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MAGAZINE

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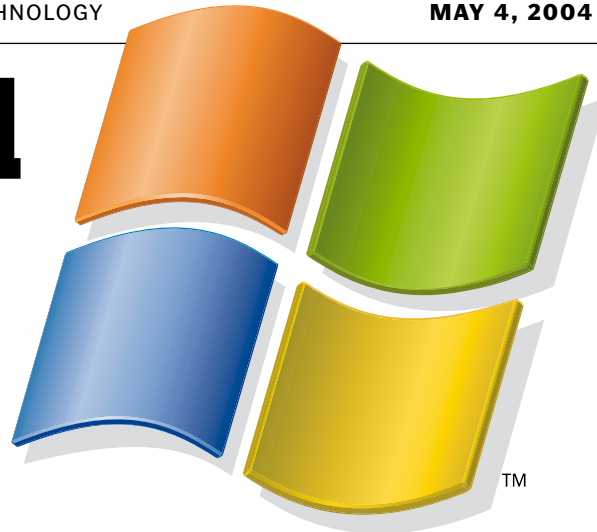
DIGITAL MUSIC PLAYERS

Carrying a Tune Is
More Fun than Ever

THE INDEPENDENT GUIDE TO TECHNOLOGY

MAY 4, 2004

174 Essential Tips, Tricks, & Fixes for



Windows & Microsoft Office



PLUS

**ENTRY-LEVEL
DV CAMCORDERS:
CANON vs. SONY**

**IOMEGA QUIKTOUCH VIDEO
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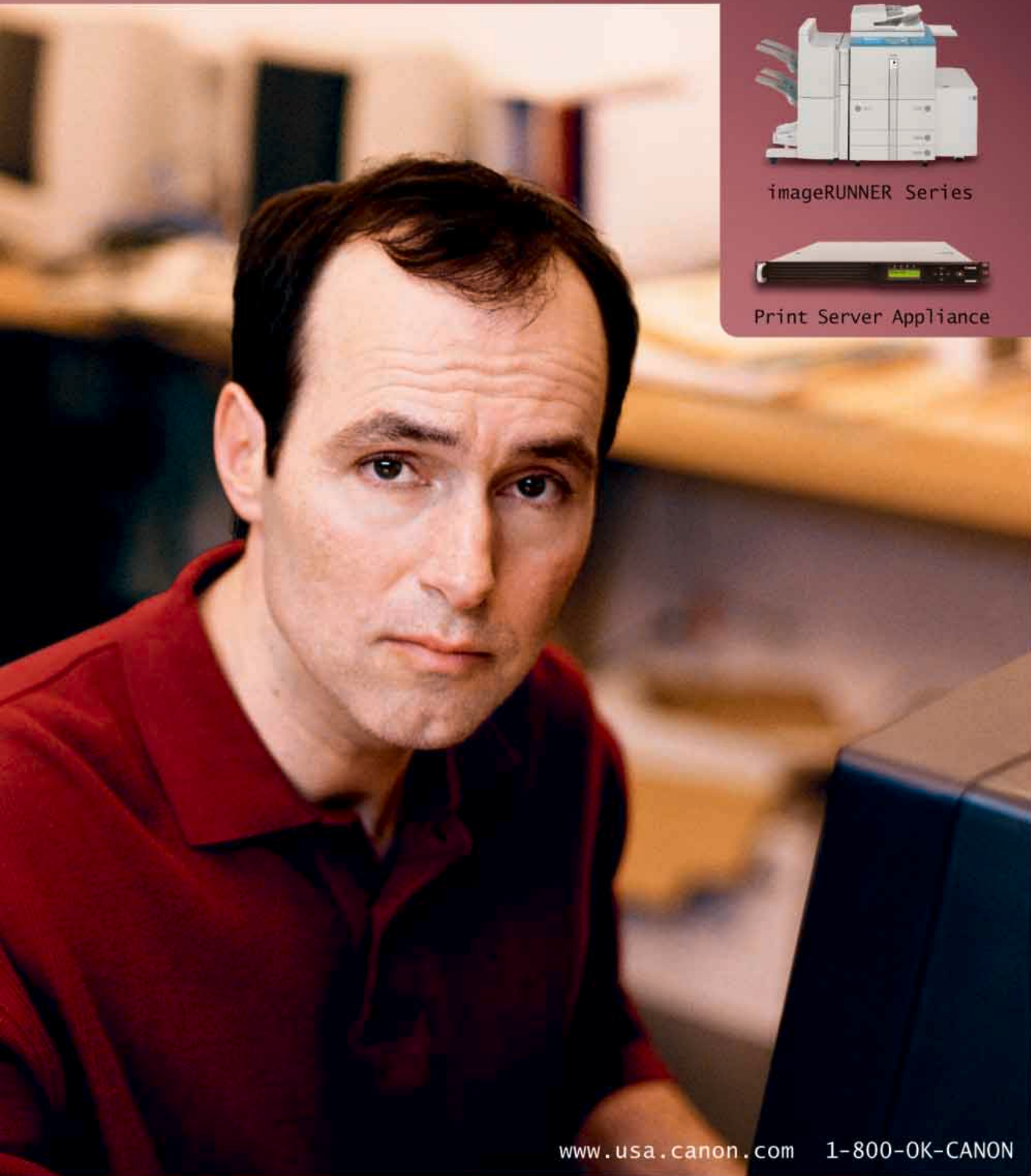


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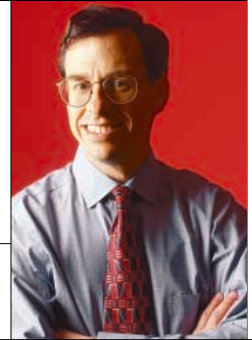


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*Among digital cameras with a built-in 10X or greater optical zoom as of July 1, 2003.



Forward Thinking

Our Upgrade for 2004

We're always looking for ways to make *PC Magazine* better, and with this issue you'll notice some of the latest improvements. In our new Editors' Choice section on page 29 we offer a quick summary of our favorite products in many categories, updated every issue. And starting with this issue, we've changed our product-rating system to allow for "half stars." This will enable us to make finer distinctions among the many products we test. You'll also notice that the magazine has undergone a facelift, thanks to the design work of art director Richard Demler and his talented staff.



Important changes are also going on behind the scenes at the magazine. We recently increased our

edit and labs staff so that we can test even more products, especially in areas where consumer electronics meet personal computers. At PC Magazine Labs in New York, we just finished building a digital-imaging lab to test digital cameras and camcorders. We've also upgraded our wireless-testing equipment and enlarged our network test-bed with 120 new nodes. And in our West Coast facility, we'll now be able to test big-screen television in our new consumer display-testing lab.

As computer and consumer electronics products evolve, we're committed to evolving *PC Magazine* along with them. Please let us know what you think.

Microsoft Windows is in for some big changes in Europe, since the EU recently ruled that the company has violated European competition laws.

Windows on the Edge

Microsoft Windows is in for some big changes in Europe, since last-minute talks between Microsoft CEO Steve Ballmer and European Union competition commissioner Mario Monti broke down in March, leaving Microsoft bracing for a legal fight. The EU then ruled that Microsoft violated European competition laws. It ordered Microsoft to pay a \$613 million fine, to produce a version of Windows that does not include Windows Media Player, and to make more details of its client operating system available to competing vendors of server operating systems. Microsoft, of course, is appealing.

Sound familiar? In fact, the arguments are very similar to those used in the U.S. antitrust case, in which Microsoft was found guilty of anticompetitive actions against Netscape in its bundling and promotion of Internet Explorer. In the EU case, though, the subject isn't Microsoft's Web browser but its media player, which competes with RealNetworks' RealPlayer and Apple's QuickTime. The case could take years to resolve, as has the U.S. antitrust case, which is still winding down.

In the near term, though, Microsoft may be forced to offer versions of Windows with and without Media Player. More important is the EU's concern

about forward-looking software—meaning software that Microsoft could bundle into future versions of Windows. It was on this very issue that the two sides couldn't agree.

New versions of any OS usually include features that some software developer was already offering. For example, Microsoft is improving the firewall in Windows Service Pack 2; it has added personal video-recording features to Media Center Edition; and it is said to be considering antivirus features and content indexing for the next major release of Windows, code-named Longhorn.



WINDOWS MEDIA PLAYER

The conclusion of the U.S. case doesn't seem to offer clear guidelines as to what Microsoft can and can't add to Windows. While I understand the need to police antitrust violations, I'm concerned that too many restrictions may result in less innovation for everyone.

Forward Thinking

MICHAEL J. MILLER

XP Reloaded

While Microsoft's legal worries drag on, it looks as if the Longhorn release of Windows will be pushed off even farther. According to rumors from Redmond, this is partly because people have been pulled off Longhorn to work on security fixes for Windows XP Service Pack 2, which is due in a few months. In view of the latest EU action, Microsoft could push the release back even more. The result may be an interim release of Windows, which some are calling XP Reloaded.

I can understand that Microsoft wants to get new

technology out faster than its current plan of releasing a major new OS every few years. I just hope that the result is comparable to Windows 98, which was an improvement on Windows 95 that didn't change the underlying code—as opposed to the equivalent of Windows Me, which looked good but wasn't stable. Despite having too many security holes and their associated patches, Win XP has proved to be a stable OS, and stability should continue to be a top priority.

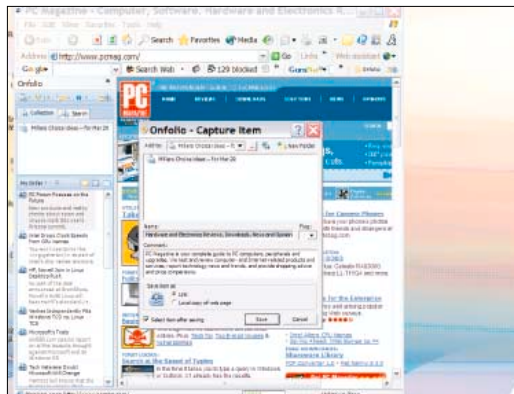
Better Ways to Search

It's amazing how something as simple as search has become one of the hottest technologies in the computer industry. Google continues to be the leader, and the company continues to come up with innovations such as a new "local" search feature for finding information related to your local area. Meanwhile, Yahoo! has a new search engine that claims to do a better job of giving you more relevant information. And MSN is about to enter with a new search engine of its own. Each has its own toolbar for accessing its search tool more easily. The intense competition can only push the technology forward.

I'm also impressed with some of the add-ons that make these search tools more useful. p-ZOOM, a neat little utility that runs inside Internet Explorer, orga-

nizes your search engine's results into categories. It often helps me narrow down a search quickly.

Grokker is a clever way of organizing search data visually. It creates concentric circles, breaking out search results into different areas to help you see re-



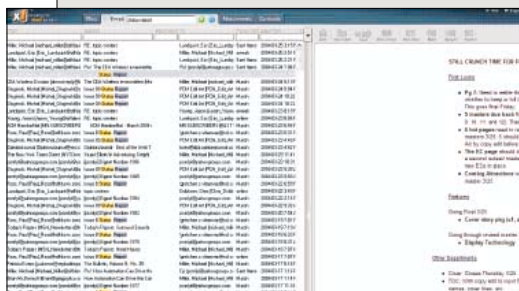
ONFOLIO helps you collect and organize search results.

lated topics. The new version also searches Google.

Another new utility is Onfolio, which helps you collect and analyze the information you find online. As you search, you can easily clip information and store it as part of a collection. The Onfolio Publisher module helps you create a report based on that information. It's a highly useful tool.

Often, people just need to know a simple fact. For that, the best tool I've seen is GuruNet, and it, too, has a new version. GuruNet is a subscription service that gives you answers or related information from a variety of reference services. If you have the new version, you can search online at www.gurunet.com, run it as a toolbar, or load a local client that lets you Alt-Click on any word to pull up the search results.

MY FAVORITE NEW UTILITY



My favorite new utility is X1, which indexes my e-mail, contacts, and files, then lets me search through them in a flash. This sounds easy but is actually quite difficult. I've tried similar products over the years, but they either require too much overhead or aren't stable. The folks behind X1 are from IdeaLab; many years

ago, they worked on a DOS search tool I loved called Magellan. Since then, the issues have gotten more complex: I get loads more e-mail now than I did then, files change more quickly, and everything needs to run in the background.

Version 3 of X1 is stable enough to recommend. I use it to search through e-mail. I just type a word or two I think is in the message, and X1 returns the messages that include it. I can also search by a particular sender or date. The results are instantaneous. X1 works with Outlook, Outlook Express, Netscape, and Eudora mail. It does not have every feature you could possibly want—one of our editors desperately wants phrase searching—but I find X1 incredibly useful.

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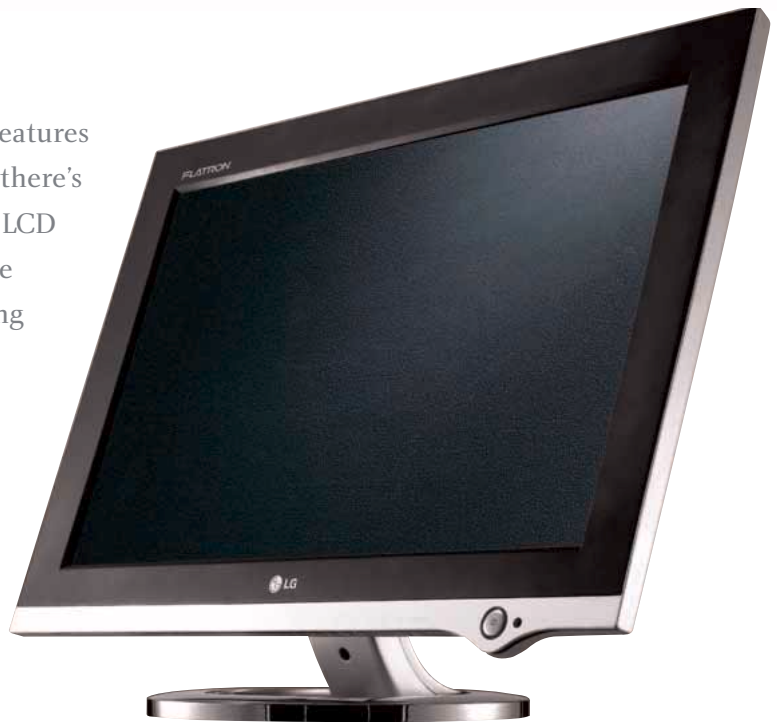
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29 Editors' Choices

A comprehensive list of our current picks in nearly 100 categories.

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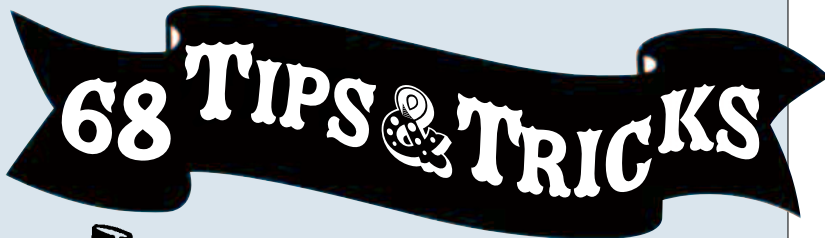
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COVER STORY

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WINDOWS



Show Windows who's boss, with dozens of PC Magazine's latest tips and tricks for making your computing experience faster, safer, more flexible, and all-around better suited to you.

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MICROSOFT OFFICE



Be the master of your Microsoft Office. We have more than a hundred tips and tricks that will make Microsoft Word, Excel, Outlook, and PowerPoint more productive, more powerful, and easier to use.

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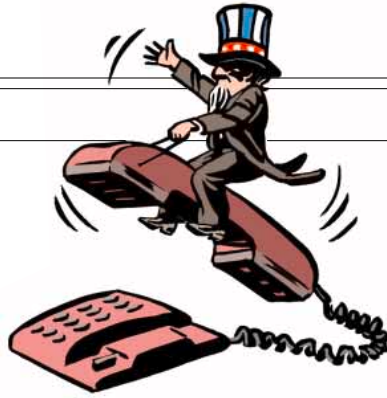
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PORTABLE MUSIC PLAYERS

104 Play as You Go

The world of digital music players gets more colorful, entertaining, and inexpensive each time we peer in. In this roundup, we study 13 popular devices, with an ear toward audio fidelity and an eye toward style.



DISPLAY TECHNOLOGY

115 What's New with Displays

Advances in display technologies make bulky CRTs seem like dinosaurs. This illustrated guide explains state-of-the-art display technology and takes a peek at what's ahead. Learn how flat panels are getting faster, how OLED panels are bringing new meaning to the term *thin*, and more.



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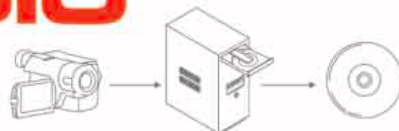
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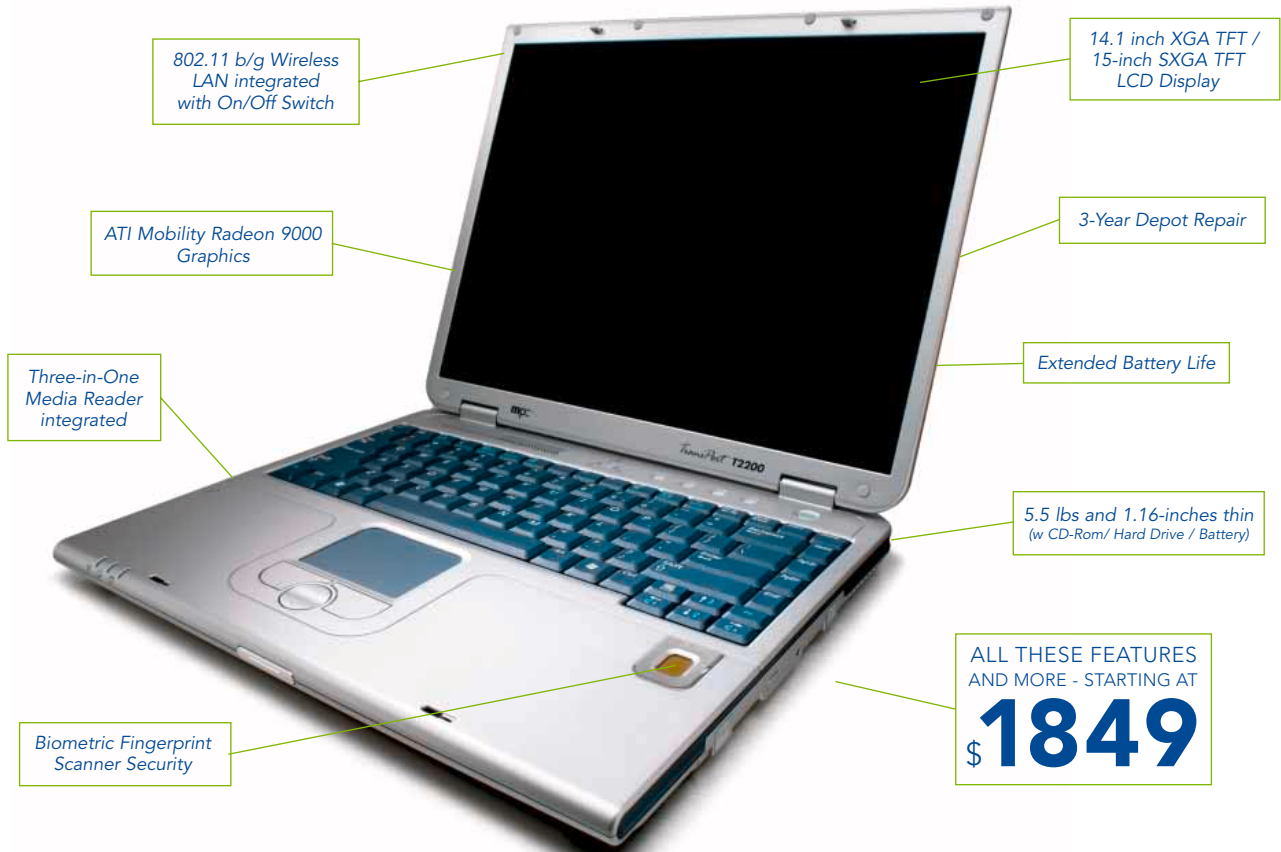


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FBI Seeks Net Wiretapping Rights

Will new broadband technologies require FBI approval?

FOR BROADBAND USERS and providers, it's time to watch the watchers. The FBI, backed by the Department of Justice and the Drug Enforcement Administration, submitted an 85-page proposal to the FCC in March that would require broadband service providers to introduce architecture in their networks for enabling law enforcement to eavesdrop. Experts say the proposal, if approved, could dramatically hinder emerging and existing technologies.

"This filing says that the FBI should be able to approve new technologies so that it can get what it wants when it tries to intercept things, which is astounding," says Lara Flint, staff counsel at the Center for Democracy and Technology. "Implementing such prior-approval authority would have a serious effect on innovation in the United States."

The proposal calls for giving police easy access to all forms of switched Internet communications, including communications via Voice over IP, instant messaging, cable modem, and DSL. Its language implies that back doors should be inte-

grated into both existing and new systems.

1994's Communications Assistance for Law Enforcement Act (CALEA) established the current rules on wiretapping for telecommunications providers. The FBI proposal seeks to extend these rules to broadband providers. And though, in many cases, CALEA requires police to seek court approval prior to wiretapping, the Bush Administration's Patriot Act circumvents many of those restrictions. "The problem is that the FBI shouldn't be designing technology systems," says Flint. "They shouldn't be going into the core of the Internet and rearchitecting things."

Back in 1994, narrowband technology ruled, argues the proposal (available at www.cdt.org). "The movement toward packet-based networks... has already progressed far enough to have a serious impact on law enforcement's ability to perform authorized electronic surveillance," it says.

The FCC is fielding comments in April. *PC Magazine* will provide follow-up coverage at www.pcmag.com.—*Sebastian Rupley*



Talking Tech

Meet the new darling of the Defense Department: the VoxTec Phraselator P2. At the DARPA Tech conference in March, Defense technologists showered praise on the \$2,800 handheld device for enabling soldiers in Afghanistan and Iraq to beat language barriers.

The gadget uses SD memory cards to store up to 30,000 typical phrases in languages ranging from Arabic to Urdu. A soldier can say, "Are you carrying a weapon?" and the Phraselator translates the phrase and reads it aloud—very accurately, say the researchers.

"We're working on a commercial, less expensive version for travelers and businesses, and a two-way translation version," says VoxTec director Shannon Dooman. Understood?—*SR*

CONFUSED YET? Marking the end of an era, Intel has decided to remove references to speed (megahertz or gigahertz) from its chip-naming strategy. Intel processor brands will have series numbers instead: For instance, the 300 series will be Celeron chips.

DVD Recording Renaissance

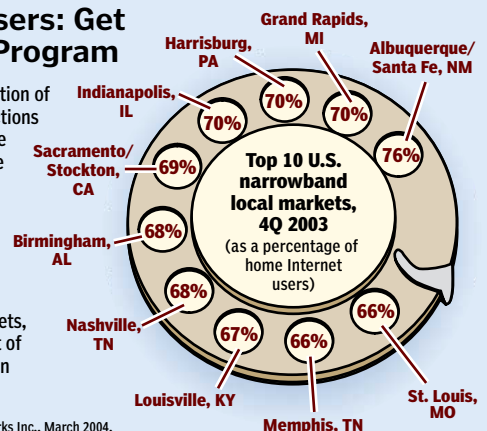


SONY IS PLANNING to double DVD storage capacity when it releases two DVD+R double-layer (DL) recording drives—one internal (\$230 street) and one external (\$330). They are scheduled to appear by the end of June.

New DVD+R DL discs will store up to 8.5GB of data—enough for 4 hours of MPEG-2 video or 2,000 songs. "We expect disc availability to be limited for the first four months following drive introduction, though," Verbatim warns. And the fact that two feature-length movies will fit on one disc could draw the interest of pirates and the ire of entertainment companies.—*SR*

Dial-Up Users: Get With the Program

Although the adoption of broadband connections has been going like gangbusters, there are still regions in the U.S. where the vast majority of home Net users have dial-up connections. In several local markets, at least 70 percent of Netizens depend on dial-up services.



Source: comScore Networks Inc., March 2004.

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Just compare the cost of digital cable & satellite with HDTV to USDTV!

	USDTV	Comcast Digital	d'sh	DISNEY
Monthly Cost	\$19.95 includes all local HDTV channels	\$40.00 for digital cable, with local channels, no HDTV	\$30.00 for basic package, with local channels, no HDTV	\$38.00 for basic package with local channels, no HDTV
HDTV Equipment Cost	\$100.00	\$9.00 per month	\$300	\$300

Is there a market for Cable TV Lite? U.S. Digital Television (USDTV) is betting there is. The company has a new subscription service that delivers popular cable channels via local television antennas—no cable service or satellites required.

For a fee of \$19.95 per month—half the average monthly U.S. cable bill, based on FCC figures—the service offers 11 cable channels (the Discovery Channel, the Disney Channel, ESPN, ESPN2, the Food Network, Fox News, Home & Garden Television, The Learning Channel, Lifetime, Lifetime Movie Network, and Toon Disney), as well as local and national broadcast channels. In some markets HDTV channels will be included. Many of USDTV's partner broadcasters have installed digital transmission facilities at the FCC's request.

USDTV is based in Salt Lake City—which, along with Albuquerque, is one of the first markets. The company is aiming for 30 cities this year. To use the service, a subscriber must have a proprietary USDTV set-top box and a roof- or attic-mounted antenna. Wal-Mart stores will sell a set-top box for \$100 and an antenna for \$30, says Steven Lindsley, USDTV's CEO.—*Cade Metz*

Robo Power Walking

FORGET FISHNETS AND CARGO PANTS. Fashion's next big thing in legware could be bionic. In March, members of UC Berkeley's engineering department showcased the Berkeley Lower Extremity Exoskeleton (BLEEX), one of the first advanced exoskeletons to provide muscular assistance to humans for otherwise arduous tasks.

BLEEX, which consists of metal leg braces, a power unit, and a large frame resembling a backpack, attaches to modified Army boots worn by the human pilot. Fueled by gasoline, BLEEX is controlled by a computer (currently a PCI04 platform) that measures information provided by dozens of sensors gauging pressure, speed, torque, and the like. While communicating with the sensors over what the Berkeley team calls a "body LAN," the computer determines how to move the exoskeleton without impeding the pilot.

Currently, a BLEEX wearer can carry 90 pounds up stairs or slopes—as well as squat, twist, and walk—with the load-sharing exoskeleton supporting all but 5 pounds. Within two years BLEEX should be available for soldiers and firefighters. Eventually, it could help disabled people walk.

By summer 2005, project lead Homayoon Kazerooni is committed to finishing a quieter, more robust machine that can be used by civilians—like the one who e-mailed him asking to use it for a North Pole expedition. "Most mobile robotic systems are made for a laboratory environment, but this design works in rain and harsh environments, using the same building blocks as cars," Kazerooni says. "It's the foundation for another mobile platform."—*Alexandra Robbins*



MY MOBLOG

Want to blog your every waking minute? Nokia has introduced Lifeblog: multimedia diary software you store on a mobile phone to organize photos, videos, and text messages. Connect the phone to a PC via USB to transfer items into Lifeblog software on a PC.

"Imaging phones have become like life recorders," says Nokia director Christian Lindholm.

• More information on "moblogging"—plus demonstrations of mobile diaries—is at www.nokia.com/lifeblog. AtomicLava, Mfop2, and Text-america also offer personal blogging tools for phones.

Wireless USB: The Next Video Data Channel?

Universal Serial Bus (USB) technology is the connectivity option du jour, and Intel is moving ahead with a wireless version. Following the formation of a consortium to develop wireless USB (WUSB), the company is providing more details about products.

Wireless USB is designed to deliver data rates comparable to USB 2.0's for such tasks as wirelessly trafficking multiple video and media streams between consumer electronics devices, PCs, and peripherals. It's been characterized as a direct competitor of the Bluetooth wireless standard, but there are big performance differ-

ences, according to Intel technology strategist Jeff Ravencraft.

Ravencraft says the expected data rate of Wireless USB is 480 megabits per second at a range of 2 meters and 110 Mbps at 10 meters, com-

pared with about 12 Mbps for Bluetooth. Wireless USB will be based on ultrawideband (UWB) radio technology coming from the MultiBand OFDM Alliance (MBOA) and WiMedia Alliance, but the Institute of Electrical and Electronics Engineers (IEEE) is working on a different version of ultrawideband.

The WUSB 1.0 specification will be released by the end of this year, says Ravencraft. "You'll see silicon arriving in mid-

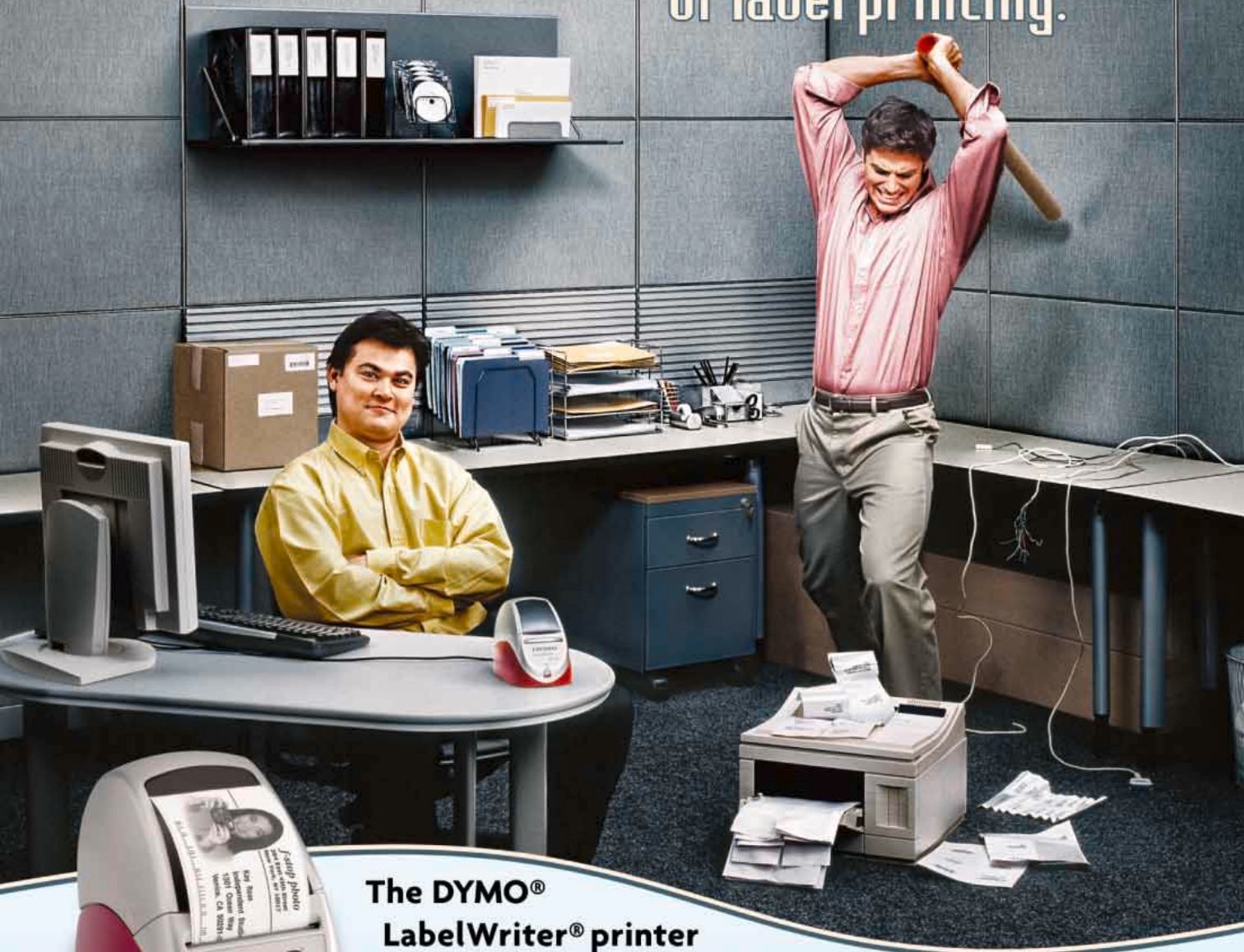
2005 and dongle-type products at the end of 2005. The consumer electronics companies are clamoring for high-data-rate wireless connectivity." What remains to be seen is where competing wireless technologies will stand by the end of next year.—*SR*



MOOD RING TV Philips is preparing new TV sets featuring patent-pending Ambilight technology, which will cause colored lights on the perimeter of a TV screen to backlight scenes dynamically; for instance, ambient blue enhancement could be used for an ocean scene.

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STAPLES

COMING ATTRACTIONS



Process Credit Cards with a Cell Phone

Mobile sales pros, small businesses, and flea marketeers, take note: You can now use a cell phone to take credit card payments anywhere you have access to Nextel's wireless network. The **Creditel PowerSwipe** is a phone-based credit card machine that frees you from needing a landline to process transactions. Simply swipe a card through the ruggedized

Motorola phone/reader combo, and the purchase processes within 8 seconds. The PowerSwipe is able to print, fax, or e-mail receipts instantly, directly from the handset. Creditel claims its security technology makes the system more secure than an ATM machine.—*Jamie M. Bsales*
\$249 direct, plus \$8 to \$12 per month for service and 15 cents per transaction. Creditel, www.creditelcorp.com.

Better Affordable Projector

The sub-\$1,000 projector market is hot, and Epson is improving upon its entry in that space with the **Epson PowerLite S1+ Multimedia Projector**. The Super VGA model delivers a rated 1,400 ANSI lumens (others in this class hover near 1,000 lumens) and an impressive 500:1 contrast ratio.

The 7-pound S1+ uses three Epson LCD panels to project a wide variety of computer and video images, from PowerPoint slides to DVD movies.

—*JMB*

\$999 list. Epson America Inc., www.epson.com.



SOHO Security Appliance

Adding to its line of integrated firewall/security appliances, Symantec will roll out its **Gateway Security 300 Series**. The family of devices will deliver firewall, intrusion prevention and detection, antivirus policy enforcement, content filtering, and virtual private network (VPN) functionality in a single, easy-to-use appliance designed for small offices or branch locations. Not enough, you say? They'll even function as a secure wireless LAN access point.—*JMB*
\$400 street and up. Symantec Corp., www.symantec.com.



Brother MFP Means Business

The **Brother MFC-8220** is a multi-function printer based on a 21-ppm monochrome laser engine. Designed for small businesses, it features quick printing, walk-up copying, monochrome and color scanning, and full-function walk-up and PC fax capabilities—all in a compact package.—*JMB*
\$349.99 list. Brother Industries Ltd., www.brother.com.

DVD Meets SATA

With the **Plextor PX-712SA**, system integrators can move the DVD burner off the EIDE bus and connect to the faster Serial ATA interface found in high-performance PCs. This enables the drive to deliver DVD+R recording at up to 12X speed, and DVD-R at 8X.—*JMB*
\$229 list. Plector Corp., www.plector.com.



Track Web Searches

Doing a research project? **Onfolio** simplifies the collection, annotation, and sharing of information found on the Web (or in your own PC) by intelligently managing the raw information you stumble across and organizing it for future use.—*JMB*
\$30 direct. Onfolio Inc., www.onfolio.com.



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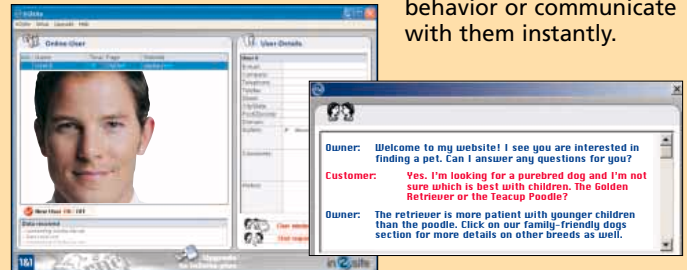
First Name	Last Name	Address	Email
Alan	Bishop	634 E. 39th Street, New York, NY 10019	alanb@myhost.com
Stephen	Bradshaw	1954 Gordin Street, Hudson, OH 44236	bradshaws@myhost.com
Catherine	Leonard	64 Stanhope Drive, Pittsburgh, PA 15237	family@myname.com
Carl	Brown	653 Liberty Avenue, Wilmington, NC 28403	brown2521@lycos.com
Tom	Stowe	26 N. Hills Road, Chandler, AZ 85226	webunited@gmx.net
Helen	McSweeney	817 Providence Hwy, Boston, MA 02116	helenmcsweeney@hotmail.com

GLORIA VAUGHN www.ggphotography.com

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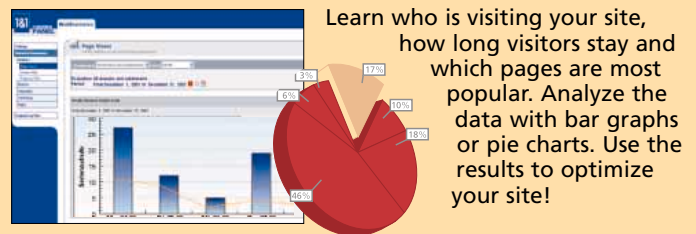
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Keep your visitors up-to-date with e-mail newsletters. Templates let you create professional looking e-mails quickly and easily with no programming!

