz—although it will sound as though you're talking into a foam-lined tin can. Now let's look at how sound makes its way from your accordion into your PC.

Digitization

Sound is an analog, or continuous, phenomenon—for example, a sine wave. To get audio into a PC, it has to be converted to the discrete world of digital. We call this process *digitization*, and it requires two steps. First, the continuous analog signal must be divided into a series of discrete signals in a process called *sampling*. Next, the amplitude (volume) of each of these samples must be measured. A special chip called an analog-to-digital converter (ADC) handles both processes.

Here's how it works: A microphone, stereo, or other input device sends an analog signal to the ADC, which samples the incoming signal, measures the amplitude, and converts both factors into a number that the computer can understand.

The number of times per second that the ADC examines the incoming signal is its *sampling rate*. The sampling rate affects the quality of the digital reproduction by limiting the frequency range. A high-pitched sound wave fluctuates rapidly. Because the ADC samples only at discrete intervals, it does not record the fluctuations in sound that occur between samples. This is an example of a sampling error that makes the digitized sound a distorted version of the original.

The bottom line is that the ADC is oblivious to all signals with a frequency higher than half its sampling rate. (Trivia note: This relationship between frequency and sampling rate is called the *Nyquist sampling criteria*.) As a practical matter, systems generally have an upper frequency limit that's somewhat lower than this theoretical limit.

This means an ADC with an 11kHz sampling rate will record frequencies up

Ever wondered what a sound looks like? Your eyes may never know, but here's a graphical representation of what your computer "sees" after it has digitized one.

LOOK MA. NO CABLE. NO DOCKING STATION. NO

No kidding. Now you can connect your laptop and desktop PCs without using any of those things. All you need is Traveling Software's remarkable new LapLink® Wireless with AirShare™ radio modules.

Simply plug the modules into your serial ports, install LapLink Remote Access™ for Windows™ and presto, whenever your laptop is within 30 feet of your desktop, they'll connect automatically.

That's right Ma, no hands.

These sleek, pocket-sized AirShare radio modules make LapLink Wireless possible. Developed by National Semiconductor, they attach easily to your desktop and laptop PCs. At just 5 oz. (with battery attached) they won't weigh you down.

© 1994 Traveling Software, Inc. 18702 North Creek Parkway, Bothell, WA 98011. LapLink Remote Access is a trademark and LapLink is

to about 5.5kHz. This rate is adequate for recording speech, but not for music. A 22kHz sampling rate offers improved recording quality, reproducing frequencies up to about 11kHz—enough range for the most common sounds. To produce recordings that accommodate the entire range of human hearing, consumer CD players use ADCs with a 44kHz sampling rate to sample music for audio.

Sample Size

The other important factor in digitization is the *sample size*. Unlike the sampling rate, which determines how many times the ADC will "listen" to the sound each second, the sample size, measured in bits, determines how precise the number describing the sound will be. If you have a piece of wood that's one yard long, it's great for measuring your desk, but poor for measuring a goldfish—all you can say is that the fish is less than a yard long. An ADC with an 8-bit sample size gives you 256 possible numbers to assign to a sample—adequate for speech, but not for music. The 16-bit sample size common on many of today's sound cards gives 65,536 possible values to the same sample: Clearly it's much more precise.

You've probably realized that transforming data back into sound is the same process in reverse. First, a digitized sample is loaded into a chip called a digital-to-analog converter (DAC). The value of the sample is then used to produce a corresponding analog signal. If the digital samples are converted back to analog at the same rate they were captured, the original sound is reproduced.

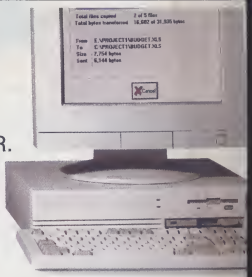
To say that digital audio has some advantages over analog audio is to grossly understate the revolutionary impact of the technology. Once an audio signal has been converted to a digital form, it ceases to be sound: It becomes data. It can be stored, transferred, compressed, manipulated, and recalled just like any other data.

Adding sound to your PC can be a good investment. Sound is used for voice annotation of spreadsheets and documents, or to supplement communication in other forms. But not all sound boards are created equal. Choosing a board that's not up to your requirements can be a costly mistake.

If you intend to work with speech only and can accept reduced sound quality, a sound board with an 8-bit sample size and an 11kHz sampling rate will fit the bill. For demanding applications such as multimedia and good-quality audio, however, your board must support a 16-bit sample size and a 44kHz sampling rate. ◩

You can reach Robert Hummel on MCI Mail at 371-5998 or by writing to him care of *PC/Computing*, 950 Tower Lane, 19th Floor, Foster City, CA 94404.

FLOPPY. NO PHONE JACK. NO LAN ADAPTER.



No inconvenience, either. Because LapLink Wireless not only synchronizes your files, it does it *all by itself*. That's right Ma, no more digging around for files to update.

Want to print directly from your laptop and access resources on your LAN? No problem.

No wonder *InfoWorld* says LapLink Wireless is "cool." We think it's pretty hot ourselves.

So pick up the phone. Call **800-480-6654**. We'll tell you where to go. To buy it, that is.

NEW LAPLINK WIRELESS FROM TRAVELING SOFTWARE

a registered trademark of Traveling Software, Inc. AirShare is a trademark of National Semiconductor Corp. InfoWorld quote from 11/8/93 issue.

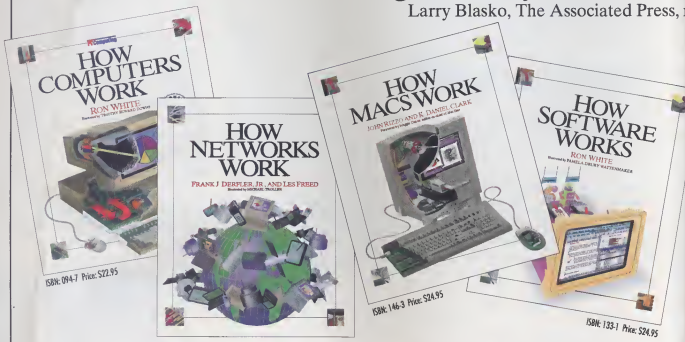
Circle 139 on reader service card.

Imagination. Inn

The How It Works Series

"... a magnificently seamless in

Larry Blasko, The Associated Press, re



No other books bring computer technology to life like the *How It Works* series from Ziff-Davis Press. Lavish, full-color illustrations and lucid text from some of the world's top computer commentators make *How It Works* books an exciting way to explore the inner workings of PC technology.

PC/Computing How Computers Work

A worldwide blockbuster that hit the general trade bestseller lists! *PC/Computing* magazine executive editor Ron White dismantles the PC and reveals what really makes it tick.

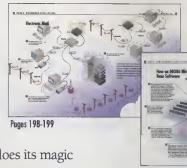
How Networks Work

Two of the most respected names in connectivity showcase the PC network, illustrating and explaining how each component does its magic and how they all fit together.

Pages 18-19

How Macs Work

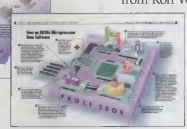
A fun and fascinating voyage to the heart of the Macintosh! Two noted *MacUser* contributors cover the spectrum of Macintosh operations from startup to shutdown.



Pages 198-199

How Software Works

This dazzlingly illustrated volume from Ron White peeks inside the PC to show in full-color detail how software breathes life into the PC. Covers Windows™ and all major software categories.

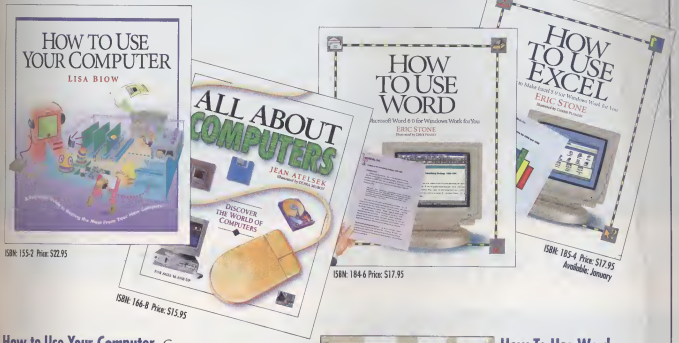


Pages 10-11

ovation. Insight.

from Ziff-Davis Press

tegration of text and graphics . . ."
iewing *PC/Computing How Computers Work*



ISBN: 155-2 Price: $22.95

ISBN: 166-8 Price: $15.95

ISBN: 184-6 Price: $17.95

ISBN: 185-4 Price: $17.95
Available: January

How to Use Your Computer Conquer computerphobia and see how this intricate machine truly makes life easier. Dozens of full-color graphics showcase the components of the PC and explain how to interact with them.

All About Computers This one-of-a-kind visual guide for kids features numerous full-color illustrations and photos on every page, combined with dozens of interactive projects that reinforce computer basics, making this an exciting way to learn all about the world of computers.

Pages 2-3

Pages 46-47

How To Use Word Make Word 6.0 for Windows Work for You!

A uniquely visual approach puts the basics of Microsoft's latest Windows-based word processor right before your eyes. Colorful examples invite you to begin producing a variety of documents, quickly and easily. Truly innovative!

How To Use Excel Make Excel 5.0 for Windows Work for You!

Covering the latest version of Excel, this visually impressive resource guides beginners to spreadsheet fluency through a full-color graphical approach that makes powerful techniques seem plain as day. Hands-on "Try It" sections give you a chance to sharpen newfound skills.

Available at all fine bookstores or call, 1-800-688-0448, ext. 5567.

ZIFF-DAVIS ZD PRESS

© 1993 Ziff-Davis Press

No one else brings

All the selection. All the service.

Announcing CompUSA Direct!

Get the buying power of the world's largest computer superstores in your home.

We're the world's largest chain of computer superstores. In fact, more people buy computers and software from us than anyone else. And now, CompUSA Direct offers you the same incredible selection, guaranteed low prices, super service and super support—right in your own home. Just pick up the phone and call **1-800-CompUSA** any time of the day or night and you can have it all!

Guaranteed Low Prices.

We regularly check our prices against our competitors' to make sure ours are lower. And if you ever happen to find a lower advertised price, we'll beat it. Better than guaranteed low prices, they're verified.

GUARANTEED VERIFIED LOW PRICES

Over 5,000 Products.

We offer the most incredible selection of computer products imaginable—including hardware, software, printers, accessories, furniture and more. When it comes to buying power, other direct companies don't even come close.

The Most Name Brands.

No one else offers all these name brands. Here's just a sample: IBM, Compaq, Toshiba, NEC, Packard Bell, Dell, Texas Instruments, Canon, Epson, Borland, Sharp, Claris, ATI, Okidata, U.S. Robotics, Sony, Lotus, Panasonic, Microsoft, WordPerfect, Hewlett-Packard.

*Technical support available through your nearest CompUSA Superstore Technical Service Center. On-site service is available within the continental U.S. only **Defective merchandise may be replaced with the same item only. Original packaging and proof of purchase is required to return any merchandise. All Hayes modems and laser printers, and some other printers, monitors and laptops must be sent to authorized service centers.

all this to your door!

All at guaranteed low prices.

Super Service. Super Support.

No one else offers complete technical support like CompUSA Direct. Plus, an extended warranty, in-store repair and on-site service are also available.*

Best Business Support.

CompUSA's Corporate Division is your best business connection. Your company gets a personal Account Representative to handle all your business needs, plus quick delivery, easy ordering, guaranteed satisfaction and more. We'll even help you set up a network.

Easy 30-Day Return Policy.

Returns are not a problem, with our 30-day money back guarantee.** Plus, there's no credit card surcharges or re-stocking fees for returned products.

Custom System Configuration.

Order it your way. Just tell us what you want and we'll customize a system for you right over the phone.

intel inside

And look for the *Intel Inside*® symbol on your quality computer products.

24-Hours A Day. 7 Days A Week.

Every hour of every day, CompUSA Direct is standing by to take your order. Call **1-800-CompUSA** for a FREE catalog, filled with over 5,000 products.

Call Today for a Free Catalog

COMPUSA DIRECT℠

1-800-COMP USA

VISA

The Intel Inside logo is a registered trademark of Intel Corporation. All other trademarks belong to their registered owners. For international orders, call 1-214-888-5770. CompUSA Direct is a registered servicemark of CompUSA Inc. CompUSA Direct, 15167 Business Avenue, Dallas, TX 75244.

Circle 270 on reader service card.

Dynamic Data Exchange; or, How to Talk with Your Mouth Full

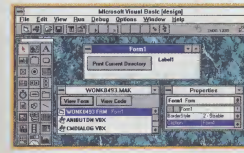
Reach out and touch someone with Windows' own Ma Bell.

So there I am at Crazy Cornelius's Computer Corral, sitting in front of the Multimedia Monster, admiring the 16-bit sound card and speakers the size of Ross Perot's ears. And this sales wonk is standing behind me telling me I can use dynamic data exchange to talk to anything, any time, and how DDE is everywhere. And I say, "No way." And he says, "Way." And I look at him. And so I crank up Word for Windows, type in DDEInitiate("Elvis"), figuring that if DDE is everywhere, wherever Elvis is, he'll respond.

And, well, we sat there for a while, ya know, and the red lights are flashin' and the drives are whirrin', and suddenly that there computer starts smokin' and I'm thinkin' what the fat-fried hell is goin' on, and it's long enough that DDE should've timed out, when all of a sudden the whole machine starts to cracklin', and I swear the King's boomin' baritone commences to shake the speakers, "Return to sender, address unknown. . ."

Guess ya gotta take yer religious experiences wheres ya can find 'em.

At this stage of Windows' evolution, we have three widely used methods to communicate between Windows applications: object linking and embedding (OLE), dynamic data exchange (DDE), and SendKeys (UCK!). If they were phone systems, OLE would be the latest from AT&T, DDE would be a party line, and SendKeys would be two cans and a string. We'll talk about SendKeys and DDE this month, and we'll save OLE for next month's column.



For some reason, Visual Basic requires a label control. The push button executes the code; the label sits there. Why not cover the label with the push button?

First, and least, SendKeys is accurately described as the last refuge of the tortured. When SendKeys works—an all too infrequent occurrence—your macro command fakes out Windows, making it think that somebody is typing at the keyboard, when in fact it's your macro doing the talking.

Ever throw a Frisbee into the air, then run like hell and try to catch it, all by yourself? Well, that's what SendKeys is like. You toss this keystroke—say, Enter—into the Windows ooze. Then, quick as you can, switch over to the application that's supposed to receive the keystroke, hoping that second application pulls an O.J. Simpson and arrives in time to take the keystroke and do something with it.

Timing is the Achilles' heel of SendKeys. On a speedy machine, the application runs fast enough to catch the Frisbee; on a slow machine it can't get there in time and the keystroke is never to be seen again.

We never use SendKeys unless the applications in question are so dumb they can't talk to each other any other way.

Doing DDE

So much for the bad news. Now the good: Almost every significant Windows application supports DDE. It's a powerful, cantankerous critter built in to Windows itself. Think of it as a rickety old telephone exchange, held together with

PRINTFILENAMES CODE

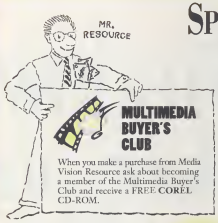
This Word for Windows macro prints a list of all the files in the current directory.

Start Word for Windows, Version 2.0 or later, click on Tools, then Macro, type in a name like PrintFileNames, and click on Enter. Then type in these lines. *Note:* Word for Windows ignores everything after the ' (apostrophe)—the comments are there for your benefit.

```
Sub MAIN
FileNew                 'Create a new document
Insert "Files in "      'Stick in a text string
Insert Files$(".")      'Files$(".") is the current directory
InsertPara              'Start a new paragraph
FName$ = Files$("*.*")  'Get name of first file in directory
While FName$ <> ""      'As long as there are files,
  Insert FName$         'Stick the file's name in the doc
  InsertPara            'Start a new paragraph
  FName$ = Files$()     'Look for the next file
Wend                    'When Fname$ is blank, no files are left
FilePrint
DocClose 2              'Close without saving
End Sub
```

Click on File, Close, and select Yes to save the changes. You're finished. To run this Word for Windows macro (and you should test it before proceeding), click on Tools, Macro and double-click on PrintFileNames.

SPRING INTO MULTIMEDIA WITH GREAT DEALS FROM MEDIA VISION RESOURCE.



MULTIMEDIA BUYER'S CLUB

When you make a purchase from Media Vision Resource ask about becoming a member of the Multimedia Buyer's Club and receive a FREE COREL CD-ROM.

M.V. RESOURCE MULTIMEDIA KIT SPECIAL

ONLY $189

- A perfect starter Multimedia Upgrade Kit
- 8-bit sound card
- Double speed CD-ROM drive
- Amplified speakers
- Includes 8 exciting software titles: Battle Chess, Leisure Suit Larry I, Jones in the Fast Lane, Space Quest IV, F-15 Strike Eagle, Greens, B-15 Flying Fortress & Railroad Tycoon

$65 AUDIO PORT

- PC audio device
- High-performance portable module for PCs & notebooks
- Plugs into parallel port of any IBM PC/AT, PS/2 or notebook
- Transport Sound™ technology & built-in speaker
- Headphone & external speaker outputs

PRO MOVIESPECTRUM $99

- Create professional desktop videos on your PC
- Smooth real-time capture at 30 frames per second up to 160 × 120
- Still-frame capture with resolutions of 320 × 240 & 640 × 480
- 32,768 vibrant colors
- Includes Microsoft Video for Windows

CDPC XL

ONLY $399

- The first complete, fully-integrated, multimedia solution
- Includes dual-speed CD-ROM drive, amplifier, speakers & MIDI
- Multi-session Photo CD ready
- Brings high-quality sound to your PC with the best in 16-bit digital audio
- Includes 5 CD-ROM titles: Out of This World, Where in the World is Carmen Sandiego?, Compton's Multimedia Encyclopedia, Action!, & Space Quest IV

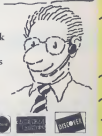
NOW YOU CAN OWN THESE EXCITING CD-ROM TITLES FROM MEDIA VISION. FROM AN ACTION PACKED ADVENTURE TO A GARDENING EXTRAVAGANZA. CALL NOW FOR DETAILS.

CRITICAL PATH

FOREVER GROWING GARDEN

QUANTUM GATE

- Order instantly from experienced multimedia sales representatives
- 30-day money back guarantee on hardware products only
- Toll-free technical support 7 days a week
- Overnight delivery
- All major credit cards accepted



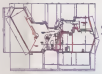
Call 1-800-684-6699

Monday thru Saturday, 6am to 6pm
International customers call (510) 770-8600

© 1994 Media Vision, Inc., 47300 Bayside Parkway, Fremont, CA 94538 (510) 770-8600. Pro MovieSpectrum, CDPC XL, Audio Port & Critical Path are all trademarks of Media Vision, Inc. Quantum Gate is a trademark of Hyperlock Studios. Forever Growing Garden is a trademark of C-Wave. Any other trademarks or registered trademarks are the property of their respective holders. Any and all bundled software and prices are subject to change without notice.

MEDIA VISION RESOURCE

Circle 123 on reader service card.

Yes, you can do Windows™ and walls and doors and floors, ceilings, whole 's, 's, trains, boats, 's, chains, 's, diamond rings, 's and things, 's, power plants, topo maps,  's, helicopters, roads and bridges, circuit boards, 's power lines, 's, airports, furniture, digital terrain models, 's, skateboards, the 's, chemical plants, 's, golf courses, anything you can think of ... even the kitchen

MicroStation. CAD software for Windows and Windows NT

Open yourself to a world of design possibilities with MicroStation CAD software. From 2D drafting to advanced 3D surface modeling, MicroStation Version 5 is the ultimate design tool for the Windows environment. And the most complete, with photorealistic rendering and animation. All in one package!

Join the many designers who have made the move to the CAD tool for the '90s.

Call 800-345-4856 for a free demo disk and brochure on MicroStation.

MicroStation
CAD *for the* '90s

INTERGRAPH

MicroStation models courtesy of Viewpoint Animation Engineering. Intergraph and the Intergraph logo are registered trademarks of Intergraph Corporation. MicroStation is a registered trademark of Bentley Systems Inc., an Intergraph affiliate. Other brands and product names are trademarks of their respective owners. © 1993 Intergraph Corporation, Huntsville, AL 35894-0001 3DA0140A0

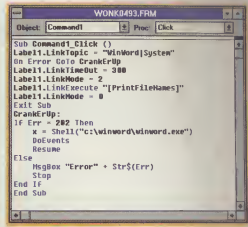
Circle 127 on reader service card.

bailing wire and chewing gum, where the callers and callees—if they're very careful and very lucky—have a chance to talk to each other. Sometimes.

We're going to show you how to use DDE, with Visual Basic making the phone call (acting as a client) and Word for Windows answering the phone (acting as a server). We chose Visual Basic and Word for Windows because most of the problems between the two are fairly well known, if not understood. The terminology carries across pretty well: You should be able to take this example and translate it into WordPerfect- or 1-2-3- or DynaComm-speak, or any of a hundred other DDE-savant applications.

Our little Visual Basic program consists of a single push button. When you push the button, Visual Basic calls Word for Windows using DDE, then tells it to run a macro. That macro prints out a list of all files in the current directory. Here's how to do it on your own—OK, with a little help. Start by creating the PrintFileNames macro, described in "PrintFileNames Code," page 218, and then exit Word for Windows and crank up Visual Basic.

You're going to need a label, so double-click on the capital A in Visual Basic's Toolbox, and move Label1 to the right, out of the way. (Only Gates knows why Visual Basic forces you to hook the LinkExecute command to a label control—even if it serves no other purpose.) Next, you'll need a push button, so double-click on that oval thing (in the screen on page 218, it's the last icon on the second line of the Toolbox). Type in a good title for the button, something like "Print Current Directory." This should give you a Visual Basic form that looks more or less like our screen shot.



The LinkTimeOut line tells Visual Basic to wait 30 seconds for a DDE response from Word for Windows. CrankErUp jump-starts Word for Windows if it's not already running.

That was the hard part. The program itself is pretty easy. Double-click on the "Print Current Directory" button and you'll be propelled into Visual Basic's program editor, ready to type in the

PC/Contact

This Month's Free Software and Shareware

All the public-domain and shareware programs and utilities featured in *PC/Computing* each month are available on our online service, PC/Contact, or on disk from Public Brand Software for a fee. Shareware requires additional payment to authors for continued use. For information on how to download files from PC/Contact or how to order shareware on disk from Public Brand Software, turn to page TK.

Lister ..... **Windows, page 188**

Do you hate the hassle of loading text files into a word processor just to print them? If so, Lister is your kind of point-and-click solution. Download LISTER.ZIP from PC/Contact's data library 3 (Utilities/Misc.).

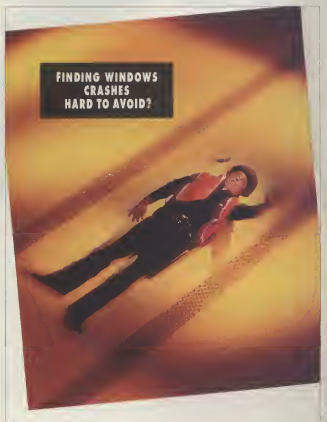
RESQ ..... **DOS, page 192**

This utility recovers any text that remains in memory after a program crashes. Download RESQ.ZIP from PC/Contact's data library 3 (Utilities/Misc.).

WinKey ..... **Q&A, page 224**

WinKey is a shareware utility from DataGem which, among other things, provides a toggle switch for your CapsLock key. Download WINKEY.ZIP from PC/Contact's data library 3 (Utilities/Misc.), or contact DataGem directly at (206) 391-4415. The registration fee is $15.

Want to join PC/Contact? See page 223 for instructions.



Circle 222 on reader service card.

Awesome monitor. Killer price.

VisionMaster 17" ONLY $799 MSRP

Three "plus" year warranty. 1280 x 1024 at 80 Hz. EnergyStar. Only VisionMaster packs $1,395 worth of performance into a $799 monitor.

3 YEAR+ WARRANTY

This is a monitor to write home about. Every high-performance feature at an unheard of price—backed by the most aggressive warranty in the business. The new VisionMaster 17" FST.

It's all here. Precision .26 dot pitch and incredibly fast 80 Hz vertical refresh for crystal clear, flicker-free images. Microprocessor control to eliminate image distortion. An anti-glare coating to relieve eye strain. A base three year warranty that can be extended to five years. MPR II low-radiation certification. And a unique "power-off" energy conservation system that makes any PC that uses it EnergyStar compliant.

Compare these features. Compare our "three plus" warranty. No monitor beats the 17" VisionMaster for value and performance. Call today—they'll be going fast.

For more information or the reseller nearest you, call today at 1-800-394-4335.

No monitor beats the 17" VisionMaster

	VISIONMASTER MF-8617	VIEWSONIC 17	VIEWSONIC 17G	NEC 5FGE	NEC 5FGP
SCREEN SIZE	17"FST	17"FST	17"FST	17"FST	17"FST
DOT PITCH	.26mm	.28mm	.28mm	.28mm	.28mm
MAX RESOLUTION	1280 x 1024	1280 x 1024	1280 x 1024	1024x 768	1280 x 1024
MAX. REFRESH @ 1280 x 1024	80Hz	76Hz	60Hz	N/A	76Hz
COLOR MATCHING	YES	YES	YES	NO	YES
POWER SAVING	YES	NO	YES	NO	YES
WARRANTY PARTS/LABOR	3YRS/3YRS	3YRS/1YR	3YRS/1YR	3YRS/3YRS	3YRS/3YRS
EXTENDED WARRANTY	YES 2 YEARS	NO	NO	NO	NO
PRICE	$799	$1199	$999	$1155	$1455

VISIONMASTER™

IDEK Iiyama

Iiyama North America, Inc.
650 Louis Drive, Warminster, PA 18974
Outside the U.S., call 215-957-6543
Fax: 215-957-6551

* Three year warranty on parts and labor when purchased through an authorized reseller.

Windows is a registered trademark of Microsoft Corporation
VisionMaster is a trademark and product of Iiyama North America.
©1994 Iiyama North America

Circle 172 on reader service card.

actions you want Visual Basic to perform when that button is clicked.

When you click on that button, the program in the screen on page 221 starts a DDE conversation with Word for Windows, has Word for Windows run the PrintFileNames macro, then ends the conversation. (The | on the second line is the pipe character, which is probably located above the backslash on your keyboard.)

Phone Tag

Windows' DDE telephone exchange has a rather strange set of rules. The application making the call—in this case, our little Visual Basic program—has to tell Windows what phone number it's looking for and what the topic of conversation will be. Windows' DDE then goes down its list of running applications, asking each app in turn, "Is this your phone number? Will you accept a phone call on this topic?" The first application that responds "Yes" to both questions gets the DDE phone call.

The second line of code tells Windows that we want to talk to an application with the phone number "WinWord" and that our topic of conversation is "System." In case Word for Windows isn't running, the next line tells Visual Basic to jump down in the code, jumpstart Word for Windows, and resume running the program.

We've also included a line that tells Visual Basic to wait 30 seconds for Word for Windows to finish running the DDE commands. It may not be necessary on fast 486 systems, but it doesn't hurt to have it in there. Visual Basic dials the DDE phone with the line LinkMode = 2. If Word for Windows is running, it will always say "Yes" to the phone number "Word for Windows" and the topic called "System." The phone call is initiated. Otherwise, Visual Basic triggers an error number 282, which causes our code to crank up Word for Windows and return to the next command.

Visual Basic then tells Word for Windows to execute the macro called PrintFileNames and hang up the DDE phone by setting LinkMode to zero. Click on the little right-wedgie (Play) button underneath Run to run your application. Then click on the Print Current Directory button and see if it works.

That's all it takes. You've just written and run a full-fledged DDE application. It really isn't difficult, eh?

Chapter 6 of Waady's Windows 3.1 Programming for Mere Mortals (1992, Addisan-Wesley), goes into much greater detail. You can heckle Woody at 72241,2125 and Vince at 76636,415 on PC/Cantact. And if you have any Visual Basic programs you'd like to send our way, we'll pay you $50 if we publish them. Send them ta: Help, PC/Camputing, 950 Tower Lane, 19th Floor, Faster City, CA 94404.

PC Contact

HOW TO JOIN PC/CONTACT

Current CompuServe or ZiffNet members type GO ZNT:PCCONTAC at any CIS ! prompt. Cost is based on CIS's fee of $12.80 per hour for 1,200 and 2,400-bits per second and $27.80 per hour for 9,600 and 14,400-bps (rates are lower if you're a CIS standard-plan subscriber).

ZiffNet users pay a monthly membership fee of $2.50. This support fee provides a variety of free and chargeable services. For information about these services, type GO ZNT:ZIFFHELP and download the files GOWORD.TXT and FREE.TXT from library 1 (General Information). For complete hourly rate information, type GO RATES while online.

Follow these steps to join ZiffNet and participate in the PC/Contact forum:

1. Set these modem and software parameters: 7 data bits, even parity, 1 stop bit, full duplex.
2. Call CompuServe's customer assistance line at (800) 848-8990 (United States) or (800) 635-6225 (Canada). From other countries, dial CompuServe direct at (614) 457-8650. You can also call CompuServe with your modem. Set it as instructed above and dial (800) 346-3247. Press Enter when your modem connects. Type PHONES at the HOST NAME prompt, press Enter, and follow the onscreen prompts to find a local access number.
3. Dial the access number with a modem. When your modem connects to the network, press Ctrl-C to get the system's attention.
4. At the HOST NAME prompt, type CIS and press Enter.
5. At the USER ID prompt, type 177000,5300 and press Enter.
6. At the PASSWORD prompt, type PC/CONTACT and press Enter.
7. At the ENTER AGREEMENT NUMBER prompt, type PCC94 and press Enter.

TOP PICKS ON DISK

You can easily get all the public-domain utilities or shareware covered in this month's issue by calling the disk vendor Public Brand Software at (800) 426-3475 or (317) 856-7571. Ask for this month's Editors' Picks from *PC/Computing*. They're available for $5 or less per disk (most disks have several utilities and programs on them), plus $5 for shipping and handling.

Circle 223 on reader service card.

INSIDE THIS MONTH

Solve DOS 6 upgrade problems • Unblast a Sound Blaster • Back up between hard disks • Check printer availability

MS-DOS Upgrade Blues

I recently tried to upgrade from MS-DOS 5 to Version 6 on my 16MHz 286 system. When I rebooted, my machine locked at the Starting MS-DOS prompt. From a bootable disk in my A: drive, however, it didn't hang. Is there a problem with MS-DOS 6 and this type of machine?

ROBERT L. VIDRICK, JR.
MECHANICSVILLE, VIRGINIA

My first thought is that the upgrade added EMM386.EXE to your CONFIG.SYS file, and your particular system doesn't like it. However, with certain configurations, even 386 and 486 machines can experience this type of hang. The most common causes of reboot hang-ups are:

BIOS incompatibility. Some of the older BIOSes came online when DOS 3.3 or earlier was the current operating system. As a result, the older BIOS often cannot take advantage of DOS 6.x's advanced features. Even some of the more recent BIOSes, such as those from 1992 or 1993, are susceptible.

You may obtain BIOS upgrades for Phoenix, AMI, and Award Software from your local retailer, the manufacturers (in most cases), and even third-party organizations such as ROM BIOS Upgrades (800-766-7467) and Unicore Software (800-800-2467, 508-686-6468).

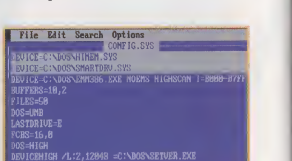
Device incompatibility. IDE, SCSI, internal fax modems, tape drives, scanners, video cards, and other devices can cause hangs, error messages, random reboots, and even complete device failures. If the problem didn't exist before you upgraded to DOS 6.x, it's a good idea to contact your peripherals' manufacturers and inquire about ROM or device BIOS upgrades or replacements (or both).

Software incompatibility. Drivers for all the devices listed above could be incompatible with the operating system upgrade. Sometimes you can use DOS's SETVER program to have the DOS version table report a different version of DOS to the driver or program, but unfortunately this quick fix doesn't always work.

If you've had your peripherals and software for a long time—more than two years—definitely contact the manufacturer or your local retailer for more information about obtaining updates.

Getting back to your problem, it's possible that the DOS 6 upgrade also added HIMEM.SYS or SMARTDRV.EXE to your CONFIG.SYS file by mistake, making your system hang. That happened to me when I ran the upgrade for my own ALR 286 system. Review your CONFIG.SYS file, remove these statements if they exist, and boot your system normally.

If the hang recurs, you may have a system BIOS incompatibility or perhaps a TSR or driver incompatibility. In this case, remove the upgrade by running UNINSTAL from your first Uninstall disk. Then contact your computer's manufacturer about a BIOS upgrade for your computer.



You just upgraded to MS-DOS 6.x and your system won't boot—chances are the upgrade added the line below what we've highlighted to your CONFIG.SYS.

Sound Blaster Screech

My Sound Blaster makes a low-pitched humming noise when I first start Windows and a very high-pitched screech when I exit Windows. If I reboot and restart Windows a second time, it doesn't happen. Changing IRQ, DMA, and I/O address settings doesn't work, and neither does a clean boot with only HIMEM.SYS. Can you help?

NEIL BOEMIO
HARTSDALE, NEW YORK

Creative Labs' tech support informs us that the problem is caused by using Version 1.5 drivers with your Sound Blaster Version 2.0 adapter. You need Version 2.0 of the Sound Blaster Wave and MIDI drivers and the updated MIDI synthesizer driver. You can get them one of three ways:

- Call the Creative Labs BBS at

HELP ABOUT: WINDOWS AUTOCAPS

I've used the AUTOCAPS utility listed in the November 1993 issue and love it, but (there's always a "but") I can't get it to work in Windows. Is there a solution?

WILLIAM J. GRASSER
HOUSTON, TEXAS

You bet. We found a shoreware utility called WinKey from DataGem that will do what you want—and much, much more. Download WINKEY.ZIP from data library 3, Utilities/Misc., in the PC/Contact forum or contact DotoGem directly at (206) 391-4415. In addition to the CopsLock function, WinKey also gives you the typewriter-style shift function, and you can disable NumLock, ScrollLock, or both. The registration fee is $15.

Circle No. 730 on Reader Service Card

HE'S NIMBLE, RELIABLE, AND DOESN'T TAKE COFFEE BREAKS. MEET YOUR NEW COMPUTER CONSULTANT.

Introducing PC Tools™ 2.0 for Windows. It's like having your own consultant-in-a box.

From the minute you let him out, he'll be solving Windows problems and making your system run smoother. He'll monitor memory, resources, and disk conditions that lead to crashes, and warn you while there's still time to make corrections.

He'll analyze your system and suggest ways to improve performance - then help you make any necessary changes instantly with your own Do-It Key. He even has the ability to translate .INI files into plain English. And only a PC Tools for Windows consultant gives you MultiDesk™ to help eliminate clutter and organize your work on multiple desktops.

Help end the frustrations of Windows, with your own consultant-in-a-box. For a free trial copy of our File Manager,* call 800-695-0678, or for more information, call FAXBACK at 800-847-8766, ext. 97540. Corporate or government buyers call 800-305-0936 to learn about the Central Advantage Program. Help is standing by.

CENTRAL POINT

UPGRADE FROM PC TOOLS, NORTON OR DASHBOARD ONLY $49.95 CALL 1-800-695-0678.

* Plus $4.95 shipping and handling. XTree, Dashboard, Norton, and all other Central Point products qualify for upgrade. Offers expire May 31, 1994. Offers good in the U.S. and Canada only.

©1994 Central Point Software. Central Point and PC Tools are trademarks of Central Point Software, Inc. Names of other products are trademarks of their respective holders.

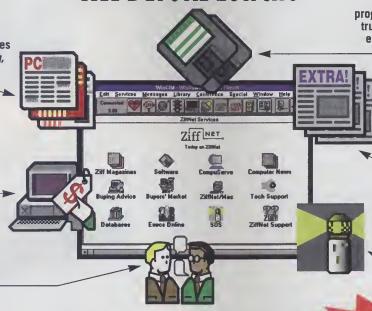
Circle 225 on reader service card.

Where Can You Meet Computer Industry Leaders, Top Editors And Battle An Alien Nation— All Before Lunch?

Exchange opinions with editors and columnists and download utilities featured in Ziff magazines like *PC Magazine, PC/Computing, Windows Sources* & more.

Consultants and buyers turn to ZiffNet's vast databases for product and price information, plus advice from experts and fellow members.

Talk directly to product managers and executives from companies like Microsoft,® Lotus,® IBM® and Adobe...let them know what you think.



Download thousands of top-rated programs, handpicked by people you trust...games, utilities, Windows,™ education, graphics & much more.

Get tomorrow's news today with *PC Week* online the Friday before it's printed — plus the award-winning international daily newswire, NewsBytes.

Instant help for computer problems 24 hours a day with ZiffNet's one-of-a-kind Support On Site database.

Online, On ZiffNet!

FREE Starter Software!

A wealth of computing resources is waiting for you.

Sign on to ZiffNet and join the over 200,000 computer users who've already discovered the benefits of being part of our online community. You'll connect with computer industry leaders, Ziff editors and other knowledgeable computer users like you.

On ZiffNet you can call up any article or product review ever printed in the Ziff magazine archives... make sure you're getting the right products at the best prices by consulting ZiffNet's Buying Advice and Buyers' Market databases...check out our extensive, highly regarded Software Library with thousands of programs, including exclusive ZiffNet custom utilities, like the "Gates Does Windows" screensaver. And this is just the beginning — you won't find the information and resources ZiffNet offers anywhere else!

Join now and get FREE Starter Software, plus $15.00 of online time!

Call 1-800-848-8199 today and we'll send you the ZiffNet edition of WinCIM (the Windows version of CompuServe® Information Manager), your ZiffNet ID and password and a $15.00 credit toward online time — all absolutely FREE!

Current CompuServe members can join ZiffNet by typing GO ZIFFNET from anywhere on CompuServe. Join now and you'll also receive our information-packed New Member Kit, plus a FREE download of specially selected screensavers when you log on the first time. Just type GO SCREENSAVE.

So, why not join ZiffNet today? We're waiting to welcome you online right now.

Call 1-800-848-8199 and ask for ZiffNet's WinCIM offer or type GO ZIFFNET today!

Ziff NET

All about computing online.

ZiffNet membership fee is just $2.50 a month. Standard connect-time charges apply for certain services like downloading software. Rates are fully explained online. GO RATES. Offer expires 7/31/94

Circle 280 on reader service card.

"Usability testing works for ViewSonic. It's why business management reads PC/Computing."

"Our monitors have earned numerous awards, we're number one in the PC CAD market and the third largest marketer of 17-inch monitors. One of the secrets of our success is that we're very sensitive to the needs of end users and respond very quickly to what they demand.

"PC/Computing has been very good for us, too. It's helped us boost our sales and market share. The editorial direction is excellent. Of the 15 publications we're in, PC/Computing's positioning is perfectly aligned with our own.

"Some magazines focus on performance only, some on price only. Business decision makers, the buyers with influence, want to know more. PC/Computing takes their point of view by combining both and adding another crucial element: Usability testing.

"In the January issue, our 17-inch monitor was voted number one for its color quality, sharpness and versatility. Usability testing makes PC/Computing unique and draws the highest percentage of quality leads. It's why business management reads PC/Computing. That makes it a key element in our marketing strategy."

Call 1-800-676-4PCC

850,000 Business Solutions Buyers are looking to buy your products. PC Computing

(405) 742-6660 (14,400 bits per second, 8 bits, 1 stop bit, no parity) to download the latest drivers.

• Call Creative Labs at (405) 742-2345 and order an updated set of drivers for a small fee.

• Visit the Creative Labs forum on CompuServe and download the latest drivers from its online forum.

With some sound adapters, close proximity to a video adapter can cause interference between the two adapters. If you experience sound problems after you've updated your drivers, open your system and move your adapter to a slot farther away from the video card's.

One Hard Disk to Another

Can I automatically back up all new and changed files from the C: drive to the D: drive every time I exit Windows? In the process of backing up these files, can I create an updatable list of the files that were backed up?

MARTE SONNEVELD
APELDOORN, THE NETHERLANDS

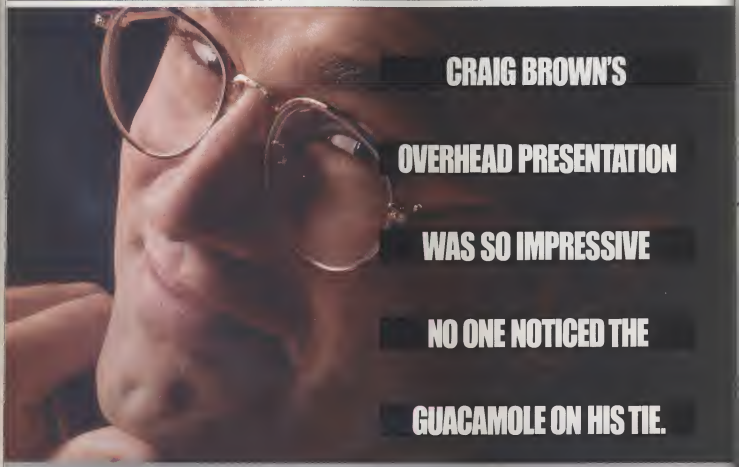
With creative use of MS-DOS's XCOPY and ATTRIB programs, you can do exactly that. Create the following batch file with your favorite text editor, and be sure to review and edit any PATH statements to reflect your own hard disk. XCOPY.EXE and ATTRIB.EXE are all normally located in your \DOS directory.

```
REM DAYBACK.BAT
@ECHO OFF
CLS
SET DATE=%4
XCOPY C:\*.* D: /A/S
ECHO %DATE% Daily Backup of C:
  drive > D:\BACKUP.LST
DIR D: /A:a /O:g /S >> BACKUP.LST
  > NUL
SET DATE=
ATTRIB -a C:*.* /S
ATTRIB -a D:*.* /S
CLS
REM  You can add other commands to
  perform following this line
ECHO Done!
```

DAYBACK sets the date environment variable using %4. It then begins XCOPY using /A to copy all files with the archive attribute set, and scans all the subdirectories on the current drive.

Once XCOPY has copied all the modified and new files to the destination drive (D:), it opens a file on the D: drive called BACKUP.LST and places the current date at the top of the file. Then, DIR creates a list in BACKUP.LST of all files on the D: drive with the attribute set, listing subdirectories first and filenames second.

Finally, the batch file clears the date environment variable and then clears the archive bits on the modified files on both the C: and D: drives. The



text of this batch file is on the PC/Contact forum on ZiffNet in data library 1 (Hot Tips/Secrets) as DAYBAK.ZIP.

Is the Printer Ready?

Is there a DEBUG script I can use to see if the printer is ready?

STEVE MARSTON
GLEN OAKS, NEW YORK

Why go through the trouble of writing a DEBUG script when the MS-DOS 5 and later MODE command's /STATUS switch already determines whether the printer is offline or ready to receive? Use the following syntax, substituting your own PATH statement for the location of MODE:

```
C:\DOS\MODE LPT1 /STATUS
```

You can also check the status of ports LPT2, LPT3, and PRN (the first parallel port) by substituting the port name for LPT1 above. Combine the result of this command-and-switch with an ON ERROR GOTO statement in your batch files, and you're all set.

DirMagic?

I upgraded to DOS 5 and want a new copy of the DirMagic utility I got for subscribing to *PC/Computing* several years ago.

SIDNEY F. MILLER
DAYTON, OHIO

Anything for a longtime subscriber. Version 3.0 of DirMagic supports a mouse, color customization, and more. Contact MJM Software Design, Box 129, Gleneden Beach, OR 97388.

Can't Delete PRN File

A 248-byte file nomed PRN was creoted in the root directory of my C: drive. DOS refuses to delete it. Even ATTRIB doesn't work. What con I do to get rid of this file?

D. B. FONDREN
CAROLINA BEACH, NORTH CAROLINA

A file named PRN poses a problem for DOS because technically it's an illegal filename. PRN is the name that DOS assigns to the logical print device, so when you type DEL PRN, DOS thinks that you're trying to delete this device and responds with "Access denied."

The solution, however, is simple. Instead of DEL PRN, type DEL ???. Be careful though—this command deletes any file that has no file extension and whose name is three characters long or less. Before entering the command, type DIR ???. to list all the files that DEL ???. will delete. Move any files that will be affected (other than PRN) to another directory, or use the ATTRIB command to temporarily hide the files and protect them from deletion.

Got a question? We'd love to answer it. Write to Help, *PC/Computing*, 950 Tower Lane, 19th Floor, Foster City, CA 94404.

Incredible overheads and prints that rivet your audience's attention. Made easily and affordably. Right at your desktop.

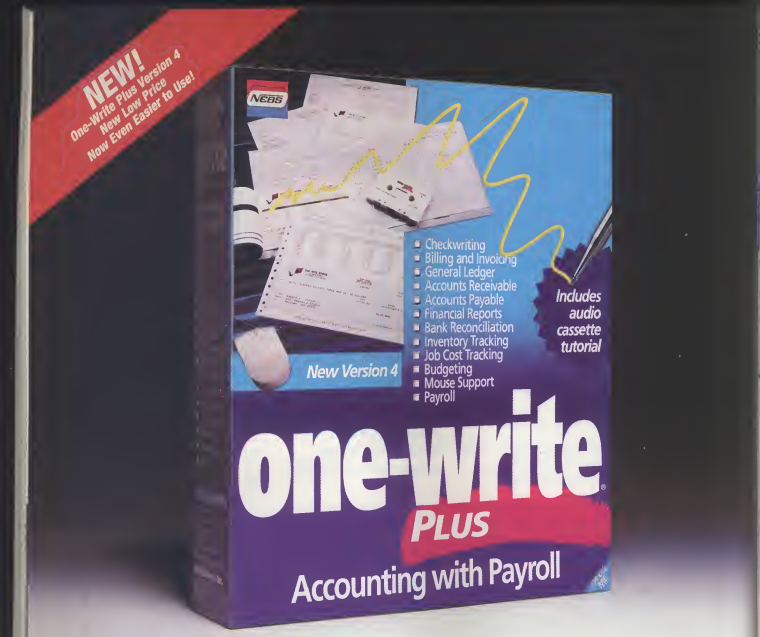
The KODAK COLOR*EASE* PS Printer. Continuous-tone transparencies and prints. Superb resolution. Plus *UltraColor* Software from Kodak that gives you great color the first time, and every time. True Adobe PostScript® Level 2. Fully compatible with your MACINTOSH Computer or WINDOWS Software. With simultaneous printing and processing to maximize your productivity. No other printer can do so much, so fast.

What you eat for lunch is your business. Helping you look your best in your presentation is ours. Give yourself a competitive edge with the KODAK COLOR*EASE* PS Printer. Because nobody knows color like Kodak.

Call 1-800-344-0006 in U.S. or 1-800-465-6325 in Canada for a sample transparency and dealer information.

PostScript is a trademark of Adobe Systems Inc. registered in the U.S. and other countries. Kodak and ColorEase are trademarks of Eastman Kodak Company. 1993.

Circle 247 on reader service card.



How could so much be so easy?

It's our system.

New One-Write Plus Version 4 is the only accounting software based on the "one-write" manual bookkeeping system. The same system used by over five million small businesses because it's so easy to understand.

One-Write Plus takes the simplicity of the one-write system and adds the speed and accuracy of your computer. You get all the accounting features your growing business needs – in a package that's truly easy.

A Complete Accounting Package

One-Write Plus gives you checkwriting, invoicing, automatic bank reconciliation, general ledger, accounts receivable, accounts payable, inventory tracking, job cost tracking, sales analysis, financial reports, and – new with Version 4 – now includes payroll. All for one low price.

You're More Likely To Use It

Since it's based on an easier system, you're much more likely to understand and use One-Write Plus. And to stick with it. In fact, over 91 percent of One-Write Plus users would buy it again. And over 93 percent would recommend it to a friend.

Now With More Ease-Of-Use Features

One-Write Plus Version 4 comes with pull-down menus, expert on-line help, full mouse support, and an on-screen tutorial with a sample company and data. It also includes a unique audio cassette tutorial that "talks" you through the software.

Absolutely The Best Value — Priced At Only $69.95

At just $69.95 Suggested Retail Price, One-Write Plus gives you outstanding value for your money. (Prices may be even lower at your local reseller.)

If you're looking for new accounting software, buy the brand that makes it all so easy. New One-Write Plus Version 4.

System requirements: IBM PC or compatible; Runs under Windows, MS-DOS or PC DOS version 3.1 is required (3.3 is recommended); 640K RAM and Hard Disk with 10 MB Free; IBM compatible printer required.

New One-Write Plus® Version 4 $69.95

Call **1-800-388-4344** for more information or the reseller nearest you.

100% NO RISK MONEY-BACK GUARANTEE

Offer may vary in Canada. Please call 1-800-461-7572 for availability and pricing in Canada.

NEBS Software Inc., 20 Industrial Park Drive, Nashua, NH 03062

Circle 150 on reader service card.

IQSPB94 79606

Incorporating PC Sources

Direct to You

Inside Spec Watch

It's time for desktop PCs to start worrying: Notebooks are on to them, providing all of the power and most of the expansion.

Notebooks have *almost* caught up with desktops—if they could just get a 17-inch monitor it'd be a TKO. This month's Spec Watch shows you what to look for in a portable and how to save money. Other trends to watch:

- **Need More Zip on Your Network?**
  While network industry associations hammer out 100Mbps standards and battle about Asynchronous Transfer Mode taking over the world, you should be buying VESA local-bus Ethernet cards. VL-Bus cards can boost performance substantially, and best of all, they don't require changes to your network.

- **Printers Go Green**
  Recyclable toner cartridges are only one way your printer can be environmentally aware. Newer laser printers bear the government's Energy Star label and feature power conservation modes to lower your electric bills. Many of these printers even hit the streets at less than $1,000.

- **Windows Accelerators Gain Resolution, Speed**
  Most accelerators now support 1,280-by-1,024-pixel resolutions, and video cards that support 1,600 by 1,280 pixels are beginning to show up. Make sure they support 72Hz vertical refresh rates at this resolution—and don't forget that your monitor has to support the same resolution and refresh rate, too.

- **3-D Sound Cards for Great Audio**
  Multimedia is getting ever more realistic. QSound Virtual Audio, also called "surround sound," creates unbeatable effects for action-packed video clips and splashy sales presentations. Make sure your sound card supports surround sound.

By Marty Jerome

VENDOR NAME	PAGE NO.	HOURS OPEN	800 NUMBER
SYSTEMS			
ACER	282-285	M-F 6-6; Sat 8-4 (PST)	800-230-ACER
Computer Discount Warehouse	312-314	M-F 7:30-7:30; Sat 9-5 (CST)	800-473-4CDW
Comtrade	286	M-Sat 7-7 (PST)	800-969-2123
Dee-One Systems	318	M-F 8-6; Sat 10-4 (PST)	800-831-8808
expotech/VTECH	291-297	M-F 7-8:30; Sat 9-6; Sun 10-3 (EST)	800-284-3976
INMAC	269	M-F 7-7:30 (PST)	800-972-9241
Insight	310	24 Hours	800-927-3159
Midwest Micro	299-303	M-F 9-7; Sat 10-4	800-682-7248
PC's Compleat	270-273	M-F 7-Midnight; Sat-Sun 10-8 p.m.	800-598-4727
USA Flex	280-281	M-F 24 Hours; Sat-Sun 9-4	800-723-0334
PERIPHERALS			
AMDEK	276	M-F 8:30-8:30	800-72-AMDEK
Arlington Computer Products	308-309	M-F 7:30 - 7:30; Sat 9-5 (CST)	800-548-5105
Computability	261-264	M-F 8-8; Sat 9-5 (CST)	800-554-9952
Dee-One Systems	318	M-F 8-6; Sat 10-4 (PST)	800-831-8808
Dustin Discount Software	274-275	M-F 6-5; Sat 10-12 (PST)	800-274-6611
Envisions	321-323	M-F 6:30-5; Sat 9-1 (PST)	800-926-7226
First Source	311	M-F 8-5; Sat 9-3 (PST)	800-301-9866
Harmony Computers	267	M-T 9-6; Fri 9-2; Sun 10:30 - 4:30	800-441-1144
Insight	310	24 Hours	800-927-3159
L.A. Trade	298	M-F 8-5; Sat 10-12 (PST)	800-433-3726
Megahaus	290	M 8-8; TU-F 8-7; Sat 9-3(CST)	800-786-1187
Midwest Micro	299-303	M-F 9-7; Sat 10-4	800-682-7248
USA Flex	280-281	M-F 24 Hours; Sat-Sun 9-4	800-723-0334
PRINTERS			
Arlington Computer Products	308-309	M-F 7:30 - 7:30; Sat 9-5 (CST)	800-548-5105
Computability	261-264	M-F 8-8; Sat 9-5 (CST)	800-554-9952
Dee-One Systems	318	M-F 8-6; Sat 10-4 (PST)	800-831-8808
Harmony Computers	267	M-T 9-6; Fri 9-2; Sun 10:30 - 4:30	800-441-1144
USA Flex	280-281	M-F 24 Hours; Sat-Sun 9-4	800-723-0334
SOFTWARE			
Computability	261-264	M-F 8-8; Sat 9-5 (CST)	800-554-9952
Computer Discount Warehouse	312-314	M-F 7:30-7:30; Sat 9-5 (CST)	800-473-4CDW
Disk-Count Software	304	M-F 9 - 8; Sat 10 - 3	800-448-6658
Dustin Discount Software	274-275	M-F 6-5; Sat 10-12 (PST)	800-274-6611
Landmark	320	M-T 8-9; F 8-6; Sat 10-3	800.683.6696
USA Flex	280-281	M-F 24 Hours; Sat-Sun 9-4	800-723-0334
MEMORY			
First Source	311	M-F 8-5; Sat 9-3 (PST)	800-301-9866
L.A. Trade	298	M-F 8-5; Sat 10-12 (PST)	800-433-3726
WorldWide Technology	319	M-F 9 -7:30; Sat 10-6	800-636-6792
NOTEBOOKS			
Midwest Micro	299-303	M-F 9-7; Sat 10-4	800-682-7248
Insight	310	24 Hours	800-927-3159
PC's Compleat	270-273	M-F 7-Midnight; Sat-Sun 10-8 p.m.	800-598-4727
TRAINING PROGRAMS			
Computer Book Club	287-289	M-F 8-5	717-794-2191
Int'l Correspondence Schools	243-245	24 Hours	800-596-5505
NRI Schools	277-279, 305-307	M-F 8-5	202-244-1600
STORAGE			
Insight	310	24 Hours	800-927-3159

Notebooks Offer Balance Between Desktops and Subnotebooks

Look for 486-based power with almost all the trimmings in 7 pounds or less.

If you're on the move you have a choice: notebook or subnotebook? Despite their growing power, subnotebooks still don't offer the features and expansion of full notebooks. Here's what your notebook should have.

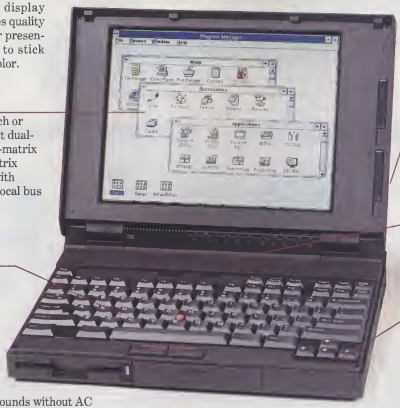
You should expect a color display. After all, color makes icons, charts, and the like discernible on 9- or 10-inch screens. The introduction of dual-scan passive-matrix technology, which refreshes each half of the display independently, makes quality color affordable. For presentations you'll want to stick with active-matrix color.

Whatever size the screen, don't accept anything slower than a 33MHz 486 CPU with integrated battery-saving technologies. Although a faster CPU clock doesn't guarantee better perfomance, it's a good rule of thumb that faster systems have faster CPUs.

Another way to boost performance is to make sure you buy enough RAM. Get at least 8MB when you buy your system. While you're at it, make sure your hard disk is as big as you can afford: You will want a 120MB drive at a minimum, but bigger is always better.

Speaking of expansion, be sure that your new machine has a full complement of ports—including at least one PS/2 port for a keyboard or mouse. Also make sure that the VGA port supports two screens simultaneously—it's very handy for presentations. And some notebooks support Super VGA on an external monitor—look for that, too. You'll also want at least one PCMCIA Type III slot (or two Type II slots) for the growing flood of PCMCIA peripherals. Ask your dealer to provide you with a list of compatible cards.

Allow an active-matrix notebook to top 7 pounds without its AC adapter, but only slightly. Passive-matrix designs should weigh about 6½ pounds. Also, be sure to check out the size and weight of the adapter: Some are the size of a small electric razor; others resemble a brick.



Display type: 9½-inch or larger backlit dual-scan passive-matrix or active-matrix color LCD with accelerated local bus graphics.

CPU: 33MHz 486.

Ports/slots: Parallel, 9-pin serial, and PS/2 ports; one PCMCIA Type III slot or two Type II slots.

RAM: 8MB, expandable to 20MB.

Hard drive: 120MB.

Weight: Under 7 pounds without AC adapter; total traveling weight less than 9 pounds.

Size: Smaller than 10 by 12 by 2 inches.

Other requirements: Standby mode, pop-up battery gauge, 6-by-3-by-3-inch battery recharger.

Features and options: Ability to swap out floppy drive for a second battery, removable hard drive, user-installable RAM, integrated pointing device.

Spec Watch

Don't settle for less than these specs:

Network Servers

CPU: Intel Pentium, 486DX2/66, or 486DX/50.

RAM: 16MB expandable to 64MB.

CPU RAM cache: 256K.

Display: 14-inch Super VGA color or monochrome.

Video card: Super VGA with 512K of RAM.

Hard drive: 1GB SCSI-2.

Drive bays: Two full-height 5¼-inch, two half-height 5¼-inch with front-panel access, two 3½-inch.

Bus: Eight EISA slots, including two VL-Bus slots.

Features and options: RAID-5, DAT backup, uninterruptible power supply.

Other requirements: FCC Class A or better, UL listed.

Red flags: *Systems with ISA bus or slotted RAM are less upgradable.*

Desktop Systems

CPU: Intel 486DX2/66 upgradable.

Secondary cache: 256K four-way set-associative.

Memory: 8MB, expandable to 32MB, 36-pin SIMMs.

Hard drive: 230MB or larger IDE.

Video: VL-Bus or PCI Windows accelerator, 15-inch monitor or larger with 72Hz refresh at 1,024 by 768 pixels.

Slots: Eight ISA slots for full-size case (including two VL-Bus or PCI), three ISA slots for small-footprint case with integrated VL-Bus or PCI video and drive.

Drives and bays: One 3½-inch 1.44MB and one 5¼-inch 1.2MB floppy drive, five half-height 5¼-inch bays.

Red flags: *Pentium-upgradable systems should include CPU, secondary CPU cache, and lots of slots for extra RAM.*

Subnotebook PCs

CPU: 20MHz 386.

Display type: 7½-inch backlit passive- or active-matrix LCD.

Weight: 4 pounds or less.

Size: Under 8¼ by 11 inches.

Keyboard: 85 percent of full-size keyboard.

RAM: 4MB, expandable to 16MB.

Hard drive: 40MB or larger.

Features and options: Removable hard drive, high-speed internal fax modem, integrated pointing device, infrared keyboard connection.

Other requirements: External floppy, at least one Type II PCMCIA slot, small recharger (5½ by 3 by 1½ inches or smaller).

Red flags: *Subnotebook displays and keyboards entail compromise—try before you buy, or make sure there's a money-back guarantee with no restocking charge.*

Windows Displays

Size: 17 inches; 20 to 21 inches for graphics applications.

Resolutions: 1,024 by 768; 1,280 by 1,024 for 20- or 21-inch monitors; noninterlaced.

Dot pitch: 0.28mm for 17-inch monitors; 0.31mm for 20-inch.

Vertical refresh rate: 72Hz or higher at all resolutions.

Tube type: Flat-square or Trinitron.

Controls: Front-panel digital image controls.

Features and options: Support for MPR II low-emissions standards, compliant with EPA Energy Star requirements.

Other requirements: Adjustable tilt-and-swivel base, video cable, antiglare coating or add-on filter.

Red flags: *Monitors with dot pitch above 0.31mm may seem fuzzy.*

Since 1982
ComputAbility
Consumer Electronics

Since 1982!

800-554-9952
See page 4 for Ordering Information
PCM 4-94

Winner of 8 Best Buy Awards in 1993!

Best Sound Card
Sound Blaster 16-ASP

Best Input Device
Microsoft Mouse 2.0

Best Communications
Procomm Plus for Windows

Best Presentation
Corel Draw 3.0

Best Personal Financial
Quicken 2.0/Windows

Best Entertainment
Kings Quest V

Best Disk Utilities
PC Tools for Windows

COMPUTER SHOPPER Best Buy OF 1993

Best Overall Software Supplier

ZOOM

FREE Prodigy Starter Kit with purchase of any Zoom Modem!

V.32 bis Voice FaxModem for Windows & DOS

Voice storage and playback with 14400 bps send/receive fax and data

Zoom now offers voice in a high-speed faxmodem at a surprisingly low price. Voice greatly expands the capabilities of faxmodems with functions like voice mail, voice delivery and fax on demand. Includes SuperVoice and COMit for Windows, BitFax/Voice for DOS.

Internal 14400 bps Voice FaxModem $149
VFP V.32bis 14400 bps Internal **$129**

External 14400 bps Voice FaxModem $175
VFX V.32bis 14400 bps External **$149**

Windows

Best in February 1994 Computer Shopper Roundup
Winner of Window Sources "Expert Pick" Award

New!

Zoom V.Fast Class 28.8 bps

The Zoom FaxModem VFX 28.8 internal provides an amazing 28.8 thousand bps uncompressed data transmission over conventional telephone lines with automatic dropback to V.32bis. The 28.8 uses V.Fast Class transmission protocols to obtain extremely fast data transfer rates and higher connect rates with quicker negotiation than V.32bis at 14,400 bps.

VFX 28.8K Internal $215
VFP 28.8K External $225

ZoomFaxModem PKT 14.4 Pocket

14,400/V.42 bis Data & 14,400 Fax

Compression to 57,600 bps. Class 1 or 2 send/receive fax with WinFax Lite DOSfax, and COMit for DOS &Windows in a pocket size ideal for office and travel.

External $189 w/ Voice Storage/Playback **$265**

SMART SHOPPER'S GUIDE

DesignCAD 2D 7.0 for Windows

AMERICAN Small Business Computers, Inc.

Within minutes, you can turn your ideas into precise designs! DesignCAD comes complete with: 500 symbols, dimensioning, drafting and editing toolboxes, materials list, scaling, zoom, layers, and support of 7 file formats.

$169.95 WINDOWS **$163.95** DOS 6.0

CHINON

535 Series Dual-Speed CD-ROM Drives with 256 Cache Buffer

535 Internal
- Exceeds MPC2 & QuickTime standards
- Multisessions Photo CD compatible
- 250ms average access time
- Double-speed 300K/ sec data transfer rate
- 256K data buffer

535 External $395 with SCSI Interface $425

$305 with SCSI Interface $349

PC MAGAZINE EDITORS' CHOICE

Compton's Interactive Encyclopedia for Windows $79 call for details!

Microsoft Encarta $89 while supplies last!

The New Grolier Multimedia Upgrade for '94 $89

Since 1982
ComputAbility
Consumer Electronics

Best Buy 1993 1994

800-554-9952
See page 4 for Ordering Information PCM 4-94

Winner of 8 Best Buy Awards!

Exclusive CD ROM Bundles!*

CD ROM Drive & Interface Options	BARE DRIVE	8 Bit SCSI Interface	16 Bit SCSI-2 Interface	Pro Audio Spectrum 16	Pro Audio Studio 16	Sound Blaster SCSI-2	Sound Blaster SCSI-2 ASP	7 Title MPC Bundle
Chinon 535 internal	$305	$349	$430	$449	$475	$499	$519	add $79
Chinon 535 External	$395	$425	$520	$559	$585	$609	$629	add $79
Mitsumi FX001D	$195 (with Sound Blaster 16 MCD = $354 or 16 MCD ASP = $390)							add $79
NEC 3XI Internal	$469	$529	$594	$613	$639	$663	$683	add $79
NEC 3Xe External	$559	$619	$684	$723	$749	$773	$793	add $79
NEC 4X	Quadruple Speed!	Quantities Limited – Call Now!						add $79
Plextor/Texel 3028I Internal	$295	$355	$420	$439	$465	$489	$509	add $79
Plextor/Texel 5026e External	$399	$459	$524	$573	$589	$613	$633	add $79
Sony CDU-33A	$169 (with Sound Blaster 16 MCD = $328 or 16 MCD ASP = $364)							add $79
Toshiba 3401B Internal	$349	$409	$474	$493	$519	$543	$563	add $79
Toshiba 3401E External	$459	$519	$584	$623	$649	$673	$693	add $79
Toshiba 4101 Internal New!	$235	$295	$360	$379	$405	$429	$449	add $79

Prices good with the Purchase of any CD ROM Drive or Upgrade Kit (at time of purchase only)

Add $79 for
- Toolworks Multimedia Encyclopedia
- Mavis Beacon Teaches Typing MPC
- World Atlas MPC
- Mario is Missing MPC
- US Atlas MPC
- Animals MPC
- Chessmaster 3000

CD-ROM BUNDLE RAMA

Buy 3 for $59 or 5 for $99*

1001 Utilities
Adventures in Heaven
America Premium Shareware
Animals SanDiego Zoo
Arthur Teaches Trouble
Audubon Birds
Autodesk Materials
Beauty and the Beast
Carmen World Deluxe
Casino Collection
CD Game Pak 1
Chess Master 3000 MM MPC Pro
CIA World Tour
Classic Movie Clips:
•Horrors
•Science Fiction
•Trailers Spectacular
•Williams Years
CPU-Mizer 6
Clipart Warehouse
Complete Bookshop
Cookbook Heaven
Deathstar Arcade
Dinosaur Adventure/Space Adv.
Eco Quest
Encyclopedia of Sound
Fantasm
Game Arena
Gardening
Gigo Games
Graphic Animation Festival V.1
Graphic Textures
Grolier Encyclop of the World V 1 & 2
Guinness Book of Records 93 MPC
HAM Radio
Hugo's House of Horrors
Interactive Storytime V 1 or 2
It's A Wonderful Life
Jokes & Pranks
Kids Collection
King Quest 5
Kodak Photo CD Access
Loom
Lovin' In The 60's
MacMillans Childrens Dictionary
Magazine Rack
Mario is Missing Deluxe
Mario is Missing - Early Years
Mavis Beacon 3.0 MPC
Mayo Clinic for Windows
Megarace
Mother Goose
Mother Goose
Monkey Island
Multimedia Audio Collection
National Geographic Mammals
New Illustrated Electronic Cookbook
Oceans Below MPC
PC Sig 10th Edition
Peter and the Wolf
ProPhone Bus Ed DOS
Return to Zork
Right College by Arko
ROM Material
Secret Weapons of the Luftwaffe
Selectware Jukebox
Software Vault 4
Solar System
Sound Effects Library
Space & Astronomy
Space Shuttle MPC
Sports Illustrated Almanac
Star Wars Chess MPC
Time Table of History
Science & Innovation
Too Many Typefaces
Toolworks Reference Library
US Atlas V 4 w/ Video MPC
US Atlas w/ Automap
US Presidents
Wave Pool
Window Wars
World Atlas V 4 w/ Video MPC

Accessories to add to you Bundle (Each counts as one title)

CD Caddy 4 Pack
Portable CD Case holds 10 ea.
CD Cleaning System
CD Lens Cleaning System
Digital Headphones
Sound Master Volume Control
CDS-CD Storage - Holds 48

***With the purchase of any CD-ROM Drive or Upgrade Kit from ComputAbility buy 3 for $59 or 5 for $99**

***Offer good at time of purchase only!**

CD-ROM BONANZA

THE SOFTWARE TOOLWORKS

Buy any CD-ROM Drive or Upgrade Kit Listed in our Ad & Receive CD-ROM Titles at These Unbelievable Prices*

*Special prices good only at the time of purchase of drive or package.

