

ZIFF-DAVIS
a SOFTBANK
Company

PC MAGAZINE

PC Labs Tests 20 Digital Cameras Plus: 18 Digital Imaging Packages



- After Hours: 6 Encyclopedias on Disk
- 11 Servers to Let You Share Printers
- More Jim Seymour Win 98 Survival Tips



FIRST LOOKS:

- Exclusive: 250MB Iomega Zip Drive
- 19" Flat-Screen Monitors
- Diamond Rio PMP300
- Deneba Canvas 8
- Sun's Solaris 7.0
- Intel eMail Station

WWW.PCMAG.COM

THE INDEPENDENT GUIDE TO PERSONAL COMPUTING VOL. 18 NO. 2 JANUARY 19, 1999

FREE SOFTWARE

ON THE WEB

THE BEST
DOWNLOAD SITES
FOR WORD PROCESSING,
WEB BROWSING,
E-MAIL, AND
MORE

PLUS

Tips and
Tricks for
Downloading

U.S.\$3.99/CAN.\$4.99/U.K.£3.25



WHO DO YOU DO IT FOR?



Winner takes all.

New Rules. New Tools.™



P.C. magazine 1155/sec

LIBRARY OF CONGRESS
JAN 06 1999
COPYRIGHT OFFICE F



NBC

CBS

www.pcmag.com

Choose 098 at www.pcmag.com/infolink

*The IntelliBase Series is sold separately. MultiSync is a registered trademark, and E500, E750, E900+, E1100+, CromoClear, IntelliBase, Experience more. Experience more.™ and the NEC Technologies icon are trademarks of NEC Technologies. Microfilter is a trademark of Toshiba. © 1998 NEC Technologies, Inc.



We can't say what applications she'll be using in five years.

We can, however, predict the monitor.



Software goes out of date. CPUs are superseded.

OUR NEW SHORT-DEPTH MULTISYNC E750
COMPLETES THE E SERIES FAMILY.

In the face of nearly chaotic change, it's reassuring to know you can count on MultiSync® E Series monitors for years to come. Take a look. Our CromoClear™ and dot trio CRTs deliver all the contrast, sharpness and color-saturation you need for demanding applications. But what isn't so apparent is the reliability and flexibility we build into each monitor. Refresh rates up to 120 Hz, PC and Macintosh compatibility and

	MultiSync E500™	MultiSync E750™	MultiSync E900+™	MultiSync E1100+™
Viewable Image Area	13.8"	16.0"	18.0"	19.8"
CRT	CromoClear	Short-depth CromoClear	Microfilter™ Dot Trio	Microfilter™ Dot Trio
Dot Pitch	0.25mm mask	0.25mm mask	0.26mm dot 0.22mm horizontal	0.28mm dot 0.24mm horizontal
Maximum Resolution	1280 x 1024 @ 65Hz	1600 x 1200 @ 73Hz	1600 x 1200 @ 77Hz	1600 x 1200 @ 77Hz

the optional IntelliBase™ Series™ monitor bases mean they'll grow as your needs change. And for added security, they're backed by a three-year warranty. MultiSync E Series monitors. With longevity like this, you might just retire before your monitors do.

NEC



New Roles. New Tools.

To learn more or for a reseller near you, call (800) NEC-INFO or visit us at www.nectech.com. Expect more. Experience more.

For under \$1,000 you'd expect
an entry level 15" LCD monitor.



Sorry to disappoint you.



The new MultiSync™ LCD1500M™ monitor surprises in many ways. Along with our famed reliability, you'll find astounding image quality and a robust multimedia speaker system. There's even a four-port USB hub that lets you hot swap peripherals with true plug and play ease. If you're looking for an LCD monitor, check out the model with high-end performance. The MultiSync LCD1500M monitor.

NEC



MultiSync LCD2000

MultiSync LCD1510
MultiSync LCD2000

MultiSync LCD400

MultiSync LCD1510

MultiSync LCD3000

MultiSync LCD1510



Learn about our complete line of MultiSync LCD monitors. Call (800) NEC-INFO, or visit www.nectech.com. Expect more. Experience more.

Choose 157 at www.pcmag.com/infolink

Michael J. Miller

Personal Multimedia

Remember when the promise of personal computers was just that—bringing computer power to individuals? People used PCs to create their own word processing documents and spreadsheets, things that automated processes done by hand or on large computers. Then, about ten years ago, we got desk-



top publishing applications and fonts and graphics in documents. Suddenly anyone could create professional-looking documents.

The same thing is happening now in multimedia applications, with software designed to let almost anyone create fancy graphics and even music. Such programs have been available for professionals for some time. Most of the publications and graphics you see are created in programs such as QuarkXPress, CorelDraw, or Adobe Photoshop or Illustrator. But for those of us who aren't graphics professionals, getting good-looking results from these programs is rather difficult.

On the other side of the spectrum, there are many template-driven and clip-art style programs that let you create graphics pretty easily but are aimed at home users.

Nowadays, many of us are creating our own Web sites and publications, and we want something unique but still professional looking. For those of us who aren't pros, this can be a challenge.

I recently met with a number of my colleagues to discuss some of the best software we've seen in the past year. The trend is clear: Many of the best programs are now trying to use the power of the PC to make it easier for anyone to create great multimedia elements.

This is particularly true in the graphics arena, where new applications aimed at typical business users—instead of graphics professionals—are the big trend. Among my favorites:

Microsoft PhotoDraw 2000 lets you start with your own photo or clip art and then format it for a document or a Web page. It offers basic photo-editing tools—for things like fixing red-eye—and lets you easily create compressed images that are the right size for putting on a Web site. It has a number of templates for logos and Web buttons, and was designed to fit in with the Microsoft Office suite.

Adobe ImageStyler is a bit more sophisticated

and is aimed specifically at people trying to create graphics for a Web site. You'd likely start with a photograph or clip-art image, but ImageStyler makes it very easy to create your own logos, graphics designs, and even Web buttons by applying predefined styles to your image. You can easily mix and match colors, textures, shading, and 3-D effects to create a unique image. And you can link graphics together, so that you can change them all at once, giving your site a consistent look. You can even attach things like specific HTML commands or roll-over text that pops up when you put your cursor on the graphic.