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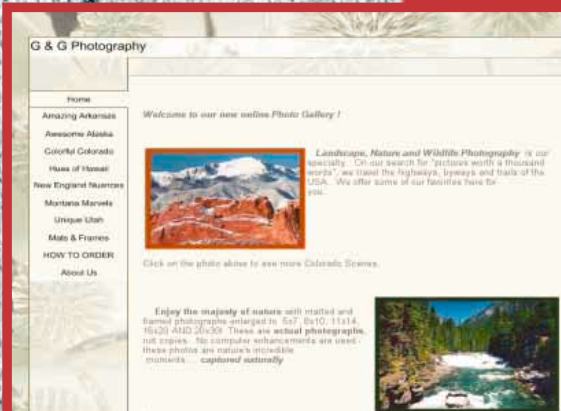


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- WISE.FTP 3.0 (\$40 VALUE)

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DOMAIN NAMES

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- Point 50 external domains to 1&1
- 5 sub domains

WEBSITE/CONNECTIVITY

- 500 MB of Web space
- 1 FTP account, unlimited access
- 5,000 MB/Month bandwidth
- Protected by up-to-date firewall
- Daily backups

APPLICATIONS

- WebsiteCreator for 12 pages
- Full version software worth \$550
- 1&1 Control Panel

E-MAIL

- 50 POP3 e-mail accounts
- Aliases, auto-responders, forwarding
- 1&1 WebMail
- Virus scanner for 1 POP3 account

WEBSITE FEATURES

- Logfiles
- CGI library (counter, guestbook, etc...)
- FrontPage 2002 extensions
- Password protection

CRM/E-COMMERCE

- 1&1 WebStatistics
- chat channel
- Customizable forums

EXPRESS SUPPORT

- 24/7 support by phone and e-mail

BUSINESS PACKAGE

\$9⁹⁹ PER MONTH

INCLUDES 3 DOMAINS

DOMAIN NAMES

- Includes 3 domains at no additional cost
- Handling of unlimited domain names
- Point 100 external domains to 1&1
- 50 sub domains

WEBSITE/CONNECTIVITY

- 1,000 MB of Web space
- 5 FTP accounts, unlimited access
- 15,000 MB/Month bandwidth
- Protected by up-to-date firewall
- Daily backups

APPLICATIONS

- WebsiteCreator for 18 pages
- Full version software worth \$550
- 1&1 Control Panel

E-MAIL

- 150 POP3 e-mail accounts
- Aliases, auto-responders, forwarding
- 1&1 WebMail
- Virus scanner for 3 POP3 accounts

WEBSITE FEATURES

- Logfiles
- CGI library (counter, guestbook, etc...)
- Own CGI programming
- FrontPage 2002 extensions
- Advanced password protection
- Perl, PHP3 and PHP4
- 1x MySQL database (100MB)
- SSH shell access
- SSI (Server side includes)
- Cron Jobs

CRM/E-COMMERCE

- 1&1 WebStatistics
- 5 chat channels
- Customizable forums
- in2site one-on-one dialogue
- Newsletter Tool
- 1&1 WebDatabase
- 1&1 WebElements - Sophisticated Form Editor

EXPRESS SUPPORT

- 24/7 support by phone and e-mail

DEVELOPER PACKAGE

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INCLUDES 5 DOMAINS

DOMAIN NAMES

- Includes 5 domains at no additional cost
- Handling of unlimited domain names
- Point 200 external domains to 1&1
- 200 sub domains

WEBSITE/CONNECTIVITY

- 2,000 MB of Web space
- 25 FTP accounts, unlimited access
- 30,000 MB/Month bandwidth
- Protected by up-to-date firewall
- No limits on simultaneous hits/bandwidth
- Server priority
- Daily backups

APPLICATIONS

- WebsiteCreator for 25 pages
- Full version software worth \$550
- 1&1 Control Panel

E-MAIL

- 300 POP3 e-mail accounts
- Aliases, auto-responders, forwarding
- 1&1 WebMail
- Virus scanner for 6 POP3 accounts

WEBSITE FEATURES

- Logfiles
- CGI library (counter, guestbook, etc...)
- Own CGI programming
- FrontPage 2002 extensions
- Advanced password protection
- Perl, PHP3 and PHP4
- 3x MySQL databases (100 MB each)
- Cron jobs
- SSH shell access
- Advanced developer tools
- SSI (Server side includes)
- Dedicated SSL Certificate

CRM/E-COMMERCE

- 1&1 WebStatistics
- 10 chat channels
- Customizable forums
- in2site one-on-one dialogue
- Newsletter Tool
- 1&1 WebDatabase
- 1&1 WebElements - Sophisticated Form Editor

EXPRESS SUPPORT

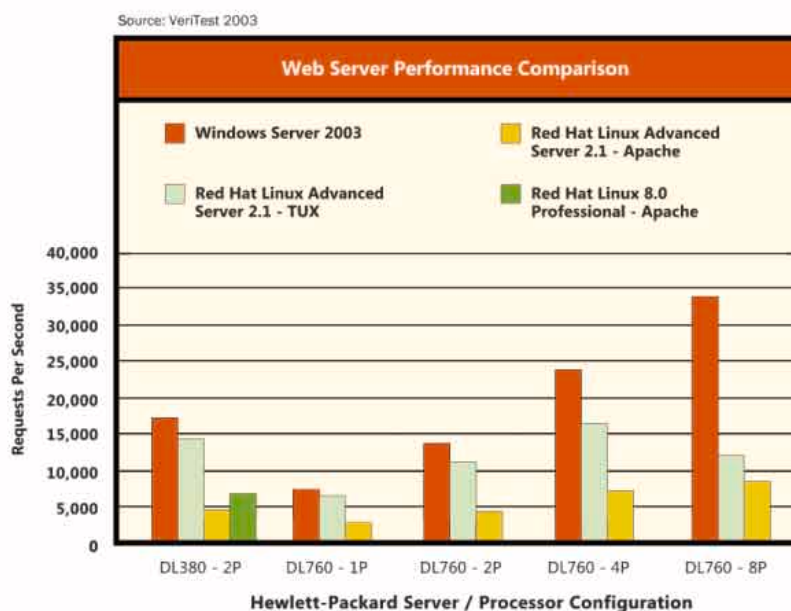
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The Windows platform generated up to 300 percent better peak Web serving performance compared to Linux according to a recent benchmark test conducted by VeriTest, a leading independent testing company. In fact, VeriTest found that Windows Server™ 2003 with Internet Information Server (IIS) 6.0 outperformed every Red Hat Linux configuration they tested, regardless of the server employed or the number of processors. To get the full study and more third-party findings, visit microsoft.com/getthefacts



EDITORS' CHOICES

MAY 4-18, 2004



In the market to buy? Here are our latest Editors' Choices in the leading technology categories—the products we've picked as the best from the hundreds that PC Magazine Labs has been testing. For links to the complete reviews, including dates of publication, visit www.pcmag.com/editorschoice.

DESKTOP PCs

GAMING DESKTOPS

- Dell Dimension XPS—3.4-GHz Extreme Edition
- NEW** Falcon Northwest FragBox Pro
- Velocity Micro Vision FX



Falcon Northwest FragBox Pro

MULTIMEDIA DESKTOPS

- Apple Power Mac G5 Dual 2 GHz
- NEW** Velocity Micro ProMagix

MEDIA CENTER PCs

- Gateway Media Center FMC-901X
- Sony VAIO Digital Studio PCV-RZ46G

VALUE PC

- eMachines T2865

HOME PC

- Sony VAIO PCV-W500GN1

CORPORATE PC

- IBM ThinkCentre S50

PORTABLE PCs

BUSINESS NOTEBOOK

- IBM ThinkPad T40



Velocity Micro ProMagix

MULTIMEDIA/GAMING NOTEBOOK

- Dell Inspiron XPS
- ULTRAPORTABLE**
- IBM ThinkPad X40
- TABLET PCs**
- HP Compaq TC1100
- Toshiba Portégé M205-S809

MOBILE DEVICES & SERVICES

PDAs

- HP iPaq Pocket PC h4350
- Sony Clie PEG-UX50

PDA/PHONE COMBO

- Handspring Treo 600



Handspring Treo 600

PHONE

- Motorola MPx200

GPS DEVICE

- TomTom Bluetooth GPS Receiver

WIRELESS E-MAIL SERVER

- GoodLink 2.0



Gateway Media Center FMC-901X

HOME ENTERTAINMENT

MEDIA CENTER PCs

- Gateway Media Center FMC-901X
- Sony VAIO Digital Studio PCV-RZ46G

MEDIA HUB

- Prismiq MediaPlayer

DIGITAL VIDEO RECORDER

- NEW** SnapStream Beyond TV 3

HDTV

- Sharp Aquos 37-inch LCD TV

CAMERAS

COMPACT CAMERAS

- NEW** Kodak EasyShare LS743
- Sony Cyber-shot DSC-T1

MIDRANGE CAMERA

- Olympus C-5060 Wide Zoom

DIGITAL SLR CAMERA

- Olympus E-1

ENTRY-LEVEL DV CAMCORDER

- NEW** Sony DCR-HC40 MiniDV Handycam

DIGITAL IMAGING

CONSUMER PHOTO PRINTER

- HP Photosmart 7960

PROFESSIONAL PHOTO PRINTER

- Epson Stylus Pro 4000

CONSUMER IMAGE EDITOR

- Adobe Photoshop Elements 2.0

PROFESSIONAL IMAGE EDITOR

- Adobe Photoshop CS

PHOTO ALBUM SOFTWARE

- Adobe Photoshop Album 2.0

PHOTO SHARING

- NEW** OurPictures

- Smugmug

PHOTO-PRINTING SERVICE

- Shutterfly

DIGITAL AUDIO & VIDEO

ANALOG CAPTURE DEVICE

- HP DVD Movie Writer dc3000

CONSUMER VIDEO EDITOR

- Pinnacle Studio 8

PROFESSIONAL VIDEO EDITOR

- Adobe Premiere Pro
- CD/DVD-BURNING SUITE**
- Roxio Easy Media Creator 7
- DVD AUTHORIZING**
- Sonic MyDVD 5.2 (consumer)
- Ulead DVD Workshop (professional)

PORTABLE AUDIO PLAYERS

- Apple iPod
- NEW** Apple iPod Mini
- NEW** iRiver iFP-390

Kodak EasyShare LS743



SOUND CARD

- Creative Labs Sound Blaster Audigy 2 ZS

SPEAKERS

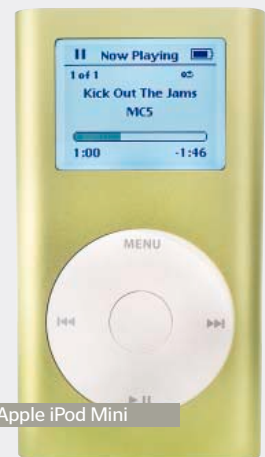
- Creative Labs Gigaworks S750
- Klipsch ProMedia GMX D-5.1

PC JUKEBOX

- Musicmatch Jukebox 8.2

MUSIC STORE

- Napster 2.0



Apple iPod Mini

EDITORS' CHOICES

MAY 4-18, 2004

WEBCAM

- Logitech QuickCam Pro

PRINTERS

PERSONAL PRINTERS

- Brother HL-5040 (laser)
- HP Deskjet 5150 (ink jet)
- Konica Minolta magicolor 2300W (color laser)

PERSONAL MFPs

- Brother MFC-8420 (laser)
- Canon MultiPass MP730 (ink jet)
- Dell A940 (ink jet)

PHOTO PRINTERS

- Epson Stylus Pro 4000 (professional)
- HP Photosmart 7960 (consumer)

NETWORK PRINTERS

- HP LaserJet 9000dn (monochrome laser)
- Xerox Phaser 4500DT (monochrome laser)
- Xerox Phaser 7750DN (color laser)



HP LaserJet 9000dn

DISPLAYS & STORAGE

BUSINESS DISPLAYS

- Dell UltraSharp 1901FP
- Samsung SyncMaster 171N

BUSINESS PROJECTOR

- NEC VT460

GAMING GRAPHICS CARD

- ATI Radeon 9800 XT

MAINSTREAM GRAPHICS CARD

- PNY Verto GeForce 5700 FX Ultra

HDTV

- Sharp Aquos 37-inch LCD TV

DVD BURNERS

- HP DVD Movie Writer dc3000
- Plextor PX-708UF
- TDK 8X Indi

EXTERNAL DRIVE

- Maxtor OneTouch

PRODUCTIVITY SOFTWARE

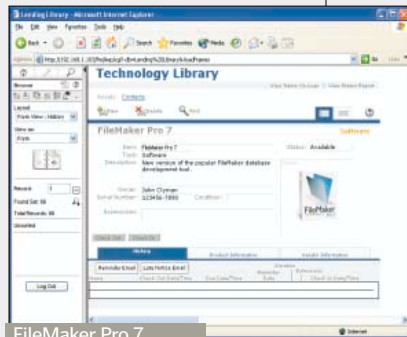
OFFICE SUITE

- Microsoft Office 2003 OCR

- ScanSoft OmniPage Pro 14 Office

PDF CREATION

- Adobe Acrobat 6.0
- FinePrint pdfFactory PRO 1.57
- Jaws PDF Creator 3.0



FileMaker Pro 7

DOCUMENT MANAGEMENT

- ScanSoft PaperPort Pro 9 Office

DESKTOP PUBLISHING

- Adobe InDesign CS

FINANCE & ACCOUNTING

- Microsoft Money 2004 Premium
- QuickBooks Premier 2004
- Quicken 2004 Premier
- TurboTax Premier 2003

WEB SITE CREATION

- NeoVerve StoreSense

MEDIA CREATION SUITE

- Roxio Easy Media Creator 7

E-MAIL CLIENT

- Microsoft Outlook 2003

VIDEOCONFERENCING

- SightSpeed Video Messenger
- VidiTel

DATABASE

- NEW** FileMaker Pro 7

UTILITIES

SECURITY

- Norton AntiVirus 2004 (antivirus)
 - Norton Internet Security 2004 (suite)
 - Norton Personal Firewall 2004 (firewall)
 - SpySweeper 2.2 (antispyware)
 - ZoneAlarm 4.5 (firewall)
- ### ANTISPAM
- Norton AntiSpam 2004
 - Qurb



ServGate EdgeForce

POP-UP BLOCKER

- PopUp Cop

INSTANT MESSAGING

- MSN Messenger 6.1

ARCHIVING

- PKZIP for Windows

PARTITIONING

- PartitionMagic 8.0

REMOTE CONTROL

- GoToMyPC 4.0

VIRTUAL PC

- VMWare

- Workstation 5

BLOG/WIKI TOOLS

- EditMe
- Socialtext Workplace 1.0

- TypePad

SEARCH TOOL

- Google Toolbar

ENTERPRISE SOFTWARE & DEVELOPMENT

NETWORK ANTIVIRUS

- Trend Micro Enterprise Protection Strategy

ENTERPRISE ANTISPAM

- BrightMail Anti-Spam 5.1

E-MAIL SERVER PLATFORM

- IBM Lotus Notes

- and Domino 6.5

WEB FILTERING

- Websense Enterprise 5.1

CRM

- Salesforce.com

DATABASE

- SQL Anywhere Studio 9

WEB CONFERENCING

- WebEx Meeting Center

ENTERPRISE DEVELOPMENT

- Borland JBuilder 9

WEB SITE DEVELOPMENT

- Macromedia Contribute
- Macromedia Studio MX 2004



Zoombinis Island Odyssey

WEB SITE ANALYSIS

- WebTrends Live Enterprise Edition

VULNERABILITY SCANNER

- Retina Network Security Scanner

NETWORKING

SERVER HARDWARE

- Dell PowerEdge 1750

SERVER OS

- Microsoft Windows Server 2003 Enterprise Edition

SECURITY APPLIANCE

- ServGate EdgeForce (small business)

REMOTE-ACCESS APPLIANCE

- Neoteris Access 1000

NETWORK PRINTERS

- HP LaserJet 9000dn (monochrome laser)
- Xerox Phaser 4500DT (monochrome laser)
- Xerox Phaser 7750DN (color laser)

GAMES & EDUCATIONAL SOFTWARE

SIMULATION

- Microsoft Flight Simulator 2004

ACTION/COMBAT

- Halo: Combat Evolved
- Orbz 2

- Savage: The Battle for Newerth

SPORTS

- Madden NFL 2003

VIRTUAL WORLD

- Second Life

ONLINE

- EverQuest: Evolution

EDUCATION

- Math Mission: The Race to Spectacle City Arcade, The Amazing Arcade Adventure
- Zoombinis Island Odyssey

MOBILE GAME

- Bejeweled

REFERENCE

- Microsoft Encarta 2004
- Visual Thesaurus

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FIRST

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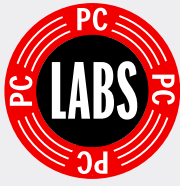
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More Ways to Share Pix

THE MAGAZINE
WORLD'S LARGEST
COMPUTER-TESTING
FACILITY



BY CADE METZ

If you have a digital camera, chances are you've sent images to friends and family as e-mail attachments. And you probably know how cumbersome this process can be: Not only must you compress your images and manually attach the files to e-mail messages, but the recipient must deal with saving and opening the attachments. • You may even have shared an online photo album hosted by a service like Shutterfly or SmugMug. Such sites let you create online photo albums

and then announce a private URL, where friends can view your photos, order prints, and download the digital files.

Recently, the market has been flooded with a range of photo-sharing applications that offer different ways of sharing images, which are sometimes easier and more convenient. In a recent article ("Photo-Sharing Software," March 16, page 95), we reviewed four of these photo-sharing apps: Picasa's Hello (www.hello.com) and Microsoft's MSN Photo Swap (www.msn.com), both of which let you swap pictures through instant-messaging clients; Novatix's SendPhotos (www.novatix.com), which helps you share photos as e-mail attachments; and How2Share's PiXPO (www.pixpo.com), which sets up a peer-to-peer network among friends and family, seamlessly sending pictures from desktop to desktop.

In the time since that roundup, more photo-sharing apps have come to market.



NO UPLOAD, NO DOWNLOAD: OurPictures sets up a network among your friends, instantly sending pictures from desktop to desktop.

Here we review three new options. We're most impressed by the applications that are built on peer-to-peer technology (as are all but Electric Shoebox). If you can convince your friends and family to download and install one of these apps, the lot of you can swap photos with remarkable ease. When some-

one shares a new batch of pictures with you, the images automatically find their way to your desktop. No one has to pay for Web space, and no one has to spend time uploading or downloading files. If you plan on exchanging large numbers of photos with large numbers of people, this is the way to go.

OurPictures



OurPictures is undoubtedly the slickest of the peer-to-peer photo-sharing tools. This application, which is built on Microsoft .NET, provides a tabbed interface that gives you easy access to two different folders: one that holds the pictures you've taken and one that holds the pictures you've received from other people.

As you move through these folders, a menu running down the left side of the screen lets you edit pictures, print them, save them to memory card or disc, view them as a slide show, and, of course, share them with others.

When OurPictures is set up to use the Photo Transfer Protocol (PTP), you can import pictures straight from your digital camera into the app's My Pictures folder. Here you can rotate images, add captions, and remove red eye.

Sharing is remarkably easy. You simply select the photos you wish to share, enter the e-mail addresses of the intended recipients, and hit Send. (The app saves the addresses you've used in the past, so you needn't retype them.) When you send images to other OurPictures users, the photos stream straight to their desktops, appearing in the app's Received Pictures folder. An interesting feature: As the recipient, you can opt to have OurPictures automatically print incoming images.

When you send photos to someone who isn't an OurPic-

LOOKS

WHAT THE RATINGS MEAN: ●●●●● EXCELLENT | ●●●●○ VERY GOOD | ●●●○○ GOOD | ●●○○○ FAIR | ●○○○○ POOR

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- Red type denotes Editors' Choice

tures user, that person receives an e-mail message with a link to a temporary Web page. For the next 30 days, he or she can use this page to view, print, or download the photos.

In the near future, OurPictures plans to build a network of photofinishers, so you can just as easily send your pictures to retailers for professional printing. At the moment, if you click on Print by Mail, you get a "Coming Soon" message.

If you've haven't already installed the Microsoft .NET Framework, it may take a few minutes to download and install OurPictures. And if you use the slide show tool, you may have to wait a while for pictures to load. The only real hassle is convincing your friends and family to load and use the application. Fortunately, the \$49.95 price tag for OurPictures includes licenses for up to four users.

OurPictures

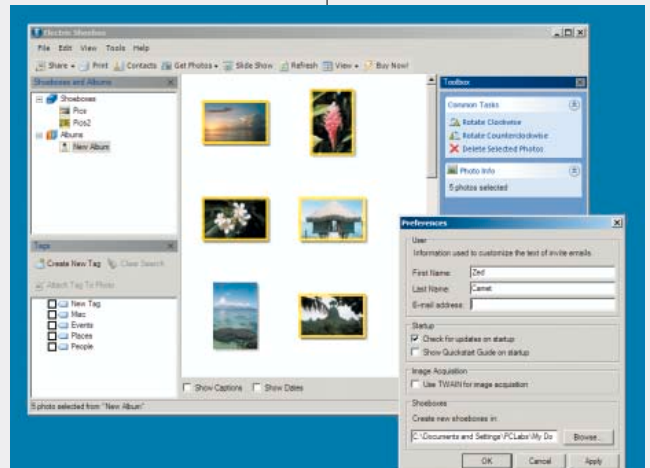
4 licenses, \$49.95 direct. OurPictures Inc., www.ourpictures.com. ●●●●○

ShareALot

ShareALot operates on the same basic premise as OurPictures. If two people are running the app, they can instantaneously send pictures to each other's PCs. Unfortunately, ShareALot isn't nearly as polished as OurPictures, and it doesn't offer even the simplest photo-editing tools. You need to supply your own app for these purposes.

Though it runs locally, the product's core application is accessed through a Web browser. A floating menu sits outside the browser, ostensibly providing quick access to various parts of the program, but this merely complicates matters.

On the whole, it isn't nearly as intuitive as OurPictures' unified Windows interface. Furthermore, when you send photos to someone, the recipient can't view them without downloading the full application. The upside is that



SERVE YOUR OWN: With the Electric Shoebox, you can share photos from your desktop as if it were a personal Web server.

ShareALot is free, at least for the moment.

ShareALot

Free download. It's The Content Inc., www.sharealot.com. ●●●○○

Electric Shoebox

Like OurPictures, Constant Time's Electric Shoebox doubles as a simple photo-editing and photo management application. It lets you resize, rotate, organize, and sort your photos. But first and foremost, Electric Shoebox is a photo-sharing tool.

If you're running Outlook, Outlook Express, or Hotmail, Electric Shoebox can assist you in preparing and attaching images to be sent by e-mail. Even more convenient, it lets you serve photos from your desktop as if it were a Web site, a feature Constant Time calls Personal Online Album Sharing.

This is quite easy to set up; two intuitive wizards walk you through the process. You just enter a Web address for your album, choose a simple HTML

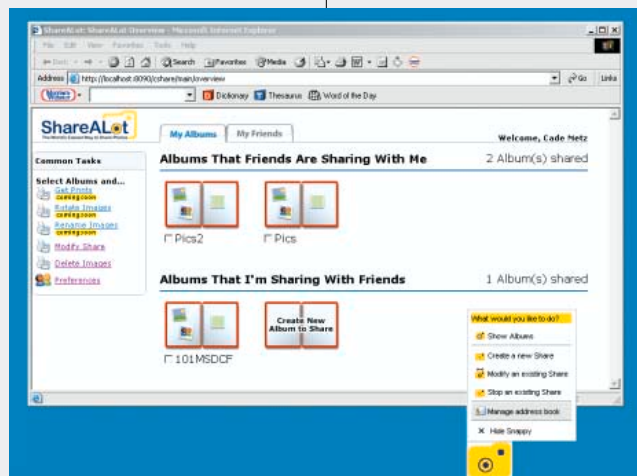
layout, and specify whom you wish to share images with. If you don't own a Web domain, Constant Time will give you a Web address on one of its domains (free for a year, \$10 for each year thereafter).

If your machine is sitting behind a router, you may have to reconfigure the router to allow for Personal Online Album Sharing, but Constant Time supplies tutorials for three of the market's most popular personal routers. Once everything is up and running, anyone on your list can access your photos on the Internet, as if accessing an ordinary Web site.

Electric Shoebox is a good solution if you want to share large numbers of photos. But unlike OurPictures and ShareALot, it's a one-way street. If you're also interested in receiving photos, you're better off with one of the other applications.

Electric Shoebox

\$29 direct. Constant Time Software Inc., www.constanttime.com. ●●●○○



SHARING ON THE CHEAP: Unlike OurPictures, ShareALot's peer-to-peer photo-sharing app is a free download.

Kodak Camera Focuses on Images

BY DANIEL GROTTA & SALLY WIENER GROTTA



The nifty little 4-megapixel **Kodak EasyShare LS743** packs almost everything a point-and-shoot user could want into a stylish, exceptionally easy-to-use device.

The 6-ounce LS743 has a nice, solid feel. The 1.8-inch LCD is sharp but doesn't automatically adjust when the scene is very dark or light, making it difficult to set up shots in those conditions. The unit can accommodate optional SD/MMC cards, and comes with 16MB of built-in memory.

The menus are models of clarity and simplicity, yet they offer a few sophisticated surprises, such

as three metering modes, two focus modes, slow shutter speeds, and ISO equivalencies ranging from 80 to 800. For novices, there's a huge range of automatic modes.

The 4-second startup time is slower than most of the shirt-pocket cameras we recently reviewed, notably our other Editors' Choice in this category, the Sony Cyber-shot DSC-T1. On the other



THIS KODAK is our favorite point-and-shoot digital camera.

hand, the 1.5-second click-to-click time was comparatively quick. In burst mode it can fire off six quick shots in just 2 seconds.

Image quality is very good—equal to or better than any point-and-shoot we've tested in terms of resolution: 1,300 horizontal lines per inch (lpi) and 1,250 vertical lpi. Our simulated daylight and flash test shots were crisp, with excellent detail and color, though slightly underexposed.

The LS743 is a very good all-around camera. The Sony entry has more bells, whistles, and sex appeal, but this Kodak arguably delivers better images.

Kodak EasyShare LS743

\$349 list. Eastman Kodak Co., www.kodak.com. ●●●●○

Olympus Camedia C-750 Ultra Zoom

Pros: Sharp images, thanks to a sw4-megapixel sensor and ED glass lens; rich feature set.

Cons: Slow, unresponsive zoom and shutter lag make action shots challenging.

Bottom line: The 4MP C-750 produces sharp, well-exposed images with its 10X zoom lens. It's a good choice as an all-around camera for enthusiasts moving up from the entry level. \$600 street. Olympus America Inc., www.olympusamerica.com. ●●●●○



Olympus Stylus 410

Pros: Good 4MP image quality; weather-resistant body.

Cons: Average boot-up times (other cameras are getting quicker).

Bottom line: The Olympus Stylus 410 is a good choice as an entry-level subcompact digital camera, with easy handling and good image quality.

The camera's all-weather capabilities should be attractive to those who plan to do a lot of outdoor shooting.

\$380 street. Olympus America Inc., www.olympusamerica.com. ●●●●○



Concord Eye-Q 4360z

Pros: Cheap for a 4-megapixel camera; fairly good images.

Cons: Slow, with noticeable shutter lag; few user-selectable settings.

Bottom line: This isn't the best 4MP camera on the market. But at around \$200, it's an interesting alternative to a \$400 model for those who don't need optional settings and don't demand very high image quality or speed.

\$200 street. Concord Camera Corp., www.concordcam.com. ●●●●○



Point-and-Shoot for Control Freaks

BY MICHAEL KOBRIN

The **Canon PowerShot A80** offers most of what you want from a 4-megapixel camera: reliable automatic settings, a fairly wide range of manual controls, and good ease of use.

Even though this is a point-and-shoot model, the A80 offers more manual control than similar cameras, and settings are not buried within menus. Some knowledge of traditional photography would help you take advantage of the A80's features, but the real meat of this camera lies in its intelligent nine-point autofocus system—which outdoes most of the competition—and its auto-exposure settings, allowing users to take good pictures without getting bogged down by the manual controls. The 3X optical zoom is suitable for most situations, though the zoom can be hard to fine-tune. We like the A80's flip-out

swiveling LCD panel, though at 1.5 inches, it's a bit small. An orientation sensor adjusts the on-screen image, so you'll see it the same way while holding the camera at any angle. The A80's mode wheel provides excellent presets for shooting in various lighting situations, as well as for slow and fast shutter speeds and panorama and movie modes. It also provides access to manual, program, shutter priority, and aperture priority modes, as well as two user-definable settings.

Overall, the A80's image quality is very good. Indoor shots taken with automatic settings were well exposed, though some outdoor shots under cloudy skies were slightly

THE CANON POWERSHOT A80 gives the user a lot of control.

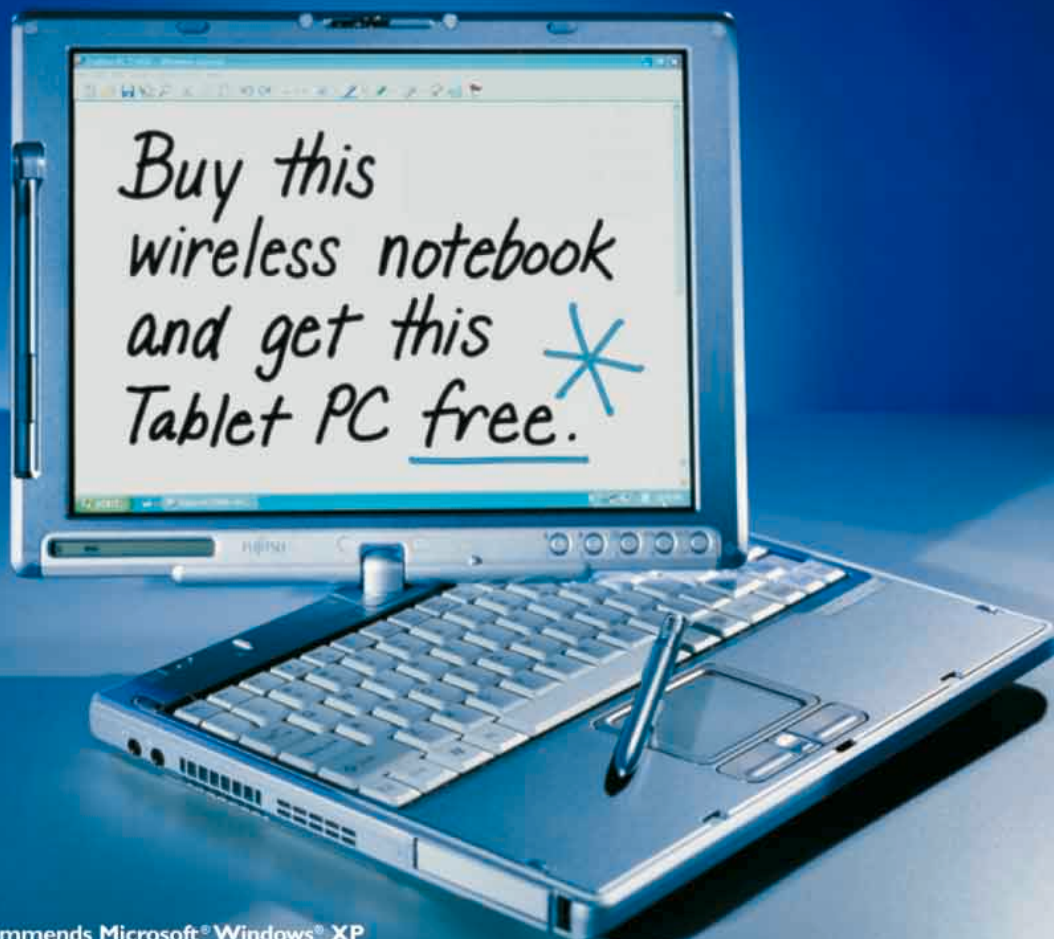
underexposed (which we easily remedied in manual mode). Also, we found a few images were not quite as sharp as they could have been.

The A80 is a fine choice for amateur shutterbugs. We prefer the image quality we saw from the Kodak EasyShare LS743, but more advanced shooters looking for additional control may prefer the A80.

Canon PowerShot A80

\$400 street. Canon USA Inc., www.powershot.com. ●●●●○





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MOBILE
TECHNOLOGY

Better, More Affordable Camcorders

BY JAN OZER

When we looked at affordable DV (digital video) camcorders last year (First Looks, December 30, 2003) we weren't thrilled with any of them. Since that time, camera giants Canon and Sony have each revamped their sub-\$800 offerings, with good results. We're still waiting for a compact DV camcorder that also doubles as a good still-image camera (with just IMP image sensors for stills, neither of these fits the bill). But either is a solid choice for those looking to shelve an aging analog recorder for capturing family memories.

CANON ZR90

The Canon ZR90 has some lovely touches, like an included wide-angle lens attachment and 22X optical zoom. Video quality, while better than we saw from entry-level models last year, is merely adequate and no match for the Sony's images.

In use, this camera is more intuitive than the Sony, with simple toggles switching between photo and video modes or programmable and automatic modes. The Canon zoom controls are larger and easier to use than the Sony's.

Other buttons, particularly the night-mode switch (for low-light shooting), were *too* accessible; we inadvertently engaged night mode several times during normal handling. In addition, the accessory shoe is not intelligent, and there is no microphone jack, limiting your ability to upgrade audio-capture capabilities.

We started by testing battery life, and the standard battery (rated at 85 minutes with the LCD active) delivered 87 min-

utes of continuous shooting. For quality testing, we first shot the EIA Resolution Chart 1956. On that test, the ZR90 trailed the Sony in its ability to capture fine detail. Comparative videos taken of the Gretag-Macbeth ColorChecker chart revealed that the ZR90 tends to mute almost all colors, particularly yellows and pinks.

The ZR90 trailed the Sony on most of our real-world trials, too. Under fluorescent lights (in automatic mode, after manual white balancing) most of the ZR90's videos were slightly



NEAT FEATURES abound in the Canon ZR90, but video image quality is just okay.

grayish and noticeably less vivid than the Sony's, with a fine patina of noise particularly noticeable against light backgrounds. Outdoor shots in direct sunlight proved closer to the Sony's output, but colors were again noticeably faded.

The ZR90's audio quality was also slightly less distinct, with a more noticeable background whine and a slight metallic sound to the voices. Surprisingly, the results reversed in still-image capture tests, where the Canon entry showed better color handling.

Canon ZR90

\$599 list. Canon U.S.A. Inc., www.canonndv.com. ●●●●○

SONY DCR-HC40 MINIDV HANDYCAM



The Sony DCR-HC40 MiniDV Handycam fits easily in a purse or large jacket pocket, produces good quality audio and video, and doesn't cost an arm and a leg—just \$699 direct. It's a fine camcorder for travel and other casual use.

The HC40 is smaller than the Canon and has an internal lens cover, which is more secure than Canon's pop-off cover. Other nice touches include new controls on the LCD panel to start and stop recording and to enable and disable LCD backlighting, saving battery power while shooting. The intelligent accessory shoe can power and control a light or microphone; the camera's external microphone port provides even greater expandability.

We did find some issues with usability. The tiny zoom lever is difficult to control, and the three LEDs (indicating which mode you're in) are impossible to see in direct sunlight. We also found the HC40's touch-screen controls a mixed bag. The panel itself is remarkably smudge-resistant and logically organized, and we liked the ability to touch areas on the



GOOD VIDEO QUALITY for an entry-level camcorder makes this Sony model our Editors' Choice.

screen to direct focus and exposure. But some operations are awkward, and the camera has a tendency to jerk when you adjust parameters via the touch screen while shooting.

The standard battery (rated at 85 minutes) proved very robust, delivering 94 minutes of shooting with the LCD active. Job number one for DV camcorders is quality, however, and this is where the HC40 proved most impressive. On resolution tests, this camera far exceeded the Canon, producing over 500 lines of resolution compared with the Canon's 400 lines. In comparative shots with the GretagMacbeth chart, the HC40 also produced generally brighter and more accurate colors than the Canon.

These results translated to superior performance in real-world trials. During indoor tests under fluorescent light, the HC40 produced brighter videos with more vivacious coloring and finer detail than the Canon. The HC40's skin tones, in particular, were much more accurate than the Canon's, and the HC40 proved more resistant to noise in low-light trials (though the video was not as bright). In outdoor shots, the HC40 again produced superior detail and color accuracy. Audio results were particularly impressive, where the HC40 recorded a strong, clear signal with only moderate background noise.

So with all these things considered, the \$100-or-so premium that you pay for the HC40 adds up to money well spent. Just be prepared to spend a

little more time mastering its controls.

Sony DCR-HC40 MiniDV Handycam

\$699 direct. Sony Electronics Inc., www.sonymstyle.com. ●●●●○



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Borland Delivers Stronger Java

BY RICHARD V. DRAGAN

Enterprise development today requires a lot more than coding. Aiming to tackle the entire software development cycle, **Borland Enterprise Studio 7 for Java** (\$6,500 direct) takes the already strong JBuilder X Enterprise compiler tool and adds solid UML diagramming abilities, Web service support, refactoring, and a standout profiler. Moreover, these new capabilities are nicely integrated into a popular IDE that still earns points for everyday coding productivity.

Enterprise Studio supports Windows, Linux, and Solaris. You need at least 512MB of RAM to run Enterprise Studio, and 768MB is recommended. We tested on Windows XP and were up and running in around 40 minutes. The core JBuilder X compiler is on two CDs; another one adds design support with Borland's Together modeling tool.

Additional components for enterprise development include Borland Enterprise Server (for a J2EE application server), and basic version control with Borland's StarTeam 5.2 Personal Edition (which comes with one user and one administrator license). Noteworthy extras include support for Sun ONE Application Server v.7 (via

a plug-in), and Altova's XML-Spy, a capable XML editor.

To test this suite, we simulated a typical development cycle for a J2EE Web application running a database to track a fleet of vehicles and drivers. We used Web services to expose key functionality to external

difficult to re-order fields, the database design tools proved more than capable.