$19 each
New Titles!

- 20th Century Video
- Almanac for DOS
- Animals! SanDiego Zoo
- Capital Hill MPC
- CD Game Pack II
- Chess Master 3000 MM MPC Pro
- Great Cities of the World V.1 & 2
- Guiness Book of Records '93 MPC
- Interactive Storytime Vol. 1
- Loom
- Mario is Missing Deluxe DOS
- Mario is Missing Early Years
- Mavis Beacon 3.0 MPC
- Mayo Clinic for Windows
- Megarace
- Monkey Island
- Newsweek Interactive 1 or 2 for DOS
- Oceans Below MPC
- ProPhone Business Ed DOS
- Secret Weapons of the Luftwaffe
- Space Shuttle MPC
- Time Magazine Almanac 1993
- Time Table of History Science & Innovation
- Toolworks Reference Library
- US Atlas w/ Automap
- US Atlas V 4 with Video MPC
- Wing Commander, Ultima V I
- World Atlas for Win. MM MPC
- World Atlas V 4 with Video MPC

$29 each

- CIA World Tour
- Electronic Home Library
- Magazine Rack
- Publish It!
- World and US Atlas Pak
- Star Wars Chess MPC

$49 each

- Q&A V 4.0
- Toolworks Multimedia Encyclopedia for DOS

CD ROM DRIVES & BUNDLES

CREATIVE
Omni CD Internal Double Speed $229
Game Blaster CD 16 - **New for '93!** $365
Digital Expo Upgrade Kit - **New!** $719

MEDIA VISION
Pro 16 Multimedia System III - **Free Dell** $779
Fusion Double CD 16 - **New For '93!**....CALL
Mumphis External - **Free Delivery** $779

NEC
3Xp Personal External $429
3Xi Internal / 3Xe External ..... $469 / $559
4X ..... CALL

TEXEL New!
Double Speed CD ROM Drive
3028 Internal / 5028 External..... $295 / $399

TOSHIBA
3401B Int / 3401E Ext 2x Speed..$349 / $459
4101 Internal $235

TURTLE BEACH
MultiSound Bonanza Multimedia Upgrade Kit w/ NEC 3xI Internal **Free Delivery** ..$1,229
w/ Texel 3028 Internal **Free Del**.....$1,025

MITSUMI
Double Speed Internal FXD001 ..... $195

CHINON
535 Double Speed SCSI II Internal..... $305
with SCSI Interface, Internal..... $349
535 Double Speed SCSI II External $395
with SCSI interface External $425

SONY
33A drive only / with Sony Inter ..$169 / $195

SOUND CARDS

CREATIVE New!
CREATIVE LABS, INC.
Sound Blaster 16 Basic $99
Sound Blaster Deluxe $65
Sound Blaster Pro Daluxe $85
Sound Blaster 16 Multi CD $159
with advanced signal processing $195
Sound Blaster 16 Scsi 2 ..... $179
with advanced signal processing $209

MEDIA VISION
Pro Spectrum 16 Basic $99
Pro Audio Spectrum 16 ..... $129
Pro Audio Studio 16 ..... $155

TURTLE BEACH
Audio Advantage PCMCIA - **Free Del** ..$99
MultiSound Monterey $349
Maui Wavetable Synthesizer Upgrade ..$159
Wave for Windows $74.95
(w/ purchase of any Sound Card)..... $39

OTHER
Advanced Grave UltraSound $129
Aztech Labs Sound Galaxy Basic Extra:
16 bit, SCSI Inter. w/ Roland Sound... $169
Logitech SoundMan 16 ..... $105
MS Sound System 2.0 w/ board $179
Diamond Sonic Sound $215
Calypso Audio Magician Plus NEW! $79
DigiSpeach Portable Sound+ $145
Roland SC-7 Sound Canvas Module $319
RAP-10 Roland Audio Prod. Free Del..$489
Orchid Soundwave 32 ..... $219
Orchid Gamewave 32 ..... $145

SPEAKERS

ACS - 50
AC-3 NEW! $175
ACS-90 / 150 ..... $75 / $109
ACS-100 / 300 ..... $129 / $269

YAMAHA
Yamaha Digital Speakers (YSTM10H) $69

ACOUSTIC RESEARCH
AR Partner 22 Black $75
AR Partner 42 Grey $149
AR Partner 370 Grey $279
AR Partner 622 Grey $219

MULTIMEDIA

ATI
VGA TV Elite Int / Ext ..... $185 / $229
TV Cha -A/V NEW! $249
Video Clipper / PC Prime Time ..... $315 / $325
Game Blaster $85

CREATIVE
WAVE Blaster $179
Video Blaster for Windows $325
Video Spigot $245
TV Coder $149

MEDIA VISION
Thunder Board $129

TURTLE BEACH
Mwa wavetable synthesizer Upgrade $159
Wave / Turtle Tools Bundle $84.95
Tahiti $259
Pinnacle $339

YAMAHA
Hello! Music! (CBX301) $269

ROLAND
Reel / Magic / SCSI Version ..... $379 / $429
Wet Storm $175
Reel / Magic CD ROM Kit $769

TURTLE BEACH
Mwa wavetable synthesizer Upgrade $159
Wave / Turtle Tools Bundle $84.95
Tahiti $259
Pinnacle $339

YAMAHA
Hello! Music! (CBX301) $269

MIRACLE SOFTWARE

Piano Teaching System

The software that turns your keyboard into the acclaimed Miracle Piano Teaching System! Bring the world's most popular piano teacher home to your keyboard.

- Make music while you learn
- Play music with your whole family
- Start playing the minute you get home

$79.95

Hours (CST): Weekdays 8am - 8pm, Sat. 9am - 5pm • Tech Info (414) 357-8181 • Fax (414) 357-7814

Since 1982

ComputAbility

Consumer Electronics

800-554-9952

See page 4 for Ordering Information — PCM 4-94

Winner of 8 Best Buy Awards!

COMPUTERS

DESKTOP

NEC

486:
Ready 425ES, 486 SX25 4MB/170MB $999
Ready 433ES, 486 SX33 4MB/210MB $1,229
Ready 446ES, 486 DX2/66 4MB/250MB $1,279
Ready Multimedia 433 CD3, 486 SX33 4MB/250MB Triple Speed $1,579

Pentium:
Image Pro 60, No Drive, 8MB, 256K Cache, 3MB VRam $2,925
Image Pro 60, 8MB 3Di, 250 Cache, 810MB HD, 4X CD-ROM ..... $3,369 / $3,659

PACKARD BELL

Forza 252, 486 SX33 4MB/340MB $1,049
Force 5210 Multimedia, 486 SX33 4MB/170MB w/ CD ROM $1,229

NOTEBOOK

EPSON

Action Note
4SL/25NO, 4MB, 120MB/160MB ..... $1,599/$1,895
4000 SubNotebook, 4MB SLC/33, 4MB, 80MB/120MB/160MB ..... $1,349 / $1,409 / $1,459
500C 486 SLC/50, passive color, 4MB 120MB / 180MB ..... $1,929 / $2,009

NEC

Versa E: Enhanced MMBS, DX2, 4MB, Active Matrix Color:
40EC, 404Hrs, 320MB / 340MB ..... $3,819 / $4,329
50EC, 50Mhrs, 320MB / 340MB ..... $4,499 / $4,319

TEXAS INSTRUMENTS

TravelMate 4000, 486 SX25
Adv Color 4MB/120MB $2,099
TravelMate 4000, 486 DX2/50
300MB Dual Scan $3,329
TravelMate 4000, 486 DX2/50
Active Color 4MB/200MB $3,799
TravelMate Desktop Docking Station/Desktop System $379
CALL FOR OTHER MODELS

PCMCIA

Free Shipping on all PCMCIA!

MODEMS:

ATI Express S/R 14.4 ..... $288
Intel S/R 14.4 ..... $295
Hayes Optima S/R 14.4 ..... $329
AT&T Keep In Touch S/R 14.4 Cell $299
I/O Redstone World Port S/R 14.4
World Port Dual Stand: Cellular Flex $599
MegaHertz S/R 14.4 Cellular $379
Picsco S/R 14.4 Cellular Comp $299
Supra ComCard S/R 14.4 ..... $279
Motorolla S/R 14.4 CELLect $419

NETWORKING:

XIRCOM

CreditCard Ethnt 16bit, 10-B2, 10BT $299
CreditCard Ethnt 16bit TPI $299
CreditCard Ethnt 16bit, 10BT $259
CreditCard Ethnt 8bit 10BT $259
CreditCard Ethnt Modem Combo $329

NATIONAL SEMI CONDUCTOR

InfoMover NE 4100T, 10BT $379
InfoMover NE 4100T, 4 Coax $779

THOMAS CONRAD

TC 3041-T, 10BT $199
TC 5097 Ethnt 16/32bit, 10BT $269

SOCKET COMMUNICATIONS

10BT Coax Adapter $279
10BT Twisted-Pair Cable $279
10BT Plus BNC Removable Cable $299
10BT Fixed Cable $299
10BT Coax-Fixed Cable $319

3COM

Etherlink 3TP $245
Etherlink 3 Combo $299

CONTROLLERS:

Adaptec SlimSCSI $269
New Media Bus Master w/SCSI II cable $299
Socket SR 700 I/O Card $199

TOKEN RING:

Madge Pocket Ring Node 16M $629
IBM PCMCIA 16/4 TokenRing $449
MEMORY CARD:
New Media SRam 1MB Type 2 ..... $159
New Media SRam 2MB Type 2 ..... $279
HARD DRIVES
Maxtor 105MB Type 3 - FREE DEL $479
Minitor MP 85/170 w/Slacker $479
Minitor MP 128/256 w/Slacker $579

SOUND CARDS:

Turtle Beach Audio Advantage PCMCIA $99
New Media WAVjammer $249

MISCELLANEOUS:

PCMCIA for your DT- Dock/ Socket $169

FLOPPY DRIVES

Floppy Drives

3.5" without Frame 1.44Mb PC/AT $55

TEAC.

All Media Floppy

The All-in-One 3.5" & 5.25"
Hot Height Internal Floppy Drive $125

PRINTERS

EPSON (Windows)

Action Laser Printer 1000 7MB $639
Action Laser Printer 1000 1MB / 2MB ..... $529 / $585
Stylus 800 Ink-Jet ($25 Rebate) $249*
*Price reflects rebate - good through 5/31/94
Stylus 300 Ink-Jet - NEW $229

NEC

Silentwriter M95, 6ppm PS $865
M90 (M95 w/FAX) $1,079
SuperScript 610 ..... $569

Primera

High resolution thermal transfer printing. Great for presentations & overheads $995

OKIDATA

ML320 / ML321 ..... $299 / $419
390 / 393C ..... $949 / $1,019
810 / 810 Turbo / 830 ..... $909 / $1,079 / $949
400e / 410e ..... $499 / $649

Star micronics

NX-2430 Black $205
Star SJ 144 NEW! $459
NX-2430 w/ NEW Rainbow ..... $225 / $249

TEXAS INSTRUMENTS

microMarc lite Jet ($30 Rebate) $249*
microWriter Black, 5ppm Laser $359
microWriter PS55 5ppm with PS $679
microLaser Pro 600 PS/23 (300 Rebate) $1,279*
*Price reflects rebate - good through 3/31/94

Canon

BJ200E / BJC230 Ink Jet ..... $289 / $385
BJ100S / BJ-600 Color Ink Jet ..... $239 / $579
LBP 430 Laser $555
LBP 860 Laser $1,379

MODEMS

NEW LOWER PRICES!

Free Prodigy Starter Kit with purchase of any Zoom Modem!

V.32 bis Sm/Ext Modem 14,400 for DOS or Win
Internal / External ..... $128 / $140
w/ Voice Int / Ext ..... $145 / $179
Zoom 14.4 PKT / with Voice ..... $189 / $229
V. Fast Class 24.4 bps
VFP 24K Int / VFX 24K Ext. ..... $169 / $195
V. Fast Class 28.8 Int / Ext ..... $215 / $229

Supra Corporation

SupraFaxModem Internal 24/96 NEW! $53
SupraFaxModem 144 ..... $99
SupraFaxModem 144LC, Class 1 only
Internal / External $149
SupraFaxModem V.32 bis, Internal $135
SupraFaxModem V.32 bis, Ext. w/cable $199
SupraFaxModem V.32 bis Upgrade $95
with Fax Software Mac $115
Supra Com Card, PCMCIA
14.4/14.4, S/R, Free Delivery $289

U.S.Robotics

Sportster 14.4 Int. / with Fax ..... $145 / $169
Sportster 14.4 Ext. / with Fax ..... $159 / $189
Courier V.32 Terbo Int / with Fax ..... $325 / $339
Courier V.32 Terbo Ext / with Fax ..... $375 / $389
World Port Dual Standard
Cellular Fax PCMCIA - Free Delivery $599

intel.

14.4 Fax Modem Int / Ext ..... $169 / $189

AT&T

14.4 Fax Modem Int / Ext ..... $149 / $185
Keep In Touch PCMCIA, 14.4 FREE DEL $399
AT&T DataPort 2001 ..... $149

PLUG & PLAY

MicroSolutions

No Slot Drive, requires AC!

Backpack CD ROM Double Speed $389
Backpack 250 Tape Drive (Req. min. DOS 3.0)
Now with Windows Software $459
Backpack Double Drive 1.2 GB
(Req. min. DOS 2.0) $155
Backpack Floptical Drive 1.4, 3.5
(Req. min. DOS 2.0) $145
Backpack Hard Drive 340 (Req. min DOS 3.0) $445

HARD DRIVES

Seagate

ST-251-1 MFM $239
ST-3624 / 3102E IDE ..... $115 / $165
ST-3283 / 3243E IDE ..... $195 / $215
ST-3390N SCSI $295
ST-3624A / 3390A IDE ..... $219 / $275
ST-3550A / 3660A IDE ..... $369 / $445

FREE DELIVERY:

ST-3655N $539
ST-3550N / 3120N SCSI ..... $539 / $585
ST-1480N / 1155N ..... $269 / $ 339
ST-12400N / 1255N ..... $1,499 / $1,619
ST-41601N $1,479
ST-42400N / 4340N ..... $1,599 / $2,099

MegaDrive

IDE 713A / 724A / 754A ..... $189 / $245 / $275
IDE 717A / 727A ..... $199 / CALL
IDE 756A - Free Delivery $299
SCSI 754SS $349

Conner

CFA 170A / 340A IDE ..... $199 / $279
CFA 170S / 340S SCSI ..... $205 / $305
CP3024 IDE $225
CFS 210A / 420A ..... $219 / $325
CPA 1960S SCSI - Free Delivery $689

Quantum

ELS 170 IDE / SCSI ..... $195 / $205
LPS 210 IDE / SCSI ..... $239 / $249
Fast IDE / SCSI - Free Delivery ..... $489 / $499
PD 1600 SCSI - Free Delivery $1,089

MICROPOLIS

FREE DELIVERY (contiguous 48 states)
1588 IDE 535 MB ..... $1,049 / $2,279
2210 / 2217 SCSI ..... $859 / $1,169
2244 / 2217 IDE ..... $859 / $1,169
2210AV / 2217AV ..... $929 / $1,269

WESTERN DIGITAL

Featuring CAVIAR

AC 1210 / AC-2250 ..... $199 / $255
AC-2340 / AC-2420 ..... $329 / $399
AC-2540 ..... $419

CONTROLLERS

Gladiator

1522 SCSI Direction Kit 16 Bit Standard
SCSI with Floppy Support & Drivers $135
1542 SCSI Direction Kit PLUS Hi
1542CF Single $185
1542CF SCSI Master Kit / PLUS ..... $249 / $295
2742 Single NEW $295
2742T 60 MAX $349
2742T Single NEW $325
2842 VL Master Kit $295

Mini Scsi
T-150 / T-160 ..... $85 / CALL
T-340 / T-356 ..... $169 / $205
Slim SCSI, APA-460, PCMCIA, Free Del. $289

FUTURE (Windows) SVP-ISA

TMC-850 MCD CD ROM Kit $129
TMC-1800 CDA, 16 bit SCSI-2 with floppy support & CD ROM SCSI support $329
700 EIDE/HA Kit $369

OTHER

Seagate ST-02 SCSI 8 Bit Adapt w/FD Cont $45
OTK PT-227, 2-Serial, 1 parallel,
1 embedded hard disk drive adapter $129

POWER SUPPLY

TRIPP LITE

Smart 450 / 500 / 600 ..... $279 / $329 / $385
Smart 750 / 1000 / 1250 ..... $429 / $529 / $650
BC Series Standby UPS Systems
BC 230, 250 VA, 2 outlet $95
BC 400 400 VA, 2 outlet $149
BC 500 500 VA, 4 outlet $179
BC 600LAN 400 VA, 4 outlet, LAN Intur. $149
BC 700LAN 500 VA, 4 outlet, LAN Intur. $179
BC 800LAN 600VA, 4 outlet, LAN Intur. $249
BC 1700LAN 750 VA, 4 outlet, LAN Intur. $329
BC 3000LAN 900 VA, 4 outlet, LAN Intur. $545

Omnipower Line Interactive UPS
OMNI 300LAN 450 VA $249
OMNI 600LAN 800 VA $349

LOWER PRICES!

Back Ups

250 / 400 ..... $99 / $155
450 / 600 ..... $185 / $255
900 / 1250 ..... $349 / $449

Smart Ups
370 / 400 ..... $309 / $285
600 / 900 ..... $335/$535
1250 ..... $699

MONITORS

CTX

640IA, 14", 360P 1024X768, Intlac $239
640IA, 14", 360P 1024X768, Intlac $239
1401hb, 14", 360P 1024x768, NI $285
1401, 14", 360P 1024x768, NI $295
1561, 15", 240P 1024x768, NI $395
1581, 15", 280P 1024x768, NI $335
1780F, 17" Flat, 31DP, 1280x1024, NI $1,299

SONY.

CPD 1320 UCZ, 14", 640x480 VGA $305
CPD 1430S, 14", 1024x768, NI $459
8514A, 20 MHz, cables & stand $685
CPD 1730S, 17", 1024x768, NI, Fine Dot $1,059
CPD 1730ES, 17", Free Delivery! $1,229

NEC

SVGA 14" 1024x768 NI, .28DP $305
SFGa, 17", .28, 1024x768, 76Hz $1,045
3PG, 27", ~NINI $2,765
NEW Multi Sync:
4FGe Energy/Sav Compliant $899
5FGp Optical Surface $1,159
3V EnergySav Compliant $499
6FGp (price good through 3/31/94) $2,249

NANAO

F34iW / F50i ..... $999 / $995
SMC Internet Plus Ether 16T ..... $1,199 / $1,399

PACKARD BELL

P8883E SVGA, 14", .39DP, 1024x768 ..... $249
P8884E SVGL, 14", .28DP, 1024x768, NI $329
P8851S SVGL, 15", .28DP, 1024x768, NI $429
P8817F SVGM, 17", .28DP, 1280x1024, NI $819

SCANNERS

Canon

IX 4015 Color Scanner, SCSI with Interface
Includes Obtix software $999

RELISYS

AVEC 3 Pass, Flatbed, Color Scanners
300 PC/400 PC/400 PC ..... $599/$795/$899
Rall Single Pass, Flatbed, Color Scanners
240 PC / 880 PC ..... $1,079 / $2,779

LOGITECH

Scanman 256 (gray scale) $165
Scanman 256 with Omni Page Direct $239
Scanman Color with Omni Page Direct $299
Foldaflex Plus $329
Scanman Easy Touch $165
Scanman Power Page $499

EPSON

ActionScanning System PC ..... CALL
ES-800C Bundle ..... CALL
ES-800C Professional PC Bundle ..... CALL

Mustek

ScanMagic 400 dpi Handheld
256 gs / Color Handheld ..... $115 / $229
GrayArist Handheld, 800 dpi $149
ProScan 105, Handheld, 400 dpi $165
ColorArist Pro Handheld 800 dpi $349
Paragon 600 Flatbed FREE DEL $839

TAPE BACK UP

COLORADO MEMORY SYSTEMS, INC.

JUMBO - Low Cost Tape Backup
DJ10-120MB $105
DJ20-250MB $162

JUMBO TRAKKER - External Parallel
Printer Port Tape Backup System:
JT10 (40-125) $269
JT20 (80-250) $315

POWERTAPE SYSTEM:
Includes Colorado Backup for DOS software
2GB Int / Ext - Free Delivery! ..... $945 / $1,029

MICE

MicroSpeed

Microtrac PC 3 Button $55
Microtrac Mouse Excess $35
PC Trac Serial Trackball with Driver 3.0 ..... $75
WinTrac Trackball $99

KENSINGTON.

Expert Trackball Serial $95

MICROSOFT

MS Ball Point Mouse 2.0 Portable $82
MS Serial Mouse 2.0 ..... $75

LOGITECH

Ocean Serial Mouse $23
First Mouse Serial $42
Kidz Mouse w/ Dinosaur $32
Mousemain Cordless II $87
Mousetrak Serial (Ps/2) $67
Trackman II Serial $79
Trackman Portable $72

NETWORKING

ARTISOFT

AE-2 Ethernet Adapter $155
Node Runner 2000C Adapter $169
Node Runner 2000C Dsk for DOS/Win ..... $49/$49
Node Runner 5000T Coax / 5-Tx ..... $69 / $459
Node Runner 5000T Coax / 5-Tx ..... $69 / $429
Sounder 2400 ..... $81
Artisoft Central Station II ..... $319 / $379
LANtastic/Win $75
Simply LANtastic Add-On Kit $67
Simply LANtastic Ethernet Kit $229
Simply LANtastic Starter Kit $185

3COM

Etherlink II 16 TP 9/16 Bit (ISO-16TP) $159
Etherlink II TP II (ISO-1E) $149
Etherlink II Coax $119
Etherlink II TP $209
Etherlink II 8 bit TP $179
CALL FOR 5 PACK PRICING!

SMC

SMC Ethernet Ultra Elite 16C Combo $119
SMC Ethernet Ultra Elite 16T $99
SMC Ethernet Ultra Elite 16 ..... $115
SMC Ethernet Ultra Elite 16C $115
SMC Ethernet Plus Elite 16T $99
SMC Ethernet Plus Elite 16 Combo $135
CALL FOR 5 PACK PRICING!

National Semiconductor

InfoMover NE2000 CTA $99
InfoMover NE2000 CT $79
InfoMover NE3000 T-1 ..... $79
InfoMover NE4100 T-1 ..... $179
InfoMover NE4100 T-4 ..... $179
CALL FOR 5 PACK PRICING!

NOVELL National

Personal Netware User-1 ..... $56
Personal Netware 5 User $256
Personal Netware Starter Kit Coax $239
Personal Netware Add-On $149

intel.

Etherexpress 16 Bnc Coax $99
Etherexpress 16 Bnc Coax 10BT $99
Etherexpress 16 Twist Pair Coax $129
CALL FOR 5 PACK PRICING!

VIDEO BOARDS

DIAMOND

Speedstar Pro, 1MB / VLB ..... $115 / $155
Stealth 1MB $169
Stealth 24, VLB / VLB ..... $145 / $185
Stealth Pro, 2MB / 2MB ..... $239 / $289
Stealth Pro, VLB 1MB / 2MB ..... $245 / $329
Viper VLB 2MB / PCI 2MB ..... $389 / $459
Viper 2MB $349
Video Star Pro - Free Delivery $649

ATI

VGA Wonder GT Windows Accel. $108
GT Graphics plus 2MB $229
ATI Ultra Pro 2 MB / VLB ..... $349 / $340
ATI Ultra Pro EISA 2MB $375

S3

VIDEO 7

9GXE, 1280 x 1024 NI, SVGA:
VL 1MB ISA / VL 1MB ..... $239 / $249
VL 1, 2MB ISA / VL ..... $349 / $349
VL 1Z, 2 MB ISA / VLB ..... $429 / $429
VL 14, 4MB $619

Hercules

Dynamite VL Pro SVGA 1MB / 2MB ..... $255 / $355
Graphite VL Pro 2 MB SVGA 800 / 720 ..... $249 / $285

CPU UPGRADES

Cyrix — **$5 shipping on all CPU upgrades!**

Upgrade Chips
CX 486 DRx2 16/32 / 20/40 ..... $279 / $319
CX 486 SRx2 20/40 / 25/50 ..... $249 / $349
CX 486 SRx2 25/50 ..... $179

FLOPTICAL

VALUE STOR

SUPER 21MB External, Includes 8 bit host adapter and software $379
VALUE STOR 21MB Internal $319
Verbatim 3.5" drive, 8 bit SCSI host adapter, cable & software $379

Hours (CST): Weekdays 8am - 8pm, Sat. 9am - 5pm • Tech Info (414) 357-8181 • Fax (414) 357-7814

Don't settle for less than these specs:

Ethernet Adapters

Card type: 16 bit, ability to autoconfigure to 8 bit.

Network support: NetWare, LAN Manager, LAN Server, Windows for Workgroups, Windows NT.

Drivers: Eagle NE2000–compatible drivers, support for NDIS and ODI drivers.

Media connectors: For 10Base-2 (Thinnet) and 10Base-T (RJ-45); automatic sensing of media configuration.

Installation: Should be software configurable and support interrupt levels above IRQ 7.

Features and options: Upgradable boot PROM; SNMP support; collision and link status LEDs; bus-mastering interface.

Other requirements: Diagnostic utilities, slot-bracket-mounted transmission and reception LEDs, 16K or larger buffer.

Sound Cards

Compatibility: Sound Blaster.

Made: Stereo.

Card type: Internal.

Sampling capability: 16-bit record and play (MPC 2 standard).

Maximum sampling rate: 44.1kHz.

Synthesizer: Wave or FM with Wave option.

Bundled software: Windows and DOS utilities for playing, recording, and editing digital and MIDI files.

Ports: Speaker, microphone, and joystick.

Features and options: Programmable digital-signal processor for compression, SCSI port for a CD-ROM drive, and QSound Virtual Audio.

Red flags: *Cards that play but can't record 16-bit sound or have a proprietary (non-SCSI) CD-ROM interface may be less useful.*

Windows Accelerator Cards

Resolutions: 1,024 by 768; 1,280 by 1,024 for 20-inch monitors.

Colors: 256 colors at 1,024-by-768 resolution for business apps; 65,000 colors at 1,024 by 768 for near–photo-quality images.

Accelerator chip: Fixed-function chip such as S3 928, IIT AGX014, or ATI 68800 (Mach 32).

Vertical refresh rates: 72Hz at all resolutions.

RAM: 1MB for 256 colors at 1,024 by 768; 2MB or more for higher resolutions and more colors.

Features and options: VL-Bus or PCI model option, Windows utility to switch resolutions and colors.

Other requirements: Driver installation software, two-year warranty, Windows 3.1 drivers, free driver updates via BBS, CompuServe, or mail.

Red flags: *Interlaced boards and boards with 70Hz (or lower) vertical refresh rates produce more flicker.*

24-Bit Color Cards

Resolutions: 1,024 by 768 or higher.

Colors: 16.7 million colors at 1,024-by-768 or 1,152-by-870 resolution.

Graphics processor: For 24-bit Windows applications, a fixed-function processor; for 24-bit DOS apps, a full-fledged graphics coprocessor (TI34020 chip).

Vertical refresh rates: 72Hz at all resolutions.

RAM: 4MB of VRAM (not DRAM).

Drivers: For Windows 3.1 and your specific DOS apps.

VGA support: Onboard VGA chip.

Features and options: VL-Bus, PCI, or EISA models, Windows utility to switch resolutions and colors.

Other requirements: 2-year warranty; free driver updates via CompuServe, BBS, or mail.

Since 1982

CompuAbility

Consumer Electronics

COMPUTER SHOPPER Best Buy OF 1998

Best Overall Software Supplier

800-554-9952

PCM 4-94

Winner of 8 Best Buy Awards!

WHERE THE TOP 50 SOFTWARE TITLES ARE ALWAYS ON SUPER SALE!

1. MS Word 6.0 for Windows.....299.95
2. MS DOS 6.2.....49.95
3. Corel Suite 5.0 for Windows.....304.95
4. MS Power Point 4.0 for Windows.....304.95
5. WordPerfect 6.0 DOS.....284.95
6. Lotus 123 Release 4 for Windows 294.95
7. Paradox 4.5 for Windows.....138.95
8. Qemm 7.....62.95
9. Quattro Pro 5.0 for Windows.....42.95
10. MS Windows 3.1 .....88.95
11. Procomm Plus 1.02 for Windows.....93.95
12. MS Access 1.1 for Windows.....299.95
13. Procomm Plus 2.01 for DOS 68.95
14. After Dark for Windows V.2.0.....29.95
15. MS Publisher 2.0 for Windows.....122.95
16. Disney Screen Saver for Win 28.95
17. MS Office 4.0 for Windows 459.95
18. Norton Utilities 7.0.....111.95
19. MS Flight Simulator 5.0 .....43.95
20. Quicken 7.0 for DOS.....42.95
21. WinFax Pro 3.0 for Windows.....78.95
22. PC Anywhere V.4.5 Host & Remote 112.95
23. Approach 2.1 for Windows 97.95
24. Print Cache 3.1 .....46.95
25. OS/2 2.0 for Windows 49.95
26. MS Works 3.0 for Win.....119.95
27. Corel Draw 3.0 for Windows 124.95
28. Claris File Maker Pro 2.1.....119.95
29. Turbotax 93 Headstart for DOS or Win .41.95
30. Quattro Pro 5.0 for DOS 42.95
31. Quicken 3.0 for Windows 41.95
32. MS Arcade 1.0 for Windows 28.95
33. ViSio 2.0 for Windows 119.95
34. Encarta Encyclopedia - CD 89
35. Corel Draw 4.0 for Windows 374.95
36. Quicken Companion 2 .....24.95
37. MS PC Works 3.0 for DOS 94.95
38. Hijack Pro 2.0 Windows.....79.95
39. MS Windows NT 3.1 .....299.95
40. WordPerfect for 6.0 Windows 284.95
41. Lantastic AI 5.0 Win/DOS.....77.95
42. MS Windows for Workgroups 3.11 ..137.95
43. Compuserve Win Membership 26.95
44. MS Visual Basic 3.0 for Win Stand ...124.95
45. Rebel Assault - CD 45.95
46. Lotus Notes 3.0 Client for Windows..409.95
47. MS Money 3.0 for Windows.....24.95
48. MS Visual C++ Stand for Win 3.5.....124.95

SOFTWARE

1st ACT! for DOS	53.95
Adobe Illustrator 4.0 for Windows	449.95
Adobe Photoshop 2.5 for Windows	584.95
Arbus Freehand 3.1	376.95
Animation Works Interactive 2.0 for Win	262.95
Auto Insight DOS only (while supplies last)	24.95
AutoCAD LT for Windows	429.95
Back Up Exec Netware	339.95
Back Up Exec SCSI for Windows	87.95
BitCom / BitFax Bundle 4.0	36.95
BitFax Builder V 4.0a	79.95
Borland Pascal with Objects 7.0	334.95
Business Works/Gen. Ledger DOS or Win	249.95
Business Works 8.0 for Windows	349.95
Business Works Payroll	239.95
CA SPI Accounting R 4.4	147.95
CA Clipper Tools 5.2	444.95
CA Clipper V.5.2	509.95
CA Visual Expert Clipper Kit for dBASE 4	252.95
CA Compete 4.2 for Windows	67.95
CA Cricket Graph for Windows 1.3.2	62.95
CA Cricket Image for Windows	62.95
CA Cricket Paint for Window	62.95
CA Cricket Presents for Window 1.4	62.95
CA drFast for Windows 2.0	161.95
CA EndSweep DOS Extender for Clipper	64.95
CA Flexiler 2.0 for Windows	72.95
CA Simply Accounting	49.95
CA Super Project 2.01 for DOS	579.95
CA Super Project 3.0 for Windows	579.95
CA SuperCalc 5.5	94.95
CA Up to Date for Windows	84.95
Cakewalk 4.0	79.95
Cakewalk Pro for Windows 2.0	299.95
Calendar Creator Plus 2.0 Win or 5.0 DOS	34.95
Canvas for Windows	259.95
Carbon Copy 2.0 Win or 8.1 DOS	128.95
Claris Draw	249.95
Central Point Anti-Virus 2.1 for DOS	87.95
Central Point Anti-Virus for Windows	87.95
Central Point Backup (Win 2.0 or DOS 6.0)	87.95
Central Point PC Tools for Windows	87.95
Central Point PC Tools Pro 8.0	87.95
Check It Plus 3.0	79.95
Check It Pro Analyst for Windows	81.95
Check It Pro Deluxe	127.95
Check It Pro Set	79.95
Chemistry Works	79.95
Clarion DB 3.0	534.95
Claris Impact for Windows	94.95
Claris Works 1.0 for Windows	119.95
Close-Up WinDOS Dual Boot 5.0	119.95
Co-Session Host / Remote	67.95 67.95
Co-Session Host & Remote	94.95
Coaster Screen Saver	33.95
Comm Works for Windows	121.95
Common Ground for Windows	88.95
Communique Suite for Windows	108.95
Compact 1.0	204.95
Compuserve DOS Membership	26.95
Compute! Works	28.95
Corel CD Power Pak	87
Corel SCSI Network Manager	389.95
Corel SCSI Version 2	89.95
Corel Ventura 4.2 for Windows	159.95
Corel Ventura for Windows 2.0	359.95
Crosstalk Mark 4 V2.1	154.95
Crosstalk/Fax Bundle	137.95
Dac Easy Instant Act 2.0 for Win	32.95
Dac Easy Instant Business for Win	32.95
Dac Easy Payroll 4.4	89.95
Dashboard 2.0 for Windows	44.95
Data Perfect 2.3	284.95
Data Perfect 2.3 Note LAN	737.95
DataBase Express for Windows	257.95
dBase Compiler 1.0	511.95
dBASE IV 2.0	504.95
dBase IV Professional for Win	574.95
Deluxe Paint II Enhanced	79.95
Design CAD 3D 4.0 / 3.5" for Win - 183.95	195.95
Design Cart 3D 4.0	232.95
Design CAD Expert Series 2.0	529.95
Design Your Own Rail Road	31.95
Desktop Set 4.0	44.95
DESQview 386 V 2.6	79.95
DESQview/386 V 2.6	93.95
DESQview/X 1.2	89.95
Digital Morkin for Windows	59.95
Direct Access 1.0 for Win 5.1 DOS	89.95
Direct Access Desktop	81.95
Disk Manager 6.0	87.95
DiskLock PC 2.2	53.95
DOSFax Pro 2.0	49.95
Double Tools 1.2	59.95
DR DOS 6.0	84.95
Dream House Professional	47.95
DynaComm for Windows 3.5 only	147.95
Easy CAD 2 V 2.7	97.95
Easy Flow 6.0	249.95
Esco Simplicity / Professional	59.95/257.95
Fastx FAX V1.21 w/Mail Premium	72.95
Eclipse Find for Win thru 1.01/94)	37.95
Eight-in-One for DOS	34.95
Eight-in-One for Windows	34.95
Enable V 4.5	464.95
Express Publisher 3.0 for DOS	76.95
EZ Cosmos for Windows	34.95
Facelift for WordPerfect for DOS or Win 2.0	59.95
Family Tree Maker DOS 2.5 only	39.95
Fast Back Plus 8.0 for DOS	84.95
Fax and Find for Windows	154.95
Federal Data Base Finder	52.95
Flow Charting 3 V2.1 (single user)	132.95
Form Flow for Windows	122.95
Form Flow Manager for Windows	249.95
FormFiller 4.5	48.95
FormTool Gold V 3.0 for DOS or Win	53.95
FrameMaker 4.0 for Win (3.5 only)	650.95
French Assistant 5.0 for DOS or Windows	53.95
Gesamtmart Guteexpert	31.95
Grammatica V for DOS	58.95
Graphic Server for Windows	189.95
Holy Bible	29.95
IBM CAD DOS or OS/2	62.95
Image Pals for Windows	64.95
Imagine 3.0	344.95
Intersection USA to Z	39.95
Letter Perfect 1.0	32.95
Lotus Smart Pics for Windows	74.95
Lotus SmartSuite 2.1 for Windows	424.95
Lotus Write 2.0	99.95
Lotus or Windows Plus	127.95
Menu Beacon Typing for Windows	56.95
Micro Cookbook for Windows	34.95
Micro After Dark 1.0 for Windows	24.95
MS Access Developer Kit 1.1	269.95
MS Basic Dev Sys 7.1	84.95
MS Fortran Powr / Station	316.95
MS FoxPro 2.5 for DOS	169.95
MS FoxPro 2.5 for Windows License Pak	262.95
MS Office Professional 4.0	631.95
MS Print	123.95
MS Quick Basic 4.5	104.95
MS Scenes Impressionistics Collect.	34.95
MS Scenes: Outer Space	34.95
MS Soundbloo	33.95
MS Source Profiler 1.0	54.95
MS Test 2.0 for Windows	304.95
MS Visual Basic 3.0 for Win Professional	304.95
MS WG Starter Kit- 2 user	449.95
MS WG User Kit - Single	149.95
MS Win for Workgroups Add on for Win	47.95
MS Win Software Dev Kit 3.1	219.95
MS Windows Printing System 1.0	94.95
MS Word DOS 6.0 (PC Word)	349.95
NetRoom 3.x3.0 / 4 User	59.95/107.95
New Nine V 4.1	119.95
News of the Past	34.95
Norton Backup 2.0 DOS or 3 Win	84.95
Novell DOS 7	83.95
Object Vision Pro 2.1	334.95
OmniScan 1.0 for Windows	289.95
Open N' BR Screen Saver for Win	29.95
Org Plus 2.0 for Windows	119.95
Org Plus 5.0 for Windows	232.95
Pendata 4.5	519.95
Pendata 4.5 Runtime Single	349.95
Peradox Workgroup Edition for Win	539.95
Pagis Editor 5.0 for Windows	249.95
PC Anywhere 4.5 LAN Complete	384.95
PC Mail Server	439.95
PC Tools Pro 9.0	86.95
Peachtree 2.0 for Windows	119.95
Peachtree Complete 7.0	176.95
Peachtree Network Accounting 7	282.95
Perform Design & Filter DOS	63.95
Personal T oster SAT 2.0	36.95
PFS: Resume & Job Search Pro for Win	39.95
PhantomAsset	39.95
PhotoEdge CD ROM for Windows	94.95
Picture Publisher 4.0 for Windows	249.95
Pizazz Plus 4.0	77.95
Presentation Task Force 4.0 for Win	87.95
Print G 6.0	49.95
Print Master Battery	79.95
Q & A 4.0 for DOS	244.95
Q & A 4.0 for Windows	249.95
QmodemPro 1.15	59.95
Quick C for Windows 1.0	104.95
Quattro Pro Win/Group Edition	193.95
Quattro Pro 4.0 for DOS	42.95
QuickBooks 2.0	94.95
QuickBooks for Windows 1.0	31.95
QuickPay Payroll 2.1	38.95
Rbase 5.0	464.95
Roots IV: Genealogy	129.95
Rubber Stamp for Windows	94.95
Selle WinDOS	184.95
Sidekick for Windows 2.0	93.95
SCSI Disc / Int Single	42.95
Shadowed 1.0	62.95
Smart Suite 1.0	84.95
Sidewyze 3.0	54.95
Smart Suite for Windows	84.95
Smalltal V for DOS / Win/ 2.0 for Win 61.95 / 239.95	
Software Bridge 5.0	77.95
Spanish Assistant 5.0	55.95
Spanish Dictionary 2.0 for Windows	52.95
Spinnaker 3.1	77.95
Studio for Windows	64.95
Super Show & Tell	64.95
Superbase 5 for Windows	337.95
SuperJAM! for Windows	79.95
Timeline 5.0 for DOS	249.95
Translate It - Span, Germ, Franch, etc	54.95
TrueType Font Pack for Win	37.95
Type Case II for Windows	34.95
Typing Tutor V Plus for Windows	29.95
UltraFAX 1.1 for Windows	31.95
Virtual Reality Studio 2.0	84.95
ViSio 2.0 License 1 User	159.95
Voice Blaster	54.95
Voice Control for Windows	92.95
Watermark Discovery 1.0	34.95
Windows Express 4.0	34.95
WordPerfect Add License for Win w/Doc	202.95
WordPerfect Inform Desktop 6 / Filer	284.95
WordPerfect Presenti 2.0 DOS	264.95
WordPerfect Works 1.0	92.95
WordScan Plus 2.0 for Windows	414.95
Writer's Toolkit 2.0 Windows	49.95
XY Write 4 / XY Write for Win ...219.95 / $217.95	
Your Medical Records	39.95
ZyINDEX for Windows 5.1	234.95

SOFTWARE

FrameMaker 4.0 for Win (3.5 only)	650.95
French Assistant 5.0 for DOS or Windows	53.95
Gesamtmart Guteexpert	31.95
Grammatica V for DOS	58.95
Graphic Server for Windows	189.95
Holy Bible	29.95
IBM CAD DOS or OS/2	62.95
Image Pals for Windows	64.95
Imagine 3.0	344.95
Intersection USA to Z	39.95
Letter Perfect 1.0	32.95
Lotus Smart Pics for Windows	74.95
Lotus SmartSuite 2.1 for Windows	424.95
Lotus Write 2.0	99.95
Lotus or Windows Plus	127.95
Menu Beacon Typing for Windows	56.95
Micro Cookbook for Windows	34.95
Micro After Dark 1.0 for Windows	24.95
MS Access Developer Kit 1.1	269.95
MS Basic Dev Sys 7.1	84.95
MS Fortran Powr / Station	316.95
MS FoxPro 2.5 for DOS	169.95
MS FoxPro 2.5 for Windows License Pak	262.95
MS Office Professional 4.0	631.95
MS Print	123.95
MS Quick Basic 4.5	104.95
MS Scenes Impressionistics Collect.	34.95
MS Scenes: Outer Space	34.95
MS Soundbloo	33.95
MS Source Profiler 1.0	54.95
MS Test 2.0 for Windows	304.95
MS Visual Basic 3.0 for Win Professional	304.95
MS WG Starter Kit- 2 user	449.95
MS WG User Kit - Single	149.95
MS Win for Workgroups Add on for Win	47.95
MS Win Software Dev Kit 3.1	219.95
MS Windows Printing System 1.0	94.95
MS Word DOS 6.0 (PC Word)	349.95
NetRoom 3.x3.0 / 4 User	59.95/107.95
New Nine V 4.1	119.95
News of the Past	34.95
Norton Backup 2.0 DOS or 3 Win	84.95
Novell DOS 7	83.95
Object Vision Pro 2.1	334.95
OmniScan 1.0 for Windows	289.95
Open N' BR Screen Saver for Win	29.95
Org Plus 2.0 for Windows	119.95
Org Plus 5.0 for Windows	232.95
Pendata 4.5	519.95
Pendata 4.5 Runtime Single	349.95
Peradox Workgroup Edition for Win	539.95
Pagis Editor 5.0 for Windows	249.95
PC Anywhere 4.5 LAN Complete	384.95
PC Mail Server	439.95
PC Tools Pro 9.0	86.95
Peachtree 2.0 for Windows	119.95
Peachtree Complete 7.0	176.95
Peachtree Network Accounting 7	282.95
Perform Design & Filter DOS	63.95
Personal T oster SAT 2.0	36.95
PFS: Resume & Job Search Pro for Win	39.95
PhantomAsset	39.95
PhotoEdge CD ROM for Windows	94.95
Picture Publisher 4.0 for Windows	249.95
Pizazz Plus 4.0	77.95
Presentation Task Force 4.0 for Win	87.95
Print G 6.0	49.95
Print Master Battery	79.95
Q & A 4.0 for DOS	244.95
Q & A 4.0 for Windows	249.95
QmodemPro 1.15	59.95
Quick C for Windows 1.0	104.95
Quattro Pro Win/Group Edition	193.95
Quattro Pro 4.0 for DOS	42.95
QuickBooks 2.0	94.95
QuickBooks for Windows 1.0	31.95
QuickPay Payroll 2.1	38.95
Rbase 5.0	464.95
Roots IV: Genealogy	129.95
Rubber Stamp for Windows	94.95
Selle WinDOS	184.95
Sidekick for Windows 2.0	93.95
SCSI Disc / Int Single	42.95
Shadowed 1.0	62.95
Smart Suite 1.0	84.95
Sidewyze 3.0	54.95
Smart Suite for Windows	84.95
Smalltal V for DOS / Win/ 2.0 for Win 61.95 / 239.95	
Software Bridge 5.0	77.95
Spanish Assistant 5.0	55.95
Spanish Dictionary 2.0 for Windows	52.95
Spinnaker 3.1	77.95
Studio for Windows	64.95
Super Show & Tell	64.95
Superbase 5 for Windows	337.95
SuperJAM! for Windows	79.95
Timeline 5.0 for DOS	249.95
Translate It - Span, Germ, Franch, etc	54.95
TrueType Font Pack for Win	37.95
Type Case II for Windows	34.95
Typing Tutor V Plus for Windows	29.95
UltraFAX 1.1 for Windows	31.95
Virtual Reality Studio 2.0	84.95
ViSio 2.0 License 1 User	159.95
Voice Blaster	54.95
Voice Control for Windows	92.95
Watermark Discovery 1.0	34.95
Windows Express 4.0	34.95
WordPerfect Add License for Win w/Doc	202.95
WordPerfect Inform Desktop 6 / Filer	284.95
WordPerfect Presenti 2.0 DOS	264.95
WordPerfect Works 1.0	92.95
WordScan Plus 2.0 for Windows	414.95
Writer's Toolkit 2.0 Windows	49.95
XY Write 4 / XY Write for Win ...219.95 / $217.95	
Your Medical Records	39.95
ZyINDEX for Windows 5.1	234.95

SERVING CUSTOMERS FOR OVER 15 YEARS!

- **One of Wisconsin's Top 10 Women Owned Businesses.**
- Corporate, Government & School POs Welcome.
- No surcharge for credit cards.
- Most orders shipped within 48 hours.
- Software shipping only $6 per order, not per title. Hardware: 5% - Min. $5.
- COD orders welcome, with only a $6 Charge.
- We ship latest version of software available.
- All products sold carry manufacturers' full warranties & Documentation.
- APO, FPO HI, AK, Puerto Rico & Canadian orders welcome: 6% - Min. $6. International orders ship first class Mail insured 15%- Min. $15. If mail cost exceeds calculated amount, you'll be billed additional. Note: UPS to AK or HI may run more than 6%. If so, you will be billed additional.
- Call for Free Catalog & Items not listed

Personal & company checks allow 14 working days to clear. Not responsible for typographical errors. Prices fluctuate beyond our control & may change for better or worse. Defective returns must have a Return Authorization number. Call our 1-800 number to obtain a Return Authorization or your return will not be accepted. Shipping & Handling are non-refundable. All sales are final. All returns are subject to a restocking fee.

P.O. Box 17882 • Milwaukee • Wisconsin • 53217

LOOK HERE FIRST FOR EXTRA SAVINGS! (TOP 50 TITLES NOT LISTED BELOW)

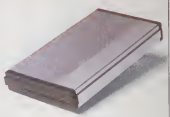
UPGRADES

Arts Pro Windows Compat / Upgd Version	34.95
Autocmp Read Atbe 3.0 Upgrade	24.95
Borland C++ 4.0 Upgrade for Win	169.95
Borland Office 2.0 Version Upgrade	239.95
Bus Excel 5.0 for Win Version Upgrade	94.95
Bus Power Point 4.0 for Win Version Upgrade	94.95
Bus Pro For 2.5 for Win Comp Upgrade	104.95
Bus Pro For 2.5 for Win Comp Upgrade	104.95
MS Office 4.0 for Win Version Upgrade	237.95
MS Office 4.0 for Win Version Upgrade	237.95
MS Powerpoint for Win Comp Upgrade	119.95
MS Visual Basic Pro Competitive Upgrade	199.95
MS Visual Basic Pro Version Upgrade	94.95
MS Visual Basic Standar Comp Upgrade	94.95
MS Visual Basic Stand Upgd Ver for Win	94.95
MS Visual C++ Pro Ver 1.5 Upgd CD Only	129.95
MS Visual C++ Std Version Upgrade	74.95
MS Visual C++ Version Upgrade	94.95
MS Windows 3.11 Upgrade	51.95
MS Word 6.0 Competitive Upgrd for Win	119.95

MS Word 6.0 Version Upgrade for DOS	122.95
MS Word 6.0 Version Upgrade for Win	92.95
Norton Utilities Competitive Upgrade	92.95
OS/2 Upgrade	114.95
Pendata 4.5 Version Upgrade	137.95
Peradox WG Upgrade Edition	139.95
Professional File Upgrade	69.95
Q&A Upgrade 4.0 for Windows	91.95
Qemm 7 Upgrade	34.95
Quattro Pro Workgroup Compat Upgrade	96.95
Stacker 4.0 Competitive Upgrade	49.95
Superbase 2.0 Win Comp Version Upgrade	94.95
WordPerfect 6.0 Comp Trade-up for DOS	117.95
WordPerfect 6.0 Comp Tradeup for Win	114.95
WordPerfect 6.0 Ver Upgrade for DOS 6	89.95
WordPerfect 6.0 Version Upgrade for Win	89.95
WordPerfect 6.0/Quattro Pro Comp Upgd	137.95
WordPerfect 6.0/Quattro Pro Upgd for Win	122.95
WordPerfect Designer/Filer Comp Upgrd	129.95

Don't settle for less than these specs:

All-in-One Modems



Transmission rate: 14,400 bps without compression, 57,600 bps with compression.

Supported standards: V.32bis (data speed), V.42 (error correction), V.42bis (data compression), CCITT Group 3 Class 1, Class 2, and CAS (fax).

Compatibility: Hayes.

Port selection: COM1 through COM4.

Bundled software: DOS and Windows communications and fax software, OCR software.

Features and options: Integrated voice, data, and fax; onboard digital-signal processor and coprocessor; 16550 universal asynchronous receiver/transmitter; LCD display on external modems; upgradability to V.Fast (V.34) protocol.

Red flags: *Fax modems without fallback transmission rates may not connect with other machines.*

Hard Drives

Performance: 13ms or faster vendor-rated average access time. If performance reported as average seek time: 10ms or faster.

Capacity: 230MB or greater.

Size: Half height or full height, depending on your system's drive space.

Interface: IDE for desktop systems with up to 1GB of capacity. For larger capacities, get a SCSI-2 drive interface.

Features and options: Self-parking heads, diagnostic and partitioning software.

Cache or buffer: 64K to 256K.

Red flags: *Mounting brackets and cables should come with the disk; look for a 30-day full money-back guarantee and a three- or five-year warranty.*

CD-ROM Drives

Access time: 200ms.

Transfer rate: Dual-speed drive: 150 Kbps to 300 Kbps.

Ondrive cache: 64K.

Interface: SCSI-2.

Compatibility: High Sierra (data) and ISO-9660, CD-Audio, and Kodak Photo CD (still photography) with multisession support (MPC 2).

Audio: Output jack and volume control.

Packaging: Internal.

Features and options: Bundled CD-ROM discs, single-handed operation.

Other requirements: Disk caddy (if needed).

Red flags: *Proprietary interfaces and drives that don't support MPC 2 will probably work with less software and hardware.*

Single-User Tape Drives

Storage capacity: 250MB when compressed.

Packaging: Internal 3½-inch drive preferred; external for PC-to-PC portability.

Interface: Floppy drive, IDE, or SCSI.

Cartridge type: DC6250 or equivalent, preformatted.

Bundled software: Windows and DOS backup software that supports either QIC-80 or QIC-525 tape format.

Other requirements: Floppy interface splitter or other interface cable, mounting hardware for internal drives.

Red flags: *Ensure full QIC-80 compatibility for QIC drives; avoid proprietary controller cards—they may take up an extra slot in your system; try for a price below $1 per megabyte.*

Train With and Keep a Powerful 486sx/25 MHz Mini-Tower Computer!

NRI's new training in Programming in C++ with Windows lets you combine two of today's hottest programming skills into one great new career!

work with the top-rated Borland Turbo C++ compiler included in your course, you master object-oriented programming methods — gaining the practical experience and design expertise that will save you time and make future programming fast and easy.

You discover for yourself how this in-demand language allows you the freedom to write real-world applications that rival software produced by top-paid design teams — from stand-alone graphics and word processing packages to spreadsheets, text editors, database managers, and more! But that's still not all...

Learn to program for the exciting visual environment of Microsoft® Windows™

With NRI training you take command of today's newest design techniques as you master programming skills for Windows — using both C++ and the built-in functions and routines of your Microsoft Windows software.

Rush this postage-paid card for your free catalog!

Every NRI course features practical, hands-on training with state-of-the-art equipment you keep. Only NRI gives you the training *and* the equipment for career advancement, part-time earnings, or even a business of your own.

Check One ☑

Please send my free catalog on NRI training in:

- ☐ **Computer Programming**
- ☐ Microcomputer Servicing
- ☐ Multimedia Specialist
- ☐ Programming in C++ with Windows
- ☐ Desktop Publishing & Design
- ☐ Word Processing Home Business
- ☐ TV/Video/Audio Servicing
- ☐ Database Management
- ☐ Industrial Electronics & Robotics
- ☐ Electronic Music Technology
- ☐ Radio Communications
- ☐ Basic Electronics
- ☐ Computer-Aided Drafting
- ☐ Building Construction
- ☐ Home Inspection
- ☐ Air Conditioning, Heating & Refrigeration
- ☐ Electrician
- ☐ Automotive Servicing
- ☐ Paralegal
- ☐ Fiction/Nonfiction Writing
- ☐ Writing Children's Literature
- ☐ Interior Design
- ☐ Bookkeeping & Accounting

For career courses approved under G.I. Bill, ☐ check for details.

Name _____ *(Please print)* Age _____

Street *(No P.O. Box numbers please)* Phone _____

City _____ State _____ Zip _____

Accredited Member National Home Study Council

5408-0494

Rush this postage-paid card for your free catalog!

Every NRI course features practical, hands-on training with state-of-the-art equipment you keep. Only NRI gives you the training *and* the equipment for career advancement, part-time earnings, or even a business of your own.

Check One ☑

Please send my free catalog on NRI training in:

- ☐ **Computer Programming**
- ☐ Microcomputer Servicing
- ☐ Multimedia Specialist
- ☐ Programming in C++ with Windows
- ☐ Desktop Publishing & Design
- ☐ Word Processing Home Business
- ☐ TV/Video/Audio Servicing
- ☐ Database Management
- ☐ Industrial Electronics & Robotics
- ☐ Electronic Music Technology
- ☐ Radio Communications
- ☐ Basic Electronics
- ☐ Computer-Aided Drafting
- ☐ Building Construction
- ☐ Home Inspection
- ☐ Air Conditioning, Heating & Refrigeration
- ☐ Electrician
- ☐ Automotive Servicing
- ☐ Paralegal
- ☐ Fiction/Nonfiction Writing
- ☐ Writing Children's Literature
- ☐ Interior Design
- ☐ Bookkeeping & Accounting

For career courses approved under G.I. Bill, ☐ check for details.

Name _____ *(Please print)* Age _____

Street *(No P.O. Box numbers please)* Phone _____

City _____ State _____ Zip _____

Accredited Member National Home Study Council

5408-0494

Don't settle for less than these specs:

All-in-One Modems

Transmission rate: 14,400 bps without compression, 57,600 bps with compression.

Supported standards: V.32bis (data speed), V.42 (error correction), V.42bis (data compression), CCITT Group 3 Class 1, Class 2, and CAS (fax).

Compatibility: Hayes.

Port selection: COM1 through COM4.

Bundled software: DOS and Windows communications and fax software, OCR software.

Features and options: Integrated voice, data, and fax; onboard digital-signal processor and coprocessor; 16550 universal asynchronous receiver/transmitter; LCD display on external modems; upgradability to V.Fast (V.34) protocol.

Hard Drives

Performance: 13ms or faster vendor-rated average access time. If performance reported as average seek time: 10ms or faster.

Capacity: 230MB or greater.

Size: Half height or full height, depending on your system's drive space.

Interface: IDE for desktop systems with up to 1GB of capacity. For larger capacities, get a SCSI-2 drive interface.

Features and options: Self-parking heads, diagnostic and partitioning software.

Cache or buffer: 64K to 256K.

Red flags: *Mounting brackets and cables should come with the disk; look for a 30-day full money-back guarantee and a three- or five-*

NO POSTAGE NECESSARY IF MAILED IN THE UNITED STATES

BUSINESS REPLY MAIL
FIRST CLASS MAIL PERMIT NO. 10008 WASHINGTON, D.C.

POSTAGE WILL BE PAID BY ADDRESSEE

NRI Schools
McGraw-Hill Continuing Education Center
4401 Connecticut Avenue, NW
Washington, DC 20078-3543

NO POSTAGE NECESSARY IF MAILED IN THE UNITED STATES

BUSINESS REPLY MAIL
FIRST CLASS MAIL PERMIT NO. 10008 WASHINGTON, D.C.

POSTAGE WILL BE PAID BY ADDRESSEE

NRI Schools
McGraw-Hill Continuing Education Center
4401 Connecticut Avenue, NW
Washington, DC 20078-3543

Train With and Keep a Powerful 486sx/25 MHz Mini-Tower Computer!

NRI's new training in Programming in C++ with Windows lets you combine two of today's hottest programming skills into one great new career!

Like never before, organizations everywhere are paying top dollar for PC programmers who can combine the power of object-oriented C++ with the new freedom and ease of Windows to create in-demand software for business, industry, or consumer applications.

Pick up the classified section in any major newspaper and you'll see: C++ programming and the ability to create PC programs for a Windows environment top the list of job skills today's employers demand.

Now you can take advantage of today's hottest programming opportunities with NRI's new at-home training — Programming in C++ with Windows. It's the right training at the right time. And the only training that gives you everything you need to succeed today on the job, in a new career, or in a full- or part-time programming business of your own.

Get hands-on training with a 486sx-based mini-tower computer system

NRI knows: To program in C++ and create Windows applications, you need to work with a state-of-the-art computer system. That's why NRI gives you hands-on experience with a 486sx/25 MHz mini-tower computer — the most powerful computer system available in home study today. You train with and keep this state-of-the-art system, complete with VGA color monitor, enhanced keyboard and mouse, a 200 meg hard drive, and five full megabytes of RAM.

This outstanding computer system gives you the memory, speed, and power you need to take advantage of all the features of your C++ compiler and Windows software ... and develop the kind of quality software programs today's employers and consumers demand. But hardware is just part of what makes NRI training so good ...

Get practical experience with a powerful 486sx-based computer, VGA color monitor, 5 meg RAM, 200 meg hard drive, enhanced keyboard and mouse, and professional software...all yours to train with and keep!

Master object-oriented programming using Borland Turbo C++®

With NRI you learn at home, at a comfortable pace. NRI's Discovery Learning Method takes you step-by-step from computer basics to advanced programming in C++, today's hottest object-oriented programming language. As you work with the top-rated Borland Turbo C++ compiler included in your course, you master object-oriented programming methods — gaining the practical experience and design expertise that will save you time and make future programming fast and easy.

You discover for yourself how this in-demand language allows you the freedom to write real-world applications that rival software produced by top-paid design teams — from stand-alone graphics and word processing packages to spreadsheets, text editors, database managers, and more! But that's still not all...

Learn to program for the exciting visual environment of Microsoft® Windows™

With NRI training you take command of today's newest design techniques as you master programming skills for Windows — using both C++ and the built-in functions and routines of your Microsoft Windows software.

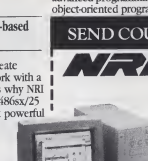
As you actually build your own software application, you develop hands-on experience with Windows' easy-to-use features —including graphics, memory management, multitasking, data exchange, and more!

Soon you're ready to use your computer and know-how to create fast, functional programs — complete with on-screen graphics, custom cursors, images, icons, and all the other Windows features you need to build high-performance software that meets today's competitive business needs.

Send for your FREE NRI catalog today!

Discover how NRI can give you the computer know-how you need for success. If the coupon is missing, write to NRI Schools, McGraw-Hill Continuing Education Center, 4401 Connecticut Avenue, NW, Washington, DC 20008.

SEND COUPON TODAY FOR FREE NRI CATALOG!



NRI Schools
McGraw-Hill Continuing Education Center
4401 Connecticut Avenue, NW, Washington, DC 20008

Yes! Send me the FREE catalog I've checked and show me how NRI can give me the state-of-the-art computer training I need for advancement, extra income, or a business of my own!

Check one FREE catalog only
- ☐ **PROGRAMMING IN C++ WITH WINDOWS**
- ☐ PC Troubleshooter
- ☐ PC Applications Specialist

Other computer career training:
- ☐ Computer Programming
- ☐ Desktop Publishing and Design
- ☐ Bookkeeping and Accounting

Name_____ Age_____

Address_____

City_____ State_____ Zip_____

Accredited Member, National Home Study Council

5408-0494

Don't settle for less than these specs:

Network Laser Printers

Emulations: PCL 5, PostScript Level 2 with automatic emulation switching.

Print engine speed: At least 17 ppm.

Resolution: 600 dpi.

Processor: 16MHz RISC.

Resident fonts: 90 total; 10 TrueType (matching Windows 3.1), 45 PCL 5, 35 PostScript.

RAM: 8MB.

Interfaces: Parallel and 10Base-T or 10Base-2 Ethernet, Token Ring, or LocalTalk.

Network support: Concurrent for Novell NetWare, Windows NT, and Windows for Workgroups.

Paper capacity: 1,000 sheets.

Warranty: One year with onsite service.

Features and options: SNMP support, EPA Energy Star compliance, legal-size paper tray.

Color Thermal Wax-Transfer Printers

Emulations: PostScript Level 2.

Print speed: 2 ppm.

Resolution: 300 dpi.

Processor: 16MHz RISC.

Printer language: PostScript Level 2.

RAM: 4MB.

Interface: Parallel.

Fonts: 35 Adobe Type 1.

Ribbon: Three-color transfer ribbon.

Features and options: Internal network interfaces, support for 4-color (3 colors plus black) ribbons, EPA Energy Star compliance.

Other requirements: RAM expandable to 8MB.

Red flags: *Be sure vendor provides a PostScript Level 2 driver; despite some claims, business-quality printing on plain copier paper isn't a reality yet.*

Desktop Laser Printers

Emulations: PCL 5, PostScript option with automatic emulation switching and all ports active.

Print engine speed: 8 ppm.

Resolution: 600 dpi.

Resident fonts: 45 total; 10 TrueType fonts (matching Windows 3.1).

RAM: At least 2MB.

Interface: Bidirectional parallel.

Paper capacity: 200 sheets.

Footprint: 260 square inches or less.

Features and options: HP-compatible font cartridges, RISC processor for 600-dpi models, toner included, EPA Energy Star compliance.

Other requirements: Toner cartridge, parallel cable, envelope tray.

Flatbed Color Scanners

Resolution: 400 to 600 dpi.

Image scanning capabilities: 24-bit color (16.7 million colors), grayscale (256 shades of gray), black and white.

Compatibility: TWAIN.

Interface: SCSI or SCSI-2.

Image controls: External controls for adjusting brightness, contrast, and color of scan; adjustable resolution.

Bundled software: 24-bit image-editing software, OCR software.

Features and options: Automatic document sheet feeder, transparency feeder.

Other requirements: Cables and SCSI adapter card included in price.

Red flags: *We recommend one-pass scanners for color documents, but it's not a given that any triple-pass scanner produces lower-quality than a single-pass.*

"What to do when Windows™ won't work."

INCREASE SPEED

WINProbe uncovers the secrets to faster Windows operation. Simply click your mouse on "Tune Up" and **WINProbe** analyzes your system, then gives you up to 35 suggestions on how to speed up your system...

- Analyzes SmartDrive settings to improve hard drive performance
- Identifies and explains how to set up a permanent swap file
- Identifies which mode is best, Standard or Enhanced
- Pinpoints the optimum driver for your VGA card
- Optimizes and frees fragmented memory
- Analyzes and suggests the best Windows setup for your system

TROUBLESHOOT YOUR OWN PC

Few things are more aggravating than computer downtime and lockups. You waste time waiting for help and usually pay a dear price to get it when you finally do. Your time is valuable, so let **WINProbe** troubleshoot the problem for you. You'll be able to quickly identify the source of the problem; hardware, software, or configuration. Telephone support time is slashed. Repair bills drop like a rock (50% and more of your repair bills are for diagnosing the problem, **WINProbe** does it for you at NO COST!). Tests include...

- CPU and system board in 16 and 32 bit operation
- Math coprocessor
- Memory; conventional, extended, expanded, and XMS
- COM ports and MODEM control lines
- Floppy drive speed and surface analysis
- Hard drive surface analysis
- Keyboard and scan codes
- Video adapter and screen
- Mouse initialization and interrupts
- Printer operation, output, and cable

Windows™ SOURCES EXPERTS' PICK

"This $99 toolkit deserves high praise for ease of use, completeness, and accuracy."
Windows Sources

"A bargain worth writing home about."
PC Computing

"WINProbe's most impressive offering is its memory-reclamation capability. This feature alone is worth the price of admission."
PC Computing

RESOLVE SETUP PROBLEMS

Say 'goodbye' to software and hardware configuration and setup problems. **WINProbe** provides helpful information on...

- Installing a new hard drive
- CMOS display and edit
- IRQ, DMA, and UMB usage
- What to do when installing an add-in card
- Cleaning up *.INI and *.GRP files
- Memory allocation and management
- Locating and removing duplicated system files

OPTIMIZE MEMORY

WINProbe includes a memory optimization feature which lets you reclaim memory that Windows applications use but don't properly make available when you're in another program. Now you can avoid system crashes and other problems caused by reduced available memory.

COMPATIBILITY

WINProbe requires an IBM AT, 386, 486, PS/2 or compatible with at least 1MB of RAM, DOS 3.1 or higher, Windows 3.0 or higher, and either a Hercules mono, EGA, VGA, or SVGA video. A mouse is recommended but not required.

BUY WINPROBE OR BUY THE BUNDLE

WINProbe is available by itself or in a special bundle with **PC Certify**, Landmark's DOS troubleshooting software and **Landmark DOS for Windows**, the remarkable DOS-like operating shell for Windows.

2 GREAT DEALS! YOUR CHOICE:

WINPROBE...

ONLY $49

WINPROBE BUNDLE...

WINProbe • PC Certify
Landmark DOS for Windows

ALL 3 PROGRAMS

ONLY $99

TOLL-FREE SUPPORT "We're Here to Help You."

90 Day Money-back Guarantee!

TO ORDER, OR FOR THE DEALER NEAREST YOU, CALL

(800) 683-6696

FAX: (813) 443-6603 • Int'l (813) 443-1331
Mon-Thur:8AM-9PM, Fri:8AM-6PM, Sat:10AM-3PM

LANDMARK
RESEARCH INTERNATIONAL CORPORATION
703 Grand Central Street • Clearwater, FL 34616

Copyright © 1994 Landmark Research International Corp. All Rights Reserved. WINProbe and PC Certify are trademarks of Landmark Research International Corporation. Windows is a trademark of Microsoft Corporation. Other names are trademarks of their associated owners.

EGGHEAD SOFTWARE North America's Software Eggsperts · COMPUSA THE COMPUTER SUPERSTORE · COMPUTER City SUPERCENTER · EB electronics boutique · SOFTWARE ETC

MEGAHAUS
HARD DRIVES

Your Drive Company!

UNEQUALED REPUTATION
Nobody knows drives like MegaHaus. We have specialized in storage solutions for over 7 years. Repeat business from satisfied customers is the backbone of our business. We satisfy our customers.

DIRECT REPLACEMENT WARRANTY
During the first year of your warranty, we replace: not repair, any defective items. All items receive lifetime technical support from our factory trained techs.