For those who want to get even more sophisticated, Macromedia Fireworks offers a vast array of

higher-end tools packaged in a way that even those of us who aren't designers can use. Along with symbols and templates, it adds features such as bundled animations, color corrections, and image slicing (so users can download parts of an image first). It is designed as a complete environment for creating Web graphics, suitable for both business and professional users.

And it's not just graphics that are moving this way. If you want unique music for your Web page, check out

Acid, from Sonic Foundry. Acid lets you start with its music clips or your own files and then mix them together to create a unique sound. By combining various clips from multiple instruments, changing the tempo or the pitch, adjusting the volume, and adding a variety of effects, you can easily make your own music.

Taken together these programs represent a range of new tools that let anyone create pages that look and sound both unique and professional. With these tools, a digital camera, and a simple Web-site creation tool, you can easily create a top-notch site.

Letting average users create things only professionals could before is one of the PC's hallmarks. It's good to see it continuing. 

Letting average users create things only professionals could before is one of the PC's hallmarks.

More on the Web:

Editor-in-chief
Michael J. Miller
answers your computing
questions every Tuesday,
exclusively at PC
Magazine Online.

www.pcmag.com/miller

SEAGATE'S SIDEWINDER AIT TAPE DRIVE TRANSFERS DATA TWICE AS FAST AS THE DLT4000.

SAVING YOU ALMOST ENOUGH TIME TO JUSTIFY
READING THIS MAGAZINE.

Does it really matter how fast you can backup data? You bet it does. When you do it every day, it matters a lot. So a faster drive, like our Sidewinder® AIT tape drive, is hard to resist. But there's more to Sidewinder than speed. Sidewinder tape is superior, too. It's the only tape media with a memory chip in each cassette to index data for faster access and restore. And Seagate Advanced Metal Evaporated (AME) media resists the flaking and peeling of standard metal particle tape for less contamination and greater reliability. In fact, Sidewinder drives almost never need routine cleaning, which saves you even more time. But we have to admit, the most attractive thing about Sidewinder is speed. And you can never have too much of that. Seagate Tape. We'll back you up.

FYI



	SIDEWINDER 50	DLT4000	SEAGATE ADVANTAGE
Capacity (Compressed)	50 GB	40 GB	25% Higher Capacity
Transfer Rate (Compressed)	6 MB/sec	3 MB/sec	Faster Backup
Head Life	50,000 Hours	10,000 Hours	Up to 5 times longer
Media Load Time (w/ MLC)	20 sec	45 sec	Faster Restore
Avg. File Access	27 sec	68 sec	Accesses Data Faster

www.seagate.com/ait1

© 2008 Seagate Technology, Inc. All rights reserved. Seagate, Seagate Technology and the S Logo are registered trademarks of Seagate Technology, Inc. Sidewinder and Sidewinder are trademarks or registered trademarks of Seagate Technology, Inc. or one of its subsidiaries. All other trademarks or registered trademarks are the property of their respective owners. See your Seagate dealer for warranty terms and conditions.

 **Seagate**
Information the way you want it™

UP FRONT

- From the Editor-in-Chief**.....4
- Pipeline**.....9
- Letters**.....21
- Trends**.....28
- ▶ More choices in wireless and phone-line home networking
- ▶ What's in an Oracle appliance?
- ▶ Tuning into desktop TV
- ▶ On-screen reading that's easy on the eyes
- ▶ Roam the planet
- ▶ Chips change their spots
- ▶ The Palm goes wireless
- Inside PC Labs**.....29
- ▶ USB speaker technology



First Looks.....41

- ▶ 250MB Iomega Zip Drive
- ▶ 19" flat-screen monitors
- ▶ Diamond Rio PMP300
- ▶ Deneba's Canvas 6
- ▶ PC radios from ICOM, Sony, and Ten-Tec
- ▶ O'Reilly Utilities for Windows 98 Annoyances
- ▶ Microtek ImageDeck
- ▶ Painter 5.5 Web Edition
- ▶ FoneCam
- ▶ L&H iTranslator Professional Service
- ▶ ALPS MD-5000
- ▶ LMSOFT Presenter 3.0
- ▶ Systat 8.0

Networking First Looks.....75

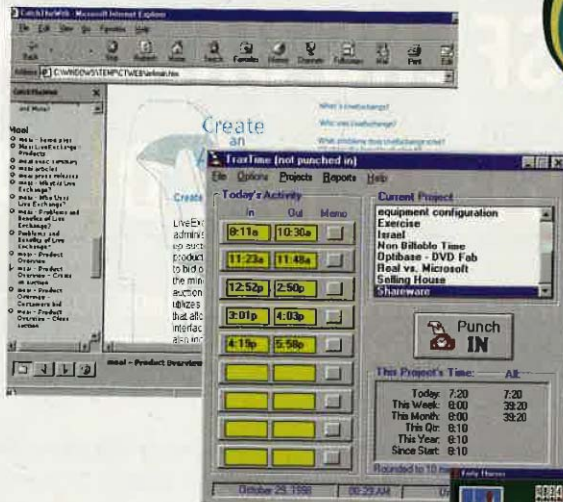
- ▶ Sun's Solaris 7.0
- ▶ Intel InBusiness eMail Station

Second Looks.....80

- ▶ Norton AntiVirus 5.0
- ▶ Dragon NaturallySpeaking

COVER STORY

Free Software On the Web



- System Utilities.....100
- Microsoft Office Add-Ons.....102
- Internet Tools.....102
- Communications Tools.....104
- Organizational Tools.....104
- Web Development Tools.....114
- Games.....114
- Tips on Web Downloading and Storage.....101
- Where To Get It: The Sites.....103
- Essentials.....104

BY GAIL SHAFFER

Downloading software. Besides sending e-mail, it's still our favorite thing to do online—especially if it's free or almost free! We scoured the Web and found a bunch of great programs for you that do all sorts of things. And we surveyed the best download sites so you can save some time the next time you're looking for something.....100



NETWORKING Sharing Printers

BY STEVE RIGNEY

Still useful after all these years, print servers give you great flexibility in placing your shared printers right where you need them. They're inexpensive and easy to set up.....179



- Axis Communications Inc.....165
- Castelle Inc.....165
- D-Link Systems Inc.....166
- Emulex Corp.....163
- Extended Systems Inc.....165
- Hewlett-Packard Co.....163
- Intel Corp.....169
- Lexmark International Inc.....163
- Linksys Inc.....193
- Microplex Systems Ltd.....193
- Osicom Technologies Inc.....193
- Two Ways to Print.....160
- Editors' Choice.....165
- Single-Printer Sharing.....166
- Summary of Features.....168
- Performance Tests.....191