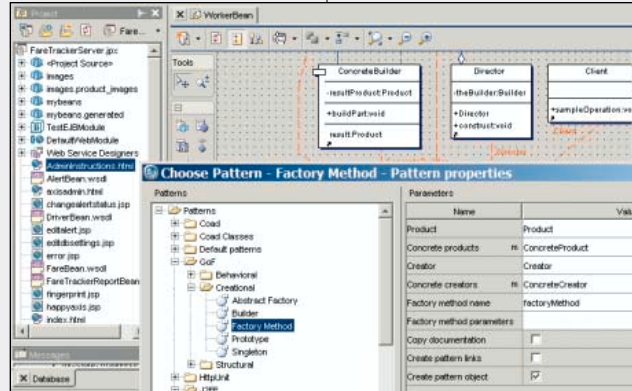
The Unified Modeling Language (UML) is widely supported in Enterprise Studio, and the product features a good selection of diagram types, including use cases,

Web services, with a well-thought-out and very usable designer that automatically creates WSDL and generates support classes to implement services. We used this feature to model a half-dozen SOAP calls for our test system. The wizard supports scanning EJBs and exposing them as Web services, too.

Several solid refactoring wizards let us change method names quickly, vary parameters, and move code around within a class hierarchy. A quality-assurance option runs checks and offers advice on fixing errors or tweaking your design and code. We liked that you can define project personalities, which hide certain features and tools so you're not overwhelmed with options. (IBM WebSphere Application Developer, which is a comparable compiler and tool, does swamp users with options.)

On the coding side, JBuilder X offers a nicely functional Struts wizard, which can definitely reduce the complexity of this popular framework for writing JSPs against controller and model Java classes. For debugging and testing code, the suite bundles Optimizeit 6.0, a profiler that generates detailed performance metrics.

Enterprise Studio can integrate well into your existing project infrastructure and provide good support for connecting to common version-control packages. You can import and export existing software design documents via XMI (an XML standard) to and from other modeling tools. System architects and software designers working in Java will find that Borland Enterprise Studio is a powerful tool that meets the challenges of today's enterprise development.



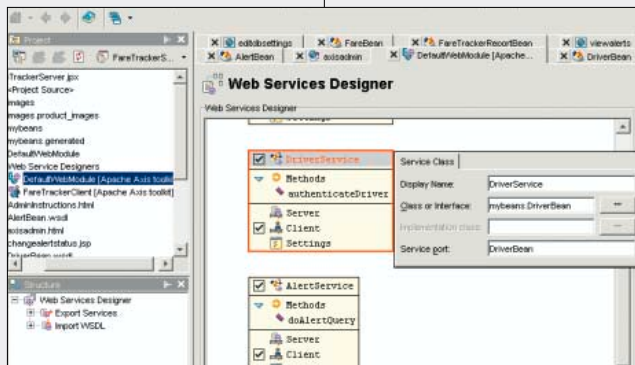
MIXING SOFTWARE DESIGN TOOLS with strong coding abilities, Borland Enterprise Studio features extensive support for UML, plus powerful wizards for generating class designs.

systems. During testing, we found Enterprise Studio's modeling and add-on modules very well integrated into the IDE. Our first step was to create an entity relationship diagram outlining tables and fields visually. From here, a wizard let us import the logical design to its physical implementation on a database. The tool also generates the SQL scripts to create actual tables. Though it was

state, activity, collaboration, deployment, and class diagrams. For each type of diagram, the visual design tool provides the appropriate set of widgets to draw with according to UML conventions. The look and feel is kept simple here, so you will need to know UML pretty well to use the tool effectively. At any time, you can generate HTML for one or all of your diagrams.

The class modeling capabilities deserve special mention because of their excellent support for software patterns, including the 23 well-known "Gang of Four" patterns, plus late-breaking J2EE designs recommended by Sun. The ability to generate complicated class relationships based on patterns using a wizard is a stellar feature that should put expert design in reach with a lot less effort.

For the coding phase of a project, JBuilder X is a major upgrade as a Java compiler. It has excellent support for designing



JBUILDER X ENTERPRISE bundles several new productivity wizards, including one for designing Web services and another for building Web apps based on the popular Struts framework.

Borland Enterprise Studio 7 for Java

\$6,500 direct. Borland Software Corp., www.borland.com. ●●●●●

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Luggable PCs Are Portable Powerhouses

BY JOEL SANTO DOMINGO

Shuttle Computer invented a niche within a niche a few years back with its innovative totable PC chassis. The square case could accept desktop components in a space not much bigger than a shoebox, making it easier for gamers to tote their homegrown hardware to LAN parties and the like. Now Shuttle has decided to enter the made-to-order market with the Shuttle XPC G2 7500. But it's not alone: Falcon Northwest has a formidable competitor aimed at the same gaming audience.

FALCON NORTHWEST FRAGBOX PRO

The Falcon Northwest FragBox Pro is a gamer's delight. It scored high on both our Serious Sam and Splinter Cell gaming tests. Eyes-on evaluation concurred, as games looked clear, smooth, and jitter-free, especially on the bundle's 15-inch NEC-Mitsubishi LCD monitor.

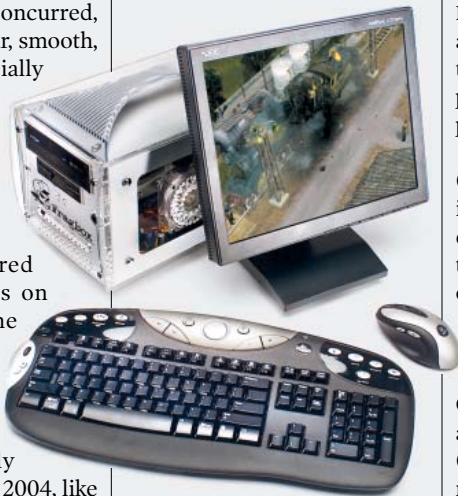
Thanks to the nVidia GeForce FX 5950 graphics card, the system garnered class-leading scores on 3DMark03. With the DirectX 9 compatibility built into the graphics card, the FragBox Pro will be ready for the highly anticipated games of 2004, like Half-Life 2 and DOOM III. The FragBox Pro also performed well on our Business Winstone

2004 and Multimedia Content Creation Winstone 2004 test, although not as well as the Shuttle entry.

Most of the FragBox Pro's 15-pound case consists of window panels to show off the illuminated interior components. A handle on the top of the case aids portability. The FragBox Pro's compact form leaves little, if any, room for expansion. With so much in the case, however, you are unlikely to be left wanting more. The USB 2.0 ports on the front and back make it easy to plug in a memory card reader or other peripherals.

The box also works nicely as an add-on to your home theater system. The system's 5.1 analog outputs and S/PDIF Toslink optical outputs offer several ways to get surround sound to your speakers.

Granted, the Shuttle entry has a more powerful proces-



THE FRAGBOX PRO lets you take power with you—and show it off via the see-through case.

sor and more hard drive space. But the FragBox Pro costs \$1,000 less (when both PCs are compared without a monitor). So with its pleasing form and kickin' gaming performance, this system packs a lot of bang for the buck (and size, for that matter).

Falcon Northwest FragBox Pro

With 2.8-GHz Pentium 4 (Northwood), 1GB DDR400 SDRAM, 120GB hard drive, DVD+/-RW drive, BFG Asylum nVidia GeForce FX 5950 graphics card, 15-inch LCD, Integrated 5.1 surround sound card, Logitech Premium Stereo Headset, Microsoft Windows XP Home: \$2,330 direct. Falcon Northwest, www.falcon-nw.com.

OVERALL ●●●●● 52 52 71 82

SHUTTLE XPC G2 7500

With an ATI Radeon 9800XT graphics card, 3.4-GHz Pentium 4 processor, dual-channel DDR400 RAM and both IDE and SATA RAID compatibility, the Shuttle XPC G2 7500 is a powerhouse in a diminutive package.

You can fit two hard drives (with up to 300GB per drive) in the Shuttle case. The single-drive XPC configuration we tested compares well to many of the high-end Pentium 4 (Northwood)-powered PCs we've reviewed. The XPC's Serious Sam and Splinter Cell test scores were well above 30 frames per second (fps), even at 1,600-by-1,200 resolution, showing that the XPC will work well with today's games. With the ATI Radeon 9800XT, the XPC



THE SHUTTLE XPC is a classy-looking luggable PC for a LAN party or media rack.

should play tomorrow's games like Half-Life 2 and DOOM III well, too.

All of the XPC's ports and connectors are easy to find. SP/DIF Toslink optical/digital input and output are great for those who want a home theater PC, and the XPC case fits well on a cramped desk. The multifunction memory card reader is a boon for digital photographers, and the DVD+/-RW drive is handy for backing up data and creating video content. The XPC could also be an excellent portable video studio in a TV news van; the hard drive capacity far outpaces that of a notebook.

Shuttle will soon offer several versions of the XPC, from a bare-bones business model (\$999) to a tricked-out gaming model (\$2,499). The XPC is an intriguing choice for gamers who need portable power, those looking to spec a multimedia PC for the living room, and anyone who wants a desktop PC that looks better than the rest.

Shuttle XPC G2 7500

With 3.4-GHz Pentium 4 processor, 1GB DDR400 SDRAM, 200GB hard drive, DVD+/-RW drive, ATI Radeon 9800XT graphics card, Microsoft Windows XP Professional: \$2,800 street. Shuttle Computer Inc., www.shuttle.com.

OVERALL ●●●●● 64 64 61 74

PERFORMANCE TESTS

High scores are best. Bold type denotes first place.

	Business Winstone 2004	Business Winstone 2004 Multitasking (overall score)	Multimedia Content Creation Winstone 2004	3DMark03		Serious Sam SE (fps)		Splinter Cell (fps)	
				1,024 x 768 2X/2X	1,600 x 1,200 4X/8X	1,024 x 768 2X/2X	1,600 x 1,200 4X/8X	1,024 x 768 Off/2X	1,600 x 1,200 Off/8X
Falcon Northwest FragBox Pro	19.6	2.4	26.9	5,029	4,152	102	48	54	37
Shuttle XPC G2 7500	21.7	2.7	31.0	4,981	3,325	84	52	43	38

RED denotes Editors' Choice.



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Pentium 4 Powerhouse

BY JOEL SANTO DOMINGO



Overclocking is still a popular pastime among the boutique PC makers, and the **Velocity Micro ProMagix** has it in spades: Both the 3.4E-GHz Pentium 4 processor and the nVidia GeForce FX 5950 Ultra graphics card are tweaked to run faster than stock components. While a gamer will be ecstatic playing Half-Life 2 and DOOM III on the ProMagix, we see this particular system as more of a video editor's station. The fast SATA RAID will get those edit jobs done quickly, there is ample room in the case for expansion, and burning work to the DVD writer is a snap with the included software.

The front panel, which includes an LED readout showing the case's internal temperature,

also includes controls for the cooling fans: You can slow them down to make the PC quieter if you aren't taxing the components. Our test bundle's Creative GigaWorks S750 7.1 THX speakers deliver rumpshaking bass and are perfect for gaming or enjoying DVD movies. The bundle includes Ulead VideoStudio 7 and DVD Movie Factory for editing and authoring, which makes the ProMagix a good starting point for content creation.

As expected, the overclocked (to 3.5 GHz) Pentium 4

CPU and GeForce 5950 graphics contribute to high scores on all our benchmark tests. Credit the overclocked components as well as the two 10,000-rpm SATA drives in a RAID 0 array.

Sure, at close to \$4,000 it costs a pretty penny. But the ProMagix buyer wants one of the fastest systems out there.

Velocity Micro ProMagix

With 3.4-GHz Pentium 4 with SSE3, 1GB 400-MHz DDR SDRAM, dual 74GB, 10,000-rpm SATA hard drives in a RAID 0 configuration and a 200GB, 7,200-rpm SATA hard drive, eVGA nVidia GeForce FX 5950 Ultra graphics card, DVD±RW drive,

DVD/CD-RW combo drive, Creative Labs Sound Blaster Audigy 2 XS sound card, Creative GigaWorks G750 7.1 speakers, ViewSonic

VG710S 17-inch LCD, Microsoft Windows XP Pro, \$3,864 direct.

Velocity Micro Inc., www.velocitymicro.com.

OVERALL ●●●●●

🎧 85 🖨️ 78

🖱️ 90 🎮 100



Compaq's Stoplight Sleeper

BY JOEL SANTO DOMINGO

Do you lust over gaming systems and other high-end PCs but want a system that's less showy than the boutique boxes? Then take a look at the **Compaq Presario 8000T**. It's grandma's Plymouth Belvedere with a 426 Hemi.

It features drool-worthy components such as a 3.2E-GHz Pentium 4 with SSE3, two 160GB SATA hard drives in a RAID 0 array, an nVidia GeForce FX 5950 Ultra graphics card, and the awesome, THX-certified Klipsch ProMedia Ultra 5.1 speakers. The 8000T compares well with other gaming PCs, such as the Dell Dimension XPS.

The 8000T's performance is on a par with other Pentium 4 desktops we've reviewed re-

cently, with a slight edge over single-drive competitors, thanks to its RAID array. The top-shelf GeForce 5950 graphics card ensures smooth playing of 3D games, and the 8000T will be ready for future games like Half-Life 2 and DOOM III.

Notable software includes Microsoft Works, Adobe Photoshop Album, and Intuit's TurboTax Deluxe. Thoughtful touches, such as the plugs

over the extra on-board sound connectors when the Creative Labs Sound Blaster Audigy 2 sound card is installed, helps novice users set up the system. The wireless keyboard and optical mouse help reduce cable clutter.

The 8000T is not as flashy as the boutique PCs we see from Velocity Micro and others, but that may be a plus for some buyers.

Compaq Presario 8000T

With 3.2E-GHz Pentium 4, 1GB DDR SDRAM, two 160GB SATA hard drives (RAID 0), DVD+RW drive, nVidia GeForce FX 5950 Ultra graphics, 17-inch LCD, Sound Blaster Audigy 2 sound card, Klipsch ProMedia Ultra 5.1 speakers, \$3,157 direct. Hewlett-Packard Co., www.hp.com.

OVERALL ●●●●● 🎧 91

🖨️ 83 🖱️ 83 🎮 94



MULTIMEDIA SCORES ARE OUT OF 100
🎧 MUSIC 🖨️ PHOTO 🖱️ VIDEO 🎮 GAMES

ABS Awesome 6300

Pros: The Athlon FX-53 gives the machine performance oomph.

Cons: Dual hard drives are 7,200-rpm where others have 10,000-rpm models.

Bottom line: The ABS Awesome 6300 is an attractive high-end multimedia powerhouse from a respected and reliable system producer.

\$3,599 direct. ABS Computer Technologies Inc., www.abspc.com.

OVERALL ●●●●● 🎧 95 🖨️ 85

🖱️ 88 🎮 91



ABS Ultimate X5

Pros: Kickin' multimedia performance. Eye-catching but not too flashy.

Cons: Price does not include monitor or speakers.

Bottom line:

A fine choice for those who want high-level components but don't want to build (and support) a system themselves.

\$2,449 direct. ABS Computer Technologies Inc., www.abscomputers.com.

OVERALL ●●●●●

🎧 70 🖨️ 53 🖱️ 70 🎮 81



Polywell Poly 875P-3200

Pros: Dual 10,000-rpm SATA RAID hard drives and TV tuner.

Cons: With its PVR functionality, it could use more storage.

Bottom line: Add more hard drive space and it could be a killer TV/PVR/video system or home server.

\$2,750 direct. Polywell Computers Inc., www.polywell.com.

OVERALL ●●●●● 🎧 83 🖨️ 76

🖱️ 93 🎮 98



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Nikon \$999.00

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- 12 Scene Modes



Kodak \$433.00

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- 4.0 Megapixel
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Canon \$999.00

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EPSON \$408.00

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SanDisk \$68.00

256MB Ultra II Compact Flash Card

Model# SDCFH-256-901



OLYMPUS \$92.00

256MB xD-Picture Card

Model# XDPC256MB



Panasonic \$181.00

512MB Secure Digital Card

Model# RP-SDH512U1A



SONY \$91.50

256MB Memory Stick Pro

160Mbps Model# MSX-256



Canon \$183.50

WP-DC300 Underwater Housing

for Canon S30/S40/S50 Digital Cameras



OLYMPUS \$149.00

PT-018 Underwater Housing

for Olympus C-740UZ & C-750UZ Digital Cameras



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Haseba \$18.00

HR-206GTS USB 2.0

6 in 1 Reader/Writer for PC or MAC



Panasonic \$259.95

KX-TG5110M 5.8GHz GigaRange® 1x8 Expandable Cordless Phone System

w/ Call Waiting Caller ID & Digital Answering System



Panasonic \$499.95

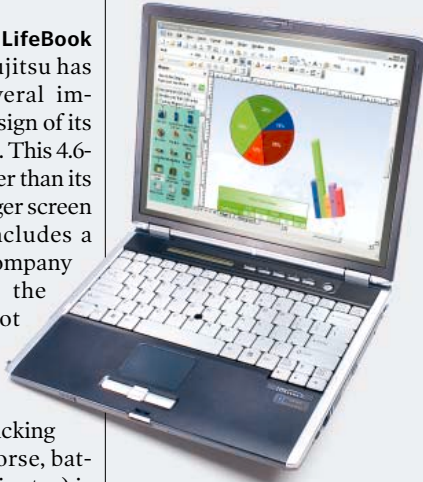
SC-HT900 DVD Home Theater System

w/ 5 DVD/CD Changer, Slim Tallboy Speakers & Subwoofer

Fujitsu Notebook Stops Short

BY CISCO CHENG

With the **LifeBook S7000**, Fujitsu has made several improvements in the design of its mainstream notebook. This 4.6-pound model is thinner than its predecessor, has a larger screen (14.1 inches), and includes a pointing stick to accompany the touch pad. But the S7000's design is not without its flaws: The keyboard feels flimsy to type on and generated a noticeable clicking with each stroke. Worse, battery life (3 hours 4 minutes) is subpar for this category, where road-warrior machines now typically run for 4 to 5 hours.



THE BIG SCREEN is welcome, but the S7000 could be better.

The S7000's silver magnesium alloy case houses a system that is almost half an inch thinner than its predecessor. But we were disappointed in the mouse and keyboard design. There is only one set of mouse buttons,

placed below the touch pad. That's fine if you're using the pad, but many notebooks with dual pointing devices add a second set of mouse buttons above the touchpad, for easier one-handed clicking when you're

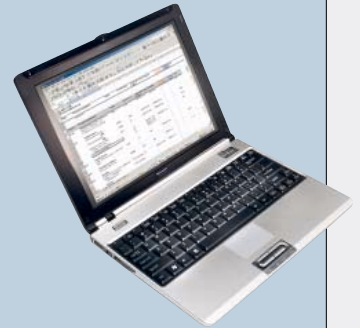
using the stick.

In performance testing, the S7000 delivered solid scores on Business Winstone 2004 (16.9) and Multimedia Content Creation Winstone 2004 (18.8). The system's wireless throughput was on a par with other 802.11g solutions.

The S7000 faces some stiff competition in this category. For example, the IBM ThinkPad T41 earned high marks for its value and durability, and the HP MC6000 has fewer features but will save you money and provide enough juice to run standard business applications.

Fujitsu LifeBook S7000

With 1.7-GHz Pentium M, 512MB DDR SDRAM, 60GB 4,200-rpm hard drive, Intel 855GM/GME graphics, Atheros 802.11a/g wireless, DVD/CD-RW combo drive, three USB 2.0 ports, one FireWire port, 14.1-inch XGA display, 4.3-pound system weight (5.0-pound travel weight), Microsoft Windows XP Professional, \$2,119 direct. Fujitsu Ltd., www.fujitsu.com. ●●●○○



Sharp Actius MM20

Pros: Weighs just 2 pounds; comes with a unique docking/charging cradle for syncing files with your main desktop PC.

Cons: Small keyboard; performance and battery life could be better.

Bottom line: The Sharp Actius MM20 marks the debut of the Transmeta Efficeon processor in the U.S. It's no powerhouse, but performance should be fine for typical chores. Its unparalleled portability and unique cradle sync feature make this an innovative portable, though it's best considered as a complement to a desktop system.

\$1,499 direct. Sharp Electronics Corp., www.sharpsystems.com. ●●●○○

A Better Business Notebook

BY CISCO CHENG

If you're looking for a thin and light workhorse, the **HP Compaq Business Notebook nc6000** should be on your list. Though slightly bulky at 6.6 pounds (including the AC adapter), this business-class notebook performs very well and gives more than 6 hours of battery life.

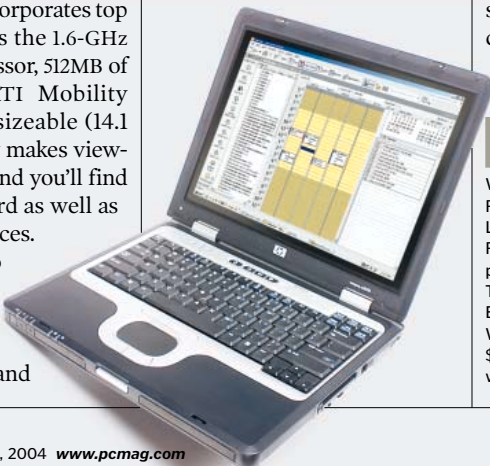
The nc6000 incorporates top hardware, such as the 1.6-GHz Pentium-M processor, 512MB of RAM, and an ATI Mobility Radeon 9600. A sizeable (14.1 inch) XGA display makes viewing comfortable, and you'll find a full-size keyboard as well as dual pointing devices.

HP continues to score points for networking, in this case with Gigabit Ethernet and

802.11a/b/g for ultimate wireless compatibility and fast transfers.

Aside from the impressive BatteryMark scores, the nc6000 did well on our benchmark tests, scoring 16.3 on Business Winstone and a respectable 19.5 on our Multimedia Content

GOOD BATTERY LIFE sets the nc6000 apart from the rest.



Creation Winstone test. On wireless tests using an 802.11g access point, the nc6000 averaged 16.4 megabits per second at close range and managed a respectable 2.71 Mbps at 120 feet, but didn't work past this distance—an average showing overall.

Though not as sleek as some of the other popular mainstream notebooks, namely the class-leading IBM ThinkPad T41, the nc6000 can definitely hold its own.

HP Compaq Business Notebook nc6000

With 1.6-GHz Pentium M, 512MB of RAM, 60GB hard drive, 14.1-inch XGA LCD, DVD/CD-RW drive, ATI Mobility Radeon 9600, SD slot, two USB 2.0 ports, S-Video-out, one Type III or two Type II PC Card slots, infrared, Gigabit Ethernet, 802.11a/b/g, Microsoft Windows XP Professional Edition, \$1,899 direct. Hewlett-Packard Co., www.hp.com. ●●●○○



Gateway M405CS

Pros: Good performance; strong battery life.

Cons: No-frills design; no additional memory slots.

Bottom line: The 6.2-pound Gateway M405CS is the first mainstream notebook we've seen to offer the Intel Centrino 802.11g wireless solution, which makes the entry-level system a bit pricier than the competition. That said, its good performance should not be overlooked.

\$1,399 direct. Gateway Inc., www.gateway.com. ●●●○○

www.pcmag.com/notebooks

The Best Phone on the Market?

BY JONATHAN ROUBINI

The PCS Vision Video Phone VM4050 by Toshiba isn't your typical cell phone. Flip it open and you'll find a striking 260,000-color (18-bit), 2.2-inch LCD. Its resolution of 320-by-240 pixels yields the same crisp quality you'd find on most Pocket PCs, albeit in a smaller package. The phone also has a second, 65,000-color display on the outside of the unit that can be used as a viewer when taking pictures or videos.

The VM4050 has a built-in VGA (640-by-480) camera with flash located on the front of the phone. What's interesting about this implementation is that you take pictures in landscape mode; most cell phones capture images in portrait mode. MPEG-4 video is supported as well, but clips are limited to 15 seconds and 128 by 96 pixels. Photo quality was about

A GREAT SCREEN is the distinguishing feature of the VM4050.

what you'd expect from a sub-1-megapixel camera. Images and videos can be e-mailed, but recipients need to click on a link that takes them to a Sprint-hosted Web site where they then can retrieve the content.

We were particularly impressed with the boot time of the phone. Many phones require 20 to 30 seconds to be fully functional, but the VM4050 takes only about 6 seconds. The phone offered clear quality calls using the handset and built-in speakerphone.

The VM4050 is not as sleek as, say, the PCS Vision Video Phone VM4500 by Sanyo, which also has video and camera capabilities. And unlike the Sanyo phone, the VM4050



PCS Vision Video Phone VM4050 by Toshiba

\$330 street, plus monthly service fees. Sprint PCS, www.sprintpcs.com. ●●●●○

doesn't offer PTT (Push to Talk) technology, but it more than makes up for this with its impressive screen and cheaper price (the Sanyo VM4500 is \$50 more).

It isn't cheap, but the user-friendly interface and fast boot time make the PCS Vision Video Phone VM4050 by Toshiba a pleasure to use. Even better, the built-in camera and video recording capabilities round out its rich set of features. But it's the large, high-resolution display that makes this phone a clear standout.

Sony's Pricy PDA/Phone Combo

BY JONATHAN ROUBINI

The Sony Ericsson P900 is the latest Sony PDA/phone device running Symbian OS 7.0. The P900 is an updated version of the P800. Some of the problems with the previous versions are fixed in the new version, but the device still lacks a camera flash and Wi-Fi support—and at \$800, we would expect support for both.

The design of the P900 is interesting—sort of a flip-phone/PDA hybrid. The flip part covers about half of the screen and con-

tains the phone keypad. The keys have a wide horizontal design—not the most comfortable for dialing, but a definite improvement over the flimsier P800 keypad. When you first power on the device, you can choose between Power On or Flight mode. Flight mode disables the phone's features but still lets you access the PDA.

If you are not familiar with Symbian OS, getting used to it will take some time. Still, most of the typical PDA applications are available, such as a calendar, a phone book, e-mail, a calculator, and video and audio players, as well as an Internet browser.

THE SYMBIAN OS the P900 employs is fine, but it takes getting used to.

We were pleased with the video quality, and pho-

tos taken in daylight were of fairly good quality. The P900 has a built-in browser that is limited to WAP, which lets you visit a limited number of Web sites. Luckily, you can install the Opera browser either from the bundled CD or download it from Sony Ericsson's Web site to browse a wider range of sites.

The device is very similar in size to the Treo 600, but the screen isn't as wide or bright. The Treo 600 has the advantage of having a Secure Digital slot (the P900 supports Memory Stick), which lets you add components such as a Wi-Fi card, while the P900 offers only built-in Bluetooth.

Sony Ericsson P900

\$799 direct, plus monthly service fees. Sony Ericsson Mobile Communications AB, www.sonyericsson.com. ●●●●○



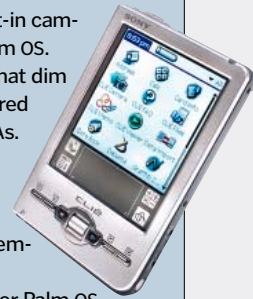
Sony Clié PEG-TJ37

Pros: Crisp screen. MP3 playback. Built-in camera. Latest Palm OS.

Cons: Somewhat dim screen compared with other PDAs. No flash limits the camera's usability indoors. Problematic Wi-Fi.

Bottom line: For Palm OS users, the Sony Clié PEG-TJ37 is a handy device. But because of its poor wireless performance, you may want to think twice if Wi-Fi is important to you.

\$300 direct. Sony Electronics Inc., www.sony.com/handheld. ●●●○○



Motorola V400 World Phone

Pros: Sturdy feel. Nice display. Handy quad-band GSM world phone.

Cons: A bit bulky compared with other camera phones. No flash limits the camera's usefulness indoors. Lacks the video recording, Bluetooth, and IR capabilities found on competitors.

Bottom line: The Motorola V400 World Phone is worth considering if you are in the market for a GSM phone that works worldwide, and if you like to check e-mail and take pictures. That is, as long as you don't mind the lack of Bluetooth and IR.

\$200 street. Cingular Wireless, www.cingular.com. ●●●●○

Shure QuietSpot Headset

Pros: Terrific sound quality and very good noise cancellation from the microphone.

Cons: Takes a little time to mold to your ear comfortably.

Bottom line: An impressive headset well worth the cost.

\$49.95 direct. Shure Inc., www.shure.com. ●●●●○



Turn Tapes into DVDs

BY JAN OZER

The **Omega Super DVD QuikTouch 8x Video Burner** is an analog-to-DVD converter with a broad software suite and exceptional recordable-media compatibility. Its 8X maximum speed and dual-format capabilities make it worth the \$110 premium over the 4X HP DVD Movie Writer dc3000 (\$249 direct), which debuted last fall, though the HP bundle delivers greater video-editing facility.

You plug your camcorder or VCR directly into the QuikTouch and control all capture and recording operations via your computer. But where the dc3000 records to DVD+R/RW discs, the QuikTouch can accept DVD-R/RW, DVD+R/RW, and even DVD-RAM.

Omega's software bundle is fine, comprising programs for DVD authoring, photo manage-

ment, CD and DVD data burning and copying, label editing, audio editing, and automatic backup. All these utilities can be called from the convenience of a single splash screen. We spent most of our time with



CONVERT OLD TAPES to DVDs with lomega's QuikTouch burner.

the capture and authoring program, Sonic MyDVD 5.2 LE, from Sonic Solutions.

Though engaging and easy enough to use, MyDVD is primarily a DVD-authoring solution, with very simple editing

capabilities. As a true video editor, it compares poorly with Arcsoft ShowBiz, bundled with the dc3000, which provides true multitrack timeline editing and a more extensive selection of transitions, titles, and special effects.

We started our tests by converting a 60-minute taped interview, which yielded a very good DVD.

But we saw noticeable blockiness and other compression artifacts on DVDs produced from older, highly used analog tapes. Also, like the dc3000, the QuikTouch doesn't avoid the Macrovision protection present on some Hollywood movies.

Omega Super DVD QuikTouch 8x Video Burner

\$359.95 direct. Requires: 800-MHz Pentium III CPU or better; 256MB RAM; USB 2.0; Microsoft Windows 98 SE, 2000, Me, or XP. lomega.com, www.iomega.com. ●●●●○

Addonics MFR

Pros: Flexible all-in-one design for easily burning photos from memory cards to CDs.

Cons: A bit bulky, with modest battery life. Truncates long filenames to eight characters.

Bottom line: This model offers a combination of portable-storage, media player, and backup features that we haven't seen elsewhere. Like any jack-of-all-trades device, it suffers from a few compromises, but it's certainly worth a look. \$235 list. Addonics Technologies Inc., www.addonics.com. ●●●●○



RCA Lyra A/V Jukebox RD2780

Pros: An all-in-one multimedia player with an intuitive interface and controls.

Cons: The screen is small and pixilates with some dark colors. Prone to skipping in audio mode.

Bottom line: The RD2780 is a solid, good-looking audio player that can show videos and photos. If you're in the market for an MP3 player, consider the additional features that come with the RD2780.

\$499.99 list. Thomson Inc., www.rca.com. ●●●●○



Altec Lansing FX6021 2.1

Pros: Spacious, detailed sound. Sci-fi aesthetics. Tethered and wireless remotes.

Cons: Expensive. No deep bass or extreme highs.

Bottom line: This is an attractive three-piece speaker system that sounds like a full-size bookshelf model. It produces reasonable volume levels and some of the most natural-sounding output we've heard on the desktop.

\$299.95 list. Altec Lansing Technologies Inc., www.alteclansing.com. ●●●●○



High-Speed External Backup

BY M. DAVID STONE

Back in the twentieth century, the only alternative to SCSI for external hard drives was a parallel port, which was deadly slow. Then came USB and FireWire drives. Both are a vast improvement over parallel-port drives, but even a FireWire port can't move data as fast as a hard drive can read and write.

The new **CMS 80GB Velocity SATA Automatic Backup System** (\$299 direct) offers to solve that problem. This external Serial ATA (SATA) drive costs more than an equivalent FireWire drive, but the performance blows a FireWire drive away.

Unless you already have a SATA controller installed, you first need to install one (available from CMS for \$39). And even if you have a controller in-

stalled, you'll have to open the case to install the pass-through card that comes with the drive. The good news is that the card doesn't need a slot, just a cutout to fit in. Once the drive



SATA SPEED now in an external drive that blows FireWire away.

is plugged in, Windows will recognize it automatically.

You can use the Velocity either simply as an additional drive or with the included backup program, CMS Bounce-

Back Professional. BounceBack includes a disaster recovery option. If your PC's internal hard drive dies, you should be able to disconnect it and boot from the Velocity.

On our test, the Velocity needed 3 minutes 5 seconds to copy 3.4GB of data (in 14,152 files) from the internal hard drive. We ran the same test with the USB 2.0 Maxtor OneTouch drive, which took 12:23—four times as long. This one statistic is enough to make clear why the Velocity is very much worth considering if you need an external drive, whether to backup your system or simply to add more capacity.

CMS 80GB Velocity SATA Automatic Backup System

\$299 direct. CMS Products Inc., www.cmsproducts.com. ●●●●○

3 OPEN THE VICTIM'S AIRWAY

Open the victim's airway by tilting his/her chin gently with one hand, while pushing back on his/her forehead with the other hand. If you suspect a neck injury, put your fingers behind the jawbone just below the ear, and push the jaw forward to open the victim's mouth.



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Xerox-Branded Monitor a Mixed Bag

BY ALFRED POOR

Having a famous name is not enough to make a monitor a good value. The **Xerox XL572D**, a 17-inch LCD made by Proview Technology, costs \$100 more than many a 17-inch LCD monitor. It does offer some extras: built-in speakers and both analog and digital inputs. But at this premium price, you should expect better image quality than the XL572D delivers.

The monitor has a slim case, and the front-panel buttons are more legible than those on many competitors' monitors. The stand's tilt adjustment, however, has a limited range of motion. The built-in speakers sounded a bit thin but delivered adequate volume. We didn't see any defects in our evaluation unit; Proview offers



THIS XEROX-BRANDED monitor (by Proview) is no great shakes.

a replacement if yours has more than five problem pixels. The XL572D accepts both analog and digital signals and comes with a full complement of cables.

The auto-sync feature got

the image size, position, and clock timing correct for an analog signal connection. Color tracking was good, and the image didn't change significantly, even at wide viewing angles. Dark-gray response was inferior, however, with some shades appearing darker than the black background. Bands were visible in color ramps, and there was faint horizontal ghosting.

The monitor's premium price would be justified if its features or performance set it above the competition. Unfortunately, there are other monitors with similar features and better image quality than the XL572D.

Xerox XL572D

\$574 direct. Proview Technology Inc., www.xerox-displays.com. ●●●○○

Quick-Draw Monitor from BenQ

BY ALFRED POOR

LCD panels that have 12-millisecond response rates are beginning to appear on the market—a welcome development. It's a start toward combating the typical LCD monitor's inability to display moving television images without smearing. One of the first 12-ms models is the 17-inch **BenQ FP767-12**.

Aside from its fast pixel performance, the FP767-12 has typical features. It comes with a single analog connection and built-in speakers. The stand is sturdy; the panel tilts but does not swivel, and its height is not adjustable. One-button access lets you set auto-sync, brightness, contrast, and speaker volume; there's no mute button.

The fast pixel response produces noticeably less smear with moving images (games and DVD movies) than on other



FAST PIXEL RESPONSE makes this BenQ a good choice for DVDs.

monitors, but it doesn't eliminate problems entirely. Darker shades were not well distinguished, indicating that shadow details will be lost. Brightness was generally uni-

form, color tracking was good, and color ramps were smooth. A strong hue inversion showed up at viewing angles of about 50 degrees above the horizontal plane, and there was noticeable horizontal ghosting.

The FP767-12's fast pixel response is a plus, but the improvement is subtle or not discernible for typical office applications. More noticeable are the viewing-angle limitations, lack of subtle distinctions among darker shades, and ghosting, especially when working with photos. All things considered, most buyers will find it hard to justify spending an extra \$100 for this faster panel, with so many fine alternatives for about \$400 each.

BenQ FP767-12

\$510 street. BenQ America Corp., www.benq.com. ●●●○○

Princeton LCD17D

Pros: Both analog and digital connections, with all cables included.

Front-panel button for signal source selection.

Cons: Flawed image quality.

The built-in speakers are not very effective.

Bottom line: The Princeton LCD17D does not stack up well against the competition.

The image quality is below par, and other basic 17-inch monitors at similar prices are as good or better.

\$450 street. Princeton Digital (USA) Corp., www.princetongraphics.com. ●●●○○



Toshiba TLP-T70MU

Pros: A compact projector with dual remotes and XGA native resolution. Image quality is a strong point.

Cons: Noisy cooling fans.

Bottom line:

The TLP-T70MU is

a bright, no-frills projector designed to handle PowerPoint images well, and it comes at a reasonable price for an XGA model.

\$1,999 direct. Toshiba America Information Systems Inc., www.csd.toshiba.com. ●●●○○



NEC LT170

Pros: Good image quality from a lightweight projector. Clever design features include a tripod mount.

Cons: No remote mouse control. Marginal sound quality.

Bottom line: The XGA-resolution NEC LT170 delivers a brighter image than most sub-4-pound projectors, and the price is competitive.

\$2,450 list. NEC Solutions (America) Inc., www.necvisualsystems.com. ●●●○○



www.pcmag.com/displays

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When you're shopping for a monitor, a lot of brand names come to mind. But before you go out and buy one, consider this - a monitor is essentially a display panel, just like your television or cell phone screen. And the most advanced display technology on the market is TFTLCD. So the first thing you should decide is which brand of TFTLCD to ask for. And the most advanced TFTLCD out there is Wiseview™.

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SAMSUNG TFT-LCD



Print Photos and CDs for less

BY M. DAVID STONE

Epson seems to be on a crusade to make printing on CDs and DVDs a standard feature across all price ranges of ink jets. Witness the



Epson Stylus Photo R200, a \$100 (street) model with CD-printing features heretofore found only on \$300 models. The R200 produces very good photos and prints from standard business applications well enough to serve as your only printer, as long as you don't demand too much speed.