SAME DAY SHIPPING
Our multi-million dollar inventory offers you the best diversity and availability in the market. We ship most orders the same day. Each order is checked at least four times for accuracy.

FAST, EASY INSTALLATION
Anyone can sell you a hard drive. We sell easy to install storage solutions. We spend countless hours researching the best solutions, then create our quick-place installation guides for each kit.

SPECIALS

SyQuest
Now available 270MB!

SQ3105A IDE Drive Bare	$239
with GSI-1B & 1 disk	$329
Portable external, attaches to printer port with 1 cartridge	$399

105MB Removable Media Drive. The #1 storage solution for the 1990's. Hard drive speed (14.8ms). Low cost per MB. Mounts in 3 1/2" or 5 1/4" bay. Great for unlimited upgradability, data archival, transport & exchange, just to name a few.

SQ310SS SCSI Drive Bare	$279
with Adaptec 1542 & 1 disk	$399
with Adaptec 1542 & 1 Disk	$529
External for MacIntosh & 1 Disk	$399

GSI GSI drive accelerators increase the data transfer rate of your IDE drive 30 to 80%. Works by enabling the drives Read Multiple & Write Multiple commands to greatly increase performance. We highly recommend these products for WD, Conner, Quantum, Seagate, Micropolis, Maxtor, & Fujitsu. Alone w/Drive

GSI-21 Board supports 2 IDE, 4 floppy drives, Doubles QIC-80 tape drive speed	$65 $55
GSI-3B Board supports 2 IDE drives. Works in conjunction with MFM, RLL, etc.	$85 $45
GSI-32 Board uses 32 bits 2 16550 serial ports & 1 bi-directional parallel port	$139 $119
GSI MaxIDEA Software solution works on existing IDE configuration (requires less than 1K of memory). Includes performance benchmark test.	$34 $25

HARD DRIVES

CONNER

IDE

210MB	14ms	CFS210A	$209
340MB	13ms	CFA340A	$279
420MB	14ms	CFS420A	$329
541MB	12ms	CFA540A	SCALL

digital

SCSI

1600MB	9.7ms	DSP3160	$1189
2103MB	9.7ms	DSP3210	$1559
3800MB	11ms	DSP3850	$2399
4000MB	11ms	DSP5400	$2599

FUJITSU

IDE

520MB	12ms	M2624F	$499
SCSI			
520MB	12ms	M2624F	$499
1080MB	9ms	M2694ESA	$829
2060MB	12ms	M2685ESA	$1429

Maxtor

IDE

248MB	15ms	7245A	$249
340MB	14ms	7345A	$278
540MB	12ms	7546A	$459
540MB	8.5ms	MXT540A	$489
SCSI			
340MB	14ms	7345S	$349

MICROPOLIS

IDE

1050MB	10ms	MC2210A	$846
1740MB	10ms	MC2217A	$1122
SCSI			
1050MB	10ms	MC2210	$846
1052MB	8.5ms	MC4110	$915
1740MB	10ms	MC2217	$1122
2100MS	11ms	MC1926	$1438
3020MB	11ms	MC1936	$2065
9100MB	12ms	MC1991	$4059

Differential Wide SCSI! The ultimate setup for speed. Price includes EISA card & cables!

1050MB	10ms	MC2210DW	$1599
1740MB	10ms	MC2217DW	$1899

Also available Audio / Visual tuned drives!

WESTERN DIGITAL

IDE

256MB	12ms	AC2282	$238
341MB	12ms	AC2340	$279
425MB	12ms	AC2420	$329
540MB	12ms	AC2540	$459

Boost WD performance 26% with MaxIDEA!

HARD DRIVES

Quantum

IDE

170MB	14ms	LPS170A	$189
270MB	12ms	LPS270A	$329
242MB	13ms	LPS340A	$279
541MB	12ms	LPS540A	$469
SCSI			
170MB	14ms	LPS170S	$189
270MB	12ms	LPS270S	$245
342MB	13ms	LPS340S	$249
541MB	12ms	LPS540S	$459
1000MB	10ms	LMP1000	$949
1225MB	10ms	PD1225S	$959
1800MB	10ms	PD1800S	$1079

Seagate

IDE

213MB	16ms	ST3243A	$199
260MB	16ms	ST3290A	$229
342MB	12ms	ST3390A	$279
452MB	12ms	ST3500A	$369
SCSI			
1690MB	8ms	ST11950N	$1469
2145MB	8ms	ST12550N	$1689

CONTROLLER CARDS

	Alone	w/Drive
ADAPTEC		
A1522BASIC 16Bit SCSI	$129	$109
A1542CBASIC 16Bit SCSI	$225	$215
A2742 EISA SCSI	$389	$369
A2842 VESA SCSI	$319	$299
7130 8Bit SCSI	$79	$65
7248 Parallel to SCSI	$189	$179
FUTURE DOMAIN		
1680SVP 16Bit SCSI	$155	$139

Many other types of controllers in stock, including IDE & SCSI caching cards!

HARD DISK CARDS

Drive & controller on card. Saves drive bay. Compatible with XT, AT, Tandy, and others.

170MB	$269	240MB $339
340MB	$439	528MB $779

IBM PS/1 PS/2 DRIVES

Complete solutions for your IBM. IBM recomends & buys from MegaHaus!

	170MB	240MB	340MB
PS/1 386 & 486	$239	$309	$389
PS/2 25, 30, 30-286	$299	$389	$479
PS/2 35 & 40	$229	$299	$379
PS/2 50 thru 95	$379	$489	$589

Larger capacities in stock. PS/2 286 120MB $589

MULTI-MEDIA KITS

Includes:
- Double speed CD ROM drive
- Media Vision Jazz 16
  - Pro Studio add $100
- Amplified Speakers
- Toolworks CD Bundle (World & Us Atlas, Grolliers Encyclopedia, San Diego Zoo's The Animals, Chessmaster3000, Mavis Beacon Teaches Typing)

Toshiba	XM3401	200ms $589
Sony	CDU 561	298ms $489
Sony	33A	325ms $359
NEC	3X CDR-510	195ms $629

ALTEC LANSING SPEAKERS CALL $

CD ROM DRIVES

NEC	3X CDR-510	195ms $439
Toshiba	XM3401	200ms $349
Toshiba	XM4101	320ms $249
Sony	CDU561	298ms $299
Sony	33A-10	325ms $269

CD Caddies with drive only $4 each!

6 Disc Changer (New 18 disc changer call)

Pioneer	DRM600	600ms $839
Pioneer	DRM602X	300ms $949
Pioneer	DRM604X	300ms $1189

CD SOFTWARE

CD Software sold separately only with CD ROM Drives.
Bundle 1 San Diego Zoo's The Animals,Toolworks Reference Library, ToolworksCreditor's Multimedia Encyclopedia , Toolworks World & US Atlas & Tempra Plus+ CD Access $89
Bundle 2 San Diego Zoo's The Animals, Toolworks Reference Library, World Atlas, US Atlas with Auto Map, Sherlock Holmes, Sports Best, Arthur's Teacher Trouble, Chessmaster 3000, & Family Choice (18 titles incl. Berenstain Bears) $159
Bundle 3 Toolworks Encyclopedia, Reference Library, World & US Atlas,Game Pack, Secret Weapons of the Luftwaffe $79
Power Tools A great shareware library $25
Family Doctor answers to 1000+ questions $66
Game Pak II 10 games incl. Chessmaster 3000 $19
The Lord of the Rings A great new game $45
Languages of the World 12 language translations $32
Mayo Clinic medical ailments reference $39
US Atlas w/ auto map intelligent road atlas $20
CIA World Trade 268 CIA country profiles $22

OPTICAL DRIVES

	Bare	Kit
Kit is 16Bit Card & 1 disk	Bare	Kit
128MB Fujitsu	$725	$879
1.3Gig Hewlett Packard	$2499	$2759
1.3Gig Maxoptix	$2699	$2959
Networking Special Media	5	
128MB / 650MB	$42/$109	$38/$95

Many other brands and types in stock.

TAPE DRIVES

CONNER

250MB QIC-80 tape drives includes software & tape — Alone w/drive

Internal 3.5 or 5.25 bay		$158	$139
External for printer port		$325	$315

SCSI Tape Drives

Kit is 16Bit card & 1 tape	Bare	Kit
850MB Teac MT01	$449	$639
250-1/4Gig Exabyte 2501	$549	$739
2Gig HP 35470	$799	$969
2Gig HP 35470	$929	$1049
2.5Gig Exabyte 8205	$1449	$1699
4-8Gig Conner 4324	$1119	$1329
4-8Gig HP 35480	$1059	$1279
4-16Gig Sony SDT5000	$1199	$1429
5-10Gig Exabyte 8505	$2239	$2519

REMOVEABLE DRIVES

Syquest	Bare	Kit
44/88MB 20ms SQ5110C	$329	$439

Syquest Media Best Price in this mag!

TEAC Alone w/HD

Floppy 1.4 (1.2 x 89)	$45 $42
Floppy Drives 1.2 & 1.4	$124 $117

Removable Hard Disk Drive Kits
Very high quality removable drive
17ms IDE drive with docking bay
250MB $309 360MB $379

DRIVE ACCESSORIES

SCSI Drive enclosures
3.5" vertical $99
Half Height $89
Full Height / Dual Half Height $139
Dual Full Height / Four Half Height $329
Four Full Height / Eight Half Height $549
Removable drive brackets, turns any 3.5" hard drive into removable IDE / SCSI $69/$119

PCMCIA

Maxtor 105MB, 19ms hard drive $459
PCMCIA to SCSI adapter $319
Desktop Docking Module! Mounts in 5 1/4" drive bay. Allows you to use any PCMCIA in your desktop $249

MEMORY

	Alone	w/HD
1x3-70ns (60ns + $3)	$80	$61
1x9-70ns (60ns + $4)	$60	$56
4x9-70ns (60ns + $5)	$169	$189

VISA MasterCard DISCOVER AMERICAN EXPRESS

1-800-786-1187

Ad. Code # CA41 — Sales Hours (Central Standard Time)
8am - 7pm Monday thru Friday — 9am - 3pm Saturday
FAX (713) 333-3024 — Local (713) 333-1910
We sell within the United States, its territories, and Canada (sorry no international orders)

Circle 105 on reader service card.

MEGAHAUS HARD DRIVES
1110 NASA Rd 1 #306
Houston, Texas 77058

NO SURCHARGE
We accept Fortune 500 & Government bids & PO's.
We check for COD and Credit Card fraud!

Prices & specifications subject to change without notice. Shipping charges are additional. Returns must be in new condition and in original packaging. Delayed items may not be returnable. No refunds on software or special orders after 30 days. Defective items must be returned with a copy of the dated invoice and original proof of their respective companies. Personal checks held for clearance. We reserve the right to refuse any sale for any reason ©1993

BE CHOOSY!

Quantex gives you the choicest features at the choicest prices.

Some companies offer you plenty of features that wind up costing you plenty of money. Others lure you with low prices—for little more than a keyboard, a monitor, and a box. At Quantex, it's never one or the other. Quantex is dedicated to providing complete systems that are loaded with the latest technology, like our Multimedia Systems and Pentium™ Performers. With high quality and low prices, Quantex is the best value around. But you don't have to take our word for it. Go ahead and compare. You'll find that with Quantex, you can afford to be choosy.

"If you need a fast Windows platform, the Quantex has strong performance numbers."

COMPUTER SHOPPER
October, 1993

"★★★★"
PCComputing
August, 1993

VESA accelerator
Fax Modem card
CD-ROM drive
16-bit Audio Card

intel inside

QUANTEX
Microsystems, Inc.

Multimedia

It's Time for Multimedia.

Your eyes and ears are in for a real treat. And so is your pocketbook.

Whether it's for educational, business or entertainment purposes, Quantex has the multimedia package you need at the price you want.

Now Hear This.

All multimedia are not created equal. Quantex has taken a step beyond conventional multimedia by advancing to MPC™ Level 2 standards.

This means crisper, true 16-bit digital sound quality and assured audio compatibility with Adlib™, Sound Blaster™, and Microsoft Windows Sound System™.

And, Quantex offers a high performance double-spin multi-session CD-ROM drive that exceeds MPC Level 2 standards with a data transfer rate of over 300KB/sec and a burst rate of up to 2.1MB/sec. For added convenience and protection, the CD-ROM drive also features caddyless loading and dust proof cover. This way, you don't have to risk damaging your discs while fussing with loading trays.

More speed. More memory. More power. Combined with lightning-fast VL-Bus video with 16.7 million colors and digital ready speakers, Quantex gives you everything you can expect from a multimedia system. And more.

Photo CD. New Age Memories.

Imagine playing back your fondest memories at the touch of a button. Now, imagine being able to browse, cut, paste, rotate and crop your memories.

With the Kodak™ photo CD software, you can. The Quantex Multimedia System is fully multi-session photo-CD compatible, including everything you need to start

QUANTEX
Microsystems, Inc.

Two Tower Center Blvd., East Brunswick, NJ 08816, Tel: (908) 563-4166, Fax: (908) 563-0407

Excite Your Senses!

your photo collection—the new age way.

Five CD-Disks with Over Twenty Titles. Included with Every System.

Ever wonder why penguins can't fly? Want to know all the facts about the Persian War? Or the stock market? How about having the famous Berenstain Bears right in your living room counting along with your children?

You can have it all, and more with the five CD-ROM disks included free with every Quantex Multimedia System. This adds up to over 20 CD titles, including an array of educational, entertaining and practical programs:

Compton's Interactive Encyclopedia, 26 volumes of information packed into one CD-ROM disc! That's not all. You also get Webster's Dictionary, Thesaurus and World Atlas, with illustrations, guides and more.

Compton's Family Choice, a medley of 15 programs that combine learning with fun. Perfect for all ages.

Dictionary of the Living World, anything in a zoo, jungle or petri dish is in this collection of terms and definitions complete with illustrations and animation.

USA Today: The 90's Volume I, a compilation of articles that recap the major events of the 90's as they appeared in USA Today with pictures, charts and graphs.

Kodak Photo-CD Access Software & Photo Sampler, a personal "photo-finishing" studio to bring back the smiles, when you are.

Satisfaction Guaranteed.

Talk about complete. Not only does Quantex provide quality multimedia systems to suit all your needs, but we also provide a quality service package that's sure to win your satisfaction. What you get is a 30-day money back guarantee, no questions asked. And, we're so confident about the quality of our systems that we've implemented our one-year Free Parts and Labor program and one-year On-Site Service warranty. So in the unlikely event that a problem occurs, we'll fix it free. With our lifetime toll-free technical support, we're here for you—for life.

intel inside

Multimedia VESA Systems

Q486SX/33MM-1 $1395

- **Double-spin CD-ROM Drive, multi-session Kodak™ Photo CD & XA ready**
- **True 16-bit SoundBlaster™ compatible audio card**
- **Digital amplified stereo speakers**
- **Five CD-ROM discs w/ over 20 titles**
- **Upgradable to OverDrive™ CPU based on Intel Pentium™ architecture**
- Intel 486™SX-33MHz CPU
- 4MB RAM expandable to 32MB
- 255MB 12ms IDE Hard Drive
- 32-bit VLB video card w/ 1MB
- 14" 1024x768 non-interlaced color monitor with 0.28mm dot pitch
- 1.44MB floppy drive
- 2 serial, 1 parallel, 1 game port
- 101 Key enhanced keyboard
- 5-bay desktop case
- Microsoft DOS 6.2/Mouse
- Windows for Workgroups 3.11
- ***420MB Hard Drive - add $79***

Q486DX/33MM-1 $1575
Q486DX2/50MM-1 $1595
Q486DX2/66MM-1 $1695

Q486DX2/50MM-2 $1795

- **Double-spin CD-ROM Drive, multi-session Kodak™ Photo CD & XA ready**
- **True 16-bit SoundBlaster compatible audio card**
- **Digital amplified stereo speakers**
- **Five CD-ROM discs w/ over 20 titles**
- **Upgradable to OverDrive™ CPU based on Intel Pentium™ architecture**
- Intel 486™DX2-50MHz CPU
- 8MB RAM expandable to 32MB
- 128K ultra-fast cache
- 420MB 12ms IDE Hard Drive
- 32-bit VLB IDE Controller
- 32-bit VLB video card w/ 1MB
- 14" 1024x768 non-interlaced color monitor with 0.28mm dot pitch
- 1.44MB floppy drive
- 2 serial, 1 parallel, 1 game port
- 101 Key enhanced keyboard
- 11-bay tower case
- Microsoft DOS 6.2/Mouse
- Windows for Workgroups 3.11

Q486DX/33MM-2 $1775
Q486DX2/66MM-2 $1895
Q486DX4/100MM-2 $2145

1-800-787-8686

Pentium Performers

The next generation of PCs is here, and no one makes it easier to go Pentium than Quantex. In fact, Quantex is offering the unsurpassed power of Pentium starting at an unbeatable price. But don't let that fool you. High speed and high performance are what Quantex Pentium is all about.

What Do You Get?

Amazing speed. The Pentium processor features a 64-bit bus and burst mode that transfer twice as much data in half the time.

Optimal efficiency. Pentium's superscalar technology executes two instructions per clock cycle. And, because the dual pipelines are divided into stages, several instructions can be processed simultaneously.

Superior Performance. The Pentium processor has a built-in cache so it never has to look far for the instructions you need most. Plus, Pentium's branch prediction feature prepares the proper set of instructions—before you execute them!

Pure Power. The Pentium processor is designed with a high-performance floating point unit on chip. This means that even the most complicated mathematical calculations can be processed five times faster than the DX2/66 chip! Now, even CAD and 3D graphics are a cinch to handle.

Subtle Satisfaction. From owning the most advanced system at the best price around.

Maximum Pentium Guaranteed

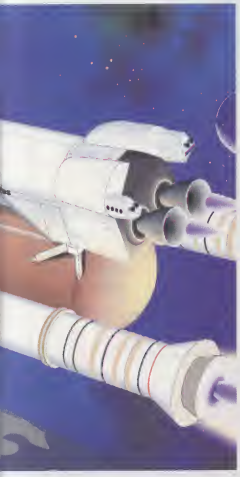
Guess what. Some companies actually offer Pentium without systems that fully support its wide range of capabilities.

But Quantex Pentium means maximum Pentium performance. Quantex Pentium supports all the features of the Pentium processor, including the full processor speed of 60MHz and its internal cache in

QUANTEX
Microsystems, Inc.

Two Tower Center Blvd., East Brunswick, NJ 08816, Tel. (908) 563-4166, Fax: (908) 563-0407

Quantex puts the power in your hands and the saving in your pocket



write-through or write back mode. And, Quantex will throw in an extra 256KB Secondary Cache Memory to give you an even faster computing session.

Complete Compatibility

Even with exciting new technology at your fingertips, you don't have to leave your favorite software behind. While the Quantex Pentium is built for the future, it retains compatibility with over 50,000 existing software applications. In addition, the Quantex Pentium supports all of today's operating systems, including MS DOS, UNIX, Windows NT, OS/2 and NEXTstep. So, pick and choose as you wish—it's compatible!

Nothing Less than Dual PCI

Quantex knows that a fast processor needs fast I/O. That's why we've built our Pentium machines with dual PCI.. Developed by Intel, PCI more than enhances the video performance. PCI also brings 32-bit local bus speed and "plug-and-play" convenience to other PCI peripherals.

So, in addition to PCI video, Quantex is also giving you a 32-bit PCI enhanced IDE controller. Capable of supporting up to 8.4G, it speeds up data transfer to your hard drive as well as to three additional drives. This way, you get 32-bit access to all your software.

A Warranty Package to Match

An advanced machine deserves an advanced service package. We at Quantex are so sure of the quality of our systems that we offer a 30-day money-back guarantee.

If on the off chance a problem should arise with your computer, Quantex will go to extremes to fix it. That includes giving you free parts and labor and on-site service during the first year. What's more, Quantex will be there for you always, with toll-free technical support for as long as you own your Quantex Pentium. Great system. Great service. Great value.

VISA MasterCard DISCOVER AMERICAN EXPRESS

Quantex accepts prepaid checks, Visa, MasterCard, Discover, and Amex. Purchase orders from government agencies, universities, and Fortune 1000 companies also accepted. On-Site Service may not be available in certain remote areas. All returned items must have a Return Merchandise Authorization (RMA) number and must be in original packaging. The cost for returned freight is not included with any Money-Back Guarantees; shipping charges are non-refundible. Prices and product descriptions subject to change without notice. Quantex Microsystems cannot be responsible for errors in typography or photography. Intel, Pentium, OverDrive, and the Intel Inside Logo are trademarks of Intel Corporation in the USA and other countries. Some of the names or trademarks shown herein may be the property of other companies. Screen image simulated.

Pentium™ PCI Performers

QP5-1 $2295

- **Intel Pentium™ 60MHz Processor**
- **32-bit PCI-Bus Enhanced IDE Controller**
- **32-bit PCI-Bus Paradise "RocketChip" graphics accelerator card with 1MB RAM; expandable to 2MB**
- **Three 32-bit PCI expansion slots**
- 8MB RAM, expandable to 96MB
- 256KB of direct mapped secondary cache
- 420MB Western Digital™ hard drive with 12ms access & 128KB 'Cache Flow Buffer'
- 14' 1024x768 non-interlaced color monitor with 0.28mm dot pitch
- 1.44MB floppy drive
- Double-spin CD-ROM Drive, multi-session Kodak™ Photo CD & XA ready
- 2 serial & 1 parallel port
- 11-bay tower case
- 101 Key enhanced keyboard
- High resolution mouse
- Microsoft DOS 6.2
- Windows for Workgroups 3.11
- One year free on-site service
- Unlimited toll-free technical support
- 30 day money-back satisfaction guarantee

QP5-2 $2495

- **Intel Pentium™ 60MHz Processor**
- **32-bit PCI-Bus Enhanced IDE Controller**
- **32-bit PCI-Bus Paradise "RocketChip" graphics accelerator card with 1MB RAM; expandable to 2MB**
- **Three 32-bit PCI expansion slots**
- 8MB RAM, expandable to 96MB
- 256KB of direct mapped secondary cache
- 540MB Western DigitalTM hard drive with 11ms access & 128KB 'Cache Flow Buffer'
- 15' flat screen non-interlaced color monitor
- 1.44MB floppy drive
- Double-spin CD-ROM Drive, multi-session Kodak™ Photo CD & XA ready
- 2 serial & 1 parallel port
- 11-bay tower case
- 101 Key enhanced keyboard
- High resolution mouse
- Microsoft DOS 6.2
- Windows for Workgroups 3.11
- One year free on-site service
- Unlimited toll-free technical support
- 30 day money-back satisfaction warantee
- ***17" monitor - add $299***

intel inside pentium processor

Caviar

PARADISE FOUND HERE Paradise

1-800-787-8686

BEST PRICES IN TOWN • (800) 831-8808

CALL FOR UPDATED PRICES

DEE ONE SYSTEMS MONTHLY SPECIALS

SUPER SALE	MOTHER BOARD WITH CPU	* BASIC SYSTEM	BASIC SYSTEM + 120MB HDD + 14" MONO & MDP CARD	BASIC SYSTEM + 120MB HDD + VGA CLUD + VGA MONO MONITOR	BASIC SYSTEM + 120MB HDD + SVGA CARD + SVGA COLOR MONITOR	BASIC SYS W/ 1GB RAM 1.2 & 1.44 FDD +120MB HDD + SVGA CARD + SVGA COLOR MONITOR	BASIC SYS W/ 1GB RAM 1.2 & 1.44 FDD +340MB HDD + SVGA CARD + SVGA COLOR MONITOR	BASIC SYS W/ 1GB RAM 1.2 & 1.44 FDD +540MB HDD + SVGA CARD + SVGA COLOR MONITOR
			(256KB RAM) ADD $50	(256KB RAM) ADD $50	(256KB RAM) ADD $50	(1MB RAM) ADD $150	(2MB RAM) ADD $250	(4MB RAM) ADD $170
486SLC2-66/64C VLB	$256	$428	$666	$716	$806	$906	$1,016	$1,086
486SLC2-50/64C VLB	228	368	626	676	766	826	976	1,046
486DX2-66C VLB	456	618	856	906	996	1,156	1,266	1,276
486DX-50C VLB	408	578	818	866	956	1,116	1,166	1,238
486DX2-50C VLB	388	478	786	786	856	1,016	1,066	1,138
486DX-33C VLB	288	456	666	746	836	986	1,046	1,116
486DLC-40/128C VLB	188	336	576	626	716	870	926	996
486DX2-80/128C NICE EISA VLB	668	838	1,676	1,126	1,216	1,376	1,426	1,496
486DX-50/128C NICE EISA VLB	636	798	1,036	1,086	1,176	1,336	1,386	1,456
486DX2-50/128C NICE EISA VLB	478	628	886	916	1,006	1,166	1,216	1,286
486DX-33/128C NICE EISA VLB	466	630	876	926	1,016	1,176	1,226	1,286
486DX2-66C IDA	436	608	846	896	986	1,146	1,196	1,266
486DX-50C IDA	384	564	802	852	942	1,102	1,152	1,222
486DX2-50C IDA	368	478	716	766	856	1,016	1,066	1,138
486DX-40C IDA	268	468	706	756	846	1,006	1,056	1,126
486DX-33C IDA	288	456	666	746	836	986	1,046	1,116
486SX-33C IDA	154	318	556	606	696	856	906	976
486SX-25C IDA	132	284	532	582	672	832	882	952
486DLC-40/64C IDA	144	384	542	582	662	842	882	662
386DX-40/64C	96	266	488	548	636	768	846	818
386SX-40	72	234	472	522	612	772	822	882
386SX-33	64	228	466	518	608	768	818	888

BEST PRICES IN THE WORLD

- 4MB RAM INSTALLED
- 120MB HARD DRIVE
- 1.44 FLOPPY DRIVE
- 1 SERIAL / 1 PARALLEL
- BUILT-IN TRACKBALL
- BATTERY PACK
- CARRYING CASE
- IBM PC DOS 6.1

Besl Buy	VGA Mono	Dual Scan Color	Active Matrix Color
486SX-25	$1,325	$2,015	$2,785
486SX-33	1,365	2,075	2,835
486DX-33	1,475	2,165	2,985
486DX2-50	1,475	2,175	2,995
486DX2-66	1,675	2,375	3,195

OPTIONS

- Upgrade to 8MB RAM.....Add $268
- 200MB Hard Drive.....Add $128
- 340MB Hard Drive.....Add $328
- Internal Battery Pak.....Add $94
- Internal Fax Modem.....Add $128
- Pocket Fax Modem.....Add $118
- Docking Station.....Add $368
- Please Call For PCMCIA Slot Model

***BASIC SYSTEM CONFIGURATION:** Motherboard & CPU, 1MB memory, IDE 2HD/2FD controller w/2S/1P/1G, 1.2MB or 1.44MB Floppy Drive, Internal Clock/Calendar, Enhanced Case with Power Supply, and 101-Key Enhanced Keyboard.

LOCAL BUS
Pentium P5-60 / P5-66 ..$1,948 / 2,248
486DX2-66 / DX-50 .....$1,278 / 1,248
STOP
486DX2-50 / DX-33 .....$1,088 / 1,068
486SLC2-56 / SLC2-50.....$1,038 / 998

- Local Bus Motherboard
- Local Bus SVGA Card w/1MB
- 64K External Cache
- 120MB IDE Hard Drive
- 4MB RAM
- 1.2MB Floppy Drive
- 1.44MB Floppy Drives
- 101-Key Enhanced Keyboard
- 14" SVGA Monitor (.28DPI)
- VL-B IDE 2HD/2FD Controller
- 2S/1P/1G Port
- Desktop or Mini Tower Case w/PS

NEW HARD DRIVES

120mb 15ms (IDE)	$152
130mb 15ms / 170mb17ms (IDE)	174 / 184
212mb 16ms / 250mb14ms(IDE)	194 / 214
340mb 15ms / 540mb12ms (IDE)	258 / 428
200mb 18ms (SCSI)	244
340mb 13ms (SCSI)	348
540mb 12ms (SCSI)	484
1.2GB 13ms (SCSI)	648
2.0GB 13ms (SCSI)	1,128

MATH COPROCESSORS

8028/-10	$40
387SX-33 / 25	48 / 46
387DX-40 / 33	52 / 50

PRINTERS

Citizen GSX-130 (9-Pin)	$158
Citizen GSX-220 / 230 (24-Pin)	188 / 248
Citizen GSX-240 / 145 (24-Pin)	298 / 378
Color Option for Citizen Printer	46 / 66
Panasonic KX-P1150 / 2023	138 / 198
Panasonic KX-P2123 / 2124	238 / 316
Panasonic KX-P1624 / 2624	376 / 396

KEYBOARDS

101 Enhanced Keyboard (Mitsumi)	$56
Maxiswitch / Keytronics	28 / 30
MaxiPro II (124 Key Programmable)	54
Fellowes 2000 / 2000 w/ Track-ball	35 / 55
Focus 8086 (w/Calculator) / 9000	44 / 58
Omnikey 101N1 / 102 / Ultra	68 / 68 / 96

VIDEO CARDS AND MONITORS

VGA-256K / 512K	$28 / 38
1MB SVGA Card (1024*768*256)	58
Windows Accelerators w/1MB	60
Trident / Cirrus Logic w/1MB (VLB)	74 / 74
Genoa 8500 VLB w/1MB	98
ATI Graphic Ultra w/Mouse	152
ATI Graphic Ultra Plus w/2MB	226
ATI Ultra Pro w/2MB (ISA / VLB)	314 / 324
ATI Ultra Pro w/2MB (EISA / PCI)	348 / 368
Diamond Speed Star Pro VLB / ISA	104
Diamond Stealth 24VLB w/1MB	144
Diamond Viper w/2MB (VLB / PCI)	358 / 408
Orchid Fahrenheit 1280+ w/1MB	138
Orchid Fahrenheit VLB w/1MB	140
Orchid Celsius VLB: 1MB / 2MB	200 / 294
MAG 15F (15") / 17F (17")	488 / 868
Nanao F340lw / F560lw	598 / 1,068
Nanao 7500i / F56w	1,648 / 1,348
NEC 3V / 4FGe / 5FGe	548 / 876 / 1,064
Sony 1430 / 1604 / 1730	548 / 928 / 958
Viewsonic 4E / 5E / 14E	264 / 344
Viewsonic 15E / 15	368 / 448
Viewsonic 17G / 17 / 20	798 / 958 / 1,538
Hitachi CM-2095 (20")	1,294
14" Mono	80
14" VGA Mono	100
14" Super VGA (1024*768, 0.39)	190
14" Super VGA (1024*768, 0.28)	218
14" Super VGA (1024*768, 0.28) NI	238
15" Super VGA (1280*1024, 0.28)	330
17" Super VGA (1280*1024, 0.28)	594

CD ROM / MULTIMEDIA

Creative Sound Blaster Pro Deluxe	98
Mediavision Jazz 16	108
Mediavision Pro Audio Spectrum 16	136
Mitsumi or SONY CD-ROM w/Card	138
Mitsumi Double Speed CD-ROM w/card	176
Panasonic CD-562 Dbl. Speed w/card	186
Sony Double Speed CD-ROM w/card	166
Qhnon CDS535 (SCSI) Internal	318
Toshiba XM-3401B 200ms (SCSI)	338
Trantor (SCSI) Host with Driver	50
Creative Edutainment CD16 Upgrade Kit	466
Speakers System	10

HARD/FLOPPY DRIVE ADAPTERS

IDE 2FD/2HD Cache Controller (OK)	$88
Vesa Local Bus IDE	26
Adaptec SCSI 1542CF / 1542CFK	178 / 235
Adaptec SCSI 2842 (EISA VLB)	278
Bustek SCSI 445S (VLB) / 742K (EISA)	260

MISCELLANEOUS

2400 Modem	28
Fax Modem (9600 Fax, 2400 Modem)	40
Fax Modem (14,400 Fax, 14,400 Modem)	108
US Robotics 14,400 FM Int / Ext	150 / 168
3-Button Mouse	10
Logitech Mouseman Serial / Bus	50 / 62
Microsoft Mouse Serial / Bus	36 / 58
Corner Tape Backup 250MB (w/Tape)	144
Colorado Tape Backup 340-700	199
Colorado Trakker JT-20 (250MB) Ext	338
16 Bit Ethernet Card Coax/10 Base T	42

Dee One Systems

To Order Call

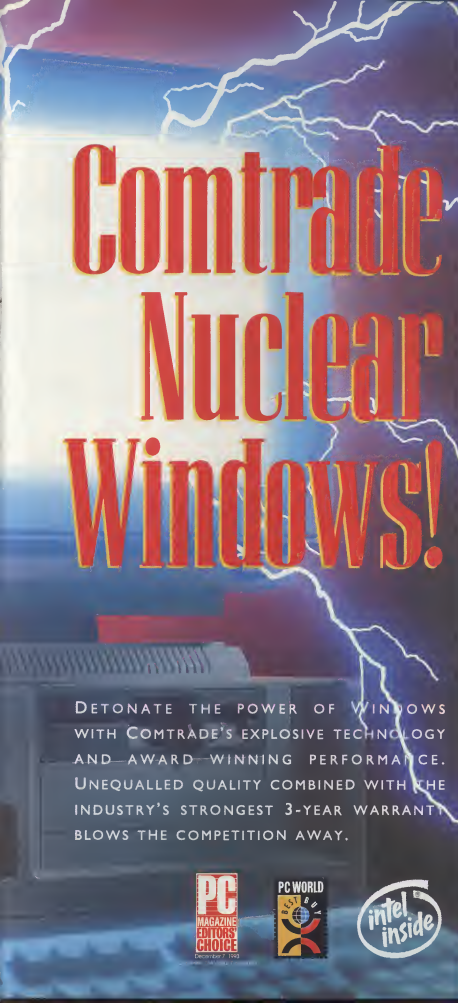
800-831-8808

Inside California or International: 408-262-8828
Service: 408-956-8285 Fax: 408-262-2828
1550 Centre Pointe Dr. Milpitas, CA 95035
Hours: M-F 8am-6pm Sat 10am-4pm (PST)

- One year warranty/parts & labor for systems
- Knowledgable Technical Support Engineers in service
- 30 days money back guarantee only upon IBM incompatibility reasons
- Prices & availability subject to change w/o notice
- 15% restocking fee on all return items within 30 days. No returns after 30 days
- Shipping , insurance & COD charges are extra & non-refundable
- Not responsible for typos

VISA MasterCard

No Surcharge on Credit Card Orders.



Comtrade Nuclear Windows!

DETONATE THE POWER OF WINDOWS WITH COMTRADE'S EXPLOSIVE TECHNOLOGY AND AWARD WINNING PERFORMANCE. UNEQUALLED QUALITY COMBINED WITH THE INDUSTRY'S STRONGEST 3-YEAR WARRANTY BLOWS THE COMPETITION AWAY.

PC MAGAZINE EDITORS' CHOICE December 7 1993

PC WORLD BEST BUY

intel inside

EISA/PCI WinMax

- Hottest 486 EISA or 64 Bit Pentium™ PCI Systems
- OverDrive Socket for Pentium™ PCI Technology
- 256K Ultra Fast Cache SRAM
- 8MB RAM & Expandable to 264MB
- Double Speed CD-ROM Drive
- One Floppy Drive (3.5" or 5.25")
- VL-Bus / PCI Local Bus IDE Hard Disk Controller
- 425MB 12ms IDE Drive with 128K Cache
- VL-Bus / PCI ThunderPro Graphics Accelerator with 1MB RAM* (Up to 1280x1024 & up to 16.7 million Colors)
- 15" Flat Screen 28mm Non-interlaced Color Monitor (36% larger edge to edge display)
- 2 Serial, 1 Parallel & 1 Game Ports
- Enhanced 101-key Keyboard & Serial Mouse
- Anti-Virus MS-DOS 6.2 & Windows 3.1
- Three-Year System & Labor Warranty

486/66 DX2 $2075

P5/60 *PCI* $2625

- MidasVision Spectrum 16-bit Sound Card Add $130
- 14,400 Baud FaxModem & Fax Software Add $120
- Diamond Stealth 32 (2MB), faster than Viper Add $125

VESA Local Bus BEST BUY

- OverDrive Socket for Pentium™ PCI/VL Technology
- 128K Cache SRAM & Expandable to 256K
- 8MB RAM & Expandable to 64MB
- One Floppy Drive (3.5" or 5.25")
- 32-Bit VL-Bus IDE Hard Disk Controller
- 425MB 12ms IDE Drive with 128K Cache
- 32-Bit VL-Bus ThunderPro Graphics Accelerator with 1MB RAM (Up to 1280x1024 & up to 16.7 million Colors)
- (Up to 38 Million Winmark 3.11)
- 15" Flat Screen 28mm Non-interlaced Color Monitor (36% larger edge to edge display)
- 2 Serial, 1 Parallel & 1 Game Ports
- Enhanced 101-key Keyboard
- Hi-Resolution 400 DPI Serial Mouse
- Anti-Virus MS-DOS 6.2 & Windows 3.11
- Three-Year System & Labor Warranty

486/66 DX2 $1825

486/100 DX4 $2125

- Double Speed CD-ROM Drive ADd $170
- 17" Flat Screen 1280x0124 Monitor Add $350
- Upgrade VL-Bus to PCI System Add $120

1.800.969.2125

International 818.961.6688
Fax 818.369.1479

Hours: 7:00-7:00 Pacific Mon-Sat
15314 East Valley Boulevard
City of Industry, California 91746

COMTRADE

"Where Quality is Everything"

Purchase order from Fortune 1000 companies, governments and institutions subject to approval. Prices are subject to change without notice. Shipping & express software are non-refundable. 30-day money back guarantee applies to Comtrade system only. Three year warranty applies to Comtrade manufactured components only. 18 months warranty on mouse & hard drive. The Intel Inside Logo, Pentium, and OverDrive are trademarks of Intel Corporation.

Circle 147 on reader service card.

WE WILL TRY TO MATCH OR BEAT ANY ADVERTISED PRICE. CALL FOR LATEST PRICING!!

M E M O R Y

WE ACCEPT PO'S FROM QUALIFIED FIRMS

NO SURCHARGE FOR MC, VISA AE & DISCOVER

CACHE MEMORY

	128S	256S	512S	256/S	512/S
8Kx8	---	6.00	8.00	7.00	9.00
32Kx8	28.00	5.00	7.00	6.00	8.00
64Kx4	---	7.00	9.00	8.00	10.00
64Kx8	---	11.00	13.00	12.00	14.00
128x8	---	---	8.00	7.00	9.00
256x8	---	---	---	48.00	50.00

Individual D-RAM Chips / INTEL Math Chips

MEMORY FOR 80-BARE CHIPS				
	64K/8	256K/8	512K/8	1024K/8
14Mhz/1	7.95	6.75	4.75	4.95
14Mhz/4	35.00	25.00	27.00	---
16Mhz/1	27.00	25.00	23.00	---
16Mhz/4	---	---	---	---
256 x 4	---	11.95	10.95	---
1Kx9/x1 (2up)	---	---	---	---
2Kx8	7.95	6.95	---	---
2Kx 4/1	3.00	2.75	2.50	2.25
2Kx4 HYB/AA---	39.00	35.00	---	---
64x4	---	2.25	---	---
64x1	---	---	2.00	2/$4

	80387	80387-20	80387-33
Addm Pentium 60	4/5/18 Meg		CALL
Addm Eval Kit	4/5/18 Meg		CALL
Atmas Sprites 286 Hunk 386SX	2/8 Meg KIT		
Enterprise 386 Sim			
Addm Sprnte Hunk & Enterprise 486	4/16 Meg KIT		
Addm MC 486SL	2/4/8 Meg		189
Addm S Series	4/8/12/16 Meg		189
Addm 3M Series	4/16 Meg		189

	80387-16	80387-20	80387-33
80387 DX (Does AA)	79.00		
80487 DX (Does AA)	249.00	309.00	329.00
Intel SX (Does AA)	79.00		
Intel DX (Does AA)	79.00		
Intel 168pin	40.00		
Intel 208X	54.00		

AMBRA

CYRIX DRx² 386 to 486 Upgrade

Clock Doubler

* Single chip upgrade solution
* Clock doubling technology
* Compatible with industry standard 386DX CPU socket
* Compatible with DOS, Windows, 3.X, OS/2 & UNIX
* Uses industry standard math chip
* Fully tested & burned-in

The Cyrix Upgrade runs at twice the speed of your original 386 microprocessor combined with a 1K internal cache you will enjoy a performance boost of 100% and more. Ideal for any DOS, Windows or OS/2 application which requires a large amount of microprocessor horsepower

CX486 DRx²-16/32	239.00
CX486 DRx²-20/40	299.00
CX486 DRx²-25/50	CALL
CX486 DRX²-33/66	CALL
CX486 SRX2 16/32	249.00
CX486 SRX2 20/40	249.00
CX486 SRX2 25/50	279.00

SIMM MODULES (Add $5.00 for SIPP)

	4MNS	4MS	8MNS	8MS	16MNS	16MS
1Meg x 9 (3 chips)	29.00	32.00	39.00	42.00	78.00	84.00
1Meg x 36 (4MB)	---	---	158.00	159.00	148.00	---
4Meg x 9	---	---	---	168.00	159.00	---
1Meg x 9 (36 chip)	---	---	---	---	---	---
1Meg x 36 (9MB)	---	---	---	---	---	---

72 PIN SIMMS (EISA)

256 x 36 16Meg		99.00	---
512 x 36 (8Meg)		82.00	84.00
1 x 36 (4Meg)	149.00	89.00	92.00
1 x 36 4Meg (w/p 1M)	159.00	99.00	102.00
2 x 36 (8Meg) (w/p 1M)	359.00	249.00	249.00
4 x 36 (16Meg)	649.00	499.00	499.00
8 x 36 32Meg	1549.00	1,099.00	---
16 x 36 64Meg	3,099.00	---	---

CYRIX FASMATH PROCESSOR

Programs to succeed up to 3X faster • Plug & closed core compat. w/486 83D87-40MHz - 40 MHz 83D87-33MHz - 33 MHz 83D87-25 - 25MHz 83D87-20SX Vr ... 89.00
83D87-35SX - 92.00 PC Week" rated #1 over all math coprocessors
Any Manufacturer "All Chipsets Supported"

AST MEMORY

MODEL	AMT. UPGRADED	AST PART #	PRICE
Rampage 4/8/16 4/32 4/32 4/64 4/64	4Meg	4/4MS	149.00
	8Meg	8/8MS	299.00
	16Meg	8/16MS	419.00
	32Meg	8/32MS	819.00
	64Meg	8/64MS	1599.00

MODEL	AMT. UPGRADED	AST PART #	PRICE
Premium 486/25, 25, 33, 33E	4Meg	4/4MS	149.00
Premium 486/25, 25, 33, 33E	8Meg	8/8MS	299.00
Premium 386/25, 33, 33E, 386/25E	4Meg	4/4MS	149.00
Premium 386/25, 33, 33E, 386/25E	8Meg	8/8MS	299.00
Premium 386/25, 33, 33E, 386/25E	16Meg	8/16MS	419.00
Premium 386/25, 33, 33E, 386/25E	32Meg	8/32MS	819.00
Premium 386/25, 33, 33E, 386/25E	64Meg	8/64MS	1599.00
Bravo LX 386/25 25	4Meg	4/4MS	149.00
Bravo LX 386/25 25	8Meg	8/8MS	299.00
Bravo LX 386/25 25	16Meg	8/16MS	419.00
Bravo LX 386/25 25	32Meg	8/32MS	819.00
Bravo LX 386/25 25	64Meg	8/64MS	1599.00
Prelude 433S, 433D, 433E, 433C	4Meg	4/4MS	149.00
Prelude 433S, 433D, 433E, 433C	8Meg	8/8MS	299.00
Prelude 433S, 433D, 433E, 433C	16Meg	8/16MS	419.00
Prelude 433S, 433D, 433E, 433C	32Meg	8/32MS	819.00
Prelude 433S, 433D, 433E, 433C	64Meg	8/64MS	1599.00
Prelude 433S, 433D, 433E, 433C	128Meg	8/128MS	3199.00
Prelude 433S, 433D, 433E, 433C	256Meg	8/256MS	6399.00
Prelude 433S, 433D, 433E, 433C	512Meg	8/512MS	12799.00

ZENITH MEMORY MODULES

MODEL	AMT. UPGRADED	AST PART #	PRICE
Z-386/20, 25, 33, 33E	4Meg	ZA4MS	149.00
Z-386/20, 25, 33, 33E, 486/25E	8Meg	ZA8MS	299.00
Z-386SX	16Meg	ZA16MS	419.00

MAGNAVOX

Z-386/20/25/33E, 386SX/16, 20, 486SX/20 & 25, 386/20 and 25 with ZAPEM SIMM
4MEG = $149.00 8MEG = $299.00 16MEG = $419.00 32MEG = $819.00

MEMORY BOARDS

IBM Compatibles @ PS/2

BOCA AT PLUS

16 BIT MEMORY BD. FOR 286, 386 AT • 0K-16Meg Bd. • 0 LIM Compat. – Rev 3.2 • No Wait-States • Parity • Expand, Disable Memory • Supports DOS, OS/2, UNIX, XENIX • Versatile Split Memory Addressing • Operates w/CPU Speeds to 33 MHz • Supports Dimensions' Multitask construction • 64 masks per Base Resolution, 4 of four

0K - $34.00	256Kp - $150.00	4Meg - $239.00	8Meg - $439.00

BOCA XT 8 BIT BUS

• Expanded memory up to 4 • Lim 4.0 compat. • 0-4Meg • Uses 256K1-100

0K - $69.00	1Meg (9 Bit) - $219.00

IBM P/S2 328IT EXPANSION BD.

0-2Meg, Set-Expand. Memory Bd. for P/S-70,72, 80, 25, Lum 4.0

0Meg	1Meg	2Meg	4Meg	8Meg
$139.00	$239.00	$319.00	$499.00	$899.00	$1099.00	CALL

PS/2 MCA 0-8MEG EXPANSION BD.

D-8Meg, Extended, and/or Exp. extend Memory Bd. of IBM PS/2 Mod. 50, 50Z, 55, 55SX, 65SX, 70, 80 • 4/0 LIM Compat.

DK - 119.00	2Meg - 199.00	4Meg - 299.00	8Meg - 439.00

IBM PS/1, PS/2 MEMORY MODULES

IBM PART NO.	WORKS WITH MODEL NO	PRICE
90X7385 (1Meg)	55SX	79.00
90X7386 (4Meg)	55, 56, 25-286, 30 MT/HR 80	149.00
64G3275 (1Meg)	80-041	79.00
64G3276 (1Meg)	80-071, 081, 121, 311	79.00
64G1260 (4Meg)	80-A21, A31, B21, C31, D31, E31	149.00
64G9634 (2Meg)	80-A21, A31, B21, C31, D31, E31, 90XL, 90XP, 90XD, 95XP, 95XD	89.00
64G0008 (2Meg)	70-A21, A61-E, B21-E, 001, 002E, 002L, 013E, W13L, W, P, 025T	SOLD
64G3277 (4Meg)	80-A21, A31, B21, C31, D31, E31	149.00
34F2553 (4Meg)	95XP, 95XD, 90XP, 90XD, 55SL, 65SX	149.00
87F8877 (4Meg)	55SX, 56SX, P50, 40SX, 350S, 35SLC	149.00
87F8878 (8Meg)	55SX	249.00
87F8879 (16Meg)	55SX	449.00
87F8884 (4Meg)	P70 S FIS P/N 33F8884	149.00
87F8885 (8Meg)	P70 S FIS P/N 33F8885	249.00
Value Point 2/16	Value Point 2/16 Notebook 2/16	175.00
64G5128 (4Meg)	Value Point 2/16 4860SX, 4850SX, P70 S, P75, 386SX	175.00
	Value Point 2/16 4860SX, 4850SX, 95 XP, 95 XD, 40SX, 40SLC	
64G5129 (8Meg)	Value Point 2/16 4860SX, 4850SX, 95 XP, 95 XD	379.00
64G5130 (8Meg)	P70 S FIS P/N 33L5130, P75 S 33L5130	379.00
	Value Point 2/16 4860SX, 4850SX, 95 XP, 95 XD	
40G1018 (1Meg MD)	P70 S Systems 6000	709.00
40G1019 (4Meg MD)	P70 S Systems 6000	1419.00
40G6134 (4Meg MD)	RISC System/6000	3319.00

IBM NOTEBOOK & LAPTOP MEMORY

79F0999 (2Meg)	L40, 5120, 75 Inch	79.00
79F1000 (4Meg)	L40, 5120, 75 Inch, Thinkpad 350, 350c	159.00
79F1001 (8Meg)	5140, 5120, 75 Inch	319.00
20Y8126 (2Meg)	5140, 5120, 75 Inch	79.00
20Y8127 (4Meg)	5140, 5120, 75 Inch	159.00
20Y8128 (8Meg)	5140, 5120, 75 Inch	319.00
20Y8129 (16Meg)	5140, 5120, 75 Inch	639.00
33G6564 (4Meg)	Thinkpad 700, 700C	419.00
33G6565 (8Meg)	Thinkpad 700, 700C	419.00
33G6566 (16Meg)	Thinkpad 700, 700C	419.00
33G6567 (32Meg)	Thinkpad 700, 700C	419.00
33G6569(64Meg)	Thinkpad 700, 700C, 720, 720C	419.00
20Y7401 (4Meg)	5170, 5140, 5120, Thinkpad 700, 700C, 720, 720C	419.00
20Y7402 (8Meg)	5170, 5140, 5120, Thinkpad 700, 700C, 720, 720C	419.00
92G0019 (16Meg)	Thinkpad 350, 350c	672.00
92F6824 (2Meg)	5140	79.00

COMPAQ MEMORY MODULES

MODEL	AMT. UPGRADED	CMPQ PART #	PRICE
DeskPro 386/20, 386/25,	1Meg Mod	115644-001	49.00
486/25, 486-O/L,	4Meg Module	115681-001	129.00
DeskPro 386/20E, 386/25E,	8Meg Module	115682-001	249.00
DeskPro 386/33L, 486/33L,	2Meg Mod	115699-001	79.00
DeskPro 386/33E, 486/33E,	4Meg Module	115700-001	159.00
	8Meg Module	115701-001	319.00
DeskPro 386S-16MHz	1Meg Exp Mod	113633-001	149.00
	4Meg Exp Mod	113634-001	329.00
	8Meg Exp Mod	113644-001	729.00
DeskPro 386/20E	1Meg Module	113344-001	79.00
DeskPro 386/25E, 386/33E	4Meg Module	113345-001	329.00
	8Meg Module	113346-001	729.00
DeskPro 2600N, 386N,	4Meg Module	113132-001	215.00
386/SX20, 386/SX25,	8Meg Module	113133-001	429.00
386/SX20, 386/SX25, 486/SX25M,	1Meg Module	113688-001	59.00
486/S25M, 486S/16M	4Meg Module	113689-001	180.00
Port 1 Series 486S	8Meg Module	113690-001	360.00
M Series Exp 92	5-4Meg	131160-001	279.00
DeskPro 386/16	1Meg Mod	106018-001	59.00
	2Meg Mod	106019-001	99.00
	1-2Meg Exp Mod	105003-001	239.00
	4Meg Exp Mod	105004-001	479.00
DeskPro 286	1-2Meg Exp	5176K-001	99.00
DeskPro 386S, 386M, 386/20	4Meg Exp	5177K-001	499.00
Prolinea 4/25S, 4/33S	1Meg Mod	149911-001	59.00
Prolinea 4/25C	4Meg Mod	149912-001	199.00
Prolinea 4/33C	8Meg Mod	149913-001	399.00
Prolinea 4000 4/50	4Meg Mod	149914-001	199.00
Prolinea 4000 4/50	8Meg Mod	149915-001	399.00
Prolinea 386 3/25S, 3/33S	1Meg Mod	147738-001	59.00
	4Meg Mod	147742-001	199.00
Prolinea 486 4/25S, 4/33, 4/50, 4/66, 0/S	1Meg Mod	147739-001	59.00
	4Meg Mod	147744-001	199.00
	8Meg Mod	141695-001	399.00
Prolinea PC Server, 486/33	4Meg Mod	147743-001	199.00
486 0/S/90	8Meg	149233-001	719.00
	16Meg	149234-001	1535.00

COMPAQ LAPTOPS & NOTEBOOKS

LTE/286	2Meg Bd	151081-002	99.00
LTE/286	4Meg Bd	151082-002	179.00
LTE/386SX/20	4Meg Module	121125-002	259.00
LTE/386SX/20	8Meg Module	121126-002	479.00
LTE 1/25 C/20, 25, 25C	4Meg Module	150769-002	259.00
LTE 1/25 C/20, 25, 25C	8Meg Module	150770-002	479.00
LTE 1/25 4/25C, 4/33C, 4/33C	4Meg Module	150769-004	809.00
LTE 1/25 4/25C, 4/33C, 4/33C	8Meg Module	150770-004	1619.00
LTE 1/25 4/25C, 4/33C, 4/33C	4Meg Module	140307-004	809.00
LTE 1/25 4/25C, 4/33C, 4/33C	8Meg Module	140307-004	1619.00
SLT/286	4Meg Module	113231-001	249.00
SLT/386	4Meg Module	113231-001	249.00
SLT/386	8Meg Module	113232-001	499.00
SLT/386	4Meg Module	113230-001	219.00
Concerto	4Meg	144704-001	CALL
	8Meg	144705-001	CALL
	16Meg	144700-001	CALL
Contura 320, 325	4Meg Module	151078-001	249.00
	8Meg Module	151079-001	499.00
Contura 4/25, 4/25C, 4/25CS	4Meg Module	150499-001	349.00
	8Meg Module	150500-001	699.00
	8Meg	149531-001	349.00
	16Meg	149532-001	699.00

PCMCIA VERSION 2.0 (See Palmtops & Subnotebooks)

MODEL	AMT. UPGRADED	PRICE
S-RAM Cards 1M/5B	1M	4/4SY1K,400 (Watchtw
S-RAM Cards 2M/5B	2M	Modems
Card Pro (made by Data I/O)		2400/9600 Data/Fax Modems
Transfers data from PCMCIA		2400/9600 Data/Fax Modems
card to desktop PC, connects		14.4K Data/Fax Modems
to a parallel port.		Ethernet 10 Base/Twist, Tape Drv

219.00	
249.00	
179.00	
179.00	
299.00	
279.00	

FLASH MEMORY

2 Meg 259.00 5Meg 569.00 10Meg 599.00 15Meg CALL 20Meg CALL

Flash Memory Cards operate like the computer as a hard disk drive. In DOS environment users system will see the flash card much like an IDC hard disk drive and assign it a logical drive (e.g D:) No battery to deal with. Also all capacities come with data compression software to double the amount of flash memory. All flash memory made by Sundisk)

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	84.00
T2000/T2000SX	2Meg	PC18-PA8317U	84.00
T2000SX/T3100SX	4Meg	PC18-PA8318U	169.00
T3000SX/T1000XE	8Meg	PC14-PA8313U	339.00
T3200SX/T3200SX (1600, 1610)	2Meg	PC-PA2931U	84.00
T3200SX/T3200SX (1600, 1610)	4Meg	PC-PA2931U	169.00
T3200SX/T3200SX (1600, 1610)	8Meg	PC-PA2931U	339.00
T4400SX, SSC/T4400	2Meg	PC-PA2932U	84.00
T4400SX, SSC/T4400	4Meg	PC-PA2932U	169.00
T4400SX, SSC/T4400	8Meg	PC-PA2932U	339.00
T4500, T4500C, T4600, T1900	2Meg	PC-PA2931U	84.00
T4500, T4500C, T4600, T1900 (3.3 V)	4Meg	PC-PA2931U	210.00
T4500, T4500C, T4600, T1900	4Meg	PC-PA2931U	169.00
T4500, T4500C, T4600, T1900, (3.3 V)	8Meg	PC-PA2931U	399.00
T2000SL	2Meg	PC-PA2930U	84.00
T2000SL	4Meg	PC-PA2930U	169.00
T1200XE	2Meg	PC13-PA2026	99.00
T1600	2Meg	PC13-PA1326	169.00
T1910	2Meg	PC13-PA1326	179.00
T1950	2Meg	PC13-PA1326	179.00
T3100	2Meg	PC15-PA3357U	109.00
T3100SX	4Meg	PC15-PA3210U	209.00
T3100	8Meg	PC8-PA1727U	189.00
T3200SX	2Meg	PC13-PA8307U	119.00
T3200SX	4Meg	PC13-PA8308U	239.00
T3000SX	8Meg	PC13-PA8309U	519.00
T5200/T5200C	2Meg	PC13-PA8307U	119.00
T5200/T5200C	4Meg	PC13-PA8308U	239.00
T5200/T5300	2Meg	PC80-PA8304U	114.00
T5200/T5300	4Meg	PC80-PA8305U	419.00

NOTEBOOK, LAPTOP MEMORY

MAKES	AMT. UPGRADED	MANU. PART #	PRICE
ACER 700	2Meg-Max.16Meg		159/255/449
ACER 900	4Meg-Max.16Meg		319/509/899
AST Ascentia 900N	2Meg	12407900	249.00
AST Bravo & Explorer	4Meg 16Meg	501255-001 - 002	189.00/819.00
AST Notebook Pro Exec	4Meg	500414-003	169.00
AST Power Exec	2Meg		
AST Power Exec 4/25SL, 4/33SL	4Meg		199.00
AST Power Exec 4/25C, 4/33C	8Meg		399.00
AST Power Exec 4/50SL	4Meg	501189-001	199.00
AST Power Exec 4/50SL	8Meg	501190-001	399.00
AST Power Exec 4/50SL	16Meg	501191-001	799.00
Aurobord 8310, Plus	8Meg	1MB-10M	139.00
Aurobord 8310, Plus	16Meg	2MB-20M	279.00
Aurobord 8320 SX	4Meg		229.00
Aurobord 8320	4Meg	4880311	229.00
Gateway 2000 Handbook 4/25 Cache	4Meg	PGA100MEM4MB	199.00
Gateway 2000 Nomad 425 DX/Quad	4Meg		199.00
Micron Millenia	4Meg	1MX-4M	199.00
Micron Millenia	16Meg 64Meg	2MX-16M-28	599.00/1599.00
NEC Powermate 386SX/16	2Meg	NEC Prospeed	79.00
NEC Powermate 386SX/20	4Meg	NEC Prospeed	159.00
NEC Prospeed 386SX	2Meg	NEC Prospeed	79.00
NEC Prospeed 386SX/20	4Meg	NEC Prospeed	159.00
NEC Ultralite 386SX/20	2Meg	PC-AT-2M	79.00
NEC Ultralite 386SX/20	4Meg	PC-AT-4M	159.00
NEC Ultralite 386SX/20	8Meg	PC-AT-8M	319.00
NEC Ultralite Versa	4Meg/8Meg/16Meg/32Meg	4PM/8M	209.429.849.1594
Packard Bell Platinum 286	1Meg	286 SIMM2	59.00
Panasonic 511-12, 512-13, 513	2Meg	SF-BA166	CALL/CALL/CALL
Panasonic 514	2Meg+16Meg		CALL/CALL/CALL
Sanyo 1610	2Meg		99.00
Sanyo 1610 NB	2Meg	MBC-NB4MEM	99.00
SHARP PC-4500, 4700	4Meg		199.00
SHARP PC-4800	2Meg	PC-IA21B	119.00
TOSHIBA T1000, 1000SE, Universal	2Meg	T1000-2M	119.00
TOSHIBA T1000SE	4Meg	T1000-4M	239.00
TI Travelmate 3000	2Meg	2358990-1	84.00
TI 4000	4Meg		199.95 / 349.95
Toshiba T1000, T1000SE	2Meg	T1000-2M	119.00
Toshiba T1000SE	4Meg	T1000-4M	239.00
Zenith Data Systems	2Meg		99.00
Zenith Master Sport 386SX	2Meg	ZA-320-1	114.00
Zenith Master Sport 386SX	4Meg	ZA-320-2	199.00
Zenith Data Systems	2Meg	ZA-150-M	119.00
	2Meg	ZA-150-M4	179.00
	4Meg	ZA-150-M8	239.00
	8Meg	ZA-150-M16	479.00
Zenith Data Systems	2Meg	ZA-150-C	119.00
	4Meg	ZA-150-C4	179.00/239.00
Zenith Z-Note 425SX, LC	4Meg	ZNM-425SX	199.00
Zenith Z-Note 425SX, LC, LNP	4Meg	ZNM-425SX	199.00

LASER PRINTER MEMORY UPGRADES

AMOUNT UPGRADED (M for .25/Mb)	1	2	3	3.5	4	5	8	9	10	12
Apple LPM, LPM II	---	---	---	---	---	---	---	---	---	---
Compaq Pagemarq 4	---	199	---	---	199	---	---	---	---	---
Epson ActiveLaser	---	149	---	---	149	---	---	---	---	---
Epson EPL 4000	---	149	---	---	149	---	---	---	---	---
Epson 8000	69	---	---	---	---	---	---	---	---	---
HP LaserJet 1000, 1500	---	149	---	---	149	---	---	---	---	---
HP 3, 3D	---	159	---	---	159	---	---	---	---	---
HP 3 Si, 3P, 3P 3Pi	---	159	---	---	159	---	---	---	---	---
HP 4, 4M, 4Si, 4Si MOX	---	---	159	---	---	159	---	---	---	---
HP 4Si	69	---	---	159	---	---	---	---	---	---
HP 4Si	---	---	159	---	---	159	---	---	---	---
HP 4Si	---	---	---	---	---	---	159	---	---	---
HP Design Jet 800, 650	---	---	---	---	---	---	159	---	---	---
HP DeskJet 500C, 550C	59	---	---	---	---	---	---	---	---	---
HP DeskJet 1200C, 1200CP---	---	---	---	---	---	---	159	---	---	---
HP PaintJet XL300	---	---	---	---	---	---	259	---	---	---
HP LaserJet 401X, 401E	---	---	---	---	159	---	---	---	---	---
HP LaserJet 4L	---	---	---	---	---	---	---	---	---	---
HP LaserJet 4039, 4079	---	89	---	---	159	---	---	---	---	---
NEC Sp 2200	---	199	---	---	---	---	---	---	---	---
NEC Sp 2700	---	199	---	---	---	---	---	---	---	---
Oki 400	---	89	---	---	159	---	---	---	---	---
Oki 800	---	159	---	---	159	---	---	---	---	---
Packard Bell PB 8500	---	159	---	---	227	---	---	---	---	---
Packard Bell PB 9500	---	159	---	---	227	---	---	---	---	---
Panasonic 4420/4423	---	129	---	---	239	---	---	---	---	---
Panasonic 4426/4427	---	129	---	---	239	---	---	---	---	---
Texas Instruments	---	149	---	---	149	---	---	---	---	---
TI XL-PS17/PS35	---	149	---	---	---	---	---	---	---	---

H.P. COMPATIBLE FONT CARTRIDGE

BAR CODER Bar Code Reader Fonts	99.00
DATAKIT 5/8/8 (HP 500) 5 Fonts, 8 Typ. Sizes, 8 Pt. Logo, 8 Scl. 24 pt	99.00
IBM 4019, 4019E, FONT CARTRIDGE 2019 Fonts, Turbo Card	105.00
TURBO ES (Compatible to Pacific Data Products) HP LaserJet IIP, IIP, IIIP, IIIP, 143 Fonts (compat. with Epson Action Laser II and IIP, HP PaintJet Xl, HP 4)	
TURBO ES (Compatible to Pacific Data Products) HP LaserJet IIP, IIP, IIIP, IIIP, 143 Fonts (compat. with Epson Action Laser II and IIP, HP PaintJet Xl, HP 4)	
UNI 4 (HP 500) 4 Fonts, 8 Typ. Sizes, 8 Pt. Logo, 8 Scl. 24 pt	179.00
UNI 4 ENHANCED (HP 500) 4019, 4019E, 4029	179.00
UNI 4 ENHANCED (HP 500)	179.00
UNI 4000 Emulation	179.00
UNI 4000 Emulation	84.00
UNI 4000 Emulation	169.00

HP, EPSON, IBM, TOSHIBA, NEC, AST, COMPAQ, PANASONIC, OKIDATA, SHARP, ZENITH, GATEWAY, TEXAS INSTRUMENTS, PACKARD BELL, MICRON, ACER, AURORA, SANYO, AMBRA, CYRIX, AMD, INTEL, ATMAS, ENTERPRISE, MAGNAVOX, ADDM, ATMAS, SPRITES, ENTERPRISE, ADDM, ATMAS, SPRITES, ENTERPRISE, ADDM, ATMAS, SPRITES, ENTERPRISE

Before You Buy

TI
IBM
AST
NEC
COMPAQ
TOSHIBA

Shop and Compare

Don't Settle for Less

PCs Compleat	Supplier 2	Supplier 3
Guaranteed Lowest Price	YES	
The Best Brand Names	YES	
30-day Money Back Guarantee	YES	
Never a Restocking Fee	YES	
30-day Price Protection	YES	
PC Computing Five Star Award	YES	
Lifetime Toll-Free Technical Support	YES	
FREE Hardware Configuration	YES	
FREE Software Installation	YES	
Same Day Shipment	YES	
Pre-Installed Software Discount	YES	
All Major Credit Cards Accepted	YES	
Never a Hidden Surcharge	YES	
5A 5% Shipping on Most Peripherals	YES	
Compaq Authorized for Direct Marketing	YES	
10 Days Same As Cash	YES	
Low Cost Business Leases	YES	
Volume Purchase Agreements	YES	
FREE Asset Tagging	YES	
Customer Satisfaction is Top Priority	YES	

PC Computing

FIVE STAR AWARD

PCs Compleat is the proud recipient of PC/Computing magazine's highest Five Star rating for service and overall performance in its listing of the nation's leading direct sellers

PCs COMPLEAT

THE BEST: BRANDS · PRICE · DELIVERY · SERVICE

SALES HOURS:
Monday-Friday 7 A.M. E.T. - Midnight
Weekends & Holidays 10 A.M. - 8 P.M.

CALL TODAY!

800-598-4727

COMPAQ

$1629*

ProLinea Desktops

Processor	Hard Drive	Price
486SX/33	120MB	$1109
486SX/33	240MB	$1259
486DX/33	120MB	$1389
486DX/33	240MB	$1469
486DX/33	340MB	$1619

Lease for $50/mo.

ProLinea Net1 $1329

ProLinea Desktop

ProLinea MT

Processor	RAM	Hard Drive	Price
486SX/33	4MB	270MB	$1399
486SX/33	4MB	340MB	$1499
486DX2/66	8MB	535MB	$2469

Lease for $51/mo.

DeskPro/M

Processor	RAM	Hard Drive	Price
486DX/33	8MB	240MB	$2659
486DX/33	8MB	340MB	$3069
486DX2/66	8MB	510MB	$3739

Lease for 3/36/mo.

TEXAS INSTRUMENTS

$1869*

TravelMate 4000E Monochrome

Processor	Price
486SX/25	$1679
486DX2/50	$2429

Lease for $61/mo.

TravelMate Accessories

TI Intelligent Docking Station	$799.99
External Battery Charger	$129.99
Deluxe Carrycase	$56.99
Ethernet Adapter	$449.99

TravelMate 4000E Color

TravelMate 4000E Color

Processor	Screen	Price
486SX/25	Enhanced Color	$2099
486DX2/40	Enhanced Color	$2699
486DX2/50	Dual Scan	$2999
486DX2/50	Active Matrix	$3799

New From Texas Instruments

486DX4/75	8.4" Active Matrix	$4399
486DX4/75	9.5" Active Matrix	$4849

Lease for $77/mo.

COMPAQ

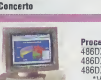
$2399*

Concerto

▲ 9.5" mono display
▲ 2 PCMCIA Type II slots
▲ Integrated, detachable keyboard

Processor	Hard Drive	Price
486SL/25	120MB	$2359
486SL/25	250MB	$2649
486SL/33	250MB	$2929

Lease for $47/mo.