COVER ILLUSTRATION BY TOM WHITE; PHOTOGRAPHY BY THOM O'CONNOR

FEATURES

CONSUMER IMAGE EDITING

Point-and-Shoot Software

BY SALLY WIENER GROTTA AND DANIEL GROTTA

You'll fall in love with your PC all over again once you start playing with digital images using one of these packages. Fix red-eye, adjust contrast and brightness—all with a click or two of the mouse—then move on to even more fun things, including making your own cards and calendars.....154



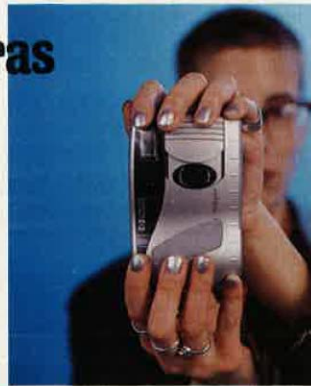
Adobe PhotoDeluxe Home Edition 3.0	156
Corel Print House Magic Deluxe 3.0	164
LivePix 2.0	167
MGI PhotoSuite II	167
Microsoft Picture It! 99	173
Ulead Photo Express 2.0	174
Editors' Choice	156
Suitability to Task	164
The Digital ShoeBox	166
Other Image Editors	174

PERIPHERALS

Digital Cameras

BY DANIEL GROTTA AND SALLY WIENER GROTTA

They've come a long way (in a short time), baby. The latest generation of digital cameras delivers near-35-mm quality photos in larger sizes. Models range from \$300 to \$1,200 and vary in features, so we've awarded Editors' Choices in three market segments. For all that digital cameras offer, they're worth the price.....116



Agfa ePhoto 780, ePhoto 1680	125
Casio QV-7000SX	125
Eastman Kodak DC210 Plus, DC260	125
Epson PhotoPC 700	128
Fujifilm MX-500, MX-700	128
HP PhotoSmart C30	131
Konica Q-M100V	131
Leica digilux	128
Nikon Coolpix 900s	148
Olympus D400 Zoom, D-620L	149
Ricoh RDC-4200, RDC-4300	149
Sanyo VPC-X300	150
Sony MVC-FD71, MVC-FD81	152
Toshiba PDR-M1	152
Editors' Choice	118
Performance Tests and Output Samples	133
Hitachi IM2: Video, Too	148
Image Transfer: Easier than Ever	150
Summary of Features	151

Get more online at www.pcmag.com

Online Exclusive:

Photo Samples

How good do the photos taken by the digital cameras tested for this issue's story look? See for yourself at our Web site.

Plus: The Daily Download! A fresh new pick from the ZDNet Software Library every day.

Also Currently Online:

100 Desktop Fixes

Windows doesn't have to look that way. Customize it to your heart's content with this collection of hints and free utilities.

Plus: Test your PC for Y2K compliance live online! Are you ready?

Multimedia Extra: CD plus Web Site

Top Software

- ▶ 30 utilities ready to install
- ▶ Searchable back-issue database
- ▶ Web site link to more free utilities and the best downloads



Visit Extra at www.pcmagextra.com. To order, call 800-335-1195 in the U.S. or 303-665-8930 elsewhere.

➔ See this issue's free utility in action at www.pcmag.com/download

COLUMNISTS

JAKE KIRCHNER	30
BILL MACHRONE	85
JOHN C. DVORAK	87
INSIDE TRACK	89
JIM SEYMOUR	93
BILL HOWARD	99

SOLUTIONS

Tutor	194
Expansion buses provide vital connection to peripherals.	
User to User	197
Use Word to create presentations, automate Windows log-on, transpose Excel images easily, and more.	
Utilities	206
InCtrl4 makes keeping track of program installation easy.	
Internet User	212
You can get DHTML to work in both IE and Navigator.	
PC Tech	215
Microsoft Visual C++ 6.0 is both easier and more powerful.	

AFTER HOURS

A World View	247
Disk-based encyclopedias provide useful, up-to-date information.	



Shogo

252
A first-person shooting game that's in a league of its own.



Also in This Issue:

PC Magazine Marketplace	226
Coming Up	254
Editorial Product Index	256
Advertisers' Index: Companies	257
Advertisers' Index: Products	260
Abort, Retry, Fail?	262

The MOTHER of All WINDOWS 98 Books

List price \$39.95.
Our price \$31.96.
You save \$7.99.

The Data Warehouse Lifecycle Toolkit

List price \$54.99.
Our price \$38.49.
You save \$16.50.

UPGRADING AND REPAIRING PCs

List price \$54.99.
Our price \$38.49.
You save \$16.50.

Upgrade your cerebral hard drive.

How do you stay ahead of the technology curve?

With books like these and more than 3 million other titles, Amazon.com has many ways to keep you wired into the latest on programming, the Internet, software and more. Plus, at up to 40% off, we'll keep you from crashing your budget.



Y2K Survival Guide

List price \$19.99.
Our price \$13.99.
You save \$6.00.

TROUBLESHOOTING, MAINTAINING & REPAIRING PCs

List price \$59.99.
Our price \$47.99.
You save \$12.00.

PERL IN A NUTSHELL

List price \$19.95.
Our price \$15.96.
You save \$3.99.

THE COMPLETE NETWORK UPGRADE & MAINTENANCE GUIDE

List price \$69.99.
Our price \$55.99.
You save \$14.00.

WAVS, MP3s & RealAudio

List price \$24.99.
Our price \$19.99.
You save \$5.00.

BOOKS, MUSIC & MORE
amazon.com

©1999 Amazon.com, Inc. All rights reserved. AMAZON.COM is the registered trademark of Amazon.com, Inc.

AOL Gazes at Sun

Now that AOL and Netscape have inked a deal for AOL to buy Netscape for \$4.2 billion, the far-reaching implications are becoming clear. It may turn out that Sun Microsystems' simultaneous strategic alliance with AOL is just as interesting as the Netscape side of the deal.

The AOL/Sun alliance is designed "to accelerate the growth of enterprise-class e-commerce, and to use Sun's Java technology to develop Internet devices that will help Internet users access America Online brands from anywhere, anytime," according to an AOL statement. As part of the deal, Sun will become a primary systems and service provider to AOL.