Physical setup is easy: Snap in each of the six ink cartridges and you're good to go. Printing on CDs is also a piece of cake: Flip the tray guide into place, load the CD tray into the guide, line up the arrows on the tray with the arrows on the guide, then print, using Epson's

PRINTING ON CDS has become affordable with the R200.

supplied software.

Compared with the printers we looked at in our November 11, 2003 issue, the R200 is faster than most for files that include photos but slower than most for just about everything else. Still, its overall time of 25 minutes 43 seconds is about on a par with other \$100 ink jets. Output quality was good to very good, with photos falling only a bit short of true photo quality.

The Epson Photo Stylus R200 is one of the better choices for a tight budget. It's certainly the only one in this price range that lets you print directly to printable CDs.

Epson Stylus Photo R200

\$100 street. Epson America Inc., www.epson.com.

OVERALL ●●●●○ [] ●●●●○
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Color Between the Lines

BY M. DAVID STONE

Personal color lasers sell for less than \$1,000, and midrange color lasers start at \$2,000, but the **HP Color LaserJet 3700n** closes the gap at \$1,599.99 (direct). Although not the perfect color laser printer, the 3700n offers a good mix of speed, output quality, and network features for small offices or workgroups.

Setting up on a network is also notable for its simplicity. HP's setup routine is one of the best, finding the printer on the network for you and handling the entire setup automatically.

The engine rating is only 16 pages per minute (ppm), but that goes for color as well as monochrome. On our performance suite, the printer handed in good though not outstanding times. It printed a 4-page PowerPoint document in 31 seconds, a 12-page text Word file in 1 minute, and a 2-page Word file (with photos,

text, and graphics) in 56 seconds.

Total time for our entire performance suite was 11 minutes 6 seconds. That's noticeably slower, of course, than high-end color lasers like HP's own color LaserJet 9500 (8:23). But it is also much better than all but one of the sub-\$1,000 printers we reviewed in our February 3, 2004, issue (the exception is the Oki C5100n, which took 6:55), making the 3700n's speed appropriate for its price.

Output quality was less than ideal but more than acceptable for most business purposes. Text was readable at 5 points and smaller for the majority of the fonts we test with. Photos rate as near-photo-quality but show a loss of subtle shading, as well as dithering (in the form of graininess). In graph-



THE 3700n is more affordable than midrange color lasers.

ics, we saw some posterization and dithering. Colors are fully saturated, though, leaving an overall positive impression, except, perhaps, to graphic artists and others with a trained eye.

HP Color LaserJet 3700n

\$1,599.99 direct. Hewlett-Packard Co., www.hp.com.

OVERALL ●●●●○ [] ●●●●○
 [] ●●●●○ [] ●●●●○

[] TEXT | [] GRAPHICS | [] PHOTO

HP LaserJet 3380 All-in-One

Pros: Good print speed and excellent text output. Very good scanning, faxing, and copying.

Cons: Graphics output shows obvious dithering.

Bottom line: A solid, easy-to-use laser MFP, the HP LaserJet 3380 All-in-One could be perfect for the budget-minded consumer who doesn't need color.

\$699 direct. Hewlett-Packard Co., www.hp.com.

OVERALL ●●●●○ [] ●●●●○
 [] ●●●●○ [] ●●●●○



Lexmark X422 MFP

Pros: Fast, excellent text output. Duplex printing works for both faxing and copying.

Cons: Maximum 600-dpi resolution.

Bottom line: High-speed printing and scanning, along with duplex capability for printed, faxed, and copied output are among the X422's attractions.

\$1,549 direct. Lexmark International Inc., www.lexmark.com.

OVERALL ●●●●○ [] ●●●●○
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Canon MultiPass MP390

Pros: Good to very good output quality. Prints photos directly from camera or memory card.

Cons: No automatic document feeder. Color copies had pink tinge in testing.

Bottom line: The Canon MultiPass MP390 prints, scans, faxes, and copies. Speed is at the low end of midrange, but output quality is good to very good. All of this makes the MP390 a reasonable choice.

\$200 street. Canon U.S.A. Inc., www.usa.canon.com.

OVERALL ●●●●○ [] ●●●●○
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A Virtual Room of One's Own

BY ROBERT P. LIPSCHUTZ

Companies using Web conferencing to cut travel costs can potentially save even more money using WiredRed's **e/pop Web Conferencing** software in-house, instead of using well-known managed services like WebEx. The product handles the most common Web conferencing scenario (giving a PowerPoint presentation) and a full range of other collaboration options, including application sharing, desktop sharing, remote control, and very high-quality video-conferencing.

We see a lot of potential here, but this introductory version does not yet have the usability or polish of WebEx. Also, companies will need to be aware of bandwidth requirements. Although e/pop uses bandwidth efficiently for video and other collaboration streams, a multiuser, video-rich conference may tax the Internet connection where the e/pop server resides.

The software divides users into three ranks: participants, presenters, and hosts. *Participants* can observe the conference, *presenters* can observe and use the sharing features, and the *host* rank adds the ability to expel users, end the conference, and change the rank and privilege status of other users.

Additionally, hosts can assign users any of three privileges: *control*, which lets a user change the page of the document that the other users are viewing; *look ahead*, which lets a user change pages in a document without changing the page the others are viewing; and *annotation*, which gives users access to the annotating tools.

Once you're in the conference, the actual user interface is flexible and innovative but

somewhat unintuitive. The participants can unlock windows so that videos, chats, and sharing windows can be put anywhere on the desktop. The trick is figuring out how to do it. First-time users will struggle, and some window glitches are still common.

We started out where most of you will, namely, sharing a PowerPoint presentation with a small group of remote participants. The look-ahead privilege lets



Initiating a Web conference and sharing a PowerPoint presentation is easy with e/pop, and the video quality is excellent.

presenters or participants skip forward or back to any slide in the presentation. In this release, only simple PowerPoint animations come across, however.

While the majority of PowerPoint-sharing sessions being done today take place with audio calls among participants, e/pop's superb videoconferencing should tempt users to show themselves as well. Unlike with other solutions we've used, the half-VGA (320-by-240) video images looked crisp and clean and were delivered at a broadcast-level 30 frames per second.

The document-sharing system lets all viewers see the

documents as they appear in a print preview mode—even if a viewer does not have the software that created the given document. A page selection toolbar simplifies movement between parts of the document.

Application and desktop sharing, typically extra-cost options with other services, are included with e/pop. While the application sharing itself worked well, and participants received the

highlighter were overly large (about the size of a 72-point font) and not configurable.

We experienced problems when attempting to use the text annotation features. Annotations are disconnected from the actual application or desktop, so it's difficult to tell exactly where an annotation will appear on the screen. For sideline text discussions, hosts can create a set of private chat channels, with each channel connecting to a different group of conference members.

You may be concerned about installation and configuration for a product like this, but you'll be done in 5 minutes with five mouse clicks. Creating a new ad hoc conference is equally easy. The host logs on to the server from a browser and creates the conference, then selects the desired audio, video, and privacy options.

Once the conference is ready to go, participants need only a Web browser, an e/pop applet download, and the conference URL. Missing from the list of e/pop features is a structured-invitation option that would let you (as WebEx offers) automatically send people e-mail invitations, including the URL and a password, if one is required.

Overall, e/pop Web Conferencing looks very promising. It is easy to install and maintain, offers a lower-priced Web conferencing solution, and has plenty of collaboration options. When the kinks are worked out, this could be the preferred approach for cost-conscious companies.

e/pop Web Conferencing
Five concurrent licenses, \$2,995 per year; site licenses available. WiredRed Software, www.wiredred.com.
●●●●○

Build Online Forms Easily

BY NELSON KING

Among a growing list of products that specialize in tools for gathering data over the Web, Quask's **FormArtist 3.2 Professional** stands out for its innovative use of graphics and overall ease. The creation software is in-

stalled on the designer's PC; he or she then uploads completed templates to any Windows or Unix Web server. Users enter data into the forms, and FormArtist stores the results as an XML document on the server. The collected data can be accessed on demand or sent via

e-mail to designated recipients.

Although strongly reminiscent of GUI designers for object-oriented programming, FormArtist makes it easy for anyone to create very effective (even flashy) forms. It's mostly a click-and-draw operation, plus filling in properties for the objects. For design impact the crown jewels are emoticons, Quask's unique use of a sequence of images to reflect rankings and evaluations. Given the use of color, images, and sound, the result can be some very impressive forms; used wisely, such touches encourage a higher return rate.

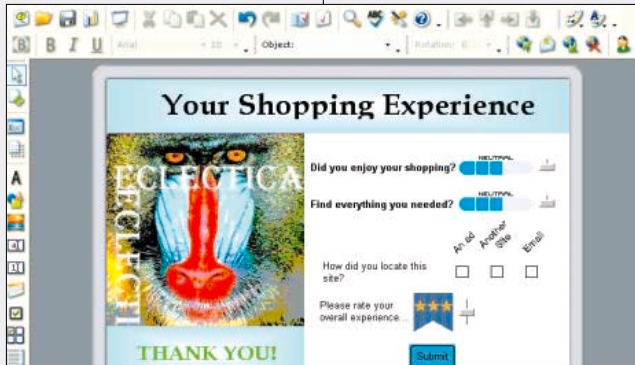
In general, FormArtist performs well, although the form loading may be slow on dial-up lines. But the form cannot be edited online after uploading to a server; it can only be

erased (with all the data downloaded) and then re-uploaded. And while Web surveys are highlighted as one of its many uses, FormArtist—unlike programs such as WebSurveyor, which emphasize the methods and jargon of surveys—is a data-entry forms generalist. It can accomplish important survey-type functions such as data validation, branching, and data piping, but only with scripting and some data management expertise.

FormArtist is a fine tool for beginners and those who want to create simple forms and surveys. The company's Presto version (\$49) includes the core tools but not the advanced database and data-export support of Professional. All versions offer the opportunity to be creative with forms.

FormArtist 3.2 Professional

Direct price: \$899. Quask Corp., www.quask.com. ●●●●○



Creative data entry and survey forms are easy to develop and use with Quask FormArtist 3.2 Professional.



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ENTERTAINMENT THAT TUNES INTO YOU

Digital entertainment at your command: That's the power that Microsoft Windows XP Media Center Edition 2004 brings to the home PC. From TV and movies to photos, video and music—all wrapped up in a power-packed PC—Media Center has you covered.

Digital Photos

My Pictures is a digital album for all of your pictures. Select a folder of pictures, edit and print using the remote, or view pictures as an automated slide show with optional transitions and background music.

Computing

It's a full Windows XP-based PC, so it can deliver e-mail, the Web and all traditional PC functionality.

Record, Pause and Rewind Live TV

Take complete control of your TV viewing experience. Personal Video Recording lets you pause live TV and record your favorite shows and series.

Remote

With the Media Center remote control, you can select and play your media, adjust the sound, and control your entertainment choices. With the Media Center START button (green button), one touch launches Media Center.

Digital Music

Find all your music in one centralized digital collection. Play radio or shuffle songs by play list, album, artist or genre. Full-screen visuals add excitement and fun.



FEEDBACK

“Whitelisting will not help beleaguered ISPs, but for the consumer it is a nearly perfect solution.”



LET'S DO BUSINESS

I just love it when the *PC Magazine* Editors' Choice is also our corporate choice. It validates our sourcing processes and makes your reviews our first stop when we investigate a technology. Case in point: "Better Corporate PCs" (April 6, page 112). I want to plug my PCs in and leave them alone until they are decommissioned. We've been buying IBM desktops ever since IBM decided to compete in the price arena.

One important aspect of this market is service. My staff used to spend hours or days being transferred all over the world, trying to get service from Dell. With our IBMs, I call a number and explain the problem in about 10 minutes, and then an IBM technician shows up at my office and fixes it. In my world of shrinking support budgets, spending a couple hundred dollars up-front for three years of support like that is a no-brainer.

NICK ALBU

SPAM AND MORE SPAM

Michael J. Miller too easily dismisses whitelisting and challenge/response programs as a solution to spam (Forward Thinking, April 6, page 5). First, he says the approach won't work for organizations that want to hear from potential customers. Why not? All a challenged sender has to do is fill out the short form—once—and the e-mail goes through. Big deal! No one is automatically blocked with no recourse.

Second, he says that the method is not ideal if you want automated mail. This is the biggest issue, minor though it is compared with the 200 spams I get every day. Simply, however, if you sign up for automated mail, or do a lot of business with places like Amazon.com, you either preapprove those domains or keep a close eye on your junk folder for the first few weeks until you have a feel for the automated mail you want. It's not perfect, but it's not terrible.

Whitelisting will not help beleaguered ISPs, but for the consumer it is a nearly perfect solution.

MARK E. SQUIRES

I'd like to suggest an idea that may work better than the solutions Michael J. Miller suggested. Pay a bounty for spammers. Base the bounty on spam volume: Bigger spammers bring bigger rewards.

How to Contact Us

We welcome your comments and suggestions.

When sending e-mail to Letters, please state in the subject line of your message which article or column prompted your response.

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MAIL Letters, *PC Magazine*, 28 East 28th Street, New York, NY 10016-7940.

All letters become the property of *PC Magazine* and are subject to editing.

We regret that we cannot answer letters individually.

Spammers have business partners, employees, suppliers, and friends. If those people are paid more for ratting them out than working for them, they'll force spammers to become one-person operations, which will automatically reduce spam volume.

Penalties should be harsh too, so the risk of criminal spamming will not be worth the cost of getting caught. Big computer companies, telcos, ISPs, and the government certainly have deep enough pockets. It's a public-interest issue, a commercial issue, and a criminal issue. I suspect a hefty bounty would cost less than the ineffective software that users are buying now. The same strategy could be used for virus writers.

RANDY GEORGI

OPEN YOUR IRIS

Our lab ran some analysis on the same four images you shared with us. Our results are different from the results detailed in the First Looks review of Readiris Pro 9 (February 3, page 34).

You mentioned that an excessive number of carriage returns was a reason Readiris Pro 9 scored very low. Deselecting *Merge Lines into Paragraphs* (the default setting) will make Readiris Pro 9 consider every line as an individual entity. Leaving the default value on will create a continuous text flow and would not have generated return symbols, thus yielding much better results in your testing.


Readiris Pro 9 was reviewed using settings different from the other solutions. When comparing Readiris using default settings, we found that results are at least comparable in performance and much faster. Moreover, for the sake of providing your readers with a fair examination, we believe it is important to explain that Readiris Pro 9 can perform raw data generation (the stance of the review), but it is more widely used for full-page document recognition, preserving original layout, table recognition, PDF creation, PDF conversion to text, multilingual recognition, HTML document creation, production OCR, and other tasks not mentioned.

JEAN-MARC FONTAINE, DIRECTOR OF SALES AND OPERATIONS, NORTH AMERICA, I.R.I.S. INC.

We tested the version of Readiris Pro 9 that I.R.I.S. provided to us, but we later learned that this was an early build that never shipped to customers. An anomaly in that version may have led to the carriage return errors, as a later build did not deliver those errors and yielded very good results. Our upcoming review of Readiris Pro 9 Corporate Edition will discuss OCR in a broader perspective.—Ed.

Corrections and Amplifications

■ A sidebar in our recent digital-camera roundup ("Digital Photography for Everyone," March 16) twice referred to an Olympus 300mm F2.8 Telephoto lens as a zoom lens. Although this telephoto lens does make distant images appear closer, it is a fixed-focus lens without any zoom capabilities.



cowboy

lasso



Visit www.ibm.com/pc/safecomputing periodically for the latest information on safe and effective computing. **Warranty Information:** For a copy of applicable product warranties, write to: Warranty Information, P.O. Box 12195, RTP, NC 27709, Attn: Dept. JDJA/B203. IBM makes no representation or warranty regarding third-party products or services. All offers subject to availability. IBM reserves the right to alter product offerings and specifications at any time, without notice. IBM is not responsible for photographic or typographic errors. *Prices do not include tax or shipping and are subject to change without notice. Reseller prices may vary. ¹Mobile Intel Pentium processors feature Intel SpeedStep[®] technology. With Intel SpeedStep, processor speed may be reduced to conserve battery power. ²11a, 11b and 11g wireless are based on IEEE 802.11a, 802.11b and 802.11g, respectively. An adapter with 11a/b or 11a/b/g can communicate on either or any of these listed formats respectively; the actual connection will be based on the access point to which it connects. ³Some software may differ from its retail version (if available) and may not include user manuals or all program functionality. Software license agreements may apply. ⁴For hard drive, GB = billion bytes. Accessible capacity is less; up to 4GB is in service partition. ⁵Includes battery and optional travel bezel instead of standard optical drive in Ultrabay bay, if applicable; weight may vary due to vendor components, manufacturing process and options. Thinness may vary at certain points on the system. ⁶Support unrelated to a



IBM recommends Microsoft®
Windows® XP Professional
for Business.

IBM ThinkPad R40

Distinctive IBM Innovations:

- Access Connections – Easiest wired and wireless connectivity
- IBM Embedded Security Subsystem 2.0™ – Strongest security as a standard feature

System Features:

- Intel® Centrino™ mobile technology
 - Intel Pentium® M processor 1.40GHz¹
 - Intel PRO/Wireless Network Connection 802.11b²
- Microsoft Windows XP Home Edition³
- 14.1" XGA TFT display (1024x768)
- 128MB DDR SDRAM⁴
- 20GB⁵ hard drive
- Ultrabay™ Plus CD-ROM
- IBM UltraNav™ – TrackPoint® and touch pad
- 1-yr system/battery limited warranty⁶

\$1,179*  NavCode 27229FU-M163

ServicePac® Service Upgrade:⁷
3-yr Depot Repair #30L9192 *132

NEW! IBM ThinkPad X40

Distinctive IBM Innovations:

- Rapid Restore™ – Push-of-a-button data backup and recovery
- IBM Active Protection System – Air-bag technology to help protect your ThinkPad

System Features:

- Intel Centrino mobile technology
 - Intel Pentium M processor ULV 1GHz
 - Intel PRO/Wireless Network Connection 802.11b
- Microsoft Windows XP Professional
- 12.1" XGA TFT Display (1024x768)
- 256MB DDR SDRAM⁴
- 20GB hard drive
- Integrated Gigabit Ethernet and modem
- Legendary IBM full-size keyboard⁸
- Only .94" thin⁹
- 2.7-lb travel weight¹⁰
- 1-yr system/battery limited warranty⁶

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IBM ThinkPad® R40

Distinctive IBM Innovations:

- IBM Embedded Security Subsystem 2.0¹ – Strongest security as a standard feature

System Features:

- Intel® Centrino™ mobile technology
- Intel Pentium™ M processor 1.40GHz²
- Intel PRO/Wireless Network Connection 802.11b³
- Microsoft Windows XP Professional⁴
- 14.1" XGA TFT Display (1024x768)
- 256MB DDR SDRAM⁵ • 20GB⁶ hard drive
- Integrated Ethernet and modem
- Ultrabay™ Plus CD-RW/DVD-ROM combo
- IBM UltraConnect™ Antenna for increased signal strength⁷
- 1-yr system/battery limited warranty⁸

\$1,279* ☐ NavCode 289793U-M163

ServicePac® Service Upgrade:¹¹
3-yr Depot Repair
#30L9192 *132

IBM ThinkPad R40

Distinctive IBM Innovations:

- Rapid Restore™ – Push-of-a-button data backup and recovery

System Features:

- Intel Centrino mobile technology
- Intel Pentium M processor 1.50GHz
- Intel PRO/Wireless Network Connection 802.11b
- Microsoft Windows XP Professional
- 15" SXGA+ TFT Display (1400x1050)
- 256MB DDR SDRAM⁵ • 60GB hard drive
- Integrated Ethernet and modem
- Ultrabay Plus CD-RW/DVD-ROM combo
- IBM UltraNav™ TrackPoint⁹ and touch pad
- 1-yr system/battery limited warranty⁸

\$1,679 ☐ NavCode 2897GAU-M163



IBM ThinkPad T41

Distinctive IBM Innovations:

- Access IBM – IBM help at your fingertips
- IBM Active Protection System – Air-bag technology to help protect your ThinkPad

System Features:

- Intel Centrino mobile technology
- Intel Pentium M processor 1.40GHz
- Intel PRO/Wireless Network Connection 802.11b
- Microsoft Windows XP Professional
- 14.1" XGA TFT Display (1024x768)
- 256MB DDR SDRAM⁵ • 40GB hard drive
- Integrated Gigabit Ethernet and modem
- Ultrabay Slim CD-RW/DVD-ROM combo
- IBM UltraConnect Antenna for increased signal strength
- Only 1" thin¹⁰ • 4.5-lb travel weight¹⁰
- 1-yr system/battery limited warranty⁸

\$1,679 ☐ NavCode 23780HU-M163

With Microsoft Office Small Business Edition 2003:¹² \$1,919

ServicePac® Service Upgrade:
2-yr Onsite Repair/9x5/Next Business Day Response
#30L9189 *197

IBM ThinkPad T41

Distinctive IBM Innovations:

- IBM Active Protection System – Air-bag technology to help protect your ThinkPad

System Features:

- Intel Centrino mobile technology
- Intel Pentium M processor 1.60GHz
- Intel PRO/Wireless Network Connection 802.11b
- Microsoft Windows XP Professional
- 14.1" SXGA+ TFT Display (1400x1050)
- 256MB DDR SDRAM⁵ • 40GB hard drive
- Ultrabay Slim CD-RW/DVD-ROM combo
- Integrated Gigabit Ethernet and modem
- IBM UltraConnect Antenna for increased signal strength
- Only 1" thin • 4.5-lb travel weight
- 3-yr system/1-yr battery limited warranty⁸

\$1,939 ☐ NavCode 2379DUU-M163

With Microsoft Office Small Business Edition 2003: \$2179

ServicePac® Service Upgrade:
5-yr Onsite Repair/9x5/Next Business Day Response
#69P9200 *449

NEW! IBM ThinkPad X40

Distinctive IBM Innovations:

- Rapid Restore – Push-of-a-button data backup and recovery
- IBM Active Protection System – Air-bag technology to help protect your ThinkPad

System Features:

- Intel Centrino mobile technology
- Intel Pentium M processor ULV 1GHz
- Intel PRO/Wireless Network Connection 802.11b
- Microsoft Windows XP Professional
- 12.1" XGA TFT Display (1024x768)
- 256MB DDR SDRAM⁵
- 20GB hard drive
- Integrated Gigabit Ethernet and modem
- Legendary IBM full-size keyboard
- Only .94" thin
- 2.7-lb travel weight
- 1-yr system/battery limited warranty⁸

\$1,499 ☐ NavCode 23861CU-M163

ServicePac® Service Upgrade:
3-yr Depot Repair
#30L9192 *132

NEW! IBM ThinkPad X40

Distinctive IBM Innovations:

- Longest standard battery life of any leading brand notebook¹³

System Features:

- Intel Centrino mobile technology
- Intel Pentium M processor LV 1.20GHz
- Intel PRO/Wireless Network Connection 802.11b
- Microsoft Windows XP Professional
- 12.1" XGA TFT Display (1024x768)
- Intel Extreme graphics
- 256MB DDR SDRAM⁵
- 40GB hard drive with IBM Active Protection System
- Integrated Gigabit Ethernet and modem
- Legendary IBM full-size keyboard
- 7.5-hr Li-Ion battery¹⁴
- 3.2-lb travel weight
- 1-yr system/battery limited warranty⁸

\$1,749 ☐ NavCode 23866GU-M163

ServicePac® Service Upgrade:
4-yr Depot Repair
#69P9195 *249

NEW! IBM ThinkPad X40 Solution Pack

Distinctive IBM Innovations:

- Access Connections – Easiest wired and wireless connectivity

System Features:

- Intel Centrino mobile technology
- Intel Pentium M processor ULV 1GHz
- Intel PRO/Wireless Network Connection 802.11b
- Microsoft Windows XP Professional
- 12.1" XGA TFT Display (1024x768)
- 256MB DDR SDRAM⁵
- 20GB hard drive
- 2.7-lb travel weight
- 1-yr system/battery limited warranty⁸

Accessories Included:

- UltraBase™ X4 media slice
- Ultrabay Slim CD-RW/DVD-ROM combo

\$1,799 ☐ NavCode 23861ZU-M163

ServicePac® Service Upgrade:
3-yr Onsite Repair/9x5/Next Business Day Response
#30L9195 *243

NEW! IBM ThinkPad X40 Solution Pack

Distinctive IBM Innovations:

- Longest standard battery life of any leading brand notebook

System Features:

- Intel Centrino mobile technology
- Intel Pentium M processor LV 1.20GHz
- Intel PRO/Wireless Network Connection 802.11b
- Microsoft Windows XP Professional
- 12.1" XGA TFT Display (1024x768)
- 256MB DDR SDRAM⁵
- 40GB hard drive
- Integrated Gigabit Ethernet and modem
- 7.5-hr Li-Ion battery
- 3-yr system/1-yr battery limited warranty⁸

Accessories Included:

- UltraBase X4 media slice
- Ultrabay Slim CD-RW/DVD-ROM combo

\$2,199 ☐ NavCode 23826UU-M163

ServicePac® Service Upgrade:
4-yr Onsite Repair/9x5/Next Business Day Response
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(Monitor not included)



(Monitor not included)



(Monitor not included)

IBM ThinkCentre™ A50p

Distinctive IBM Innovations:

- Rapid Restore Ultra – Push-of-a-button data backup and recovery

System Features:

- Intel® Pentium® 4 Processor with HT Technology 2.80GHz
- Microsoft Windows XP Professional
- 256MB DDR SDRAM*
- 40GB hard drive • CD-RW
- Integrated 10/100 Ethernet
- Norton AntiVirus™ (2003 OEM Edition)
- Lotus® SmartSuite® Millennium license
- 1-yr limited warranty with limited onsite service**

\$789

NavCode 843398U-M163

With Microsoft Office Small Business Edition 2003: \$1,029

ServicePac® Service Upgrade:†
2-yr Onsite Repair/9x5/Next Business Day Response
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IBM ThinkCentre A50p

Distinctive IBM Innovations:

- Rapid Restore Ultra – Push-of-a-button data backup and recovery

System Features:

- Intel Pentium 4 Processor with HT Technology 2.80GHz
- Microsoft Windows XP Professional
- 256MB DDR SDRAM*
- 40GB hard drive • CD-RW
- Intel Extreme Graphics 2
- Integrated 10/100 Ethernet
- Norton AntiVirus (2003 OEM Edition)
- Lotus SmartSuite Millennium license
- 3-yr parts/1-yr limited onsite service limited warranty**

\$859

NavCode 843298U-M163

With Microsoft Office Small Business Edition 2003: \$1,099

ServicePac® Service Upgrade:
3-yr Onsite Repair/9x5/4-hr Response
#41L2732 *229

IBM ThinkCentre M50

Distinctive IBM Innovations:

- Rapid Restore Ultra – Push-of-a-button data backup and recovery

System Features:

- Intel Pentium 4 Processor with HT Technology 2.80GHz
- Microsoft Windows XP Professional
- 512MB DDR SDRAM*
- 40GB hard drive • CD-ROM
- Gigabit Ethernet-integrated
- Norton AntiVirus (2003 OEM Edition)
- Lotus SmartSuite Millennium license
- 3-yr limited warranty with limited onsite service**

\$1,049

NavCode 8187EJU-M163

With Microsoft Office Small Business Edition 2003: \$1,289

ServicePac® Service Upgrade:
4-yr Onsite Repair/9x5/Next Business Day Response
#69P9161 *89

IBM ThinkCentre M50

Distinctive IBM Innovations:

- Rapid Restore Ultra – Push-of-a-button data backup and recovery

- IBM Embedded Security Subsystem 2.0 – Strongest security as a standard feature

System Features:

- Intel Pentium 4 Processor with HT Technology 3.0GHz
- Microsoft Windows XP Professional
- 512MB DDR SDRAM*
- 40GB hard drive • DVD-ROM
- Intel Extreme Graphics 2
- Gigabit Ethernet-integrated
- Norton AntiVirus 2003 OEM Edition
- Lotus SmartSuite Millennium license
- 3-yr limited warranty with limited onsite service**

\$1,069

NavCode 8187F4U-M163

With Microsoft Office Small Business Edition 2003: \$1,309

ServicePac® Service Upgrade:
3-yr Onsite Repair/24x7/4-hr Response
#41L2740 *159

IBM ThinkCentre S50

Distinctive IBM Innovations:

- The smallest IBM desktop without compromise: 62% smaller than a standard IBM desktop

System Features:

- Intel Pentium 4 Processor with HT Technology 2.80GHz
- Microsoft Windows XP Professional
- 512MB DDR SDRAM*
- 40GB hard drive • CD-ROM
- Gigabit Ethernet-integrated
- Lotus SmartSuite Millennium license
- 3-yr limited warranty with limited onsite service**

\$1,079

NavCode 818336U-M163

With Microsoft Office Small Business Edition 2003: \$1,319

ServicePac® Service Upgrade:
4-yr Onsite/9x5/4-hr Response
#69P9162 *250

IBM ThinkCentre S50

Distinctive IBM Innovations:

- The smallest IBM desktop without compromise: 62% smaller than a standard IBM desktop
- IBM Embedded Security Subsystem 2.0 – Strongest security as a standard feature

System Features:

- Intel Pentium 4 Processor with HT Technology 3.0GHz
- Microsoft Windows XP Professional
- 512MB DDR SDRAM*
- 40GB hard drive • DVD-ROM
- Intel Extreme Graphics 2
- Gigabit Ethernet-integrated
- Norton AntiVirus 2003 OEM Edition
- Lotus SmartSuite Millennium license
- 3-yr limited warranty with limited onsite service**

\$1,119

NavCode 818343U-M163

With Microsoft Office Small Business Edition 2003: \$1,359

ServicePac® Service Upgrade:
3-yr Onsite/9x5/4-hr Response
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IBM ThinkPad Accessories

Tripp Lite Traveler portable surge suppressor
#22P7141 *12

Targus Deluxe Mobile Essentials Kit
#22P7437 *60

ThinkPad Premiere Leather Carrying Case†
#10K0209 *99

ThinkPad 72W AC/DC Combo Adapter
#22P9010 *99

ThinkPad Port Replicator II
#74P6733 *179

IBM ThinkCentre Accessories

IBM Portable 40GB USB 2.0 Hard Drive with Rapid Restore
#09N4255 *299

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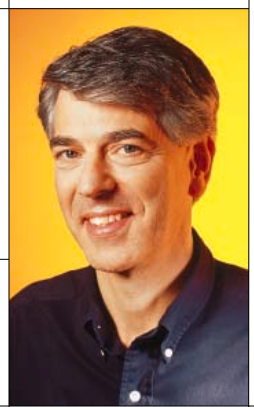
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Bill Machrone



Interface Disappointments and Delights

You'd think that good user interfaces would be a foregone conclusion—and that by now everyone would know the difference between a good one and a bad one. Sadly, nothing could be farther from the truth. I have just finished reviewing the 13 personal music players starting on page 104, and the gross shortcomings of many of these devices continue to astound me. The review covers small, on-the-go players; the Apple iPod Mini is among the heavier devices. It is also the hands-down winner.

The user interface brought the contest down to the iPod versus everything else. And this is what I find so astonishing: The iPod has been around since late 2001, and has had its interface praised to the heavens for all that time, yet when you look at the vast majority of other products, you would think that they'd been created in some iPod-less parallel universe. It's not that they should imitate Apple, but there's a lot they should learn from the recognized leader.

The user interface for consumer electronic devices has two dimensions: the physical implementation on the device and the software behind it. The buttons, knobs, and switches all make up the physical aspect, and they tell the software what to do. A button or switch has a cycle time: the time required to depress it, the time for you to recognize that it's been actuated, and the time to release it. A well-designed switch should balance travel, effort, and physical feedback. You can't provide input any faster than the switch's cycle time, and when the switch is used for scrolling through menus, the stage is set for UI disaster.

By contrast, the Synaptics scroll wheel on the iPod (the same technology that is in many laptop touch pads) responds at human speed. It is what makes the mouse so successful: Things happen at the rate you determine. There's no cycle time, no waiting for feedback, no pressing twice because you're not sure whether the device "heard" you. I found there is tremendous variability in switch quality, too. Some switches were crisp and well defined, while others were mushy, sad excuses for input devices; the worst you can say about the Synaptics pad is that it sometimes won't respond to a guitar-callused fingertip.

A circular touch pad is not a requirement for

interface success; you can navigate with a rocker button or pseudo-wheel (which looks like a wheel but only rocks back and forth). A true wheel, however, is far superior. In fact, the iPod owes a huge debt of gratitude to the original Diamond Rio 500, an MP3 player that was introduced way back in 1999, which had a multifunction wheel on the side. The wheel scrolled through menus, changed volume, selected options, and generally made the Rio a pleasure to use. Apple then took the interface much farther, but the now-ancient Rio still outperforms the many devices that use pseudo-wheels instead of the real thing.

The other half of the equation is the software. What forces of evil could so cloud the minds of the designers that they would put the volume controls down a level from the main menu? Have they never actually used a music player? Such a design gaffe is inexcusable.

Also, some of the players use sluggish microcontrollers—or poorly written software—so that you experience a small delay between the time you press a control and the time it actually takes effect. In this day of fast microcontrollers with sophisticated power conservation and interrupt-driven schemes, this too is inexcusable. It's a source of user error and annoyance.

I was also astounded that a number of the players wouldn't let you change so much as your tone equalization settings without halting music play. If the Rio didn't do this five years ago, why do designers think that consumers should put up with it now? And the Rio let you navigate to other songs while your current selection continued to play. So why are so many of today's players incapable of performing this feat? I find it mind-boggling that apart from storage capacity, a five-year-old player would outperform many of the current products in our roundup.

Of course, there are standout exceptions. iRiver has done a terrific job with user interfaces, and that company's products, including the player I tested, are generally a delight to use. I wish every company would challenge and extend the state of the art—or at least meet it.

You would think that most of these personal music players had been created in some iPod-less parallel universe.

MORE ON THE WEB: You can contact Bill Machrone at Bill_Machrone@ziffdavis.com. For more Extreme Tech columns, go to www.pcmag.com/machrone.

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John C. Dvorak



The Looming Legal Threat to Wi-Fi

To drive around looking for connections to open wireless access points is called *wardriving*. In Canada, people who are caught doing this can be arrested for stealing bandwidth. The legality of this practice in the U.S., however, is a bit hazy, and there are many mitigating factors. One is that several organizations deliberately leave access points unencrypted so that people can use them as necessary. Also, many computers with built-in wireless simply grab the first signal they detect. Then there's the trespassing issue: The wardriver isn't trespassing on the router, the router is trespassing on the wardriver's airspace.

FREE ACCESS

This issue was brought home to me recently when one of my laptops told me it was ready to install new Windows XP upgrades, even though the laptop was not on a network and my wireless access point was off-line. I discovered that a neighbor's wireless router, named "default," had provided the access. Using my Toshiba's View Wireless Connections option, I saw five nearby networks that I could grab, three of which were unencrypted. Obviously there's plenty of free access around for harried travelers. It seems to me that being able to download your e-mail at an open connection is a good thing.

Look into the legality of this, though, and you hear vague comments like "The FBI doesn't know how legal it is" or "It may be illegal, because you're using someone else's connection or you're spying on their network." This issue will create ridiculous legal problems, which is bad news for both consumers and law enforcement, unless a sensible, national policy can be developed.

PERSONAL AND CORPORATE RESPONSIBILITY

Let me jump in and propose a simple, logical public policy. Law enforcement doesn't need to get involved whenever some guy in a doughnut shop poaches a nearby Wi-Fi connection to check his e-mail, thinking he's on the shop's network. This shouldn't be a crime, even if he's intentionally poaching. We must put the burden of responsibility on the broadcaster, not the end user. It has to be made clear that people sending open connections all over town should be responsible for them.

Here's what I propose: Once a wireless signal leaves private property, it becomes public domain. If the person transmitting the signal wants it protected, then encryption is up to him or her. If someone beams an Internet connection into my home and I happen to lock onto the signal, he is trespassing on me, not the other way around. Public policy must reflect this logic. Keep it out of my house if you don't want me using it. Keep it out of my car. Keep it away from me in public places.

THE PUBLIC INTEREST

This policy makes sense because it lets anyone who wants to provide open access do so without hassle or fear. Groups in San Francisco and Seattle are openly promoting free 802.11 connectivity. Many coffee shops, restaurants, and community groups now provide free wireless access, and directories of these hot spots are easy to find online.

This ubiquity of access is to be encouraged as in the public interest. But it can't happen if the law doesn't make the person transmitting the 802.11 signal responsible, instead of blaming any roaming users who are simply grabbing open connections. If this means that a corporate network is wide open to hackers, because the company doesn't bother encrypting the signal it broadcasts all over town, then so be it.

We must not follow the Canadian model that views using unprotected 802.11 connections as bandwidth theft. My computer grabs wireless signals impinging on my house more often than it grabs my own 802.11 connection. It just does. Agencies shouldn't be required to sort this out; it would be a law enforcement nightmare. In fact, it's in the public interest to discourage law enforcement intervention in this area, or I could be arrested for accidentally connecting to another person's router, when I didn't want to connect to it in the first place. That's ridiculous. I'm sure that no cops want to get involved in this mess either.

If you feel as strongly about this as I do, send this column to your Congressperson and tell him or her what you think. Together, we can make a difference if we speak up early.

MORE ON THE WEB: Read John C. Dvorak's column every Monday at www.pcmag.com/dvorak. You can reach him directly at pcmag@dvorak.org.

Law enforcement doesn't need to get involved whenever some guy in a doughnut shop poaches a nearby Wi-Fi connection to check his e-mail.

Lost at C:\

"When I invented the disk drive,
I never imagined not being able
to find my stuff!"

Al Shugart

Seagate Founder & Hard Disk Drive Innovator
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Inside Track

Microsoft's Plan to Take Over the World Dept. (I thought it already had!): Microsoft buys Connectix for the Linux IP to facilitate moving Office Suite to Linux, then develops a Microsoft version of Linux called MS-Linux. Paying for MS-Linux buys you support; the code is free. Microsoft then releases Office for Linux, which it supports for all Linux implementations for a while, but then it retreats and supports only Office for MS-Linux.