Concerto

LTE Lite 4/25

Screen	Hard Drive	Price
Mono	120MB	$1999
Mono	209MB	$2299
Active Mono	120MB	$2799
Active Mono	209MB	$3099

Lease for $73/mo.

Contura 4/25

Screen	Price
Mono	$2199
Dual Scan	$2599
Active Matrix	$3449

Lease for $81/mo.

LEADING EDGE

$969*

VL Bus Desktops

Processor	Hard drive	Price*
486SX/25	170MB	$919
486SX/33	170MB	$1009
486DX/33	260MB	$1249
486DX2/50	345MB	$1609
486DX2/66	345MB	$1699

*VGA color monitors begin at $209.99

Lease for $50/mo.

VL Bus Desktops

VL Bus Minitowers

Processor	Hard drive	Price*
486DX/33	260MB	$1309
486DX2/50	345MB	$1669
486DX2/66	345MB	$1839

*VGA color monitors begin at $209.99

WinPro 486SLC Series

Processor	Hard drive	Monitor	Price
486SLC33	120MB	14" VGA	$979
486SLC33	170MB	14" SVGA	$1059

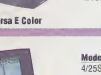
NEC

$1499*

UltraLite Versa E

Processor	Screen	Hard drive	Price
DX2/40	Monochrome	120MB	$2579
DX2/40	Monochrome	250MB	$2989
DX2/40	Active color	120MB	$3819
DX2/40	Active color	250MB	$4229
DX2/50	Monochrome	209MB	$3259
DX2/50	Active color	209MB	$4499
DX2/50	Active color	340MB	$4919

Lease for $95/mo.



Versa E Color

Ready Multimedia Desktops

▲ 4MB RAM, expandable to 36MB
▲ Double or triple speed CD-ROM drive
▲ MediaVision 16-bit stereo sound
▲ 9600/4800 fax, 2400 data modem

Processor	Hard drive	Price
486SX/25	170MB	$1499*
486SX/33	250MB	$1899

Lease for $55/mo.

AST

Authorized Systems Reseller

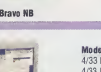
$1729*

Bravo NB

▲ 486SX/25 processor
▲ Accelerated local bus graphics
▲ PCMCIA Type III slot

Screen	Model	Hard Drive	Price
Mono	123W	120MB	$1639
Mono	173W	170MB	$1799
Dual scan	123W	120MB	$2279
Dual scan	173W	170MB	$2399
Active matrix	173W	170MB	$2899

Lease for $62/mo.



Bravo NB

PowerExec

Model	Screen	Price
4/25SL Model 203/W	Mono	$2399*
4/25SL Model 203/W	Active color	$4029
4/33SL Model 203/W	Monochrome	$2629
4/33SL Model 203/W	Active color	$4229
4/33SL Model 343/W	Active Matrix	$4629

Lease for $89/mo.

AST

Authorized Systems Reseller

$999*

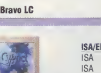
Bravo LC

▲ 4/8MB RAM exp. to 64MB
▲ 120/170/210MB hard drive

Model	Hard Drive	Price*
4/25s Model 123W	120MB	$999
4/33 Model 123W	120MB	$1299
4/33 Model 173W	170MB	$1359
4/33 Model 213W	210MB	$1539
4/66d Model 213W	210MB	$1979

*Monitors sold separately

Lease for $50/mo.



Bravo LC

Bravo MT

Model	Hard Drive	Price*
4/33 Model 3	Optional	$1269
4/33 Model 173W	170MB	$1539
4/33 Model 343W	340MB	$1999
4/66d Model 3	Optional	$1819
4/66d Model 173W	170MB	$2099
4/66d Model 343W	340MB	$2539

*Monitors sold separately

Lease for $50/mo.

Cygnet

$2149*

Desktop Systems

RAM	Video	Price
8MB	20M-Wm	$2149*
16MB	20M-Wm	$2479
16MB	60M-Wm	$2699

*Monitors sold separately

Lease for $79/mo.

Cygnet Desktop

Tower Systems

ISA/EISA	Video	Price*
ISA	20M-Wm	$2149
ISA	60M-Wm	$2699
EISA	20M-Wm	$2879
EISA	60M-Wm	$3099

Includes 16MB RAM
*Monitors sold separately

15" SVGA color monitor $399.99

Circle 148 on reader service card.

Toshiba Direct

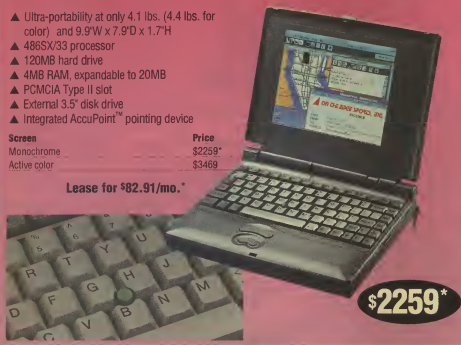
Portégé T3400

- Ultra-portability at only 4.1 lbs. (4.4 lbs. for color) and 9.9"W x 7.9"D x 1.7"H
- 486SX/33 processor
- 120MB hard drive
- 4MB RAM, expandable to 20MB
- PCMCIA Type II slot
- External 3.5" disk drive
- Integrated AccuPoint™ pointing device

Screen	Price
Monochrome	$2259*
Active color	$3469

Lease for $82.91/mo.*

T3400 Color



$2259*

T4700

- 486DX2/50 processor
- 8MB RAM, expandable to 24MB
- Brilliant 9.5" display with local bus video
- 2 PCMCIA slots (1 Type II, 1 Type III)
- Microsoft Sound System, built-in microphone, audio out port
- MS-DOS, Windows 3.1, UltraFont & Indeo video compression software

Screen	Hard drive	Price
Dual scan color	200MB	$3996*
Dual scan color	320MB	$4329
Active color	200MB	$4599
Active color	320MB	$4949

Lease for $146.76/mo.

$3999*

T4700 Dual Scan

T1910

- 486SX33 processor
- 4MB RAM, expandable to 20MB
- 9.5" display
- Type III PCMCIA slot
- 82-key keyboard
- MS-DOS, Windows 3.1
- Ballpoint mouse 2.0 with Quickport
- Enhanced power management

Model	Screen	Hard drive	Price
T1910	Monochrome	120MB	$1499
T1910	Dual scan color	120MB	$2099
T1910	Dual scan color	200MB	$2329

Lease for $55/mo.

$1499

T1950

- 486DX2/40 processor
- 4MB RAM, expandable to 20MB
- 9.5" display
- Type III PCMCIA slot
- 82-key keyboard
- MS-DOS, Windows 3.1
- Ballpoint mouse 2.0 with Quickport
- Enhanced power management

Model	Screen	Hard drive	Price
T1950	Monochrome	120MB	$1899
T1950	Monochrome	200MB	$2099
T1950	Dual scan color	120MB	$2499
T1950	Dual scan color	200MB	$2719
T1950	Active color	120MB	$2849
T1950	Active color	200MB	$3069
T1950	Active color	320MB	$3399

Lease for $70/mo.

$1899

T4600

- 33MHz 486SL processor
- 4MB RAM, expandable to 20MB
- 9.5" display
- 2 PCMCIA slots
- Ballpoint mouse with QuickPort
- MS-DOS, Windows 3.1

Screen	Hard drive	Price
Monochrome	200MB	Call
Active color	120MB	$3689
Active color	200MB	$4096
Active color	320MB	$4449

Lease for $143/mo.

$3889

Desk Station IV

Toshiba's Desk Station IV turns your T4600 and T4700 into a full-function desktop computer by providing:

- 2 full-size, 16-bit industry standard expansion slots
- 5.25" half-height drive bay
- Parallel, serial, PS/2 mouse, VGA monitor, 101-key keyboard ports and 1 floppy disk drive port
- Separate monitor stand
- Monitor, notebook and keyboard extra

TOSHIBA

$599.99

PCs COMPLEAT

THE BEST: BRANDS · PRICE · DELIVERY · SERVICE

NEW SALES HOURS:
Monday-Friday 7 A.M. E.T. - Midnight
Weekends & Holidays 10 A.M. - 6 P.M.

CALL TODAY!

800-598-4727

© PCs Compleat All prices subject to change and do not include shipping. Monitors sold separately. Lease prices reflect 36 month operating lease to approved business customers. All products or brand names are trademarks of their respective companies. PCs Compleat, 34 St. Martin Drive, Marlborough, MA 01752. Phone (508) 480-8500. Not responsible for typographical errors.

IBM • IBM • IBM

ValuePoint Systems Feature

▲4MB RAM expandable to 64MB
▲VESA Local Bus Graphics (up to 1280x1024)
▲3.5" 1.44MB disk drive
▲2 Serial, parallel, keyboard, mouse ports
▲101 key keyboard, IBM Mouse

ValuePoint SpaceSavers

You can't beat the ValuePoint SpaceSavers if you're looking for IBM quality, service and support at an entry level price.

ValuePoint Desktops

With lots of room for expansion, here's a system you won't grow out of in 2 years.

ValuePoint MiniTowers

The most flexibility offered in any configuration featuring 8 expansion slots and 6 drive bays.

ValuePoint P60/D Pentium

The ultimate power trip is here in a Pentium system featuring PCI architecture, LANS, graphics, publishing, CAD/CAM and more at a full-tilt 32-bit speed.

ValuePoint SpaceSaver

ThinkPad 500 subnotebooks

Lighten your load, with true desktop class power.

▲ 486SLC2/50 processor
▲ 4MB RAM exp. to 12MB
▲ 170MB hard drive
▲ 7.4" VGA monochrome display
▲ Serial, enhanced parallel, mouse board, mouse, external disk drive ports
▲ 1 Type II PCMCIA slot
▲ 81-key keyboard
▲ TrackPoint II integrated pointing device
▲ 3.5" external floppy drive
▲ Nickel Metal Hydride battery, AC adapter
▲ Weighs only 3.8 lbs. (w/battery) and measures 10.11" x 7.23" x 1.67"
▲ IBM DOS 6.1, Prodigy

$2419*

IBM Business Partner

Authorized Personal Computer Dealer

ValuePoint Models and Specifications

Model	Hard Drive Video	Slots	Bays	Software	Price
ValuePoint Si SpaceSaver *(Video RAM expandable to 1MB)*					
486SX/25	120MB	512K	3	3	IBM DOS/MS Windows	$ 929
486DX/33	212MB	512K	3	3	IBM DOS/MS Windows	$1399
486DX2/66	212MB	512K	3	3	IBM DOS/MS Windows	$1789
ValuePoint Desktop *(ZIFF socket, Pentium OverDrive upgradability, VESA local bus slot)*					
486SX/33	170MB	1MB	5	5	IBM DOS/MS Windows	$1359
486DX/33	212MB	1MB	5	5	IBM DOS/MS Windows	$1559
486DX/33	340MB	1MB	5	5	IBM DOS/MS Windows	$1719
486DX2/66	340MB	1MB	5	5	IBM DOS/MS Windows	$2159
ValuePoint MiniTower *(527MB system includes 8 MB RAM standard)*					
486DX2/66	340MB	1MB	8	6	IBM DOS/MS Windows	$2269
486DX2/66	527MB	1MB	8	6	IBM DOS/MS Windows	$2699
ValuePoint P60/D Pentium *(features 32-bit PCI architecture, 16MB RAM expandable to 128MB, 256KB cache. Intel PCI local bus with 3 PCI local bus slots open and available)*					
Pentium 60MHz	424MB	1MB	4	5	none	$4039
Pentium 60MHz	525MB	1MB	4	5	none	$4099

Monitors priced separately. Other models available.

ValuePoint Multimedia Desktops

▲ Based on the IBM ValuePoint config.
▲ SoundBlaster 16 stereo sound card
▲ IBM internal double speed CD-ROM
▲ Creative Labs stereo speakers & microphone
▲ 10 CD-ROM titles including Kodak Photo CD Access, Software Toolworks Multimedia Encyclopedia, Multimedia Microsoft Works, Microsoft Bookshelf, HSC Interactive Presentation Tool, Grandma & Me, Where in the World is Carmen Sandiego?, Loom, The Secret of Monkey Island, Secret Weapons of the Luftwaffe

Processor	Hard Drive	Price
486DX/33	212MB	$2049
486DX2/66	340MB	$2649
486DX2/66 *	340MB	$2469

**excludes speakers, microphone and CD-ROM software titles*

Compleat Your System With These Great Peripherals

Software

...tor Windows 1994	$9.99*/$4.99
...ing Your Money v.10	$9.99*/$4.99
...SmartSuite Upgrade	$279.99*/$314.99
SmartSuite	$389.99*/$449.99
1-2-3	$259.99*/$294.99
1-2-3 Upgrade	$99.99
...s Organizer	$74.99*/$99.99
...ix Pro	$59.99*/84.99
...ni V	$69.99*/$109.99
...rton Utilities 7.0	$79.99*/$119.99
...rton AntiVirus 3.0	$59.99*/$89.99
...rton Desktop (Win 3.0	$79.99*/$119.99
...WindowWorks	$39.99*/$84.99

**Low price available when purchased with a system*

...soft Office Version Upgrade	$249.99
...soft Office Competitive Upgrade	$289.99
...soft Office	$449.99
...soft Word 6.0 f/Win	$294.99
...soft Encarta CD-ROM	$89.99
...ng Pro f/Win	$39.99
...rPerfect 6.0 f/Win	$279.99
...rPerfect 6.0 f/Win Version Upgrade	$99.99

Circle 149 on reader service card.

Multimedia

Creative Labs Discovery 16 Kit	$449.99
Creative Labs Edutainment 16 Kit	$519.99
ProAudio Spectrum 16 sound card	$159.99
SoundBlaster16 SCSI ASP sound card	$224.99
Labtec CS-150 stereo speakers	$19.99
Microsoft Sound System 2.0	$139.99

NEC *Monitors*

SVGA, 14", MPRII	$319.99
4Fge, 15", Accucolor	$689.99
5FGe, Energy Star	$1069.99
5FGp, 17", 1280x1024	$1219.99
6FGp, 21", Opticlear	$2369.99

SONY *Monitors*

14", 1024x768, .25mm aperture	$559.99
17", 1024x768, Digital Image	$1049.99
17", 1600x1200, Dynamic Focus	$1199.99
20", 1280x1024, .30mm aperture	$2279.99

Multimedia Bundles

Desktop Library Upgrade Kit	$459.99
CD-ROM drive, Internal, 2X, SCSI	$319.99

New Media

Visual Media SCSI PCMCIA Adapter	$219.99
WAVjammer PCMCIA sound card	$279.99
Bus Toaster SCSI 2 PCMCIA adapter	$269.99

Maxtor

PCMCIA, 105MB Drive Kit, Type III	$469.99
DeskRunner, Drive Bay Adapter	$139.99
130MB IDE Drive	$194.99
245MB IDE Drive	$279.99
345MB IDE Drive	$374.99

Luxurious Leather

$99.99

- Padded computer section with divider for accessories
- 3 section compartment for files
- Pockets for disks, pens, & business cards
- External pocket 13"x 9"x2"

Also from Targus

Prestige Leather(3 colors)	$224.99
Business Traveler	$199.99
Premier Leather	$139.99
Business Commuter	$124.99
Universal Case	$69.99
Notepac (5 colors)	$39.99

TARGUS Lifetime Replacement Warranty

PCMagazine TOP PICK 1994 PCComputing FIVE STAR AWARD

PCs Compleat is the proud recipient of PCComputing magazine's highest Five Star rating for service and overall performance in its listing of the nation's leading direct sellers

PCs COMPLEAT

THE BEST: BRANDS • PRICE • DELIVERY • SERVICE

SALES HOURS:
Monday-Friday 7 A.M. E.T. - Midnight
Weekends & Holidays 10 A.M. - 8 P.M.

CALL TODAY!

800-598-4727

MEMORY MEMORY MEMORY MEMORY

LAPTOP & NOTEBOOK MEMORY

AST

PowerExec 4/25SL
4MB ... 50Y1139-001 ... $152 | 8MB ... 50Y1597-002 ... $369
16MB ... $749

PowerExec Ltr 3/25SL, 3/25SL-C, EL
4MB ... 50Y1138-001 ... $179
8MB ... $359

Premium Exec 286, 386SX/20, 25, 25C
4MB ... 50Y1149 ... $249
8MB ... $395

Bravo MB 486
4MB ... $579
8MB ... $959
16MB ... $1919

Compaq

Concerto 486
4MB ... $569
8MB ... $959

Contura 3/20, 3/25, 3/25c
4MB ... $329
8MB ... $549

Contura 4/25c series
4MB ... $329
8MB ... $549

LTE 386S/20
4MB ... $229

LTE Lite 20; 25; 25c, 25s
4MB ... $329
8MB ... $549
16MB ... $799

LTE Lite 4/25c
4MB ... $329
8MB ... $599

SLT 286
4MB ... $329

SLT 386s/20
4MB ... $599

IBM

PS/2 CL57SX and ThinkPad 700, 700c, 730, 720c
4MB ... $299
8MB ... $389
16MB ... $939

ThinkPad 710T
4MB ... $789
8MB ... $939

N51 Notebook (All)
4MB ... $179
8MB ... $359

L40SX, N33SX, PS/Note 102
4MB ... $185

L40SX, PS/Note 102
8MB ... $329

NEC

UltraLite Versa (all models)
2MB ... $249
8MB ... $499
16MB (2) ... $1126

UltraLite SL 51/25C
2MB ... $179
4MB ... $359

UltraLite SL/20, SL/20P
2MB ... $179
4MB ... $259

ProSpeed 286, 386SX/16
4MB ... $179

ProSpeed 386
4MB ... $359

Texas Instruments

TravelMate 3000 (all models)
2MB ... $179
4MB ... $359

TravelMate 5100 (all models)
2MB ... $179
4MB ... $359

TravelMate WinSLX/25
2MB ... $179

PERSONAL COMPUTER MEMORY

AST

Premmia
4MB ... 50Y1139-001 ... $152 | 8MB ... 50Y1597-002 ... $369

Bravo 2/25s
2MB ... 50Y0710-004 ... $96 | 8MB ... 50Y0824-002 ... $316

Advantage! 386SX/20 25 Advantage! Pro 25/25C Bravo 3/25s
1MB ... 50Y0708-004 ... $48 | 4MB ... 50Y0822-002 ... $179

Advantage! Pro 486SX/25, 33, 50, 50/2, Bravo LC 4/25s, 33, 33c, 50c, 4/25T
2MB ... 50Y0710-001 ... $73 | 4MB ... 50Y0812-002 ... $179

Premium 386/25, 33; 33T, Premium II 386SX/16, 20; 25
1MB ... 50Y0708-002 ... $48

Advantage! 486/25, 33; 33c; 50/33, Bravo 4/33; 486/25, Premium II/25, 33T, Server SE 4/25
2MB ... 50Y0710-004, 700-005 ... $69

Advantage! 486/25, 33; 33c; 50/33, Bravo 4/33; 486/25, 4/33; 33c; 50c; 66, Premium 386/33T, 486/25, II 25T; 33; 33c; 33T, Premium II 386/25; 33; 486/25; 486SX2/25, Premium Server SE 4/33
4MB ... 50Y0710-004 ... $179 | 8MB ... 50Y0700-001 ... $359

Compaq

ProSignia 2/25s; 2/25cs
2MB ... 144166-001 ... $89 | 8MB ... 144742-001 ... $319

ProSignia 4/25s, 4/33, 4/50
1MB ... 147243-001 ... $39 | 2MB ... 149483-001 ... $74
4MB ... 147604-001 ... $181 | 8MB ... 149485-001 ... $354

DeskPro 386/20e, 386/25c, 25
1MB ... 113730-001 ... $180 | 4MB ... 113649-001 ... $244

DeskPro 386s/16
4MB ... 112264-001 ... $180 | 8MB ... 113634-001 ... $255

DeskPro 2/25s, 33s, 4/25S, 33s, 66, 386/M, 386M, 386S/25S, 33S, Systempro LT Series, Portable 486s, 4S Series
2MB ... 116869-001 ... $74
4MB ... 116895-001 ... $181 | 8MB ... 113877-001 ... $359

ProSignia PC Server 486s /33, 0X2/66
4MB ... 149735-001 ... $649

DeskPro 386s 33, 486s 33, Systempro
1MB ... 115144-001 ... $79 | 8MB ... 116561-001 ... $379

Dell

Power Desktop 325D, P, 333D, 333P, 433P, 466P, 466D
4MB ... 310-2127 ... $179

Powerline WinExtreme 420; 425; 433; 450; 450DE/2, 466DE
2MB ... 310-2466 ... $74 | 8MB ... 310-2482 ... $269

Powerline WinExtreme 420; 425; 433; 450; 450DE/2, 466SE
32MB 83 ... 310-2630 ... $1206

Performance T, L & M series
4MB ... 310-2305 ... $180 | 16MB ... 310-2327 ... $460

Hewlett-Packard

Vectra QS/16S; 20PC, RS/20, 20C, 25, 25C
4MB Ea ... 01542 or 1542A ... $179

Vectra 386/16M, 386/20M, 386/25M PC
2MB ... 1D4964 ... 592 ... 8MB ... 1D4044 ... $310

Vectra 486/PC 25T; 33T; 486s/20, 486s/25W, 33W; 50W, 66W
2MB ... 0D581A ... $74 ... 8MB ... 0D153A ... $354

Vectra 386s/25; 486/25SE; 486/33SE; 486/50SE; 486s/66SE
1MB ... 0D381A ... $74 ... 8MB ... 0D152A ... $354

Vectra 386s/33M; 33MD
2MB ... 0D714A ... 592 ... 8MB ... 0D715A ... $310

US ROBOTICS

Sportster 14,400 Fax®
High Speed Modems
Specifically designed for small business, home office and personal use

V.42/MNP® 2-4 Error control and V.42 bis/MNP5 data compression for highest possible throughput • Includes fax software • Toll free voice warranty on parts and labor

INTERNAL	EXTERNAL
14.4 FAST	14.4 FAST
$149	**$179**

ORDER NOW!

FAX /MODEMS

Megahertz
Linking Your World

PCMCIA 2.0 Data/Fax with XJACK
14.4Kbps FAX/Modem ... $379
24/9600bps FAX/Modem ... $509

Internal Data/Fax w/MNP-5, V.42/V.42bis
14.4Kbps FAX/Modem ... $419
9600bps FAX/Modem ... $269
2400bps FAX/Modem ... $249

Pocket Modems for any serial port
14.4Kbps FAX/Modem ... $319
9600bps FAX/Modem ... $275

MONITORS

ADI

- MicroScan 3E+ 14", 0.28mm, 1024x768 NI @ 72Hz; Microprocessor based digital controls, 30K-64Kbps ... $359
- MicroScan 4XL 15"DS, 0.28mm, 1280x1024 NI @ 60Hz; Microprocessor based digital controls, 30K-64Kbps ... $449
- MicroScan 5A, 17"DS, 0.26mm, 1280x1024 NI @ 60Hz; Microprocessor based digital control, 30K-64Kbps ... $849

CPU UPGRADES

Kingston

SX/Now! 386 CPU Upgrade
25MHz (SX) ... $149
33MHz (SX) ... $199

DX2/Now! 486 CPU Upgrade
25MHz (DX2) ... $279
50MHz (DX2) ... $399

Cyrix

486 Upgrades
Cx486/Dx/16/25 ... $269
Cx486DLC/20/40 ... $319
Cx486DLC/25/50 ... $369
Cx486SLC/16/32 ... $269
Cx486SLC/20/40 ... $349

Intel

Intel Math
RC80732 16, 20, 25MHz ... $85
RC80750 16, 20, 25, 33MHz ... $89
RC80751 Kobe 16, 20, 25MHz ... $89

Intel OverDrive Processors
486SX/25 with socket ... $325
486SX/25 with socket ... $458
486DX2/25 without socket ... $439
486DX2/50 without socket ... $554
486DX2/50 or 486SX2/25 with socket ... $555

LASER MEMORY

Canon LBP-4, 4Lpx, 4Mpx
4MB ... 062-2708 ... $150 | 2MB ... N/A ... $195

Epson EPL 6000
2MB ... 80451 ... $120 | 4MB ... N/A ... $198

Epson ActiveLaser L, EPL-8000
2MB ... N/A ... $135 | 4MB ... N/A ... $213

HP LaserJet IIIsi, 4, 4M, 4Si, 4SiMX, 3L300, InkJet 600
2MB ... C2061A ... $181 | 8MB ... C2084A ... $354

HP LaserJet IIP, III, IIIP, IIID
2MB ... 33479A ... $97 | 4MB ... 33473A ... $170

HP LaserJet II & III
2MB ... 33440A ... $110 | 4MB ... 33445A ... $195

IBM Laser 4029 all models
2MB ... 1412356 ... $94 | 4MB ... 1412335 ... $157

Okidata 400
1MB ... 70010-01 ... $67 | 2MB ... N/A ... $108

Panasonic 4410 & 4420
2MB ... KX-P4410 ... $113 | 4MB ... N/A ... $191

Panasonic 4455 & 4420
2MB ... KX-P4455 ... $129 | 4MB ... N/A ... $193

Texas Instruments Microlaser and XL
1MB ... 2535729-0001 ... $46 | 4MB ... 2560502-0002 ... $99

SIMMS

1x9(3-chip)..... $43
4x9 ..... $175
1x36 ..... $181
2x36 ..... $354

1MB x 9 70ns (9 chip) ... $46
1MB x 36-70 (1MB) ... $174
4MB x 9-70ns ... $175
1MB x 36-70 (4MB) ... $181
2MB x 36-70ns (8MB) ... $354

ONE DAY 30 DAY GUARANTEE

WE SET THE STANDARD:

- MEMORY GUARANTEED - 100% COMPATIBLE IN FORM, FIT, AND FUNCTION
- ALL PRODUCTS USER INSTALLABLE
- INSTALLATION INSTRUCTIONS INCLUDED WITH MOST MEMORY PRODUCTS
- FREE TECHNICAL SUPPORT
- CORPORATE PO'S, APO/FPO'S WELCOME
- GOVERNMENT AND EDUCATIONAL PRICING
- INTERNATIONAL ORDERS WELCOME
- SPECIAL VOLUME PRICING
- OVERNIGHT DELIVERY AVAILABLE
- VISA, MASTERCARD, AMERICAN EXPRESS, AND DISCOVER ACCEPTED
- NO SURCHARGE ON CREDIT CARDS

DON'T SETTLE FOR LESS!

CALL FOR ANY MEMORY UPGRADE NOT LISTED

WE STOCK MEMORY UPGRADES FOR THOUSANDS OF COMPUTERS AND PRINTERS

VISA MC AMEX DISC

TOLL FREE FROM USA & CANADA

800-320-9866

INTERNATIONAL ORDERS

714-448-7750

FAX ORDERS

714-448-7760

BUSINESS HOURS:

Monday - Friday, 8am-5pm, P.S.T.

Saturday, 9am-3pm, *Orders Only*

First SOURCE International

MAIL OR FAX ORDERS TO:

First Source International, Inc

7 Journey

Aliso Viejo, CA 92656

Terms and Conditions: Memory products are third party manufacturer's numbers are for memory reference. Bought items are non-refundable if this number is required for all returns. All non-defective returns, unopened, refused, or cancellation returns will be subject to a 20% restocking fee. Due to U.S. tariffs placed on some manufacturers' memory prices may be higher than advertised. Prices and availability are subject to change without notice. We reserve the right to limit any purchase. First Source International accepts no responsibility for errors in typography or photography. We will match any competitor's price on an identical product, with acceptable written evidence. Trade names and registered trademarks are of those respective companies.

CALL THE UPGRADE EXPERTS 800-320-9866

The Future's in Computer Service, So Start Preparing Now!

Only NRI could give you training this complete, experience this practical. You actually build a powerful 486sx/25 MHz computer system—including a 200 meg hard disk drive and Super VGA color monitor—while gaining the hands-on skills you need to service today's most sophisticated computers with confidence.

Over 220,000 jobs! That's what the Department of Labor forecasts for computer service technicians by the year 2005, a 38% increase over today's level. For you, that means tremendous opportunity if you have the training and the skills to get into this high-paying, top-growth field.

Now you can cash in on this opportunity — full-time, part-time, or in a computer service business of your own — once you've mastered electronics and computers the NRI way.

Get inside a 486sx/25 MHz computer system...and see for yourself the potential of today's computer technology!

Now NRI includes a high-speed 486sx/25 MHz mini-tower computer system as the centerpiece of your course to give you real-world training with state-of-the-art technology. You build this 1 meg RAM, 32-bit CPU computer from the keyboard on up. Plus, we've recently added two important features to this already powerful system: a 200 meg IDE hard disk drive, for extra storage capacity, and a Super VGA color monitor, to add impact and drama to all your computer's applications. But that's not all!

You also learn to diagnose and repair IBM-compatible computers with the remarkable Ultra-X hardware and software included in your NRI training. Plus, NRI's computer training now covers more troubleshooting procedures than ever, including upgrading, printer repair, recovering lost data, fixing RAM problems, and more.

Understanding you get only through experience

You need no previous background in electronics to succeed with NRI. You start with the basics, rapidly building on the fundamentals of electronics to master advance microcomputer concepts.

Best of all, you learn by doing — performing hands-on experiments with your NRI Discovery Lab and digital multimeter, then actually building and testing the powerful 486sx/25 MHz computer system you train with and keep.

Learn at home in your spare time

With NRI, you learn at your own convenience in your own home. No classroom pressures, no night school, no need to quit your present job until you're ready to make your move. And all throughout your training you've got the full support of your personal NRI instructor and the entire NRI technical staff.

Get all the facts from NRI's free full-color catalog. Send today!

Now, at an affordable tuition, your incomparable NRI hands-on training program includes even more than ever before:

- Discovery Lab you use to design and modify circuits, diagnose and repair faults
- Hand-held digital multimeter with "talk-you-through" instructions on audio cassette
- Digital logic probe that lets you visually examine computer circuits
- A powerful 486sx/25 MHz computer, featuring a 32-bit Intel 80486sx CPU, "intelligent" keyboard, and 1.44 meg, 3.5 inch high-density floppy drive
- 1 meg RAM, 64K ROM
- Super VGA color monitor
- 200 meg IDE hard disk drive
- DOS, QBasic, and Microsoft Works software
- Ultra-X diagnostic package including R.A.C.E.R. plug-in card and QuickTech menu-driven software for fast, professional troubleshooting
- Reference materials, programming guidelines, and schematics

See other side for highlights of NRI hands-on computer training

SEND CARD TODAY FOR FREE NRI CATALOG

NRI Schools
McGraw-Hill Continuing Education Center
4401 Connecticut Avenue, NW
Washington, DC 20008

GI Bill

For career courses approved under GI Bill, check for details.

Check one FREE catalog only

- ☐ Microcomputer Servicing
- ☐ TV/Video/Audio Servicing
- ☐ Industrial Electronics & Robotics
- ☐ Basic Electronics
- ☐ Computer-Aided Drafting
- ☐ Computer Programming
- ☐ Desktop Publishing & Design
- ☐ PC Applications Specialist
- ☐ Programming in C++ with Windows

Name _____ (please print) Age

Address _____

City _____ State Zip

Accredited Member, National Home Study Council

249-0494

Get In-Demand Computer Servicing Skills With NRI "Hands-On" Training

You set up and perform electronics experiments and demonstrations using your NRI Discovery Lab. You even interface the lab with your 486sx computer to "see" keyboard-generated data.

After you build this digital logic probe, you explore the operation of your computer's 101-key, detached "intelligent" keyboard and its dedicated microprocessor.

You install the 1.44 meg, 3-1/2" floppy disk drive, learning disk drive operation and adjustment. Later, you dramatically improve your computer's data storage capacity by installing a powerful 200 meg IDE hard drive.

You learn to quickly diagnose and service virtually any computer problem with the extraordinary R.A.C.E.R. plug-in diagnostic card and QuickTech diagnostic software included in your course.

NRI training is so complete, hands-on mastery is "built-in"

No other training — in school, on the job, anywhere — prepares you so thoroughly for today's money-making opportunities in computer service. And only NRI builds meaningful training around the kind of powerful computer system you'll be called on to service and repair in the real world.

As you assemble your 486sx/25 MHz mini-tower computer system — complete with monitor, floppy drive, hard drive, operating and applications software — you'll perform hands-on demonstrations and experiments that bring theory to life, giving you a total mastery of computer operation. But NRI doesn't stop there.

Now! Includes diagnostic hardware and software for quick, accurate troubleshooting

Your NRI training now includes a remarkable diagnostic package that allows you to quickly locate and correct defects in IBM-compatible computers.

You'll use the Ultra-X R.A.C.E.R. diagnostic card to identify individual defective RAM chips, locate interfacing problems, and pinpoint defective support chips. Experts call the R.A.C.E.R. card the easiest to use, most powerful tool for PC troubleshooting available today!

With your QuickTech diagnostic software package, also from Ultra-X, you'll go on to test the system RAM and such peripheral adapters as parallel printer ports, serial communications ports, video adapters, and floppy and hard disk drives.

This ingenious diagnostic package is just one more way NRI's real-world, hands-on training gives you both the knowledge and the professional tools to succeed as today's in-demand computer service technician.

Free catalog tells more... send today!

Send the postage-paid card today for NRI's big, free catalog that gives all the facts about NRI computer training. See for yourself how NRI hands-on training can help you cash in on the growing opportunities for skilled computer service technicians.

If the card is missing, write to NRI at the address below.

NRI Schools
McGraw-Hill Continuing Education Center
4401 Connecticut Avenue, NW
Washington, DC 20008

IBM is a registered trademark of International Business Machines Corp. R.A.C.E.R. and QuickTech are registered trademarks of Ultra-X, Inc. Intel Inside is a trademark of the Intel Corp.

SEND CARD TODAY FOR FREE NRI CATALOG

NO POSTAGE NECESSARY IF MAILED IN THE UNITED STATES

BUSINESS REPLY MAIL
FIRST CLASS MAIL PERMIT NO. 10008 WASHINGTON, D.C.

POSTAGE WILL BE PAID BY ADDRESSEE

NRI Schools
McGraw-Hill Continuing Education Center
4401 Connecticut Avenue, NW
Washington, DC 20078-3543

CARD 101

20,000 PRODUCTS 24 HOURS A DAY.

SYSTEMS

All brands at the lowest prices!

SOFTWARE

Lotus SmartSuite 97 Upgrade *259
SmartSuite 97 289
Lotus 1-2-3, 97 219
Lotus 1-2-3 Upgrade 89
Approach 97 219
Notes/Domino 489
Ami Pro 3.01 209
Ami Pro 3.01 Cruiser/Turbo Tool 59
Ami Pro 3.01 Upgrade 89
1-2-3 for DOS 89
1-2-3 Mac/Win 249
Improv 2.1 269
SmartYou 89

CAMBRIX

Complete House SWRVCD213 329
Small Biz or Home SWRVCD212 49
Fractal Catalog™ SWRVCD225 30
A Line in the Sand SWRVCD224 30
Electricity and Magnetism SWRVCD223 29
The Angkor Legacy SWRVCD222 30
The Angkor Spectacular SWRVCD221 30
Sounds Kitchen SWRVCD230 30
Musical Puns SWRVCD231 30
Coming Soon 30
Earth and Universe SWRVCD211 35
Earth and Universe SWRVCD212 35
Sound Kitchen SWRVCD210 35

NETWORKING

3Com HomeConnect 3C5610 ..... $154
Ethernet 10 Base-T 3C509 129
Ethernet 8/16 Base-T 3C589 209
Ethernet 8 Combo 3C562 229
Ethernet 8 Combo 3C562c 229
Ethernet 8/16 10 pack 3C919 3,999
Ethernet 32 Bit 10 Base-T 3C529 229

ARTISOFT

Network Interface Cards (NIC)

140-bit AE-2 Starter Kit $479
140-bit AE-2 Window Starter Kit 499
214-bit AE-3 ISDN Single 79
214-bit AE-3 Window Single 99
NAS Node/Server 2000/dx 179

SMC

Ethernet+ Elite 16C $129
Ethernet+ Elite 16T 8 Pack 479

Thomas Conrad

TC-4045 16/4 Token Ring $349

Xircom

Network Gateway Connectivity

PE3-10BT Pocket Ethernet $269
PE3-10BC Pocket Ethernet 299
PE3-10BT Pocket Ethernet 269
Pocket Ethernet Starter Kit 349
PE3p 10BT Ether Plug 10/4 Hz-IT 349

MEMORY/SIMM

1MB 9 x 80ns ..... SCall
1 MB x 9 70ns ..... Call
2Mx36 9 70ns ..... Call
4 MB x 9 70ns ..... Call
512 x 36 2MB ..... Call
1 x 36 4MB ..... Call
2 x 36 8MB ..... Call
4 x 36 16MB ..... Call

PCMCIA CARDS

Ibeca 14.4 Fax Modem $299
Ibeca Ethernet Adapter FLA/5 169
Protocol Peripherals 14.4 Fax Modem 249
Minstar 42MB Hard Drive 440
Minstar 85MB Hard Drive 479
Minstar 170MB Hard Drive 899

New Media

New Media 56 bit wizard card ..... Call
New Media SCSI adapter card 249

Megahertz

2400/9600 bps MB5470HM $199
14.4/9.6 bps MB5C144 169

intel

Intel FaxModem 2400/9600 bps 199
Intel FaxModem 9600/19200 bps 299
Intel FaxModem 14.4/14.4 bps 289

Xircom

Media Networking Connectivity

Xircom Network combo 269
Xircom Network RJ-45 329
Xircom Network SNC 279

U.S. Robotics

US Robotics FaxModem 14.4/14.4 bps 339
US Robotics FaxModem 2400/9600 bps 299

UPS

American Power Conversion

Surge Arrester $19
Backup-UPS 250 99
Backup-UPS 400 169
Backup-UPS 900 369
Smart-UPS 250 299
Smart-UPS 600 559
Smart-UPS 1,000 1,169
Smart-UPS 1400IC 1,799
Smart-UPS 3000IC 3,899

PRINTERS

Canon

BJ-100X CNBJ100XW $269
BJ-200E CNBJ200E 289
BJ-S10 CNBJS10 399
BJC-4000 (SJ-48) CNBJC4000 1,299
BJC-610 (SJ-30) CNBJC610 1,499
BJC-620 (SJ-50) CNBJC620 1,499
LASER LBP-430 CNLBP430 1,649
LBP-860 CNLBP860 1,269

EPSON

Epson AP3250 ..... $174
Epson AP4000 249
Epson AP-870 214
Epson LQ-570+ 299
Epson LQ-1070+ 459
Epson LQ-870 429
Epson LQ-1170 599
Epson LQ-1070 Color 599
Epson EP-X 6000 1,312
Epson EP-X 8000 1,749
Epson S-1000 B/U MAC/PS/EPOS 319
Epson B/U EPSET-5000 319
Action Printer 3000 EPSAP3000 199

HEWLETT PACKARD

HP DeskJet 310 MAP4DJ310 ..... $249
HP DeskJet 500 MAP4C4709 309
HP DeskJet 520 HPDJ520 369
HP DeskJet 540 MAP4C4710 449
HP DeskJet 560C MAP4C4711 599
HP DeskJet 1000C MAP4DJ1000C 1,419
HP DeskJet 1200C PS MAP4DJ1200 1,929

IBM by LEXMARK.

3160 LEXX3160 ..... $399
3161 LEXX3161 449
2300 LEX2300 529
4039-010 Laser 10 LEXW4039 1,139
4029-010 Laser 10 LEXW4029 1,139
Lexmark 4037 LEX4037 629
Lexmark 4037 LEX4037 629
Lexmark 4049 LEX4049 1,469
Lexmark 2380+ LEX2380+ 349

Xircom

PE3(X)-3N Ethernet 10BT $235
Pocket 2+ Pro PCMCIA BASED 424
Serverboxer 10BT PE3 MAP/TCP/IP 1,929

OKIDATA

OL400IC Laser $399
OL400E Laser 629
OL810 Laser 1,239
ML380 Turbo Mono 319
ML380 Turbo Color 719
ML390 Dot Matrix 379
ML391 Turbo Dot Matrix 519
ML321 Dot Matrix 419
ML320 Dot Matrix 319
ML3410 Dot Matrix 1,119
ML320 Dot Matrix 319
ML3410 Dot Matrix 1,119
ML391 Dot Matrix 587
OL 20E+ OL Matrix 1,079

Panasonic

KX-P4410 Laser $589
KX-P4430 Laser 699
KX-P4440 Laser 1,149
KX-P4450 Laser 1,749
KX-P1123 Dot Matrix 239
KX-P1123 Dot Matrix 239
KX-P1124 Dot Matrix 319
KX-P1624 Dot Matrix 319
KX-P1654 Dot Matrix 439
KX-P4420 Color Laser 1,499
Switch-Mate 3400 KXSW3400 89

steer

NX-2400 24 Pin Color $744
SLI 144 Color Laser 1,552
SLI 98 Laser 744
SJ48- Ink Jet 399

TEXAS INSTRUMENTS

TI MicroPrinter 8545 ..... $1,485
TI MicroWriter 4500 LED Super 24HS 679
TI MicroWriter Pro 6000 Laser 17 Pages 1,399
TI MicroWriter Pro 600 P523 1,349
TI MicroWriter Pro 600 P524 1,599

FUJITSU

Print Partner 10 FJPD10 ..... $799
Print Partner 10W FJPD40 849

PARADISE VIDEO CARDS

WESTERN DIGITAL

24 Bit Color Accelerator
VCAL KIT/RT $119
Paradise Accelerator Value Card
VCAL/RT 79
VL1280/2 Local Bus Dual Voltage
VCAL/VL1280 109

MODDEMS

intel

Intel Internal 14.4 modem $139
Intel SatisFAXtion 400 169
Intel SatisFAXtion 400e 205
Intel SatisFAXtion 300 245
Intel SatisFAXtion 400 Internal 169
Intel SatisFAXtion 400 269
Intel SatisFAXtion 400e 329

Hayes

Hayes Ultra 96 Modem $480
Hayes Ultra 144 Modem 639
Hayes Optima 24+ Fax 96 159
Hayes Optima 96/96 FC 349
Hayes Optima 144/SC 22 439

PRACTICAL PERIPHERALS

PM14400FXMT Ext V.fc/fax 239
PM14400FX PKT Pocket V.42bis ..... Call
PM14400FX Internal V.fc/fax 239
PM14400FXIA External I/O 269
PM9600FXMT Ext V.32/fax 209
PM9600FXMT Ext V.32/fax 209
PM9600FX Internal 209
PM9600FXSA Internal 209
PM2400FX Internal 109

CD-ROM DRIVES

Double speed!

CHINON

Model CD532 ..... $59 Kit 419

NEC

Model 36 ..... $239 Kit $359
Model 3x/ Internal ..... 249 Kit 559
Model 3x/ External ..... 329 Kit 619
Bare ..... Call

Teac

Teac DS-100 32ms/300KB/S $249
Teac DS-200 Slot-Load 299

TEAC

Bare ..... $139 Kit $359

PLEXTOR

Model DM-3028
Internal bare ..... $256 Kit $449
External bare 301 499

TOSHIBA

Model 3401
Bare ..... $429 Kit $480

MULTIMEDIA

CREATIVE

Sound Blaster Pro Deluxes $125
Discovery CD 8 Internal 16S 765
Discovery CD 16 Internal 16 485
Sound Blaster 16 SCSI-2 Value 229
Sound Blaster 16 ASP 329
Sound Blaster MIDI Kit 59
Wave Blaster 169
Video Spigot for Windows 469

MEDIA VISION

Fusion Double CD 16 System $539
Pro Audio Spectrum 16 Multimedia 479

REVEAL

MultimediaFX + 32 16 drive double speed, 32Kb/s transfer, 16 bit sound, speakers, microphone and 16 titles $299

MultimediaFX + 64 16 drive double speed, 64Kb/s transfer, 16 bit sound, speakers, microphone and 16 titles 379

MultimediaFX + 96 16 drive double speed, 96Kb/s transfer, 16 bit sound, speakers, microphone and 21 titles 399

INPUT DEVICES

Digitize - Ergonomic - Mouse		
Logitech Mouse Man	Ser.	79
Logitech Mouse Man	Bus	79
Logitech TrackMan	Ser.	79
Logitech TrackMan	Bus	79
Logitech TrackMan Cordless		129
Logitech Marble Mouse		89
Kurta XLP 12"x12"	Digitizer	239

MATH COPROCESSORS

intel

80287SX $99
80387SX-20 99

Talon

Talon 25MHz Internal $199

WeitekPower

w/C's unstructured hooks 1SX/1x25/K $179
w/C's structured hooks 1SX/1x25/K 199

INTEL OVERDRIVE

OverDrive 486SX/20	$329	
OverDrive 486DX/20	439	
OverDrive 486DX/25	449	
OverDrive 487SX/25	449	

MONITORS

HITACHI

15" SuperScan CM715E $499
17" SuperScan Pro CM751E 799
17" SuperScan Pro CM753E (Digital) 1,249
20" SuperScan Pro CM2038 3,649
21" SuperScan Pro CM2138 (Digital) 5,499
21" SuperScan Elite CM2139 2,499

Sight

NEC

15" MultiSync 3FG .28 dp MP3+E $399
17" 1280x1024 NI .28 dp MP3E 699
20" 1280x1024, NI, .28 dp, ... 1,299

NEC

15" MultiSync 3FG .28 CMNEC3FGE $539
17" MultiSync 3FG .28 CMNEC3FGE 799
17" MultiSync XV .28 CMNEC3XVE 1,099
17" MultiSync XV .28 CMNEC3XVE 1,299

ADI

14" MicroScan 3D CMADI14 ..... $349
14" MicroScan 3D CMADI14A 340
14" MicroScan 3D CMDS14E 379
14" MicroScan 3D CMDS14S 399
14" MicroScan 3A CMDS14T 299

NOKIA

Nokia 445X .31" CMNOKIA445X $2,399
Nokia 449M 21" CMNOKIA21D 2,695
Nokia 447Xi 21" CMNOKIA447Xi 2,999
Nokia 447Pi/20 17" CMNOKIA17D 1,399
Nokia 445X .31" CMNOKIA445X 2,399
Nokia 445Xi .28" CMNOKIA445Xi 2,699

REMOVABLE STORAGE

MOTAMETRIX

Fujitsu Internal Magneto Optical (FC) 5780 ..... $1,299
Fujitsu Internal 128MB 429
Bernoulli Transfer Multidisk 150 399
Bernoulli Transfer Multidisk 150 460
Bernoulli Transfer Mini Floptical 150 299
Bernoulli PC/28 Interface Card 109

COMNER

Tape/Disc 2.5GMB Internal 4/DAT $139
Tape/Disc 250MB Ext. For A/S400T 359

EXABYTE

8mm 5.0 Gig Model 8505 ..... $2,599
8mm 2.2 Gig Model 8205 1,699
8mm Tape Drive Internal 1,199
External 1,299

MEGA

Iomega Tape250 Inside Internal $189
Iomega Tape250 PC Powered Ext 159
Iomega Tape250 Parallel 319
Iomega Tape250 Insider Basic 259

WangDAT

4mm DAT 2GB 3/5 16 Bit Kit $990
4mm DAT 2GB 3/5 16 Bit Bare 840
4mm DAT 4GB 3/5D Ext 16 Bit Kit 1,296
4mm DAT 8GB 3460 Hi, 16 Bit Kit 2,599

HARD DRIVES

HARD DRIVES International

Complete installation kit, including 3 1/4" mounting frame, Data/Cable Rail Set, Screws, Jumper Blocks & Brochure. HDD=Hard Drive Installation Guide with step-by-step installation instructions.

Capacity	Interface	Model	Access	FF/Height	Bare	Kit
1.7GMB	IDE	WDAC2170	12ms	3.5"/1.0"	$159	

WESTERN DIGITAL

170MB	IDE	WDAC2170	12ms	3.5"/1.0"	$159	
210MB	IDE	WD1210A	12ms	3.5"/1H	209	$229
250MB	IDE	WD2502A	12ms	3.5"/1H	219	239
340MB	IDE	WD2340A	12ms	3.5"/1H	279	299
420MB	IDE	WD2420A	12ms	3.5"/1H	369	389
540MB	IDE	WD2540A	12ms	3.5"/1H	429	449

CONNER

170MB	IDE	CP3017A	17ms	3.5"/1H	$189	$209
250MB	IDE	CP3022A	15ms	3.5"/1H	229	249
340MB	IDE	CP30344	13ms	3.5"/1H	283	303
420MB	IDE	CP30423	13ms	3.5"/1H	365	385
545MB	IDE	CP30544	10ms	3.5"/1H	579	599
545MB	SCSI	CP30540	10ms	3.5"/1H	649	759

FUJITSU

520MB	IDE	FJD524A	12ms	3.5" HH	$499	$519
520MB	SCSI	FJD524S	12ms	3.5" HH	519	689
1050MB	SCSI	FJD1054S	12ms	3.5" HH	999	1,149
2060MB	SCSI	FJD2545	12ms	5.25" FH	1,299	1,449

Maxtor

130MB	IDE	MXT131A	15ms	3.5"/1H	$189	$209
213MB	IDE	MXT213A	15ms	3.5"/1H	219	239
250MB	SCSI	MXT245S	15ms	3.5"/1H	289	419
340MB	IDE	MXT340A	12ms	3.5"/1H	319	318
340MB	SCSI	MXT345S	12ms	3.5" HH	349	499
540MB	IDE	MXT540A	12ms	3.5"/1H	529	549
540MB	SCSI	MXS540S	12ms	3.5"/1H	759	909

MICROPOLIS

976MB	IDE	MC2210A	10ms	3.5" HH	$823	$849
1050MB	SCSI	MC2210S	10ms	3.5" HH	839	989
1.1GMB	IDE	MC2217A	10ms	3.5"/1H	1,049	1,199
1750MB	SCSI	MC2217S	10ms	3.5"/1H	1,099	1,249
2100MB	SCSI	MC3243S	11ms	3.5"/1H	1,499	1,649
3000MB	SCSI	MC1936	11ms	5.25" FH	2,099	2,249

Quantum

170MB	IDE	QLPS1170A	12ms	3.5"/1H	$189	$209
210MB	IDE	QLPS2100A	12ms	3.5"/1H	249	349
270MB	IDE	QLPS2270A	9ms	3.5"/1H	249	269
270MB	SCSI	QLPS2270S	9ms	3.5"/1H	269	419
340MB	IDE	QLPS3430A	12ms	3.5"/1H	279	299
340MB	SCSI	QLPS3430S	12ms	3.5"/1H	299	449
540MB	IDE	QLPS5440A	12ms	3.5"/1H	529	529
540MB	SCSI	QLPS5440S	12ms	3.5"/1H	569	719
1.0GMB	SCSI	QLMP1080S	12ms	3.5"/1H	849	999
1225MB	SCSI	QLPD1225S	10ms	3.5" HH	949	1,099
1.6GMB	SCSI	QLPD1862S	10ms	3.5" HH	1,189	1,339

Seagate

42MB	IDE	ST351A	28ms	3.5"/1H	$139	$159
130MB	IDE	ST3145A	15ms	3.5"/1H	189	209
213MB	IDE	ST3243A	15ms	3.5"/1H	219	239
260MB	IDE	ST3290A	15ms	3.5"/1H	239	249
340MB	IDE	ST3391A	12ms	3.25" FH	279	299
340MB	SCSI	ST3390N	12ms	3.5" HH	299	449
452MB	IDE	ST3550A	12ms	3.5"/1H	399	419
540MB	IDE	ST3600A	12ms	3.5"/1H	529	549
540MB	IDE	ST3655A	12ms	3.5"/1H	529	549
540MB	SCSI	ST3655N	12ms	3.5"/1H	529	739
1050MB	SCSI	ST31200N	11ms	3.5"/1H	999	1,049
1700MB	SCSI	ST11950N	12ms	3.5"/1H	1,299	1,399
1700MB	SCSI	ST11950N	Barracuda	3.5" HH	1,579	1,729
2100MB	SCSI	ST12430N	Barracuda	3.5" HH	1,499	1,709
2100MB	SCSI	ST12550N	Barracuda	3.5" HH	1,559	2,009
2100MB	SCSI	ST12400N	10.5ms	3.5"/1H	1,559	1,709
2900MB	SCSI	ST34300N	11ms	5.25" FH	2,099	2,249

If you don't see what you need -- call!

FREE Insight Catalog.

The Insight catalog is your "Super Phone" source for computers, hardware and software.

Insight

National Accounts - 800-998-9061
Corporate Fax - 602-902-1191
Government Fax - 602-902-1125
Educational Fax - 602-902-1177

Prices and availability subject to change without notice. POs, Worry Free Guarantee and 30 Day Price Warranty may have some restrictions. Shipping is non-refundable. All trademarks are the properties of their respective owners. Opened software is not returnable. Intel Inside is a registered trademark of Intel Corporation. ©Insight Direct, Inc. 4/96

BETTER

■ Order 24 hours a day, seven days a week.
■ "Worry-Free" Money-Back Guarantee.
■ One-Year System Warranty. ■ Custom configuration of your system to suit your needs.
■ Computer Shopper *Best Buy Award* for Hard Drives 6 straight years. ■ The best selection of some of the hottest brand names in computers, hardware, and software. Over 20,000 items in stock.

FASTER

■ Fully automated Federal Express delivery.
■ 24-hour delivery on our most popular systems.
■ 98% of in-stock items delivered next business day.

CHEAPER

■ Simply the lowest prices. ■ Our tremendous buying power means savings to you. ■ Wide range of payment options including low-cost leasing. ■ Use your Insight Credit Card - no down payments. No annual fee. ■ Call for your copy of our NEW Insight catalog - A shopper's paradise - FREE!

800-755-9649

Circle 103 on reader service card.

Meet Your Maker.

Acer is the end-to-end direct source that manufactures what it sells.

Join The Pentium™ Revolution With The AcerPower 9000T.

Make the next technological move up with the impressive Pentium-based AcerPower 9000T. Unmatched 64-bit processing speed and massive expansion capability add up to a system that will serve you for years to come—at a price you can afford now.

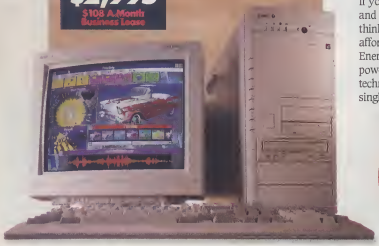
Acer Power 9000T

- Intel® Pentium 60MHz CPU
- BMB System RAM (expandable to 192MB)
- 256KB Second-level Cache
- 540MB Fast IDE Hard Drive
- Panasonic™ 2X CD-ROM Drive
- 1.44MB Floppy Disk Drive
- 15" .28mm Dot Pitch Non-interlaced SVGA Color Monitor
- ATI PCI Graphics Accelerator
- 2 PCI 64-bit Expansion Slots
- 4 ISA Expansion Slots
- 1 Combination PCI/ISA Slot
- Microsoft® Windows™ for Workgroups, MS-DOS® 6.2, Productivity/Entertainment Packs, Works for Windows,™ and Quicken® Installed

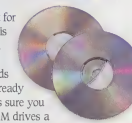
SPECIAL 15" SVGA Monitor with ATI Graphics Card

intel inside

$2,995
$108 A Month Business Lease



Acer Raises The Standard! All Systems Feature A CD-ROM Drive.



Technology waits for no one—so don't wait for other companies to realize a CD-ROM drive is an essential part of a complete PC system. New encyclopedias of information, interactive multimedia software and virtual worlds of advanced information technology are already becoming mainstream. Now Acer makes sure you won't be left behind by making CD-ROM drives a standard feature on all desktop PCs. **And to top it off, all systems also come standard with MS-DOS 6.2 and Windows for Workgroups.**

AcerPower—For Power-Hungry Applications.

Ready for a Windows workstation that's fast enough to keep up with you—and multiple applications? Then the AcerPower series is made for you. Real power-users wouldn't settle for less than the screaming 32-bit processing power, integrated CD-ROM drive and VESA local bus accelerated graphics featured in the AcerPower line. And don't worry about the system taking up the whole room—the AcerPower series includes a slim minitower that's still big on power.

AcerACROS—The Affordable High-Performance Workstation.

If you thought 486 power, 32-bit processing, a built-in CD-ROM drive and accelerated local bus video were way out of reach of your budget—think again! The AcerACROS series has got it all at a price you can afford now. Add to your savings when you choose one of the EPA Energy Star-compliant AcerACROS systems. Some models enter a low-power-use state to conserve energy and costs. Plus, Acer ChipUp™ technology makes upgrading these systems as easy as replacing the single CPU chip.

VISA MasterCard LEASING

Acer Computers • The Industry Source

Now you

800-230-ACER

AcerPower 486DX2/66T

- Intel 486DX2/66MHz CPU
- 16MB System RAM (expandable to 64MB)
- 256KB Second-level Cache
- 420MB Hard Disk Drive and **2X CD-ROM Drive**
- 1.44MB Floppy Disk Drive
- S3 1MB VESA Graphics Accelerator
- 15" .28 Non-interlaced SVGA Color Monitor
- Upgradable to Intel Pentium Upgrade Processor
- Microsoft Works for Windows, Productivity/ Entertainment Packs and Quicken® Installed
- 8 16-bit ISA Slots, 2 on 32-bit VESA Bus

The Power House

$2,755
$99 A Month Business Lease

AcerPower 486DX2/66

- Intel 486DX2/66MHz CPU
- 8MB System RAM (expandable to 64MB)
- 256KB Second-level Cache
- 340MB Hard Disk Drive and **2X CD-ROM Drive**
- 1.44MB Floppy Disk Drive
- S3 1MB VESA Graphics Accelerator
- 15" .28 Non-interlaced SVGA Color Monitor
- Upgradable to Intel Pentium Upgrade Processor
- Microsoft Works for Windows, Productivity/ Entertainment Packs and Quicken Installed
- 8 16-bit ISA Slots, 2 on 32-bit VESA Bus

PC WORLD

$2,355
$85 A Month Business Lease

AcerPower 486DX2/50

- Intel 486DX2/50MHz CPU
- 8MB System RAM (expandable to 64MB)
- 128KB Second-level Cache
- 420MB Hard Disk Drive and **2X CD-ROM Drive**
- 1.44MB Floppy Disk Drive
- S3 1MB VESA Graphics Accelerator
- 15" .28 Non-interlaced SVGA Color Monitor
- Upgradable to Intel Pentium Upgrade Processor
- Microsoft Works for Windows, Productivity/ Entertainment Packs and Quicken Installed
- 8 16-bit ISA Slots, 2 on 32-bit VESA Bus

The Graphics Blaster

$2,195
$79 A Month Business Lease

Acer ACROS 486DX2/50

- Intel 486DX2/50MHz CPU
- 4MB System RAM (expandable to 36MB)
- 128KB Second-level Cache
- 420MB Hard Disk Drive and **2X CD-ROM Drive**
- 1.44MB Floppy Disk Drive
- 1MB VESA Cirrus Logic™ Graphics Accelerator
- 14" .28 Non-interlaced SVGA Color Monitor
- Upgradable to Intel Pentium Upgrade Processor
- Microsoft Works for Windows, Productivity/ Entertainment Packs and Quicken Installed
- 4 16-bit ISA Slots

The Perfect Windows Workstation

$1,795
$65 A Month Business Lease

Acer ACROS 486SX/33

- Intel 486SX/33MHz CPU
- 4MB System RAM (expandable to 36MB)
- 340MB Hard Disk Drive and **2X CD-ROM Drive**
- 1.44MB Floppy Disk Drive
- 1MB VESA Cirrus Logic Graphics Accelerator
- 14" .28 Non-interlaced SVGA Color Monitor
- Upgradable to Intel Pentium Upgrade Processor
- Microsoft Works for Windows, Productivity/Entertainment Packs, Quicken and Prodigy® Installed
- 4 16-bit ISA Slots
- **128KB Cache Upgrade.....$35**

Excellent Price/ Performance

$1,495
$54 A Month Business Lease

Upgrade Your Monitor!

For just a little extra money you can see a lot more. Take advantage of our monitor upgrade program.

$99 Additional

AcerView™ 56L 15" Color Monitor

- 15" Non-glare Flat Square Screen
- Low Radiation CRT
- SuperFine 0.28mm Dot Pitch
- 1024 x 768 Resolution, NI
- Intelligent Micro-control System
- Ergonomic Tilt/Swivel Base

$549 Additional

AcerView 76i 17" Color Monitor

- 17" Non-glare Flat Screen
- SuperFine 0.28mm Dot Pitch
- iColor System for Color Adjustments
- Intelligent iScreen Menus
- Automatic Display Mode Switching
- 16 User-programmable Display Modes
- VGA, SVGA, XGA, VESA and CAD/CAM Compatible
- VLMF Low Radiation Feature

Call for prices to purchase monitors separately.

Multimedia Upgrade Kit

Make the most of the new Acer CD-ROM standard with this special multimedia upgrade kit that includes: Sound Blaster and Business Audio-compatible 16-bit Sound Card; High-performance Stereo Speakers; Microsoft Multimedia Bundle with Works, Encarta,™ Golf, Cinemania™ and Soundbits.™

Only $195

can buy Acer direct.

Monday through Friday 6 AM–6 PM and Saturday 8 AM–4 PM Pacific Time
Also available through our fine resellers and retailers.

When calling, please reference #044 ACD

Acer

Come to the source for all your notebook needs.

Acer Manufactures Its Own Notebooks.

At Acer, we know notebook computers inside and out—because we manufacture them ourselves. So when you're working on the road and need your network, mainframe or other resources that you use most, you can rely on your AcerNote for power and convenience. Stay connected with the PCMCIA capabilities featured in the AcerNote 735 and 750 series of modular color notebook computers. With PCMCIA, just slide in a PC-card and you can tap into your network, send information to a fax machine via modem or access additional storage devices.

Ergonomic trackball and palmrest.

Service And Support

Call A Helpful Engineer 7 Days A Week/24 Hours A Day.

Have a question about how to set up your system? Want to know how to get going on Microsoft Works for Windows? Curious about what options are available with your system? Just call us toll-free, any time of day, any day of the week and our trained professionals will be happy to help.

A Full Year Of On-Site Service.

Don't worry. If you have a problem with your Acer desktop system, we'll have a service representative out to you in 48 hours—we promise.

Express Parts Replacement.

Because time is money, we will get replacement parts out in less than 72 hours. You can feel confident with Acer after-sale service.

30-Day Money-Back Guarantee.

We are so sure that you'll be totally satisfied with your new Acer system that we're offering a full 30-day money-back guarantee—no questions asked.

Rely On The Strength Of A $1.9 Billion Giant.

Since our start in 1976, Acer has grown to be the vendor of choice for the world's top computer companies. Some of the biggest names in the industry recognize Acer as one of the most quality-conscious PC manufacturers in the world today. Our attention to detail, excellent record of reliability and great value have helped us to achieve status as the world's leading OEM manufacturer. Acer has achieved a solid reputation for innovation after 17 years of building unique computing solutions. You'll get new technology first with Acer. And now you can buy direct from the industry source.

Acer Note 735c 486SX/33

Introducing The Flexible New 486SX/33 AcerNote 735c Series Now With PCMCIA Capability.

intel inside

Now you can have outstanding 486SX/33MHz power and speed with the new AcerNote 735c series. Incredible flexibility con be yours anywhere you need it with PCMCIA ports and a high-performance CPU packed into a sleek and sophisticated notebook computer with local bus video.

- Intel® 486SX/33MHz CPU
- 4MB System RAM
- 2 PCMCIA Type II Slots/1 Type III Slot
- 9.5" Passive-matrix Color Display
- 209MB Hard Disk Drive
- Palmrest with Integrated Trackball
- **Local Bus Video with 512KB VRAM**
- MS-DOS 6.2, Microsoft Windows 3.1
- International Travelers Warranty
- 24-hour "Hot Swap" Warranty

$2,395

$86 A Month Business Lease

$1,795 Monochrome Price

$65 A Month Business Lease

ACER COMPUTERS THE INDUSTRY SOURCE

Now you can buy Acer direct.

VISA MasterCard LEASING

Also available through our fine resellers and retailers.

AcerNote 750c 486SL/25

- Intel 486SL/25MHz CPU
- 4MB System RAM
- 2 PCMCIA Type II Slots/1 Type III Slot
- 9.5" Active-matrix Color Display
- 209MB Hard Disk Drive
- Palmrest with Integrated Trackball
- MS-DOS 6, Microsoft Windows 3.1 and Works for Windows Installed
- International Travelers Warranty
- 24-hour "Hot Swap" Warranty

Active-Matrix Color Display

$3,395
$123 A Month Business Lease

AcerNote 730c 486SX/25

- Intel SL-Enhanced 486SX/25MHz CPU
- 4MB System RAM
- 9.5" Dual-scan Passive-matrix Color Display
- 120MB Hard Disk Drive
- Palmrest with Integrated Trackball
- SmartCase Modular Housing
- **Free Fax Modem and Software**
- MS-DOS 6, Microsoft Windows 3.1 and Works for Windows and Prodigy Installed
- International Travelers Warranty

Affordable Color Notebook

$2,195
$79 A Month Business Lease

AcerNote 750 486SL/25

- Intel 486SL/25MHz CPU
- 4MB System RAM
- 2 PCMCIA Type II Slots/1 Type III Slot
- 9.5" Monochrome Display
- 120MB Hard Disk Drive
- Palmrest with Integrated Trackball
- SmartCase™ Modular Housing
- MS-DOS 6, Microsoft Windows 3.1 and Works for Windows Installed
- International Travelers Warranty

Connect With PCMCIA

$1,695
$62 A Month Business Lease

AcerNote 730 486SX/25

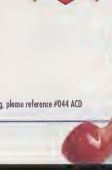
- Intel SL-Enhanced 486SX/25MHz CPU
- 4MB System RAM
- 9.5" Monochrome Display
- 120MB Hard Disk Drive
- Palmrest with Integrated Trackball
- **Free Fax Modem and Software**
- MS-DOS 6, Microsoft Windows 3.1 and Works for Windows and Prodigy Installed
- International Travelers Warranty
- 24-hour "Hot Swap" Warranty

Exceptional Value And Performance

$1,495
$54 A Month Business Lease

Assistance Around The Globe.

When you take your Acer notebook on the road, you take first-class service and support with you. The AcerNote series is backed by a one year, 24-hour replacement warranty in the U.S. and Canada. To assure you the security of support in over 20 countries worldwide, a free one-year Acer International Travelers Warranty is also included.



Call 800-230-ACER

Monday through Friday 6 AM-6 PM and Saturday 8 AM-4 PM Pacific Time

When calling, please reference #044 ACD

Acer Notebook Accessories

When it comes to notebook computers—Acer wrote the book! You'll find a full range of notebook computers offered in the AcerNote lineup, so you can be certain of finding just the right one for you. Plus, if you need any other peripherals or notebook accessories, count on Acer for the best in quality and performance.

PCMCIA Fax/Data Modem

14.4 Fax/Data Modem
$299

9600/2400 Fax/Data Modem
$199

PCMCIA Card

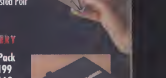
IBM Ethernet–Coax
$349

IBM Ethernet–Twisted Pair
$349

Spare Battery

NiMH Battery Pack
AcerNote 750–$199
AcerNote 735–$169
AcerNote 730–$169

NiCad Battery Pack
AcerNote 750–$119
AcerNote 735–$99
AcerNote 730–$99



Additional Memory

AcerNote 750, 735, 730 Series–4MB Memory Upgrade
$269

AcerNote 735, 730 Series–8MB Memory Upgrade
$699

AcerNote 750 Series–16MB Memory Upgrade
$1,599

Please call 1-800-230-ACER for details on the money-back guarantee, limited warranty and International Travelers Warranty. Return shipping and insurance charges are the responsibility of the customer. Not available in Canada. On-site service may not be available in certain remote locations. Products, availability, prices and programs are subject to change or cancellation without notice. Shipping and handling charges are extra. Acer, ACROS and the Acer logo are registered trademarks and AcerNote, AcerPower, AcerVerse, ChipUp and SmartDoze are trademarks of Acer America Corporation and Acer, Inc. Intel and the Intel Inside Logo are registered trademarks of Intel Corporation. All other brands and product names are trademarks or registered trademarks of their respective companies. ©1994 Acer America Corporation. All rights reserved.