AOL will get more than \$350 million in licensing, marketing, and advertising fees from Sun. AOL's big hope, though, is that Sun's vision of ubiquitous networking—incorporating everything from Internet-connected soda machines to conference room tables with plug-and-play networking—can help make

AOL ubiquitous. Thus your Java-smart hand-held device might connect easily to an airport Internet kiosk, bringing up AOL and Netscape's browser.



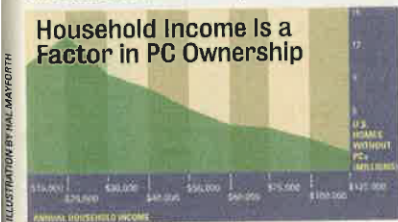
AOL CEO Steve Case has made clear that he has his eyes on Sun's hardware and software platforms as opportunities to marry AOL with enterprise e-commerce strategies. AOL and Netscape will continue development of the upcoming Netscape browser, called Communicator 5.0, and will add Version 1.2 of Sun's Java Development Kit to the browser. AOL will also embed Sun's scaled-down version of Java, PersonalJava, in all AOL clients.

The PC Proliferates

Low PC prices and the lure of the Internet drove almost 4 million buyers to purchase their first PCs in the first six months of 1998, according to data from ZD Market Intelligence. Some 50 million homes—almost half of U.S. households—now have at least one PC.

Declining prices have also led more lower-income families to buy PCs. Households with incomes of less than \$30,000 accounted for a third of all new PC purchases in the first half of 1998. Still,

Household Income is a Factor in PC Ownership



households flush with cash are far more likely to house PCs than low-income households: Those earning less than \$30,000 constituted only a quarter of all homes owning PCs.



Thinking Thin

of respondents to a recent PC Magazine Online poll told us that they didn't expect to have a flat-screen display on their desktops until 2001. Another 30 percent said that they'd have one by 2000. Only 13 percent of those responding said that they'd have one by 1999. Seven percent of respondents told us they already had flat-panel displays.

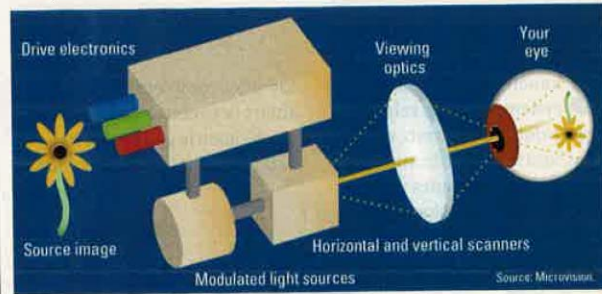
The Eye Is the Display

What's round, super-lightweight, ultraportable, low-cost, and long-lasting? It can support millions of colors at perfect resolution and comes in blue, green, or brown. It's your eye, of course, and it may be the ultimate display of the future.

Microvision, a developer based in Seattle, acquired rights to a technology known as Virtual Retinal Display (VRD) from the University of Washington Human Interface Technology Laboratory in 1993. A VRD device sends an encoded beam of light through the pupil to the retina, stimulating the receptors so you seem to see a high-quality image an arm's length away. It eliminates the need for any screen, letting the eye complete the function performed by a flat panel's matrix array.

Built into eyeglasses or goggles, VRD could display images that don't block one's view, useful in image-guided surgery. And in cellular phones and pagers, it could let you view e-mail, Web pages, faxes, and files as if on a full-size monitor.

Microvision says VRD poses no danger to the eye and adheres to safety standards.



www.pcmag.com

Just How Good Are Digital Cameras?

Join us online to compare digital camera output samples. By a process of elimination, you'll end up with your favorite.

The Top 100 Web Sites

Our new list has five sites in each of 20 categories that reflect the Web's expanding scope.

John C. Dvorak: Fresh Weekly

Check in with our cantankerous columnist every Monday for his news, views, and snide asides.

100 Tools for Desktop Renovation

Our download experts have found 100 free utilities that let you customize your desktop.

Do You Get Our Newsletter?

Stop by our home page and sign up for our newsletter, now featuring expert insight from Bill Machrone. We'll send it right to your e-mail box.

PIPELINE

Walking Web

Wireless tablets for Web surfing on the run are due to arrive in 1999. The WebPad, from the Conceptual Products Group at Cyrix, is one of the most talked-about tablets. Powered by the Cyrix MediaGX processor, the tablet is about the size of an Etch A Sketch and accesses the Internet wire-



NO WIRES: The Cyrix WebPad.

lessly via a radio-frequency base station—a set-top box or standalone base station.

The base station options provide for cable modem, ISDN, or 56-Kbps connections. Once you connect to the base station, you can roam wirelessly at a range of about 150 feet and use a pen and on-screen navigation buttons to surf the Web. Though the unit is only a prototype now, Cyrix is talking to manufacturers and expects units to start shipping early this year. Cyrix foresees the WebPad being popular for use with home networks. No pricing information is out yet.

Global Converging Technologies is also working on a wireless tablet for Web surfing, the Cendis Net Display, to arrive in the summer of 1999. It will be touch-sensitive and priced around \$500. The Cendis Net Display, unlike the Cyrix WebPad, will have a monochrome display.

Bio-Identities

Bio-metric identification systems—which rely on fingerprints, voice prints, retinal scans, and the identification of other unique attributes you carry around—are slowly making the transition out of the exotic stage and into the mainstream.

To move product development along, Microsoft and a group of software companies have come up with BioAPI (*API* stands for *application programming interface*), a tool that software developers can use to build support for all sorts of biometric devices right into their applications. Today developers need to write support for specific biometric devices and force their customers to use certain hardware.

A standard such as BioAPI

can offer complete interoperability between applications and any biometric gadget—a key ingredient that will help broaden



the market, says Karan Khanna, lead product manager for Windows Security at Microsoft. The proposal is only in the initial stages now, with product development a year away.

THIS ISSUE'S CONTRIBUTORS: Angela Hickman, Carol Levin, Sebastian Ruple, Don Willmott.

ILLUSTRATION BY BARTON STABLER

Personal Projection

Worldwide sales of ultra-portable projectors—models that weigh under 10 pounds—grew nearly 400 percent from 1997 to 1998, according to the market research firm Pacific Media Associates. The ultraportable market should nearly double by next year, reaching almost \$1 billion in sales, according to Pacific Media.