The company begins to complain that Office for Linux is subpar, because the OS itself won't let certain things work as well as they do in Windows. Becoming an open-source supporter doesn't mean Microsoft won't **bad-mouth all open-source** products.

The company will be a Linux vendor long enough for Bill Gates to say, "We know this product inside and out, and it's not as good as we hoped," and go on about how the company had embraced Linux, thinking it would take the pressure off Microsoft regarding Windows and the "neat" things Windows does. The final straw will be the abandonment of Linux with a lot of hoopla. Then the company will finance a slew of "Why Is Linux Dead?" articles. You watch.

Amiga Not Dead Yet Dept.: When I wrote about the MorphOS initiative, essentially a **clean-room redesign** of the Amiga OS for the PowerPC, I failed to mention that there is still a lively **pure-Amiga** crowd that is developing a new OS for a PowerPC iteration of the original Amiga. OS4's implementation should modernize and perhaps revitalize the platform. A competition between these two camps could be the best thing to happen to desktop computing in decades.

Sounds like Amiga Dept.: If you want to check out a new concept for a memory dongle, get the Forward Solutions **Migo device** (www.Amigo.com), probably the first real dongleware out there. Though it appears to be a USB memory fob, the Migo is actually a sync system that creates one or many virtual computers. When you sync it to your desktop machine, it turns any computer you connect it to into a miniclone of your desktop, complete with your layout, wallpaper, and so on.

The Migo uses the resources of the slave machine to give you the impression that you're at your own desk. This includes **full mail synchronization** of all your Outlook files, an extremely useful function for Outlook users, though I wish it supported other clients. The 256-MB version sells for about \$140; I highly recommend it.

Ever since Tektronix introduced the first **Phaser printer**, many of us have stood in awe as this somewhat alien technology evolved. It is essentially an offset printer, using solid inks, that pretends to be a



The final straw will be the abandonment of Linux with a lot of hoopla.

laser printer. It still produces one of the **cheapest color pages** you can print. Moreover, it's quite different from either a laser or an ink jet.

After Xerox—the inventor of the basic laser printer technology—bought the Tektronix printer division, I assumed it would abandon this unusual technology. To its credit, the company did not, but years passed with such minor changes that I wondered whether the Xerox team would ever do anything new.

Enter the Xerox 8400. This is a **marvelous device**. It's remarkably quiet; the mechanics are new; it's faster; it holds more paper and is a lot cheaper, at less than \$1,000. It's probably the best network printer for the money, and it's still available as a full-duplex model (which prints on both sides of the paper, though that version costs more). Although it still has the same silhouette, there are some **hot-looking** new design elements.

E-Mail Blues Dept.: Have you noticed the effectiveness of e-mail waning? People give you temporary addresses they never use, or they only pick up their e-mail randomly and then criticize you for using the wrong box. Some legitimate mail is **stopped by their spam filters**, not to mention the silly use of blacklists. If I were in the e-mail business, this would concern me. Comeback for MCI Mail, perhaps?

Changing the Subject Dept.: The most interesting piece of engineering in Europe must be the Eurostar train and the so-called Chunnel. The ride under the English Channel takes **20 minutes flat** in the high-speed train (300 km/hr or about 186 mph). Although the train is a marvel, the computerized booking and ticketing system went down as I tried to change my reservation. The woman there said it **goes down all the time**, for anywhere from 5 to 30 minutes.

A friend in the news department at MSNBC Europe said that **IT in Great Britain is dreadful**. As the country was known for IT, especially out of Manchester, maybe some reader can enlighten me as to how it deteriorated.

As I write this, I'm floating around Europe and finding a lot of **open 802.11** connections, especially in London. There are a few on the continent, but you mostly find large, pay-as-you-go systems, many set up by Swiss Telecom, that cost upwards of \$10 an hour. Their big allies, it seems to me, are the spammers. On the road, you get so much spam that you need a high-speed connection to get your e-mail in a reasonable time. Cutting the acceptable message size to 5-8K helps a little. This morning, I found 650 messages in my e-mail box; about 10 of them were not spam.

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Bill Howard



The Bang-for-the-Buck Axiom

Tax refund time is here, and I've been bombarded with queries from friends and neighbors itching to buy a new PC, notebook, digital camera, or HDTV. The savvy ones ask not only what to buy but also whether any major changes are in the offing before year's end that would make them wish they'd waited.

Almost as inviolate as Moore's Law, if not as famous, my Bang-for-the-Buck Axiom holds that your wallet does best when you identify the highest-performance components, then back off one or two levels. Intel's flagship Pentium 4 at 3.4 GHz runs \$400 to \$1,000 (if you buy the chip by itself). Drop back to 3.0 or 2.8 GHz and you're looking at a \$200 CPU—half the price for fractionally less performance. Who really needs the fastest CPU? Gamers, serious video editors (home or professional), and graphic artists will benefit. If you're retouching a photo from a 4-megapixel camera in Adobe Photoshop Elements, sorry, that's no reason to go all out.

If you must have a fast PC, the shorthand search term is *gamers'* PC, no matter what your intended use. A fast hard drive is a fast hard drive. The low end of the gamer spectrum is about right for most people's high end. Just stay away from plastic-window side panels and neon lights; what you wouldn't bolt to the underside of your car shouldn't adorn your PC.

If you have any interest in multimedia, look for a PC with Windows XP Media Center Edition—though the TV tuner probably won't be all that hot. (Sony PCs are an exception.)

Oddly, Windows XP MCE costs PC makers a bit less than the Windows XP Pro it's based on. You usually get a bay with flash card readers in front—great for off-loading pictures from your camera—and FireWire ports whose importance has peaked, but they're still the way to off-load video from a DV camera. If you can find a cheap (sub-\$1,000) MCE PC with a quiet cooling fan (good luck!), that's the most idiot-proof way to replace your multihundred-disc CD changer, because rights-managed media files generally don't play across digital audio hubs. They do on MCE PCs.

DVD burners are now cheap enough that you should buy one instead of DVD/CD-RW. For 30GB to 50GB DVD successors, don't worry about the format wars between HD DVD (NEC, Toshiba) and Blu-ray

(Philips, Sony, and everyone else); whichever format succeeds the DVD is still a couple years away from being mainstream. You should sidestep the current DVD-RW-versus-DVD+RW problem and buy a multidrive (DVD±RW) that supports both. HP won't sell you a PC with a DVD multidrive, just as Sony won't sell you a PC with SD as part of the array of flash card sockets, so you need to think hard before buying one of those brands, regardless of how good they are otherwise.

If your goal is never to have to open your PC's case, then buy a 200GB hard drive (preferably SATA), get 1GB of RAM (not 512MB, and never 256MB), and Gigabit Ethernet. For those who want an alternative to a Sony PC, the ATI 9800 series is the current hot ticket among TV-tuning graphics cards. At the least, get a graphics card with TV-out capacity so you can make the TV part of a media player.

The only technology on the horizon that could make you wish you'd held off on a mid-2004 purchase is PCI Express, a faster bus standard for desktops and notebooks. ExpressCard, the PCI Express successor to the PC Card, will not kill off the PC Card overnight, no matter what backers say. (A PC Card is fast enough for most things, and it just plain works.) Most notebooks will have one of each this year and probably next. Intel will have a 64-bit mainstream (so to speak) CPU later this year, but in case you can't wait, the AMD Athlon 64 matches or beats a P4 Extended Edition CPU for a lot less money.

If I were to splurge on anything, I would pay \$1,000 for a 19- or 20-inch LCD monitor at high resolution (1,600-by-1,200). Stick with the standard 4:3 aspect ratio for now.

Broadly speaking, most high-tech categories will be stable this year: printers, displays, portable music players, camcorders (HD is still too pricy.) The one exception is HDTV, where you may want to wait till late 2004 for integrated cable cards in the TVs to replace those clunky set-top boxes. Perhaps we'll have a solution for moving protected content between HDTV, HD DVR, and DVD players sometime in 2005.

If I were to splurge on anything, I would pay \$1,000 for a 19- or 20-inch LCD monitor at high resolution.

MORE ON THE WEB: You can contact Bill Howard directly at bill_howard@ziffdavis.com. For more On Technology columns, go to www.pcmag.com/howard.

SOLUTIONS

MAKING TECHNOLOGY WORK FOR YOU

Cool Camera Projects

Digital cameras open up a whole new world of photo possibilities. **BY DAVID CARDINAL**

You probably bought your digital camera to record holiday celebrations or send photos of your family to dotting relatives. Or maybe you have it just for work and haven't found much other use for it. But no matter what you use your camera for, chances are that you've tapped only a few of its possibilities. In this article we'll give you some ideas of what else you can do with your digital camera for fun and possibly for profit.

GO FLY A KITE

When we first heard about kite aerial photography (KAP), we thought the concept was science fiction. But the truth is, with a bit of effort almost anyone can fly a camera (Figure 1) and rig it to take images from the sky (Figure 2). You'll need a kite large enough to lift your camera, a bracket to hold the camera on the kite while allowing it to pivot and stay level, and a system for remotely releasing the shutter—normally either the remote system from a model airplane or a standard wireless camera-triggering mechanism. You can also use the servos from a remote-control kit to aim the camera once it is in the air.

A basic KAP rig for a point-and-shoot camera can be

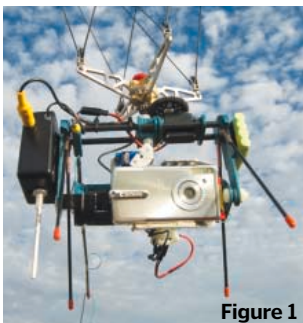


Figure 1

UP AND AWAY: Fly your camera from a kite to get amazing aerial photos.



Figure 2

built for as little as \$400. Rigs that can support larger cameras or add wireless video for helping compose your images can cost considerably more. There aren't any off-the-shelf solutions large enough to support digital cameras, so you'll need to do some work yourself, but you can find plenty of background information and instructions at <http://arch.ced.berkeley.edu/kap/kapoc.html> and lots of helpful advice in the rec.kites newsgroup. In particular, you'll want to make sure you use an extra-long tail for stability and practice your takeoff and landing techniques with a bean bag before risking your digital camera in the air.

Santa Cruz sports photographer Pete Burnight took the attached beach volleyball photo with a Nikon Coolpix from a rig he built—similar to Chris Benton's rig, which is pictured here.

SELL ON EBAY

By now everyone knows something about how to sell on eBay. But did you know that items with appealing images sell for more? Research shows that quality photos do make a difference. Meanwhile, like most of



Figure 3

Figure 4



Figure 5



Figure 6



IT'S ALL IN THE PRESENTATION: Quality images help to ensure the success of your eBay auctions.

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Bayesian filters
help block spam.

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Open-source vs.
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Figure 7



Figure 8

GO FISH: Create new effects shooting by candlelight or flashlight.

us, you're probably not sure how to take a good-looking photograph of that piece of jewelry or household appliance you have for sale. After all, professionals use lighting studios costing thousands of dollars.

Take heart: It isn't that hard. For a few dollars you can build a simple "studio" from a sheet of neutral white plastic attached to PVC pipe (**Figure 3**), which can greatly improve your product photographs. And now there are prebuilt "mini-studios" like the Photek Digital LightHouse (www.photekusa.com) that do the same thing, can be stored easily, and cost less than \$100 each. The key requirements are having an even background, both below and behind your item, and lighting it evenly, either with natural sunlight through a window or with diffused work lights. If you have a small tripod or a tripod with a reversible center column, that can help you compose your shots better and let you use lower shutter speeds. Any digital camera with a custom white balance can do an excellent job.

We used a Nikon Coolpix 4300 on Automatic to take these images. The only setting we had to adjust was the white balance, which we preset based on the scene—easy enough with the 4300's menu system.

Figure 4 shows a typical eBay product shot: a model train on a table. In **Figure 5** you can see the difference a simple tabletop studio can make. But you can make your images even more striking, as **Figure 6** illustrates. To create a dramatic effect like this,

you first need to add plenty of extra lighting on your subject, so that it is very bright compared with the background. Then manually set the exposure on your camera so the subject appears normally exposed, and the background will fade to black.

SHOOT SMALL

Digital cameras can focus very tight and shoot in low light. This makes all sorts of new photographic opportunities possible. You can create attractive images using a flashlight or even candles. Experiment with the white-balance setting on your camera to explore the creative potential of this approach.



Figure 9

Wildlife photographer Moose Peterson is also an avid fly fisherman and always on the lookout for fresh ways to showcase his fishing flies. Using the close focus of his digital camera and a triple-A Maglite flashlight as the only light source, he was able to create artistic images (**Figure 7**) that showed off his flies well enough for him to sell the pictures to fly-fishing companies.

As you can see in **Figure 8**, all he used was an artful arrangement of fishing items and the hand-held light.

FOR THE BIRDS

Bird photography has traditionally been reserved for those who could afford expensive cameras and even more expensive fast telephoto lenses. But with digital technology, all you need to take excellent photographs of birds is a fairly good camera, a spotting scope, and a simple adapter to hold them together. Essentially you're combining the magnification of your scope with that of your camera, allowing you to take impressively sharp pictures from considerable distances. The technique is called *digiscoping*.

The only major limitation of digiscoping compared with more expensive photo outfits is the much slower shutter speeds, as the spotting scope doesn't pull in as much light as a fast telephoto lens. As a result, digiscoping is best used for

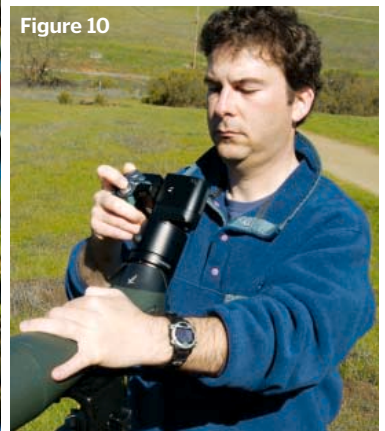


Figure 10

ZOOM IN: Get next to nature with a scope and camera.

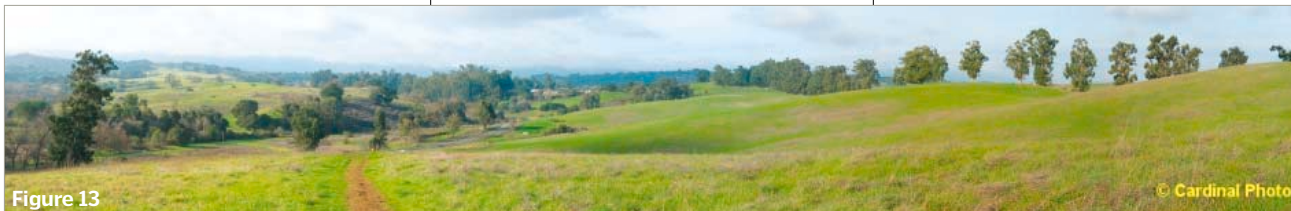


Figure 13

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birds who are perched or standing still. You won't be able to get great flight shots, but you can certainly get compelling images of a bird on a nest or waiting patiently for prey. You can hold your camera up against the scope's eyepiece, as we did to get the image of a great blue heron shown here (Figure 9), but you're much better off with an adapter you can screw or clamp onto your scope, like the one we show attached to a Nikon Coolpix 4500 and a Swarovski Optik scope (Figure 10).

If you get an adapter designed to go over your scope's eyepiece, you'll be able to use the scope when you don't have the camera mounted. You get the best quality, however, if you buy an eyepiece designed specifically for digiscoping.

Because this is an unusual application, it may take a little research to find the combination that will work for you. You can find an excellent selection of adapters for digiscoping and telescope connection at ScopeTronix (www.scopetronix.com), along with a configuration wizard to help you learn what you need. The cheapest adapters clamp onto your scope. Some of the more expensive ones provide their own eyepieces.

SHOOT THE MOON

Most of us have enjoyed looking through a telescope at one time or another. But capturing or sharing that experience has been best left to astronomers—until the advent of the handy digital camera. You



Figure 11



Figure 14

WIDE ANGLE: Stitch several shots together for a panoramic view.

can use a simple adapter to connect your digicam to a telescope of nearly any size and record your astronomical observations for posterity.

There are two basic ways to work. If you have a point-and-shoot camera, the technique is just like digiscoping: Either hold your camera up to the telescope or attach it to the eyepiece with an adapter. You'll want that adapter to keep the camera still if you're going for anything other than shots of the moon. If you're using a single-lens reflex camera, however, you'll want to get a T-Adapter and use the camera in place of the telescope's eyepiece. With this approach you focus the SLR using the telescope's focusing knob and set the shutter exposure manually.

We tried both approaches to get images of the moon and found that either could capture images nearly as good as those taken with a much more expensive telephoto lens. To get the image in Figure 11, we used the first method



Figure 12

THE SKY'S THE LIMIT: Combining a camera and a telescope can yield amazing results.

(Figure 12), holding a Canon Powershot A80 against the eyepiece of a backyard telescope after focusing the scope on the moon, then using the camera's LCD to align it with the telescope until the moon was centered in the frame. The camera was in Auto mode, relying on its own auto-focus and auto-exposure capabilities to capture the image.

PANORAMA

Capturing the grandeur of natural scenes is one of the trickiest problems for a photographer. Our eyes are adept at grasping the full sweep of a vista, but our cameras have not been. Now panoramas are within the reach of anyone who owns a digital camera. By taking a number of overlapping images and stitching them together on your computer, you can easily create panoramas of almost any size or shape. Many cameras even come with free software to help you.

Ideally, you should use a stable tripod that allows you to pan horizontally and take several overlapping images on the same level. Depending on the scene, you can take anything from two images to a full 360-degree sweep. Images with even light work best.

We shot our panorama with a hand-held Canon Powershot A80 set on Auto. To get the perspective we wanted and to hide an unsightly parking lot, we crouched low to the ground and took eight overlapping frames, moving slightly to the right for each successive image (Figure 13). To assemble the images quickly into a panorama, we used the supplied Canon Photo-Stitch software (Figure 14). For more information, including a comparison of software products, www.panoguide.com is an excellent resource site.

You may never again think of your digital camera as just for taking snapshots. Whether you try all of these ideas or only one, you can have a lot of fun expanding the boundaries of digital photography.

David Cardinal is a professional photographer and software author. He publishes the Web site www.nikondigital.org (an information resource for digital photographers), teaches digital photography, and sells DigitalPro software through www.proshooters.com.

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INTERNET

Detecting Spam

Bayesian filters can learn to recognize spam, but they can't get rid of it altogether. **BY GABRIELLE GAGNON**

More than 60 percent of Internet traffic is spam, so it's not surprising that people are turning to the science of big numbers for help. Many hope that Bayesian filters, based on algorithms that use probability to block unwanted messages, will stop this cyber-pestilence.

Bayesian filters are more or less based on the Bayes rule, a theory of conditional probability that estimates the likelihood of an event (hypothesis) given the certainty of another event (evidence). Basically, the rule says that the likelihood of an event occurring in the future can be inferred from the number of times it occurred in the past.

Applied to spam, this means that if you break a message down into discrete elements (words, HTML tags, URLs, whatever) and you find that particular elements recur frequently in spam and not in ordinary mail, you can be reasonably confident that messages containing them are spam.

A typical Bayesian filter is a client-side, e-mail plug-in with a built-in database for collecting messages (evidence) and an inference engine for assigning probability (confidence) ratings. As messages arrive, it rates them, vetting individual elements and assigning a composite rating to each message as a whole, and copies them to the database. If a given rating indicates that a message is probably spam, the filter blocks it from the in-box. Users can flag any spam that gets through.

Because Bayes's theorem requires looking at all the evidence, Bayesian filters look at an entire message and compare it with both spam and nonspam samples to arrive at their numbers. This not only helps prevent false positives but also catches flags that don't occur to people. (Surprisingly, *ff0000*, the HTML code for bright red, is as much of a spam indicator as any pornographic term.)

The filters aren't fooled by cheap tricks, either. Extra characters inserted into known spam words (as in "S*E*X!!!") will not pass, because such things do not

appear in ordinary correspondence.

Bayesian filters can also be tuned for individuals—a plus if you're a mortgage broker and your regular mail looks more like spam than most people's—but training them takes time. To achieve an accuracy rate better than 99 percent, you might have to classify thousands of messages. Fortunately, filters often come pretrained.

Does this mean Bayesian filters will put spammers out of business? No. It doesn't even mean they will keep your mailbox spam-free. You'll always see some spam, and if you train your filter from scratch you'll see lots of it. That's partly because Bayesian filters are designed to prevent false positives—blocking good mail is a greater sin than letting spam through—but it's also because they need training.

Someone—either you or the vendor—has to tell the filter what is and isn't spam. Once this happens, the filter can do an excellent job of evaluating items similar to

those it has seen before. But when it sees something new, it rates the unknown either as neutral (50/50) or as slightly more likely to be not spam. Without other evidence, innovative spam gets through.

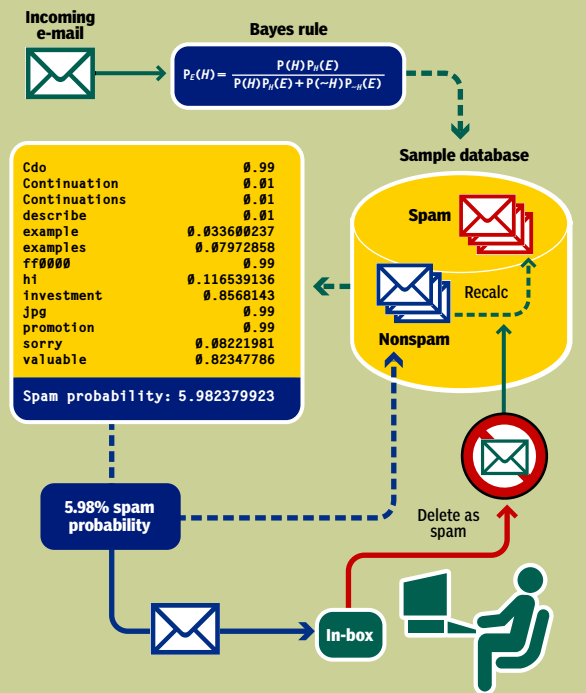
You have to be conscientious. If you don't identify spam as such, or if you flag good mail as spam by mistake, the filter's rating system could become corrupted. It can also become corrupted if disguised spam fools you into classifying it as good mail. Finally, just because a filter is labeled *Bayesian* doesn't guarantee that it applies all of Bayes's precepts or that it takes a purely scientific approach. To minimize the chance of losing good mail, designers make simplifying assumptions and give varying weights to different evidence, and these variations affect performance.

Bayesian filters are a useful weapon in the war on spam, but they're not perfect. The best solutions employ other techniques as well, such as white- and blacklists, honeypots, and community filtering. For more information on antispam techniques and how effectively antispam tools use them, see "Spam Blockers" at www.pcmag.com/article2/0,1759,1514410,00.asp.

Gabrielle Gagnon is a longtime contributor to PC Magazine.

How Bayesian Filtering Works

Bayesian filters compare incoming message elements with sample data and calculate the probability of their being spam, according to the Bayes rule. If the overall probability of a message being spam is below a set threshold (for example, 90 percent), the message is allowed into the user's in-box. Users can delete spam that gets through, using a special function, and filters adjust their statistics accordingly.





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SECURITY WATCH

Is Open-Source Really Safer?

Does open-source code really get a better security review than closed-source software? **BY LARRY SELTZER**

The usually simmering debate about open-source versus closed-source recently boiled over, following the leak of Microsoft Windows source code on the Internet. And it boiled over here too. After I wrote a column for one of *PC Magazine's* sister sites about the Windows source code leak and what it might reveal about the value of closed-source code as a security technique (www.eweek.com/article2/0,4149,1527194,00.asp), 95 percent of the responses said that I didn't get the point: Open-source, being open, gets a better code review. Anyone can get the source, look at it, and find problems in it.

Inherent in this argument is the assumption that closed-source projects don't get code reviews, or at best they get inferior ones. In fact, there's no reason to believe

however, an attempt to set up a formal organization called Sardonix to organize these reviews essentially failed when funding dried up after nobody followed through with the work.

A SecurityFocus article on the failure (www.securityfocus.com/news/7947) hints at the reason: People don't want to volunteer to do the boring, rote parts of a real security audit. Instead, people want to find scary vulnerabilities and exploits, then bask in the glory of having found them.

On the other hand, Microsoft pays people to do code reviews, and the reviewers' evaluations and compensation depend on how well the reviews are done. According to Michael Howard, senior program manager in Microsoft's security business and technology unit, if a vulnerability is found

in code someone wrote or reviewed, it will affect the responsible person's subsequent performance evaluation.

Microsoft is not the only one that reviews Microsoft products. Howard says that an extensive outside review of Microsoft Windows XP SP2 is currently underway. No doubt many people consider Microsoft either lazy or stupid in terms of security, and we all wish the company had gotten better at it faster. From what Howard says, though, Microsoft seems serious about security and capable of doing it right.

Yet serious problems persist in Microsoft products, just as they persist in open-source products. The reason is not that nobody cares. It's that it's hard to write completely secure software.

The one vulnerability resulting from the leaked source as of this writing—an integer overflow bug—illustrates the problem.

Vulnerability Name	Metric	ID	Date	Public	Name
Database	108.16	VU#16532	11/10/99		BNDD_T_NDCT record processing may cause buffer overflow
Search	104.73	VU#11970	04/03/99		Sun Solstice AdminSuite ships with insecure default configuration
Vulnerability Name	99	VU#945216	02/08/2001		SSH CBC32 attack detection code contains remote integer overflow
View Name	94.5	VU#254235	09/10/2003		Microsoft Windows RPCSS Service contains heap overflow in DCOM request lifetime handling
Vulnerability Name	94.5	VU#483492	09/10/2003		Microsoft Windows RPCSS Service contains heap overflow in DCOM activation routines
View Name	89.5	VU#150227	02/19/2002		Multiple vendors' HTTP proxy default configurations allow arbitrary TCP connections
By Name	87.72	VU#03923	06/23/2000		Format string input validation error in wu-ftpd site_exec() function
By Name	81	VU#072768	07/27/98		Buffer Overflows in various email clients
By Name	79.65	VU#073047	04/04/2001		Network Time Protocol (ntpjd) daemon contains buffer overflow in ntp_control_gettime() function
By Name	79.31	VU#079543	05/14/2001		IE5 decodes filenames superfluously after applying security checks
By Name	78.75	VU#050145	07/16/2003		Microsoft Windows RPC vulnerable to buffer overflow
By Name	78	VU#117304	03/17/2003		Buffer Overflow in Core Microsoft Windows DLL
By Name	74.81	VU#074571	07/18/2001		Multiple vendor internet daemons vulnerable to buffer overflow via crafted

IF YOU SEARCH the CERT Coordination Center's vulnerability database, (especially when sorting by the severity metric), you'll see lots of platforms well represented.

that closed-source companies can't do good reviews—and not a lot of reason to assume that open-source projects get the scrutiny people think they get. Moreover, there's no official system for reviewing open-source code for security problems.

Unquestionably, a lot of checking of open-source projects happens. Recently,

THE LOOKOUT

WHO CAN YOU TRUST

A new worm, Sober.D, appeared in early March, claiming to contain a patch to defend against Mydoom. The worm arrives in an e-mail message with a subject line of "Microsoft Alert: Please Read!" and carries a sending address with a Microsoft domain. The body of the message urges recipients to "Please download this digitally signed attachment. This Update includes the functionality of previously released patches."

This isn't the first social engineering tactic to attempt to hoodwink users by purporting to come from a known, trusted entity. In the past year a variety of phishing scams, allegedly from eBay, Wells Fargo, and others, tried to trick people into divulging sensitive personal information. The moral: Be skeptical, even when a message appears to come from a trusted source. Don't be in a hurry to open an attachment or a click on a URL in an e-mail message. Instead, go to the entity's real site. If there's something you should download or a form to fill in, you'll find it there.—Sharon Terdeman

The code that was leaked dates from about 3.5 years ago, when few people if any were aware of integer overflows as a potential security problem. A code review considered good by the standards of the time could have easily missed it.

Microsoft's position is that the vulnerability was found and fixed in Internet Explorer 6. And it is completely plausible that a later review, with an awareness of integer overflows and their implications, would have uncovered the problem.

On the other hand, the "OpenSSL ASN.1 parser insecure memory deallocation" bug (www.kb.cert.org/vuls/id/935264) was very similar to the recent Windows vulnerability, related to the same ASN.1 standard. But that bug got little publicity by comparison, even though pretty much every open-source operating system uses that standard.

Every version of OpenSSL up to that point was vulnerable, which means the weakness had slipped through for years. How could this have happened? Simple: It's hard to find such things.

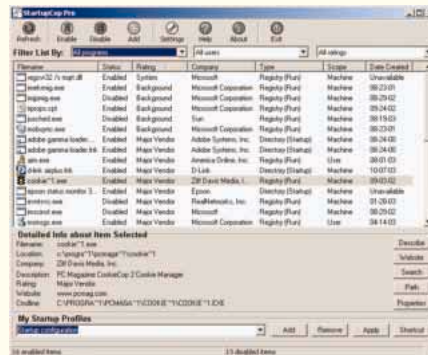
Wouldn't it be great if the relationship between source code and security were as simple as some people think?

Larry Seltzer is the editor of *eWEEK's* online Security Center (<http://security.eweek.com/>).

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ENTERPRISE

Fast Food

The Seattle Seahawks' radio-frequency ID system satisfies fans' hunger, without the long lines. **BY ALAN COHEN**

Football stadium hot dogs seem as low-tech as life gets. Leave it to Paul Allen, the cofounder of Microsoft, to think otherwise. Last year, the team Allen owns, the Seattle Seahawks, became the first NFL club to incorporate *radio-frequency identification* (RFID) technology into its concession sales. The Seahawks' RFID system was designed to speed sales and cut lines that all too frequently snake around stadium snack bars—keeping fans away from the action, not to mention the food. The system has also helped drive sales up.

RFID has long proved its efficiency for collecting tolls, recording marathon times, and keeping track of inventory, but the Seahawks system represents its first use in a sporting venue. Then again, Seahawks Stadium is not a typical venue. Opened in July 2002, the stadium went high-tech from the start, with 200 high-definition televisions, a multimillion-dollar video production studio, high-speed Internet access in all 82 luxury suites, and state-of-the-art video boards designed so that replays can be seen even from the 5-yard line.

The RFID system was added in the stadium's second season, and not all fans use it. So far, it has been installed only in the premium Club Seat sections (7,000 plush seats that surround the field). But that's likely to change, given the system's success.

"It certainly speeds up lines," says Mike Flood, Seahawks vice president for community relations. "And the less wait at the concession, the more incentive there is to buy. We're seeing an uplift in sales, though the final numbers are not in yet."

Smart System Technologies, the company that makes the PowerPay RFID system used in Seattle, says that on the average, RFID sales figures are 18 percent higher than with cash transactions.

By season's end, approximate-

ly 40 percent of the eligible patrons had signed up for the PowerPay program. These fans specify the credit cards they want assigned to their accounts. Each one then receives a key fob (featuring the Seahawks logo) that contains a Texas Instruments RFID chip and an antenna. The only information on the chip is an identification number unique to the user.

At the concession stand, the fan simply passes the key fob in front of a PowerPay reader connected to the point-of-sale terminal. The reader produces an electromagnetic field that sends out just enough energy to power up the RFID tag, which sends its ID number to the reader. Because the reader has a range of just a few inches, there's no danger that the key fob in your pocket is going to be charged for the food the guy in front of you just ordered.

Each reader is integrated into Tangent software running the POS terminals. The 52 terminals are linked to a set of servers in the stadium, which take each tag number and pass it to the PowerPay server. That server then sends the number via a broadband VPN to PowerPay's central

database in Hoboken, New Jersey.

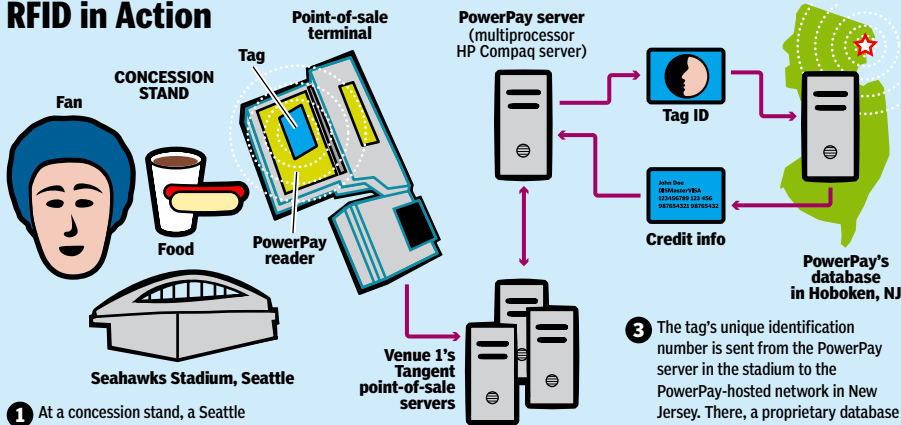
This proprietary database, built on Microsoft SQL Server 2000 Enterprise Edition, matches the number not only with a credit card account but also with specific discounts, rewards, or promotions. This is potentially the real power of the system.

"With PowerPay, the Seahawks can see what fans like to buy and then target them with coupons based on their preferences," says Mark Johnson, the president and CEO of Smart System Technologies. And because the same key fobs can also be used outside Seahawks Stadium, local merchants could partner with the team for promotional campaigns and loyalty programs.

Once the database has located the account information, it's sent back to the PowerPay server in the stadium and shared with the Tangent system, which processes the transaction. While this process may sound like a lot of work, testing at Seahawks Stadium has shown that the average PowerPay transaction takes just 6.5 seconds, compared with 15 seconds for a cash purchase or 37.5 seconds for a traditional transaction using a swiped credit card.

Seahawks fans aren't the only ones who have embraced RFID on the gridiron. The Philadelphia Eagles began using PowerPay in its premium seating area in November, and Johnson says he's in negotiation with more than 2 dozen other NFL clubs. Sure, you'll still be stuck with a \$7 beer—but at least you won't be stuck in line.

RFID in Action



1 At a concession stand, a Seattle Seahawks fan orders food, beverages, snacks, and other merchandise. When he's ready to pay, he holds a tag in front of a mechanical reader that's connected to the point-of-sale terminal. The tag transmits a unique identification number to the reader.

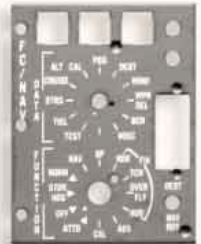
2 Each of the 52 POS terminals in the Seahawks Club Seat areas is linked via a LAN to Venue 1's Tangent POS servers. The PowerPay server is hooked into this system.

3 The tag's unique identification number is sent from the PowerPay server in the stadium to the PowerPay-hosted network in New Jersey. There, a proprietary database matches the Seahawks fan's tag number with credit card information, as well as any discounts or coupons. This information is then sent back to the stadium server, and the Tangent POS server processes the transaction.

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USER TO USER

PC MAGAZINE'S COMMUNITY OF EXPERTS AND READERS

Sorting Text in Excel

I found your September 2, 2003, article "Sort Thousands of Rows Individually" (www.pcmag.com/article2/0,4149,121586,9,00.asp) very interesting. I have a similar problem, but the values I need to sort are words and sentences, not numbers. I'd like to be able to sort them alphabetically, using the first letter of the first word in the cell. Can this be done as easily as you showed with numbers?

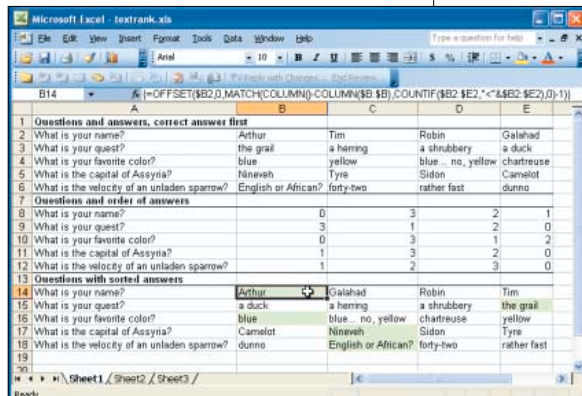


FIGURE 1: Sorting individual rows of text is more complicated than sorting numbers.

Specifically, I have a file containing multiple-choice questions and their answers. In each row, column A contains the questions, column B contains the correct answer, and columns C through E contain other possible answers. I want to copy each row's answers into new columns in alphabetical order, to mix them up.

GREGG KLOWDEN

You could write a macro that would sort each row in a range individually, but that would change the original cells, eliminating your own information as to which answer is correct. The previous article solved the problem for numbers by selecting the smallest, the second-smallest, and so on, using the SMALL() function. But there is no such function for text values, so the solution is fairly complex. We'll work up to it gradually.

We'll assume the questions start in cell A2 and the answers in B2:E2, with the correct answer always in column B. The

formula =COUNTIF(\$B2:\$E2, "<"&B2) would return the number of items in the range that are smaller (alphabetically) than B2. The smallest value would be ranked 0, as none are smaller. The largest would get 3, as it's larger than the other three.

We're going to need an Excel array containing the ranks of the four answers. Select a range of four cells in a blank row below all the questions. Enter =COUNTIF(\$B2:\$E2, "<"&\$B2:\$E2), and press Ctrl+Shift+Enter.

Excel will put the four rank numbers in those four cells. This is an intermediate result, just to demonstrate that we can get an array containing the ranks.