Acer

VTech Makes Buying Direct Easy...

486DX2/66 Multi-Media Hardware Feature Comparison

Feature	VTech	DELL	Gateway	ZEOS
Memory	8MB	8MB	8MB	8MB
Hard Drive	426MB	450MB	424MB	426MB
Floppy Drives	3.5"	3.5"	3.5"	3.5"
Video	1MB VLB	1MB VLB	1MB VLB	1MB VLB
3 Year Warranty	Yes	No	No	No
Double Speed CD-ROM	Yes	Yes	Yes	Yes
Sound Card & Speakers	Yes	Yes	Optional ($132)	Optional ($148)
Modem	Yes	Optional ($79)	Optional ($49)	Optional ($49)
Remote Diagnostics Sftw.	Yes	No	No	No
Case	Full Size	Desktop	Baby AT	Desktop
External Cache	128K	128K	128K	No
Monitor	15"	15"	15"	Upgrade ($95)
PC Computing Service	★★	★★	★★	★★
Value Rating (Aug 1993)	★★★	★★	★★	★★
Price	**$2199**	**$3074**	**$2476**	**$2762**

The VTech Multi-Media systems are available with VTech's integrated local bus or with our new VESA local bus . Each system also includes Compton's Interactive Encyclopedia, Webster's Dictionary and World Atlas which will turn your computer into a complete information center for the whole family.

In 1993 Computer Shopper singled out VTech as one of the fastest growing companies in the PC industry. The reason is simple, we are the manufacturer - not an assembler of someone else's components - which means we can truly deliver-"Technology at Prices You Can Afford."

- VTech designs and manufactures our own components so we control the quality, features and performance.
- With over 11,000 employees and 3 research and engineering labs VTech has the technology and resources to build incredible systems.
- Our prices are among the lowest in the industry because we supply systems to some of the largest manufacturers in the world and that helps us keep production high and prices low.
- 3 year warranty - PC Computing gave VTech a 5 Star Service Value Rating beating out Dell, Gateway, ZEOS, IBM and Compaq.

3 YEAR WARRANTY

BEST BUY

...Multi-Media Systems You Can See and Hear

Expo 486SX33M

- Pentium Technology Ready
- 4MB RAM
- 250MB 13ms IDE Hard Drive
- Double Speed CD-ROM
- Stereo Sound Board
- Compton's Interactive Encyclopedia, Webster's Dictionary and World Atlas
- Local Bus Graphics with 1MB
- 3.5" Diskette Drive
- 14" VTech HiRez Monitor
- Full Size Metal Desktop Case
- 9600/2400 Data/Fax Modem
- Remote Diagnostics Software
- MS-DOS 6.2 & Windows 3.1
- Enhanced 101 - Keyboard & Mouse
- 3 Year Warranty

$1449
$1399 with 486SX25

Expo 486DX33VM

- **Intel Verified:** for the Pentium™ OverDrive™ Processor
- 4MB RAM with 128KB Cache
- 340MB 13ms IDE Hard Drive
- Double Speed CD-ROM
- Stereo Sound Board
- Compton's Interactive Encyclopedia, Webster's Dictionary and World Atlas
- VLB Graphics with 1MB
- 3.5" Diskette Drive
- 15" VTech HiRez Monitor
- Full Size Metal Desktop Case
- Dual Cooling Fans
- 9600/2400 Data/Fax Modem
- Remote Diagnostics Software
- MS-DOS 6.2 & Windows 3.1
- Enhanced 101 - Keyboard & Mouse
- 3 Year Warranty

$1799
$1899 with 486DX2/50

Expo 486DX2/50VM

- **Intel Verified:** for the Pentium™ OverDrive™ Processor
- 8MB RAM with 128KB Cache
- 424MB 13ms IDE Hard Drive
- Double Speed CD-ROM
- Stereo Sound Board
- Compton's Interactive Encyclopedia, Webster's Dictionary and World Atlas
- VLB Graphics with 1MB
- 3.5" Diskette Drive
- 15" VTech HiRez Monitor
- Full Size Metal Desktop Case
- Dual Cooling Fans
- 9600/2400 Data/Fax Modem
- Remote Diagnostics Software
- MS-DOS 6.2 & Windows 3.1
- Enhanced 101 - Keyboard & Mouse
- 3 Year Warranty

$1999
$2199 with 486DX2/66

Expo 486DX2/66VM

- **Intel Verified:** for the Pentium™ OverDrive™ Processor
- 16MB RAM with 128KB Cache
- 527MB 12ms IDE Hard Drive
- Double Speed CD-ROM
- Stereo Sound Board
- Compton's Interactive Encyclopedia, Webster's Dictionary and World Atlas
- VLB Graphics with 1MB
- 3.5" Diskette Drive
- 15" VTech HiRez Monitor
- Full Size Metal Desktop Case
- Dual Cooling Fans
- 9600/2400 Data/Fax Modem
- Remote Diagnostics Software
- MS-DOS 6.2 & Windows 3.1
- Enhanced 101 - Keyboard & Mouse
- 3 Year Warranty

$2599

VTECH® Technology You Can Afford™

Hot New VESA Systems...

The Expo 486 VESA System with Multi-Media upgrade

The VTech VESA systems have been specially optimized to deliver the speed and graphics performance that today's Windows applications demand. Each system is equipped with two VESA slots and extra attention has been placed on system compatibility with a wide range of VESA cards. These systems deliver great Windows performance and the extra features you want, at prices you can afford.

The ExpoTech family of VESA systems is available with a wide range of processors, hard drives and memory combinations. All VTech systems are covered by a 3 year warranty and include the extra features and support VTech is known for.

- 2 VLB Slots
- Novell Certified
- Advanced case design with dual cooling fans
- 30 day money back guarantee

The VTech VESA systems are loaded with the extra features. Dual Cooling Fans keep the processor, system board, and option cards cool. This means if you upgrade to the Pentium OverDrive Processor it will be safe and reliable. In fact, these systems have been Intel Verified: for the Pentium™ OverDrive™ Processor.

3 YEAR WARRANTY

BEST BUY

...Prices You Can't Beat

Expo 486SX33V

- **Intel Verified**: for the Pentium™ OverDrive™ Processor
- 4MB RAM
- 250MB 14ms IDE Hard Drive
- VLB Graphics with 1MB
- 3.5" Diskette Drive
- 14" VTech HiRez Monitor
- Full Size Metal Desktop Case
- Dual Cooling Fans
- 9600/2400 Data/Fax Modem
- Remote Diagnostics Software
- MS-DOS 6.2 & Windows 3.1
- Enhanced 101 - Keyboard & Mouse
- 3 Year Warranty

$1199
$1399 with 486DX33

Expo 486DX33V

- **Intel Verified**: for the Pentium™ OverDrive™ Processor
- 4MB RAM with 128KB Cache
- 340MB 13ms IDE Hard Drive
- VLB Graphics with 1MB
- 3.5" Diskette Drive
- 14" VTech HiRez Monitor
- Full Size Metal Desktop Case
- Dual Cooling Fans
- 9600/2400 Data/Fax Modem
- Remote Diagnostics Software
- MS-DOS 6.2 & Windows 3.1
- Enhanced 101 - Keyboard & Mouse
- 3 Year Warranty

$1549
$1599 with 486DX2/50

Expo 486DX2/50V

- **Intel Verified**: for the Pentium™ OverDrive™ Processor
- 8MB RAM with 128KB Cache
- 424MB 13ms IDE Hard Drive
- VLB Graphics with 1MB
- 3.5" Diskette Drive
- 15" VTech HiRez Monitor
- Full Size Metal Desktop Case
- Dual Cooling Fans
- 9600/2400 Data/Fax Modem
- Remote Diagnostics Software
- MS-DOS 6.2 & Windows 3.1
- Enhanced 101 - Keyboard & Mouse
- 3 Year Warranty

$1749
$1949 with 486DX2/66

Expo 486DX2/66V

- **Intel Verified**: for the Pentium™ OverDrive™ Processor
- 16MB RAM with 128KB Cache
- 527MB 12ms IDE Hard Drive
- VLB Graphics with 1MB
- 3.5" Diskette Drive
- 15" VTech HiRez Monitor
- Full Size Metal Desktop Case
- Dual Cooling Fans
- 9600/2400 Data/Fax Modem
- Remote Diagnostics Software
- MS-DOS 6.2 & Windows 3.1
- Enhanced 101 - Keyboard & Mouse
- 3 Year Warranty

$2299

intel inside

1-800-819-0070

Circle 195 on reader service card.

VTech Power Systems...

VTech is the first and only company to bring Symmetrical Multiprocessing to the desktop at prices that blow away even single processor systems. Just look what the experts are saying.

- "The overall performance of the VTech gave it the highest rating of any of the 486 systems, and the jaw dropping price is outstanding."
  Computer Shopper, February 1994
- "The awesome VTech Platinum beats the Pentium and costs a cool $3,995 [Now Even Lower!]"
  Computer Shopper, February 1994
- "Multiprocessing is clearly the wave of the future."
  PC Week, August 23, 1993
- "VTech leads in PC Multiprocessing."
  PC Magazine, October 12, 1993

The VTech Platinum SMP with CD-ROM

VTech is the first and only company to bring Symmetrical Multiprocessing to the desktop at prices that compete with single processor systems. VTech provides you with three upgrade paths. From the single processor Platinum 486 you can upgrade to dual 486 processors, a single Pentium™ Overdrive™ Processor, or for the ultimate in power and performance, dual Pentium™ Overdrive™ Processors.

Pentium systems are the next frontier of PC performance. If you have a need for speed the VTech Pentium systems will deliver. Utilizing the PCI bus the VTech systems deliver high power at breakthrough pricing.

3 YEAR WARRANTY

BEST BUY

...Double Your Power, Not Your Price

Platinum 486DX2/50

- Intel 486DX2/50 Processor
- Intel Verified: for the Pentium™ OverDrive™ Processor
- 8MB RAM
- 424MB 13ms IDE Hard Drive
- 256KB Copy Back Cache w/Cast Out Buffering
- SCSI II w/ built-in BIOS support
- 16550 Serial Port Controllers
- Multiprocessor Upgrade Slot
- S3 VLB Accelerator with 1MB
- 3.5" Diskette Drive
- 15" VTech HiRez Monitor
- Full Size Metal Desktop Case
- MS-DOS 6.2 & Windows 3.1
- Enhanced 101 - Keyboard & Mouse
- 3 Year Warranty

$1999
$2299 with 486DX2/66

Platinum 486DX2/66

- Intel 486DX2/66 Processor
- Intel Verified: for the Pentium™ OverDrive™ Processor
- 16MB RAM
- 424MB 13ms IDE Hard Drive
- Double Speed CD-ROM
- 256KB Copy Back Cache w/Cast Out Buffering
- SCSI II w/ built-in BIOS support
- 16550 Serial Port Controllers
- Multiprocessor Upgrade Slot
- S3 VLB Accelerator with 1MB
- 3.5" Diskette Drive
- 15" VTech HiRez Monitor
- Full Size Metal Desktop Case
- MS-DOS 6.2 & Windows 3.1
- Enhanced 101 - Keyboard & Mouse
- 3 Year Warranty

$2799

Platinum 486DX2/66[2]

- Dual Intel 486DX2/66 Processors
- Intel Verified: for the Pentium™ OverDrive™ Processor
- 16MB RAM
- 527MB 12ms IDE Hard Drive
- Double Speed CD-ROM
- 256KB Copy Back Cache w/Cast Out Buffering
- SCSI II w/ built-in BIOS support
- 16550 Serial Port Controllers
- S3 VLB Accelerator with 1MB
- 3.5" Diskette Drive
- 15" VTech HiRez Monitor
- Full Size Metal Desktop Case
- Windows NT
- MS-DOS 6.2 & Windows 3.1
- Enhanced 101 - Keyboard & Mouse
- 3 Year Warranty

$3799

Platinum P5-60

- Intel 60MHz Pentium™ CPU
- 8MB RAM with 256k Cache
- 424MB 13ms IDE Hard Drive
- PCI Local Bus Graphics with 1MB
- 3.5" Diskette Drive
- Enhanced Parallel Port
- High Speed Serial Port Controllers
- 15" VTech HiRez Monitor
- Full size Metal Desktop Case
- Double Speed CD-ROM
- MS-DOS 6.2 & Windows 3.1
- Quality Keyboard, Mouse
- 3 Year Warranty
- Next generation P5T Pentium Overdrive Processor Ready
- Dual Cooling Fans
- Self Sensing setup for HD and memory

$2799
$3299 with 16MB and 527MB HD

VTECH® Technology You Can Afford™

VTech Value Systems...

The Expo 486 Integrated Systems

The ExpoTech series of integrated systems from VTech have been our most popular systems. Their great combination of performance, features, and low price have made them the clear choice for anyone looking for great value.

Integrated means we've combined as many features and performance enhancements as possible into the main system board. This integration creates a well designed board with exceptional reliability and performance.

BEST BUY

Expo 486SX33

- Pentium Technology Ready
- 4MB RAM
- 210MB 12ms IDE Hard Drive
- Local Bus Graphics with 1MB
- 3.5" and 5.25" Diskette Drive
- 14" VTech HiRez Monitor
- Full Size Metal Desktop Case
- 9600/2400 Data/Fax Modem
- Remote Diagnostics Software
- MS-DOS 6.2 & Windows 3.1
- Enhanced 101 - Keyboard & Mouse
- 3 Year Warranty

$1149
$1133 with 486SX25

Expo 486DX33

- Pentium Technology Ready
- 4MB RAM with 128KB Cache
- 340MB 13ms IDE Hard Drive
- Local Bus Graphics with 1MB
- 3.5" and 5.25" Diskette Drive
- 14" VTech HiRez Monitor
- Full Size Metal Desktop Case
- 9600/2400 Data/Fax Modem
- Remote Diagnostics Software
- MS-DOS 6.2 & Windows 3.1
- Enhanced 101 - Keyboard & Mouse
- 3 Year Warranty

$1499
$1549 with 486DX2/50

Expo 486DX2/50

- Pentium Technology Ready
- 4MB RAM with 128KB Cache
- 424MB 13ms IDE Hard Drive
- Local Bus Graphics with 1MB
- 3.5" and 5.25" Diskette Drive
- 14" VTech HiRez Monitor
- Full Size Metal Desktop Case
- 9600/2400 Data/Fax Modem
- Remote Diagnostics Software
- MS-DOS 6.2 & Windows 3.1
- Enhanced 101 - Keyboard & Mouse
- 3 Year Warranty

$1599

Expo 486DX2/66

- Pentium Technology Ready
- 8MB RAM with 128KB Cache
- 424MB 13ms IDE Hard Drive
- Local Bus Graphics with 1MB
- 3.5" and 5.25" Diskette Drive
- 15" VTech HiRez Monitor
- Full Size Metal Desktop Case
- 9600/2400 Data/Fax Modem
- Remote Diagnostics Software
- MS-DOS 6.2 & Windows 3.1
- Enhanced 101 - Keyboard & Mouse
- 3 Year Warranty

$1899

...Power Portables

The ExpoTech Notebooks offer a great combination of features and price. The removable hard drive provides versatility usually found only on systems costing hundreds more.

- Portable - Weighs less than 7lbs.
- Powerful - 4MB RAM and 120MB HD
- 9600/2400 Data/Fax modem
- 1 Year Warranty on Notebooks

ExpoNote 486SLC/33

- 4MB RAM, 120MB Hard Drive
- Removable Hard Drive
- 640x480 VGA with 64 grey levels
- Simultaneous External VGA port
- 3.5 Diskette Drive
- 9600/2400 Data/Fax Modem
- MS-DOS 6.0 & Windows 3.1
- Only 2.1"(H) x 11.4"(W) x 8.25"(D)
- Power management functions
- Full Size Mouse

$1299
$999 with 386SX/33
Modem not included in 386SX/33

VTech Computers, Inc., 800 Church Street, Lake Zurich, Illinois 60047

7 days a week: Central Standard Time Monday-Friday 7:00am-8:30pm, Saturday 9:00am-6:00pm
Sunday 10:00am-3:00pm, Fax 1-800-947-3976, Government & Education 1-800-947-6461

Software, modem & service package for desktop & tower systems only.

The Intel Inside Logo, Intel, Pentium and OverDrive are trademarks of Intel Corporation. All other brands and product names are trademarks or registered trademarks of their respective companies. All prices and configurations are subject to change without notice or obligation. Prices do not include shipping

1-800-819-0070

Circle 196 on reader service card.

Winner of 8 Best Buys including "Best Overall Peripheral Supplier" Computer Shopper Jan. 1994

Best Buy

USA Flex... Name

Special Bundle Offer!

HP DeskJet 310 Printer

SAVE

- Laser Quality 300 dpi
- Over 16 million colors available (depending on software)
- 84 typeface, style & size combinations
- Parallel interface
- Weighs 4.3 lbs. 12" x 2.5" x 7.75"
- 1 year warranty Limited Quantity

PLUS COLOR Capable Kit AND Sheet Feeder Included

ALL FOR $299*

*with Purchase of any Notebook listed on this page

TEXAS INSTRUMENTS

As Low As... $1849

TravelMate 4000E WinSX/25 Mono	$1849
TravelMate 4000 WinDX/25 Mono 120MB HD/200MB HD	$1999/$2179
TravelMate Win4000 DX2/50 Mono 120MB HD/200MB HD	$2529/2699
TravelMate 4000E WinSX/25 Advanced Passive Color 486SX 25MHz, 120MB HD	$2099
TravelMate 4000 WinDX2/40 Color 486DX2 40MHz, 200MB HD	$2959
TravelMate 4000E WinDX2/50 Dual Scan Color 486DX2 50MHz, 200MB HD	$3219
TravelMate 4000E WinDX2/50 Active Matrix Color 486DX2 50MHz, 200MB HD	$3799

EPSON ActionNote™ Starting at... $1299

Action Note 4000 80MB	$1299
Action Note 4000 120MB	$1349
Action Note 4000 170MB	$1399
Action Note 4SLC/33 170MB	$1429
Action Note 4SLC/33 170MB W/Modem	$1499
Action Note 4SLC2-50 120MB W/Modem	$1699
Action Note 4SLC2-50 180MB	$1629
Action Note 4SLC2-50 180MB W/Modem	$1799
Action Note 500C 120MB W/Modem	$1899
Action Note 500C 180MB W/Modem	$2099

UNBELIEVABLE PRICES

"Factory-Reconditioned"

COMPAQ

CONTURA Notebooks

All Models Include: 1 Year COMPAQ Factory Carry-In Warranty. Limited Availability.

CONTURA 386/25 Model 60/m (139400-004M)	$999
CONTURA 395/25 Model 84/m (139400-009M)	$1049
CONTURA 396/25C Model 84/m (139410-004M)	$1549
CONTURA 425 Model 120/m (146500-003-R)	$1399
CONTURA 4/25C Model 120 /m+fm (146500-005-R)	$1549

TOSHIBA

NEW

Portege T3400CT Only...

$3379

- 486SX/33 3.3V
- 4.1 pounds
- Active Matrix
- 120MB Hard Drive
- 4 MB RAM (Exp. to 20MB)

T1900 120MB/200MB	$1499/$1699
T1900C Color 120MB/200MB	$2099/$2319
T1950 120MB/200MB	$1879/$2089
T1950CS 120MB/200 MB	$2479/2699
T1950CT 120MB/200 MB/320MB	$2849/3129/3489
T3400/T3400CT 120MB	$2229/$3449
T4600 Mono/120MB/200MB	$2299/$2499
T4600C Color 120MB/200MB/340MB	$3699/$4149/$4449
T4700CS 200MB/320MB	$3399/$4239
T4700CT 200MB/320MB	$4579/$4929
T6600C/CD/CDV	$6199/$6699/$7699

NEW USA Flex

IBM ThinkPad® 500 3.8 LB. SubNotebook

From... $1599

- 486SLC2 50/25MHz
- 4MB RAM (Max 12MB)
- 1 Type II PCMCIA Slot
- Integrated TrackPoint II™ pointing device
- 3.5-9Hrs.Battery Life

IBM ThinkPad 500 w/85MB	$1599
IBM ThinkPad 500 w/170MB	$1699

ALSO AVAILABLE...

IBM ThinkPad® 720

486SL C2 50/25MHZ, 4MB RAM (EXP. TO 16MB) 6.5 lbs. 9.5" Mono Notebook,PC-DOS 5 and PRODIGY pre-installed 3 Yr. International Carry-in Warranty $2599

PRINTERS

EPSON

LASER PRINTERS

ACTION LASER 1000	$599
ACTION LASER 1500	$649
ACTION LASER 1500-II	$719

DOT MATRIX PRINTERS

LX-810	$184
AP 3250	$172
AP 3260	$198
LQ-570+	$239
FX-870	$268
FX-1170	$349
LQ-1070+	$364

LQ-570 $430
LQ-1170 $598
LQ-2550 Clr. $899
DFX-5000 $1319
DFX-8000 $2249
Stylus 300 $229
Stylus 800 $249*

*After $25 Mail in Rebate

PANASONIC

LASER PRINTERS

KX-P4410	$529
KX-P4400	$549
KX-P4430	$659

KX-P5400 $799
KX-P4450 $999

DOT MATRIX PRINTERS

KX-P1150	$129
KX-P2180	$175
KX-P2023	$179*
KX-P2123	$239
KX-P2124	$309

KX-P1624 $369
KX-P3123 $249
KX-P3124 $319
KX-P3624 $399

*After $20 Mail in Rebate

CANON

BUBBLE JET PRINTERS

BJ-10SX/BJ-200e/BJ-230	$259/$299/$389
BJC-600	$589
LBP-430	$589

PRINTERS

NEC

Silentwriter 95f/fx	$869/$1099
Silentwriter Model 610/1097	$569/$1379

TEXAS INSTRUMENTS

microWriter	$519
microWriter PS23/PS65	$679/$939
microMarc™	$279
microLaser Pro 600 PS23/PS65	$1369/$1529
Pro 600 imaging cartridge	$159

SHARP

JX-9400	$499
JX-9460PS	$959

MONITORS

NEC

14" SVGA	$309
15" 3V	$509
15" 3FGe	$579
15" 4FGe	$689

17" SFGe $1049
17" SFGp $1229
21" 6FGp $2369

FLEXVision

14" VGA MONO	$119
14" 1024X768 NI	$265
15" 1250X1024	$339

CTX

14" 5439-G	$219
14" 5468/1451 NI	$249/$269
15" CMS 1561LR	$369

MAG Innovision

14" LX1450 LG	$299
15" MX15F-L/17" MX17F-L	$499/$679

MONITORS (cont.)

ZENITH

15" 640x480 .28 Flat	$449
17" 1024x768 NI Flat	$1099

SONY

14" CPD-1430	$549
14" CPD-1730	$1079
20" GDM-2036S	$2069

DATA CARTRIDGES

3M Data Cartridges

DC2000 40/80MB	$11.45 ea.
DC2120 120/250MB	$15.45 ea.
DC2120 Ximat (QIC-80)	$20.45 ea.
DC2120 Rhomat	$21.95 ea.
DC600A	$16.45 ea.
DC6150 250/500MB	$17.45 ea.
DC6250 250/500MB	$22.45 ea.
DC6525 350/700MB	$26.95 ea.

TAPE BACK-UP

COLORADO Memrory Systems

JUMBO 250 Int/Ext.	$169/$249
JUMBO TRAKKER 120MB	$219
JUMBO TRAKKER 250MB	$329
POWERTAPE™ 1100 Int/Ext.	$579/CALL
2400 Int/Ext.	$949/$1089
4000 Int/Ext.	$1229/$1489
6000 Int/Ext.	$1199/$1399

VIDEO CARDS

ATI Technologies

GRAPHICS ULTRA+ 2MB	$239
GRAPHICS ULTRATM PRO 2MB ISA/VLB/EISA	$359/$359/$399

DIAMOND

SPEEDSTAR PRO 1MB ISA/VLB	$109/$119
STEALTH PRO VLB 2MB	$339
VIPER VLB 2MB	$389

HERCULES

Dynamite Pro ISA (1MB)	$159
Dynamite Pro ISA (2MB)	$199
Dynamite Pro VLB (1MB)	$159
Dynamite Pro VLB (2MB)	$199
Graphite Pro ISA (1MB)	$249
Graphite Pro ISA (2MB)	$379
Graphite Pro VLB (1MB)	$249
Graphite Pro VLB (2MB)	$379
Graphite 2MB Upgrade Kit	$159

ORCHID

Fahrenheit 1280+ 1MB ISA/VLB	$159/$169
Fahrenheit 1280+ 2MB VLB	$209
Fahrenheit VA 1MB ISA (only)	$179
Celsius VLB 1MB/2MB	$239/$299

TO ORDER, CALL...

USA FLEX

Code # PC0404

171 Brighton Drive, Bloomingdale, IL 60108

1-800-723-0334

Federal Express® Delivery Service Available

No Surcharge On These Credit Cards

Circle 202 on reader service card.

Brands for Less!

The Value Package

IBM® PS/ValuePoint® System

- IBM Model 6381M50
- Genuine Intel® 486DX 33MHz
- 4MB RAM (64 MB maximum)
- 212 MB Hard Drive
- VESA Local Bus SVGA video, 512K Video Mem.
- 3.5", 1.44MB diskette drive
- 14" .SVGA color monitor
- 2 serial, 1 parallel, keyboard & mouse ports
- Basic 101-key keyboard, Mouse
- 1 Year Onsite Warranty
- Around-the-clock IBM HelpWare®

HP DeskJet 520 Printer

- Laser-quality 600 dpi output
- Prints 3 pages per minute
- Water resistant ink
- Plain-paper convenience
- Print envelopes and transparencies
- Feeds up to 100 sheets (letter or legal)
- Perfect for Windows users
- 3-Year Warranty

IBM ValuePoint 486DX 33MHz System! HP DeskJet 520 Printer

$1999

Plus, Software and Accessories

- IBM DOS 6.0
- MS Windows™ 3.1
- MS Works for Windows 3.1 that includes: Word Processing, Data Base, Spreadsheet
- Microsoft Money
- 6 Foot Printer Cable
- Disk Storage Box
- 6 Outlet Surge Protector
- 11 Piece Tool Kit
- Mouse Pad

HEWLETT-PACKARD Authorized Dealer

HP DeskJet 520 Printer (NEW)

Laser-quality 600 dpi output. Plain-paper convenience. Prints envelopes and transparencies, 3 pages per minute. Includes 13 scalable typefaces for Windows. 3-Year Warranty.

B1-C2170A $289

HP DeskJet 500C Printer

Laser-quality 300 dpi output. Single inkjet cartridge system. Simple black or color ink cartridge swapping. Plain-paper convenience. Print envelopes and transparencies. 3-Year Warranty

B1-C2114A $389

HP DeskJet 310 Portable Printer

300 dpi output, 2 ppm for Letter Quality (.67 cps), 3 ppm for draft (330 cps). Over 16 million colors available. 84 typeface, style & size combinations. Weighs 4.3 lbs. 12" x 2.5" x 7.75". 1 year warranty

C2621A $299

Optional Color kit $39.95

Automatic cutsheet feeder $69.95

HP DeskJet 560C Printer (NEW)

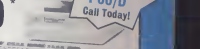
Laser-quality 600 dpi output, Dual inkjet cartridge system for Simultaneous black and color printing. Up to 16.7 million colors, Plain-paper convenience, 3-Year Warranty

C2168A $579

IBM® PS/ValuePoint™

Now available Pentium ValuePoint P60/D Call Today!

Starting At... **$1249** *



*System prices include 14" FLEXVISION SVGA .28mm dot pitch, 1024x768 NI Monitor.

All PS/ValuePoint Systems Feature

- Intel Microprocessors
- 4MB RAM (Exp. to 64 MB)
- VESA Local Bus SVGA video: 640x480, 800x600, 1024x768, 1280x1024
- One 3.5", 1.44MB disk drive
- Basic 101-key keyboard
- 2 serial, 1 parallel, keyboard, mouse
- IBM DOS, MS Windows 3.1
- 1 Year Onsite Warranty
- Around-the-clock IBM HelpWare® Support

IBM PS/ValuePoint Specifications

Model	Speed	Hard Drive	Price*
PS/ValuePoint SI - SpaceSaver			
486SX	25 MHz	120 MB	$1149
486SX	25 MHz	212 MB	$1249
486DX	33 MHz	120 MB	$1499
486DX	33 MHz	212 MB	$1629
486DX2	66 MHz	212 MB	$1999
PS/ValuePoint Desktop (Includes 32-Bit VLB Slot, IFF socket, and a Pentium™ Overdrive Upgradeable)			
486SX	33 MHz	170 MB	$1599
486DX	33 MHz	212 MB	$1789
486DX	33 MHz	340 MB	$1999
486DX2	66 MHz	340 MB	$2399

IBM, ThinkPad and HelpWare are registered trademarks and PS/ValuePoint, PowerPad II, are trademarks of International Business Machines Corporation. Pentium, Intel and the Intel Inside logo are registered trademarks of Intel Corporation

POWER POTECTION

TRIPP LITE

ISOBAR® Command Console Plus (10,000 Protection) $75

ISOBAR® Command Console Compact (5,000 Protection) $49

ISOBAR® Surge Suppressors ($10,000 Protection)
Isobar 4/isobar 6/isobar 8 ..... $46/$51/$59

DataShield S100 Surge Suppressor (5,000 Protection) $59

Standby UPS/SC (725,000 Protection) 250/400/500 ..... $109/$169/$199

Standby UPS BC-LAN (725,000 Protection) 400/500/600 ..... $189*/$229*/$269 750/900 ..... $329*/$379

ISOBAR® Ultra Surge Suppress. (725,000 Protection) 4/6/8 ..... $49/$59/$69

Isotel® Ultra Surge Suppress. (725,000 Protection) 6/8 ..... $64*/$74

OMNIPOWER® LAN
Standby UPS (*50,000 Protect.) 500/600/750 ..... $299*/$399*/$439 900/1250 ..... $529/$659

UNISON® From TRIPP LITE
On-line UPS ($75,000) 450 VA/600VA/900VA ..... $499/$549/$699 ($100,000 Protection) 1200 VA/1500 VA ..... $1199/$1359

New Power Miser (*5,000 Protection) $59

New Super 7 (2 year warranty) $19

FAX MACHINES

HEWLETT-PACKARD

HP FAX-900 Plain paper fax $769

HP FAX-950 Plain paper fax $949

MODEMS

HAYES

	Int./Ext.
ACCURA 2400	$$75
ACCURA 96+fax96	$189/$209
ACCURA 144+fax144	$199/$229
Optima 144+ fax Pocket Ed.	$119

US ROBOTICS

	Int./Ext.
Sportster 9600 FAX	$139/$159
Sportster 14.4 FAX	$159/$179

BOCA

14,400/14,400 V.32 MODEM
Internal $119
External $149

CD ROM

CD-ROM Bundles

Creative Labs
- Omni CD™ (int.) $289
- Discovery CD 8 (int.) $349
- Discovery CD 16 (int.) $419
- Edutainment™ 16 (int.) $479
- Digitaledge CD™ (int.) $629

MediaVision
- Double Fusion LX $449
- Fusion Double CD 16 Int $529
- Pro 16 Multimedia Int. System II $949

CD ROM

Drives

Mitsumi
- FX001 ..... $169
- FX001D $249

Sony CD ROM Kit
Internal Double Spin Drive, Interface card, Driver, Cables & Manuals $199

Toshiba
- Internal XM3401B-TA $399
- External 340 P1000 ..... $499

NEC 3x MultiSpin Family
- 3Xi Internal DI-CDR-3XI $469
- 3Xe External DI-CDR-3XE $559
- 3Xp Personal White DI-CDR-3XPW or Gray DI-CDR-3XPG $429

Sound Cards and Video Boards

MediaVision
- ProAudio Spectrum 16 ..... $165
- ProAudio Studio 16 ..... $215

Creative Labs
- Sound Blaster Pro Deluxe $119
- Sound Blaster 16 Basic $139
- Sound Blaster 16 SCSI-2™ $179
- Sound Blaster 16 SCSI-2 Advanced Signal Processing $219
- Sound Blaster 16 MultiCD™ $169
- Sound Blaster 16 MultiCD Advanced Signal Processing $189
- WaveBlaster™ $179
- Voice Assist™ $59

CD ROM

Aztech Sound Galaxy NX Pro Extra $99
Sound Galaxy NX II $69
Sound Galaxy Basic 16 ..... $115
Sound Galaxy Basic 16 Extra $135
Sound Galaxy Sonic Adapter $10

Speakers

Altec Lansing
- ACS50 ..... $75
- ACS150 ..... $115
- ACS100 ..... $129
- ACS300 ..... $299

$299
SAVE $100 OFF RETAIL

Sony CDU-33A
Double-Speed Internal Drive
300KB/sec transfer, 350ms access, 64KB buffer
Sound Blaster 16 Audio Board by Creative Labs
8-16-bit stereo sampling & playback, 20-voice, and more
Speakers, cables & Instructions

(706) 562-5205 • FAX (706) 351-7204
Gvn'l 1-800-723-2291/Ext 1-800-944-5366
Gvn'l Ext. FAX (706) 351-7373
Quote/Ord. Espanol 1-800-723-2290 • (706) 562-6142
Prior Sales Atmospherique 1-800-723-2256 • (706) 562-6141
Verhandlungen in deutsch (706) 924-6680
(7:00 Uhr bis 15:00 Uhr)(Montag to 9:00 a.m. CT)
Customer Service 1-800-955-1466
(7:30 a.m. - 6:00 p.m. Mon.-Fri., Sat. 9 a.m. - 2 p.m. CT)

USA FLEX

Code # PC0404

Circle 203 on reader service card.

FEEL THE POWER WITHOUT THE PINCH

Monochrome
$1299
486SLC-33, 4MB RAM/ 120MB HDD

Dual Scan Color
$1999
486SX-33, 4MB RAM/ 120MB HDD

Superior Performance At Excellent Price...

An unbeatable offer at just $1299... Check out the most aggressively priced 486SLC-33MHz with 120MB hard disk capacity, 4MB RAM on board. To further sweeten the deal, we are throwing in an internal data/fax modem, carrying case, soft vinyl leather-look cover at no additional cost to you, and that's not it... No trackball is better than a mouse for heavy Windows users, Bondwell bundles a notebook mouse for you free of charge.

Your Dependable Supplier...

With over 18 years of history and nine years of solid notebook/laptop manufacturing and design expertise, Bondwell gives you the best combination of pricing, performance and support. Simply because we care, you can count on Bondwell to provide continue support on parts for years you own the product. Because we control the complete design and manufacturing process, we have total control over the quality of our systems and we stand behind this committment of quality.

486SLC-33

- **486SLC-33MHz**
- Internal Cache
- **4MB RAM**
- **120MB Hard Disk Drive**
- 3.5" 1.44MB Floppy Drive
- Backlit 10" VGA 640 X 480
- **Simultaneous Display**
- Printer Port, Serial Port, VGA Port
- **PS/2 Keyboard Port**
- 85-Key Inverted "T" Keyboard
- **Dual Battery Packs** (Quick Charge)
- Battery Life 6Hr. with Power Management
- 100-240V Power Adapter
- Advanced Power Management Features
- **MS-DOS 6.2 Installed**
- Weighs 6.2 Pounds
- Measures 8.6 X 11.7 X 1.95 Inches

FREE
2400/9600 Data/Fax Modem
Notebook Mouse
Carrying Case
MS-DOS 6.2

Ready To Ship

	10" Mono		Dual Scan Color
	120MB	200MB	120MB
486SLC-33	$1299	$1399	-
486SLC2-50	$1349	$1449	-
486SX-33	$1399	$1499	$1999
486DX-33	$1749	$1849	$2249
486DX2-50	$1899	$1999	$2399
486DX2-66	-	$2199	$2599

18 YEARS SOLID EXPERIENCE

Bondwell®

VISA MasterCard American Express

CALL 800-627-6888

Canada: 416-405-0711, Outside USA: 510-490-4300, ext.768

Major credit cards accepted, 30 days money back guarantee, One year warranty, Life time toll-free support, Prices and specifications are subject to change without notice. Bondwell Industrial Co. Inc. USA: 47485 Seabridge Drive, Fremont, CA94538

EUR404A

Circle 109 on reader service card.

COMPUTER DISCOUNT WAREHOUSE™

CDW

ANOTHER FACT ABOUT COMPUTER DISCOUNT WAREHOUSE™

FACT: CDW® now opens earlier and closes later:
7:00 A.M. to 9:00 P.M. CST, M-F
9:00 A.M. to 5:00 P.M. CST, Sat.

BENEFIT: Ordering from **CDW®** is more convenient than ever!

WHY PAY RETAIL? CDW® SELLS SOFTWARE FOR LESS!

NEW

MICROSOFT EXCEL V5.0 for Windows
Version Upgrade
ONLY $89.47
33553

ADOBE ILLUSTRATOR V6.0 WIN	446.79
ADOBE PHOTOSHOP V3.0	326.15
ARES PORTWINDOW/DP	147.20
ARES PORTWINDOW/UP	147.20
ARTISOFT LANTASTIC SOFTWARE	83.58
ARTISOFT LANTASTIC W/WIN V5.0	87.43
ARTISOFT LANTASTIC W/WIN V5.0	79.43
AUTODESK AUTOCAD	1,599.00
AUTODESK AUTOSKETCH/WIN	185.04
IBM DOS V6.1 UPG	62.49
INTEX SYSTEMS HILAAK PRO V2.0	79.98
INTUIT QUICKBOOKS/DOS UPGRADE	47.99
INTUIT QUICKBOOKS/DOS/PAY VO.0	89.99
INTUIT QUICKBOOKS/WIN V2.0	97.38
INTUIT QUICKEN DELUXE WIN CD-ROM	53.92
INTUIT QUICKEN/WINDOWS V3.0	45.02
INTUIT QUICKEN/WINDOWS & QUICKPAY 1	57.77
INTUIT QUICKEN DOS VO.0	45.02
INSIGNIA ACCESS PC V3.0	74.99
KOVAK PHOTOLIST ACCESS/WIN	21.75
LASERTOOLS PRINT CACHE	45.30
LASERTOOLS PRINT SPOOLER	45.30
LOTUS 1-2-3 4 NISE	345.00
LOTUS 123 WINDOWS V4.01	292.63
LOTUS 123 WIN SY LICENSE	292.63
LOTUS 123 WIN SY UPG	292.63
LOTUS 1-2-3 V3.1 MULTIMEDIA ED	299.94
LOTUS 1-2-3 V4.01 - ORGANIZER WIN	299.94
LOTUS FREELANCE V5.01	331.11
LOTUS FREELANCE V5.01 UPG	331.11
LOTUS IMPRESSIONS V1.1	113.23
LOTUS AMI PRO V3.01	229.79
LOTUS AMI PRO SUPERBUNDLE	229.79
LOTUS APPROACH V3.0	134.44
LOTUS APPROACH V3.0 V0-1	134.44
LOTUS 1-2-3 AS UPG	97.86
LOTUS SMARTSUITE UPG VO.1	279.15
LOTUS SMARTSUITE V3.01 MULTIMEDIA ED UPG	299.94
LOTUS AMI PRO V3.01 VERS UPG	58.88
LOTUS 1-2-3 V4.01 VERS UPG	129.87
LOTUS FREELANCE GRAPHICS V2.01 UPG	96.70
MICROSOFT APICADE	09.00
MS CREATIVE WRITER WIN	37.80
MS MAPPOINT VO.0 WIN	44.80
MS MICROSOFT DOS 6	89.99
MS POWERPOINT V3.0 WIN	197.38
MS WINDOWS V3.1 UPG	66.65
MACROMEDIA ACTION! V2.5 WIN	139.78
MACROMEDIA ACTION! V2.5 UPG	79.78
NORTON CACHE 2000 HEADHUNTER	109.00
NORTON CLOSE-UP HOST & REMOTE	113.11
ONLINE OPTIMIZER 1.0 USERS	87.99
PACIFIC MICRO MAC-IN-DOS	58.59
PACIFIC MICRO MAC-IN-DOS PLUS	68.59
POWERUP CALENDAR CREATOR PLUS	41.82
POWERUP CALENDAR CREATOR + WIN	41.82
QUARTERDECK DESQVIEW 386 V2.5	89.95
QUARTERDECK DESQVIEW 386 V2.6	89.95
QUARTERDECK DESQVIEW/X	89.95
QUARTERDECK OEMM FOR I-GAMES	67.66
QUARTERDECK OEMM V7.0 UPG	39.82
QUARTERDECK QEMM V7.0	344.44
SPC HARVARD GRAPHICS PRESENTER V3.0	221.80
SPC HARVARD GRAPHICS V3.0	221.80
SPC HARVARD GRAPHICS V3.0 WIN UPG	79.75
SPC HARVARD GRAPHICS V2.0 WIN	344.50
SAMNA UNERASE V5.0	57.29
SAMNA WORD/VIEW V3.0 NODE	171.99
SHAREWARE VIDEO VO.2	17.17
SHAREWARE VIDEO VO.1	69.99
SPINNAKER FORM/WORKS/WIN V2.0	101.99
STACKER V3.1 DOS UPG	53.50
STACKER V3.1 SPECIAL DOS V6.0	53.50
STACKER V3.1 WINDOWS UPG	53.50
SWIFT LETTER/EMAIL FOR WORD	27.99
SYMANTEC Q&A V4.0 WIN	144.83
SYMANTEC Q&A V4.0 COMP UPG WIN	72.42
TOUCH TYPING STUDY	29.99
TRAVELING SOFTWARE LAPLINK V5.2	89.95
TRAVELING SOFTWARE LAPLINK V5.2 UPG	49.95
VIRGIN/TH SUBST CD	12.00
WORDPERFECT DOS 5.1 DOS LICENSE	139.00
WORDPERFECT DOS 5.1 DOS LICENSE UPG	139.00
WORDPERFECT/WIN V6.0 LICENSE	199.34
WORDPERFECT/WIN V6.0 UPG	199.34
WORDPERFECTIONS V2.0 WIN W/SCRIP	129.99
WP OFFICE V4.0 DOS	262.58
WP OFFICE V4.0 WIN	262.58
WP V6.0 W/DISATTRO PRO	299.73
WORDPERFECT/WIN V5.2 LICENSE	187.50

WordPerfect V6.0 for Windows
Version Upgrade
ONLY $98.74
31968

MS WORD V6.0 WIN COMP UPG	317.11
MS EXCEL V5.0	299.31
MS EXCEL V5.0 COMP UPG	115.52
MS MAIL V3.0 WIN CD	84.00
MS WORKS V3.0 WIN	84.00
MS WORKS V3.0 WIN	77.07
MS WORKS V3.0 VERS UPG	134.24
MS PROJECT V3.0 COMP UPG	182.84
MS PROJECT V3.0 WIN	182.84
MS ACCESS V1.1A UPG	116.99
MS ACCESS V1.1 VERS UPG	18.11
MS ACCESS	299.40
MS ACCESS DIST KIT	203.35
MS ACCESS V2.0	299.40
MS POWERPOINT V4.0 WIN VERS UPG	119.28
MS POWERPOINT V4.0 WIN COMP UPG	119.81
MS POWERPOINT V4.0 WIN	312.67
MS ENCARTA BIBTHEOVEN CD	184.19
MS BOOKSHELF	79.95
MS DOS V6.2 UPG	2.97
MS-DOS V6.2 UPG 3 PACK	47.75
MS MULTIMEDIA MUSICIANS CD	84.99
MS PUBLISHER V2.0 WIN	87.81
MS MULTIMEDIA BEETHOVEN CD	44.53
MS CINEMANIA 1994 CD	54.92
MS WINDOWS V3.1 UPG CD	54.92
MS VISUAL BASIC COMP UPG	79.75
MS VISUAL BASIC PRO V3.0 WIN	83.99
MS VISUAL BASIC V3.0 WIN	297.40
MS WINDOWS SND SYS V2.0 SW	54.92
MS WINDOWS SND SYS V2.0 UPG	54.92
MICROSOFT WINDOWS PRINTING SYS	79.75
MS FOXPRO V6.0 WIN UPG	178.41
MS FOXPRO V6.0 WIN COMP UPG	178.41
MS FOXPRO V6.0 COMP UPG WIN	178.20
MS FOXPRO V6.0 WIN	299.40
MS FOXPRO V3.0 COMP UPG DOS	178.20
MS FOXPRO V5.0 DOS	299.85

MICROSOFT WORKGROUP Add-on V3.11 for Windows
ONLY $49.92
33146

LOTUS FREELANCE V3.01 UPG	96.81
LOTUS 1-2-3 V4.01 + ORGANIZER UPG WIN	108.18
LOTUS 1-2-3 V4.01 STARTER PK	108.18
LOTUS 1-2-3 V4.01	299.94
LOTUS 1-2-3 4 UPG KIT	97.99
LOTUS IMPROVWIN V3.0	113.23
MARKETSOFT MATHCAD V5.0 WIN	192.33
MICROSOFT ACCESS DEVELOPER V1.1	299.40
MICROSOFT EXCEL/DPV WIN	299.40
MEDIA VISION CRITICAL PATH CD	48.14
MEDIA VISION PLANET ADRENALINE CD	48.14
PROCOMM PLUS WIN	99.99
MICROSOFT ACCESS V1.1	299.40
MICROSOFT ABC FLOWCHRT WIN	251.00
MICROGRAFX WINDOWS DRAW V1.0	49.39
MS LINK V3.61 W 0	82.84
MICROSOFT FORTRAN V5.1	143.99
MS OFFICE V4.0 PROFESSIONAL	499.00
MS OFFICE V4.0 WIN COMP UPG	299.40
MS OFFICE V4.0 WIN	451.92
MS PROJECT SIMULATOR V3.0	44.65
MS WORD V6.0 DOS VERS UPG	102.04
MS WORD V6.0 DOS	302.04
MS WORD FOR WINDOWS V2.0	299.40
MS VISUAL C++ PRO UPG	129.65
MS VISUAL C++ V1.0 - WINDOWS NT	299.40
MICROSOFT WINDOWS V3.1 UPG	48.87
MICROSOFT WINDOWS V3.1 LICENSE	79.89
MS WORD V6.0 WIN	299.40
MS WORD V6.0 WIN VERS UPG	93.77

BORLAND QUATTRO PRO V5.0 for Windows or DOS
ONLY $39.95
31798/31800

MS FOXPRO WIN DIST KIT	299.90
MS FOXPRO V3.0 DOS DIST KI	299.90
MS WINDOWS NT V3.1 ADV SRV UPG	834.95
MS WINDOWS NT V3.1 ADV SRV	1,199.95
MS PROFIV V2.0 WIN	119.28
MS WINDOWS NT V3.1	262.58
MS WINDOWS NT V3.1 UPG	99.99
MS ONCD/SAVE GC	64.19
MS WORD C++ V1.0 WIN	299.40

LOTUS 1-2-3 V4.01 for Windows
Version Upgrade
ONLY $97.09
32690

SYMANTEC DIRECT ACCESS V1.0 WIN	83.08
SYMANTEC ACT V1.1 WIN	249.22
SYMANTEC ACT V2 WIN	249.22
SYM NORTON PC ANYWHERE V4.5 DOS	112.77
SYM NORTON PC ANYWHERE V4.5 WIN	112.77
SYMANTEC FIX-IT DOS V4.5 REMOTE	89.99
SYM NORTON BACKUP V3.0 WIN	87.13
NORTON DESKTOP FOR WIN V3.1 WIN	113.03
SYMANTEC ANTI VIRUS V3.0	80.07
SYMANTEC ANTI VIRUS V3.5 DOS	80.07
NORTON UTILITIES V5.0	89.99
NORTON UTILITIES V7.0	109.99
SYMANTEC PC ANYWHERE V1.0 WIN	112.77
SYMANTEC Q&A 4.5 DOS	242.66
SYMANTEC Q&A 4.5 DOS PRO SET	242.66
TRAVELING SOFTWARE LAPLINK V5.2	89.95
COMMWORKS V3.0 WIN SPC UPG	71.25
TRAVELING SW LAPLINK V5	89.95
VIRGIN/TH SUBST CD	12.00
WORDPERFECT DOS 5.1 DOS LICENSE	139.00
WORDPERFECT DOS 5.1 DOS LICENSE UPG	139.00
WORDPERFECT/WIN V6.0 LICENSE	199.34
WORDPERFECT/WIN V6.0 UPG	199.34
WORDPERFECTIONS V2.0 WIN W/SCRIP	129.99
WP OFFICE V4.0 DOS	262.58
WP OFFICE V4.0 WIN	262.58
WP V6.0 W/DISATTRO PRO	299.73
WORDPERFECT/WIN V5.2 LICENSE	187.50

CDW® HOURS
Sales:7:00 - 20:00 CST Mon-Fri, 9:00-15:00 CST Sat.
TECH SUPPORT
7:00-7:00 CST Mon-Fri, 10:00-15:00 CST Sat.
(708)465-6000

Orders Limit: Limited to stock on hand. Limit 4 per item. Subject to reasonable qty. limits & change. Shipping Charges: Ground UPS: $5.00 per box. Next Day Air: $15.00 per box. Second Day Air: $10.00 per box. Canada: $20.00 per box. Hawaii: $25.00 per box. Alaska: $25.00 per box. Shipping charges may vary depending on destination, weight, dimensions and method of shipping selected. Handling: $3.00 per shipment. Payment: Subject to credit approval. Visa, MasterCard, Discover, American Express, Diners Club, Carte Blanche, COD, Net 30 Days. Prices: Subject to change. Returns: 14 days from invoice date. Defective returns: 30 days from invoice date. Shipping charges for defective returns will be refunded. Returns: All returns require a CDW Return Authorization Number. Call (708) 465-6000 for a CDW Return Authorization Number before returning any item. Returns processed without a CDW Return Authorization Number will be subject to a restocking charge. Damaged Returns: Must be reported to CDW within 5 days of receipt of shipment. Returns will be subject to a restocking charge. Lost or damaged items are the responsibility of the customer. Returns: Software returns must be in original condition with all original components and manuals. Returns: Hardware returns must be in original boxes with all original packing materials. Returns: Opened software may be returned for exchange only. Returns: Notebooks, printers and fax machines may be returned for repair only. Returns: Memory may be returned only if defective. Returns: Sales of computer equipment are subject to restocking charges. Returns: Call CDW for more information. Returns: Call CDW for more information. Returns: Call CDW for more information

COMPUTER DISCOUNT WAREHOUSE™

COMPUTER DISCOUNT WAREHOUSE

Panasonic KX-P3123

NEW!

24 Pin Dot Matrix Printer
- ✔ 240 cps Max Print Speed (draft)
- ✔ Super Quiet Technology
- ✔ 4 Internal Scaleable Fonts + Adobe Type Manager
- ✔ Parallel Interface, 46KB Buffer Std.
- ✔ Optional Serial Interface and Color Kit

KX-P3123 ..... **$254.67** CDW 36510

WHY PAY RETAIL?

CDW® Sells For Less

SHARP

I486 Color Notebooks
- ✔ From the World's Largest Manufacturer of LCD Color Displays
- ✔ SL-Enhanced I486DX/33
- ✔ 4MB RAM Std., 20MB Max.
- ✔ 200MB Hard Drive
- ✔ PCMCIA Type II Card Slot
- ✔ Pre-installed MS-DOS & Windows 3.1
- ✔ Bonus: Includes Clip-on Trackball
- ✔ Choose from 9.4" Dual Scan or 9.4" Active Matrix Displays

Choose From Two Brilliant Color Displays

PC-8150 Dual Scan **$2877.26** 34089

PC-8650 Active Matrix **$3368.15** 34088

HARDWARE, SOFTWARE & PERIPHERALS AT *DISCOUNT* PRICES

NETWORKING PRODUCTS

NOVELL

Netware V4.01

5 USER CD	669.00
10 USER CD	1054.00
25 USER CD	3035.00
50 USER CD	5899.00

Netware V3.12

5 USER 3.5"	686.00
10 USER 3.5"	1084.00
25 USER 3.5"	2311.00
50 USER 3.5"	4385.00
100 USER 3.5"	8385.00

Call for Pricing on NetWare CD-ROM
NOVELL UPGRADES AVAILABLE

1 USER NETWARE V1.0 NEW 117.67
5 USER 285.62

NOVELL PRICING IS SUBJECT TO CHANGE. PLEASE CALL CDW FOR THE MOST CURRENT PRICING

ACCTON

COAXTIVE STARTER KIT	189.99
COAXTIVE ADD-ON KIT	139.89

THOMAS CONRAD

TC6143 ETHERNET COAX	170.47
TC6143 ETHERNET COAX 4PK	599.56
TC6143 ETHERNET 10BT	89.95
TC6143 ETHERNET 10BT 4PK	349.56
TC6242 ARCNET 8 BIT COAX CARD	139.59
TC6242 ARCNET 8 BIT 4PK	549.56
TC6242 ARCNET TP CARD	139.59
TC6243 ARCNET ALL-IN-ONE CARDS	299.48
TC6540 ARCNET HUB/PORT 4 PORT HUB COAX	179.95
TC6555 ETHERNET 8 PORT CON 10BT	229.74
TC6556 ETHERNET 16 PORT 10BT	329.74
TC6245 TOKEN RING 16/4 CARD	319.89

CDW Carries the Complete
Line of TCNS Products. Call for Details!

ARTISOFT

NODERUNNER 2000A	217.34
NODERUNNER 2000C	172.47
NODERUNNER 2000T	172.47
NODERUNNER 2000A	119.88
NODERUNNER 2000C	84.44
NODERUNNER/2 2000C	89.44
1397 T-WIRE HUB	1099.00
1397 T-WIRE INTERNAL HUB	599.00
NODERUNNER STARTER KIT WINDOWS	479.29
LANTASTIC 4 HUB 8	79.17
LANTASTIC AI V5.0 WINDOWS	79.19
LANTASTIC AI V5.0 DOS	79.19
LANTASTIC FOR WINDOWS 4PK	139.89
SIMPLY LANTASTIC START KIT NEW	204.03
SIMPLY LANTASTIC V 5.0 NEW	69.89
T-RUNNER 8 PORT 10BT	299.88
T-RUNNER 12 PORT 10BT	469.41

SMC

ULTRA16 ETHERNET COAX	165.26
ULTRA16 ETHERNET COAX 4PK	583.89
ULTRA16 ETHERNET 10BT	179.24
ULTRA16 ETHERNET 10BT 4PK	629.24
ULTRA16 ETHERNET COMBO	179.24
ULTRA16 ETHERNET COMBO 4PK	893.49
ETHERCARD+ ELITE COAX	139.79
ETHERCARD+ ELITE COAX 4PK	519.29
ETHERCARD+ ELITE MCA COAX	169.79
ETHERCARD+ ELITE 10BT	169.79
ETHERCARD+ ELITE 10BT 5PK	619.22
ETHERCARD+ ELITE MCA 10BT	199.79
ETHERCARD+ ELITE COMBO	169.79
ETHERCARD+ ELITE COMBO 5PK	619.22
3016 ETHERNET 8 PORT CON 10BT	339.61
3116 ETHERNET 16 PORT CON 10BT	539.61
8003WC ARCNET CARD	119.08
8003WS ARCNET CARD TP	119.08
PC500TP ARCNET CARD TP	119.08
PC130 ARCNET CARD COAX	88.50
8012ZL2 ARCNET 12 PORT HUB COAX	1199.00
TOKENCARD ELITE 16/4	359.00

3Com

3C503 ETHERLINK II COAX	154.84
3C503 ETHERLINK II COAX 5 PK	713.10
3C509 ETHERLINK III 10BT	159.00
3C509 ETHERLINK III 10BT 5 PK	732.10
3C509 ETHERLINK III COMBO	179.98
3C509 ETHERLINK III COMBO 5 PK	829.10
3C579 ETHERLINK ISA 10BT	224.91
3C579 ETHERLINK ISA 10BT 5PK	1024.91
3C16DT 12 PORT LINKBUILDER 10BT	838.96

NETWORKING PRODUCTS

OTHER TOP-QUALITY NAME BRANDS

EAGLE NE2000+ CDAX	109.90
EAGLE NE2000+ CDAX 5PK	494.95
EAGLE NE2000 THIN COAX w/TPA	154.30
NATIONAL SEMI NE2000+ CDAX	89.54
NATIONAL SEMI NE2000+ 10BT	84.59

If You Don't See What You Are Looking For Call CDW Carries the Best Networking Selection in the Industry!

Xircom

PE3103C POCKET ETHERNET CDAX	309.89
PE3103D POCKET ETHERNET 10BT	258.00
PE3103T POCKET ETHERNET 10BT	288.31
PE3103TC POCKET ETHERNET COAX	288.31
POCKET TOKEN RING 16/4	729.00
PTR203 PARALLEL PORT MULTIPLEXOR	77.80
XIRCOM 16 4K POCKET MODEM	308.19

IBM TOKEN RING

IBM TOKEN RING 16/4 ISA	551.40
IBM TOKEN RING 16/4 MCA	509.25
IBM TOKEN RING MAU	408.88

intel

ETHEREXPRESS 16 COAX	99.33
ETHEREXPRESS 16 COAX 4PK	354.13
ETHEREXPRESS 16 COAX 20PK	1668.28
ETHEREXPRESS 16 10BT	99.33
ETHEREXPRESS 16 10BT 5 PK	354.13
ETHEREXPRESS 16 10BT 20PK	1668.28
ETHEREXPRESS 16 COMBO	158.52
ETHEREXPRESS 16 COMBO 4PK	615.82
ETHEREXPRESS 16 COMBO 20PK	2938.93
ETHEREXPRESS 16 FLASH 10BT	111.88
ETHEREXPRESS 16 FLASH 10BT 5PK	515.82
ETHEREXPRESS 16 FLASH COMBO	158.52
ETHEREXPRESS 16 FLASH COMBO 5 PK	599.00
ETHEREXPRESS 16 MCA	158.52
ETHERNEXPRESS 16A	204.53
NETCHPT 8 COAX	388.85
NETCHPT 8 10BT	388.85
ETHEREXPRESS 8/16	519.93
ETHEREXPRESS 8/16 HUB	1485.98

TAPE, REMOVABLE & FLOPPY DRIVES

COLORADO
MEMORY SYSTEMS

JUMBO 120MB INTERNAL	86.21
JUMBO 250MB INTERNAL	87.24
TRAKKER 120MB PARALLEL PORT	249.00
TRAKKER 250MB PARALLEL PORT	328.84
TRAKKER 120MB SCSI EXTERNAL	1087.58
TRAKKER 240MB SCSI EXTERNAL	1087.58
POWERDAT 4GB SCSI INTERNAL	1197.79

MEGA

TAPE 250MB INTERNAL	169.57
TAPE 250 INTERNAL PLUS	185.13
FLOPTICAL 21MB INSIDER	379.27
FLOPTICAL 21MB EXTERNAL SCSI	379.27
BERNOULLI 150MB INSIDER DE	379.79
BERNOULLI 150MB PC POWERED	477.67
BERNOULLI 150MB TRANSPORTABLE	679.29

SUMMIT
COMPUTER NETWORKS

SE120 120MB INT TAPE B-U	139.86
SE250 250MB INT TAPE B-U	153.39
SE305 305MB INT TAPE B-U	259.90

MICROSOLUTIONS

BackPack 5.0" 1.44MB FLOPPY PARALLEL	177.86
BackPack Dual 5.0" 1.2MB FLOPPY PARALLEL	277.72
BackPack 170MB HD PARALLEL	334.58
BackPack 340MB HD PARALLEL	577.44
BackPack 2X CD-ROM PARALLEL	377.44
BackPack 250MB 1/4" TAPE 3-U PARALLEL	359.05

TAPE, REMOVABLE & FLOPPY DRIVES

SyDOS

PRO NOTE 40MB PARALLEL	416.17
PUMA 85MB PARALLEL	442.44
PUMA 105MB PARALLEL	470.29
MARLIN 105MB INT IDE	478.28
8MM SHOT SCSI 5MB/PT	526.00

Mountain.

TU-250 250MB INT IDE	189.32
FS800 300MB INT IDE	449.50
SIDECAR II 300MB PARALLEL TBU	358.77
1200-4 4GB EXT SCSI	2045.39
TAPE-1 250MB INT QIC 80/40/WIDE	249.00
750MB-1 5GB EXT TBU WIDE	1264.81

NYSE TERMINALS

WYSE 30 AMBER OR GREEN	272.89
WYSE 30 AMBER OR GREEN	295.89
WYSE 50 AMBER, GREEN, WHITE	328.36
WYSE 60 AMBER, GREEN, WHITE	372.89
WYSE 150 AMBER, GREEN, WHITE	285.45
WYSE 160 AMBER, GREEN, WHITE	315.45
WYSE 385 COLOR	815.45

MULTIMEDIA, SOUND, CD

ALTEC LANSING AC830 SPKRS/SW	274.26
CDW 5 CD HUNDRED	129.17
CDW 6 CD "BUSINESS BUNDLE"	179.99
CDW 6 CD ENTERTAINMENT BUNDLE	179.99
CDW 4 CD EDUTAINMENT BUNDLE *	65.18
CREATIVE LABS QUICKVIEW 16 IN INT	81.80
SOUND BLASTER PRO DLX	114.30
EDUTAINTA AUDIO 16 INT	89.89
SOUND BLASTER 16 ASP MCD	167.19
MEDIA VISION PRO AUDIO 16 BASIC	107.76
MEDIA VISION PRO AUDIO 16 BASIC	107.76
MEDIA VISION PRO AUDIO SPECT 16	129.30
MEDIA VISION PRO AUDIO SPECT 16	129.30
MEDIA VISION PRO 16 SYSTEM 1 BUNDLE	809.40
MEDIA VISION PRO 3D 4X	644.52
MEDIA VISION CDPC MAGIC	644.52
MS MULTIMEDIA BEETHOVEN	52.66
MICROSOFT BOOKSHELF CD	119.99
MICROSOFT WIN SND SYS V2.0	82.95
MS ENCARTA 1995	84.44
MS WIN SND SYS V2.0 W/BOARD	139.20
SOUND BLASTER PRO MCD 2X	179.24
ORCHID SOUNDWAVE 32	172.73
ORCHID GAMEWAVE 32	130.40
PROCOM INT MULTIMEDIA STATION	799.73
PROCOM EXT MULTIMEDIA STATION	780.48
SONY EDITOR LIBRARY INT 2X	287.47
SONY EDITOR LIB INT W/SND 2X	467.73
SONY EDITOR LIB EXT W/SND 2X	467.73
TURTLE BEACH MULTISOUND	349.77
TURTLE BEACH MONTEREY SND CRD	349.77

"AVAILABLE ONLY WITH CD-ROM DRIVE"
PURCHASE CALL FOR DETAILS

CD-ROM & OPTICAL DRIVES

CHINON CD502I INT CD-ROM KIT	385.60
CHNON CD535I EXT CD-ROM KIT	455.88
HITACHI 1900S EXT CD-ROM	499.95
HITACHI CDR1950 EXT	539.84
HITACHI 6750 INT CD-ROM	409.88
HITACHI CDR6750 INT	417.78
NEC 3W INTERNAL	479.90
NEC 3XE EXTERNAL	558.92
NEC 3XI PANASYNC	527.31
ORCHID CDS3110 INT	229.63
PANASONIC CDROM& DISC CHJADPASPN	1014.00
PROCOM 200MS INT SCSI CD-ROM	452.09
PROCOM 200MS EXT SCSI CD-ROM	457.46
SONY CDU535 INT CD-ROM	202.72
SONY CDU561 INT SCSI 2X CD-ROM	286.83
SONY CDU7205H EXT CD-ROM	454.88
SYDOS PARALLEL PORT CD-ROM	299.51
PLEXTOR 5028 240MS INT KIT	CALL!
PLEXTOR 5028 240MS W/PA SPECTRUM 16	CALL!
PLEXTOR 5028 240MS EXT KIT	CALL!
PLEXTOR 5028 W/PA SPECTRUM 16	CALL!
TOSHIBA 3401 INT SCSI CD-ROM	382.80
TOSHIBA 3401 INT SCSI CD-ROM w/Adpt	412.80
TOSHIBA 3401 Ext SCSI CD-ROM	480.81
TOSHIBA 3401 Ext SCSI CD-ROM w/Adpt	513.00
TOSHIBA 3401 Ext SCSI 4 Drive Tower	2035.08

PLOTTERS, DIGITIZERS & SCANNERS

HURTA

IPGONS 12 X 12 X 8 BUTTON	299.29
IPGONS 12 X 12 X 16 BUTTON	315.33
IPGONS 12 X 12 X 16 BUTTON, STYLUS	415.55
IPGONS 16 X 16 BUTTON	342.90
IPGONS 16 X 16 BUTTON, STYLUS	443.98

CalComp

DI III 12X12 X BUTTON	308.37
DI III 16 X 12 BUTTON	338.37
DI III 16 X 16 BUTTON PEN	395.85
DI III 12X16 16 BUTTON CORDLESS	590.89
SLATE 12X12 PUCK 8 PEN	1463.40

Canon

IX4015 COLOR SCANNER 1339.82

Summagraphics

SUMMASKETCH III 12 X 12 16 BUTTON	253.90
SUMMASKETCH III 12 X 12 4 BUTTON	224.44

HOUSTON INSTRUMENT

HI 7100 A-D SIZE B PEN	2298.78
HI 7200 A-F SIZE D PEN	3317.22

HEWLETT PACKARD

HP SCANJET 6P	734.61
HP SCANJET 6P DOCUMENT FEEDER	899.93
HP SCANJET IICX W/ ISA	998.50
HP SCANJET IICX DOCUMENT FEEDER	474.72

EPSON

ACTIONSCANNER ES600C	796.86
ACTIONSCANNER ES800C	1085.00
ACTIONSCANNER ES800C PRO	1238.53

VIDEO PRODUCTS

VGA & SUPER VGA MONITORS

AST VISION 4N 14"	359.91
MAG INNOVISION MX15F	315.00
MAG INNOVISION MX17FG	927.50
MAG INNOVISION MX17FG	927.50
MAGNAVOX CM2095 14" .28 NI	289.80
MAGNAVOX CM2095 14" .28 NI	289.80
MAGNAVOX CM2095 14" .28 NI	289.80
MAGNAVOX 20CM64 20" SPECIAL!	599.00
NANAO FX1 15"	1047.77
NANAO FX61 17"	1047.77
NANAO FS09W 17"	1149.00
NEC 3V 15"	499.92
NEC 4D 15"	737.72
NEC 5FG 15"	1079.27
NEC 5FGE 17"	1079.27
NEC 6FG 17"	1317.01
NEC 6FGp 21"	2388.94
PANASONIC C1951 14"	335.75
PHILIPS 1764DC 17"	719.50
PHILIPS 1964DC 19"	1199.00
PHILIPS BRILLIANCE 21"	2388.82
SONY 1730E 17"	1047.00
SONY 1750E 17"	997.00
SONY 1750E 17"	1147.00

VGA & SUPER VGA DISPLAY CARDS

ADS VGA TO TV ELITE	224.57
ATI GRAPHICS ULTRA PRO 2MB	394.92
ATI GRAPHICS ULTRA PRO 2MB ISA	394.92
DIAMOND STEALTH PRO 2MB VLB	487.21
CREATIVE LABS VIDEO BLASTER	209.02
CREATIVE LABS VIDEO SPIGOT	249.00
DIAMOND STEALTH PRO 1MB	249.82
DIAMOND STEALTH PRO 2MB	338.61
DIAMOND SPEEDSTAR PRO 1MB	197.43
DIAMOND SPEEDSTAR PRO 2MB	286.22
HERCULES GRAPHITE PRO 1MB	258.45
HERCULES GRAPHITE PRO 2MB	348.45
HERCULES DYNAMITE 2MB	223.92
INTEL SMART VIDEO RECORDER	488.98
ORCHID FAHRENHEIT VA	172.84
ORCHID FAHRENHEIT VA	172.27
ORCHID CELSIUS VLB 1MB	249.70
ORCHID CELSIUS VLB 2MB	297.96

If You Find a Better Price, Call CDW® Before You Buy (800) 886-4CDW

NASDAQ
BUY WITH CONFIDENCE
CDW® IS A NASDAQ TRADED COMPANY
TICKER SYMBOL: CDWC
D & B Rated: 4A1
Duns 19-762-7252

No Surcharge For Credit Cards
AMERICAN EXPRESS | VISA | MasterCard | DISCOVER
Credit Card charges are not to exceed retail price of any product. Freight is calculated on the contents of each individual shipment. Shipping charges may vary depending on the size, weight and destination of the order. Call for freight charges on large orders. Shipping charges are non-refundable. All shipping rates are subject to change. ** These items are shipped via Next Day Air.