Key to this growth is that these projectors weigh less than half as much as competing designs, while offering many of the same features and, in some cases, brighter images. Low price is also a factor. Released nearly two years ago, the Lightware VP800 remains one of the



PRESENTING: The 6.8-pound InFocus LP425 is one of the lightest projectors you can buy.

best-selling projectors for professionals. Sales shot up last year when Lightware lowered the price to \$3,000—unprecedented in a market where most projectors were closer to \$10,000. The unit now sells for under \$2,000.

Soon you'll be able to carry a notebook and a projector that together will weigh less than a laptop did just a few years ago.

Top-Selling Retail Software

1	Sony MVC-FD71 (\$670)
2	Agfa ePhoto 307 (\$160)
3	Sony MVC-FD81 (\$790)
4	Kodak DC-50 (\$210)
5	Kodak DC-280 (\$940)
6	Sony MVC-FD51 (\$480)
7	Kodak DC-210+ (\$575)
8	Olympus D-800L (\$860)
9	Kodak DC-200 (\$390)
10	HP Photosmart C-20 (\$380)

Source: ZD Market Intelligence, data for October.

E-Shopping Arrives

While the final numbers won't be compiled for another couple of months, 1998 appears to have marked the arrival of big-time e-commerce revenues. According to CyberDialogue, a research firm, about 6.7 million adults shopped online in 1998. According to America Online, nearly 50 percent of its 14 million subscribers have shopped online, with the numbers sharply increasing during the last quarter of 1998. A big boost came during the holiday season as major retailers such as Nordstrom offered online shopping options.

Online Trading Rings Up Profits



Oracle Express analyzes 50 times

more

data than Hyperion Essbase.

	<i>Data Density</i>	<i>Query Execution Time</i>
Oracle Express 6.1	5.0	0:34:02
Hyperion Essbase 5	0.1	0:36:30



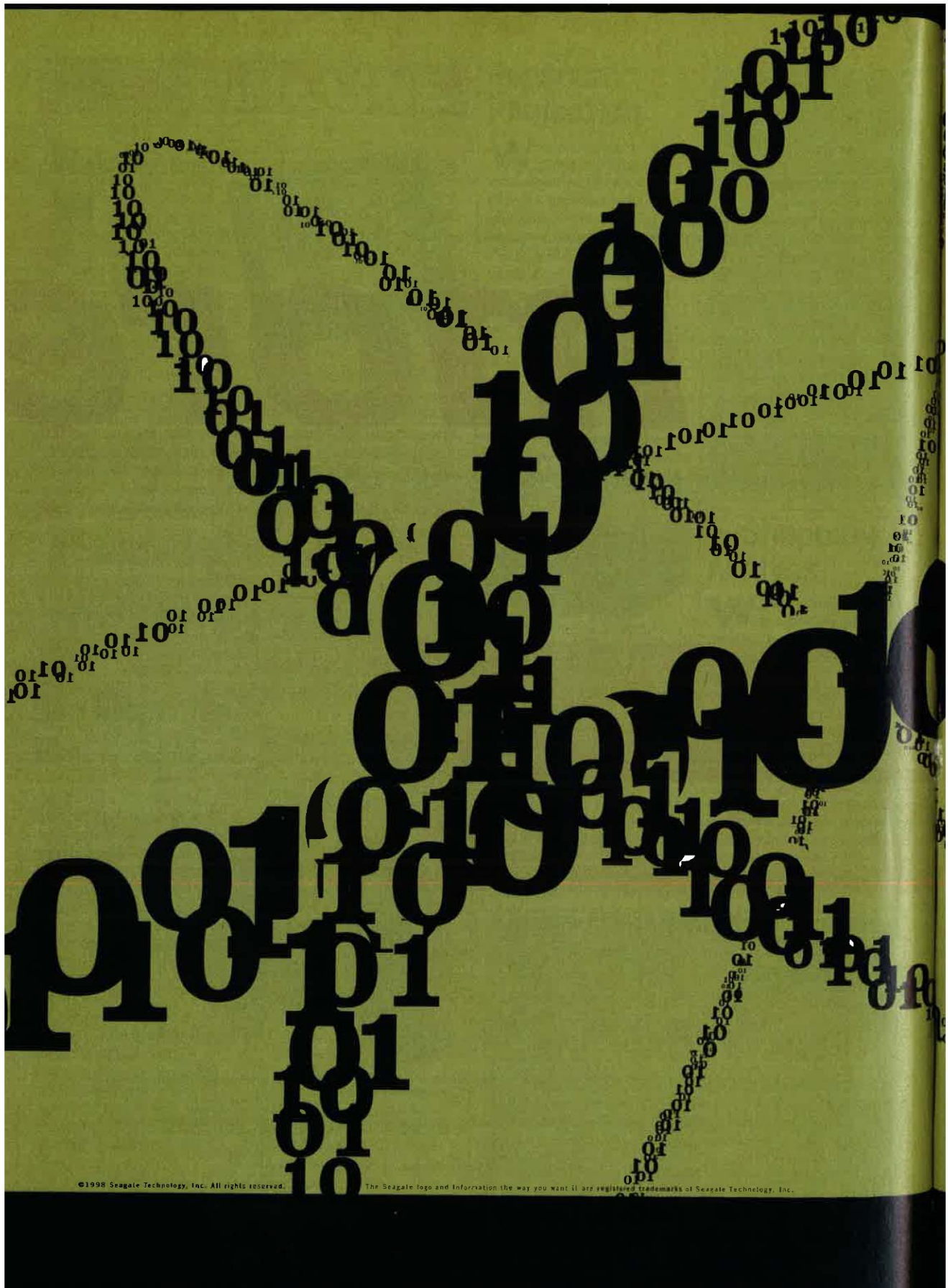
In a recent industry standard OLAP council benchmark, Oracle® Express® ran 250,000 queries against a data density of 5.0 and delivered an average response time of 0.07043 seconds. That's 50 times more data than the previous record.