The alphabetically first item will be the one whose rank is 0. We'll use Excel's MATCH() function to determine the offset of that item within the answers. In column B of an unused row, enter =MATCH(COLUMN()-COLUMN(\$B:\$B),COUNTIF(\$B2:\$E2, "<"&\$B2:\$E2),0) and

again press Ctrl+Shift+Enter. The COUNTIF function returns the array of ranks, as before. The expression COLUMN()-COLUMN(\$B:\$B) returns 0 in column B, 1 in C, 2 in D, and 3 in E. The value returned by this formula is the one-based offset of the answer having the specified rank. When you copy this formula across into columns C through E, you'll get the locations of the four answers in ranked order. If you copy the four cells down into other rows, you'll get the locations for answers to the corresponding questions.

Finally, we'll use the OFFSET() function to retrieve the items in order. OFFSET() returns the contents of a cell that's a specified number of rows and columns away from a starting cell. We want the same row (offset 0), with a column offset defined by the MATCH calculation above. Highlight the answers, copy them to the clipboard, and paste a copy starting in column A in an otherwise unused row. In that same row in column B, enter this formula:

=OFFSET(\$B2,0,MATCH(COLUMN()-COLUMN(\$B:\$B),COUNTIF(\$B2:\$E2, "<"&\$B2:\$E2),0)-1). Here again you must press Ctrl+Shift+Enter so Excel will treat this as an array formula. Copy the formula across to column E, then copy all four cells down as far as the last question.

The result is what you requested—a list of questions with the answers sorted in order! You can now delete the intermediate steps. And of course, the next time you need to create a set of questions and answers, you can just make a copy of this workbook and insert the new data.—NJR

Keep Your Wireless Connection from Changing

I use an 802.11g wireless connection, and I know that the Windows Zero Configuration applet searches for a new connection every 3 minutes. I have found that if this applet is disabled at boot-up, the wireless connection is not made, but if WZC is stopped shortly after a wireless connection is made, the connection stays active indefinitely, barring outside influences.

I have been using Services.msc to stop WZC (I have it in my start-up folder), but I have to scroll to the bottom of the Services window to access WZC to stop it. I

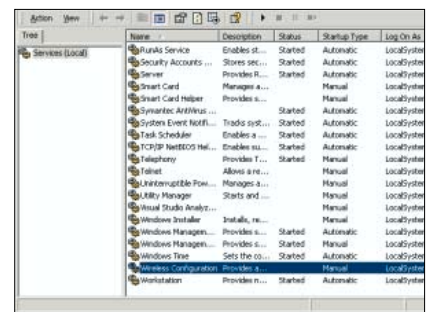


FIGURE 2: Services.msc lets you enable or disable Windows services.

would like to find a faster way to do this, perhaps in the form of a shortcut to a batch file that would start or stop the service, or a shortcut directly to WZC within the Services window. Can you tell me how to accomplish my goal?

ANDREW CARSELL

A macro that would sort each row in a range individually would change the original cells, eliminating information.

People who work with hex colors a lot tend to remember the codes for favorite colors.

Wireless networks are becoming more and more common. It's not at all unusual to be within range of several. If your connection stutters, WZC may try to hook you up with a different connection. Yet, as this reader notes, if WZC is off at start-up, the system may not connect at all. You don't have to open the *Services* dialog, scroll to the bottom, double-click on *Wireless Zero Configuration*, and click on the *Stop* button. Instead, you can create a shortcut that has the same effect.

Open Windows Explorer and navigate to C:\Windows\System32 (or C:\Winnt\System32 if you're running Windows 2000). Locate the file net.exe. Right-drag it onto

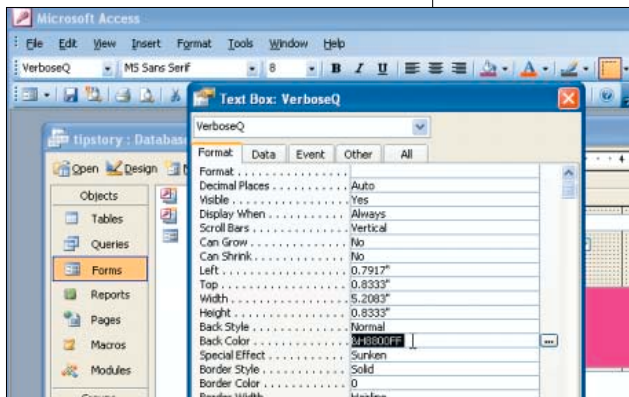


FIGURE 3: You can use hexadecimal color codes in Microsoft's Access to specify colors.

the desktop and choose *Create shortcut(s) here* when you drop it. Click twice slowly in the filename area and name the shortcut *Stop WZC*. Right-click on the shortcut, choose *Properties*, and click on the *Shortcut* tab. The *Target* field will probably show C:\WINDOWS\system32\net.exe. Append a space to this, followed by *stop wzcsvc* (don't forget the space before *stop*). If you like, repeat these steps and create another shortcut to start the service; just replace *stop* with *start*.—NJR

Color Codes in Access

When designing forms and reports in Microsoft Access, there's an option to change the color of various objects. When you select a color using the color dialog, it is translated into a seven-digit numeric code. This code is a mystery to me. It bears no apparent relationship to the RGB of the color selected, and it's not a hex code, either—the standard ways to define or select colors in most applications. In de-

signing Web pages and various other documents using other applications, I typically use a standard set of colors for which I have memorized the hex color code. I'd love to be able simply to enter that code in the color fields in Access. What is the relationship between the color codes used in Access and those standard codes, and is there a way to use those standard codes in place of Microsoft's codes?

MARK J. LACORE

When you understand the hexadecimal color numbers, you can tell at a glance roughly what an unfamiliar one will represent. The three pairs of hex digits represent

the blue, green, and red components of the color respectively. For example, 8800FF would have a moderate amount of blue, no green, and lots of red—a sort of magenta. And yes, people who work with them a lot tend to remember the codes for their favorite colors.

Fortunately, this expertise can still be useful in Access. In the Field Properties dialog, you simply add "&H" as a prefix to the color code, for example, &H8800FF. As soon as you enter this value, Access displays it as a decimal number, in this case 8913151. If you need to go the other way, from decimal to hexadecimal, you can use the Windows Calculator. Launch it and select Scientific from the View menu. Type the number in or copy/paste it, and then click the Hex option button.—NJR

Mixed-Up Grid Lines in Word

My friend has a Microsoft Word document containing a bunch of horizontal and vertical lines (it's a custom-made form), and he'd like to remove some of the lines. He deleted some but can't seem to get rid of others. While experimenting, I found that if I draw a line in a Word document and then drag it elsewhere on the document, I too can't seem to find any way to delete the line. I checked the Microsoft help pages but found no mention of such a problem.

SCOTT ESRHYNER

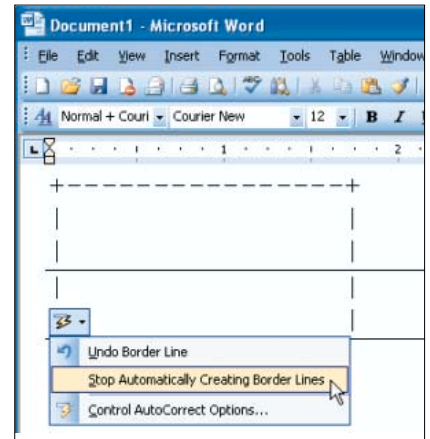


FIGURE 4: When lines become borders, they can be difficult to delete. You can, however, use AutoCorrect options to stop Word from creating borders automatically.

Some of the lines in your form are made from characters like underscores, dashes, and bars (|). You can delete and manipulate those easily. The lines that are giving you trouble are borders—formatting elements rather than characters. When you enter three or more of certain characters at the start of a line and then hit Enter, Word automatically inserts border formatting in place of the characters. Underscores, dashes, tildes, and asterisks all yield different types of borders.

To clean up the form, press Ctrl+A to highlight the entire document, choose "Borders and Shading" from the Format menu, and clear all borders. Now select "AutoCorrect Options" from the Tools menu, click the "AutoFormat as You Type" tab, and uncheck the box titled "Border Lines." Finally, rebuild the form; this time, Word won't erroneously turn your lines of characters into borders. Note that when Microsoft Office 2003 creates a border line, it adds a floating AutoCorrect Options button. Click the button to reverse the AutoCorrect action or to turn it off before going on.—NJR

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1 WINDOWS

68 TIPS & TRICKS



With Longhorn at least a year away, Windows XP may be the Windows we use longer than any before. Previous versions have appeared every one to three years; Win XP has already been around for two and a half years, and though it's a huge improvement in many ways (when's the last time you saw a blue screen?), Windows still has

a ways to go. * In addition to our ever-expanding library of tips (available online at www.pcmag.com/tips), we present here a bunch of new tricks for this aging OS. They can make Windows look and act the way you want—within reason—and keep

you safe, too, whether you're a desktop user or a mobile user, whether you use several systems or several

people use yours. And although Web browsing and e-mail aren't OS functions, Internet Explorer and Outlook Express are bundled with Windows XP, so we've rounded out our story with ways to make those apps better, safer, and more efficient.

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Customization, File Management, And Navigation

BY NEIL J. RUBENKING

EDIT THE SEND TO MENU

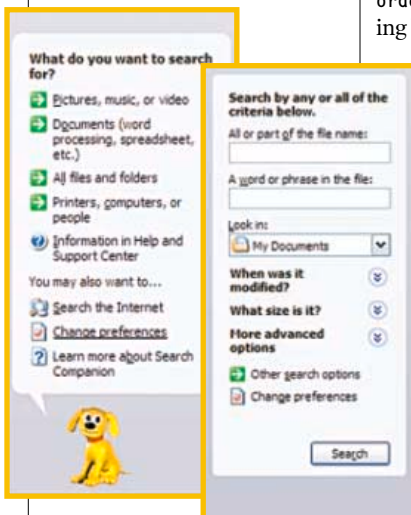
When you right-click on a file and choose *Send To*, menu options let you copy that file to the A: drive, the *My Documents* folder, or various other places. You can add a menu item that will send files to any folder you want. Navigate to `C:\Documents and Settings\user-name\SendTo` for Windows 2000 and XP, or `C:\Windows\SendTo` for Windows 98 and Me. If you don't see the folder you want, select *Folder Options* from the *Tools* menu, click on the *View* tab, and check *Show hidden files and folders*. In a second Explorer window, select the folder in question. Right-drag it into the *Send To* folder and choose *Create Shortcuts Here*. Rename the shortcut as you want to see it in the *Send To* menu.

CHANGE PREFERENCES TO SPEED SEARCHING

Users accustomed to the straightforward search feature in Windows 2000 and earlier versions may not want to waste time with the animated Search Companion and separate search categories in Windows XP. In the Search window, select *Change preferences*, then *Without an animated screen character*. Click on *Change preferences* again, then *Change files and folders search behavior*, then *Advanced...*, and finally OK. Now searching for files will be straightforward.

CONFIGURE THE PRE-LOG-ON DISPLAY

The screen saver and desktop (along with other appearance settings) that are visible before any user has logged on are controlled by Registry settings. You can use the Registry editor to make the display settings at log-on match those of the current user. First, set the screen saver and desktop image the way you want them to be at



log-on. Launch Regedit and navigate to `HKEY_CURRENT_USER\Control Panel\Desktop`. Select *Export* from the *File* menu (or from the Registry menu if you're not running Windows XP). Export just this key to `Fixdefault.reg` and then close Regedit. Open `Fixdefault.reg` in a text editor and replace all instances of `HKEY_CURRENT_USER\` with

`HKEY_USERS\.Default\`. Save the file as plain text, and then double-click on it to transfer the settings. Click on *Yes* and then OK in the two message boxes that pop up.

CONTROL LAUNCH ORDER

You may need to launch multiple start-up programs in order, perhaps to connect to a VPN before launching a program that needs that connection. Create a new folder called `C:\Ordered Launch` and drag any shortcuts that currently reside in *Start | All Programs | Startup* to this new folder. If the shortcuts don't already exist, create them in the new folder.

Open a command prompt, navigate to `C:\Ordered Launch`, and issue the command `DIR /B /S > ordered.bat`. Enter `notepad ordered.bat` to open the resulting batch file in Notepad. Copy and paste the lines in the desired launch order. Surround each line with quotes and precede it with the `start` command and a space; for example, `start "C:\Ordered Launch\First Program.lnk"`.

Double-click on the batch file to test it. The programs will start in the specified order, but if one takes longer to initialize, it may appear out of order. In that case, insert a delay line after the slow-starting program. This line will insert a 5-second delay: `ping -n 5 127.0.0.1 > nul`. Edit the value after `-n` to set a different delay. After testing the file, open Windows Explorer and right-drag it to the *Startup* folder, selecting *Create Shortcuts Here*.

USE HOTKEYS TO SWITCH PROGRAMS

If you routinely use a specific set of programs, you can set up hotkeys that will launch or directly switch among them instead of cycling with Alt-Tab. Find a desktop or *Start* menu shortcut that launches a pro-

gram and select *Properties*. On the *Shortcut* tab, click in the *Shortcut key* box, and press the key combination you want to use. Be sure to choose key combinations that are not needed by any of your programs; for example, use Alt-Shift-1, Alt-Shift-2.

CREATE AN AUTO-PLAY CD

The application CDs that you buy launch automatically, and your burned CDs can do the same. They can invoke a setup program or display an HTML page that links to the CD's contents. Use Notepad to create a three-line text file based on the lines below, and name it `Autorun.inf`. Place the file in the CD's root directory.

```
[autorun]
open=setup.exe
icon=icon.ico
```

Replace `setup.exe` with the program that should launch when the CD is inserted, and replace `icon.ico` with the file containing the CD's icon. In both cases, be sure to omit the drive letter. If you want to launch a nonexecutable item like an HTML file, precede it with `start.exe` in the `open=` line. Note that all file links in the HTML file should be relative ones, omitting the drive letter.

HIDE TABS IN DISPLAY PROPERTIES

When children—or, let's face it, some adults—learn how Display Properties can modify their systems' appearance, they sometimes make inappropriate changes to shared computers. You can suppress certain configuration changes by adding values to the Registry key `HKEY_CURRENT_USER\Software\Microsoft\Windows\CurrentVersion\Policies\System`. In each case, find or create a DWORD value with the specified name and set its data to 1. The *Themes*, *Desktop*, *Screen Saver*, and *Settings* tabs are suppressed by values named `NoThemesTab`, `NoDispBackgroundPage`, `NoDispScrSaverPage`, and `NoDispSettingsPage`.

OUR CONTRIBUTORS: Konstantinos Karagiannis is a senior editor of *PC Magazine*. John Clyman, Alan Cohen, and Richard V. Dragan are contributing editors. Associate editor Sarah Pike and PC Magazine Labs lead analyst Neil J. Rubenking were in charge of this story.

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The *NoDispAppearancePage* value suppresses both the *Appearance* and the *Themes* tabs. A value named *NoDispCpl* will block the Display Properties dialog completely.

To prevent someone from changing the background by right-clicking on an image in IE and choosing *Set as Background*, navigate to *HKEY_CURRENT_USER\Software\Microsoft\Windows\CurrentVersion\Policies\ActiveDesktop* and add a DWORD value named *NoChangingWallpaper*, and set its data to 1. This setting is specific to Windows XP, and the background must be set to an image, not (*None*).

MAKE THE FILMSTRIP VIEW AVAILABLE

Windows XP's *My Pictures* folder has an extra View option called *Filmstrip*. To make this view available for another folder, right-click on the folder and choose *Properties*. Click on the *Customize* tab and pull

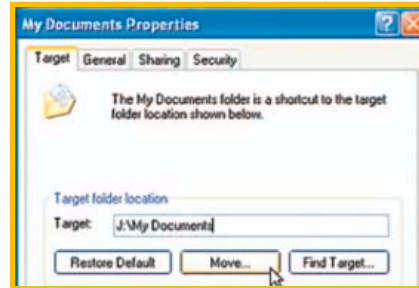
down the list of folder types at the top. Choose either *Pictures* or *Photo Album*. If you want, check the box *Also apply this template to all subfolders*. Click on OK. You may need to press F5 to refresh the display.

MOVE THE MY DOCUMENTS FOLDER

Keeping the *My Documents* folder on a partition separate from the operating-system files can save you pain if you have to reformat the boot partition. You may also want to store it on a network share that gets backed up regularly. Right-click on *My Documents* on the desktop or in the *Start* menu and choose *Properties*. Click on *Find Target* to select the new location, and click on OK. In the *Move Documents* box, click on *Yes* to move the documents.

SIZE COLUMNS PERFECTLY

Click anywhere inside the right-hand pane in Windows



Explorer in the *Details* view and press Ctrl-NumPadPlus. Each column will resize so it's just big enough for the widest item. This is especially helpful if one or more columns have disappeared because they are set to zero width.

RESTORE A LOST STATUS BAR

When you open Windows Explorer, the Status bar may be absent even if you previously checked *View | Status Bar* in the menu. To make Windows remember that setting, first close all Windows Explorer windows and launch just one. Size it the

way you want and put a check next to *Status Bar* in the *View* menu. Now close the window by holding down the Shift key while clicking on the X icon at top right. This also works in Internet Explorer.

SPECIFY A STARTING FOLDER FOR WINDOWS EXPLORER

Windows XP launches Windows Explorer in *My Documents* by default. To make Windows Explorer start in another folder, edit the shortcut that launches it. Right-click on the shortcut and choose *Properties*. Click in the *Target* field on the *Shortcut* tab and press the Right Arrow key. Append this text " /e,c:\\"—that is, *space, slash, e, comma, C, colon, backslash*—to the existing command. You can substitute another folder for C.

Performance and Troubleshooting

BY NEIL J. RUBENKING

DON'T LET INDEXING SERVICE USE TOO MUCH CPU

The Indexing Service, which speeds searches by indexing local files, can get out of hand, consuming 80 to 90 percent of CPU cycles. If your system is sluggish and the hard drive seems to be running continuously, launch the Task Manager, click on the *Processes* tab, and click on the CPU column head twice to put the CPU hogs at the top. If the Indexing Service, called *Cidaemon.exe* in this list, is consistently using 80 to 90 percent of your CPU cycles, you may improve performance by shutting it off. Launch *Services.msc* from the *Start* menu's *Run* dialog. Find the Indexing

Service and double-click. Click on the *Stop* button and then set *Startup type* to *Disabled*.

LAUNCH PROGRAMS FROM THE RUN DIALOG

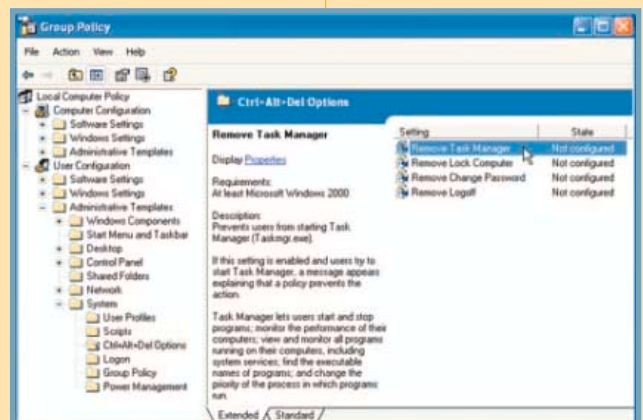
You can launch *Regedit* and *Mscconfig* directly from the *Start* menu's *Run* dialog without having to type in their paths. Other programs can launch this way; you just have to add a key to the Registry. Navigate to *HKEY_LOCAL_MACHINE\SOFTWARE\Microsoft\Windows\CurrentVersion\App Paths*. Add a subkey whose name is the filename of the executable; for example, *Myprog.exe*. Set the (*Default*) value's data to

the full pathname of the program; in this example, *C:\Program Files\MyProg\Myprog.exe*. Also create a string value named *Path* whose data is just the path portion of the location: *C:\Program Files\MyProg*.

LIMIT ACCESS TO THE TASK MANAGER

To prevent users from killing important processes like anti-

virus scanning or usage monitoring, use the Group Policy Editor to disable the Task Manager. Log on as an administrator, launch *Gpedit.msc* using the *Start* menu's *Run* dialog. Navigate to *User Configuration\Administrative Templates\System\Ctrl+Alt+Del Options*. In the right-hand pane, double-click on *Remove Task Manager* and change its status to *Enabled*. You can



still launch the Task Manager by right-clicking on `C:\Windows\System32\TaskMgr.exe`, choosing *Run As...*, and using the Administrator password.

This works in Windows XP Pro and 2000 only; Windows XP Home lacks the Group Policy Editor. To accomplish something similar in Win XP Home, log on to each user account and edit the Registry. In `HKEY_CURRENT_USER\Software\Microsoft\Windows\CurrentVersion\Policies\System`, create a DWORD value named *DisableTaskMgr*, and set its data to 1. Do the same in the key `HKEY_USERS\Default\Software\Microsoft\Windows\CurrentVersion\Policies\System`.

RECOVER A CORRUPTED SYSTEM FILE

If an essential Windows file gets whacked by a virus or otherwise corrupted, restore it from the Windows CD.

Search the CD for the filename, replacing the last character with an underscore; for example, `Notepad.ex_`. If it's found, open a command prompt and enter the command `EXPAND`, followed by the full pathname of the file and of the desired destination: `EXPAND D:\SETUP\NOTEPAD.EX_ C:\Windows\NOTEPAD.EXE`. If either pathname contains any spaces, surround it with double quotes.

If the file isn't found, search on the unmodified filename. It will probably be inside a CAB file, which Win XP treats as a folder. Simply right-drag and copy the file to the desired location. In other Windows platforms, search for a file matching `*.cab` that contains the filename. When the search is done, open a command prompt and enter `EXTRACT /L` followed by the desired location, the full pathname of the CAB file, and the

desired filename; for example: `EXTRACT /L C:\Windows D:\I386\Driver.cab Notepad.exe`. Again, if the destination or CAB file pathname contains spaces, surround it with double quotes.

RESTORE A LOST SHOW DESKTOP ICON

The Show Desktop icon in the Quick Launch toolbar isn't a normal shortcut. If you accidentally delete it—and our mail suggests people often do—you can't recreate it the way you would a shortcut to a program. Instead, launch Notepad and type these lines:

```
[Shell]
Command=2
IconFile=explorer.exe,3
[Taskbar]
Command=ToggleDesktop
```

Save the file with the name `Show Desktop.scf` in the folder `C:\Documents and Settings\username\Application Data\Microsoft\Internet Explorer\`

Quick Launch, where *username* is replaced by your actual user account name.

LOSE THE COMPRESSION

On an NTFS partition, Disk Cleanup can compress old files to save space. But calculating the savings and performing the compression often take a long time, and on some systems, Disk Cleanup hangs during the process. If that happens, or if you don't care to wait, use this Registry tweak to disable the compression: Delete the key `HKEY_LOCAL_MACHINE\SOFTWARE\Microsoft\Windows\CurrentVersion\Explorer\VolumeCaches\Compress Old Files`.

Not sure whether your partition is NTFS or FAT32? For a quick explanation of NTFS—and why you may or may not want to use it—see “Use NTFS for Faster Drive Access” at www.pcmag.com/article2/0,4149,888008,00.asp.

Security

BY RICHARD V. DRAGAN

BASIC SECURITY

We hope we've already hammered home some of the basic, critical security measures you should take with your PC, but our consciences won't let us leave them unmentioned. A few primary steps are to keep Windows, applications, and your antivirus and personal firewall updated with the latest security patches (you are running antivirus and a firewall, right?); set a screen saver and system resume password; and choose strong passwords. Be sure to visit our libraries of tips (www.pcmag.com/tips) and current security info (www.pcmag.com/security) regularly to stay up to date.

SECURE YOUR NEW SYSTEM

New systems may have securi-

ty holes that can be exploited by worms like Blaster, which wreaked a fair amount of havoc on PCs in the past year. The first thing to do with a new or reformatted system (or one you've just upgraded from XP Home to XP Pro, for that matter) is to update it with critical security patches from Microsoft. But there's a catch: You could get infected by a worm in the few minutes required to



download the security patches.

The solution is to turn on Internet Connection Firewall (ICF) before you connect to the Internet for the first time. To do this, go to the Control Panel, select *Network Connections*, and highlight the name of the connection. Right-click and select *Properties* to bring up networking settings. Click on the *Advanced* tab, then select *Protect my computer and network by limiting or preventing access to this computer from the Internet*, and click on *OK*. ICF is now on.

Next, connect to the Internet and browse to <http://windows-update.microsoft.com>. Follow this page and download and install all critical security updates.

To stay safe, know that ICF can do the job as a basic firewall, but third-party solutions do more and offer greater control over security settings. Our Security Watch page (www.pcmag.com/security) contains reviews of personal firewalls and antivirus utilities. Once

you've installed and updated these, you can turn ICF off.

KEEP FILES PRIVATE

If you want to encrypt the contents of an individual file or directory, Windows XP Pro will do the trick, provided you enable NTFS on your hard drive. To encrypt a file, right-click on it to bring up the *Properties* window. Click on the *Advanced* button, then in the *Advanced Attributes* dialog box click on *Encrypt contents to secure data*. This will encrypt the file (using either DES, which employs a 56-bit key on each 64-bit block of data, or 3DES, which uses a 56-bit key three times on each 64-bit block of data), and it will provide a certificate just for you. This certificate is key; if you reinstall Windows or otherwise lose your user account, your access to the encrypted files will be gone, too. You need to export your certificates to back them up: For detailed instructions, search on *export certificate* in Windows Help.

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Windows XP does not require you to enter your password when you open the encrypted file. Once you log on to a session, encrypted files are available for you—and anyone who walks up to your system—to view.

Windows XP Home doesn't support this method. Both XP Home and XP Pro, however, let you create password-protected compressed files. To do this, right-click on the desired file and choose *Send To | Compressed (zipped) Folder*. Open the resulting folder and select *Add a Password* from the *File* menu; delete the original file. Note that this encryption is relatively weak. It should dissuade casual users but won't put up much of a fight against someone determined to hack it apart.

UPDATE AUTOMATICALLY

If it seems Microsoft comes out with another critical update just about every day, that's because new threats pop up that often. Check for Windows Security Updates regularly, or let the system do it: Go to the Control Panel, select the *System* icon, and click on the *Automatic Updates* tab to reveal the Windows Update settings.

Make sure the check box *Keep my computer up to date* is checked. With this option selected, you have several choices for specifying exactly how and when new updates get downloaded and installed. We recommend choosing *Download the updates automatically and notify me when they are ready to be installed*, so you'll have control over when the installation takes place.

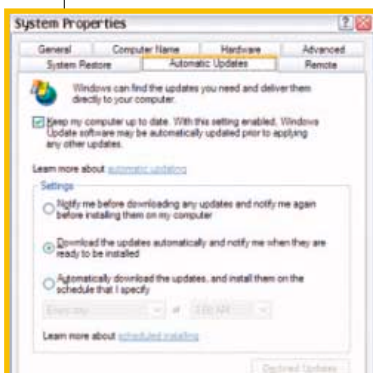
TOUGHEN PASSWORDS

A password is pointless if it's easy to crack. Automated programs called *password crackers* can easily break passwords built from one or more common names or dictionary

words, like *CoolDude* or *KitchenLarry*. You need a strong password, eight or more characters, including both numeric and special characters (like *7@#&!)*. Avoid incorporating actual words or names. You also need to change your passwords frequently. For our complete list of password dos and don'ts, visit www.pcmag.com/article2/0,1759,1159861,00.asp.

BEWARE SPYWARE

Spyware has gotten a lot of press lately, and for good reason. Without protection, after a few browsing sessions, and



almost certainly after downloading some freeware (particularly certain peer-to-peer file-sharing apps), your system will probably collect unwanted software that can take control of your system and turn it into a console to display apparently unstoppable pop-up ads, or worse. A good antispyware program is a must-have.

Need convincing? Try this simple test. Launch *Msconfig* from the *Start | Run* dialog, and click on the *Startup* tab. If there are unfamiliar-looking items, look them up at www.sysinfo.org/startupinfo.php or www.answerthatwork.com/Tasklist_pages/tasklist.htm. Even if doing this task checks out, there's no guarantee that your system is spyware-free; we strongly recommend installing and running an antispyware application. For reviews of security and privacy software, including antispyware apps, visit www.pcmag.com/security.

Networked, Multiuser, and Telecommuter PCs

BY JOHN CLYMAN

MASTER THE BASICS

If you're installing a home or small-office network for the first time—or if your network isn't working the way you'd expect—take advantage of Windows XP's built-in networking set-up and troubleshooting tools, found in the *Network Connections* applet in the Control Panel. Select *Set up a home or small office network* from the left-hand panel, and Windows will walk you through network configuration and help you choose sensible settings. If you're trying to fix an existing network, try the *Network Troubleshooter* in Windows Help and Support. For a comprehensive look at home networking, read "Home Networking 101" at www.pcmag.com/article2/0,1759,1244080,00.asp and our

recent case study at www.pcmag.com/homenetworking.

SKIP THE NETWORK?

If all you're trying to do is share an Internet connection among multiple machines, you can use Internet Connection Sharing, a Windows feature that lets multiple systems piggyback on one machine that connects directly to the Internet. But we advise forgetting ICS and investing in a low-cost router. While most routers are designed to share broadband connections, models that share dial-up connections are available. Consider only a router that includes a stateful packet inspection (SPI) firewall. For reviews of routers, personal firewalls, and more, visit www.pcmag.com/security.

Editing the Registry

To apply a tip that involves editing the Registry, first launch *Regedit* from the *Start* menu's *Run* dialog. Use the tree view at the left to navigate to the specified key.

Before making any changes, back up the current values; a wrong edit could render your system unbootable. Select *Export* from the *File* menu (or from the *Registry* menu in pre-Win XP systems), and export the key to a REG file; for example, *Backup.reg*. If the tip involves only changes or deletions, launching the backup file will restore the previous values. If the tip requires adding keys or values, you can remove those manually. You can open the *Backup.reg* file in *Notepad* and insert comments about any additions; any line starting with a semicolon is treated as a comment.

With the data backed up, you can now apply the Registry tweak. To delete a key or value, right-click on it and choose *Delete*. To create a new subkey, right-click on the containing key and choose *New | Key*. To create a new value of a specified type, right-click in the right-hand pane and choose, for example, *New | DWORD value*. To change the data for a value, double-click on it and enter the new data.

HE DOESN'T PLAY FAIR.



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KEYBOARD SHORTCUTS

★ ★ ★ ★ ★ ★ ★ ★ ★ ★

Internet Explorer: Press Ctrl-Enter to add *www.* before and *.com* after the text you've entered thus far (this works only if *Web addresses*, in the *Content | AutoComplete* settings in *Internet options*, is checked).

Internet Explorer: Press F11 to toggle Kiosk mode (full-screen with no title bar, status bar, or menu).

Internet Explorer: Ctrl-I toggles the *Favorites* pane.

Internet Explorer: Ctrl-B brings up the *Organize Favorites* dialog.

Outlook Express (and Outlook): Press Ctrl-Enter to send a message.

Networking: Windows-Ctrl-F launches the *Find Computer* dialog to search for a computer on your local area network.

Windows Explorer: Highlight a folder in Windows Explorer's folder tree and press Shift-NumPadAsterisk to open the folder and all subfolders.

Windows Explorer: Highlight one or more files or folders and press Shift-Del to delete them permanently, bypassing the Recycle Bin.

Windows Explorer: Alt-Enter displays properties of the selected item.

Windows key combinations:

- > Windows-E invokes the Windows Explorer window.
- > Windows-F starts a file search.
- > Windows-L locks your system until you enter your password.
- > Windows-M minimizes all windows.
- > Windows-R brings up the *Run* dialog.
- > Windows-Pause/Break brings up the *System Properties* dialog.

TROUBLESHOOT YOUR NETWORK

When you encounter a network problem, some of these command line tools can help you narrow down the source. From the command prompt:

- `ping ipaddress` (for example, `ping 192.168.0.1`) shows whether your PC can contact another computer or network device at a specific IP address. First ping your router to see if your LAN is working, then ping something on the Internet to see if the problem is outside.

- `tracert ip address` (for example, `tracert 192.168.0.101`) reveals every router hop from your PC to another computer or network device. If you start seeing dropped responses, you may be able to tell whether the problem is local.

- `ipconfig /all` shows all your computer's IP-related settings. If your PC is having trouble getting online, try `ipconfig /renew` to refresh your IP address or get a new one.

- `netstat` gives you a list of all the active TCP/IP ports on your system, very useful in detecting whether a Trojan horse has commandeered your system. For more information, search www.pcmag.com for the article "Don't Let Your PC Become a Porn Zombie."

TAKE CONTROL—OR GET HELP

Windows XP's Remote Desktop tool lets you remotely administer other Windows XP machines, as well as Windows 2000 and 2003 servers. On the client machine, select *Start | All Programs | Accessories | Communications | Remote Desktop Connection*, and enter the IP address of the computer you intend to connect to. If the connection is permitted, you'll get a window onto the server machine and be able to control it just as if you were sitting in front of its keyboard, monitor, and mouse. Conversely, you can set your Windows XP machine to accept connections from remote systems. Right-click on



My Computer, select *Properties*, select the *Remote* tab, and mark the check box under *Remote Desktop*, then click on *Select Remote Users...* to specify who can access your machine.

Windows XP's Remote Assistance lets you request help from a friend or help desk staff, who can then log on during a period of time you specify, taking control while you observe (and chat via Windows Messenger). For these remote tools to work, your firewall or router will need to permit traffic across port 3389.

MAP DRIVES

If you're using Windows file sharing, you probably know that you can access files on other machines not just by browsing your Network Places but by entering UNC (Universal [or Uniform] Naming Convention) names like this:

```
\\machinename\sharename\path\to\file.txt
```

But UNC names can become cumbersome. Instead, map a network location to a drive letter: Replace the UNC name above with something like `P:\to\file.txt`, where `P:` refers to a directory on another machine.

Windows offers a number of ways to map network drives. From a command prompt (or a

batch file invoked at start-up), you can type, using the example above, `NET USE P: \\machinename\sharename\path`. You can also go to *Start | My Network Places*, right-click, choose *Map Network Drive*, and browse to a location. Or click on the *Tools* menu in the standard Windows toolbar and select *Map Network Drive*.

SHARE FILES, STAY SAFE

Enabling the Internet Connection Firewall will block other computers from viewing shared folders on your system. Here's how to enable file sharing with others on the LAN without disabling ICF. You should do this, of course, only if you trust others on your network. First, as noted above, be certain that you're behind a router that blocks unsolicited inbound traffic. Next, make sure you've locked down permissions so that only the necessary folders are shared and they require user names and passwords for access. Now, go to your ICF and poke some holes in it: Right-click on your network connection and select *Properties*, then *Advanced*. Press the *Settings* button, then repeat the following process six times, replacing `portnumber` first with `135`, then `136`, `137`, `138`, `139`, and `445`.

MORE ON THE WEB

Check out pcmag.com/tips for more Windows tips, tricks, and fixes.

Mobile Computing

BY KONSTANTINOS KARAGIANNIS

Click on the *Add* button and enter the following:

- Description of Service: File Sharing *portnumber*
- Name or IP Address: 127.0.0.1
- External Port Number for This Service: *portnumber*
- Internal Port Number for This Service: *portnumber*

Click on OK twice.

Now that you've opened these six ports for TCP traffic, you also need to do it for UDP traffic. Repeat the procedure above for the same six ports, this time selecting the UDP radio button under *Select the external port for this service*.

Now, try browsing to one of the shared directories from another PC on your network. It should request your credentials and then work properly. But remember, you're relying on your hardware router/firewall to prevent anyone on the Internet from viewing your shared folders.

GAIN PRIVILEGES

If you've set up user accounts with limited privileges, you don't necessarily have to log off and back on as a more privileged user to perform administrative tasks. In Windows XP Pro, you can use the *Run As* option to run a single program with the rights of another user. On the desktop or in Explorer, right-click on the program you want to run and choose *Run As*. Select the radio button labeled *The following user*, and enter the user name and password for the account you want to use. If you're selecting a shortcut in the *Start* menu, you may have to hold the Shift key while you right-click to make the *Run As* option appear.

If you always want a specific program to ask you what user account to run under, right-click on its shortcut and choose *Properties*, then click on the *Advanced* button and check *Run with different credentials*. Each time you launch the program, you'll be prompted to run it with the current account or specify a different account.

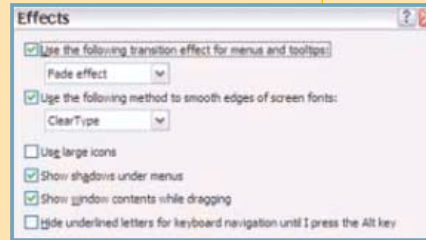
ENSURE CRISP TEXT ON-SCREEN

Laptop screens are usually easier on the eyes than the oh-so-subtly flickering CRTs. Even at high resolutions, however, fonts on LCDs can look a little jaggy around the edges. To clear them up with ClearType, right-click on your desktop and select *Properties*. Hit the *Effects* button on the *Appearance* tab and select *ClearType* under *Use the following method to smooth edges of screen fonts*. While you're there, click on *Use large icons*, too, if you have a high-resolution display. And for best overall display results, always use your display's native resolution.

USE MONITORS AND PROJECTORS

Windows XP does an excellent job of handling dual displays—but not all laptop graphics chips do. To give yourself an edge when either docking or traveling, familiarize yourself with your model's options. Right-click on the Windows desktop, select *Properties*, and go to the *Settings* tab. The *Advanced* button will open a dialog box of options specific to your graphics adapter.

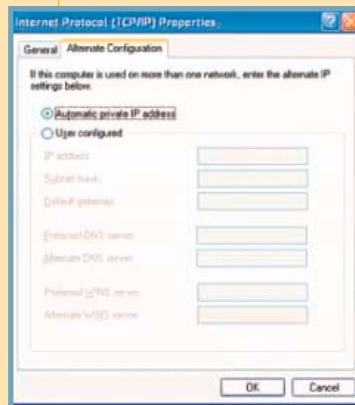
There's usually a way to specify the resolution setting of an external monitor or projector. Make sure that when you connect such a device you set this second display to a native or supported resolution to avoid blocky fonts or small virtual desktops that you have to scroll around within. Some adapters even let you easily set whether a second display duplicates what's on your laptop panel or acts as an exten-



sion of it, letting you, for example, have a word processor open in one and an e-mail client in another.