CDW® HOURS
Sales7:00 AM-9:00 CDT Mon-Fri,
9:00-5:00 CDT Sat.
Tech Support for Customers
8:00-7:00 CDT Mon-Fri,
9:00-5:00 CDT Sat.

MOST ORDERS SHIP THE SAME DAY

COMPUTER DISCOUNT WAREHOUSE™

CDW

Intel EtherExpress Ethernet Adapters

EtherExpress quality, performance, compatibility, and ease of use has made them the most popular choice for networks large and small. Great CDW prices make the decision even easier.

EtherExpress 16 COAX	$99.33	20754
EtherExpress 16 COAX SPK	$454.13	24327
EtherExpress 16 10BT	$99.33	20752
EtherExpress 16 10BT 5 PK	$454.13	23506
EtherExpress 16 Combo	$116.77	27605
EtherExpress 16 Combo SPK	$555.09	28243

Xtra Value

WHY SETTLE FOR LESS?

CDW® SERVICES YOU BETTER

Canon BJC-600 Color BubbleJet Printer

Plain Paper Color, Laser Performance

- Laser-quality 360 DPI, 170 cps HQ Mode
- Optimized for Plain Paper
- Unique Integrated Print Head System
- 64 Nozzles Per Color
- 200 Pages Text, 135 Pages Graphics Per Cartridge
- 100 Sheet (10 Envelopes) Auto Feeder

#1 Color Printer

BJC-600 .....$588.50 CDW 32009

CDW® CARRIES OVER 15,000 PRODUCTS. IF YOU DON'T SEE IT, CALL!

COMPUTERS

TOSHIBA

T1910 530MB MONO	1477.64
T1910CS 530MB DUAL CLR	2249.64
T1910XE 530MB MONO	1677.64
T1950/120MB MONO	1877.10
T1950CS/120MB MONO	2187.92
T1950CS/120MB DUAL CLR	2477.13
T1960/120MB ACT CLR	2777.13
T1960CS/120MB ACT CLR	2799.92
T1960CT/200MB ACT CLR	2999.00
T1960XE/120MB ACT CLR	3199.99
T3400/320MB MONO	2197.00
T3400CS/320MB MONO	2497.00
T4400/120MB Mono	2849.00
T4400/200MB Mono	2299.00
T4400CS/200MB ACT CLR	3699.00
T4960C/340MB ACT CLR	3999.00
T4700CS/200MB DYNAMIC CLR	3697.00
T4700CS/340MB DYNAMIC CLR	4238.00
T4700CT/340MB DYNAMIC CLR	4499.00
T6800/516MB ACT CLR	5099.00
T6800CS/516MB ACT CLR	6099.00

ASI BRAVO SERIES

LC 4/25S 120MB	999.95
LC 4/33S 120MB	UP 4/33D 170MB 1415.04
LC 4/33D 170MB	UP 4/33D 340MB 1883.77
LC 4/33D 210MB	1497.97 LC 4/66D 170MB 1858.52
LC 4/33D 340MB	1648.21 LC 4/66D 340MB 2127.00
LC 4/50 210MB	1897.58 MT 4/33D 170MB 1495.97
LC 4/50 340MB	1948.21 MT 4/33D 340MB 1965.77
LC 4/66D 170MB	1858.52 MT 4/66D 170MB 2149.15
LC 4/66D 170MB	1858.52 MT 4/66D 340MB 2375.32
NOTEBOOK 60HD MONO	1692.15
NOTEBOOK 120MB MONO	1719.70
NOTEBOOK 120MB COLOR	2237.93
NOTEBOOK 170MB MONO	1799.45
NOTEBOOK 170MB COLOR	2317.68
NOTEBOOK 170MB DUAL CLR	2884.68

Canon

NOTE-JET 4/25 180MB	2591.74
NOTE-JET 4/25 120MB COLOR	2825.25
NOTE-JET 4/25 240MB COLOR	3139.63
INNOVA 4/25 120MB MONO	1925.51
INNOVA 4/25C 5X 240MB	1925.71
INNOVA 4/50L 170MB	1349.55
INNOVA 4/50L 240MB	1426.96

NEC VERSA NOTEBOOKS

4/40 120MB MONO	2584.43
4/40 170MB MONO	2817.30
4/40 250MB MONO	2999.87
4/40 250MB COLOR	3720.91
4/50 209MB MONO	3256.00
4/50 340MB MONO	3499.00
4/50 340MB MONO	3558.79
4/50 340MB COLOR	4917.39
READY 4/25SE 170MB Multimedia	1447.15
READY 4/33SE 210MB Multimedia	1879.88
READY 4/33SE 340MB Multimedia	2139.92
IMAGE 14 4/33SE 340MB	2599.82
POWERMATE 4/33SX 170MB	1539.00
POWERMATE 4/33SX 210MB	1599.00
POWERMATE 4/50DX2 210MB	1468.68

SHARP NOTEBOOKS

486/33 200MB PAS CP w/Trackpad 3597.97
SHARP 486/33 200MB ACT Clr w/Trackpad 2997.75

Texas Instruments

TM4000E 4/25SE 120MB MONO	1748.57
TM4000 4/25DX 200MB MONO	2177.86
TM4000E 4/25S 120MB ACV COLOR	2098.42
TM4000S 4/40 200MB PAS COLOR	2797.89
TM4000E 4/50 200MB MONO	2529.84
TM4000E 4/50 200MB DUAL COLOR	3499.00

DOT MATRIX & LASER PRINTERS

OKIDATA

184 TURBO	219.14 ML391	565.97
ML320	406.49 PACEMARK 3410	1227.92
ML321	432.43 OL400E	499.98
ML380	514.99 OL800E	699.98
ML385	614.99 OL810E	899.98
ML395C	1039.74 OL805	1079.11
ML520	499.98 OL820	1299.98
ML521	499.19 DOCU-T 4000	2999.49
ML590	599.98	

Canon

BJ105X	255.88
BJ210E NEW	298.00
BJ230	298.00
BJC-600 COLOR	518.50
LBP430 LASER	589.50
LBP860 600DPI 8PPM NEW	1359.91

EPSON

AP3250	415.53 LQ870	444.91
AP3260	499.15 LQ1070	559.69
AP3260	599.15 LQ2550	849.08
LX810	249.90 DFX5000	1319.64
LX-810	249.90 GQ3500	599.95
FX870	335.38 STYLUS 800	229.05
FX1170	537.97 STYLUS 800+	279.95
LQ-570+	385.38	
LQ1070+		656.70
ACTION LASER 1500 W/2MB		715.22

W/ TRADE-IN MAIL-IN REBATE EPS-3 $100.04

IBM LEXMARK

4029/ 85 5PPM	837.17
4029-10R 10PPM	1033.46
4029-10S 10PPM	1334.42
4029-10RD 10PPM DUPLEX	1819.77
4029-10Z 10PPM	1819.77
4029-12L 12PPM	2399.86
4029-12C 16.7PPM	2733.95

NEC

P3200	224.78 Silentwriter 640	788.58
SuperScript 610	867.70 Silentwriter 95F	867.70
SuperScript 640	1139.00 Silentwriter 1097	1377.80

Panasonic

1150	193.49 4450	409.49
2023	262.26 4420 NEW	254.67
2624	282.87 4450 LASER	647.25
2123	243.37 4430 LASER	659.88
2180	315.41 4440 LASER	799.00

Texas Instruments

MICROMARC 810LITE	277.97
MICROWRITER BASIC	517.16
MICROWRITER PS35	877.20
MICROWRITER PS55	937.20
MICROLASER PRO 8PS22*	1299.00
MICROLASER PRO 12PS24	1799.00
POWERTEST UPG -IN1002	274.68

** AFTER $100 MANUFACTURER REBATE (ENDS 3/31/94)*

SHARP PRINTERS

SHARP JX9400 300DPI 4PPM	497.09
SHARP JX9450PS 300DPI 4MB PS	949.68

HEWLETT PACKARD

DeskJet Portable 310	367.40 Laser Jet 4P	999.92
DeskJet 500C	499.20 LaserJet 4M	1499.56
DeskJet 500C ...+99 JD	499.20 LaserJet 4	1499.56
DeskJet 500C ...+99 JD	499.20 LaserJet 4Si	2999.00
HP PrintWriXL300	2095.00 LaserJet 4Si MX	3599.00
HP PrintWriXL800	2208.93 LaserJet 4Si MX ...+600K JD	4006.36
LaserJet 4L	699.20	

HARD DRIVES & CONTROLLERS

Maxtor

131MB IDE	415.10	1.2GB IDE	937.81
170MB IDE	232.75	340MB SCSI	365.63
245MB IDE	314.67	540MB IDE	537.87
345MB SCSI	554.44		

MICROPOLIS

1006MB IDE	813.10	1.96GB SCSI-W	969.35
1006MB SCSI	812.15	1.78GB SCSI-W	1789.36
1.7GB SCSI	1299.29	3GB SCSI	2199.00

CONNER

210MB IDE	225.87	540MB IDE	535.17
340MB IDE	353.87	540MB SCSI	549.23
343MB SCSI	335.99	1GB SCSI	977.21
420MB IDE	399.99		

Seagate

200MB IDE	235.75		
340MB IDE	354.58		
341MB IDE	309.00		
420MB IDE	399.99		
1.0GB SCSI-2	1079.11		
1.05B SCSI-2	897.00		
2.1GB 2MB WIDE SCSI-2	2099.33		

CONTROLLERS

ACCULOGIC IDE W/1FLPR, 1SER, 1GAME	35.08
ACCULOGIC IDE W/BIOS	48.90
ADAPTEC 1542B ISA	274.00
ADAPTEC 1610A SCSI-2 CD XCT	84.56
ADAPTEC 1640CF SCSI-2	449.00
ADAPTEC 2742T EISA SCSI-2	339.72
ADAPTEC 2842 VLB SCSI-2	299.45

MODEMS & COMMUNICATIONS

Robotics

SPORTSTER MODEMS

14.4 INT	139.50
14.4 INT. W/FAX	149.50
14.4 EXT	169.50
14.4 EXT. W/FAX	179.50
WORLDPORT 14.4	249.00

COURIER MODEMS

V.STERLING INT	333.60
V.STERLING INT W/FAX	378.00
V.STERLING EXT	378.00
V.STERLING EXT W/FAX	396.00
DUAL STD TELEBOX W/FAX	737.63

Hayes

ACCURA 2400I INT	59.10/69.25
ACCURA 96 + FAX INT	139.00
ACCURA 96 + FAX 96 V.FC	159.00/169.45
ACCURA 96 + FAX 144 V.FC	169.75/179.25
OPTIMA 2400	374.30
OPTIMA 24 + Fax 96	112.54 OPTIMA 144 + Fax 96 V.FC	206.30
OPTIMA 96 + Fax 96	139.34 OPTIMA 288 V.FC	439.13
OPTIMA 96 + Fax 96 V.FC	208.52 Ext Port Kit	499.18
OPTIMA 144	364.80 Ultra 9600 Ext	599.18
OPTIMA 14.4 + Fax	264.50 ISDN Modem	1,199.00
	ESP Accelerator Serial Board	349.00
	Serial	79.50/119.94

Intel

2400/E INT	61.88
2400 EXT	109.50
PM2400/FX 2400 INT W/FAX	79.95
PM2400/FX 2400 V.42 EXT W/FAX	167.40
PM9600/FX 9600 INT W/FAX	139.77
PM9600/FX 9600 EXT W/FAX	199.95
PM14400/FX 14.4 INT W/FAX	159.90
PM14400/FX 14.4 EXT W/FAX	219.95
PM14400FXSA 14.4 EXT W/FAX, LCD	274.45
PM1440/FXP 14.4 POCKET W/FAX	287.50

SATISFAXTION MODEMS

100 INT	88.66	400 INT	273.05
200 INT	209.09	400 EXT	323.56

FAX MODEMS

2400 V.42BIS Int	108.75	9600 Ext W/FAX	149.80
2400 V.42BIS Ext	112.62	14.4 Int W/FAX	156.15
9600 Int W/FAX	129.95	14.4 Ext W/FAX	174.00

BOCA

BOCA 14.4K INT W/FAX			117.22
BOCA 14.4K EXT W/FAX			147.42
V.FC 24K SPS INT			199.59
V.FC 24K SPS EXT W/2000 I/O BOARD			249.50

BATTERY BACKUP AND UPS

tripp lite

BC250	99.11	BC400 LAN	246.00
SC400	192.99	BC750 LAN	313.90
SC650	249.99	BC900 LAN	439.67
BC500 LAN	199.49	BC1500 LAN	449.59

SMART UPS SERIES NEW

SMART 250 LAN			232.48
SMART 450 LAN			311.77
SMART 500 LAN			359.08
SMART 800 LAN			434.91
SMART 900 LAN			513.87
SMART 1000 LAN			525.84
SMART 1400 LAN			699.54
POWERMASS 4 OUTLET			38.38
ISOBAR 4 OUTLET			38.38
ISOBAR 6 OUTLET			48.16

AMERICAN POWER

BACK UPS 250	89.84	BACK UPS 600	374.15
BACK UPS 400	159.83	BACK UPS 1250	498.77
BACK UPS 400	169.83	SMART UPS 400	384.04
BACK UPS 600	263.67	SMART UPS 600	363.38

UNINTERRUPTIBLE NETWORK MINI

SURGEARREST PRO NEW	33.95
SURGEARREST PLUS INTEL	44.95
LINE R 600	119.09

MICE

LOGITECH TRACKMAN PORTABLE	72.50
LOGITECH C7 SERIAL/PS2	79.95
LOGITECH MOUSEMAN CORDLESS	89.95
LOGITECH DESKTOP TRACKBALL	94.95
LOGITECH CC3 TRACKBALL	99.95
LOGITECH MOUSEMAN	109.75
LOGITECH TRACKMAN MARBLE	109.95
MICROSOFT MOUSE 9.0 SERIAL*	79.00
MICROSOFT MOUSE 9.0 PS/2*	79.00

** WHILE SUPPLIES LAST.*

PCMCIA

BOCA 14.4K DATA/FAX	229.70
DATAFAX 14.4K W/FAX	238.00
DATAFAX 14.4K W/FAX	238.00
EAGLE MODEM 2400 INTERNET	179.00
HAYES OPTIMA 14.4 W/FAX	315.00
KTI TOKEN RING 16M	462.64
INTEL 14400 W/FAX	199.00
INTEL 14400 W/FAX	199.00
LINKSYS ETHERNET 10BT	197.95
LINKSYS ETHERNET 10BT COMBO	297.95
MEGAHERTZ XJ10BT 10BASE-T/AUI	169.27
MEGAHERTZ 14.4 W/FAX	265.49
MEGAHERTZ 14.4 W/FAX XJ	339.74
MEGAHERTZ 2400 XJACK W/FAX	197.82
MEGAHERTZ 2400 XJACK W/FAX	197.82
MINISTON 40MB HARD DRIVE	399.00
NAT SEMI NE4100T ETHERNET	68.90
NAT SEMI NE4100T ETHERNET 20BAX	82.80
PRACTICAL 14.4K DATA/FAX	279.16
PRACTICAL 14.4K W/FAX	279.16
USR 14.4K W/FAX	299.00
USR WORLDPORT 14.4 W/FAX	281.23
XIRCOM CREDIT CARD ETHERNET	249.00
XIRCOM ETHERNET 10BT	229.61
XIRCOM PE3-10BT/MODEM	319.71
XIRCOM PE3-10BT/MODEM	319.71

MEMORY UPGRADES

CDW® Features Delkin, Kingston, Pacific Data and Simple Technology Memory.

ABT BRAVO 486LC 2MB	CALL!
ACMEMORIES 4/25 4MB	CALL!
ABT PREMIUM 5 1MB CUPID SIMM	CALL!
ABT PREMIUM 8MB SIPS	CALL!
COMPAQ DESKPRO 8MB	CALL!
COMPAQ CONTURA 4MB	CALL!
COMPAQ CONTURA 4MB	CALL!
COMPAQ LTE 386/16 4MB	CALL!
COMPAQ LTE 4/25C 4MB	CALL!
COMPAQ PRESARIO 486/33 4MB	CALL!
COMPAQ PRESARIO 4/66 16MB	CALL!
EPSON ACTION LASER 2 8MB	CALL!
EPSON ACTION LASER 2 4MB	CALL!
HP LASER 4L 1MB MEM UPG	CALL!
HP LASER 4L 2MB MEM UPG	CALL!
HP LASERJET 5SI 4MB	CALL!
HP LASERJET 4 4MB	CALL!
HP PAINTJET XL300 4MB	CALL!
IBM 300 440SX2 4MB	CALL!
IBM THINKPAD 700 4MB	CALL!
NEC POWERMATE 25 4MB	CALL!
NEC VERSA 4MB	CALL!
NEC VERSA 4MB	CALL!
ONLAN/IBM 4MB	CALL!
PANASONIC 4420, 4430 2-4MB	CALL!
TOSHIBA LTC 7443 4MB	CALL!
TI MICROLASER 4MB	CALL!
TI TM4000 4MB	CALL!
Toshiba 1800, 1850, 2000SX/S, 2000EX 2MB	CALL!
Toshiba 1800, 1850, 2000SX 4MB	CALL!
Toshiba 1930C,4930C,4930C 8MB	CALL!
Zenko 440, 440SXC 4MB	CALL!
Toshiba T1960, 1850, 2000SX/E, 2000SX 8MB	CALL!
Kingston Memory	CALL!

Due to an Industry-Wide Memory Shortage, Please Call CDW for the Best, Most Current Pricing and Availability Information.

PROCESSOR UPGRADES

CYRIX 486DRX2 UPGRADE	249.25
INTEL OVERDRIVE 16/20MHZ	299.44
INTEL OVERDRIVE 25MHZ	399.99
INTEL OVERDRIVE 33MHZ	499.55
KINGSTON 50MHZ 25MHZ	199.95
KINGSTON 50MOW 25MHZ	199.95
KINGSTON 486/50W 25MHZ	329.76
KINGSTON 486/50W 33MHZ	329.63

MATH COPROCESSORS

INTEL 287XL	49.80
INTEL 387SX 16/20/25MHZ	76.84
INTEL 387SX 33MHZ	91.20
INTEL 387SL	78.22
INTEL 387DX	81.13

CDW Computer Centers, Inc.
1020 E. Lake Cook Road
Buffalo Grove, IL 60089

CDW® Sells for Less and Services You Better!
(800) 886-4CDW
FAX (708) 465-6800

CALL FOR FREE CDW® CATALOG

©1994 CDW® Computer Centers, Inc. PCC884

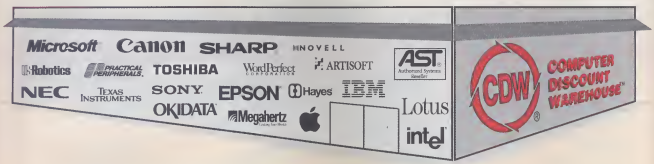
Circle 114 on reader service card.

COMPUTER DISCOUNT WAREHOUSE™

CDW®–Your Best Buy Just Got Bigger

Computer Shopper Best Buy of 1993

Winner of 4 1993 Best Buy Awards



CDW® and our family of manufacturers are celebrating a GRAND OPENING at our new 100,000 sq. ft. state-of-the-art facility. As the industry's premier direct marketer of name brand hardware, software and peripherals, we are offering these best buys to you:

PRACTICAL PERIPHERALS

CDW TOP SELLER

Practical Peripherals 14.4K bps Data/Fax MiniTower Modem

- ✔ V.32bis Data, V.42 Error Correction, V.42bis Data Compression
- ✔ Includes DOS and Windows Software, Vertical Stand
- ✔ Lifetime Warranty

14.4FXMT.....**$179.55** CDW 26163

TEXAS INSTRUMENTS

PRICE DROP!

Best-selling Texas Instruments Notebooks with New Lower Prices!

TM4000E WinSX/25
Monochrome 120MB.....**$1748.57** CDW 32070
TM4000E WinDX2/50
Monochrome 200MB.....**$2529.84** CDW 32678
TM4000E WinDX2/50
Dual Scan Color 200MB **$3068.00** CDW 32679

CDW CIRCLE OF SERVICE®

Megahertz

CDW TOP SELLER

1Megahertz 14.4K bps Data/Fax PCMCIA Modem with XJACK

- Only Megahertz has the XJACK® Extendable Connector ● XJACK Lightens Your Load: No Awkward External Connectors
- Auto Installation ● Hot Swappable
- Advanced Error Correction
- 5 Year Warranty

CDW 27680.....**$309.31** CDW 27680

MAGNAVOX

Magnavox 20CM64 20" SuperVGA Monitor

- ✔ Max Resolution: 1280x1024 Non-Interlaced
- ✔ Max Refresh: 90Hz, .31mm Dot Pitch
- ✔ Supports Wide Variety of Video Standards
- ✔ Front Mounted Controls, Tilt/Swivel Base
- ✔ 1 Year Warranty

Special Low Price

20CM64.....**$999.00** CDW 20751

800-886-4CDW

Circle 133 on reader service card.

©1994 CDW Computer Centers, Inc

884

Free Product Information

NO POSTAGE NECESSARY IF MAILED IN THE UNITED STATES

BUSINESS REPLY MAIL
FIRST CLASS MAIL PERMIT NO. 433 RIVERTON, NJ

POSTAGE WILL BE PAID BY ADDRESSEE

PCComputing
P.O. BOX 1689
RIVERTON, NJ 08077-9689

PCComputing FREE PRODUCT INFORMATION

Circle the numbers below corrsponding to products featured in this issue's advertisements and listed in the Editorial Product Index. Manufacturers will mail product literature to you free of charge.

Void after July 31, 1994

PRODUCTS FEATURED IN ADVERTISEMENTS

101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120	121	122	123	124	125	601	602	603	604	605	606	607	608	609	610	611	612	613	614	615
126	127	128	129	130	131	132	133	134	135	136	137	138	139	140	141	142	143	144	145	146	147	148	149	150	616	617	618	619	620	621	622	623	624	625	626	627	628	629	630
151	152	153	154	155	156	157	158	159	160	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175	631	632	633	634	635	636	637	638	639	640	641	642	643	644	645
176	177	178	179	180	181	182	183	184	185	186	187	188	189	190	191	192	193	194	195	196	197	198	199	200	646	647	648	649	650	651	652	653	654	655	656	657	658	659	660
201	202	203	204	205	206	207	208	209	210	211	212	213	214	215	216	217	218	219	220	221	222	223	224	225	661	662	663	664	665	666	667	668	669	670	671	672	673	674	675
226	227	228	229	230	231	232	233	234	235	236	237	238	239	240	241	242	243	244	245	246	247	248	249	250	676	677	678	679	680	681	682	683	684	685	686	687	688	689	690
251	252	253	254	255	256	257	258	259	260	261	262	263	264	265	266	267	268	269	270	271	272	273	274	275	691	692	693	694	695	696	697	698	699	700	701	702	703	704	705
276	277	278	279	280	281	282	283	284	285	286	287	288	289	290	291	292	293	294	295	296	297	298	299	300	706	707	708	709	710	711	712	713	714	715	716	717	718	719	720
301	302	303	304	305	306	307	308	309	310	311	312	313	314	315	316	317	318	319	320	321	322	323	324	325	721	722	723	724	725	726	727	728	729	730	731	732	733	734	735
326	327	328	329	330	331	332	333	334	335	336	337	338	339	340	341	342	343	344	345	346	347	348	349	350	736	737	738	739	740	741	742	743	744	745	746	747	748	749	750
351	352	353	354	355	356	357	358	359	360	361	362	363	364	365	366	367	368	369	370	371	372	373	374	375	751	752	753	754	755	756	757	758	759	760	761	762	763	764	765
376	377	378	379	380	381	382	383	384	385	386	387	388	389	390	391	392	393	394	395	396	397	398	399	400	766	767	768	769	770	771	772	773	774	775	776	777	778	779	780
401	402	403	404	405	406	407	408	409	410	411	412	413	414	415	416	417	418	419	420	421	422	423	424	425	781	782	783	784	785	786	787	788	789	790	791	792	793	794	795
426	427	428	429	430	431	432	433	434	435	436	437	438	439	440	441	442	443	444	445	446	447	448	449	450	796	797	798	799	800	801	802	803	804	805	806	807	808	809	810
451	452	453	454	455	456	457	458	459	460	461	462	463	464	465	466	467	468	469	470	471	472	473	474	475	811	812	813	814	815	816	817	818	819	820	821	822	823	824	825
476	477	478	479	480	481	482	483	484	485	486	487	488	489	490	491	492	493	494	495	496	497	498	499	500	826	827	828	829	830	831	832	833	834	835	836	837	838	839	840
501	502	503	504	505	506	507	508	509	510	511	512	513	514	515	516	517	518	519	520	521	522	523	524	525	841	842	843	844	845	846	847	848	849	850	851	852	853	854	855
526	527	528	529	530	531	532	533	534	535	536	537	538	539	540	541	542	543	544	545	546	547	548	549	550	856	857	858	859	860	861	862	863	864	865	866	867	868	869	870
551	552	553	554	555	556	557	558	559	560	561	562	563	564	565	566	567	568	569	570	571	572	573	574	575	871	872	873	874	875	876	877	878	879	880	881	882	883	884	885
576	577	578	579	580	581	582	583	584	585	586	587	588	589	590	591	592	593	594	595	596	597	598	599	600	886	887	888	889	890	891	892	893	894	895	896	897	898	899	900

PRODUCTS FEATURED IN EDITORIAL

Please answer questions below:

1. **Where do you use your computer?** (Check one only):
   A ☐ Home B ☐ Business C ☐ Both
2. **What kinds of computers do you use?** (Check all that apply):
   D ☐ IBM/Compatible Laptop E ☐ IBM/Compatible Desktop F ☐ MAC
3. **Do you plan to buy any of the hardware or software mentioned below in the next three months?** (Check all that apply):

HARDWARE
G ☐ PC
H ☐ MAC
I ☐ Laptop
J ☐ Printer
K ☐ Monitor
L ☐ Disk/Tape Back-up
M ☐ Add-in Board
N ☐ Modem
O ☐ Input Device
P ☐ Local Area Network

SOFTWARE
Q ☐ Accounting
R ☐ Spreadsheet
S ☐ Personal Finance
T ☐ Desktop Publishing
U ☐ Word Processor
V ☐ Database Manager
W ☐ Graphics
X ☐ Utility

Y ☐ Communications
Z ☐ Windows/Multi-tasking
1 ☐ Programming Language. Compiler
2 ☐ Integrated/Multifunction
3 ☐ CAD

4. **From which of the following sources do you purchase personal computer products?** (Check all that apply):
   4 ☐ Specialty Computer Retail Stores 6 ☐ Direct from Manufacturers
   5 ☐ Mail Order Firms 7 ☐ Other

PLEASE PRINT CLEARLY

PCC 4/94-4

Name

Title | Telephone

Company Name

Address

City | State | Zip

5. ☐ Please send me a one-year (12 issue) subscription to PC/Computing for $16.94 (U.S. price). all other countries add $16.00 for additional postage.

PC Computing FREE PRODUCT INFORMATION

Circle the numbers below corresponding to products featured in this issue's advertisements and listed in the Editorial Product Index. Manufacturers will mail product literature to you free of charge.

Void after July 31, 1994

PRODUCTS FEATURED IN ADVERTISEMENTS

101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120	121
126	127	128	129	130	131	132	133	134	135	136	137	138	139	140	141	142	143	144	145	146
151	152	153	154	155	156	157	158	159	160	161	162	163	164	165	166	167	168	169	170	171
176	177	178	179	180	181	182	183	184	185	186	187	188	189	190	191	192	193	194	195	196
201	202	203	204	205	206	207	208	209	210	211	212	213	214	215	216	217	218	219	220	221
226	227	228	229	230	231	232	233	234	235	236	237	238	239	240	241	242	243	244	245	246
251	252	253	254	255	256	257	258	259	260	261	262	263	264	265	266	267	268	269	270	271
276	277	278	279	280	281	282	283	284	285	286	287	288	289	290	291	292	293	294	295	296
301	302	303	304	305	306	307	308	309	310	311	312	313	314	315	316	317	318	319	320	321
326	327	328	329	330	331	332	333	334	335	336	337	338	339	340	341	342	343	344	345	346
351	352	353	354	355	356	357	358	359	360	361	362	363	364	365	366	367	368	369	370	371
376	377	378	379	380	381	382	383	384	385	386	387	388	389	390	391	392	393	394	395	396
401	402	403	404	405	406	407	408	409	410	411	412	413	414	415	416	417	418	419	420	421
426	427	428	429	430	431	432	433	434	435	436	437	438	439	440	441	442	443	444	445	446
451	452	453	454	455	456	457	458	459	460	461	462	463	464	465	466	467	468	469	470	471
476	477	478	479	480	481	482	483	484	485	486	487	488	489	490	491	492	493	494	495	496
501	502	503	504	505	506	507	508	509	510	511	512	513	514	515	516	517	518	519	520	521
526	527	528	529	530	531	532	533	534	535	536	537	538	539	540	541	542	543	544	545	546
551	552	553	554	555	556	557	558	559	560	561	562	563	564	565	566	567	568	569	570	571
576	577	578	579	580	581	582	583	584	585	586	587	588	589	590	591	592	593	594	595	596

PRODUCTS FEATURED IN EDITORIAL

601	602	603	604	605	606	607	608	609	610	611	612	613	614	615	616	617	618	619	620	621
626	627	628	629	630	631	632	633	634	635	636	637	638	639	640	641	642	643	644	645	646
651	652	653	654	655	656	657	658	659	660	661	662	663	664	665	666	667	668	669	670	671
676	677	678	679	680	681	682	683	684	685	686	687	688	689	690	691	692	693	694	695	696
701	702	703	704	705	706	707	708	709	710	711	712	713	714	715	716	717	718	719	720	721
722	723	724	725	726	727	728	729	730	731	732	733	734	735	736	737	738	739	740	741	742
743	744	745	746	747	748	749	750	751	752	753	754	755	756	757	758	759	760	761	762	763
764	765	766	767	768	769	770	771	772	773	774	775	776	777	778	779	780	781	782	783	784
785	786	787	788	789	790	791	792	793	794	795	796	797	798	799	800	801	802	803	804	805
806	807	808	809	810	811	812	813	814	815	816	817	818	819	820	821	822	823	824	825	826
827	828	829	830	831	832	833	834	835	836	837	838	839	840	841	842	843	844	845	846	847
848	849	850	851	852	853	854	855	856	857	858	859	860	861	862	863	864	865	866	867	868
869	870	871	872	873	874	875	876	877	878	879	880	881	882	883	884	885	886	887	888	889
890	891	892	893	894	895	896	897	898	899	900										

Please answer questions below:

1. **Where do you use your computer?** (Check one only):
   A. ☐ Home B. ☐ Business C. ☐ Both
2. **What kinds of computers do you use?** (Check all that apply):
   D. ☐ IBM/Compatible Laptop E. ☐ IBM/Compatible Desktop F. ☐ MAC
3. **Do you plan to buy any of the hardware or software mentioned below in the next three months?** (Check all that apply):

HARDWARE
G. ☐ PC
H. ☐ MAC
I. ☐ Laptop
J. ☐ Printer
K. ☐ Monitor
L. ☐ Disk/Tape Back-up
M. ☐ Add-in Board
N. ☐ Modem
O. ☐ Input Device
P. ☐ Local Area Network

SOFTWARE
Q. ☐ Accounting
R. ☐ Spreadsheet
S. ☐ Personal Finance
T. ☐ Desktop Publishing
U. ☐ Word Processor
V. ☐ Database Manager
W. ☐ Graphics
X. ☐ Utility
Y. ☐ Communications
Z. ☐ Windows/Multi-tasking
1. ☐ Programming Language/ Compiler
2. ☐ Integrated/Multifunction
3. ☐ CAD

4. **From which of the following sources do you purchase personal computer products?** (Check all that apply):
   4. ☐ Specialty Computer Retail Stores
   5. ☐ Mail Order Firms
   6. ☐ Direct from Manufacturers
   7. ☐ Other

PLEASE PRINT CLEARLY

PCC 4/94-4

Name

Title Telephone

Company Name

Address

City State Zip

5. ☐ Please send me a one-year (12 issue) subscription to PC/Computing for $16.94. (U.S. price); all other countries add $16.00 for additional postage.

Free Product Information

BUSINESS REPLY MAIL
FIRST CLASS MAIL PERMIT NO. 433 RIVERTON, NJ

POSTAGE WILL BE PAID BY ADDRESSEE

PC Computing
P.O. BOX 1689
RIVERTON, NJ 08077-9689

NO POSTAGE NECESSARY IF MAILED IN THE UNITED STATES

OPEN SUNDAYS

WHOLESALE TO THE PUBLIC

IF YOU FIND A BETTER PRICE... CALL US BEFORE YOU BUY!

FAX

TOSHIBA
4700 449
5400 575

Panafax
FX 150 ... 388
260 M ... 1139
650 M ... CALL

FAX CLEANING KIT
• Help reduce service calls
• Protects the machine's life
• Increases tray life
• Built from machine

$49

Panasonic
110 556
140 438
150 368
250 423
350 459
450 B ... 485

SHARP
FO 135 ... 297
810 299
FJ 38 AB ... CALL
200 328
112 ♦ ... 319
202 ♦ ... 388
183 ♦ ... 566

FUJITSU
DEX 440 ... 665

PERFRCT FOR HOME USE
Canon
FAXPHONE 80
• 10 Pg. Auto-Feed
• Voice/Fax Switch
• Auto Paper Cutter
• Answering Machine Interface
• Large 32K Roll Capacity
FAX PAPER, 4 Rolls, 32ft, Color $6.99
$399

EXTRA HEAVY DUTY
FUJITSU
• Rated Highest Quality
• 30 Page Auto. Doc. Feeder
• Stop-Down/Step-up Models
• 410° Paper Roll
DEX 440 $999

brother
720 248
810 299
FJ 38 AB ... CALL
730 ♦ ... 428
714M ... 444
740 ♦ ... 477
780MC ... 477

FAX SWITCHES
COMMUNICHOICE
FAX 168 ... 57.99
FAX 188 ... 69.99
TF 555 ... 149

FAX ON DEMAND

FaxExpress
Delivers Instant Information on request
It Speeds the day saving.
So you can spend the day working
Automatically faxes information to inquiring callers
• Lets your customers and employees access information 24 Hours a day, about your products and services - Without tying up office personnel.
• Calls can select document directly by DX or type a voice menu using a Touch-Tone phone-then receives it on caller's fax machine!
• Ideal For Telecript support, Marketing, Customer Service, Dealer and Sales Support, Fax Broadcasting, Instant Article Publishing
• Stores up to 800 pages
CAN PAY FOR ITSELF IN JUST A FEW WEEKS
$2495

PRINTER FAX
RECEIVES PLAIN PAPER FAXES WITH YOUR LASERJET
$188
RECEIVES PLAIN PAPER FAXES WITH YOUR LASER, INKJET OR DOT MATRIX PRINTER
$399
• No Computer Required
• Connects to PC or Fax Server
• Receives & Store Faxes when printer is not available
• Auto Switch Phone/Fax/Answer. Mach.

PLAIN PAPER FAX

HEWLETT PACKARD
POPULAR DESKJET TECHNOLOGY
• Quick Doc. Reduction
• Error Correction Mode
• Factory Serviced
• Remote Diagnostics
• 256KS Memory

900	688
950	939
310	977
F 72	1368
F 78	1569
F 85 ...	SUPER

FAX 200 ... $788 • 3 FREE TONER REFILLS
VALUED AT **$699**

NEC
401	1277
402	2377

Panafax
PX 560	835
UF 121	1188
UF 322	669
755	1777
755 ...	2127

Panasonic
3000	1169

OKIDATA
251	1788
2300	1988

XEROX
7024 1277
704 2130
7052 2279
7053 3579
800 1399
2500 L ... 1989
3000 L ... 1989
4800 L ... CALL

SHARP
1700 777
2130 877
3400 1277
3450 ..... CALL
4600 1999
5320 1788
5400 ..... CALL
brother
900 377
950 M ... 838

TOSHIBA
LOW END COMMERCIAL QUALITY
• 250 Sheet Recive Capacity
• Sturdy Build
TF 611
531 1068
551 2298
581 ..... CALL
$1479

Canon
BUBBLE JET
• 5 Pg. Auto Feed
• 50 Pg. Incoming Capacity
• 60 Sec. Print Speed
B 60 ..... $636 • 2 FREE TONER REFILLS
VALUED AT **$599**

B 70	679
B 75	758
B 80	999
200	966
LTD	1272

Panasonic
LED PLAIN PAPER WITH ANSWERING MACHINE
KFX 3000
• 20 Pg. Auto Feed
• 20 Pg. Out of Paper Reception
• 70 Sheet Incoming Capacity
$1198

COPIERS

SHARP
SF 7329
ENTRY LEVEL COMMERCIAL COPIER **$888**
• 250 Sheet Capacity
• 13 Copies Per Minute
• Stationary Platen

SF 2035 ...	988
SF 7070 ...	1169
SF 7800 ...	1588
SF 7850 ...	1788
SF 7900SUPER	2188
Z 72	899
Z 85	1099
Z 92	488
Z 98	CALL

Canon
ENTRY LEVEL OFFICE COPIER
NP 1020
• 8 Copies per min.
• 100 Sheet Cap
• Legal/Letter
• Factory Serviced
• Manual Bypass
Z 67 **$488**

NP 1020 ...	1368
NP 1500 ...	1995
NP 2020 ...	2495
NP 2120 ...	NEW

Canon
RATED BEST
PC 6RE
• Letter/Legal
• 100 Sheet Capacity
• Factory Serviced
• Reduction/ Enlargement
$699

(PC)
PC 2 LP
LEGAL COPY CAPABLE
• 1.9 Multicopy
• 50 Sheet Capacity
• Compact **$488**

PC 310 ...	358
PC 330 ...	447

Canon
SUPER VALUE
PC 3 LP ... 479
PC 7 ... 775
PC 11 ... 799
PC 3 II

PC 12
• Single sheet feed
• 6 Copies per minute
• Factory Serviced
• Lightweight 26Lb.
$898

Canon
TOP OF THE LINE
• Letter/Legal
• 10 Copies per minute
• 70-122% Zoom

COPIER CARTRIDGES
• 3000 COPIES
• All in one cartridge
• Factory serviced
• No maintenance
$99

FOR THE OFFICE
mita 1438
COPYSTAR
• Reduce/Enlarge
• Copies 8x14"
• 250 Sheet Tray
• Stationary Platen
OUR PRICE **$1488**
$2395

Panasonic
• 250 sheet capacity
• Letter/Legal
• Manual By-Pass
• Reduction/ Enlargement
FF 830
$688

930	688
1020	918
1275	1295

CALL US FOR SUPPLIES ON ALL YOUR COPIER TONER NEEDS

HARD DRIVES

WESTERN DIGITAL

1210A ..213M ... 208
2052A ..359M ... 319
2040A ..340M ... 268
2420A ..420M ... 338

Conner
3043AH ..199M ... 159
3072E ..179M ... 148
3104E ..179M ... 168
3083H ..259M ... 225
3034E ..450M ... 288
3084E ..549M ... 475

Quantum
LPS 144
LPS 216
210 S 216
1050 S 316
1.2SS 316

Maxtor
7213A ..131M ... 209
7245A ..245M ... 218
7345A ..345M ... 288
7345 S ..345M ... 329

Seagate
3145A ..136M ... 199
3243A ..208M ... 249
3239A ..260M ... 218
3330A ..260M ... 288
3330H ..340M ... 358
3550A ..452M ... 388
3550N ..452M ... 479
3655A ..528M ... 529
3600A ..529M ... 588
4120HP ..1.0G ... 1088
12400N 2.1G ... 1588

2624-1/T 320M ... 448
2624/53-324M ... 348
2052FA 1.75G ... 1588

MICROPOLIS
2205 ..510M ... 608
1528 ..1.0GM ... 799
2210A ..971M ... 888

OKIDATA
380+ 199
1Us-T 201
1Us+ 227
521+ 295
520+ 359

521+ 448
590+ 599
571+ 578
571+ 618
595C+ 945
3140 1158

Panasonic
24 PIN, FAST, SUPER QUIET, WIDE CARRIAGE **KX-P3624**
• 300 CPS draft / 100 CPS LQ
• Factory Serviced
• 21 Fonts - ATM
• 256K Print Buffer
$308

EPSON
LX 810 181
FX 2190 469
AP 3250 ♦ ... 156
LQ 570+ 232
LQ 870 423
LQ 1070+ ... 365
LQ 1170 ... 519
LQ 2550 ... 866
DFX 5000 ... 1788
All Epson 220V ..... CALL

Kodak DICONIX 180 SI ... 191

PRINTERS

Panasonic 2ND WEIGHTY
2180 168
2130 178
2123 218
2124 288
3131 365
1695 345
1624 478

Panasonic
24 PIN, FAST, SUPER QUIET, WIDE CARRIAGE **KX-P3624**
• 300 CPS draft / 100 CPS LQ
• Factory Serviced
• 21 Fonts - ATM
• 256K Print Buffer
$308

EPSON
LX 810 181
AP 3250 ♦ ... 156
LQ 570+ 232
LQ 870 423
LQ 1070+ ... 365
LQ 1170 ... 519
LQ 2550 ... 866
DFX 5000 ... 1788
All Epson 220V ..... CALL

Kodak DICONIX 180 SI ... 191

Canon BJ 10 E
LOWEST PRICE PORTABLE WITH LASER QUALITY RESOLUTION
w/ Carry Case $488
Sheet Feed & Batt. $188

STYLUS
20 $222 60
$265

SCANNERS
600 C DCR 7x7
600 SCSI 791
600 GS 1788

OKIDATA
ULTRA COMPACT 600 DPI
• 7 Pages per minute with RISC Processor
• 5 builtin fonts
• 5 Years Print Head warranty
410 E
$597

SHARP
JX 9000 ... 979
AL 1000 ... 536
AL 1500 B ... 748

Panasonic
INEXPENSIVE LASER PRINTER
KX P4410
• 300 DPI
• 28 built-in fonts
• 512K, up to 4.5MB
• 200 Pg. Letter/Legal tray
• Factory Serviced
• LCD control Panel
$477

HEWLETT PACKARD

LASERJET	DESKJET	DESKWRITER
IV L ... 858	500 279	500 282
IP 595	500 C ... 377	550 C ... 499
IV ML ... 877	550 C ... 474	890 499
IV P 929	850 C ... 1538	850 C ... 549
IV MP ... 1329	1200 C/PS 2188	SCANJET
IV 1936	PAINTJET	IIP 858
IV M 1429	XL 300 ... 1288	IIC+ 894
IV SI 2788	PORTABLE 375	

220V IIP, DESKJET, IV ..... CALL

brother
HL 0 582
HL 6 V 644
HL 10H ... 1514
HL 10V ... 938

Canon
LBP 430 ... 553
4 SX 790
6 SX 1239
10 SX 2088

NEC
JM 1000 ... 288
2-15 F 648
2-15 FX ... 1089
2-17 1038
2-07 FX ... 1248
2-17 1638

FARGO COLOR PRINTER
PRINERA 677
1067 1538

CARTRIDGE INCLUDED

NOTEBOOK COMPUTERS

TOSHIBA
T 1950 120 ... 1799
T 1952 200 ... 1988
T 1960CS 120 ... 2277
T 1960CS 200 ... 2577
T 1950CT 120 ... 2588
T 1950CT 200 ... 2788

T 3400 3599
T 3400 CT ... 3199
T 4600 120 ... 3199
T 4600 200 ... 2266
T 4600CD 120 ... 3636
T 4600CD 200 ... 3936
T 4600CD 320 ... 4186

EPSON ACTION NOTE
SLC 33 1588
4/120 1588
4/170 1688
360C
PASSIVE COLOR
4/120 1343
4/170 1348

4/120 1588
4/180 1688
360C
ACTIVE COLOR
4/120 1888
4/180 1994

NEC THE E SERIES
MONO COLOR
486 DX2/40 4MB/120MB ... 2438 3592
250MB ... 2817 3969
486 DX2/50 4MB/200MB ... 3083 4218
340MB ... 3468 4615

800-521-FAX

65 Worth St., N.Y., N.Y. 10013
INFO & ORDERS
212 925-6200
Export/ Wholesale 212 941-1192
Cust. Serv./ Repairs 212 431-5426

Mail/phone orders wel Visa, MC Discover Para & Comp checks in advance Allow 10 days for checks to clear) COD Certified or Cashiers Checks, Credit Card Fuel Limit $2000 orders charged on day shipped. Due to the unstability inherent in mail industry price may vary from published listings. All merchandise except special orders come with full money back guarantee excluding shipping/handling charges. Please ask for authorized # from our cust. service dept. prior to returning any merchandise. 20% restocking with merchandise returned in brand new condition. Business copiers require professional installation and check in advance. ★ Factory Serviced Like new condition; New Box, Packaging, Manual, with Full MFG. Warranty.

HOURS ; SUNDAY 10 - 5, MONDAY - THURSDAY 10 - 7, FRIDAY 10 - 2

P.O.S' WELCOME

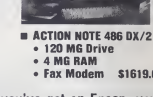
For Printers, It's Arlington!

Arlington Computer Products appreciates your interest in our products!

EPSON

FX870	$259	LQ1170	$589
FX1170	$345	LQ2550	$879
LQ570+	$235	DFX5000+	$1299
LQ870	$425	DFX8000	$2189
LQ1070+	$355	Action 3250	$169
Action Laser 1000			$579
Action Laser 1500			$639
Action Laser 1500-2MG			$689
Stylus 300			$235
Stylus 800			$255*

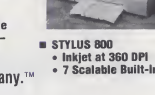
*after rebate



- **ACTION NOTE 486 DX/2**
  - **120 MG Drive**
  - **4 MG RAM**
  - **Fax Modem $1619.00**

- **ACTION LASER 1500**
  - **6 PPM**
  - **27 Fonts**
  - **PCL5 Compatible**
  - **PC Computing — "Best PCL5"**

Byte Magazine "Best Buy!"



- **STYLUS 800**
  - **Inkjet at 360 DPI**
  - **7 Scalable Built-In Fonts**

When you've got an Epson, you've got a lot of company.™

CHIPS

1MB/4MB Simms .... $49/$149
Epson Action 2 MG $99
Cyrix DRx2-25/50 ..... $365
Cyrix DRx2-20/40 ..... $289
HP 2MG/4MG ..... $99/$159
OKI Laser 2MB $125

intel

80387 SX/DX ..... $75/$85
Overdrive SX20/25 .. $279/$295
Overdrive DX25/33 .. $295/$475

TEXAS INST.

486/WINSX 120 ..... $1835
486/WINSX 25 Color $2119
486/DX2/50-200 MG $2639
486/DX2/40 Color $2889
486/DX2/50E Color $3749
MicroWriter Basic $519
MicroWriter PS23 ..... $675
MicroWriter PS55 ..... $935
Pro 600 PS23 ..... $1329

SOFTWARE

Aldus Pagemaker 5.0 ..... $519
Corel Draw 4.0 ..... $359
Lotus 123 2.4/3.4 ... $279/$325
Lotus 123 4.0 ..... $279
Microsoft Office $449
Microsoft Windows 3.1 .... $69
Microsoft DOS 6.0 Upg. $49
Word Perfect 6.0 ..... $249
Word Perfect Windows $269

DRIVES & TAPES

Back Pack 250 ..... $339
Connor 250 Tape $149
Connor 120/170 .... $179/$199
Connor 212/540 .... $239/$639
Teac Dual Floppy $119
Toshiba 3½" 1.44 ..... $69

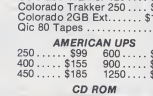
COLORADO

Colorado Jumbo 120 ..... $99
Colorado Jumbo 250 ..... $159
Colorado Trakker 120 .... $275
Colorado Trakker 250 .... $315
Colorado 2GB Ext. $1069
Qic 80 Tapes $21

AMERICAN UPS

250	$99	600	$259
400	$155	900	$369
450	$185	1250	$485

CD ROM



NEC - TRIPLE SPEED

NEC 3Xe $549
NEC 3Xi $439
NEC 3Xp $419
NEC 4X Pro $899
Fusion Double CD $499

SEAGATE HARD DISKS

40 MB for AT (ST251-1) .. $229
535 MG 6310N SCSI $609
245 MG 3283 ..... $279
260 MG 3290A $225
452 MG 3550A $409

HEWLETT-PACKARD

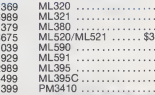
Laserjet IV w/Toner $1369
Laserjet IVP w/Toner $989
Laserjet IVMP w/Toner .. $1379
Laserjet IVL w/Toner $675
Laserjet IVML/w/Toner .. $1039
Laserjet IVM w/Toner $1929
Laserjet IV SI w/Toner .. $2989
Laserjet IV SI MX $4499
Jet Direct 2371A $399
Jet Direct 2371B $449
1MG/2 MG ..... $69/$99
4MG Upgrade $159
8MG Upgrade $339
Deskjet 310 ..... $299
Deskjet 500/500C $309/409
Deskjet 550C $479
Deskjet 1200C $1399
2P/IIC Scanner .... $719/$979
Deskjet 1200C/PS $1939
Pacific Page XL .... $259/$699
Pacific Data 25 in Font .. $239

NETWORKING

Netware 3.12 5 User $579
Netware 3.12 10 User $1299
Netware 3.12 25 User $1799
Netware 3.12 50 User $2349
Netware 3.12 100 User $3299
Netware 4.0 10 User $1849
Netware 4.0 25 User $2649
Lantastic Starter 5.0..... $419
Node Runner 2000C $159
2000C 12-Pack $1859
Central Station $385
E143 Ethernet $185
NE2000 ..... $99
SMC Hub 8 Port T/P $325
SMC TP 12 node Conc... $579
SMC+16-9 Pack $619
SMC Ethercard +/+16 $89/$115
3 Com Etherlink III $119
3 Com Etherlink II 16 .... $159
Etherlink III 5 Pack $519
Intel Ether 16 ..... $89
Intel Ether 16-5 Pack $429
Intel Ether 16-20 Pack ... $1629
Intel Netport II $355
Intel Token 16/S $389
Xircom Pocket Ethernet .. $269
Xircom PCMCIA Ethernet $279

OKIDATA

ML320 ..... $295
ML321 ..... $415
ML380 ..... $209
ML520/ML521 ..... $369/$489
ML590 ..... $415
ML591 ..... $569
ML395 ..... $959
ML395C $1029
PM3410 ..... $1199



OL400E $495
OL410E $659
OL810/OL830..... $899/$1089
OL850+ $1199
Doc It 3000 ..... $2389
Doc It 4000 ..... $2699
Okidata Laser 2 MG..... $125

Panasonic

1124i	$229	2624	$369
2023	$199	3123	$279
2123	$229	4410	$535
2124	$295	4430	$639
2180	$169	4440	$999
1624	$379	4455	$1659

4410/4450I 2 MG ...$129

NEC

Jetmate 1000 ..... $269
P6200/P6300 ..... $399/$599
P9300 ..... $825
Superscript 610 ..... $635
Model 95/95FX .... $869/$1079
Model 1097 ..... $1349

SCAN. & DIGIT.

Epson Action Scanning .. $769
Color ScanMan $409
ScanMan w/Omni Page .. $185
Summasketch 12×12 ..... $255
Summasketch 12×18 ..... $499

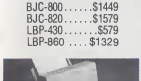
Arlington Computer Products, inc.

FOR ORDERS & QUOTES:

800-548-5105

Canon

BJ-10SX $239
BJ-200 .....$285
BJ-200e $285
BJ-230 .....$389
BJC-600 .....$579
BJC-800 .....$1449
BJC-820 .....$1579
LBP-430 .....$579
LBP-860 .....$1329



■ BJ-200 - 360 DPI
- 4 PPM

NEW TECHNOLOGY!

■ NOTEJET 486 - SLC/25
- Built-In "Bubble-Jet" printer
- 4 MG Ram
  85 MG - $2139 135 MG - $2349
  180 MG - $2549

■ NOTEBOOK 486 - SLC/25
- 120 MB • Fax Modem
- 4 MG..... $1499.00
- As Above with Dual STN Color $2199

Canon has "Bubble-Jet" Technology!

intel Modems

Along with connecting you to an audience of millions, Intel Fax Modems provides outstanding value.

Fax Modems

24/96 Int. . . $99.00 96/96 Int. . $139.00 14.4/14.4 Int. $145.00
24/96 Ext. . . $119.00 96/96 Ext. . $159.00 14.4/14.4 Ext. $165.00

SatisFAXtion MODEMS

200 2400 V.42/9600 Fax . $199.00 400 14.4/14.4 Fax . . . $259.00
300 14.4/9600 Fax . . . . $219.00 400 Ext. 14.4/9600Fax . . . $295.00

PC MCIA MODEMS

Take your office with you wherever you go. The Intel PCMCIA Fax-modem is a credit card-sized adapter that inserts into a computer's PCMCIA slot

24/96 . . . . . $149.00
14.4/14.4 . . . . . $259.00

MONITORS

NEC

3 FGE/3 V.....$579/499
4 FGE.....$679
5 FG/5 FGP.....$1245/1189
5 FGE.....$1049
6 FGP.....$2289

CTX

5468A/1451.....$249/$279
1560/1760.....$379/$699

MAG

MX15F 15".....$495
MX17F 17".....$879

MITSUBISHI

EGA.....$239
Diamond Pro 17.....$999
Diamond Scan 15 FS.....$479
Diamond Pro 21 FS.....$2149
HL6955 20".....$1759

NANAO

F340IW.....$659
F550I/F550IW.....$995/$1089
T560I/F560IW.....$1649/$1339
F760IW.....$1999

SONY

CPD-1604S.....$939
CPD-1730 17".....$999
GDM 2036S.....$1999

VIEW SONIC

15/17-7.....$429/$789
17.....$959
20/21.....$1529/$1789

MODEMS

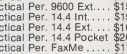
Hayes

Accura 14.4/Fax - Int. $189
Accura 14.4/Fax - Ext. ...$219
Hayes Optima 96 .....$309
Hayes Optima 96 Fax $339
Hayes Optima 14.4/Fax ...$369
Hayes 28.8 .....$425
Hayes Ultra 96 14.4 .....$589
Hayes Pocket 14.4 .....$299
PCMCIA 14.4 .....$269

PRACTICAL PERIPHERALS

Practical Per. 9600 Int. ...$139
Practical Per. 9600 Ext. ...$155
Practical Per. 14.4 Int. $159
Practical Per. 14.4 Ext. $169
Practical Per. 14.4 Pocket $269
Practical Per. FaxMe $119
PCMCIA 14.4 .....$265

US Robotics



16.8 HST Ext.....$459
14.4 Dual Std. 16.8.....$659
Sportster 14.4 Int.....$145
Sportster 14.4 Ext.....$159
Sportster 14.4 Int. Fax....$149
Sportster 14.4 Ext. Fax....$169
Courier V.32 Terbo Fax ...$369
PCMCIA 14.4 .....$259

VIDEO BOARDS

ATI VGA Wonder 1MG...$119
ATI Graph Ultra + 2MG ...$229
ATI Graph Prof 2 MG $329
ATI Prof 2MG VLB.....Call
Boca Super VGA $99
Diamond Stealth Pro.....$239
Diamond Viper 2 MG.....$389
Hercules Dynamite VLB ...$155
Hercules Graphite 2MG ...$369
1024 VGA 16 Bit $59

ARLINGTON COMPUTER PRODUCTS... GREAT SERVICE SINCE 1984!

- PC Magazine "...Arlington offers worry-free mail order purchasing!"
- PC Sources Review "...You can be confident that what you order will work!"
- PC Computing "...Courteous service and terrific technical support!"
- PC Computing Mail Order Review of Peripheral Specialists 8/93. We received the only 5 Star Rating for Price!

Prices and availability subject to change without notice. Qualified purchase orders accepted.

Hours C.S.T.
7:30-8:30 pm Mon-Fri
9:00-5:00 pm Saturday

CIRCLE 336 ON READER SERVICE CARD

1970 Carboy,
Mt. Prospect, IL 60056

NO SURCHARGE FOR CHARGE CARDS!

CUSTOMER SERVICE AND IN ILLINOIS
708-228-6333
SHIPPING
708-228-9748
TECHNICAL ASSISTANCE
708-228-1470
FAX
708-228-0516

Arlington Computer Products, inc.

FOR ORDERS & QUOTES:

800-548-5105

Circle 161 on reader service card.

Lean, Mean, "Green" Machines From Amdek!

"Lean" on price, **"Mean"** on full features, and **"Green"** on helping to protect you and the environment! The Amdek AM/815E ($379) and the AM/817E ($839) monitors meet the Swedish MPR-II low radiation emission guidelines and the VESA DPMS Energy Star power savings standard. These two monitors will power down when not in use to help save you and the world money on energy. Amdek introduced the industry's first PC video monitor in 1978 and has been successfully providing quality PC monitor solutions for over fourteen years. Amdek "Direct" offers great prices, a 30-day money back guarantee, toll-free technical support, a one year warranty, no surcharge on credit card orders, low pricing on evaluation units, and special programs for resellers and corporate accounts. **Amdek "Direct"**—The best combination of great prices, proven support and immediate availability from a company with over fourteen years of display experience!

Amdek Family of Display Products

	AM/432E	AM/732E	AM/732NI	AM/815E	AM/817E
Screen Size	14"IS VGA Mono	14" SVGA Color	14" SVGA Color	15"IS SVGA Color	17"ISHi-Res Color
Max Resolution	640x480	1024x768	1024x768NI	1280x1024NI	1600x1200NI
Max Refresh Rate	70 Hz	70 Hz	90 Hz	90 Hz	105 Hz
Dot Pitch	N/A	.28mm	.28mm	.28mm	.26mm
100-240 VAC (Auto-sensing)	Yes	Yes	Yes	Yes	Yes
MPR II Compliant	No	No	Yes (as option)	Yes	Yes
Power Management	No	No	No	Yes	Yes (Avail. 3/94)
PIN Cushion Control	No	No	No	Yes	Yes
*Unit 1 Price	$109	$269	$279	$379	$839
*Unit 2-9 Price	$106	$263	$272	$369	$818
*Evaluation Unit Price	$94	$239	$259	$349	$759

To Order Call Toll Free:
800-72-AMDEK
Call For Volume Discounts

AMDEK
VALUE THROUGH THE YEARS

"Amdek Direct" pricing. We accept Visa, Mastercard or cashier's check. Trade accounts are available with credit limits and terms. Shipping, handling and applicable sales tax not included in the price. All prices, offers and specifications are subject to change without notice. Any return being shipped to an Amdek location will require an RMA (Return Merchandise Authorization) number. Original packaging and proof of purchase required to return any merchandise. Amdek is a registered trademark of Wyse Technology Inc. All other trademarks are the property of their respective owners and are used for identification purposes only. ©1993 Wyse Technology Inc.

Circle 193 on reader service card.

DISCOVER THE MAGIC
MidWest Micro
Circle 276 on reader service card.

Because work doesn't stop when you leave the office, you need the Elite SubNote. Weighing only 3.9 pounds, it comes in handy in places you've never even thought of. But don't just take our word for it, get the SubNote today and find out for yourself what you've been missing.

A rabbit's foot for good luck? What you really need is the Elite DX4 SoundBook. Now there's a good luck charm to carry around (especially if your business depends on powerful presentations). Audiences love the colorful detail and melodious sound projected by this lightweight portable (you'll love the weight)! For small groups, the SoundBook offers a large 10.3" screen and for larger crowds, simultaneous video. Plus, 75 MHz processing speeds mean you won't be embarrassed by sluggish software during your demonstration. If your business depends on powerful presentations, depend on Elite's DX4 SoundBook.

MidWest Micro

6910 U.S. Route 36 East, Fletcher, Ohio 45326

1-800-682-7248

Fax: 1-800-562-6622

Monday–Friday: 9 a.m. to 7 p.m. Saturday: 10 a.m. to 4 p.m.

MasterCard VISA DISCOVER

For your protection we check thoroughly for stolen credit cards.

Dealers Call:

1-800-682-4711

NOW WINDOWS FOR WORKGROUPS

energy

intel inside

Reaching New Heights In Portable Computing

Easy To Pick Up, Hard To Put Down

Whether you're an amateur magician or a polished professional, we're positive that you'll be able to levitate our Elite line of 486 Notebooks and SubNotes (all under 6.9 pounds!).

Seeing Is Believing

Weighing only 3.9 pounds, the Elite 486SX-25 SubNote delivers spell-binding desktop power in a space-saving design. You'll find Intel's "SL Enhanced" 486SX-25 processor (designed especially for portable computers) inside, as well as 4 Mb of RAM and up to a 520 Mb hard drive. And with the SubNote's captivating 10" high-contrast screen and up to five hours of battery life, you'll never feel like you're sacrificing desktop quality for lightweight portability.

Presto! For a notebook you can see and hear try our color DX4 SoundBook. This notebook highlights the latest Intel clock-tripler chip for 75 MHz processing speeds and integrated audio features. You get a built-in microphone, a speaker and external jacks for sounds never before heard from a 6.9 pound notebook computer. Bundled audio accessory software for Windows and DOS environments lets you record, compress, store and playback voices, sounds or music. You'll also get local bus accelerated video and 1 Mb video DRAM for true 24-bit color graphics on a whopping 10.3" dual-scan color screen.

Trying to steal the spotlight, our 486SX/DX Notebooks come with a large 9.5" monochrome, 10.3" dual-screen color or 9.5" active-matrix color screen and an upgradeable Intel processor. A PCMCIA Type III slot lets you add network adapters, modems and interchangeable hard drives.

Long On Battery Life, Short On Weight

All Elite 486SX/DX Notebooks and SubNotes operate on Intel's "SL-Enhanced" microprocessor. Known for low power consumption, the processor also delivers excellent power management for longer battery life.

A Hard Act To Follow

As you'll soon learn, the only tricks we have up our sleeves are the best products at the best prices in the computer industry. The proof lies in our 14 Computer Shopper Best Buy Awards chosen by Shopper readers and PC Computing's prestigious Five Star Rating for top-hat service and price performance.

ELITE NOTEBOOKS

ELITE 486SX/DX Notebook

- Intel SL-Enhanced Processor
- 4 Mb RAM (expands to 20 Mb)
- 9.5" Mono, 10.3" Dual Scan, or 9.5" Active Matrix VGA Display
- Turbo Bus Accelerated Video
- 3.5" Built-in Diskette Drive
- User Replaceable Hard Drive
- Two Type II/One Type III PCMCIA Slot
- Built-in Trackball
- NiCd Battery and AC Adapter
- Advanced Power Management with SMM
- One Parallel and One Serial Port
- External VGA and Keyboard Port
- MS DOS 6.2
- Weight: Mono – 6.4 lbs. Color – 6.9 lbs.
- Carrying Case

Elite 486SX-25 Monochrome Notebook with 120 Mb Hard Drive
#005501 **$1399**

Elite 486DX-33 Monochrome Notebook with 260 Mb Hard Drive
#007304 **$1599**

Elite 486SX-25 Dual Scan Color Notebook with 260 Mb Hard Drive and WFW 3.11
#007305 **$1999**

Elite 486DX2-50 Dual Scan Color Notebook with 260 Mb Hard Drive and WFW 3.11
#007306 **$2199**

Elite 486DX2-66 Dual Scan Color Notebook with 340 Mb Hard Drive and WFW 3.11
#005580 **$2499**

Elite 486DX2-50 Active Matrix Color Notebook with 340 Mb Hard Drive, WFW 3.11 and an additional 4 Mb of RAM for a total of 8 Mb
#005581 **$3499**

Elite 486DX2-66 Active Matrix Color Notebook with 520 Mb Hard Drive, WFW 3.11 and an additional 4 Mb of RAM for a total of 8 Mb
#005582 **$3999**

ELITE DX4-75 SoundBook

- Intel 486DX4-75 MHz Processor
- 4 Mb RAM (expands to 20 Mb)
- 10.3" Dual Scan VGA Color Display
- Local Bus Video with 1 Mb Video DRAM
- Business Audio Features Including: Built-in Microphone and Speaker External Jacks for Line In and Line Out
- 3.5" Built-in Diskette Drive
- User Replaceable Hard Drive
- Two Type II/One Type III PCMCIA Slot
- Built-in Trackball
- NiMH Battery & AC Adapter
- Advanced Power Management with SMI
- One Parallel and One Serial Port
- External VGA and Keyboard Port
- MS DOS 6.2
- Weight: 6.9 lbs.
- Carrying Case

SoundBook DX4-75 with 260 Mb Hard Drive
#007301 **$2499**

SoundBook DX4-75 with 340 Mb Hard Drive, WFW 3.11, & PCMCIA 9624 S/R Fax Modem
#007312 **$2999**

Elite 486SX-25 SubNote

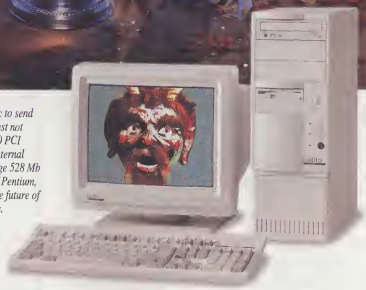
- Intel 486SX-25 SL-Enhanced Processor
- 4 Mb RAM (expands to 12 Mb)
- 9.5" Mono VGA Display
- Turbo Bus Accelerated Video
- 3.5" External Diskette Drive
- User Replaceable Hard Drive
- One Type II PCMCIA Slot
- Built-in Trackball
- NiMH battery and AC Adapter
- Advanced Power Management with SMM
- One Parallel and One Serial Port
- External VGA and Keyboard Port
- MS DOS 6.2
- Weight: 3.9 lbs.
- Carrying Case

Elite 486SX-25 Monochrome SubNote with 120 Mb Hard Drive
#005576 **$1299**

with 340 Mb Hard Drive and PCMCIA 9624 S/R Fax Modem
#007307 **$1599**

Policy: No service charge for credit card orders. Prices are subject to change. Repair or replacement of defective products is at MidWest Micro's discretion. We are not responsible for errors in typography and photography. Original shipping and handling fees, as well as return shipping charges, are non-refundable. There are no returns for credit after 30 days. Call or write MidWest Micro for more information on warranties and policies. All products are trademarks of their respective manufacturers. All registered and unregistered trademarks are the sole property of their respective companies.

You don't have to be psychic to send and receive messages, at least not when you have Elite's P5-60 PCI System. Complete with an internal 14.4 Kbps fax modem, a large 528 Mb hard drive and the power of Pentium, this value-priced PC puts the future of computing at your fingertips.



MidWest Micro

1-800-682-7248

intel inside

Microsoft WINDOWS FOR WORKGROUPS

Seagate

Is An Intel-Based Elite System In Your Future?

Ask the crystal ball. What does it see? An image is materializing…customers paying too much for computer technology. Poor souls, haven't they heard of MidWest Micro? Luckily, you aren't among them. Ah, there you are. Over there on the phone.