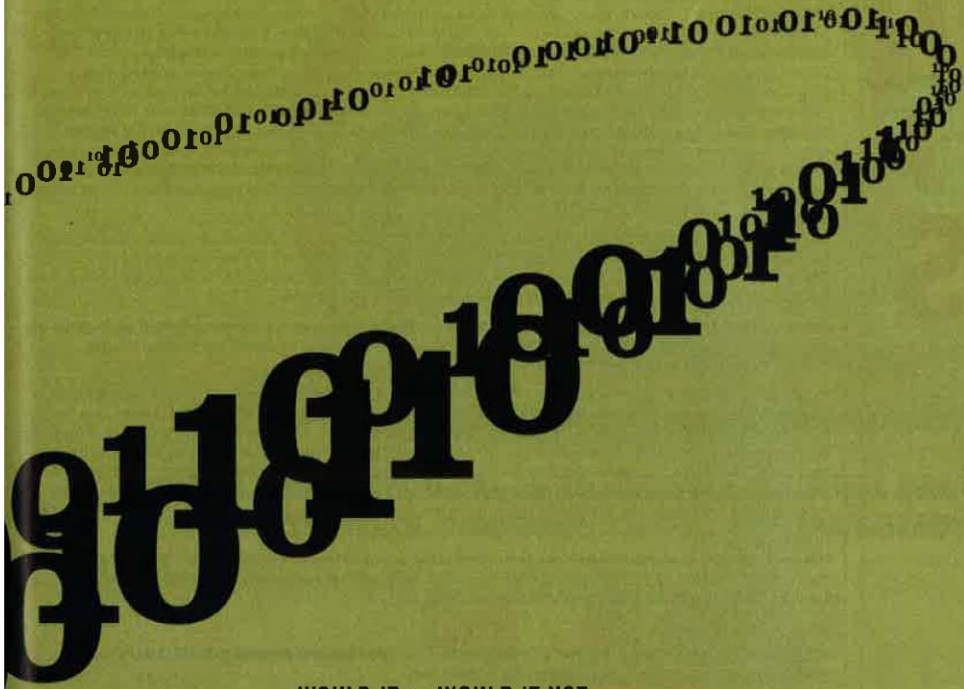
With a data density of 0.1, Oracle Express was 34% faster than the previous record. Oracle Express offers unparalleled scalability against the largest volumes of data. What's more, Oracle Express, combined with Oracle Discoverer® and Oracle Reports, delivers an integrated business intelligence solution, from reporting to ad hoc query and advanced analysis. When you want fast answers to hard questions, Express finds them—no matter how much data you have. Call us at

1-800-633-0510, ext. 18202, or visit us on the Web at www.oracle.com/info/24 today.

ORACLE®

©1998 Oracle Corporation. All rights reserved. Oracle is a registered trademark, and Oracle Express and Oracle Discoverer are trademarks or registered trademarks of Oracle Corporation. All other names may be trademarks of their respective owners.





**WOULD IT or WOULD IT NOT
be nice to have central control of all your data?**

WITH STORAGE NETWORKING, YOU WILL.

In order to take control of data, you need a place to keep it. All of it. Consider the revolutionary new Storage Networking architecture. A new concept for the enterprise. A blindingly fast sub-network dedicated to storage, based on high-speed fibre channel technology. It will make your enterprise information into a flexible, manageable, and continuously accessible resource. It will free your main network from back-up duties that consume valuable bandwidth, and it will speed up the entire network. As Storage Networking becomes a reality, Seagate intelligent storage devices and software will play a central role. And you will be in control.

FYI: www.seagate.com/sn2



Choose 374 at www.pcmag.com/infolink

Get a DOWN LOAD of this.

w
w
w
.
p
c
m
a
g
.
c
o
m

250 FREE DOWNLOADS
(to be precise)



ZD
DAVIS



EDITOR-IN-CHIEF Michael J. Miller

EDITOR Jake Kirchner

SENIOR EXECUTIVE EDITOR Bill Howard

EXECUTIVE EDITORS Leon Erlanger, Peter McKie, Gail Shaffer, Don Willmott

DIRECTOR, PC LABS Steve Buehler

ART DIRECTOR Laura Baer

SENIOR NETWORKING EDITOR Frank J. Derfler, Jr.

SENIOR ONLINE EDITOR John Clyman **SENIOR EDITORS** Carol Venezia (First Looks), Sebastian Ruple (West Coast)
MANAGING EDITOR Paul B. Ross

SENIOR ASSOCIATE EDITORS Jamie M. Bsaies (Hardware), Carol Levin (Trends), Sharon Terdeman (Technical Columns) **ASSOCIATE EDITORS** Eileen Bien (First Looks Networking), David Lidsky (Internet), John Morris (Software), Tom Ponzo (First Looks Online), Jennifer Triverio (After Hours), Anush Yeghazarian (PCs) **ASSISTANT MANAGING EDITOR** Kim Schueler **PRODUCTION EDITOR** Monica Sirignano **COPY CHIEF** Glen Boisseau Becker **STAFF EDITORS** Mary E. Behr, Doug Beizer, Paul Dwyer, Matthew Graven, Nancy E. Hirsch, Josh Levy, Carol A. Mangis, Michael W. Muchmore **SENIOR WRITER** Cade Metz **STAFF WRITER** Angela Hickman **SENIOR COPY EDITORS** Jennifer Golub, Joseph N. Levine **COPY EDITORS** Michael Feist, Jeremy A. Kaplan, Barbara McGeoch, Ann Odvow **ASSISTANT COPY EDITOR** Sarah Pike **PRODUCTION MANAGER** Patricia Perkowski **SENIOR LAYOUT EDITOR** Lillian Gaffney **LAYOUT EDITOR** Michal Dluginski **PRODUCTION SYSTEM SUPPORT ANALYST** Nancy Goodman-Slayback **LIBRARIAN** Nancy Sirapyan **LIBRARY ASSISTANT** Dolores Williams **EDITORIAL RESEARCHERS** Adam Asch, Roderick A. Beltran, Richard Brown, Sharon Nash, Angela Tuka **DIRECTOR, IS TECHNOLOGY** Craig Ellison **NETWORK SUPPORT ANALYST** Melvin Acevedo **COMMUNICATIONS MANAGER** Anita Anthony **ASSISTANT TO THE EDITOR-IN-CHIEF** Christine Curti **ASSISTANT TO THE EDITOR** Rita Arahamian **ADMINISTRATIVE ASSISTANT** Christina Okang **SYSOP, PC MAGNET** Ken Hipple