CONFIGURE AN ALTERNATIVE

If you've taken a notebook from the office to your home or a customer's site, you may have experienced the frustration of having to change networking configurations each time. Rather than having a pre-assigned static IP address for everyone on the LAN, most networks today implement the Dynamic Host Configuration Protocol (DHCP), which gives



out an address on request. But some mobile workers often move between both types of networks, DHCP and non-DHCP. The Alternate Configuration settings in Windows XP make this much easier. Right-click on your network connection and choose *Properties*. Select *Internet Protocol (TCP/IP)*; click on the *Prop-*

erties button. Select *Obtain an IP address automatically* on the *General* tab to set up DHCP, and select the *Alternate Configuration* tab. Click on *User configured*, then enter the information for your fixed-IP (non-DHCP) network configuration.

START UP RIGHT

When you start up on battery power, your laptop probably loads lots of processes and programs you don't need, making boot-up take longer and use more power than necessary. While there's no easy solution for having the laptop recognize its power source and boot only what's necessary, you can employ user profiles to help a bit. In User Accounts (through the Control Panel), create a new account called something like *YourName Battery*, then log out and back on under that name. Clear any items from the *Startup* folder that you don't want loaded automatically when your laptop isn't plugged in; then remember to use the new log-on name when you boot up unplugged.

A few caveats are in order here. For one, some programs give you the option of installing for any user on the system or just the current user. You need to make sure programs you want to run in all profiles are installed for all users, not just the user account under which they were installed. You'll also want to modify your *My Documents* location so that both of your profiles point to the same folder (for directions, see the tip "Move the My Documents Folder" in the "Customization, File Management, and Navigation" section). Other customization items, such as e-mail preferences and display elements, may not carry over to the new profile, either; you'll have to reset those as well.

Internet Explorer

BY NEIL J. RUBENKING

BACK UP YOUR FAVORITES

To back up or transfer your Internet Explorer Favorites, select *Import and Export...* from IE's *File* menu. Choose *Export Favorites* and click on *Next*. Choose the main *Favorites* folder for the source folder and hit *Next*. Click on *Export to a File or Address*, select a filename to hold the Favorites list, click on *Next*, and then hit *Finish*. You now have an HTML file containing your Favorites, including submenus, in an outline form. You can store this on a disc for backup, copy it to another computer and import it, even launch the HTML file and click on the links directly.

SHARE FAVORITES

To make all user accounts on

a Windows 2000/XP system share the same Favorites, you have to tweak the Registry. Export the Favorites first. Now log on as each user and navigate to the Registry key `HKEY_CURRENT_USER\Software\Microsoft\Windows\CurrentVersion\Explorer\User Shell Folders`. Locate the value named *Favorites* and change its data from the default of `%USERPROFILE%\Favorites` to `%ALLUSERPROFILE%\Favorites`. Then import the saved Favorites into any user account.

BLOCK INTERNET OPTIONS

Unscrupulous Web sites or malicious programs can hijack your home page, causing IE to start at a sleazy URL. Anybody with access to your computer

can do the same or change other important settings. This dual Registry tweak offers some defense against unauthorized changes. Close all IE windows first. Navigate to



`HKEY_CURRENT_USER\Software\Policies\Microsoft\Internet Explorer\Restrictions` and find or create a DWORD value named *NoBrowserOptions*. Double-click on it and set its data to 1. Now switch to the neighboring key `HKEY_CURRENT_USER\Software\Policies\Microsoft\Internet Explorer\Control Panel`. Find or

create a DWORD value named *HomePage*, and set its data to 1. To use Internet Options or change the home page yourself, temporarily change those two values to 0.

DELETE INDIVIDUAL AUTO-COMplete ITEMS

When you start typing in a Web form with Auto-Complete enabled, you will see a list of previous entries for the same field that begin with what you've typed so far. You can select one to avoid retyping it. To see all

stored entries for a field, click in that field and press the Down Arrow key. To remove an entry that is erroneous, outdated, or private, highlight it using the Down Arrow (not the mouse) and press Del.

ELIMINATE POINTLESS SCRIPT ERROR MESSAGES
Configuration settings can

Outlook Express

BY ALAN COHEN

SEPARATE LIVES, SEPARATE E-MAIL

Splitting a check is one thing; splitting an in-box is something else entirely. Fortunately, Outlook Express makes it easy for two or more users on the same PC to keep their mail separate. All you need to do is create identities. Go into the *File* menu, scroll down to *Identities*, and click on *Add New Identity*. Enter a name for each person—and a password, if you need a little technology to supplement your trust. Keep in mind that while each identity gets its own address book, contacts can also be copied to a shared address book. And you don't need multiple users to have multiple identities; if you have work and personal e-mail accounts, identities are a handy way to keep

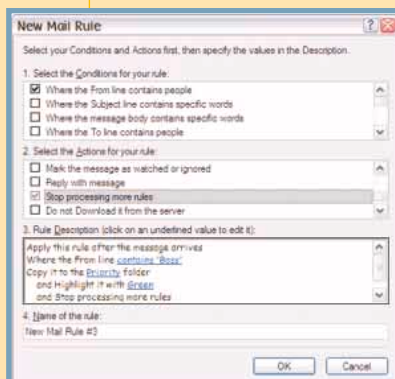
them separate.

Note that sometimes OE fails to launch when you try to switch identities. If that happens, bring up the Task Manager and kill the *Msimn.exe* process.

KNOW WHEN TO SAY WHEN

Message rules let you automate a sequence of events whenever e-mail arrives; say, all messages from your boss should be highlighted in green and put in your *Priority* folder. OE checks incoming messages against all the rules you've set up, in the order you've listed them. But what if a message fits several rules? If you also

have a rule that deletes messages with *Mets* in the subject header—you may expect that a message from your boss about the Mets will be saved to your *Priority* folder. Actually, the message is deleted. That's because OE keeps messages in



your in-box until it's done scanning all the rules. To get around this, OE lets you add the command *Stop processing more rules* to any rule. Using it can save you a lot of grief.

SLIM DOWN AND SPEED UP

Outlook Express folders can bulk up faster than Charlize Theron, increasing OE's load time and slowing its performance. But keeping folders trim means more than deleting messages. When you delete a message, it's simply tagged for removal the next time OE performs a process known as *compacting*. By default, compacting is automated, happening every now and then in the background. But the process takes a while and can slow down your PC's performance at an inopportune time (like when you're writing your fan letter to Charlize Theron). Instead, compact manually. First, go to *Tools | Options*, click on *Maintenance*, and remove the check next to *Compact messages in the background*. Then, once a week, go to *File | Folder | Compact All Folders*. (If you get an error message, close OE, then open it and try again.)

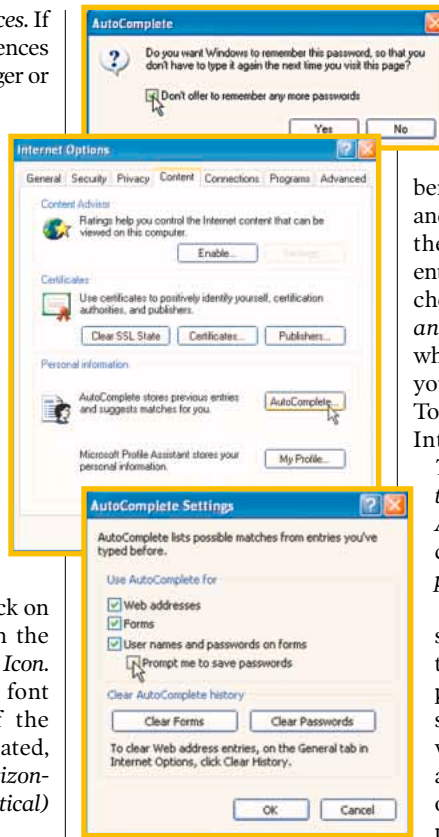
cause Internet Explorer to react incorrectly to script errors. You may get dialog boxes that display painfully granular details and ask whether to continue running scripts on the same page—handy for developers but pointless for most others. To turn off such notifications, select *Internet Options* from the *Tools* menu and click on the *Advanced* tab. Make sure the box *Disable script debugging* is checked. Find *Display a notification about every script error* and make sure it is not checked. Then click on OK.

If you allow the Machine Debug Manager (MDM) to run, it can generate script errors, too. Launch Msconfig from the *Start* menu's *Run* dialog and click on the *Startup* tab. If MDM is on the list, uncheck it and restart. In Windows 2000, Msconfig is not available, so you will have to disable MDM in the Registry. Navigate to the key `HKEY_LOCAL_MACHINE\SOFTWARE\Microsoft\Windows\`

`CurrentVersion\RunServices`. If you find a value that references the Machine Debug Manager or MDM, delete it.

MAKE ADDRESS BAR TEXT BIGGER

When your display is set to a high resolution, reading the text in Internet Explorer's Address Bar may be difficult. The Address Bar uses the same font as the icon titles on the desktop, which can be changed through Display Properties. Right-click on the desktop and choose *Properties*, then the *Appearance* tab. If you're running Windows XP, click on the *Advanced* button. In the pull-down *Item* list, select *Icon*. Choose a more readable font and click on *Apply*. If the icon titles are now truncated, change *Icon Spacing (Horizontal)* and *Icon Spacing (Vertical)* to larger values.



MANAGE SAVED IE PASSWORDS

When you enter a user name and password, Internet Explorer may ask if you want it to remember the password. Click on Yes and it will automatically fill in the password next time you enter that user name. But if you check *Don't offer to remember any more passwords*, then whether you click on Yes or No, you won't be prompted again. To recover this feature, launch Internet Options from IE's *Tools* menu, select the *Content* tab, click on the *AutoComplete* button, and check *Prompt me to save passwords*.

To delete an individual saved password entry, go to the log-on box on a Web page and double-click. Your saved AutoComplete entries will drop down. Use the arrow keys to scroll to the one you want to delete, and press the Del key.

KEEP YOUR CARBON COPY LISTS PRIVATE

Maybe you don't want your friends spamming your other friends. Maybe you don't have many friends and don't want anyone to know that. Whatever the reason, when you send a message to multiple recipients, it's a good idea to conceal their e-mail addresses. The *To* and *Cc* fields are no use here, but *Bcc* (blind carbon copy) will do the trick. Open a New Message window and look at the headers. If you see a *Bcc* field, you're all set; just enter the addresses. If you don't see the *Bcc* field, click on the *View* menu and check *All Headers*.

A message with a blank *To* field is a red flag for antispam programs: Put your own e-mail address in the *To* field and recipients' addresses in the *Bcc* box. Send the message normally, and rest easy: Your mail is on its way, but your distribution list is staying put.

MAKE RULES GO RETRO

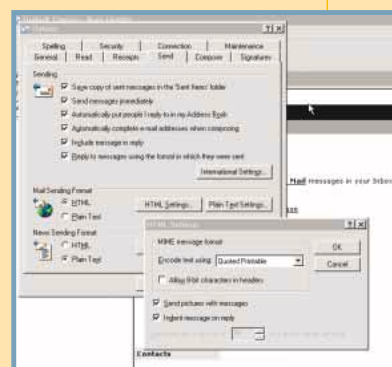
Message rules sort and manipulate incoming mail, but you can also apply them to mail you already have. Indeed, applying a new rule to old mail is a handy way to organize your cache of stored messages. Simply create the rule as you would normally, but once you're done, click on the *Apply Now* button in the *Message Rules* dialog box. In the next box that appears, choose the rules to apply, as well as the

folder you want to go through, and click on *Apply Now*. Once the rules have worked their magic, you can delete them or keep them around to work on any new messages you receive.

SEE THE BIG PICTURE

Here's a common Outlook Express complaint: You've inserted a picture into a message, but your recipients don't see it. Here's the simple fix: In the *Tools* menu, select *Options*, and then click on the *Send* tab.

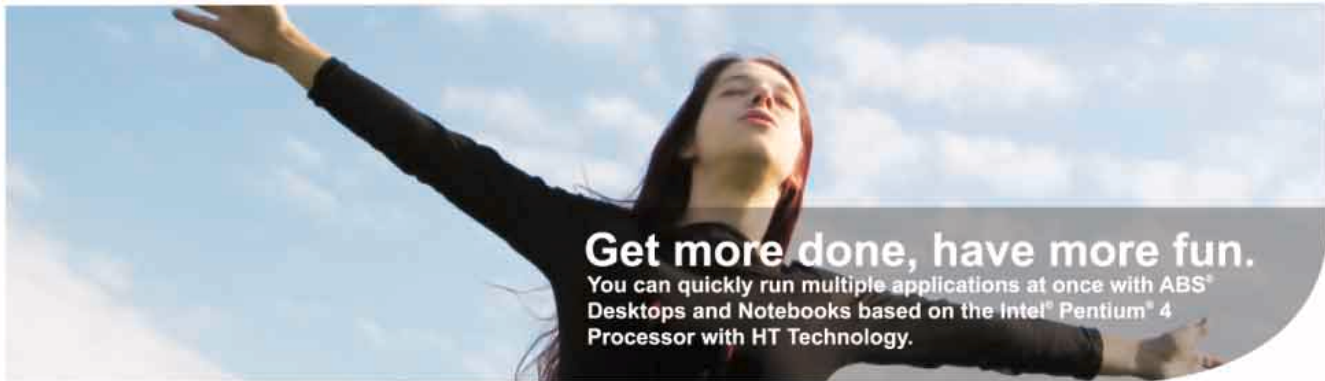
Where you see *Mail Sending Format*, make sure that HTML is selected. Then click on HTML *Settings* and check *Send pictures with messages*. Pictures visible, problem solved.



ESTABLISH YOUR OWN ARCHIVES

One way to save hard drive space and boost OE's performance is to

get messages off your system entirely. What you don't want to delete, you can archive: In Outlook Express, create a new folder called *Archives* (you can call it whatever you want; just use the same name in the subsequent steps). Move the messages you want to archive into this folder, then close OE. In Windows Explorer, find the *Archives.dbx* file, which is kept in OE's *Store* folder with the rest of OE's folders and messages. (Click on *Tools | Options*, the *Maintenance* tab, then the *Store* folder button to locate it.) Back up *Archives.dbx*, then open OE and delete the *Archives* folder. To restore your messages, create a new folder in OE called *Archives*. Open the folder, then close OE. Delete the file *Archives.dbx* from the *Store* folder, and replace it with the backup copy of *Archives.dbx*. Open OE, and voilà! Your backed-up messages are back in the *Archives* folder. ☰



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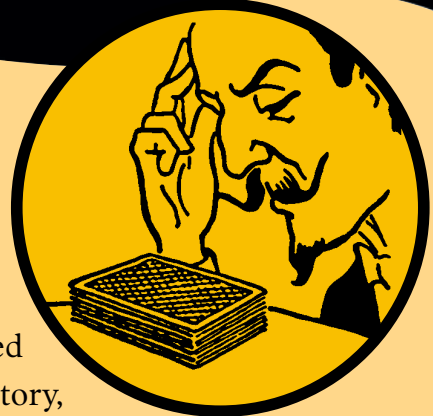


MICROSOFT OFFICE

106 TIPS & TRICKS



With every version of the Microsoft Office suite, Microsoft refines an already mature set of applications and adds many handy features. But much of Office's power—hidden options, unknown features, and shortcuts—goes unused and undiscovered by the majority of people that use the suite. In this story,



we've compiled some of our favorite tips and tricks

for Word, Excel, Outlook, and PowerPoint. These are tips that will make Microsoft Office more powerful, more productive, and even easier to use, and they'll let you customize the suite to work the way you want. Whether you're using Microsoft Office XP or Microsoft Office 2003, you're sure to find tips and



tricks here that will help you make even better use of the nation's best-selling office suite software.

IN THIS STORY

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| 94 | General Microsoft Office Tips |
| 95 | Word Tips |
| 95 | Excel Tips |
| 99 | Outlook Tips |
| 100 | PowerPoint Tips |

General Office

BY LAURA DELANEY

ZOOM IN AND OUT

You can use the scroll button on your mouse to zoom in and out of documents quickly. Just hold down the Ctrl key and roll the scroll wheel forward to get a closer view of the document, or roll it back to shrink it.

FAST FORMATTING

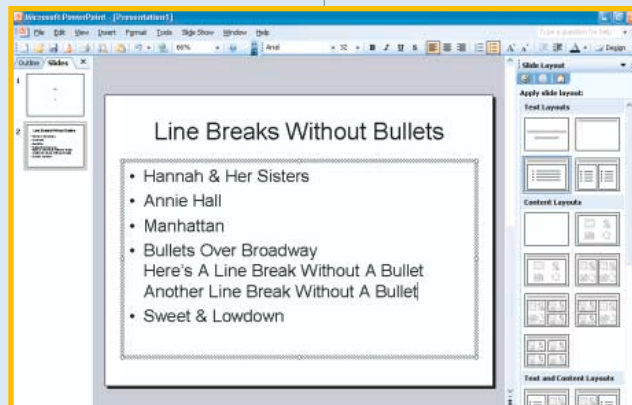
One of our favorite hidden gems is the Format Painter. This Paintbrush icon should appear by default on the standard toolbar. To add it to the toolbar, go to *Tools | Commands*, navigate

MORE FILE OPTIONS

If you hold down the Shift key while selecting the *File* menu in Word (or in Outlook when composing a message), the menu options change. You get handy options to *Save All* and *Close All* open files. In Excel, you get a *Close All*—but not a *Save All*—option.

LINE BREAKS WITHOUT BULLETS

When you're creating a bulleted or numbered list in Word or PowerPoint, you might



to *Format*, and drag the Paintbrush icon to a toolbar.

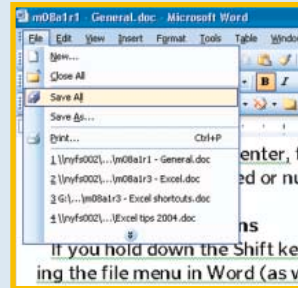
When you click on this icon, Format Painter copies the text formatting of the area where the cursor is located. If you select an entire paragraph or cell and then click on the icon, Format Painter will also copy the paragraph or cell formatting. You can then “paint” the copied formatting into other parts of the document by simply highlighting text.

By double-clicking on the Format Painter icon, you can apply the copied formatting repeatedly until you press Esc.

want an item to appear on the list without a bullet. You can start a new line without a bullet by pressing Shift-Enter. The next time you press the Enter key, the new line will continue the bulleted or numbered list. Another useful trick: In Excel, you can press Alt-Enter to start a new line within a cell.

USE AUTOCORRECT TO ADD SYMBOLS

The AutoCorrect feature in Office can automatically place symbols in your documents. Here are some of our favorites.



- (c) will do this: ©
- (r) will do this: ®
- (tm) will do this: ™
- ==> will do this: ➔
- <== will do this: ➜
- > will do this: ➤
- <-- will do this: ➤

UNDERSTANDING SMART TAGS

Smart Tags, which were introduced in Microsoft Office XP, are small XML-based icons that dynamically appear above or below data when an action is possible. Some Smart Tags are specific to an application, like Stock Symbol Smart Tags in Excel, or to a specific type of data, like a name or address in Word or Outlook. The most universal is the Paste Options Smart Tag, which appears whenever data is pasted into any Office application.

To ensure that the Smart Tags option is active, select *AutoCorrect Options* in the *Tools* menu in any Office application and click on the *Smart Tags* tab. Make sure the *Label text with smart tags* box is checked. There you will find

KEYBOARD SHORTCUTS

★ ★ ★ ★ ★ ★ ★ ★ ★ ★

Ctrl-C: Copy selection.

Ctrl-X: Cut selection.

Ctrl-V: Paste copied selection.

Ctrl-Shift->: Increase font size.

Ctrl-Shift-<: Decrease font size.

Alt-F11: Open Visual Basic for Applications.

Alt-Shift-F10: Display Smart Tag options.

numerous recognizers such as address, financial symbol, person name, and others, as well as a choice to remove Smart Tags altogether. Keep in mind that these choices will affect all Office applications where Smart Tags are an option.

Paste options: After pasting data in any Office application, clicking on the Smart Tag (which looks like a clipboard) will open up a menu with numerous formatting choices, including *Match Destination Formatting* (which will format the data being pasted in the same way as the rest of the document) and *Keep Source Formatting* (which will keep the text being pasted in the same format it had in the source document).

Address Smart Tags: Certain Smart Tags can perform handy actions. For example, if you type the name of one of your Outlook contacts into a Word document, a Smart Tag will provide options to send e-mail, open the contact information (if it exists), insert the person's address, or schedule a meeting. Smart Tags associated with an address include options to add the address to your contact list and to display either a map or driving directions (which automatically brings you to <http://mappoint.msn.com>).

Excel error-checking: Error-checking Smart Tags in Excel appear when a cell entry violates a set of rules for a function or formula. The choices offered help users spot possible errors in calculations and enable them to correct the errors or change the error-checking options.

Stock symbol: The Stock Symbol Smart Tag in Excel recognizes stock symbols and lets users get information from MSN MoneyCentral.

Other Smart Tags: Microsoft has provided an API for developers to build custom Smart Tags. Others are available on the Web. You can see a list of the ones currently available by clicking on *More Smart Tags* in the Smart Tags dialog box.

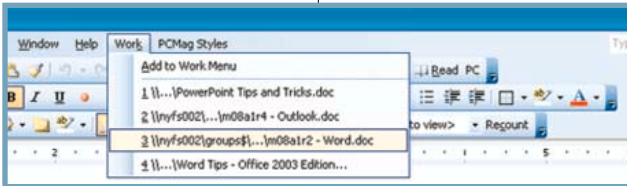
OUR CONTRIBUTORS: Helen Bradley, Edward Mendelson, and M. David Stone are contributing editors of *PC Magazine*. Associate editor Matthew P. Graven and PC Magazine Labs senior lead analyst Laura Delaney were in charge of this story.

Word

BY EDWARD MENDELSON

FAST ACCESS TO OFTEN-USED DOCUMENTS

You can keep frequently used documents readily available on Word's menu bar so you don't have to use the *File* menu and search through files and folders to find them. You do this by adding a *Work* menu to



Word's menu bar. Simply go to *View | Toolbars | Customize*, choose the *Commands* tab, and select *Built-in Menus* from the list of categories. Then choose *Work* from the list of commands and drag it to where you want it on the top-line menu. From your new menu, choose *Add to work menu* to attach a filename to the menu. To remove a filename, press *Ctrl-Alt-Minus* and click on the item you want to remove.

OPEN THE LAST-OPENED DOCUMENT

You can create an icon on your desktop that will launch Word and automatically open the document you last opened. Either locate the file *Winword.exe* in Windows Explorer (for Office 2003, this is typically in *C:\Program Files\Microsoft Office\OFFICE11*) or find it with the *Search* item on the *Start* menu (in the *Search* tool, you'll probably need to turn on *More advanced options*, then add checkmarks next to *Search system folders* and *Search subfolders*).

Once you find *Winword.exe*, right-click on the file icon and drag it to your desktop, and then select *Create Shortcuts Here*. Right-click on the

new shortcut icon, choose *Properties*, and go to the *Shortcut* tab. In the *Target* field, after the existing file path, add a space and then */mFile1*. You can also assign a shortcut key if you want to launch the file with a keystroke combination. When you're done, click on

Apply. In the *General* tab, give the shortcut a descriptive name and click on *OK*.

USING THE PASTE SPECIAL COMMAND

When you copy text from the Web or another document

into a Word file, Word will reproduce the typeface, color, and font size displayed in the original page. If you want the pasted text to match the formatting in the destination document, use *Edit | Paste Special*, and choose *Unformatted Text*.

REARRANGE PARAGRAPHS WITH TWO KEYSTROKES

Do you need to swap the second and third paragraphs in the document you're working on? Don't waste time dragging text around within your document using the mouse. Just click on the paragraph you'd like to move, hold down *Shift-Alt*, and move the paragraph up or down using the arrow keys. Each press of the arrow key causes the selected paragraph to jump over one adjacent paragraph.

ERASE PRIVATE INFORMATION

Word documents contain hidden information that can pro-

KEYBOARD SHORTCUTS

★ ★ ★ ★ ★ ★ ★ ★ ★ ★

Shift-F3: Toggle selected text between lowercase, initial capitals, and uppercase.

F4: Repeat your last action, including searching, typing, and formatting.

Shift-F4: Repeat the most recent *Find* command.

Shift-F5: Jump to the last change you made in the document.

Ctrl-F6: Toggle between open documents.

Alt-mouse click: Open the *Research* pane with information on the word or name you clicked on.

F7: Run the spell-checker.

F12: Open the *Save As* dialog.

vide clues to your identity and the identity of people to whom you e-mailed a file using Outlook. Word 97 goes so far as to retain logs of the last ten people who revised

Excel

BY HELEN BRADLEY

GET THE RIGHT ANSWER

When writing formulas, make sure the results will be calculated as you intended. Excel adheres to the standard order of precedence for calculations and calculates percentages, exponents, multiplication, and division in this order before calculating addition and subtraction. For example, $=7+5*3$ results in an answer of 22, not 36. To force a calculation to be completed before other calculations, place it inside parentheses: $=(7+5)*3$ will result in 36. If you're unsure how Excel is evaluating a formula, click on the cell and choose *Tools | Formula Auditing | Evaluate Formula*. Click on *Evaluate* to watch as each part of the formula is successively calculated.

AUTO-EXPANDING CHART SERIES

In earlier versions of Excel, it was difficult to create a chart that expands when data is added to the end of one or more of the series. Excel 2003's *List* feature solves this problem. To designate a data area as a list, click in a cell in the soon-to-be list, and choose *Data | List | Create List*. Then create your chart using the list data. Now, whenever you add new data to your list, the data area plotted by the chart expands automatically to include it.

ONE PAGE, ONE CHART

It's often handy to embed a chart on a worksheet near the data to which it relates. But sometimes you may want to

print the chart on a page by itself. To do this, select any part of the chart, choose *File | Print*, and the chart will print on a page by itself.

SEE CHARTS IN BLACK AND WHITE

Another handy feature when printing charts is the *Preview* command. You can print images in black and white by going to *File | Print*, clicking on the *Preview* button and then the *Setup* button, selecting the *Chart* tab, and then checking the *Black and white* box next to *Print*. The preview will now be in gray scale, letting you determine if the contrast is sufficient to distinguish the bars, lines, columns, and so on from one another.

FILENAMES IN FOOTERS

With Excel 2002, Microsoft added the ability to include the path to an Excel worksheet in its header or footer. The

your document, often with easily extractable e-mail addresses. Unrevised versions of your text may also be hidden in your files. Microsoft has posted a *Remove Hidden Data* tool on its Web site, but this is cumbersome to use and doesn't remove all identity information. Before making a Word file public, you can thoroughly clean it by opening it in WordPad (located in

Start | All Programs | Accessories) and saving the file in Rich Text Format. (Word can save to RTF but doesn't discard all the hidden information.) After you've saved the file, you can change its file extension from .rtf to .doc.

DRAWING A LINE

You can create a line across the page of your Word or Outlook document with just a few key-

strokes. Type three consecutive hyphens and press Enter to get a normal line. Type three underscores and Enter, and you'll get a bold line. And if you type three equal signs and press Enter, you'll get a double line.

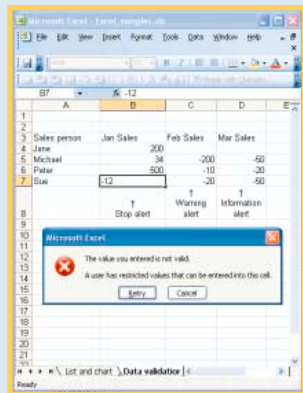
WORD'S BUILT-IN CALCULATOR

Did you know you can add a calculator to Word's toolbars or menus? Go to *View | Tool-*

bars | Customize and choose the *Commands* tab. In the list of categories, go to *Tools*, select *Tools Calculate* in the list of commands, and drag it to a toolbar or drop-down menu. After you drop the command on the toolbar or menu, immediately right-click on the command, choose *Change Button Image* from the pop-up menu, and choose the calculator icon.

Excel Tips

path is automatically updated if the file's location changes. Do this by selecting *View | Header and Footer* (or *File | Page Setup | Header/Footer*) and clicking on the *Custom Header* or *Custom Footer* button. The button with the folder icon adds the necessary code `&[Path]&[File]` to the selected area of the header or footer. While you could select the path and filename from the list of preset headers/footers, a custom one lets you format the text and add an image, too.



VALIDATE INFORMATION

Excel's Data Validation feature lets you limit the data that can be entered into a cell to what you specify as valid possibilities. For example, you can limit data to only whole numbers greater than 1,000. The Error alert you choose to use with the Data Validation rule has a significant bearing on whether or how easily invalid data can be

entered. Only the Stop Style alert actually prevents invalid data being entered.

The other two options, Warning Style and Information Style, each warn that invalid data is about to be entered but allow the user to continue entering the data. The Warning Style option requires the user to select Yes to make the invalid entry. The Information Style option is less stringent, with a warning dialog that will accept the invalid data by default.

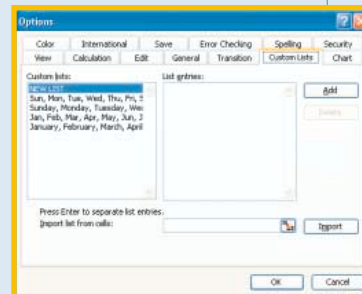
CUSTOM LISTS AND SORTS

If you frequently enter the same data into a worksheet—a list of employee names, for example—you can speed up the process by creating a custom list. Choose *Tools | Options* and select the *Custom Lists* tab. Type the list in the *List entries* pane, one entry per line, and click on *Add*. You can also use the *Import list from cells* field to add a list that already appears in a workbook. Once you've created the list, you can type any of the list entries (one employee's name, for example) in any cell and then drag the fill handle to fill the selected cells with the remainder of the list entries.

You can also use a list to sort data in a worksheet: Go to *Data | Sort* and select the column containing the list entries, choose *Options*, and then choose your custom list from the *First key sort order* drop-down menu.

CONFIGURE EXCEL DEFAULTS

Excel uses two template files, *Book.xlt* and *Sheet.xlt*, to control default settings for new workbooks and new worksheets that you add using the *Insert | Worksheet* command. By modifying and saving



these documents, you can customize default settings. *Sheet.xlt* should contain only one worksheet, and you use it to configure options appropriate to individual worksheets, such as gridline color. Use *Book.xlt* to configure default options for entire workbooks, such as styles.

If you don't have either of these files (Excel works fine without them), you can easily create them. Create a new workbook and then save it with the appropriate name in the *XLStart* folder. For Office 2003, this is typically located in *C:\Program Files\Microsoft Office\Office11\XLStart*.

RUN A MACRO LATER

You can use the `OnTime` command to create macros that will run automatically at

another time.

In our first example, we've created a timer so our macro will run after a certain amount of time has elapsed—in this case 5 seconds. We did this by specifying `Now + TimeValue (time)`. The value in parentheses defines the number of hours, minutes, and seconds before the macro should run.

```
Sub runMyApp1()
    'run in 5 seconds
    Application.OnTime
    Now + TimeValue
    ("00:00:05"),
    "showAlert"
End Sub

Sub showAlert()
    MsgBox "Time's up!"
End Sub
```

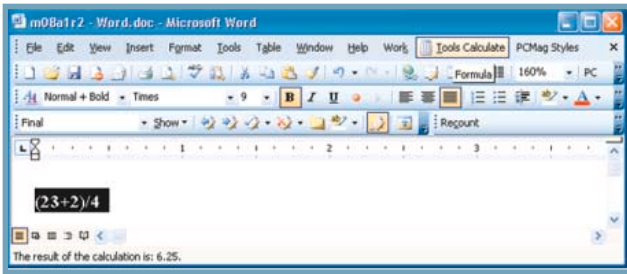
You can also set the macro to run at a specific time. In our second example, `runMyApp2` causes `showAlert` to run at 11:30 A.M. The time value in this scenario is based on a 24-hour clock, so 2:30 P.M., for example, would be 14:30.

```
Sub runMyApp2()
    'run at 11:30am
    Application.OnTime
    TimeValue("11:30:00"),
    "showAlert"
End Sub

Sub showAlert()
    MsgBox "Time's up!"
End Sub
```

PROCESS THE LOT

When the aim of your macro is to process each cell in a range of cells, one after the other, you can do this using a



You can use the same pop-up menu to specify whether to display text, an icon, or both in the toolbar. Now, type a simple

calculation (try 2 + 2) in a Word document, highlight it, and click on the new icon or menu item. To replace the cal-

culatation with the result, just press Ctrl-V. Before you press Ctrl-V, note that the result appears in the status line at the bottom of the window.

TAMING SQUIGGLES AND SMART TAGS

Some of the features that are supposed to help you can just be downright annoying. Take those squiggly red and green underlines Word puts under

words and sentences. Intended to point out spelling and grammatical errors, these are often wrong or inappropriate. To turn off the squiggly lines, choose *Options* from the *Tools* menu, select the *Spelling & Grammar* tab, then uncheck *Check spelling as you type* and *Check grammar as you type*.

Similarly, the Smart Tags that appear under dates, telephone numbers, pasted text,

For loop. For example, here is a macro that doubles the contents of every cell in the selected range (the error statement avoids problems where cells contain non-numeric data).

```
Sub processRange()
Dim myCell As Range
For Each myCell In Selection
On Error Resume Next
myCell.Value = myCell.Value * 2
Next myCell
End Sub
```

To adapt this example to your own needs, simply place your own code for processing cells between the *For Each myCell* and *Next myCell* statements.

DEFINE CONSTANT VALUES

Using the Name tool, you can define a constant, such as a tax rate, that you frequently use in Excel formulas. Go to *Insert | Name | Define* and type a name—*TaxRate*, for example. In the *Refers to* area, type the constant value and click on OK. For a 7 percent tax rate, you would enter 0.07. Now you can write a formula like *=SalePrice*TaxRate* and Excel will use the constant value you defined for *TaxRate*.

FIND AN EXACT MATCH

To search for an exact match for an item in a table and return data only if the item is found, use a lookup formula with the FALSE argument. This argument will locate only exact matches, and it doesn't require the first column of the table to be sorted.

If your unsorted list is in the range A2:C5 and the value you need to look up is in cell A8, *=VLOOKUP(A8,A2:C5,2,FALSE)* will return an exact match, even if it is in column B. If no match is found, an #N/A error will be displayed.

If all you need is the position of a matching item in the list, you can use the MATCH function. For example, *=MATCH(A8,A2:A5,0)* will

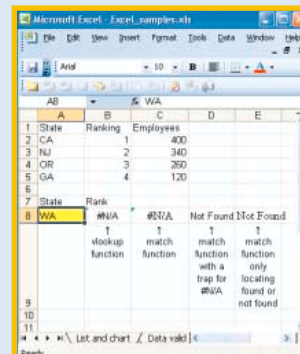
return the item's position or an #N/A if a match is not found.

If you don't like the look of #N/A, you can use the IF function to create a friendlier message for when a match is not found:

```
=IF(ISNA(MATCH(A8,A2:A5,0)), "Not Found", MATCH(A8,A2:A5,0))
```

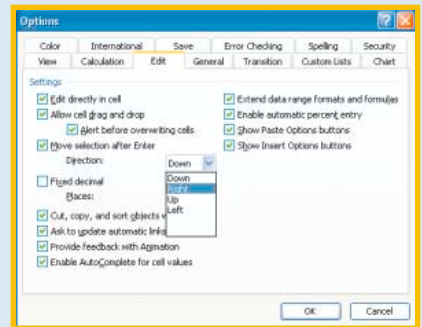
Similarly, if all you want to know is whether or not a match is found in the list, you can use the following statement:

```
=if (ISNA(MATCH(A8,A2:A5,0)), "Not Found", "Found")
```



FAST FORMULAS

Sometimes you need to copy a formula or data to a series of nonsequential cells. You can do this quickly without having to paste it into each cell individually. First copy the data from the source cell. Then hold down the Ctrl key as you click on each destination cell.



Once all the cells are highlighted, you can paste the data by pressing Ctrl-Enter.

Similarly, you can type data into a series of cells. Again, while holding down the Ctrl key, click on all the cells you want to enter the text into. Next, type the text you are entering and then press Ctrl-Enter to add the text to all the selected cells.

CONTROL DIRECTION

Here's a simple yet very handy tip. By default, the cell pointer moves down when you press Enter after entering data into a cell. But you can actually change the direction in which the cell pointer will move when you press Enter. Go to *Tools | Options* and go to the *Edit* tab. Check the box next to *Move selection after Enter* if it isn't already enabled, and choose the direction you want the pointer to move in from the drop-down menu. When working in a document, you can make the pointer move in the opposite direction from the one you've chosen by holding down Shift while you press Enter.

KEYBOARD SHORTCUTS

★★★★★★★★

- F2:** Edit a cell's contents.
- Ctrl-I:** Open the Format Cells dialog.
- Ctrl-Page Up:** Move to the next sheet in the workbook.
- Ctrl-Page Down:** Move to the previous sheet in the workbook.
- Ctrl-Shift-↑:** Copy the value from the cell above into the current cell.
- Ctrl-↓:** Copy the formula from the cell above into the current cell.
- Ctrl-R:** Fill contents of active cell into selected cells to the right.
- Ctrl-D:** Fill contents of active cell into selected cells down.
- Ctrl-`:** Toggle between showing cell values and formulas in cells.
- Ctrl-⌵:** Set selection to currency format with two decimal places.

and so on can be distracting. You can choose *AutoCorrect Options* from the *Tools* menu, then select the *Smart Tags* tab to turn off individual features or all Smart Tag displays.