You don't need a medium to tell you about the performance of Elite VESA and PCI Systems. With processors ranging from the entry-level 486SX-33 to the Pentium P5-60 (a 64-bit processor that operates twice as fast as a DX2-66 processor), they provide values that are out of this world!

Known for their 32-bit technology, VESA Local Bus Systems offer show-stopper graphics on a value-minded budget.

PCI Local Bus Systems offer superior compatibility, automatic configuration and high-speed data handling. Vibes say that you're still skeptical about PCI technology, so let me also tell you that systems using a PCI bus offer the best expandability for peripheral devices, leaving plenty of room for future upgrades. And since the PCI bus is self-configuring, you can add network cards, video cards and other peripherals with true plug and play operation!

Phenomenal Value

Take the guess work out of buying a computer system…order from MidWest Micro. Otherwise you might be watching your money disappear into thin air. Most of our systems come with reliable Seagate hard drives, three-year warranties, Windows For Workgroups 3.11 and DOS 6.2 installed.

The Real Three-Year Warranty From The Company That Won't Disappear After The First Act

No other computer company has attempted a feat like the one you are about to witness. With one pass of the magic wand, VOILA! We've extended the warranty on Elite Desktop Systems from one year to three years! Breaking a well-established tradition in the computer industry, this warranty is complete. That means all of the system's internal components, the hard drive and the monitor are covered for three full years! Only a company that's confident in its act can offer a warranty like this plus a **30-Day Money Back Guarantee, Immediate Parts Replacement Policy, Lifetime Toll-Free Technical Support** and round-the-clock information via our **On-Line Bulletin Board Service.**

VESA SYSTEMS

486SX-33 $1299

#006674

- Intel 486SX-33 Processor
- 4 MB RAM, 128 Kb Cache
- 340 Mb IDE Hard Drive
- 32-Bit VESA Local Bus Graphics with 1 Mb
- 32-Bit VESA Local Bus IDE
- 3.5" and 5.25" Diskette Drives
- 14" SVGA .28 Non-Interlaced Color Monitor with Hitachi CRT
- 8-Bay Mini-Tower Case
- 5 ISA and 3 VESA/ISA Slots
- 101-Key Enhanced Keyboard
- High-Resolution Mouse
- MS DOS 6.2 and WFW 3.11

486DX-33 $1469

#006675

486DX2-50 $1499

#006676

486DX2-66 $1999

#006677

- Intel 486DX2-66 Processor
- 8 Mb RAM, 128 Kb Cache
- 340 Mb IDE Hard Drive
- 32-Bit VESA Local Bus Graphics with 1 Mb
- 32-Bit VESA Local Bus IDE
- Double Speed Multimedia CD-ROM Drive
- 3.5" Diskette Drive
- 15" SVGA .28 Non-Interlaced Multi-Scan Color Monitor with Hitachi CRT
- 8-Bay Mini-Tower Case
- 5 ISA and 3 VESA/ISA Slots
- 101-Key Enhanced Keyboard
- High-Resolution Mouse
- MS DOS 6.2 and WFW 3.11

486DX2-66 $2499

#006678

- Intel 486DX2-66 Processor
- 16 Mb RAM, 128 Kb Cache
- 528 Mb IDE Hard Drive
- 32-Bit VESA Local Bus Graphics with 2 Mb
- 32-Bit VESA Local Bus IDE
- Double Speed Multimedia CD-ROM Drive
- 3.5" Diskette Drive
- 15" SVGA .28 Non-Interlaced Multi-Scan Color Monitor with Hitachi CRT
- 8-Bay Mini-Tower Case
- 5 ISA and 3 VESA/ISA Slots
- 101-Key Enhanced Keyboard
- High-Resolution Mouse
- MS DOS 6.2 and WFW 3.11

SERVICE

Every MidWest Micro Elite is backed by:

- 3 Year "Real Warranty" on desktops
- 1 Year Warranty on portables
- 30-Day Money Back Guarantee
- Immediate Parts Replacement Policy
- Lifetime Toll-Free Technical Support
- On-Line Bulletin Board Service

PCI AND PENTIUM SYSTEMS

486DX2-66 PCI $2499

#006679

- Intel 486DX2-66 Processor
- 8 Mb RAM, 256 Kb Cache
- 528 Mb IDE Hard Drive
- PCI Local Bus Graphics
- Double Speed Multimedia CD-ROM Drive
- 3.5" Diskette Drive
- 15" SVGA .28 Non-Interlaced Multi-Scan Color Monitor with Hitachi CRT
- 8-Bay Middle Tower Case
- 3 ISA, 2 PCI and 1 PCI/ISA Slots
- 101-Key Enhanced Keyboard
- High-Resolution Mouse
- MS DOS 6.2 and WFW 3.11

P5-60 $2499

#006680

- Intel 60 MHz Pentium Processor
- 8 Mb RAM, 256 Kb Cache
- 452 Mb IDE Hard Drive
- PCI Local Bus Graphics
- 3.5" Diskette Drive
- 14" SVGA .28 Non-Interlaced Color Monitor with Hitachi CRT
- 8-Bay Middle Tower Case
- 4 ISA, 2 PCI and 1 PCI/ISA Slots
- 101-Key Enhanced Keyboard
- High-Resolution Mouse
- MS DOS 6.2 and WFW 3.11

P5-60 $2999

#006681

- Intel 60 MHz Pentium Processor
- 8 Mb RAM, 256 Kb Cache
- 528 Mb IDE Hard Drive
- Intel PCI Local Bus Graphics
- Double Speed Multimedia CD-ROM Drive
- Internal 14.4 S/R FAX Modem
- 3.5" Diskette Drive
- 15" SVGA .28 Non-Interlaced Color Monitor with Hitachi CRT
- 8-Bay Middle Tower Case
- 3 ISA, 2 PCI and 1 PCI/ISA Slots
- 101-Key Enhanced Keyboard
- High-Resolution Mouse
- MS DOS 6.2 and WFW 3.11

P5-60 $3499

#006682

- Intel 60 MHz Pentium Processor
- 16 Mb RAM, 256 Kb Cache
- 528 Mb IDE Hard Drive
- Intel PCI Local Bus Graphics
- Double Speed Multimedia CD-ROM Drive
- 3.5" Diskette Drive
- 17" SVGA .26 Non-Interlaced Color Monitor with Hitachi CRT
- 8-Bay Middle Tower Case
- 3 ISA, 2 PCI and 1 PCI/ISA Slots
- 101-Key Enhanced Keyboard
- High-Resolution Mouse
- MS DOS 6.2 and WFW 3.11

AD#M401

Circle 272 on reader service card.

We Got Tools Out the Wahzoo!

Finally! A CAD System that is all it is cracked up to be. There is nothing extra to buy! DesignCAD 2D for Windows comes complete with all the tools you will need to produce professional designs (from doghouses to Space Shuttles.)

You'll be drawing within minutes thanks to DesignCAD's On-line Instruction and logical interface!

Save time by recording your actions to a Macro so you never have to do the same thing twice. Also, you can put your most-used tools in a "Hot Toolbox" to readily access your most-used commands.

DesignCAD 2D for Windows offers more editing options than other CAD packages. For example, with our "Quick-Change Edit Box" just enter your new specifications and the changes are made for you.

Plus, DesignCAD 2D for Windows offers more than 50 dimensioning options. The dimensioning will even change automatically to reflect your modifications.

Best of all, you can own DesignCAD 2D for Windows for thousands less than comparable Computer Aided Design systems. Call, write or fax to order your copy ***TODAY!***

DesignCAD 2D for Windows Only $349 or less!

(All Tools Included)

DesignCAD 2D is Also Available in DOS!

Call for a FREE brochure and Demo Disk!

Phone (918) 825-7555
Fax (918) 825-6359

PC MAGAZINE EDITORS' CHOICE December 17 1991

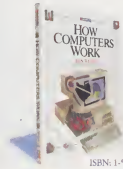
American Small Business Computers • One American Way • Pryor • OK • 74361

Circle 166 on reader service card.

See the Disk Spin.

See the Mouse Point. See the CPU Process. See How Computers Work.

Discover what really makes your PC tick in this exciting new book, *PC/Computing How Computers Work*. This skillfully illustrated, completely original guide graphically dismantles the PC and shows in brilliant full-color detail what really happens inside your computer. Written by *PC/Computing* executive editor Ron White and based on the magazine's popular "How It Works" column, *PC/Computing How Computers Work* is the perfect companion for the computer enthusiast!



ISBN: 1-56276-094-7
Price: $22.95

Available at fine bookstores, or call

1-800-688-0448
ext. 5412

ZIFF-DAVIS ZD PRESS

© 1992 Ziff-Davis Press

MEMORY SUPER SOURCE

LIFETIME* WARRANTY 100% GUARANTEED

WE WILL BEAT ANY LEGITIMATE PRICE QUOTED BY A COMPETITOR IN THIS ISSUE.

COMPAQ · AIR · HP · DELL · ZENITH · AT&T · EVEREX · TOSHIBA · IBM · OKIDATA · Apple · EPSON · SUN · AST · MAGNAVOX · NEC · SHARP · CANON · ACER · GIMS

Seagate

FACTORY NEW – FULL WARRANTY

IDE		
130MB ST3144A	15MS 3.5\"	$ 189
128MB ST9145AG	16MS 3.5\"	299
260MB ST3290A	16MS 3.5\"	245
340MB ST3390A	12MS 3.5\"	309
209MB ST9235AG	16MS 2.5\"	399
452MB ST3550A	12MS 3.5\"	418
540MB ST3655A	12MS 3.5\"	535
SCSI		
457MB ST3550N SCSI-2	12MS 3.5\"	520
526MB ST3660N SCSI-2	12MS 3.5\"	825
343MB ST3390N SCSI-2	12MS 3.5\"	399
1400MB ST31650N	12MS 3.5\"	1121
1350MB ST41600N	12MS FH	1825
1.7GB ST31200N SCSI-2	12MS 3.5\"	953
1.2GB ST41200N	14MS FH	995
1.6GB ST41651	13MS FH	1137
2.1GB ST42100N SCSI-2	14MS FH	1429
2.1GB ST42400 SCSI-2	13MS FH	1499
3.55GB ST43400N SCSI-2	10MS FH	2250
1.7GB BARRACUDA-1	ST11900N SCSI-2	3 SLOT 1655
2.1GB BARRACUDA-II	ST12550N SCSI-2	3.5\" 2025
2.2GB	ST12400N SCSI-2	12MS 3.5\" 1745

Maxtor

FACTORY NEW – FULL WARRANTY

IDE		
130MB 7131A	14MS 3.5\"	189
213MB 7213A	14MS 3.5\"	249
245MB 7245A	15MS 3.5\"	245
345MB 7345A	15MS 3.5\"	299
SCSI		
345MB 7345S SCSI-2	12MS 3.5\"	385
540MB 540S	BMS 3.5\"	1295
1.2GB 1240S SCSI-2	BMS 3.5\"	1325

CONNER

FACTORY NEW – 1 YEAR WARRANTY

IDE		
170MB CP30174E	17MS 3.5\"	$ 207
212MB CP30204	14MS 3.5\"	225
250MB CP30254H	14MS 3.5\"	249
340MB CP30344	14MS 3.5\"	299
540MB CP30544	10MS 3.5\"	495
SCSI		
212MB CP30200	12MS 3.5\"	253
540MB CP3540 SCSI-2	10MS 3.5\"	615
1GB CP1065 SCSI-2	10MS 3.5\"	955

WESTERN DIGITAL

FACTORY NEW – 2 YEAR WARRANTY

IDE		
212MB WD2200	12MS 3.5\"	$ 225
250MB WD2250	14MS 3.5\"	249
340MB WD2340	12MS 3.5\"	295
420MB AC2420	13MS 3.5\"	349
540MB WD2540	11MS 3.5\"	495

TOSHIBA

5 YEAR WARRANTY ON 3.5\"
1 YEAR WARRANTY ON 2.5\"

SUPERFAST SCSI-2		
130MB N/A	17MS 2.5\"	$329
200MB IDE MK2224	17MS 2.5\"	419
200MB SCSI MK2224	17MS 2.5\"	439
340MB IDE MK2326	2.5\"	588

1 x 9 $48
4 x 9 $154
70 NS SIMMS

4MB 2 BANK SIMM-PC	147	2YR 2 X 9 1MX8 SIMM	13	1MB 2 X 9 256K SIPP	53
4MB 1 X 9 2MX8 SIMM	154	1MB 2 X 9 256K SIMM	14	1MB 2 X 9 256K SIPP	53
4MB 2 X 9 4MB SIMM	199	1MB 2 X 9 1MB SIMM	14	1MB 2 X 9 1MB SIPP	55
4MB 1 X 9 2MB 2 DRP SIMM	199	4MB 2 X 9 2MB SIMM	15	256K 2 X 9 1MB SIPP	19
1MB 2 X 9 4MB 2 DRP SIMM	42	256K 2 X 9 4MB SIMM	16	256K 2 X 9 4MB SIMM	19
1MB 2 X 9 4MB 2 DRP SIMM	42	1MB 2 X 9 4MB SIMM	42	256K 2 X 9 2MB SIPP	19
1MB 2 X 9 4MB 2 DRP SIMM	42	1MB 2 X 9 4MB SIMM	42	256K 2 X 9 4MB SIPP	23
1MB 2 X 9 8MB 2 DRP SIMM	44	4MB 2 X 9 8MB SIMM	140	256 X 36 – 1MB	55
1MB X 9 4MB 2 DRP SIMM	44	4MB 2 X 9 8MB SIMM	140	512 X 36 – 2MB	99
1MB X 9 4MB 2 DRP SIMM	44	4MB X 9 72PIN SIMM	147	1 X 36 – 4MB	185
1MB X 9 8MB 2 DRP SIMM	90	1MB X 9 72PIN SIPP	48	2 X 36 – 8MB	360
1MB X 9 8MB 2 DRP SIMM	90	1MB X 9 30PIN SIPP	52	4 X 36 – 16MB	699
1MB X 9 70NS SIMM	720	1MB X 9 80NS SIPP	52		

MOTHER BOARDS

OPTI	
386DX-33-64K CACHE W/CPU	146
386DX-33-256K CACHE W/CPU	240
386DX-40-64K CACHE W/CPU	215
386DX-40-256K CACHE W/CPU	299
486SX-25-64K CACHE W/CPU	349
486DX-33-64K CACHE W/CPU	449
486DX-33-256K CACHE W/CPU	540
486DX-50-256K CACHE W/CPU	740
PRIME	
486DX-33 128K CACHE	537
486DX-50 256K CACHE	740
486DX-66 4-ISA, 2-VESA 256K CACHE	812
486DX2-66 6-ISA, 2-VESA 256K CACHE	894
OCEAN	
JAGUAR 386DX-40 128K	138
HIPPO 486DX-33 ISA 256K*Dynamic Cache*	448
HIPPO 486DX-50 ISA 256K*Dynamic Cache*	548
JAGUAR 4 - 486DX-33 - 128K Main Ca	318
JAGUAR VESA486DX-33 Rev. 2-Multi*Dynamic	358
AMERICAN DEGIGOS	
486SX-25 ISA 128K	249
486DX2-66 ISA 128K	556
486DX-33 VESA 256K	484
486DX2-66 VESA 256K	729
SILICON STAR	
386DX-40 128K Cache	169
486DX-33 ISA 128K Cache	409
486DX-33 VESA 256K Cache	479
486DX-50 VESA 256K Cache	534
NICE Made in U.S.A.	
486SX-33 8-ISA, 2-VESA LB 256K	499
MINI 486DX-33 5-ISA, 3-ESA 2-VESA LB 256K	629
MINI 486DX2-66 5-ISA, 3-ESA, 2-VESA LB 256K	829
486DX2-66 8-ISA, 2-ISA, 1 Meg Cache	1119
SUPER VISA 486DX2-66 8-ISA 1-VESA LB 512K	1088
A.R. Made in U.S.A.	
486DX-33 8-ISA, 3-VESA 256K P24T Socket	548
486DX2-66 8-ISA, 3-VESA 256K P24T Socket	849
486DX-33 8-ISA, 3-VESA 256K	788
486DX2-66 8-ISA, 3-VESA 256K	1049
VEGA Made in U.S.A.	
SX-460-33 VESA 2-VL 256K,ZIF MULTI I/O IDE	618
SX460-33 VESA 3-VL 256K,ZIF	668
486DX2-66 256K	1049
486DX2-66 3-VESA 256K	1099
MICRONICS (U.S.A.)	
MX-33 486DX-33 VESA 256K	599
MX-50 486DX-50 VESA 256K	764
DEMINI 486DX-33 VESA 256K	764
DEMINI 486DX2-66 VESA 256K	1249
MYLEX (U.S.A.)	
486DX2-66 256K MULTI I/O	1218
486DX-50 ISA 256K MULTI I/O	1230
486DX2-66 VESA 64K MULTI I/O	1048
486DX2-66 VESA/ISA256K MULTI I/O	1099
AMI Made in U.S.A.	
SUPER VISA-486DX-33 LC 486DX-33 256K	678
SUPER VOYAGER 486DX-33 VESA 2-VLB 256K	888
SUPER VOYAGER 486DX2-66 VESA 2-VLB 256K	1099
ENTERPRISE II VLB 486DX2-66 256K	1378

Quantum

FACTORY NEW – 2 YEAR WARRANTY ELS & LPS
5 YEAR WARRANTY ON P. DRIVES
1 YEAR WARRANTY ON 2.5\" DRIVES

CAPACITY M/N	SPEED SIZE PRICE	
IDE		
127MB ELS127A	17MS 3.5\"	$181
170MB ELS170A	17MS 3.5\"	183
240MB ELS270A	16MS 3.5\"	249
525MB LPS540A	10MS 3.5\"	495
SCSI		
127MB ELS127S	17MS 3.5\"	184
170MB ELS170S	17MS 3.5\"	195
270MB LPS270S	16MS 3.5\"	252
540MB LPS540S SCSI-2	10MS 3.5\"	495
1GB P1080S SCSI-2	10MS 3.5\"	908
2.1GB P125S SCSI-2	10MS 3.5\"	1085
1.8GB P190S SCSI-2	10MS 3.5\"	1085

FUJITSU

FACTORY NEW – 5 YEAR WARRANTY

SCSI		
1.2GB M2694SA	10MS 3.5\"	$885
2.4GB M2954SA	12MS FH	1415

MICROPOLIS

FACTORY NEW – 5 YEAR WARRANTY

IDE		
979MB 2210A	10MS 3.5\"	$990
1.6GB 2217A	10MS 3.5\"	1185
SCSI-2		
978MB MC2210 SCSI-2	10MS 3.5\"	860
1.2GB MC1598 SCSI-2	15MS FH	811
1.6GB MC1908 SCSI-2	10MS FH	1225
1.75GB MC2217 SCSI-2	10MS 3.5\"	1185
2.0GB MC1548 SCSI-2	14MS FH	1289
2.1GB MC1906 SCSI-2	11MS 3.5\"	1489
2.4GB MC1362 SCSI-2	11MS FH	1489
3.6GB MC1936 SCSI-2	11MS FH	2145

SAMSUNG

FACTORY NEW – FULL WARRANTY

IDE		
120MB 3062	17MS 3.5\"	189
252MB 3125	15MS 3.5\"	235

digital

FACTORY NEW – 5 YEAR WARRANTY
DISK DRIVES FOR POWER USERS

SCSI II			
1.0GB 31075	9.5MS	3.5\"	$909
1.6GB 31605	9.5MS	3.5\"	1231
2.1GB 52005	12.5MS	5.25\"	1787
3.5GB 53505	11.5MS	FH	2517

HEWLETT PACKARD

FACTORY NEW – 5 YEAR WARRANTY

CAPACITY M/N	SPEED	SIZE	PRICE
SCSI			
1.0GB C2247	10MS	3.5\"	$1145
1.0GB C97558	13MS	FH	1395
1.9GB C3009	11.5MS	FH	1995
2.1GB C3010	11.5MS	FH	2295
2.1GB C2490	9.9MS	3.5\"	2295

DYNAMIC RAMS

1MB 1 X 9 SIMM 70NS	4.75
1MB 1 X 9 SIMM 60NS	5.25
1MB 1 X 9 SIMM 80NS	4.75
1MB 1 X 9 SIPP 70NS	4.75
1MB 1 X 9 SIPP 80NS	4.75
1MB 1 X 9 SIPP 60NS	5.25
1MB 1 X 9 SIPP 100NS	4.75
1MB 1 X 9 SIPP 120NS	4.75
1MB 1 X 9 SIPP 150NS	4.75
1MB 1 X 9 SIPP 200NS	4.75
1MB 1 X 9 SIPP 250NS	4.75
1MB 1 X 9 SIPP 300NS	4.75
1MB 1 X 9 SIPP 350NS	4.75
1MB 1 X 9 SIPP 400NS	4.75
1MB 1 X 9 SIPP 450NS	4.75
1MB 1 X 9 SIPP 500NS	4.75
1MB 1 X 9 SIPP 550NS	4.75
1MB 1 X 9 SIPP 600NS	4.75
1MB 1 X 9 SIPP 650NS	4.75
1MB 1 X 9 SIPP 700NS	4.75
1MB 1 X 9 SIPP 750NS	4.75
1MB 1 X 9 SIPP 800NS	4.75
1MB 1 X 9 SIPP 850NS	4.75
1MB 1 X 9 SIPP 900NS	4.75
1MB 1 X 9 SIPP 950NS	4.75
1MB 1 X 9 SIPP 1000NS	4.75
1MB 1 X 9 SIPP 1050NS	4.75
1MB 1 X 9 SIPP 1100NS	4.75
1MB 1 X 9 SIPP 1150NS	4.75
1MB 1 X 9 SIPP 1200NS	4.75
1MB 1 X 9 SIPP 1250NS	4.75
1MB 1 X 9 SIPP 1300NS	4.75
1MB 1 X 9 SIPP 1350NS	4.75
1MB 1 X 9 SIPP 1400NS	4.75
1MB 1 X 9 SIPP 1450NS	4.75
1MB 1 X 9 SIPP 1500NS	4.75
1MB 1 X 9 SIPP 1550NS	4.75
1MB 1 X 9 SIPP 1600NS	4.75
1MB 1 X 9 SIPP 1650NS	4.75
1MB 1 X 9 SIPP 1700NS	4.75
1MB 1 X 9 SIPP 1750NS	4.75
1MB 1 X 9 SIPP 1800NS	4.75
1MB 1 X 9 SIPP 1850NS	4.75
1MB 1 X 9 SIPP 1900NS	4.75
1MB 1 X 9 SIPP 1950NS	4.75
1MB 1 X 9 SIPP 2000NS	4.75
1MB 1 X 9 SIPP 2050NS	4.75
1MB 1 X 9 SIPP 2100NS	4.75
1MB 1 X 9 SIPP 2150NS	4.75
1MB 1 X 9 SIPP 2200NS	4.75
1MB 1 X 9 SIPP 2250NS	4.75
1MB 1 X 9 SIPP 2300NS	4.75
1MB 1 X 9 SIPP 2350NS	4.75
1MB 1 X 9 SIPP 2400NS	4.75
1MB 1 X 9 SIPP 2450NS	4.75
1MB 1 X 9 SIPP 2500NS	4.75
1MB 1 X 9 SIPP 2550NS	4.75
1MB 1 X 9 SIPP 2600NS	4.75
1MB 1 X 9 SIPP 2650NS	4.75
1MB 1 X 9 SIPP 2700NS	4.75
1MB 1 X 9 SIPP 2750NS	4.75
1MB 1 X 9 SIPP 2800NS	4.75
1MB 1 X 9 SIPP 2850NS	4.75
1MB 1 X 9 SIPP 2900NS	4.75
1MB 1 X 9 SIPP 2950NS	4.75
1MB 1 X 9 SIPP 3000NS	4.75
1MB 1 X 9 SIPP 3050NS	4.75
1MB 1 X 9 SIPP 3100NS	4.75
1MB 1 X 9 SIPP 3150NS	4.75
1MB 1 X 9 SIPP 3200NS	4.75
1MB 1 X 9 SIPP 3250NS	4.75
1MB 1 X 9 SIPP 3300NS	4.75
1MB 1 X 9 SIPP 3350NS	4.75
1MB 1 X 9 SIPP 3400NS	4.75
1MB 1 X 9 SIPP 3450NS	4.75
1MB 1 X 9 SIPP 3500NS	4.75
1MB 1 X 9 SIPP 3550NS	4.75
1MB 1 X 9 SIPP 3600NS	4.75
1MB 1 X 9 SIPP 3650NS	4.75
1MB 1 X 9 SIPP 3700NS	4.75
1MB 1 X 9 SIPP 3750NS	4.75
1MB 1 X 9 SIPP 3800NS	4.75
1MB 1 X 9 SIPP 3850NS	4.75
1MB 1 X 9 SIPP 3900NS	4.75
1MB 1 X 9 SIPP 3950NS	4.75
1MB 1 X 9 SIPP 4000NS	4.75
1MB 1 X 9 SIPP 4050NS	4.75
1MB 1 X 9 SIPP 4100NS	4.75
1MB 1 X 9 SIPP 4150NS	4.75
1MB 1 X 9 SIPP 4200NS	4.75
1MB 1 X 9 SIPP 4250NS	4.75
1MB 1 X 9 SIPP 4300NS	4.75
1MB 1 X 9 SIPP 4350NS	4.75
1MB 1 X 9 SIPP 4400NS	4.75
1MB 1 X 9 SIPP 4450NS	4.75
1MB 1 X 9 SIPP 4500NS	4.75
1MB 1 X 9 SIPP 4550NS	4.75
1MB 1 X 9 SIPP 4600NS	4.75
1MB 1 X 9 SIPP 4650NS	4.75
1MB 1 X 9 SIPP 4700NS	4.75
1MB 1 X 9 SIPP 4750NS	4.75
1MB 1 X 9 SIPP 4800NS	4.75
1MB 1 X 9 SIPP 4850NS	4.75
1MB 1 X 9 SIPP 4900NS	4.75
1MB 1 X 9 SIPP 4950NS	4.75
1MB 1 X 9 SIPP 5000NS	4.75
1MB 1 X 9 SIPP 5050NS	4.75
1MB 1 X 9 SIPP 5100NS	4.75
1MB 1 X 9 SIPP 5150NS	4.75
1MB 1 X 9 SIPP 5200NS	4.75
1MB 1 X 9 SIPP 5250NS	4.75
1MB 1 X 9 SIPP 5300NS	4.75
1MB 1 X 9 SIPP 5350NS	4.75
1MB 1 X 9 SIPP 5400NS	4.75
1MB 1 X 9 SIPP 5450NS	4.75
1MB 1 X 9 SIPP 5500NS	4.75
1MB 1 X 9 SIPP 5550NS	4.75
1MB 1 X 9 SIPP 5600NS	4.75
1MB 1 X 9 SIPP 5650NS	4.75
1MB 1 X 9 SIPP 5700NS	4.75
1MB 1 X 9 SIPP 5750NS	4.75
1MB 1 X 9 SIPP 5800NS	4.75
1MB 1 X 9 SIPP 5850NS	4.75
1MB 1 X 9 SIPP 5900NS	4.75
1MB 1 X 9 SIPP 5950NS	4.75
1MB 1 X 9 SIPP 6000NS	4.75
1MB 1 X 9 SIPP 6050NS	4.75
1MB 1 X 9 SIPP 6100NS	4.75
1MB 1 X 9 SIPP 6150NS	4.75
1MB 1 X 9 SIPP 6200NS	4.75
1MB 1 X 9 SIPP 6250NS	4.75
1MB 1 X 9 SIPP 6300NS	4.75
1MB 1 X 9 SIPP 6350NS	4.75
1MB 1 X 9 SIPP 6400NS	4.75
1MB 1 X 9 SIPP 6450NS	4.75
1MB 1 X 9 SIPP 6500NS	4.75
1MB 1 X 9 SIPP 6550NS	4.75
1MB 1 X 9 SIPP 6600NS	4.75
1MB 1 X 9 SIPP 6650NS	4.75
1MB 1 X 9 SIPP 6700NS	4.75
1MB 1 X 9 SIPP 6750NS	4.75
1MB 1 X 9 SIPP 6800NS	4.75
1MB 1 X 9 SIPP 6850NS	4.75
1MB 1 X 9 SIPP 6900NS	4.75
1MB 1 X 9 SIPP 6950NS	4.75
1MB 1 X 9 SIPP 7000NS	4.75
1MB 1 X 9 SIPP 7050NS	4.75
1MB 1 X 9 SIPP 7100NS	4.75
1MB 1 X 9 SIPP 7150NS	4.75
1MB 1 X 9 SIPP 7200NS	4.75
1MB 1 X 9 SIPP 7250NS	4.75
1MB 1 X 9 SIPP 7300NS	4.75
1MB 1 X 9 SIPP 7350NS	4.75
1MB 1 X 9 SIPP 7400NS	4.75
1MB 1 X 9 SIPP 7450NS	4.75
1MB 1 X 9 SIPP 7500NS	4.75
1MB 1 X 9 SIPP 7550NS	4.75
1MB 1 X 9 SIPP 7600NS	4.75
1MB 1 X 9 SIPP 7650NS	4.75
1MB 1 X 9 SIPP 7700NS	4.75
1MB 1 X 9 SIPP 7750NS	4.75
1MB 1 X 9 SIPP 7800NS	4.75
1MB 1 X 9 SIPP 7850NS	4.75
1MB 1 X 9 SIPP 7900NS	4.75
1MB 1 X 9 SIPP 7950NS	4.75
1MB 1 X 9 SIPP 8000NS	4.75
1MB 1 X 9 SIPP 8050NS	4.75
1MB 1 X 9 SIPP 8100NS	4.75
1MB 1 X 9 SIPP 8150NS	4.75
1MB 1 X 9 SIPP 8200NS	4.75
1MB 1 X 9 SIPP 8250NS	4.75
1MB 1 X 9 SIPP 8300NS	4.75
1MB 1 X 9 SIPP 8350NS	4.75
1MB 1 X 9 SIPP 8400NS	4.75
1MB 1 X 9 SIPP 8450NS	4.75
1MB 1 X 9 SIPP 8500NS	4.75
1MB 1 X 9 SIPP 8550NS	4.75
1MB 1 X 9 SIPP 8600NS	4.75
1MB 1 X 9 SIPP 8650NS	4.75
1MB 1 X 9 SIPP 8700NS	4.75
1MB 1 X 9 SIPP 8750NS	4.75
1MB 1 X 9 SIPP 8800NS	4.75
1MB 1 X 9 SIPP 8850NS	4.75
1MB 1 X 9 SIPP 8900NS	4.75
1MB 1 X 9 SIPP 8950NS	4.75
1MB 1 X 9 SIPP 9000NS	4.75
1MB 1 X 9 SIPP 9050NS	4.75
1MB 1 X 9 SIPP 9100NS	4.75
1MB 1 X 9 SIPP 9150NS	4.75
1MB 1 X 9 SIPP 9200NS	4.75
1MB 1 X 9 SIPP 9250NS	4.75
1MB 1 X 9 SIPP 9300NS	4.75
1MB 1 X 9 SIPP 9350NS	4.75
1MB 1 X 9 SIPP 9400NS	4.75
1MB 1 X 9 SIPP 9450NS	4.75
1MB 1 X 9 SIPP 9500NS	4.75
1MB 1 X 9 SIPP 9550NS	4.75
1MB 1 X 9 SIPP 9600NS	4.75
1MB 1 X 9 SIPP 9650NS	4.75
1MB 1 X 9 SIPP 9700NS	4.75
1MB 1 X 9 SIPP 9750NS	4.75
1MB 1 X 9 SIPP 9800NS	4.75
1MB 1 X 9 SIPP 9850NS	4.75
1MB 1 X 9 SIPP 9900NS	4.75
1MB 1 X 9 SIPP 9950NS	4.75
1MB 1 X 9 SIPP 10000NS	4.75

CACHE

64KB 15NS	4.75
64KB 20NS	4.75
64KB 25NS	4.75
64KB 30NS	4.75
64KB 35NS	4.75
64KB 40NS	4.75
64KB 45NS	4.75
64KB 50NS	4.75
64KB 55NS	4.75
64KB 60NS	4.75
64KB 65NS	4.75
64KB 70NS	4.75
64KB 75NS	4.75
64KB 80NS	4.75
64KB 85NS	4.75
64KB 90NS	4.75
64KB 95NS	4.75
64KB 100NS	4.75
64KB 105NS	4.75
64KB 110NS	4.75
64KB 115NS	4.75
64KB 120NS	4.75
64KB 125NS	4.75
64KB 130NS	4.75
64KB 135NS	4.75
64KB 140NS	4.75
64KB 145NS	4.75
64KB 150NS	4.75
64KB 155NS	4.75
64KB 160NS	4.75
64KB 165NS	4.75
64KB 170NS	4.75
64KB 175NS	4.75
64KB 180NS	4.75
64KB 185NS	4.75
64KB 190NS	4.75
64KB 195NS	4.75
64KB 200NS	4.75
64KB 205NS	4.75
64KB 210NS	4.75
64KB 215NS	4.75
64KB 220NS	4.75
64KB 225NS	4.75
64KB 230NS	4.75
64KB 235NS	4.75
64KB 240NS	4.75
64KB 245NS	4.75
64KB 250NS	4.75
64KB 255NS	4.75
64KB 260NS	4.75
64KB 265NS	4.75
64KB 270NS	4.75
64KB 275NS	4.75
64KB 280NS	4.75
64KB 285NS	4.75
64KB 290NS	4.75
64KB 295NS	4.75
64KB 300NS	4.75
64KB 305NS	4.75
64KB 310NS	4.75
64KB 315NS	4.75
64KB 320NS	4.75
64KB 325NS	4.75
64KB 330NS	4.75
64KB 335NS	4.75
64KB 340NS	4.75
64KB 345NS	4.75
64KB 350NS	4.75
64KB 355NS	4.75
64KB 360NS	4.75
64KB 365NS	4.75
64KB 370NS	4.75
64KB 375NS	4.75
64KB 380NS	4.75
64KB 385NS	4.75
64KB 390NS	4.75
64KB 395NS	4.75
64KB 400NS	4.75
64KB 405NS	4.75
64KB 410NS	4.75
64KB 415NS	4.75
64KB 420NS	4.75
64KB 425NS	4.75
64KB 430NS	4.75
64KB 435NS	4.75
64KB 440NS	4.75
64KB 445NS	4.75
64KB 450NS	4.75
64KB 455NS	4.75
64KB 460NS	4.75
64KB 465NS	4.75
64KB 470NS	4.75
64KB 475NS	4.75
64KB 480NS	4.75
64KB 485NS	4.75
64KB 490NS	4.75
64KB 495NS	4.75
64KB 500NS	4.75
64KB 505NS	4.75
64KB 510NS	4.75
64KB 515NS	4.75
64KB 520NS	4.75
64KB 525NS	4.75
64KB 530NS	4.75
64KB 535NS	4.75
64KB 540NS	4.75
64KB 545NS	4.75
64KB 550NS	4.75
64KB 555NS	4.75
64KB 560NS	4.75
64KB 565NS	4.75
64KB 570NS	4.75
64KB 575NS	4.75
64KB 580NS	4.75
64KB 585NS	4.75
64KB 590NS	4.75
64KB 595NS	4.75
64KB 600NS	4.75
64KB 605NS	4.75
64KB 610NS	4.75
64KB 615NS	4.75
64KB 620NS	4.75
64KB 625NS	4.75
64KB 630NS	4.75
64KB 635NS	4.75
64KB 640NS	4.75
64KB 645NS	4.75
64KB 650NS	4.75
64KB 655NS	4.75
64KB 660NS	4.75
64KB 665NS	4.75
64KB 670NS	4.75
64KB 675NS	4.75
64KB 680NS	4.75
64KB 685NS	4.75
64KB 690NS	4.75
64KB 695NS	4.75
64KB 700NS	4.75
64KB 705NS	4.75
64KB 710NS	4.75
64KB 715NS	4.75
64KB 720NS	4.75
64KB 725NS	4.75
64KB 730NS	4.75
64KB 735NS	4.75
64KB 740NS	4.75
64KB 745NS	4.75
64KB 750NS	4.75
64KB 755NS	4.75
64KB 760NS	4.75
64KB 765NS	4.75
64KB 770NS	4.75
64KB 775NS	4.75
64KB 780NS	4.75
64KB 785NS	4.75
64KB 790NS	4.75
64KB 795NS	4.75
64KB 800NS	4.75
64KB 805NS	4.75
64KB 810NS	4.75
64KB 815NS	4.75
64KB 820NS	4.75
64KB 825NS	4.75
64KB 830NS	4.75
64KB 835NS	4.75
64KB 840NS	4.75
64KB 845NS	4.75
64KB 850NS	4.75
64KB 855NS	4.75
64KB 860NS	4.75
64KB 865NS	4.75
64KB 870NS	4.75
64KB 875NS	4.75
64KB 880NS	4.75
64KB 885NS	4.75
64KB 890NS	4.75
64KB 895NS	4.75
64KB 900NS	4.75
64KB 905NS	4.75
64KB 910NS	4.75
64KB 915NS	4.75
64KB 920NS	4.75
64KB 925NS	4.75
64KB 930NS	4.75
64KB 935NS	4.75
64KB 940NS	4.75
64KB 945NS	4.75
64KB 950NS	4.75
64KB 955NS	4.75
64KB 960NS	4.75
64KB 965NS	4.75
64KB 970NS	4.75
64KB 975NS	4.75
64KB 980NS	4.75
64KB 985NS	4.75
64KB 990NS	4.75
64KB 995NS	4.75
64KB 1000NS	4.75

MATH CO-PROCESSORS

INTEL	
80387-16MHZ (PLCC)	99.00
80387-20MHZ (PLCC)	99.00
80387-16MHZ (PGA)	99.00
80387-20MHZ (PGA)	99.00
80387-25MHZ (PGA)	99.00
80387-33MHZ (PGA)	99.00
80387-16MHZ (PLCC)	99.00
80387-20MHZ (PLCC)	99.00
80387-25MHZ (PLCC)	99.00
80387-33MHZ (PLCC)	99.00
80387SX-16MHZ (PLCC)	99.00
80387SX-20MHZ (PLCC)	99.00
80387SX-25MHZ (PLCC)	99.00
80387SX-16MHZ (PGA)	99.00
80387SX-20MHZ (PGA)	99.00
80387SX-25MHZ (PGA)	99.00
80387SX-33MHZ (PGA)	99.00
80387SX-16MHZ (PLCC)	99.00
80387SX-20MHZ (PLCC)	99.00
80387SX-25MHZ (PLCC)	99.00
80387SX-33MHZ (PLCC)	99.00
CYRIX	
83D87-16MHZ (PLCC)	99.00
83D87-20MHZ (PLCC)	99.00
83D87-25MHZ (PLCC)	99.00
83D87-33MHZ (PLCC)	99.00
83D87-16MHZ (PGA)	99.00
83D87-20MHZ (PGA)	99.00
83D87-25MHZ (PGA)	99.00
83D87-33MHZ (PGA)	99.00

ENVISIONS GIVES YOU ALL IT TAKES TO CREATE THE BEST...

DESKTOP PUBLISHING

Solutions: Take creative control with Envisions' total DTP scanning solutions. It's an unbeatable value with award-winning scanners!

Envisions Scanners Add up to Value

- 600, 800, or 1200 dpi base resolutions
- 16.8 million colors and 256 grayscales
- Twain compatibility scans into an open application
- 200 steps of brightness and contrast
- Single light source ensures exact color registration
- 8.5" x 14" scan window takes legal sized documents
- On-board input/output buffer quickens scan time
- 30-day M.B.G. and one year warranty

Adobe Photoshop™ 2.5 for Windows image editing software has taken desktop publishing to the high end. Photoshop offers extensive features for creating original art, editing and enhancing scanned images, color separating and importing renderings from other applications.
Retail value $895
Stand alone—Call us
Included in DTP Solution!

Microsoft Publisher™ 2.0 makes page layout a breeze! Assemble photos, illustrations and text onto Publisher's electronic page to create eye-catching newsletters, brochures, flyers, presentations, letters, reports, banners, manuals and other impactful pieces.
Retail value $199
Stand alone—N/A
Included in DTP Solution!

Kai's Power Tools™ new Windows version offers 33 awesome plug-in filters for Photoshop and other programs with plug-ins. Transform your images with textures, backgrounds, gradients, glows, halos, metallic tubes and more for a creative explosion!
Retail value $199
Stand alone $89
Included in DTP Solution!

Ofoto™ new color version for Windows fully automates the color and grayscale adjustment process. In just one step, you can automatically scan, classify, straighten, crop, sharpen, and determine the best highlight and shadow value for your image.
Retail value $295
Stand alone—Call us
Included in DTP Solution!

Only $1299 Value $2387 — Part# EST-3057B

ENV8100 DTP Scanner Solution Includes

Photoshop 2.5	$ 895
Microsoft Publisher	$ 199
Kai's Power Tools	$ 199
OFOTO Color	$ 295
Total Software Value..	$ 1588

Envisions 800/1600 dpi scanner plus software DTP solution is only $1299

Only $1699 Value $2787 — Part# EST-3058B

ENV24Pro DTP Scanner Solution Includes

Photoshop 2.5	$ 895
Microsoft Publisher	$ 199
Kai's Power Tools	$ 199
OFOTO Color	$ 295
Total Solutions Value..	$ 1588

Envisions 1200/2400 dpi scanner plus software DTP solution is only $1699

Pictured: ENV24Pro with optional $699 transparency adapter for scanning slides, x-rays, transparencies.

TWAIN Compatibility

COREL Compatibility — ★★★★ Direct Top 40 Vendors Four Star Winner PC Computing

Envisions flatbed scanners and bundled software require 386 or higher, Windows 3.1, 4 MB RAM, 20 MB hard disk space free, ISA slot available for interface card (included). PS/2™ and Apple® Macintosh versions are also available.

ENVISIONS
Scanner Solutions Made Easy

30 DAY GUARANTEE

Restocking fees may apply.

WE LOVE QUESTIONS! CALL OUR SCANNER HOTLINE: QUESTIONS?℠ 1-800-926-7226

Envision Solutions Technology, Inc., 822 Mahler Road, Burlingame, CA 94010
Local: 415-692-9061, Fax: 415-692-9064

ENVISIONS' SCANNERS INCREASE YOUR PRODUCTIVITY WITH...

OFFICE AUTOMATION

Solutions: Retype documents no more! Automate tedious retyping, filing and organizing chores with Envisions' OA scanner solutions!

Recollect™ document image management software lets the paperless office become a reality! Capture, store, recall and manage your critical data. Auto text recognition and auto indexing saves time and labor. Easy search and retrieval capabilities make Recollect a powerful office solution.
Retail value $795
Stand alone $595
Included in OA Solution!

Scan&Type™ lets you accomplish any tedious form-filling task quickly, accurately, and efficiently on your computer. Simply scan any form, and fill it directly on screen. Or, open a saved PCX file and effortlessly fill it. Saves time, paper, and looks clean and professional!
Retail value $129
Stand alone $119
Included in OA Solution!

CardScan™ business card software is your answer to better organization of those crucial business contacts. One button scanning, auto sort and file, automatically dials the phone number you need! It keeps an image of the card for reference. It's like a terrific assistant!
Retail value $149
Stand alone—Call us
Included in OA Solution!

Lotus Organizer™ is an on-screen calendar, to-do list, planner, address book, notepad and reminder all rolled into one. Use it to set up meetings with anyone on your LAN or WAN via cc:Mail.
Retail value $149
Stand alone $99
Included in OA Solution!

TextBridge™ by Xerox is text scanning at its easiest! It performs OCR with exacting accuracy.
Retail value $99
Stand alone $99
Included in OA Solution!

Image Folio™ Award-winning image editing & processing software
Retail value $249
Stand alone $129
Included in OA Solution!

Pictured: ENV8100 with 25-page automatic document feeder for fast, easy, and accurate text scans.

Only **$1499** You Save $921

Part# EST-3059B

ENV8100 OA Scanner Solution:

- ENV8100 Scanner
- Xerox TextBridge OCR
- Image Folio

Value	$ 799
25-Page Auto Doc Feeder	$ 399
Scan&Type	$ 129
CardScan	$ 149
Lotus Organizer	$ 149
Recollect	$ 795
Total Solutions Value	$ 2420

Envisions 800/1600 dpi scanner plus software OA solution is only $1499

Only **$1999** You Save $821

Part# EST-3060B

ENV24Pro OA Scanner Solution:

- ENV24Pro Scanner
- Xerox TextBridge OCR
- Image Folio

Value	$ 1199
25-Page Auto Doc Feeder	$ 399
Scan&Type	$ 129
CardScan	$ 149
Lotus Organizer	$ 149
Recollect	$ 795
Total Solutions Value	$ 2820

Envisions 1200/2400 dpi scanner plus software OA solution is only $1999

Other flatbed scanning solutions available starting at $599
Call us! 1-800-926-SCAN

WE LOVE QUESTIONS!
CALL OUR SCANNER HOTLINE:
QUESTIONS?℠
1-800-926-7226

Envisions Solutions Technology, Inc., 822 Mahler Road, Burlingame, CA 94010
Local 415 692-9061, Fax 415 692-9064

ENVISIONS
Scanner Solutions Made Easy

ENVISIONS' HANDHELD SCANNERS *DEFINE* VALUE!

Features and Bundled Items:	ENVISIONS ENV256™	Logitech ScanMan®256	ENVISIONS ENVColor™	Logitech ScanMan®Color
Resolution	Up to 400 dpi	Up to 400 dpi	Up to 800 dpi	Up to 400 dpi
Grayscales/Color Capability	256 Grayscales	256 Grayscales	16.7 Million Colors	16.7 Million Colors
Automerge/AutoStitch	✓	✓	✓	✓
Image Editing Software Included	Halo Desktop Imager PC Magazine's Editors' Choice	FotoTouch by Logitech	Halo Desktop Imager PC Magazine's Editors' Choice	FotoTouch by Logitech
Text Scanning Software Included	Perceive Personal	Catchword Pro by Logitech	Perceive Personal	Available at additional cost
Your Price	$149.00	$279.99*	$299.00	$524.99*

*Average of 3 prices quoted by Egghead Software stores in the San Francisco Bay Area on 2/8/94. Hand scanner bundles require 386 or higher, Windows 3.1, 4MB RAM, 5MB hard disk space free.

Envisions' bundles are more logical than Logitech's, by far!
Let's be reasonable – both Envisions and Logitech offer terrific handheld scanners bundled with premium software to scan text and graphics. They both scan full pages using automerge technology. But why does Logitech make you pay so much more? We can't figure it out either. It's not logical!

What's the difference between these scanned photos?
Sure, the Logitech ScanMan™ Color delivers a nice scanned image, but are you prepared to spend an extra $226 for the Logitech name? When you grab an ENVColor scanner, you get a complete scanning solution for text and graphics, all for hundreds less than Logitech!

Photo scanned with ENVISIONS' $299 ENVColor handheld scanner at 400 dpi in 24-bit color.

Photo scanned with Logitech's $525 ScanMan™ Color handheld scanner at 400 dpi in 24-bit color.

Free with Scanner! **Envisions' handheld scanner bundles include imaging and text software!**

Automatically merge multiple scans and create posters!
HALO Desktop Imager brings full page desktop scanner power to your handheld scanner!

- Automerging assembles multiple scans easily
- Preview mode takes guesswork out of fine-tuning
- Blow up an image to 10,000% using minimal disk space
- Batch file conversion feature

Value $169
June 16, 1992 HALO Desktop Imager

Scan text off the page for quick, accurate data entry!
Perceive Personal 2.0's new accuracy and speed saves time and effort when scanning text. Perceive 2.0 recognizes a variety of text styles and sizes. There's no need to re-type, ever!

- Recognizes 6-24 point type without training–even mixed fonts on the same page!
- Up to 99.8% accuracy; eliminates tiresome corrections
- Recognition speed for a full page of text is a fast 15-40 seconds, based on performance of a 386/33MHz PC, with 4 MB of RAM.

Value $299

ENV256 and ENVColor (24-bit) Scanner Solutions Include:

- Gray or Color Scanner
- Halo Desktop Imager
- Perceive Personal OCR

Total Software Value $468

ENV256 Solution Only $149 EST-4530B

ENVColor Solution Only $299 EST-4460B

NEW

Now you can capture text and images on the go with Envisions' new portable handheld scanning solution!
Scan anything, anytime–anywhere! Here's all you need to connect your handheld scanner to your laptop or notebook computer through the printer port. It's easy to install because there's no need for an interface card! Twain-compliant to scan directly into any open Twain-based application. An $885 value!

ENV256 and ENVColor (18-bit) Portable Scanner Solutions Include:

- Perceive Personal, Halo Imager, plus
- Lotus Organizer, value $149
- CardScan Business Card Software, value $149
- ENV-LPT Laptop Adapter, value $99
- ScanPad, value $20

Total Software Value $885

Gray Portable Only $249 EST-3078B

Color Portable Only $399 EST-3079B

One Year Warranty!

WE LOVE QUESTIONS!
CALL OUR SCANNER HOTLINE:
QUESTIONS?℠
1-800-926-7226

TWAIN Compatibility

ENVISIONS
Scanner Solutions Made Easy

MICROSOFT WINDOWS

30 DAY GUARANTEE MONEY BACK
Restocking fees may apply

©1994 Envisions Solutions Technology, Inc. All rights reserved and trademarks acknowledged. Prices and specifications are subject to change without notice.

Product Index

PRODUCTS FEATURED IN THIS ISSUE
FOR FREE INFORMATION ON THESE PRODUCTS, CIRCLE THE CORRESPONDING READER SERVICE NUMBER ON THE REPLY CARD ON PAGE 277.

Page Number	Name/Company	Reader Service
	COMPUTER SYSTEMS	
	486-BASED SYSTEMS	
34	DECpc LPX and DECpc LPV Digital Equipment Corp.	607
34	EISA VL-Bus Professional 66 Commode Electronics	608
34	Insignio 466P Inmac	609
34	P5/1 Consultant IBM	610
	NOTEBOOKS—COLOR	
105	486 Color Subnote Aspen Computer	652
105	Elite 4865X/33 Color SubNote MidWest Micro	653
105	Portége T3400CT Toshiba America	651
131	PowerBook Duo 270c Apple Computer	656
105	Sager Midern NP-640C Sager Midern Computer	654
105	SubNote 4DX2/40S Twinhead	655
	PEN-BASED SYSTEMS	
32	Simon BellSouth Cellular	601
	PERIPHERALS	
	CD-ROM DRIVES	
32	Reno Media Vision	605
	CONTROLLERS—CACHING DISK	
174	Promise DC-200 Promise Technology	714
174	SmartCache III PM2021 Distributed Processing Technology	716
	CONTROLLERS—DISK	
174	Adaptec AHA-1524C Adaptec	713
174	Future Domain TMC-1680 Future Domain	719
	DIGITAL CAMERAS	
50	Model 4 Dycam	614
50	QuickToke 100 Apple Computer	615
	FAX MODEMS—PORTABLE	
32	Sharp CE-FM1 Sharp Electronics	602
	HARD DRIVES—IDE	
154	Conner CFP30544 Conner Peripherals	691
154	Fujitsu M2624T Fujitsu Computer Products	692
154	Micropolis 2210A Micropolis	693
154	Micropolis 2217A Micropolis	694
154	ProDrive LPS 540 AT Quantum	695
154	Seagate ST3655A Seagate Technology	696
154	Western Digital WDAC2540 Western Digital	697
	HARD DRIVES—SCSI	
154	Conner CFP1060S Conner Peripherals	703
154	Conner CFP30540 Conner Peripherals	698
154	Empire 1080 Quantum	710
154	Fujitsu M2624FA Fujitsu Computer Products	699
154	Fujitsu M2694ESA Fujitsu Computer Products	704
154	HP C2247 Hewlett-Packard	705
154	HP C2490A Hewlett-Packard	706
154	IBM 0662 IBM	707
154	Maxtor MXT-540S Maxtor	700
154	Micropolis 2210XL Micropolis	708
154	Micropolis 2217 Micropolis	709
154	ProDrive LPS 540 S Quantum	701
154	Seagate ST12550N Seagate Technology	712
154	Seagate ST31200N Seagate Technology	711
154	Seagate ST3655N Seagate Technology	702
	MULTIMEDIA UPGRADE KITS	
32	ReelMagic Upgrade Kit Sigma Designs	604
	PRINTERS—COLOR	
134	ColorEase PS Eastman Kodak	677
134	ColorMaster Plus 6613 XF ColComp	678
134	ColorScript 230 QMS	679
134	ColorScript 1000 QMS	680
134	Jolt PSe Dataproducts	681
134	Phoser IISDX Tektronix	682
	PRINTERS—PORTABLE	
54	Canon BJ-10sx Canon Computer Systems	617
54	Notebook Printer II Citizen America	616
	SCANNERS—COLOR	
134	ArtiScan 8000C Tomorack Technologies	661
134	AVR 6600/CLX AVR Technology	662
134	AVR 8800/CLX AVR Technology	663
54	Canon IX-4015 Canon Computer Systems	618
134	Envisions ENV8100 Envisions Solutions Technology	664
134	ES-800C Pro PC Scanning System Epson	665
134	ScanJet IIcx Hewlett-Packard	665
134	ScanMaker IISP Microtek Lab	666
134	ScanMaker IIXE Microtek Lab	667
134	SconOffice/C for Windows Umax Technologies	668
134	Umax UC-840 Umax Technologies	669
	WINDOWS SOFTWARE	
	ACCOUNTING/PERSONAL FINANCE	
46	Money 3.0 Microsoft	612
	BUSINESS TOOLS	
48	PeopleScheduler 2.0 Adaptive Software	613
	CD-ROMS	
76	Andrew Tobias' TaxCut MECA Software	629
76	The Clinton Health Security Plan Allegra New Media	624
76	Compton's Interactive Encyclopedia Compton's NewMedia	626
76	Random House Dictionary Random House	625
76	Small Blue Planet Cambrix Publishing	628
76	Tuneland Starring Howie Mandel 7th Level	627
	GRAPHICS/PRESENTATION	
134	CorelDraw 4 Corel	670
134	Image-in Professional 3.2 CPI	672
134	Matisse 1.25 Fauve Software	671
134	Painter 2.0 and X2 Fractal Design	673
134	Photoshop 2.5 Adobe Systems	674
134	PhotoStyler 2.0 Aldus	675
134	Picture Publisher 4.0 Micrografx	676
	INTERNET SERVICES	
60	America Online America Online	620
60	Bix Delphi Internet Services	621
60	The Pipeline The Pipeline	619
	MULTIMEDIA	
32	A2Z Magazine Media Multimedia	603
32	Grovis Personal Piano System Advanced Grovis Computer Technology	606
	NETWORKS/UTILITIES	
64	Desk To Desk CBIS	622
64	PowerLan 3.0 Performance Technology	623
	PERSONAL INFORMATION MANAGERS	
36	CrossTies CrossTies Software	611
	DOS SOFTWARE	
	CACHE	
174	Norton Speedrive Symantec	715
174	SmartDrive Microsoft	717
174	Super PC-Kwik PC Kwik	718

PRODUCTS BY ARTICLE

To request information on all the products in one article, circle the corresponding number on the reply card on page 277.

Page Number		Reader Service
105	**How Small Can Color Get?** Five color subnotebooks, including Aspen's 486 Color Subnote and Toshiba's Portégé T3400CT.	898
134	**Scan It, Edit It, Print It** Ten color scanners, including Hewlett-Packard's ScanJet IIcx. Seven image editors, including Adobe's Photoshop. Six color printers, including Tektronix's Phoser IISDX.	899
154	**Big Drives in Tiny Packages** Twenty-two hard drives, including Western Digital's WDAC2540 and Seagate's ST3655N.	900

ADVERTISER INDEX

FOR FREE INFORMATION ON THESE ADVERTISEMENTS, CIRCLE THE CORRESPONDING READER SERVICE NUMBER ON THE REPLY CARD ON PAGE 277.

	READER SERVICE NUMBER	PAGE NUMBER
A Matter of Fax	*	279
Acer America	*	262-265
Adobe Systems	132	163
Advanced Logic Research	142	26
Ambra Computer Carparation	*	40-45
	*	52-53
AMDEK	193	282
America Online, Inc.	*	127-128
American Power Conversian	116	28
American Small Business Camp.	166	288
Apple Computer	*	15
	*	24
Arlington Computer Products	161	280-281
AST COMPUTER	*	30-31
ATI Technologies Inc.	112	152-153
Autodesk Retail	*	183
Bandwell	109	272
Barland International	125	55
Coere Carp.	261	206-207
Cal Camp	249	96
Central Point Safware	222	221
	223	223
	225	225
Clear Safware	183	14
Colarada Memary Systems	184	175
Camp Usa	270	216-217
Campaq Camputer	218	4-5
	177	8-9
Campuserve	128	77
Camputability	*	235-237
	*	239
Computer Assaciates	252	29
Computer Discaunt Warehause	130	273
	134	274-275
	133	276
Camtrade	147	253
Carel Carp.	218	38
	180	81
Creative Labs	135	79
Crasstalk, Inc.	260	169
Dee One Systems	*	252
Dell Camputer Carp.	*	C5-C8
Delrina Technalagy	227	97
Deneba Systems, Inc.	175	57
Digital Visian, Inc.	220	10
Dustin Discaunt Saftware	129	2
	274	3
Eastman Kodak Company	247	228-229
Eden Systems	190	27
Envisians	*	290-292
Epsan	*	58-59
Fidelity Investments	106	205
First Source International	*	258
Gateway 2000	*	65-75
Hayes Microcamputer Products	262	83
IBM - PC DIRECT	*	122-123
IDEK	172	222
INMAC	*	194
Insight	103	261
Intergraph Carparation	127	220
Intuit, Inc.	*	47
L.A. Trade	*	254
LANDMARK/Supersaft	*	245
Logitech	156	63
Lotus Development Carp.	*	112-113
	*	119
	*	151
	*	37
	*	86-87
MAG INNOVISION	181	95
Media Visian	137	18
	123	219
Megahaus	105	246
Micrografx	253	195
Micrasaft	*	C2-Pg1
	*	132-133
	*	16-17
	*	164
Micrasaft Press	178	11
Micratek Lab, Inc.	185	159
	138	161
Midwest Micra-Peripherals	276	283
	237	284-285
	272	286-287
Mitsubishi	120	211
Nanaa	212	197
NCR Carp.	*	91-94
NEC Technalagies	157	170-171
	159	172
NOTIS Systems Inc.	241	176
NRI Schools	*	241-243
	*	259-260
Ocean Isle Safware	263	189
One Write Plus, Inc.	150	230
Pacific Data Products, Inc.	*	199
PC/Camputing	*	227
	*	129
PC's Campleat	148	255
	149	256-257
Plextor	266	191
PawerSaft	214	178-179
QMS	145	104
Quantex	*	19
	*	247-251
Relisys	144	203
Rase Electranics	169	196
Seika Instruments	113	201
Spectrum Signal Processing	158	61
STAC Electranics	268	12-13
Tektranix, Inc.	121	193
Texas Instruments	117	85
Tashiba America, Inc.	215	142-143
Traveling Safware,inc.	139	212-213
Twinhead Carp.	126	99
UMAX	257	185
USA Flex	202	270
	203	271
ViewSanic	170	49
VTECH/EXPOTECH	195	266-267
	196	268-269
WinBook Camputer Carp.	188	111
WardPerfect	*	186-187
WardPerfect Carparation	163	101
	164	102-103
Warldwide Technalagy	251	289
Xircam	273	130
ZD Press	*	214-215
	*	288
Zeas Int'l	265	21
Zeas Int'l	248	22-23
Zeas Int'l	216	89
Ziffnet	280	226

Direct to You Section	231-292
PC/Camputing Marketplace	295-309

Marketplace

Advertising Account Representatives

Kevin Tracey	Account Representative	212-503-5102
Jonathan Schwartz	Account Manager	212-503-5101
Thomas Lee	Account Representative	212-503-5101

National Advertising Staff 1-800-825-4237

Robert A. Bader VP, Central Advertising
Thomas Koletas Asst. Sales Manager
Bessi Dian Asst. Prod. Manager
Tricia Maguire Ad Coordinator

Premier

The color showcase that puts the spotlight on leading-edge PC products and services.

Featuring...

295-304

OS/2 296-297

Classified

Flexible-format display advertising: computer systems, components, software and more.

305-309

Index

	Premier	Classified
HARDWARE		
Boards/Components/Chips		
Communications	299	305
Voice Mail	299	
Computer Systems		305
Input/Output Devices		
Bar Coding		305
Mass Storage Devices	299	
Midi	300	
Networking		
On-Line Services/Shopping	298	
Security		
Video		
SOFTWARE		
Bar Coding		305
Business Applications	300	305
Accounting		
Communications		
Education		305
Graphics/Design	301	306
Multi-media	302	306
Personal	302	
Foreign Languages	302	
Religion		
Public Domain		306
Scientific		
Security	301	
Shareware		306
Systems/Languages		
Utilities	303	
Vertical Applications		
Adult		308
Entertainment		
Windows	304	
SUPPORTING PRODUCTS		
Accessories		307
Information Resources	304	307
Services	304	307
Supplies	304	307

PhoneDisc®

Finds People and Businesses Anywhere... Instantly!

No more thumbing through volumes of phone books to locate lost family, friends and sweethearts. Use the latest state-of-the-art CD-ROM technology to find new suppliers. Begin a job search. Plan a trip. Verify credit applications. Locate debtors. Plan sales routes. Check for trademarks. And much more! Accurate listings from Database America. Only the official PhoneDisc® gives you Best QUALITY, Best SOFTWARE and Best PRICE.

Winner: IIA Best CD-ROM, OPA Achievement in Business.

Updated quarterly to insure quality.

PhoneDisc® USA Residential
Search 80+ million residences by name. Two disc set (Western & Eastern Regions).
ONLY $99

PhoneDisc® USA Business
9.6 million U.S. Businesses on one disc. Search by name, SIC code, business type, address or phone number.
ONLY $99

BUY BOTH RESIDENTIAL & BUSINESS AND SAVE. ONLY $159

PhoneDisc® Reverse. Extend your search power! Same powerful search software as above plus telephone and address searching of residences. 90 million businesses and residences. Buy the U.S. on five disc set or your geographic region

SPECIAL OFFER 5 Disc set ONLY $349 *$129 for one region*

See your local dealer or call to order.

CALL TO ORDER: 1-800-284-8353

Digital Directory Assistance, Inc.
5181 River Rd. Bldg. 6
Bethesda, MD 20816

CIRCLE 401 ON READER SERVICE CARD

(Down) Time is Money

- Remains in place during use...just type right through it
- Prevents costly repairs
- Soft, flexible, fits like a glove
- Durable High-Tech Polymer lasts for years
- More than 1,000 custom fit models available
- **The original SafeSkin® - Only $24.95**

Protect Your Entire System
Dust Covers - All Models - All Styles
Economical Vinyl from $6.95 each
Breathable Fabric from $7.95 each

Call Today: 1-800-627-7752

VISA/MC or COD
MCP, Inc. FAX (216) 339-1313
Dealer Inquiries Invited.

CIRCLE 422 ON READER SERVICE CARD

OS/2 APPLICATIONS

Great price and selection—call or visit:

COMPUSA 1-800-COMPUSA

EGGHEAD SOFTWARE 1-800-EGGHEAD

MicroWAREHOUSE 1-800-367-7080

Prices shown are manufacturer list prices. Specials and discounts may be available. All products may not be in stock at all stores. Be sure to ask for availability.

Arcadia Workplace Companion

by Arcadia Technologies, Inc.

"A PIM with a Twist: This One's for OS/2 (PC Magazine, September 28, 1993)." Yes, the Arcadia Workplace Companion is a native 32-bit and complete personal information manager (PIM) software designed specifically as an integrated part of the OS/2 Workplace Shell environment.

$149

Golden CommPass

by Creative Systems Programming Corp.

Time is money when your modem is talking with CompuServe. Golden CommPass saves you both. It is the only OS/2 software that completely automates your online session with CompuServe forums, libraries, mail and weather.

$99

DeScribe Word Processor 4.0

by DeScribe, Inc.

DeScribe® Word Processor 4.0 sets the pace with its native 32-bit application that out performs any product of its kind, using superior multitasking and multithreading capabilities to continue working while other operations are underway. The exclusive and incomparable Unlimited UNDO, extensive custom toolbox and document processing features combine with seamless Workplace Shell integration to make DeScribe 4.0, THE product of choice.

upgrade $139

$495

CPU Monitor Plus!

by BonAmi Software Corp.

Sensational Performance Monitor and Controls for OS/2 computers. CPU & RAM utilization for all DOS, Windows, and OS/2 programs and threads in Real-Time! Start and stop programs, change execution priorities, suspend threads, log data...much, much more!

$129.95

Performance 2.1 PLUS

by Clear and Simple

A Tuning & Utility Kit for OS/2. 100 Page book INSTRUCTS and 25 OS/2 REXX Utilities make your system perform snappy! PLUS - 15 add'l Utilities. Automate a daily file backup; Automatic Desktop Saves; Create OS/2 Boot Diskette; reset icons; Simplify managing your disk space and more! INCLUDES 3000+ OS/2 Icons!

$39.95

Lotus SmartSuite for OS/2

by Lotus Development Corp.

The first complete desktop suite of native applications for IBM's OS/2 operating system. Comprised of 32-bit, OS/2 Workplace Shell-integrated versions of Ami Pro, 1-2-3, Freelance Graphics and cc:Mail, the integrated suite is compatible and shares interface similarities, including Lotus SmartIcons images, with products in the Lotus Suite of Windows applications.

upgrade $595

$795

BackMaster for OS/2 2.1

32-Bit Multi-Threaded PM Backup Utility

by MSR Development

Full, partial, and unattended backups. Supports FAT and HPFS file systems, handles long file names and EA's, Backup WPS, desktop, and system files, read existing DOS QIC 40/80 tapes, Migrate DOS files to OS/2 using tape, uses STAC data compression, transparent background operation, supports most QIC 40/80 tape drives including: Archive XL Series CMS Jumbo 120/250, Conner 250, IOmega TAPE250, Mountain FileSafe 4000/ 8000, Summit SE120/250, and many other Generic QIC 40/80 drives. Disaster recovery utilities included! Requires OS/2 2.1 and 8MB of memory.

$79.95

AVAILABLE NOW!

Great price and selection—call or visit:

INDELIBLE BLUE Inc.

1-800-776-8284

The Corner Store
1-800-IBUYOS2

Prices shown are manufacturer list prices. Specials and discounts may be available. All products may not be in stock at all stores. Be sure to ask for availability.

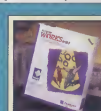
CA - SuperProject 3.0

by Computer Associates International, Inc.

CA-SuperProject is a complete set of project management and presentation tools that are easy to use and learn. Features include: interactive project creation in PERT, Gantt, and WBS views; pop-up forms; user-defined fields and formulas; interactive control of column widths and titles; WYSIWYG graphics; preview to screen; multiple outlines; effort, elapsed, workday, and span-driven tasks; and input and tracking of actuals.

upgrade

$149



FOOTPRINT Works For OS/2

by Footprint Software, Inc.

The Complete Package for Personal Productivity. 5 well integrated applications, in one program, that are affordable and easy to use. Word Processing, Spreadsheets, Data Filer, Report Writer, Charts. "Allows you to exchange text, spreadsheets and database files from other popular programs".

$149

CA - Realizer 2.0

by Computer Associates International, Inc.

CA-Realizer defines a new generation of development tools. The same CA-Realizer BASIC code that creates a Windows application ports instantly to a OS/2! CA-Realizer will even make a set of Windows or OS/2 install Disks! CA-Realizer's newly enhanced feature set makes it a must have for any serious corporate, professional or end-user developer.