CONTRIBUTING TECHNICAL EDITOR Neil J. Rubenking **CONTRIBUTING EDITORS** Bill Machrone (Vice President, Technology), Greg Alwang, Douglas Boling, Padraic Boyle, Bruce Brown, Sheryl Canter, John C. Dvorak, Les Freed, Daniel Grotta, Sally Wiener Grotta, David Linthicum, Edward Mendelson, Jan Ozer, Charles Patzold, Stephen W. Plain, Alfred Poor, Jeff Prussie, John R. Quain, Neil Randall, Sal Ricciardi, Steve Rigney, Winn L. Rosch, Jim Seymour, Barry Simon, Luisa Simone, Craig Stinson, M. David Stone

SENIOR ASSOCIATE ART DIRECTOR Lisa Kocarek **ASSOCIATE ART DIRECTORS** Eileen Hanley, Michael Scowden **ASSISTANT ART DIRECTOR** Lora Morgenstern **GRAPHICS DIRECTOR** David Foster **GRAPHIC ARTIST** Mark Tyner **ART PRODUCTION MANAGER** Talor Min **CONTRIBUTING PHOTOGRAPHER** Thom O'Connor **ASSISTANT TO THE ART DIRECTOR** Frieda T. Smallwood

TECHNICAL DIRECTORS Ben Z. Gottesman (Software), Nick Stam (Hardware), Jeffrey G. Witt (Networking and Communications) **DIRECTOR, OPERATIONS** John R. Dalaney **SENIOR PROJECT LEADERS** Richard Fisco (PCs), Jay Munro (Internet, PC Tech) **PROJECT LEADERS** Laura Cox (First Looks), Russ Iwanchuk (Networking and Communications), Diane Jecker (Software), S. Joe Yang (Hardware), Kevin Young (Networking and Communications) **PROGRAMMERS** Richard V. Dragan, Win Swarr **PRODUCT TESTING MANAGER** Charles Rodriguez **TECHNICAL ANALYSTS** Oliver Kaven, Melanio Lopez, Jacqueline Paredes, Mark Valentine, Brad Walden, Martin Wong **SUPPORT TECHNICIANS** David Carela, William Pagan, Miriam Sampson, Sunita Sawh, Jeffrey Spada **INVENTORY CONTROL MANAGER** Tom Kennedy **INVENTORY CONTROL COORDINATORS** Richard P. Bifone, Bryan Hughes **ADMINISTRATIVE ASSISTANTS** Christina M. Evelyn, Leslie Sorich

PC MAGAZINE ONLINE

MANAGING EDITOR Tin Albano **SENIOR EDITOR** Josh Taylor **SENIOR TECHNICAL EDITOR** Thomas W. Giobel **TECHNICAL EDITOR** Webster T. Mudge **PROGRAMMER** Brian D. Buck **ASSOCIATE EDITOR** Edward Grossman **DESIGNER** Marcie Gandell **STAFF EDITORS** Jennifer L. Anderson, Troy Dreier, Richard Egan **PRODUCTION EDITOR** Matthew Slaybaugh

PUBLISHING DIRECTOR Nancy Newman

NATIONAL SALES DIRECTOR Vickie Pinsky **GROUP BUSINESS DIRECTOR** Bret Violette **ASSOCIATE BUSINESS MANAGER** Christine Holsten **RESEARCH DIRECTOR** Gordon Plutsky **MARKETING MANAGER** Dawn Gudelis

SENIOR ADVERTISING PRODUCTION MANAGER Ivis Funchichely **ADVERTISING PRODUCTION COORDINATORS** Milena Kotrch, Simone Oliver-Weeks **EDITORIAL PRODUCTION MANAGER** Pamela J. Berkowitz **MULTIMEDIA PRODUCTION MANAGER** Louise Laberge

ADVERTISING OFFICE: One Park Ave., New York, NY 10016-5802; 800 33 MAG AD, 212-503-5100

THE INDEPENDENT GUIDE

PC Magazine is the Independent Guide to Personal Computing. Our mission is to test and review products and report fairly and objectively on the results. Our editors do not invest in firms whose products we review, nor do we accept travel tickets or other gifts of value from such firms. Except where noted, *PC Magazine* reviews are of currently available products. We review products without regard to advertising or business relationships with any vendor. Softbank, the majority holder of ZD Inc., has made a number of strategic investments in high-technology companies. A list of those companies is available online at www.pcmag.com/faq, and we will alert our readers to such investments whenever pertinent.

HOW TO CONTACT THE EDITORS

We welcome comments from readers. Send them to internet address pcmag@zd.com or to *PC Magazine*, One Park Ave., New York, NY 10016-5802. Please include a daytime telephone number. *PC Magazine's* general number is 212-503-5255. The West Coast Operations number is 650-513-8000. We cannot look up stories from past issues, recommend products, or diagnose problems with your PC by phone. For an index of past issues and a list of upcoming stories, browse www.pcmag.com.

If you are dissatisfied with a product advertised in *PC Magazine* and cannot resolve the problem with the vendor, write (do not call) Ellen Askin, Advertising Department, at the above address. Please include copies of your correspondence with the vendor.

SUBSCRIPTION SERVICES

Internet: <http://subscribe.pcmag.com/service>.
U.S. and Canada: telephone, 303-665-8930; fax, 303-604-7455.
Elsewhere: telephone, 303-604-7445; fax, 303-604-0540.
Mail: *PC Magazine*, P.O. Box 54093, Boulder, CO 80322-4093.

Subscription rates. The one-year rate (22 issues) is \$49.97 in the U.S., \$85.97 elsewhere. Make checks payable to *PC Magazine*; U.S. currency only.

Back issues are \$9 each in the U.S., \$10 elsewhere (subject to availability). Prepayment is required. Make checks payable to *PC Magazine*; U.S. currency only. Mail your requests to Back Issues, ZD Inc., P.O. Box 53131, Boulder, CO 80322-3131.

Mailing lists. We sometimes make lists of our customers available to mailers of goods and services that may interest you. If you do not wish to receive their mailings, please write to us. Include your mailing label with any correspondence; it contains information about your subscription that will facilitate processing. Please allow 6 to 8 weeks for your first issue to arrive or for any changes in your subscription to take place.

Additional information on advertised products can be requested online at www.pcmag.com/infoink.