$99

Fax/PM *by Microformatic*

Fax/PM (32-bit) Award Winning; Object Oriented; Workplace Shell savvy fax software for OS/2 and OS/2 for Windows. Easy to use - Fax directly from your application, maintains all system fonts and graphics. Separate send\receive directories improve fax management. Industrial strength Distribution list support; Runs in background; OCR support; Fax up to 3 fax documents in 1 transmission!

$150

LinkRight *by Rightware Inc.,*

Transfer files from OS/2 to OS/2 or OS/2 to/from DOS. HPFS, long file names, EA aware. Uses serial and parallel ports. Uses compression and CRC checking. Multi-threaded Includes OS/2 PM, OS/2 character mode and DOS versions. Compatible with LapLink™ cables.

upgrade $119

$189

HyperACCESS/5 *by Hilgraeve*

Discover how good communications can be. This award-winning async comm program includes: names support for 200+ modems, built-in virus protection, remote control through modems and across networks for DOS and OS/2, twelve fast file transfer protocols, including Z modem, seventeen terminal emulations "Editors' Choice" PC Magazine, "Best Overall...extremely easy to learn and use" Software Digest, "Best Buy", PC World, "Best for OS/2", PC Week.

$199

Power Translator® Professional

by Globalink

Power Translator Professional offers full-sentence idiomatically-accurate, foreign language translations for OS/2, with Subject Dictionary capability obtain maximum translation accuracy with subject, industry or profession specific terminology. Multi-user and multi-tasking. Bilingual screens and manuals. Languages include Spanish, French or German to/from English. Russian coming soon.

Call for Prices

Ready!™ for OS/2

Sponsored by the OS/2 Vendor Council

Dealers, Resellers, & Mail Order Inquiries Welcome

Call (203) 658-1204

OS/2 - PREMIER

Mouse Order

Get online with the Channel that lets you shop and buy over 20,000 computer products, 24 hours a day, right from your PC!

Turn on The Desktop Channel™. The easiest, most convenient way to shop for tens of thousands of computer products from over 800 manufacturers. Just browse, point and click, and your order is delivered overnight. The Desktop Channel network also provides comprehensive product information with real-time pricing and inventory status.

And, online access is FREE of charge!

Once you buy from your desktop, you'll never shop any other way:

- Free online access via 800 number
- Free tech support
- Overnight delivery
- Unbeatable low prices
- Hassle-free return policy
- Optional toll-free phone ordering
- Backed by a $150 million reseller

Call now to get your FREE starter kit!

800-808-3375

#IWD024

4 Technology Drive, Peabody, MA 01960

© NECS Inc. 1994, The Desktop Channel is a trademark of New England Circuit Sales, Inc.

PC-EXPANDER PLUS™

Connect up to 8 VGA Monitors, Mice and Keyboards to a Single PC

- PC/AT, PS/2 and 100% Compatibles
- VGA up to 1024 x 768 Resolution
- Selectable Takeover Delay
- Use either PS/2 or Serial Mice

CYBEX

4912 Research Drive · Huntsville, AL 35805 U.S.A.
(205) 430-4000 · FAX (205) 430-4030

CIRCLE 403 ON READER SERVICE CARD

Bright color. Bright price.

$2,599.

SPECIAL OFFER!

The BOXLIGHT 1285 ColorShow Projection Panel. Our brightest true-color panel. And for $950 off the list price, it's an unbeatable value.

- Compact, easy-travel panel
- 640 x 480 resolution
- PC and Mac compatible
- FREE remote and cables

Your direct source for all the bright answers.
- Widest selection
- Instant availability
- Overnight shipping
- 30-day guarantee

BOXLIGHT®
17771 Fjord Dr. N.E., Poulsbo, WA 98370
206/779-7901 • Payment: Visa, MasterCard, American Express, COD and Purchase Orders (some restrictions). Leasing and rental options available. 30-Day Money-Back Guarantee

Call Today 1-800-497-4007

CIRCLE 406 ON READER SERVICE CARD

CIRCLE 404 ON READER SERVICE CARD

Do-It-All Portable Disk

For Home, Office & Travel Computing!

Compact, Plug N' Play with Any PC
Simply plug units into any portable or PC parallel printer port and you're ready to go!

Unlimited Storage - Great Backup & More!
Work just like hard drives. Also ideal for data transport, data security and privacy. *Double-the-capacity based on use of DOS 6.0 data compression

FAX (408) 437-9333
1-800-873-VALU

3 Special Promos!

Mobile Disk 120/240MB* $299.
A complete ready to go handheld hard drive. Call for higher capacities, battery & 05-2 models!

Portable 128/256MB* Rewritable Optical Drive $899.
Optical disk, an ISO standard, is the most reliable, rugged and low cost removable mass storage!
Extra! 512MB/1GB* Optical Disk (4 disks) only $99. **plus a Lifetime Warranty**

Portable 21/42MB* Floptical Drive $399.
Rugged 3.5" 21MB floptical drive. Read/ write regular 720K/1.44M floppies too.

Extra! 21/42MB* Floptical diskettes only $13.95

CIRCLE 407 ON READER SERVICE CARD

PCs, Workstations

9-Track

Incredibly compact, super reliable. 1600, 6250 bpi. Great price!

3480

Smallest, lightest in the world, super reliable. Low price!

800-729-8725

Includes software, PC controller

619-571-5555
FAX 619-571-0982
Europe (+44) 734-891891
FAX (+44) 734-891897

Overland Data

Your best choice for 1/2 inch tape solutions since 1980

CIRCLE 405 ON READER SERVICE CARD

Cut Printer Costs by 90%

From $295!

CALL NOW for your FREE Printer Connectivity Guide!

1-800-923-5465

Excellink VISA/MC Accepted
Fax: 408-295-9011

Connect up to 10 PCs to your printer without a LAN
Cabling included FREE!
High-speed buffer frees up your PCs fast
Installs in minutes
Fully automatic
Windows compatible
30-day money back guarantee
Lifetime Warranty

© Copyright 1994, Excellink, Inc

CIRCLE 440 ON READER SERVICE CARD

Only $199

Turtle Beach

Maui

Wavetable Synthesizer Upgrade

Before you buy another sound card... Improve the one you have with a Turtle Beach quality synthesizer and SampleStore™, our expandable synthesis technology.

While today's newest sound cards provide only a fixed number of instruments, Maui™ from Turtle Beach Systems, allows you to add instruments of your choice via our breakthrough SampleStore technology.

Maui includes the following:

- 128 16 bit Instruments stored in ROM (FM is dead!)
- 256K of SampleStore RAM (upgradeable to 8 megs)
- Upgrades any existing sound card
- Supports DOS and Windows Software

MULTIMEDIA WITH AN ATTITUDE

TURTLE BEACH SYSTEMS

52 Grumbacher Road • York, Pennsylvania • 17402

717-767-0200 • FAX: 717-767-6033

All trademarks are registered by their respective companies. Specifications may change without notice

CIRCLE 408 ON READER SERVICE CARD

Elvis Is Alive

... and well, with 24 other artists in the hottest, least expensive, most professional sounding MIDI Karaoke on the market today!

Kar-A-O-Ke Turtle Beach MIDI Karaoke™

Only $49

Customize each song to fit your voice perfectly with our pitch and speed controls. Use any of our 25 song selection — from Broadway greats to today's biggest hits — or create your own hits ... it's easy since MIDI Karaoke uses standard MIDI files.

But wait, there's more ... Turtle Beach MIDI Karaoke is the only Karaoke application with the bouncing ball. Yes, from word to word, our bouncing ball guides you perfectly through the song so you sing the right words at the right time. AND...most, most importantly, it's the only Karaoke application that allows you to record your own voice directly to the hard drive while you're singing and then play back the entire file — music and voice together!!

So don't get all shook up. Get all this and more for only $49!

See your favorite dealer, or call 800-645-5840 and order your Turtle Beach MIDI Karaoke today.

WORKS WITH ANY SOUND CARD!

TURTLE BEACH SYSTEMS

52 Grumbacher Road • York, Pennsylvania • 17402 • 717-767-0200 • FAX: 717-767-6033

CIRCLE 410 ON READER SERVICE CARD

ONLY $89!

POWER TOOLS

Add Greater Music And Sound Capability To Your Sound Card.

Turtle Tools For Multimedia™ brings the music and sound capability of your sound card to its fullest potential.

It's fun. It's easy. It's for everyone who has ever wanted to create and play music ... whether you are a complete amateur or a professional.

Create your own music; produce a business presentation; play songs on your PC keyboard; edit voicing, mix levels, tempo, key, etc. ... and make beautiful professional quality sound.

See your favorite dealer, or call 800-645-5840 today!

Turtle Tools For Multimedia includes ...

- 5 multimedia programs.
- 350 sound effects on CD (CD ROM not required).
- 90 MIDI files.

WORKS WITH ANY SOUND CARD!

TURTLE BEACH SYSTEMS

P.O. Box 5074 • York, Pennsylvania • 17405

717-843-6916 • FAX 717-854-8319

CIRCLE 409 ON READER SERVICE CARD

DATABASE MAILING AND MARKETING

MAIL

Save up to 38% on 3rd-class postage! Discover how you can professionally manage your mailing lists on your PC with ArcList and AccuMail. These easy-to-use programs pay for themselves! AccuMail corrects and standardizes addresses, adds the ZIP+4 and delivery point barcode, so you receive optimal postal discounts. ArcList eliminates duplicates, will merge/purge lists, performs postal presorting.

Boost the performance of your direct marketing efforts. For a copy of the *FREE* Mail Flow Planning System diskette from the postal service, call 1-800-368-5806

CIRCLE 411 ON READER SERVICE CARD

Save on postage and printing every time you mail!

FREE Catalog!

Save money and boost profits with MAILER'S Software products. Call today for a FREE catalog!

- ZIP+4, Carrier Routes, Barcodes, Presorting...
- ZIP & Phone Databases, Demographics...
- Books, Mailing Lists, Duplicate detection...
- Phone Headsets, Label Printers, and more!
- Many products you won't find elsewhere!

We've been helping businesses cut costs and improve productivity since 1985. We have a complete line of products -- software and hardware -- to help your business operate at peak performance. Our staff is ready to help you select the products that best fit your needs. Call now!

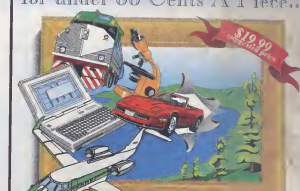
Call 1-800-800-MAIL

MAILER'S Software™

Your #1 Source for Direct Marketing Software
970 Calle Negocio, San Clemente, CA 92673

CIRCLE 412 ON READER SERVICE CARD

Original Masters for under 35 Cents A Piece...



THE SERIES - $19.99

The clip art images contained in these wonderful full-color collections are categorized into 24 themed packages, from Business & Industry to Sports and Leisure.

Sophisticated and Versatile Original Hand-Drawn Clip Art
Full Color Graphics that maintain their Impact in Black & White
Windows/DOS Compatible

Masterclips
The Art of Business

Available now at your local retailer or call (800) 292-CLIP(2547)
Masterclips, Inc. • 5201 Ravenswood Rd • Suite 111 • Ft Lauderdale FL • 33312-6004

CIRCLE 413 ON READER SERVICE CARD

The Next Generation in Label Design Software

LabelWorks™ for Windows

LabelWorks sets the new performance standard for professional quality label design. No other program combines such easy operation with this much power! **$295.00**

- Provides Desktop Publishing features to enhance label design. Features include: WYSIWYG, rulers, guides, page zooms, lines, shapes.
- Rich text support allows you to edit font styles, types, and sizes within the same line.
- Supports all major Bar Code symbologies, including Code 39, 93, 128, POSTNET, UPC, Bookland EAN. 19 types in all.
- Imports & Exports using TIFF, GIF, BMP, PCX, WPG, WMF, TARGA graphic files.
- Rotates Text, Bar Codes and imported graphics in 90 degree increments.
- Prints labels on virtually any windows supported printer.
- Prints labels directly from dBase, DIF & ASCII files.

Dealer Inquiries Welcome.

Call for Free DEMO Software

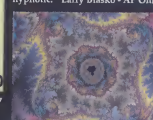
AMERICAN MICROSYSTEMS
2190 Regal Parkway, Euless, TX 76040
(800) 648-4452 (817) 571-9015 FAX (817) 685-6232

"A Touch of Chaos"

Fractal Screen Saver for Windows

"Ever changing fractal images dissolve, explode, pour and spiral through a seemingly infinite range of colors... If you have a sound card, the images are accompanied by soft sounds in nature." *Stan Miastkowski - Windows Sources*

"Stunning is an understatement... the compulsion to watch is almost hypnotic." Larry Blasko - AP Online



"A Touch of Chaos" supports 256 color SuperVGA modes up to 1024x768 resolution.

30 Day / MBG **$39.00**

To Order - (800)289-1347
Bourbaki, Inc. / P.O.B.2867
Boise, ID 83701

CIRCLE 414 ON READER SERVICE CARD

PC ACCESS Security System

- HARDWARE & SOFTWARE BASED SECURITY
- SOFTWARE COMPATIBLE
- 2-LEVELS OF PASSWORD PROTECTION
- AUDIT TRAIL
- FLOPPY DRIVE DISABLE
- USES ONLY 2K OF RAM
- SOFTWARE IS PROVIDED FOR 3 1/2 & 5 1/4 DISKETTES
- U.S. PATENT #5,012,514
- MADE IN THE U.S.A.

In under 5 minutes you can install the security system that will prevent unauthorized access to your PC and data.

Aspect Technologies, Inc.

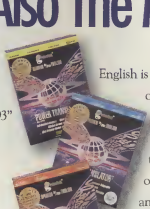
Call 800-757-7522, 206-277-5453
18317 151st Court SE, Renton, WA 98058

The "Most Innovative" Software Of 1993 Is Also The Most Useful.

Plug in to POWER TRANSLATOR™ from Globalink®, the software package named "the most innovative of 1993" by *Discover Magazine*.

POWER TRANSLATOR features speeds up to 100 times faster than human translators, easily-updated dictionaries of over 250,000 words and phrases, and a 90%-plus accuracy rate!

Now, getting grammatically-correct translations of words, phrases or entire documents in Spanish, French or German to/from English is as easy as the push of a button.



WINNER 1993 Discover TECHNOLOGICAL INNOVATION AWARD

Find out about the software package that's got *Discover Magazine*—and a lot of other people—talking. Call Globalink today and ask about POWER TRANSLATOR, your ticket to world-wide communication.

Globalink, Inc.
9302 Lee Highway, Fairfax, VA 22031-1208
Intl.: 1-703-273-5500
Fax: 1-703-273-3866
1-800-255-5660
U.S. and Canada

CIRCLE 415 ON READER SERVICE CARD

UP TO 90% OFF ON ALL CD ROM TITLES

We're Bundling Up for Winter!!!

3 FOR $49
BARGAINS
Bring Your World
Chessmaster 3000
Midi Music Shop
Mirror Mirror
MPC Wizard
Phoenix 3.0
Tempra Photo CD
US Atlas
VGA Spectrum
World View

3 FOR $59
ENTERTAINMENT
Calif. Collection
Deathstar Arcade
Game Master
Jones in Fast Lane
Loom
Monkey Island
San Diego Animals
Sherlock Holmes
Time Table of History
Who Killed Sam Rupert

3 FOR $59
EDUCATION
Atlas Pak
Audubon Bird
Audubon Mammals
CD-CAD
Education Master
Font Master
Marketing Master
Mavis Beacon
Publish It!
Reference Library

3 FOR $69
FAMILY
Arthur's Teachers
Brain Drain
Dino. Adventure
Family Doctor
Great Cities I & II
Kodak Photo CD
Mario / World Atl
Mammals
Playing w/ Lang.

3 FOR $69
CHILDREN
Barney Bear / School
Barney Bear / Space
Beauty & the Beast
Britanica Family
Interactive Storytime I
MacMillan Dict.
Mixed Up Mother
Peter and the Wolf
Sleeping Beauty

3 FOR $79
MAC BUNDLE
Animals
Atlas Pak
Dict. of the Living
Jets and Props
Mayo Clinic
Total Baseball
US History
Wild Places
World View

TRY TO BEAT OUR HOT PRICES!!

	Retail	Yours
MAYO	~~99.00~~	17.50
ANIMALS	~~99.00~~	22.00
BOOKSHELF	~~295.00~~	33.00

SOFTEC PLUS INC
4021 E. GRANT RD.
SUITE 201
TUCSON, AZ 85712
1-800-779-1991
FAX 1-602-325-5402

CIRCLE 417 ON READER SERVICE CARD

LEARN A FOREIGN LANGUAGE!

In today's international marketplace, knowing a second language is more important than ever. With foreign language courses from HyperGlot, you can gain that competitive edge. We have courses in Spanish, French, German and Italian.

LEARN TO SPEAK SPANISH 4.0 WITH VIDEO!

A complete first year language course with extensive Quicktime™ video and sound on CD. This course will teach you to speak, understand, read and write Spanish! Native speakers lead you through the course step by step. **Spanish 4.0 and many other HyperGlot Products are available through your local retailer.**

1-800-290-4568
To order or receive a catalog call toll-free or write: P.O. Box 10746, Knoxville, TN. 37939

HyperGlot the foreign language software company.

CIRCLE 416 ON READER SERVICE CARD

The World Center For Multilingual PC Software

Systems Tutorials Translators — Dictionaries Word Processors

Windows Interface $29
Use Japanese or Chinese Fonts in DTPs, Word Processors Spreadsheets etc.
BONUS Dictionary Included
English→Chinese or Japanese

1-800-569-2099

Multilingual Word Processor $169
Most Languages Available
Spell Checkers & Extra Fonts
Use in all Windows programs

Japanese Translator $59
ORDER TODAY!
Type English out comes Japanese!
Easy to use English to Japanese Translator

SPECIAL PRICE!
"Software like these once cost $1000's"

"C.I.R. uniting the business of the world with language"
2130 Sawtelle Blvd. 300B Los Angeles, CA 90210

CIRCLE 425 ON READER SERVICE CARD

Save Disk Space

PKZIP®

"PKZIP is the undisputed champion of data compression" - BYTE Magazine

"It [PKZIP] combines blazing decompression times and excellent compression speed" - PC Magazine

PKZIP version 2.0

PKWARE® introduces the next generation of its award winning compression utility. PKZIP 2.0 yields greater performance levels than achieved with previous releases of the software.

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.

Data Compression Library

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, etc.

PKLITE® Put Your Executables on a Painless Diet!

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!

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 gives you the ability to compress files so that they cannot be expanded. This discourages reverse engineering of your programs.

You may place your order for PKWARE products by phone, by fax or by mail. Prices listed are for use on a single computer. Please call for multiple use information.

PKZIP, PKUNZIP,® PKSFX® 2.0	$47.00
PKLITE	46.00
PKLITE Professional	146.00
PKWARE Data Compression Library	295.00

Please add $5.00 Shipping & Handling per package in the US & Canada, $11.25 overseas. Wisconsin residents please add 5% state sales tax and applicable county sales tax.

Terms: ALL ORDERS OUTSIDE OF THE UNITED STATES AND CANADA MUST BE PREPAID, MasterCard, VISA, Check or Money order drawn on an USA bank in US FUNDS, NO COD. Corporate Purchase Orders (Net 30 Days) accepted for software from large corporations within the USA & Canada. Please make remittance payable to PKWARE Inc. Prices and Terms subject to change without notice.

You can receive a catalog containing information on the complete line of PKWARE® software by calling or writing.

PKWARE® INC.

9025 N. Deerwood Drive Brown Deer, WI 53223-2437
(414) 354-8699 Fax (414) 354-8559

CIRCLE 418 ON READER SERVICE CARD

DON'T GET NAILED BY FAULTY MEMORY

Static, dust and environmental changes can all lead to defective system RAM and eventual system failure. Avoid aggravation and lost work by testing your PC memory with RAMexam™ - the ideal "pre-treatment" for memory intensive software like Microsoft Windows.

NOW $29.95 **CALL 800-676-9386**

From Qualitas - makers of award winning 386MAX!

CIRCLE 419 ON READER SERVICE CARD

FREE CBSI 486 Business Computer

Earn $4,000 Per Month From Your Home With A Computer!

Quit spending money on your computer and let it earn money for you. This is a proven turnkey business an individual or couple can run. If you purchase our software and business program, we will give you the computer and printer. If you already own a computer, you may receive a discount. Begin part-time and still retain the security of your present position. Financing available.

To receive free cassettes and color literature, call toll-free:

1-800-343-8014, ext. 427

(in Indiana: 317-758-4415) **Computer Business Services, Inc.**

FOR WINDOWS

myHouse

Create and walk through your home design projects in 3D color!

All New! Now with Movie Maker!

- *Easy 2D Floor Plan Creation*
- *Create And Edit A Home Movie Tour*
- *More Than 300 Predrawn 3D Design Objects*
- *Full-Size Plans–No Plotter Needed*
- *Compatible With myHouse For DOS*

View your floor plans as full-scale, 3D renderings or create a movie tour of your design

DesignWare
17 Main Street, Watertown, MA 02172
PH: (617) 924-6715 Fax: (617) 924-1699

To Order, CALL: **800-536-2596**

CIRCLE 420 ON READER SERVICE CARD

SUPER MAT™

...the new comfort edge

The Best Way To Stop Unwanted Noises and Vibrations Fits Neatly Under Your Computer.

Annoying noises are absorbed and damaging vibrations are dampened by new Super mat high-tech material to create a quieter less stressful working environment. Plus Super mat:

- Protects CD & Hard Disks
- Protects your desktop from marks and scratches
- Adds style to your desktop

Call to order now and save $5.00

Only $19.95. Reg. $24.95

Dealers and institutional inquiries welcome

Call or send check or M/O to: Inove Tech

1933 Davis St. Ste. 289 San Leandro, CA 94577

Add $4.75 S/H, Cal. res. add 8.25% tx

SUPER MAT™ from inove Technologies Inc.

FAX 510-638-6754

CALL 1-800-88-INOVA

CIRCLE 421 ON READER SERVICE CARD

Explore the Internet - FREE!

DELPHI, a leading international online service, now offers full access to the Internet. You can explore this incredible electronic network with no risk. You get 5 hours of evening/weekend access to try it out for free!

Use electronic mail to exchange messages with over 10 million people throughout the world. Download programs and files using "FTP," connect in real-time to other networks using "Telnet," and participate in "Usenet Newsgroups" the world's largest bulletin board with over 3500 topics. If you're not familiar with these terms, don't worry; DELPHI has expert online assistants and a large collection of help files, books, and other resources to help you get started.

After the free trial you can choose from two low-cost membership plans. With rates as low as $1 per hour, no other online service offers so much for so little.

5-Hour Free Trial!

Dial by modem, 1-800-365-4636*
Press Return once or twice
At Username, enter JOINDELPHI
At Password, enter RDC44

*Current Internet users can Telnet to delphi.com instead. Complete details provided during the toll-free registration

DELPHI

Questions? Call 1-800-695-4005 (voice)
Send e-mail to INFO@delphi.com

CIRCLE 419 ON READER SERVICE CARD

PLUG IN TO THE POWER OF IMAGE!

Place your next ad in the high-energy section where affordable four-color displays fuel top-notch response! Boost your image, and track winning results from 875,769 Business Computing Experts who are spending over $100,000 a year on PC hardware, software, and services!

PC/COMPUTING PREMIER

800-825-4237

BIBLE BOOKSTORE ON DISK!

Since 1981 we have offered Full Featured, Fast and Friendly Bible study software.

800-423-1228 Free Catalog!

BIBLE RESEARCH SYSTEMS
2013 Wells Branch Pkwy. #304
Austin, TX 78728 512-251-7541

TELEPHONE PBX SYSTEMS & VOICE MAIL

ICV-Karel PBX, An Optimum Electronic Telephone System For Office Automation.
•Built In Fax Switch •Hot Line
•Music On Hold •Night Service
•Call Transfer •Call Hold •DISA
•Conference •Do Not Disturb
•Automatic Hold On Busy
•Toll Restriction •PC Link SMDR
•Voice Mail •50 Other Features
Starting from 2 phone lines and 6 extensions.
2 by 6 $349 • 4 by 8 $449
4 by 12 $649 • 6 by 18 $749
24 Hour Info & Fax Back Line
(603) 893-2235
ICV CORPORATION
40 Lowell Rd. Industrial Park #9
Salem, New Hampshire 03079
Phone: (603) 893-2234
Fax: (603) 893-2275
Email: icv@world.std.com

CIRCLE 501 ON READER SERVICE CARD

BAR CODE READERS
AMERICAN MICROSYSTEMS
2190 Regal Pkwy. • Euless, Texas 76040 • (817) 571-9015

FOR PC, XT, AT, PS/2 & TERMINALS:

MAG STRIPE

SLOT (BADGE)

- No software changes required
- Data appears as keyboard input
- Reads Code 39, I-2of5, UPC/EAN, Codabar 11, 93, 128, MSI/Plessey
- Auto-discriminates between codes
- Accepts WAND, SLOT, MAG STRIPE, CCD, LASER
- Easy To Use

WAND

LASER

CCD

METRO LASER

BAR CODE PRINTING SOFTWARE:

- For Epson, OKI, IBM, Dot Matrix and HP LaserJet Printers
- Prints Code 39, I-2of5, UPC/EAN, Codabar, 128, 93, 11, MSI/Plessey

DECODER BOX

PORTABLE READERS:

- Use as a portable, wedge or terminal
- Input Devices: WAND, CCD, or SV LASER
- Real-time clock for date and time stamps
- Automatic power off with resume
- "Built-In" Inventory programs
- 54 key alpha/numeric keyboard
- Supports HAYES compatible modems

VISA MasterCard

(800) 648-4452 • FAX: (817) 685-6232
30 Day Money Back Guarantee
One Year Warranty

CLASSIFIED

America's most popular, most complete, and most affordable solution for the mail order business—order entry/invoicing, credit card processing with draft capture, UPS manifesting, profit analysis, accounting, telemarketing, list management, Clipper version, dBase III + plus. Single and Multi-user versions. Find out why more people buy MOM after comparing! Demo kit $25 refundable if desired.

MailOrderManager
THE BUSINESS AUTOMATION SOLUTION FOR DIRECT MARKETERS

Dydacomp Development Corporation
150 River Road, Suite N1, Dept. PCC
Montville, NJ 07045
1-800-858-DMOM
201-335-1256

CIRCLE 502 ON READER SERVICE CARD

COMPUTER RESET

USED COMPUTERS
IBM, COMPAQ & MAJOR BRANDS
LARGE SELECTION

MEMORY EXPANSIONS • PARTS
DRIVES • MONITORS • KEYBOARDS
CONTROLLERS & SOFTWARE
HARD-TO-FIND ITEMS

Computers from $169 Monitors from $49
CGA Color Monitors $129
Color Printers $249
TANDY NOTEBOOK Computer $199

FREE CATALOG
214-276-8072
P.O. BOX 461782
DEPT. PCC
GARLAND, TX 75046-1782
FAX & BBS 214-272-7920

CIRCLE 503 ON READER SERVICE CARD

COMPUTER GRAPHICS

- Animation
- Desktop Publishing
- Photo Retouching
- Computer Illustration
- Multi Media Production

1-800-225-9023
INTERNATIONAL FINE ARTS COLLEGE
1737 N. Bayshore Dr., Miami, Florida 33132
or Fax your inquiry to: (305) 373-5923
Classes start in Jan. & Sept

Name _____
Address _____
City _____ State _____ Zip _____
Phone (___) _____
Yr of HS Graduation _____ Age _____

CIRCLE 504 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
- Ada and C++ courses available

FOR FREE INFORMATION CALL 1-800-767-AICS or 1-205-323-6191

AMERICAN INSTITUTE OF COMPUTER SCIENCES
The leading edge of learning

BAR CODE PRINTING AND READERS

BEAR ROCK MEANS BAR CODES

- Bear Rock Labeler™ for Windows,™ Label and envelope design software with full bar code support.
- PrintBar™ Precision bar code fonts for Macintosh™, Windows™ or OS/2.
- Printbar II.™ DOS memory-resident bar code printing program for PC's.
- CodeScan.™ Bar code readers. 30 day evaluation, 5 year warranty.

Ask about special discounts!
1-800-232-7625
Bear Rock TECHNOLOGIES
4140 Mother Lode Drive • Shingle Springs, CA 95682
(916) 672-0244 • FAX (916) 672-1103

FREE PROGRAMS

That's right! Now you can free your software from those troublesome hardware locks. Don't buy a new program because they won't replace your lost or stolen hardware lock.

Our SAFEKEY software programs are guaranteed to UNLOCK the following:

TANGO PRO CADKEY 3D-STUDIO
SURFCAM4 MASTERCAM TOPAS
EZCAM MICROSTATION & MORE

*NEW – If your program uses ANY Rainbow Technologies Inc. lock, protect it from being lost or stolen with the PC-KEY and now the WINKEY

From $300 plus S&H
(609) 390-2799
(609) 390-3750 FAX

IMAGINE THAT
1 EVERGREEN DR, SEAVILLE, NJ 08230

CIRCLE 505 ON READER SERVICE CARD

CLASSIFIED

RFFlow
Professional Flowcharting
For Microsoft® Windows™

Create professional, fine quality charts quickly and easily. Call for free trial disk. (303) 693-5767 FAX (303) 665-4859

$129.95 **RFF ELECTRONICS**
1053 Canyon Court, Loveland, CO 80538

CIRCLE 506 ON READER SERVICE CARD

Be a PC repair expert!
CAREER-LEVEL HOME STUDY

Learn PC repair, troubleshooting, installation, upgrading. Increase your value to your company, or open your own PC repair business. No high-tech instruments or electronics. Over 90% of PC repairs involve easy mechanical steps or parts replacement. **Send or call for free literature.**

Call 800-223-4542

Name _____
Address _____
City _____ State ____ Zip ____

The School of PC Repair
PCDI, 6065 Roswell Road
Dept. JE685, Atlanta, GA 30328

CIRCLE 507 ON READER SERVICE CARD

FREE SOFTWARE

Choose from:
Games, Education, Home, Fonts - Windows™ or DOS

Only $2.50 service charge per collection. Credit Cards Only.

MICRO STAR Software Club™
619-931-4949 Ext. 106
Satisfaction Guaranteed

CIRCLE 508 ON READER SERVICE CARD

SlideImagers
Overnight
$4.95 Slides & Canons
Digital Output
- Slides/Overheads
- Dye-Sub Output
- Large Color Posters
- Canon Fiery Lasers
- Slide Duplication
- 4x5 Neg/Pos/B&W

Photo CD™
Scans $.90
(800) 232-5411
22-7th St. • Atlanta, GA 30308 • 404-873-3353

CIRCLE 513 ON READER SERVICE CARD

FREE CATALOG
1.800.447.2181
Large Quality Selection Virus-Free Software

PC
ASP member
SHAREWARE
1763 Garnet Ave. • San Diego, CA 92109
619.272.6673

CIRCLE 540 ON READER SERVICE CARD

Jet-Master
Re-usable Jet Printer Refill. Lowest cost/recharge, Black & Color. Waterproof inks.
From $20.95

MacInker
Eliminate ribbon costs. Re-ink your ribbons automatically-5¢ recharge, better than new printing and longer printhead life. Over 250,000 sold

Epson MacInker 49.95
Universal Cartridge MacInker ..79.95
Multicolor Adapter.....40.00
Call for comprehensive catalog!

Computer Friends, Inc.
14250 NW Science Park Drive
Portland, OR 97229
Order 1-800-547-3303
Tel. (503) 626-2291
Fax (503) 643-5379

CIRCLE 509 ON READER SERVICE CARD

CONSOLIDATED CD ROM

Worldwide Suppliers of CD ROM Software
Always new titles!

- Business
- Clip Art
- Games
- Music
- Religion
- Travel
- Caddies
- Education
- Literature
- Reference
- Shareware
- Adult

Call TOLL-FREE for a Free Catalog
1-800-8-CD-ROMS
Unconditionally Guaranteed
Resellers Wanted
Multimedia & Memory Expansion
213 67th Avenue • Philadelphia, PA 19126 • USA
(800) 8-CD-ROMS • (215) 276-7677 • Fax (215) 276-7854

CIRCLE 510 ON READER SERVICE CARD

SOFTWARE LABS
WORLD'S LARGEST SHAREWARE DISTRIBUTOR
Selected by **IBM** as a supplier for software testing.
See why **IBM** chose our professionally tested virus-free library
Call TOLL FREE or write for our free world famous 92-page catalog with exclusive 12 BONUS DISK offer.
100 CORPORATE POINTE SUITE 195
CULVER CITY CA 90231
800-569-7900
FAX: 310-410-2044

CIRCLE 511 ON READER SERVICE CARD

ICA Software
DARE TO COMPARE
Highest Quality Lowest Price SHAREWARE Guaranteed!!!
Free Catalog
800-331-3065
P.O. BOX 1011-354 Trumbull, CT 06611

CIRCLE 512 ON READER SERVICE CARD

SHAREWARE
for IBM
Same cost for 3.5" or 5.25"
Ship & Hand only $2/order
REGULAR ITEMS $1.50
XARGON OVERKILL ANCIENTS
MAHJONGG KILOBLAST WOLF3D
BIOMENACE EXECUTIONER
SPECIAL ITEMS: $2.00
BLAKE STONE (DOS 5/6,386,VGA)
MONSTER BASH DUKE NUKEM 2
CATACOMB ABYSS ZONE 66
ANDROID - Epic's fantastic Pinball!
WE HAVE CD'S at GREAT PRICES!
FREE CATALOG !
Visa Mastercard
ComPro Software
248 W. Park Ave. Suite 356
Long Beach NY 11561
1-800-PC-DISCS

CIRCLE 541 ON READER SERVICE CARD

ACCOUNTING FINANCE
One in four PC/Computing subscribers purchased accounting/finance software in the past 6 months.
Did they buy from you?
Get your share! Call your PC/Computing Marketplace account representative today at:
800-825-4237
Source: 1st Half 1992 Buying Trends Market Study, Base: employed subscribers

Best Files in the USA!

Channel 1®

- 100,000 NEW Shareware Programs
- Special FREE Downloads Area
- INTERNET – Email AND Newsgroups
- Hi Speed 100 line Mega BBS!
- Online Games and Entertainment!
- Adult, Business, Games, Windows, Graphics and Music Libraries
- FREE Daily Financial Markets News

Use Your New V.32/V.32BIS Modem!
No Surcharge

Set Your Modem to 8-N-1 and Dial
617-354-3230

CIRCLE 514 ON READER SERVICE CARD

Gamma UniVerse™ for Windows

Foreign languages in Windows ... featuring quality TrueType fonts!

Arabic, Chinese, East/Central/West European, Greek, Hebrew, Indian, IPA, Japanese, Korean, Persian, Russian, Sanskrit, S.E. Asian, Tibetan, Urdu and more – scalable fonts for Windows to support all the world's languages.
Does not require special versions of Windows.

From $149.95. Call the WinLanguage™ experts with your foreign language needs. We have easy to use solutions for supporting foreign languages in Windows. If after 30 days of using any of our products and following our easy to use documentation, you are not comfortably using the foreign language of your choice in Windows, return the product for a full refund.

Gamma Productions
tel 310.478.6774
fax 310.478.7765
2130 Sawtelle Blvd., #305
Los Angeles, CA 90025

CIRCLE 515 ON READER SERVICE CARD

77%
of PC/Computing subscribers initiate, select, or authorize computer product purchases.

Do they select you?

Get your share!
Call your PC/Computing Marketplace account representative at:
800-825-4237

Source: 1992 Buying Trends Market Study Wave III

GAMES AND MUSIC

Computer & modem access to the world's best library of shareware games & music!

All our files are worth downloading. Official distribution point for quality games from Apogee, MVP, Moraffware, Soleau, ImagiSoft, Arcanum, Id, Epic, Alive, and Gamers Edge and many more.

Great music files not just sound.

Guaranteed VIRUS FREE

Log on: 516-689-0285

FREE down loads when you log on!

CIRCLE 516 ON READER SERVICE CARD

DUPLICATION FROM $.49

HIGHEST QUALITY MEDIA

From $.49 (5.25") and $.80 (3.50")

- All Diskette Formats
- Custom Labels
- Diskette Mailers / Accessories
- Assembly Services
- Generous Volume Discounts

FORMATTED DISKETTES

FORMATTED	QTY 250	BLANK
$.69	3.50" DS/HD	$.59
$.56	3.50" DS/DD	$.49

- FREE FORMATTING on First Order
- BASF, MEMOREX, VERBATIM
- SONY AVAILABLE for Small Upcharge
- COLORED MEDIA Please Add $.05

800-255-3142
Diversified Systems Group, Inc
PO Box 1114, Issaquah WA 98027

CIRCLE 517 ON READER SERVICE CARD

FREE

204 PAGE GUIDE TO THE NEWEST & MOST COMPETITIVELY PRICED COMPUTER PRODUCTS

- Media & Supplies • Accessories
- Networking • Data Communication
- Power • Hardware & Software
- Computer Furniture

CALL
1-800-8 GLOBAL
or FAX 1-516-625-6683

GLOBAL COMPUTER SUPPLIES
NY • CA • GA • IL

CIRCLE 543 ON READER SERVICE CARD

Rite Hite PRODUCTS

Height Adjustable Ergonomic & Hardware Management Products at DISCOUNT PRICES
Starting at $79

• Undermount Keyboard Support

• C.P.U. Holders • Wrist Rests
• Monitor Stands • Mouse Platforms

1 800 272-6514

CIRCLE 531 ON READER SERVICE CARD

STOP THROWING AWAY

TONER CARTRIDGES

Empty Cartridges Recycled
Guaranteed To Work Like New

From $36

FREE U.P.S. PICK-UP & DELIVERY

National Toner
Recycling & Supply
(800) 676-0749

CIRCLE 518 ON READER SERVICE CARD

HARD CASE PROTECTION
Your notebook won't feel a thing!

NB-4000
$179.95
Holds computer accessories, files and disks (pictured)

NB-3000 $149.95
Holds computer & accessories
NB-1000 Holds computer only $59.95
w/shoulder strap $69.95

- Hard double-shell construction
- Highest quality foam interior
- Lockable • Made in USA

1-800-475-0707
719-531-5535

DOUBLECASE
5350 N. Academy Blvd
Colorado Springs, CO 80918

CIRCLE 519 ON READER SERVICE CARD

Where Adults Come To Play!

The World's Choice For
HOT MODEM FUN!

- HOT CHAT Live W/Thousands of Ladies & Gents in Groups & Private!
- Tons Of Sizzling Hot Message Areas, Shareware Files and Adult GIFs!
- Matchmaker With "DATING-BASE"!
- Straight and Gay Sections!
- Live Competitive Tournament Gaming!
- Unlimited Connect With One Low Price! Local Numbers In Over 800 Cities! Plus Much Much More!

Now With Our Exclusive
FANTASY Area!

ODYSSEY BBS

For Modem Signup or More Info Call
818-358-6968
Over 21 (M/F)

CIRCLE 521 ON READER SERVICE CARD

SEXY MODEM
Call from home or office!
•The Ultimate BBS•
FREE

- Sexy Chat with Singles/Couples
- 100,000 Shareware & Adult GIF, Windows and DOS files
- USA Today Online
- FREE ACCESS
- Unlimited Downloads
- 14.4k on all 60 Lines
- New GIF's posted daily by our photographers

1-217-792-3663
Must be over 21 to access
Customer Support Voice Line 415 281-4429

CIRCLE 522 ON READER SERVICE CARD

FREE GIFS!

Download some of the "Sexiest" images from our Adult On-Line Magazine - FREE!

LACE, which has been rated #1 by its users offers you:

- Positively the best Color Photographs & Scans in the World! GIF's not available on any other BBS!
- VIDEO for Window's files. Watch our models come to life. They talk to you, entice you and show you why they enjoy Adult Modeling.
- GORGEOUS & Sexy Models both Amateur and Professional!
- LOCAL ACCESS #s for over 800 cities in the U.S.
- HIGH SPEED Access available on ALL lines 14.4 down to 1200 baud.

Set your modem to 8-N-1 and your terminal emulation to ANSI and dial:

(818) 709-4275

LACE
the on-line adult magazine
Questions? (818) 709-3795 (voice)
Adults Only • Limited Offer

CIRCLE 523 ON READER SERVICE CARD

FREE
INTERACTIVE
ADULT CD-ROM SAMPLER
Add $4.95 for Postage/Handling in U.S.

ORDER TOLL FREE - MUST BE 18+
1.800.697.4947
INTERNATIONAL ORDERS: 714.669.1818
FAX: 714.573.0948
P.O. BOX 3684 TUSTIN, CA. 92681 U.S.A

P-I-X-I-S
INTERACTIVE

CIRCLE 524 ON READER SERVICE CARD

FOR ADULTS ONLY
You must be over 21 to access

LIFESTYLE
Meet sexy singles/couples on the world's hottest adult chat system—Lifestyle BBS.
Less than 30 per hour.
Log on: 516-689-5390

AND

GRAFIX
Computer pictures so hot they could melt your modem.
Log on: 516-689-2853

SUPER CHEAP • 100% PRIVATE
Local access from 500+ cities

CIRCLE 525 ON READER SERVICE CARD

San Francisco's Premier Adult Gay Men's Online Service has NOW gone Nationwide!

- Local access from over 1,000 US cities!
- Live uncensored group & private chat!
- Online, interactive, multi-player games!
- Lively salon style public forums!
- Over 20,000 Adult rated GIFS & files!
- MatchMaker online database!
- 50+ lines available 24 hours a day!
- Gay owned and operated, your privacy assured!
- *Much, much more!*

For your local access number, information, & signup, CALL:

(415) 703-8200

Set modem to 8/N/1. You must be 21 or older.
Finally...a national adult Gay men's BBS!

EYE CONTACT

Free Adult CD-ROM Sampler

1-800 882-6959

LASER CONCEPTS
20929-47 Ventura Blvd. #323
Woodland Hills CA 91364
(818) 884-9417
Hours: 10-6 pst M-F
• $.95 shipping & handling

CIRCLE 526 ON READER SERVICE CARD

ACCOUNTING FINANCE

One in four PC/Computing subscribers purchased accounting/finance software in the past 6 months.

Did they buy from you?

Get your share! Call your PC/Computing Marketplace account representative today at:

800-825-4237

Source: 1st Half 1992 Buying Trends Market Study, Base: employed subscribers

PC/Computing subscribers triple accessory spending.

In the next 6 months, PC/Computing subscribers intend to triple accessory spending for their organizations to an average of $9,641—up from $3,311.

Get your share!

Advertise in PC/Computing Marketplace.

Call today for information at 800 825-4237.

Source: 1st Half 1992 Buying Trends Market Study
Base: employed subscribers

QuickTime™ Movies & Photos

EroticaCafé CD $99
Sample the international cuisine...
Best selling adult CD ROM. QT1.6
Mac #300
IBM #301

Mac #100
IBM #101
Bare Assets CD $79
See the models dance on the beach, play in the pool, and pose in the studio.

Glamour Girls of 1943 CD $65
Nostalgic movies and photos of "pin-ups" from the 1940's.
Mac #200
IBM #201

3-floppy sampler sets/ All titles/ $29

Space Coast Software Orders 800-940-2040
Inquires 407-768-2442/ Fax 407-768-2221
1250 s. Harbor City Blvd. Suite #8, Melbourne, FL 32901
Visa/MC Adults Only Must be 21 to order

CIRCLE 527 ON READER SERVICE CARD

Let us Blow Your Hardware!

TERI WEIGEL • TRACI LORDS • SAVANNAH

Taylor Wayne • Bianca Trump • Ashlyn Gere • Tianna Taylor
Falleri • Jeanna Fine • Zara Whites • Lulu Devine • Chessie Moore • Ashley Nicole
Selena Steele • Cassidy • Alicia Rio • Tracy West • Tawny Peaks • Crystal Storm
Deena Duos • Madison • Ashley Sinclaire • Devon Shire • Pandora Peaks

PHOTO CD'S
952...Wicked (w/Kodak Access Software) $69.88
961...Mark of Zara $49.88
962...Cat & Mause $49.88
965...Hunter Heaven $49.88
966...Double Play I $49.88
967...Double Play II $49.88

Adult CD-ROM's As Low As $29.88

ALSO AVAILABLE:
- PM Color Catalog
- Free Tech Support
- Cybernetics BBS (305) 428-0012
- Year-Round Contests and Discounts (Win Free CD's!)
- 3-Some & 4-Way Bundles with Special Pricing
- Usage Free Photo CD's

INTERACTIVE CD'S
963...Penthouse Interactive $129.88
974...Adult Movie Almanac $99.88
958...Seymour Butts $69.88
969...Scissors-n-Stones $69.88
957...Paradise Club Interactive $49.88
959...Digital Dancing $69.88
950...Nightwatch Interactive $59.88
968...Dream Machine ..... NEW! $69.88
971...After Midnight Screen Saver ..... NEW! $59.88

MULTI-MEDIA MOVIES
976...The Other Side of Chelsea... NEW! $49.88
977...Deception ..... NEW! $49.88
980...Hidden Agenda ..... NEW! $49.88
975...Beverly Hills 90269 ..... NEW! $49.88
978...Murphie's Brown ..... NEW! $49.88
979...The Fisherman's Wife ..... NEW! $49.88
954...Wicked $39.88
955...Betrayal $39.88
956...Cat & Mause $39.88
947...The House of Sleeping Beauties $49.88
960...Legends of Porn 2 ..... $29.88
972...Traci, I Love You $29.88
973...New Wave Hookers $29.88
985...Secrets $29.88
986...Hidden Obsessions $29.88

GUARANTEED LOWEST PRICE!
WE MATCH ANY ADVERTISED PRICE!

MUST BE 21 TO ORDER
TOLL FREE: 800-354-5353
ORDER FAX LINE: 305-426-9801
FOREIGN ORDERS & DEALERS: 305-426-4552

ALL FAX & MAIL ORDERS RECEIVE FREE 2ND DAY UPGRADE
Department 63, P.O. Box 4188, Deerfield Beach, FL 33442
MasterCard VISA
STAR WARE CORPORATION

CIRCLE 529 ON READER SERVICE CARD

BodyCello

FREE* ADULTS ONLY CD SAMPLER

Sample
20 demos of the finest in adult entertainment software. See new interactive titles, beautiful nudes and artwork. MAC/MPC CD-ROM #555
Must be 21 to order. Dealer Inquiries Welcome.

*Send $4.75 for postage/handling in U.S. (Outside the U.S. & Canada send $15) CALL FOR A FREE COLOR CATALOG!
BodyCello • P.O. Box 910531 Sorrento Valley, CA 92191 • 619-576-6969 • FAX: 619-536-2397

1-800-922-3556

BC2

CIRCLE 546 ON READER SERVICE CARD

Unleash the power of your modem

The Exchange®
Bulletin Board System
The only all-files BBS you'll ever need

Thousands of Free Programs
- Windows
- DOS
- OS2
- Word Processing
- Database
- Games
- Adult Photos (Gifs)
- Animated Adult Movies
- E-Mail
- Live Chat & More
- Local Access from over 600 Cities

Great for beginners & advanced users of all ages

We're only a phone call away!
Modem: 516/579-5550
Supporting up to 14.4 Kbs, N-8-1 Full Duplex

CIRCLE 528 ON READER SERVICE CARD

84%

of PC/Computing subscribers advised friends and business colleagues on purchasing PC products in the past six months.

Are they recommending YOU?

Profit with the influentials.

Call your PC/Computing Marketplace account representative today at

800 825-4237.

Source: 1992 Buying Trends Market Study Wave III

Sexy Software™ SEXY DISKS™

Sexcapades™ . . . The GAME
The First Adult Game with TRUE SOUND and 256 Color VGA Graphics
The game everyone has been waiting for. For that evening you won't forget with a lover, one or group of very close friends. Fulfill your sexual desires. Find out how your partner would really like to make love. (Over 80 Color VGA Scenes • Real Voices Guide the Action • Foreplay Option • Play with 2-3 Close Friends. Now supports SoundBlaster™ cards! Req: your $79. VGA and hard disk required - shipped on high density disks

SPECIAL SALE PRICE $49.00

CONNOISSEUR COLLECTION ALL NEW! In 256 Color VGA!!
ALL movies have sound - play thru standard speaker or SoundBlaster™
Sexy Disk #CC1 • YOU RE THE STAR » The FIRST CUSTOMIZABLE movie. You write the dialog and title
Sexy Disk #CC2 • THE FIRST SOUND MOVIE! The first computer movie with SOUND. See the incredible 256 color VGA graphics while hearing the actual dialog. DIGITIZED & LIFELIKELY!
Sexy Disk #CC3 • THE BEST MOVIE! The best computer movie available. Only for the serious collector. 256 stunning VGA colors
Sexy Disk #CC4 • VOLUPTUOUS MOVIE with Sound See that sexy bombshell in realistically proportioned women
Sexy Disk #CC5 • GODDESS MOVIE with Sound! See men of incredible proportions and women with unique abilities - UNBELIEVABLE!!

Prices: 1 Movie $29, 3 Movies $65, 5 Movies $94

Now You Can Have Your Own GIRLFRIEND™ . . . a sensuous woman living in your computer!
GIRLFRIEND is the first **VIRTUAL WOMAN**. You can watch her talk to her ask her questions and relate with her. Over 100 picture files provide you to see your girlfriend as you ask her to wear different outfits, and guide her into different sexual activities. As a true artificial intelligence program, **GIRLFRIEND** starts with a few basic personality traits and develops her own style as you use it. She will remember your name, your birthday, your likes and dislikes. **GIRLFRIEND** comes with the basic software and **GIRLFRIEND LISA**. Additional girls will be added. This program requires 7-10MB of free space.
SG3 GIRLFRIEND - Basic introductory Program **$69. FREE** - Second GIRLFRIEND Just Added **NEW! SG7 GIRLFRIEND TERI** - 300+ PICTURES Free $79.

ORIGINAL Sexy DISKS - 6 disk set with movies, pictures, games *$32*

ADD $4.5H • $7 FOR ON ORDERS ADD $0/DISK • IN PA ADD TAX • MUST STATE AGE OVER 21 YEARS
VISA/MC Orders Only: 800-243-1615 (7/1 - 24 HRS / 7 DAYS
FAX (215) 997-2571 • Or OK/MO to: Sexy Software, P.O. Box 229 , Dept 600-U, Hatfield, PA 19440

Sexy Software™ SEXY CD-ROMS™

SUPER CD-ROM SALE
ALL CD-ROMS: $69 EACH OR 3 FOR $149
LIMITED OFFER - MAY BE WITHDRAWN AT ANY TIME. REG. $99 EACH OR 3 FOR $249

Sexy FLIX — *Full Length Digital Movies - Our Exclusively!*
KING Q. – The sexiest dinosaur movie ever made - CRYSTAL HOLLAND stars with prehistoric monsters, cavemen, and lots of special effects
TOO NAUGHTY TO SAY NO – HARRY REEMS and GINGER LYNN star in an erotic daytimer in a teaming school for girls – from EMMALUNG HOUSE pr. SUZE RANDALL
SEX GAMES – When a hacker taps into a computer dating service he is able to program the women to do all sexual fantasies – SHAUNA GRANT stars
Sexcapades™ - The MOVIE – An incredible score of explicit sex and nudity in a great sci-fi movie. Also our popular Sexcapades game
NO HARD DISK SPACE REQUIRED – WINDOWS NOT REQUIRED

Sexy CD-ROMS
Sexy CD #1 Fantasy Girls – CHICKS – 650 MB of Erotica with over 2500 VGA pictures, stories cartoons, games, sound files. SURE TO COMPARE!
Sexy CD #2 an explosive collection containing over 1000 Super VGA pictures (1024 x 768 x 256) and over 300 MB of true 24 bit color These are pictures that cannot be found anywhere else! The women and the quality are stunning.
Sexy CD #3 another collection of over 650 MB of the hottest pictures available. Over 2,000 VGA pictures, movies and utilities that will have you spending days just trying to see it all!
MEANS DRIVEN VIEWING - NO DUPLICATION

MIX & MATCH CD-ROMS / Sexy PIX™
COLLEGE GIRLS, GOODS OF PASSION, PINUP OF PEPPER, 3D DREAMGIRLS, ORGAN MACHINE, TRACI LORD VOL. SEYMOUR BUTTS, WICKED WINDOWS, BOOKCASE BEAUTIES, NORTHERN DELIGHTS 1 & 2, SUZIQ, WINDOW ON WHEELS, DEEP IMPACT, DEBBIE DOES DALLAS, ADAM LAMBERT, HOT P.I.'S 1, 2, 3, 4, EXOTIC GIRLS, TROPICAL GIRLS, DIGITAL DREAMS, PRINCESS OF PERSIA

CIRCLE 530 ON READER SERVICE CARD

CLASSIFIED

Penn Jillette

I'll Bet It's Your Damn Thurman Unit Again!

They pelted us with rocks and garbage.
—David Letterman

FOR THE PAST two years we've given you a phony clip-and-save April Fools' ad for a stupid-cheap computer at the bottom of this page to spread around like a hard copy virus. (If you save old copies of *PC/Computing*, check out our joke prices from two years ago—they've become damn close to fair. On second thought, if you keep old computer magazines, don't bother—it'd be better to try to get out a little more. Even a T.G.I. Friday's would be a step in the right direction.)

Y'all did us proud. You spread the phony ad by hand, fax, Xerox, and modem. We shut down some phone lines and got some very important people stupid-angry (you, the customers, are always right, and I have a day job—we're invincible). We've been there, we've done that twice. We're done.

Here's my humble plan for this April Fools': Let's all work together and try to slide a word into our culture. Alan Freed is credited with making up the term *rock and roll*. *Saturday Night Live* sure has enriched our culture—not! David Letterman, back when he was a little goofier, tried to get a catchphrase into the culture by brute force: "They pelted us with rocks and garbage." He said it a lot and encouraged others to as well. I did my part, but it didn't fly.

Computer people coin like mother-hubbards. Jaron Lanier started saying *virtual reality* and now it means "kinda 3-D-ish, sort of." Dvorak must have come up with something (I had a mean-spirited Dvorak joke prepared, but at the NewTek party in Topeka, John dealt me a solid, and I owe him one—next time). *Multimedia* now means *A/V*, and *media* is singular. We can't beat any of that, but maybe we can have some fun.

Clearly, our fake word has to have something to do with Uma Thurman. I was at a computer conference, and one of you people came up to me and said, "I don't know who Uma Thurman is, but you sure are making her famous." Bless his pocket protector.

Uma Thurman? My first idea was an anagram, but as great a name as Uma Thurman is, all you can really get out of it is *Math Numura*, and what good is that? If you put Uma Thurman and Penn Jillette together (good thinkin'), the best you get are *multiple ramjet henna nut*, *implement lutheran junta*, or *platinum enthral jet menu*—I like those, and the latter could almost work for a Mac, but they're not right for us. UMA could be Universal Media Access (controller), the chip in a CD-ROM that handles the digital video transfer, but where's the beef?

How about this?—*thurman*, a common noun for the part of the computer about which the speaker knows jack but about which the listener knows even less.

"It must be the thurman." "It's your goddamn thurman that's fatutzed." "Ask your office computer geek to give you a new thurman."

Whenever some computer-ignorant person comes to you with a problem you can't solve, tell them, "It's the thurman" and send them to someone else. And any time someone asks you about a computer problem that someone told them was "the thurman," look at it, shake your head and say, "Yup, it's the thurman" and send them to someone else. Use *thurman* for all RTFM situations.

If we all work on this, we might each get one good laugh out of it. And what else do you want for April Fools'—a new thurman?

PC/Computing *(ISSN 0899-1847) is published monthly by Ziff-Davis Publishing Company, a division of Ziff Communications Company, One Park Ave., New York, NY 10016. Second-Class postage paid at New York, NY 10016 and at additional mailing offices. Postmaster: Send address changes to* PC/Computing, *P.O. Box 58229, Boulder, CO 80321-8229. Printed in the U.S.A. Canada Post International Publications Mail Product (Canadian Distribution) Sales Agreement No. 278513. The Canadian GST registration number is R123669673.*

ALL VS. ALMOST.

Dell's built-in trackball **VS.** *tacked-on trackballs. (Makes you wonder what else they forgot.)*

Crisp, clear active matrix or dual-scan STN color displays **VS.** *washed-out pastels on single-scan passive screens.*

Dell's affordable Type II/III PCMCIA expansion for industry-standard peripherals **VS.** *overpriced proprietary accessories.*

Access to dedicated notebook technicians 24 hours a day, 7 days a week **VS.** *access to an answering machine.*

33MHz with local bus video **VS.** *25MHz with standard ISA video. (No comparison.)*

45 days of Getting Started software support **VS.** *you're on your own.*

DELL LATITUDE MOBILE COLOR

$2,449

Business Lease: $91/MO.

- 4MB OF RAM
- 170MB HARD DRIVE

ORDER CODE **#5000705**

DELL BEST BUY

DELL LATITUDE MOBILE SALES MANAGER

$2,799 *SAVE $700*

Business Lease: $104/MO.

- 4MB OF RAM
- 170MB HARD DRIVE
- ACT!–CONTACT MANAGER
- MICROSOFT POWERPOINT
- MICROSOFT WORKS
- 24/96 FAX MODEM
- ATTACHE CARRYING CASE

ORDER CODE **#5000706**

DELL LATITUDE MOBILE POWERPACK

$2,999 *SAVE $300*

Business Lease: $111/MO.

- 8MB OF RAM
- 170MB HARD DRIVE
- 14.4 FAX MODEM
- EXTRA BATTERY
- ATTACHE CARRYING CASE

ORDER CODE **#5000707**

FEATURES COMMON TO THESE CONFIGURATIONS:

- 9.5" DUAL-SCAN STN COLOR DISPLAY
- INTEL® 486 SX SL-ENHANCED 33MHz PROCESSOR
- LOCAL BUS VIDEO WITH 512K VRAM
- TYPE II/III PCMCIA EXPANSION SLOT
- 3.5" DISKETTE DRIVE
- NiMH BATTERY
- MS-DOS 6.2, WINDOWS 3.1
- DIMENSIONS: 8.6" x 11.7" x 1.7"
- WEIGHT: 6.4 LBS.
- COMMWORKS (5 COMMUNICATION TOOLS IN 1 PACKAGE)
- AMERICA ONLINE

Feature for feature, dollar for dollar, we'll place the new Dell Latitude™ up against any notebook in its class. Any time. Any place. And we challenge you to find more features and support on any other notebook starting at $1,699.[1]

Bundled with the options above, the challenge gets even tougher.

Call 1-800-727-1144 now to order the new Dell Latitude.

And don't settle for anything less.

DELL

TO ORDER, CALL

800-727-1144

HOURS: MON-FRI 7AM-9PM CT, SAT 10AM-6PM [illegible]

CANADA* 800-668-3021 MEXICO CITY* 220-781 [illegible] #11XCJ

)U WHO WEREN'T)WER, BUY IT.

Pictured System
DELL DIMENSION XPS P60 PENTIUM 60MHz SYSTEM
$3,499
Business Lease $129/Mo.

- 16MB RAM • 128MB Max RAM
- 256KB External Cache
- 528MB Hard Drive
- Multi-session, Double-spin CD ROM Drive
- 7 Expansion Slots Total (3 ISA, 1 PCI, 1 PCI/ISA Available)
- PCI #9GXE Video Accelerator Card with Video Control Panel Software
- 1MB Video RAM
- VS15 Color Monitor (15" CRT, 1024 x 768, .28mm, NI)
- 3.5" 1.44MB Diskette Drive
- MS-DOS 6.2/Microsoft Windows 3.1/Mouse

Order Code #5000659

DELL DIMENSION 433SV i486 SX 33MHz SYSTEM
$1,399
Business Lease $52/Mo.

- 4MB RAM • 64MB Max RAM
- 270MB Hard Drive
- Upgradeable to Pentium Overdrive™
- 5 Expansion Slots Total (3 ISA, 2 VL/ISA Available)
- Accelerated Local Bus Video
- VS14 Color Monitor (14" CRT, 1024 x 768, .28mm, NI)
- 3.5" 1.44MB Diskette Drive
- MS-DOS 6.2/Microsoft Windows 3.1/Mouse

Order Code #5000660

DELL DIMENSION 433V i486 DX 33MHz SYSTEM
$1,699
Business Lease $63/Mo.

- 4MB RAM • 64MB Max RAM
- 340MB Hard Drive
- Upgradeable to Pentium Overdrive
- 5 Expansion Slots Total (3 ISA, 2 VL/ISA Available)
- Accelerated Local Bus Video
- VS14 Color Monitor (14" CRT, 1024 x 768, .28mm, NI)
- 3.5" 1.44MB Diskette Drive
- MS-DOS 6.2/Microsoft Windows 3.1/Mouse

Order Code #5000661

DELL DIMENSION 466V i486 DX2 66MHz SYSTEM
$1,999
Business Lease $74/Mo.

- 4MB RAM • 64MB Max RAM
- 450MB Hard Drive
- Upgradeable to Pentium Overdrive
- 5 Expansion Slots Total (3 ISA, 2 VL/ISA Available)
- Accelerated Local Bus Video
- VS14 Color Monitor (14" CRT, 1024 x 768, .28mm, NI)
- 3.5" 1.44MB Diskette Drive
- MS-DOS 6.2/Microsoft Windows 3.1/Mouse

Order Code #5000662

DELL DIMENSION XPS 450V i486 DX2 50MHz SYSTEM
$2,199
Business Lease $81/Mo.

- 8MB RAM • 64MB Max RAM
- 450MB Hard Drive
- Upgradeable to Pentium Overdrive
- 7 Expansion Slots Total (5 ISA, 1 VL/ISA Available)
- VL #9GXE Video Accelerator Card with Video Control Panel Software
- VS15 Color Monitor (15" CRT, 1024 x 768, .28mm, NI)
- 1MB Video RAM
- 3.5" 1.44MB Diskette Drive
- MS-DOS 6.2/Microsoft Windows 3.1/Mouse

Order Code #5000663

DELL DIMENSION XPS 466V i486 DX2 66MHz SYSTEM
$2,599
Business Lease $96/Mo.

- 8MB RAM • 64MB Max RAM
- 450MB Hard Drive
- Multi-session, Double-spin CD ROM Drive
- Upgradeable to Pentium Overdrive
- 7 Expansion Slots Total (4 ISA, 1 VL/ISA Available)
- VL #9GXE Video Accelerator Card with Video Control Panel Software
- VS15 Color Monitor (15" CRT, 1024 x 768, .28mm, NI)
- 3.5" 1.44MB Diskette Drive
- MS-DOS 6.2/Microsoft Windows 3.1/Mouse

Order Code #5000664

DELL DIMENSION XPS P60 PENTIUM 60MHz SYSTEM
$2,599
Business Lease $96/Mo.

- 8MB RAM • 128MB Max RAM
- 256KB External Cache
- 450MB Hard Drive
- 7 Expansion Slots Total (4 ISA, 1 PCI, 1 PCI/ISA Available)
- PCI Video Card
- 1MB Video RAM
- VS14 Color Monitor (14" CRT, 1024 x 768, .28mm, NI)
- 3.5" 1.44MB Diskette Drive
- MS-DOS 6.2/Microsoft Windows 3.1/Mouse

Order Code #5000665

DELL DIMENSION XPS P60 PENTIUM 60MHz SYSTEM
$2,999
Business Lease $111/Mo.

- 8MB RAM • 128MB Max RAM
- 256KB External Cache
- 450MB Hard Drive
- Multi-session, Double-spin CD ROM Drive
- 7 Expansion Slots Total (3 ISA, 1 PCI/ISA Available)
- PCI Video Card
- 1MB Video RAM
- VS15 Color Monitor (15" CRT, 1024 x 768, .28mm, NI)
- 3.5" 1.44MB Diskette Drive
- MS-DOS 6.2/Microsoft Windows 3.1/Mouse

Order Code #5000666

3 levels of magnification and on-the-fly resolution switching.

And you have the security of knowing your system is backed by the computer company that ranks highest in customer satisfaction — according to the 1993 J.D. Power and Associates Desktop Personal Computer Customer Satisfaction Study among business users.†

So get your hands on all the power you ever wanted. Even if you weren't born into money.

DELL™

TO ORDER, CALL
800-766-4400

HOURS: MON-FRI 7AM-9PM CT SAT 10AM-6PM CT SUN 12PM-5PM CT
IN CANADA† CALL 800-668-3021. KEYCODE #11XDX

*some products and promotions not available in Canada or Mexico. †Business leasing arranged by Leasing Group, Inc. The Intel Inside and Pentium Processor logos, i486, Pentium and Overdrive are trademarks of Intel CORPORATION. MARKS test results obtained by running WINBENCH version 3.11 at 1024x2048, 256 colors. Furnas screen image source. Kodak Photo CD Photo Sampler. ©1993 Eastman Kodak Company. Photographer: Steve Kelly.

FOR THOSE OF YO
BORN INTO P

Upgrade to a virtual screen monitor by adding our optional 1MB VRAM and 1MB DRAM upgrade. Then you can pan across multiple applications while you work.

Our multi-session, double-spin CD ROM drives come with a special edition of Aldus PhotoStyler and are Kodak Photo CD compatible.

*By adding the #9GXE card, the new Dell Dimension XPS WINMARK performance is up to 1.6 times faster than standard VGA.***

$3,499

DELL DIMENSION XPS P60 PENTIUM SYSTEM
(Other systems featured are not pictured.)

There are plenty of ways to attain it.

Our Dell Dimension XPS P60 systems are all Pentium processor based, and our i486 systems can easily be upgraded to Pentium Overdrive. Every Dell Dimension system on this page features accelerated local bus video. The rest of the specs read like a power user's wish list of the latest technological innovations.

Take the CD ROM drive for example. Its double-spin technology delivers nearly twice the data transfer rate of single-spin drives. It's multi-session, which means it's Photo CD compatible and you can have your CDs printed on up to four separate occasions. Even its motorized loading tray is state-of-the-art.

Video on this XPS system is supplied by a #9GXE video card that delivers 26 million WINMARKS,**

intel inside

*†1993 J.D. Power and Associates Desktop Personal Computer Satisfaction Study conducted among 1,956 user respondents. *25MHz, monochrome system. *Prices valid in the U.S. Corporation. MS-DOS and Microsoft are registered trademarks and Windows is a trademark of Microsoft Corporation. Peavey is a registered trademark of Peavey Electronics Cor Dell disclaims proprietary interest in the marks and names of others. ©1994 Dell Computer Corporation. All rights reserved.*

KICKBUTT.[2]

60MHz Pentium microprocessor. Wow.

8MB RAM

450MB hard drive

256KB external cache

PCI video card

1MB video RAM

MS-DOS® 6.2, Microsoft® Windows™ 3.1, and a mouse

VS15 Color Monitor (15" CRT, 1024 x 768, .28mm, NI)

Multi-session, double-spin CD ROM drive

One 3.5" diskette drive

This system comes from the company that ranked highest in the 1993 J.D. Power Desktop Personal Computer Customer Satisfaction Study among business users.[1]

$2,999

Business Lease®: $111/month

Multimedia Sound upgrade including Sound Blaster 16 and Peavey® Speakers available for an additional $199.

DELL DIMENSION™ XPS P60 PENTIUM™ SYSTEM

You might think you've been clippin' right along with your i486™. Well, sit down in front of one of these babies and find out what speed is all about.

Take a minute to read the features up there by the monitor – starting with that sweet little 60MHz Pentium chip that's nearly twice as fast as any i486 chip. Then call the 800 number below and find out how simple it is to finance a new Dell® Pentium System. You won't find anything in the same league. Not with all that power. And not for $2,999. Yeah, $2,999. That's the kicker.

DELL™

TO ORDER, CALL

800-951-3355

HOURS: MON-FRI 7AM-9PM CT SAT 10AM-6PM CT SUN 12PM-5PM CT

IN CANADA? CALL 800-668-3021. KEYCODE #11XD4

Order Code #5000639

[1]1993 J.D. Power and Associates Desktop Personal Computer Satisfaction Study conducted among 1,956 user respondents.