PC MAGAZINE EXTRA

PC Magazine Extra, the interactive CD-ROM companion to *PC Magazine*, is available quarterly. To order (\$49.95 per year in the U.S., \$72 in Canada, \$99 elsewhere), please call 303-665-8930 in the U.S. or 303-604-7445 elsewhere. Or write to *PC Magazine Extra*, P.O. Box 54943, Boulder, CO 80322-9494.

PC MAGAZINE ONLINE

PC Magazine is on the World Wide Web (www.pcmag.com) and The Microsoft Network (Go To pcmagazine). We operate *PC MagNet*, an on-line service of ZDNet, hosted by CompuServe. (For details, see the Utilities column.) *PC Magazine* subscribers receive free access to our online archives.

PERMISSIONS, REPRINTS

Material in this publication may not be reproduced in any form without permission. If you want to quote from an article or use *PC Magazine's* logo in conjunction with an Editors' Choice designation, write Chantal Tucker or fax her at 212-503-5475; for information on reprints, please contact ZD Reprints at 800-825-4237.

The following are registered trademarks of ZD Inc.: DOSMark, NetBench, PC, PC DIRECT, PC Labs, PC MAGAZINE, PC MAGAZINE AWARD FOR TECHNICAL EXCELLENCE, PC MagNet, ServerBench, WinBench, Winstone, and ZD.

The following are trademarks of ZD Inc.: Abort, Retry, Fail?, After Hours, BusinessCard, Corporate Developer, CPUmark, EasyComputing, Extending Your Apps, Features Plus, First Looks, First Looks Plus, Lab Notes, New & Improved, OFF THE STACK, PC Bench, PC Magazine At Home, PC Magazine CD, PC MAGAZINE EDITORS' CHOICE, PC Magazine Extra, PC Magazine Marketplace, PC Solutions, PC Tech, Pipeline, Power Programming, Quick Clips, Read Only, ScreenDemos, Tech Notes, Tutor, User-to-User, WinDrain, ZDgit, ZDNet, and ZiffNet.

Other trademarks and trade names used throughout the publication are the property of their respective owners.

Copyright (c) 1998 ZD Inc. All rights reserved. Reproduction in whole or in part without permission is prohibited.

Scarier than Spam

The entire antitrust case against Microsoft was bolstered by e-mail records, many of which were simply the outgrowth of sloppy business practices and the mess that the overreliance on e-mail has created. It's going to get worse, and I see no way out of it. And I'm not talking about the Microsoft case; I'm talking about e-mail users and what they have to face daily.

There is some irony here, because I myself have been promoting the use of e-mail as the primary form of intercompany and interpersonal nonverbal communication since I first got involved with computers. Even back in the 1970s, it was apparent that e-mail was more efficient than anything else. E-mail would have been a worldwide standard earlier had not the cheap fax machine come along to dominate the 1980s and put e-mail on the back burner.

Many of us, during the dark ages of e-mail, were plugged into CompuServe Mail, or even better, MCI Mail. Internet mail was more difficult and less universally accepted, and it appeared as if proprietary systems would rule. MCI fostered AT&T Mail and other systems, which all languished. MCI Mail itself was never improved, and before you knew it AOL came up with its "You've got mail" message and dominated the scene, followed by what we have today, which is mostly Internet mail.

Then only a few people were using e-mail, and it was manageable. Now that everyone does, it's become a disaster. This is worsened by mediocre e-mail organizational tools and a lack of verification for standard Internet mail. Combine these problems with the ubiquitous HTML "mailto:" command and the "reply to all" command and what we have is nothing less than a monster no tool can easily fix. Let's examine just a few of the e-mail problems.

- *E-mail is too easy to send.* This is the primary problem. It's simply far too easy to send e-mail, whether you need to or not. The natural barriers that force an individual to make a compose-and-send decision (printing, cost of postage, and so on) have been removed. To make things worse, it's too easy to develop mailing lists that let people broadcast e-mail as if it were bulk mail. Sloppy practices don't help, either. For example, I get numerous e-mails that don't concern me from various Ziff-Davis departments sent to broadcast lists.

- *It's too easy to reply to e-mail.* On top of the ease with which mail can be sent, it's even easier to reply

to. And the reply often has the old message embedded for reference. You also have the "reply to all" function, which turns each recipient into a broadcaster and any e-mail into nothing less than a chain letter growing in distribution with each iteration.

- *Fear of nonreceipt.* I've always considered this the biggest headache with general Internet mail. I'm not the only one, since I'm often subjected to the solution to this problem: multiple sends. I know that some people have multiple e-mail boxes, usually to help them sort through mail by levels of importance. Because I can't be sure that mail is received, no matter how many safety nets are in place to notify me of problems, I'll send multiple copies.

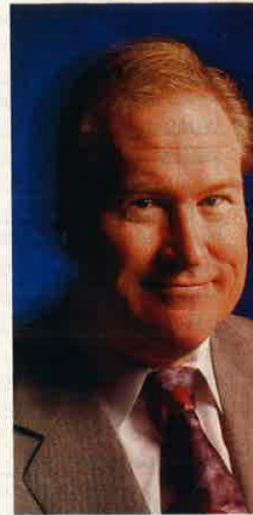
- *Mail storms.* Often when a mail thread begins, people will feel the obligation to chime in for no good reason except to make their presence felt. Adding "Amen," "I agree with this idea," or other such blather and rebroadcasting the message does nobody any good. And getting into an e-mail argument that is broadcast company-wide quickly becomes a nightmare. I can't imagine what productivity losses occur when a simple argument develops into a mail storm.

- *Attachments.* The ease with which someone can attach a program to an e-mail message causes bandwidth and server problems as well as lengthy downloads. Then there are support issues, such as the Mac user who wants to run the Windows program. The program, of course, is some silly animation someone collected off the Web and sent around as today's humor.

- *Organization.* This is the subject of another column. But suffice it to say, we have poor tools to sort and organize (or even find) the mail we collect.

- *The pack-rat phenomenon.* This brings us back to Gates and company and all the mail they collected for no good reason.

Needless to say, there are a lot of problems developing with e-mail, and they're continuing to grow. I didn't even have to mention spam mail to swamp you with problems. And I see no easy cure for this situation except discipline. It will sink us if we don't try to do something. Starting with strict policies would help.



Combine all the other e-mail problems with the "mailto:" and "reply to all" commands and what we have is a monster.

More on the Web:

Read John C. Dvorak's news, views, and snide asides every Monday, exclusively at PC Magazine Online.

www.pcmag.com/dvorak