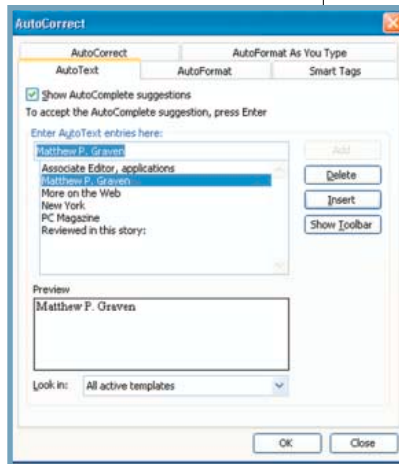
FIX STUBBORN FORMATTING

Ever try to fix formatting that refuses to change? You can start with a clean slate by removing all formatting from the selection—select the block of text and press Ctrl-Shift-N.

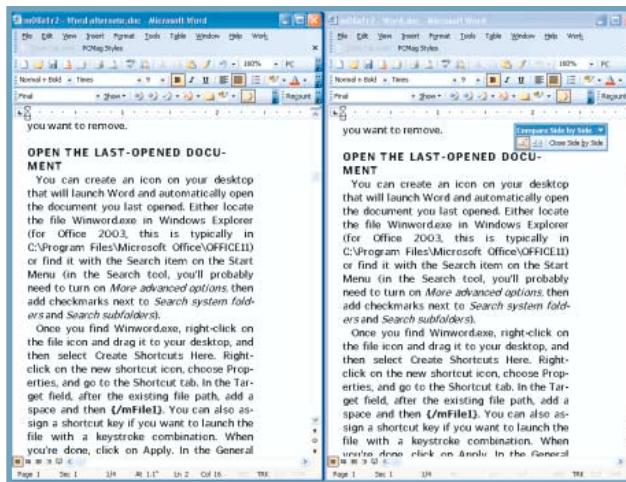
Alternatively, you can use Word's *Reveal Formatting* task pane to modify the formatting. In Word 2003, just hit Shift-F1; in Word 2002, select *Reveal Formatting* from the *Format* menu.

When you click on an underlined link, an options dialog will display settings that you can modify. By checking the *Distinguish style source* option, you can view whether formatting was applied directly or via a style.

You can also see which styles are applied to multiple paragraphs. Choose either *Normal* or *Outline* under the



View menu. Then select *Options* from the *Tools* menu, go to the *View* tab, and enter a value of 0.5 inches or more next to the field labeled *Style area width*. A panel at the left edge of the window will display the styles associated with each paragraph.



CLICK ON THE STATUS BAR

Unless you've turned the status bar off in *Tools | Options* (under the *View* tab), it will appear at the foot of Word windows. This displays information such as the current page and line. You can double-click on the *Page* and *Ln* indicators to bring up the *Go To* menu.

Other status menu items are toggles: Double-click on REC to access macro recording, TRK to start tracking changes, EXT to extend the selection, or OVR to switch the typing mode from insert to overwrite. You can also right-click on some of these to bring up options menus.

CUSTOMIZE AUTOTEXT

You've probably noticed that Word completes certain phrases, such as "Best Wishes," before you've finished typing. You can customize this list so that Word completes

only the phrases you define. Select *AutoCorrect Options* from the *Tools* menu, then go to the *AutoText* tab. Delete any items you don't want to keep, then add names and phrases that you type often, such as your name, company, or address.

COMPARE TWO DOCUMENTS SIDE BY SIDE

In Word 2003, you can compare documents side by side. Open two documents. Then, from the *Window* menu of one of them, select the *Compare Side By Side* command. If you have only two documents open, the command will automatically choose to compare them. If you have three or more documents open, you'll have to select which document to compare with the current file.

A floating toolbar with two buttons will open. If the button on the left is selected, Word will scroll both documents at the same time. Press the button on the right side of the toolbar to return to where the cursor was located when you started comparing.

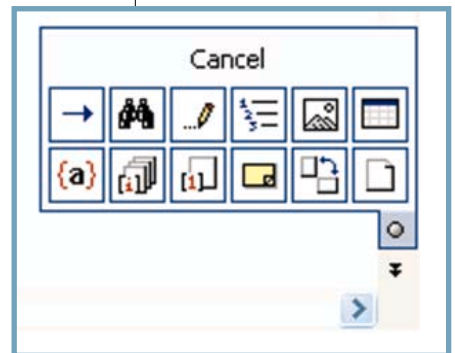
EDIT TWO PARTS OF A DOCUMENT

Are you worried about the consistency of your introduc-

tion and conclusion? A spectacular yet underused feature is Word's ability to display two different parts of a document at the same time. To do this, you can either select the *Split* option from the *Window* menu to display a dividing line in the current window. Alternatively, you can drag down the tiny divider tool at the top of the right scroll bar. You can navigate to different parts of the document in each pane and use F6 to jump between them.

SMARTER NAVIGATION

Many Word users know that the up-and-down double arrows at the foot of the vertical scroll bar will page up and down through an open document. Fewer, however, know that the little dot icon between those arrows, called the *Select Browse Object* button, lets you change the func-



tion of the double-arrow buttons and of the Ctrl-PgUp and Ctrl-PgDn key combinations. You can, for example, choose to browse by heading, so the buttons will automatically jump you up or down to the next heading. Other choices let you browse by footnote, endnote, comment, graphic, or table.

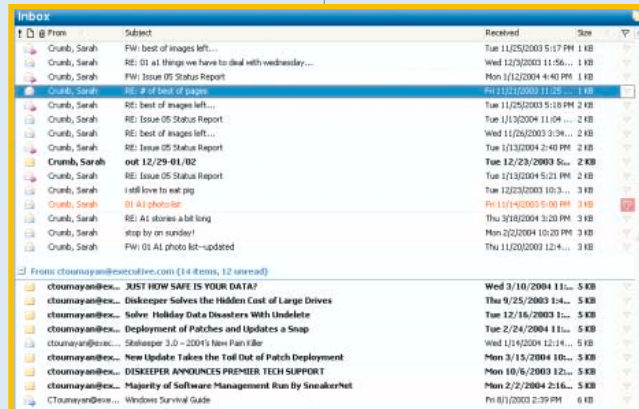
MORE ON THE WEB
 Check out pcmag.com/tips for more
 Microsoft Office tips, tricks, and fixes.

Outlook

BY M. DAVID STONE

SORT BY MULTIPLE COLUMNS

Sorting by a single column in Outlook is a simple matter of clicking on the column head. Sorting by multiple columns, however, is not so obvious. But it's actually quite easy. First, sort by the first criterion, such as *From*, by clicking on the column head. Then hold the Shift key down as you click on a second heading, such as *Received*. Your messages will be sorted



primarily by sender, and all the messages from each sender will be ordered chronologically. You can even add additional columns to sort by. Outlook will sort your messages by each additional criterion with the earlier criteria to give you a multicolumn sort.

VIEW CONVERSATIONS

Outlook 2003 lets you view messages by thread, which is a convenient way to scan your in-box much faster. Just choose *View | Arrange By | Conversation* to see your mail arranged this way. If you have the reading pane on the right, you can get to this setting faster by clicking on *Arranged by* at the top of the message list. You'll find that if each message contains the earlier messages, you can read just the latest message in the thread instead of work-

ing through each one, so you can easily clean out your in-box by deleting earlier notes and keeping only the latest one.

MORE ROOM TO READ

Outlook 2003 has a handy three-column format, with the reading pane on the right, which makes it easier to read mail without opening each message. But sometimes you need more room for reading. Alt-F1 toggles the navigation

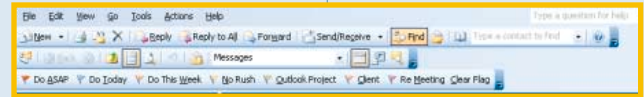
pane on and off, giving the extra space to the reading pane. Try this once and you'll probably use it regularly.

GO WHERE YOU WANT TO

The first time you save or add an attachment during any given session, Outlook starts at the *My Documents* folder by default. If you rarely save files to or attach them from *My Documents*, this can be annoying. One easy fix is to add shortcuts in the *My Documents* folder that take you to the folders you use most often. That way, you can click on the shortcut rather than being forced to navigate through multiple levels.

To create a shortcut, open the *My Documents* folder. Choose *File | New | Shortcut*, select *Browse*, and navigate to the folder you want the short-

cut to take you to. Click on *Next* and enter a name for the shortcut. When naming the file, use an ampersand as the first character so that the shortcut will appear at the top of your list. Now click on *Finish*. The next time you open



Outlook and add or save an attachment, simply click on the shortcut to go from *My Documents* to the folder you want.

COLOR YOUR FLAGS

If you use each flag color in Outlook 2003 to mean something different but sometimes forget which flag means what, here's a handy trick: Put the flags on a toolbar and give them custom names. Not only do the buttons tell you what each flag is for, but you can also use the buttons to add flags to messages quickly.

Start by choosing *View | Toolbars | Customize*. In the *Customize* dialog box, choose *Toolbars* and then *New*. Enter "Flags" as the name, and click on *OK*. Drag the new toolbar onto Outlook's toolbar area. Next, choose the *Commands* tab in the *Customize* dialog

box. From the *Categories* list, choose *Actions*, and find the entries for *Red Flag*, *Blue Flag*, and so on. Drag each flag command to the new toolbar. Also drag the *Clear Flag* command, which lets you clear flags from messages. Right-click on each

flag button, enter a name in the *Name* box, make sure the *Image and Text* option is checked, and then close the *Customize* dialog box. Next time you want to flag an item, simply select the item and click on the appropriate flag button in the toolbar.

EXPAND AND COLLAPSE THE FOLDER TREE

If you'd rather use keystrokes than the mouse whenever possible, you can use the asterisk key on the numeric keypad to expand the currently selected folder in Outlook's folder tree. Press the key again, and the next level of subfolders in all the newly opened folders will expand. Each keystroke opens another level. The minus key on the numeric keypad will collapse all the folders at once.

ASSIGN CATEGORIES AND CHANGE ENTRIES BY DRAGGING

In Outlook, you can assign categories as a way of making it easier to group related items. For example, you can classify various contacts as personal or business. If you want to assign categories to Outlook items that already exist, you can do this with a simple drag-and-drop. Choose *View | Arrange By | Categories*. Next, if the program is not already set to show groups, choose *View | Arrange By | Show In Groups*. You can then assign a category to a record by dragging the record to the appropriate group. You can also use this method to enter or modify other fields, such as company names.

KEYBOARD SHORTCUTS

★ ★ ★ ★ ★ ★ ★ ★

Ctrl-Shift-I: Switch to in-box.

Ctrl-Shift-O: Switch to out-box.

Ctrl-Enter: Send current message.

Ctrl-R: Reply to a message.

Ctrl-Shift-R: Reply All to a message.

Ctrl-Shift-A: Create a new appointment.

Ctrl-Shift-M: Create a new message.

Ctrl-1: Switch to Mail.

Ctrl-2: Switch to Calendar.

Ctrl-3: Switch to Contacts.

Ctrl-4: Switch to Tasks.

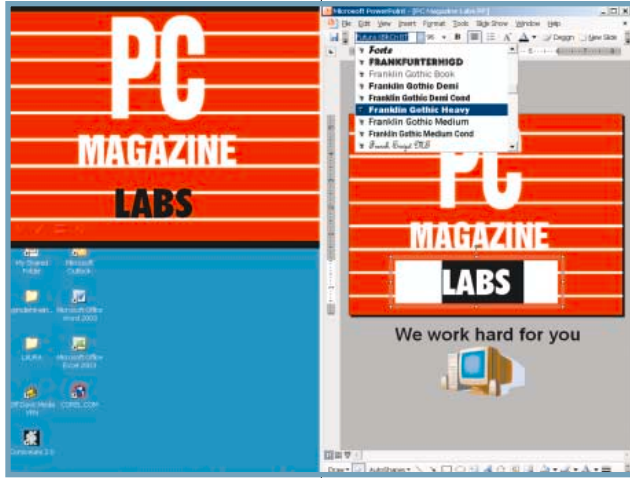
PowerPoint

BY LAURA DELANEY

PREVIEW SLIDE SHOWS

For a quick preview of a slide show while you're editing a presentation, hold down the

Ctrl key while clicking on *View Show* in the *Slide Show* menu. Instead of launching in full-screen mode, the presentation,



starting with the current slide, will appear in a small window atop the slide being edited. To edit the slide and see your changes in real time, resize the PowerPoint window so the preview slide is in view. Any modifications you make will instantly appear in the preview window.

NUDGE OBJECTS

Using the mouse to move an object a minuscule distance can be very frustrating. Forget the mouse and use the keyboard instead. Just select the object you want to nudge and use the arrow keys to move it in the direction you want. Each press of the key will move the object 1/12 of an inch.

A DIFFERENT BACKGROUND

If you'd like a different look for one or more slides in a slide show, you can omit the master

background chosen for your presentation. First navigate to the slide you'd like to change. Then click on *Format | Slide Background*, check the box that says *Omit background graphics from master*, and hit *Apply*. To choose multiple slides at once, go to the *View* menu and click on *Slide Sorter*. Then hold down the Ctrl key and click on the slides you'd like to modify. You can then go to the *Format* menu and repeat the steps to omit the background, as above.

ALIGN OBJECTS

You can automatically place or align objects evenly with other objects in a slide (without using a guide or grid). Select the objects by clicking on them while holding down the Ctrl key. Click on the *Draw* button at the bottom left of the screen, and choose *Align* or *Distribute*. Select one of the options in the

Outlook Tips

IS IT REALLY SPAM?

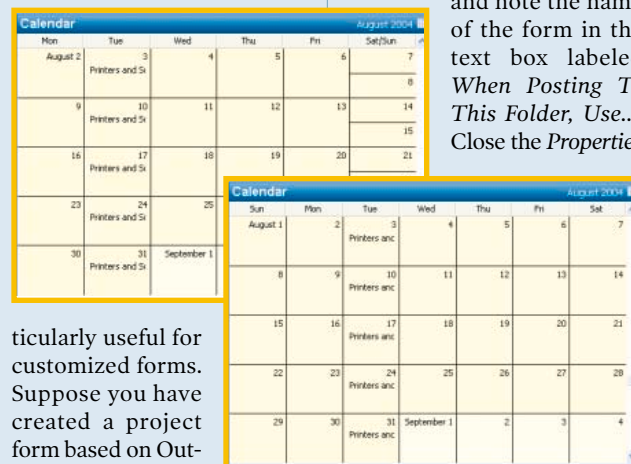
Outlook 2003 includes a decent spam filter, but like other spam filters, it occasionally misidentifies legitimate e-mail as junk. In cases where real mail comes in from unexpected sources, Outlook's whitelist feature won't help. At the very least, be sure to give your junk mail a quick glance before you delete it, to make sure you're not losing messages from friends or business associates. It's the sort of task you can handle on the train coming into work or while you're on hold on the phone. Also make sure you have the latest version of the spam filter. Microsoft has already posted an update, which you can get by clicking on *Help | Check for Updates*.

USING DEFAULT ENTRIES IN FORMS

Information in Outlook is stored in a database, so when you look at items like a contact or appointment, it is using a

form to retrieve info and provide fields for entering information. Outlook lets you customize forms and create default entries for fields.

Creating a default entry for a given field in a form is par-



ticularly useful for customized forms. Suppose you have created a project form based on Outlook's Task Entry form, and you have a field for the client associated with the project. If you have a primary client whose name is the one that most often shows up in this field, you might like Outlook to enter the name auto-

matically each time you create a project record.

To create a default entry, first confirm the name of the form that you want to modify. Right-click on the folder name in the folder list, choose *Properties*,

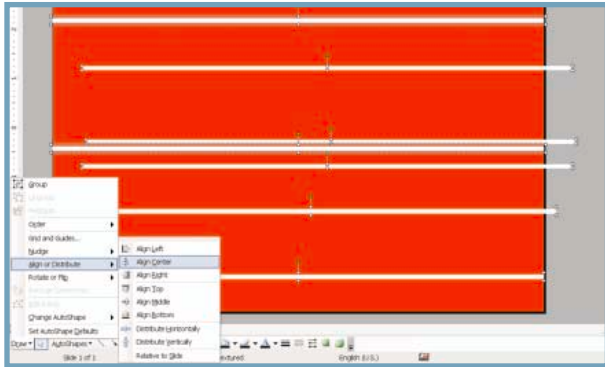
and note the name of the form in the text box labeled *When Posting To This Folder, Use...* Close the *Properties*

Close the *Properties* window, go to the appropriate folder, and create a new blank record. Add the entry that you want as the default, and choose *Tools | Forms | Publish Form*. Navigate through the folders to find the old form, and publish

the modified version in the same folder using the same name. (You can use a new name, but then you'll also have to change the name of the form to use in the folder's *Properties* dialog box). Then close the record you were working in, and open a new one. On the first attempt, you may get the message that Outlook can't open the form. Click on *OK* and try to open a new form again. It should open with the default entry already added.

SATURDAY AND SUNDAY: ONE DAY OR TWO?

The default month view for the Outlook Calendar combines Saturday and Sunday into one column. You can, however, switch it to showing a separate column for each. To find the command, right-click anywhere on the calendar and choose *Other Settings*. Then remove the check from the option to *Compress Weekend Days*. And of course, you can go back to having both in one column by checking the box



pop-up menu, and the objects will be aligned or distributed automatically.

HIDING SLIDES

You can create a slide that you can display as a reference during a slide show when needed. To hide the reference slide, go to the *Slide Show* menu and choose *Hide Slide*. Make a note of the number of the hidden slide. At any point in your presentation, you can hop to

that slide by typing its number and pressing Enter.

This trick works for any slide, not just hidden ones. If you have multiple nonsequential hidden slides, press the *H* key to go to the next one. To return to where you were in the presentation, right-click on the slide and select *Last Viewed*.

Alternatively, you can create an action button on another slide that will display

the hidden slide. To do this, choose a slide for the action button, click on *Slide Show | Action Settings*, and select an icon to be placed on the slide. Once you've placed the action button, the *Action Settings* dialog box will appear. You can choose to trigger the action by a mouse click or a mouse-over. Then select *Hyperlink to* and choose *Slide...* from the drop-down list. Choose the hidden slide from the list of slides in your presentation. During your presentation, simply click on the action button to display the hidden slide.

You can also use the steps above to create an action button on the hidden slide that will take you back to the slide you just clicked away from.

KEYBOARD SHORTCUTS

★★★★★★★★

EDITING MODE

- Ctrl-M:** New slide.
- Ctrl-D:** Duplicate the current slide.
- Ctrl-Shift-C:** Copy Auto-shape style.
- Ctrl-Shift-V:** Paste Auto-shape style.
- Ctrl-Shift G:** Group objects.
- Ctrl-Shift H:** Ungroup objects.
- Shift-F9:** Toggle the grid on and off.
- Alt-F9:** Toggle the guides on and off.

PRESENTATION MODE

- F5:** Start presentation.
- Right Arrow:** Next slide or build.
- Left Arrow:** Previous slide or build.
- Home:** First slide.
- End:** Last slide.

again. This setting also controls whether the calendar prints with six columns or seven.

BEWARE OF BROKEN DATES

If you choose the *Details* tab for an Outlook contact, you'll see *Birthday* and *Anniversary* fields. Dates added here are automatically inserted into your calendar as recurring events. (You don't have to know the year someone was born, just the day.) Unfortunately, this feature doesn't work properly in Outlook 2003. Try this quick test:

Create a new contact named *Debbie Smith* with today's date as the birthday. Save the record. Then change the name to *Debbie Johnson* (perhaps she got married), and then save the record. Finally, change the birthday to three days later (as if you accidentally entered it incorrectly the first time), and save the record. If you did this in Outlook 2002, you'd have one calendar entry, with the right date. You would also have a

linked object in the *Notes* field of the contact, so you could remove the event from the calendar by deleting the object.

In Outlook 2003, however, you'll find a separate calendar entry for each time you saved the record, and no linked objects in the *Notes* field. Instead, you have to find each entry in the calendar or go to the *Activities* tab and let Outlook find them for you. Unfortunately, there is no way around this. All we can do is warn you to be aware, because the entries are recurring. If you don't clean out old versions of entries that have been modified, they'll show up with the wrong names and dates year after year.

ARCHIVE YOUR MESSAGES

As messages gather in your inbox, your Outlook data file can grow to extremely large sizes. This eats up system resources and increases the time Outlook takes to load. If you don't want to delete messages, consider archiving them. One way to

archive is to use the *File | Archive* command, fill in the options in the *Archive* dialog box, and choose *OK*. Another easy way is to create a second data file. From the main Outlook window, select *File | Open | Outlook Data File* if you already have a file to archive to, or *File | New | Outlook Data File* if you need to create one.

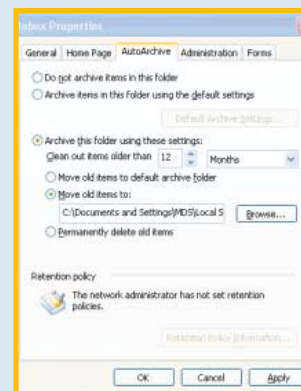
If you're using Outlook 2003, you'll also see a dialog box asking you to choose whether to use the new Outlook format or the format used by Outlook 97 through 2002.) Once the sec-

ond file is open, drag and drop the folders or files you want to archive to the second file, and, finally, close the file.

Yet another alternative is to use Outlook's auto-archive feature. To set automatic archiving for any given folder, right-click on the folder, choose *Properties* and then the *AutoArchive* tab, and set the options to match your needs.

ARCHIVE AS TEXT

When you're ready to archive an old thread, consider exporting it to a text file rather than sending it to an Outlook archive. The text file will take up less space on your hard drive and can be easily opened in Word if you ever need to browse or search through it. To create the text file, select the messages to be archived, then choose *File | Save As*. Make sure the file format is set to text only, navigate to the appropriate folder, enter a name for the file, and choose *Save*. You can then delete the messages from Outlook. ■





FILEMAKER PRO 7:

Effortlessly Manage All Your Information

An unbeatable combination of power and ease of use has made FileMaker Pro the number-one easiest-to-use database software for small organizations, workgroups, and anyone managing people, projects, and assets. It's no wonder—most databases require an experienced application development expert to get applications up and running. But with FileMaker Pro, just about anyone can design and deploy powerful productivity-enhancing applications on their own.

With the availability of FileMaker Pro 7, FileMaker, Inc., delivers breakthroughs like the ability to manage and store any type of file, open multiple windows in the same database, dramatically increase database storage, confirm changes before saving, and a new, advanced security system.

Users of existing versions of FileMaker will have a host of reasons to upgrade. And anyone contemplating a database for the first time will find that FileMaker Pro 7 gives them what they need without the steep learning curve of competing solutions.

Manage Any File

How many times have you searched manually through countless files for that one graphic you needed to reuse—only to end up recreating the same thing from scratch, just to “save” time? FileMaker Pro 7 solves this problem with a major improvement to one of its greatest features, Container Fields.

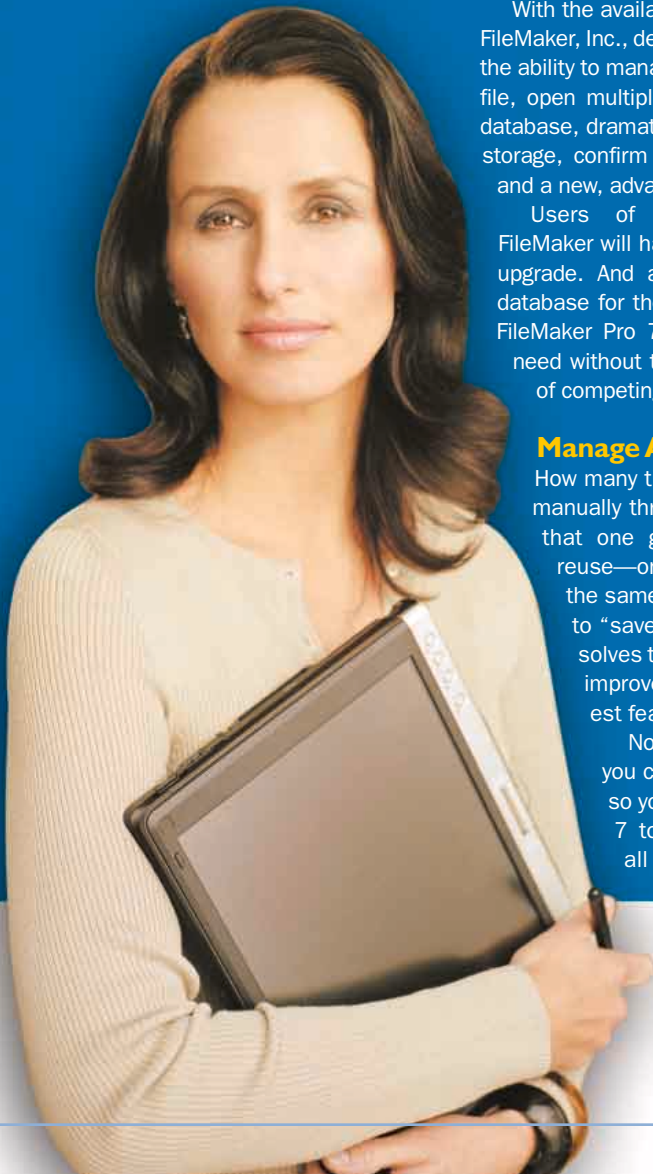
Now, with Container Fields, you can store any type of file, so you can use FileMaker Pro 7 to organize and manage all of your information.

Container Fields let you import, export, link to, and manage virtually any file or document type, including digital pictures and video, Word documents, Excel spreadsheets, PowerPoint presentations, and Adobe Acrobat files. You can also store relevant information—such as date created, date modified or contents—along with your files. Now you can easily create your own solution for managing documents with FileMaker Pro 7, which can help save time and boost productivity.

Looking for a specific graphic you placed in a Word document, or the entire file? A quick database search will help you find either in seconds. The same feature can help real estate or financial firms share, track, archive and retrieve hundreds of credit applications, mortgages, and other financial documents. Architectural firms can manage bids, contracts and drawings more easily; while law firms may track the myriad legal documents associated with each case. And you can link these document files to other client data as well, streamlining workflows. It's a perfect solution for organizations that don't have the time or resources to deploy a full-fledged document management system.

Bigger Files, Advanced Security

Of course, you'll need space to keep all those files. With FileMaker Pro 7, you can store up to a whopping eight terabytes of information in a single database. That's over 4,000 times more data than FileMaker Pro 6. Within text fields you can



store up to 2GB of data, or 4GB in Container Fields.

FileMaker Pro 7 also has much more granular and flexible security. You can assign custom privileges that specify which data each user can create, change, view, edit, and delete—all the way down to the individual field level. For example, you can allow the marketing group to access all records, but only let salespeople access specific fields within those records that are relevant to their individual territories.

You can also assign user privileges for viewing and editing layouts, value lists, scripts, and menu items much more easily. And FileMaker Pro 7 lets you carry those same security levels—along with record locking—to the Web site you've created with the database's unique, one-step Instant Web Publishing feature.

7 in Action

The Alabama Eye Bank's Scott G. Howard is particularly excited about the new features in FileMaker Pro 7. One of the top ten eye banks in the world, the Alabama Eye Bank uses FileMaker Pro to manage its entire donor-screening process. Howard is a typical FileMaker user in that he started with a small solution without IT help, which has since expanded to manage their entire donor-screening process.

Howard has always wanted to store the specular microscope images of donor eye tissue in his database. But he ran up against the 2GB file size limit of the previous version of FileMaker Pro, so he had to store references to the images instead. With FileMaker Pro 7's Container Fields and practically unlimited database capacity, Howard can now access these images with ease—and make them available to

everyone on the network. "With this new capacity we can keep these images online for years," says Howard.

Alabama Eye Bank is also talking with a major ophthalmology firm to jointly develop an asset-management database to store marketing presentations, as well as digital video and graphics files.

"We always wanted to do this but we put it off because we thought we'd have to purchase an expensive document management system. Now we can do it all in FileMaker Pro 7 and link it with our existing public relations activity database. The ability to analyze all this information will really enhance our development efforts with participating hospitals."

More New Features

FileMaker Pro 7 also boasts many new developer and productivity features, 70 new Web scripts for much richer Web publishing, more intelligent calculations, and better solutions documentation. You can now alternate background colors in reports by row or apply font styles based on specific calculations to, for example, highlight overdue payments in bold red.

Yet even with all these new features, FileMaker Pro 7 is still easier to use. With its new relational model, you can merge all of your tables into a single file, and share a single set of scripts and security accounts across them. The Relationships Graph tool lets you create and then view and maintain relationships among tables simply by drawing lines between fields.

FileMaker Pro 7 also lets you open



Hold Everything! Now you can store any type of file in Container Fields—from Adobe Acrobat PDFs to spreadsheets, PowerPoint presentations, and even digital pictures and videos.

multiple windows per file, so the same data can be viewed in different ways. So for example, you could view your contact list in one window while you work on contact A's information in another, contact B's in a third, and so forth. Finally, better confirmation of record and layout changes ensures greater data-entry accuracy and lets you experiment with multiple new layouts and database structures without having to commit to any of them.

FileMaker Pro has always balanced tremendous power with impressive ease of use. With FileMaker Pro 7, the best gets even better.

Next Month:

Focus on Security and the Web

New Features

The most important new and enhanced features in FileMaker Pro 7 are:

- Import, store, and export any file: PDFs, Microsoft Word and Excel files, Quark and InDesign files, photos, music files, and more
- Open multiple windows in the same database at the same time for unprecedented multitasking
- Super-expanded 8-terabyte database storage; Container Fields can store up to 4 gigabytes and text fields up to 2 gigabytes
- A new option lets you confirm data and layout changes before you commit them, so you can experiment with new layouts
- New relational model to streamline the creation of simple and complex databases
- New Relationships Graph to link data between tables just by clicking and dragging
- Enhanced Web publishing capabilities, all with point-and-click ease
- Advanced security features using account names and passwords and simple assignment of custom privileges for any user

Using an old version of FileMaker Pro? Licensed users of FileMaker Pro 6 all the way back to FileMaker Pro 2.1 may upgrade to FileMaker Pro 7 for only \$149 (save \$150 off full price).*

See www.filemaker.com/fmp7 for details.

*Only licensed users of FileMaker Pro software are eligible for this promotion. For FileMaker Pro 2.1-5.x customers, this offer expires Sept. 17, 2004. After Sept. 17, 2004, only FileMaker Pro 6 customers will qualify for this offer.

Play as You



Reviews by Bill Machrone
Photography by Thom O'Connor

Silver, gold, green, pink, and blue are the new white. If you're looking at the new Apple iPod Minis, that is. The company that put the zap in the digital-music zeitgeist wowed us even more, by adding a colorful little buddy to the best-selling portable digital player line on the market. iPods are so popular that some companies actually make money selling white, Apple-style headphones to roving rockers who don't actually own an iPod.

If you're just getting started with digital music, know that the process of digitizing your music collection has gotten easier, but not much faster; there's a limit to how fast

your PC can rip the bits from your CDs. For encoding your music, Musicmatch Jukebox has won several PC Magazine Editors' Choice awards over the years, and it continues to hold its own as a music recorder, manager, and player. But it doesn't work with every portable device. Although nearly all the players we tested include a music manager or two, check these players for compatibility with your existing computer-based music collection.

On the format front, MP3 remains the most popular music file type by a long shot, although the growing popularity of on-line music stores (and the growing fear of trolling file-sharing networks) has increased the number of formats you'll encounter. iTunes songs are saved as AAC files; Napster's and Musicmatch's are

WMA format. Most players we reviewed can decode both MP3 and WMA, but only the Apple iPod Mini could handle AAC. Online stores use digital rights management to monitor where you play those files; see the sidebar "Good-Bye, MP3; Hello, DRM!" for more information on how such files are encrypted and where they'll play.

MORE ON THE WEB

Sony MiniDisc players are a popular alternative to digital music players. We talk about the format and take a look at the newest player at www.pcmag.com.



Digital music players rock. Picking the right one doesn't. But it shouldn't be too much of a challenge once you have the right information.



The right digital music player has to fit your lifestyle, whether it's your workout buddy, a travel companion, or your portable music library. The differences were obvious in our testing: We can help you choose between one of the smaller, hard drive players or the lightweight, flash memory players. Our tests showed that all of the players were compe-

tent sonically; the earphones made bigger differences in sound quality. We've reviewed 13 portable digital music players, with an ear toward audio fidelity and an eye toward style.—*Jeremy A. Kaplan*



PHOTO (TOP LEFT) BY RICHARD MORRELL/CORBIS

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Flash Memory Players

Auvi SA100

\$79.99 list. Auvi Technologies, 636-447-4005, www.auviworld.com. OVERALL RATING: ●●●●○

The Auvi SA100 is a USB key that plays music, period: It appears as a disk drive to your system, you transfer files to it, and you listen. The player's no-frills approach is a refreshing antidote to the rampant featuritis afflicting some of the other players.

If you transfer albums or playlists as folders, the SA100 keeps them in order. But it plays them as though they were just one big folder. The control buttons are all segments of a brightly chromed dome, and you can easily learn their various positions and functions. The EQ button cycles through four preset equalizations, which correspond more or less to the standard designations: jazz, pop, rock, and classical.

You can use the SA100 as a standard USB key too; the device's music software ignores all files that aren't MP3 or WMA. Just pop off the end cap to expose the USB connector. A small green LED signals that the unit is on; a red LED verifies that the USB connection is active. Although the USB 1.1 bus limits throughput, it doesn't take much time (or much music) to fill the SA100's 128MB capacity.

Unfortunately, the SA100 lacks a repeat function, prohibiting us from testing battery life efficiently. But the low cost is terrific: The SA100's \$79.99 list price puts it within reach of any music aficionado. And the 64MB version costs only \$49.99.

BenQ Joybee 150

\$190 street. BenQ Corp., 909-569-0700, www.benq.com. ●●●●○

BenQ's music players are among the few that can compete with Apple iPods in terms of design. The metallic-grape and glass-mirrored BenQ Joybee 150 looks as if it should hold expensive makeup. The large backlit screen is informative and easy to read. The FM receiver is among the best we tested—sensitive and stable—and holds up to 30 presets. But the 150's poorly crafted interface undermines its attractions.

A remote replicates most of the important controls, and you can transfer files with standard Windows tools, albeit at USB 1.1

speeds. Voice recording is adequate. The player is reasonably light, at 2.4 ounces. But the 150 bristles with other features that you'll probably never use.

You can customize the power-on and power-off screens, change the player's display font, and load text files and play them, e-book-style, on the screen (only ten words or so at a time, however, on three of the four lines). You can record from a CD player or other line-level source via the line-in jack and the provided patch cord. Recording from FM, though, causes digital noise that interferes with reception and mars the recording. With much effort, you can create MP3 files that scroll the lyrics to the screen in sync with the music for personal karaoke. We would trade all of these features for a USB 2.0 connection.

The 150 can't navigate to another song or folder while you're listening: Any attempt to enter the menus stops the player. The slightly large ear buds didn't fit us well and

a Stop/Play button, and a Record button. It includes FM radio and voice recording, and it can record from a line-level source, such as a CD player. Locking FM stations into presets is easier than with most other players. You can navigate to other songs and other folders while listening.

Like the BenQ Joybee 150, the FY200 has some features that many people probably won't use, such as the ability to change fonts and load your own splash-screen graphics. You can change the display's background color from orange to green too.

Some of the FY200's accessories are more useful: an arm strap, a belt clip, a protective case, and two sets of ear buds. The conventional ear buds sound poor, though, and didn't fit our ears well. The alternative set is arranged as a necklace: The ear buds come off of the neck cord, which also supports the player. These ear buds sound much better than the traditional ones. An accessory clip prevents the earphone plug from pulling out of the player. The proprietary software has a conventional two-window interface and performs a variety of maintenance tasks, such as editing the list of FM stations, up-



were lacking in bass response. The player's controls are easy to operate by touch, but the remote's controls are undifferentiated.

We had high hopes for the 150, but the features may not match people's needs, and the interface needs improvement.

Digitalway MPIO FY200

\$140 street. Digitalway Co., 858-554-1300, www.mpio.com. ●●●●○

The compact and light Digitalway MPIO FY200 is a top-notch choice for on-the-go music. Like the iRiver player, the interface is well thought-out, giving maximum control with minimal buttons: The FY200 does everything with a wheel, a volume rocker,

grading firmware, editing ID3 tags, and formatting the player's memory. You can also install a driver that lets you use Windows Media Player or RealOne Player to move files.

With good ergonomics, a light weight, and a host of carrying options, the FY200 is a very complete music player. If it had a USB 2.0 interface, it would move to the front rank among flash players.

FID iRock 860

\$150 street. First International Digital Inc., 847-202-1900, www.myirock.com. ●●●●○

About the size of a double-wide Bic lighter, the FID (First International Digital) iRock 860 feels good in your hand. The controls are crisp and positive, and their shapes are easy to tell apart with your fingers. The three-line screen is informative, with a bright blue backlight. As with the

OUR CONTRIBUTORS: Don Labriola is a lead analyst at PC Magazine Labs and a contributing editor of *PC Magazine*. Associate editor Jeremy A. Kaplan and lead analyst Bill Machrone were in charge of this story.

Joybee, you can't navigate to one song while playing another. But you can skip to the song or folder you want to play; some players, such as the Auvi SA100, play only sequentially. Among the controls is the semi-useless A-B memory play button. Despite the player's pluses, it just isn't in the league of the iRiver iFP-390T.

An easily navigated menu controls the repeat function, the display contrast, and a sleep timer. Conveniently, you can choose among five equalization presets without going into the menu.

To manage the 860, you use standard Windows tools, and keep your music organized in subfolders. You can navigate on the 860 screen to choose the music you want to hear; it plays the directory you choose and stops. The provided software opens up other capabilities as well, such as annotating music files with ID3 tags and creating playlists with M3U files.

The FM receiver is sensitive and pulls in weak stations satisfactorily. You can create presets with the software or tune in stations manually. The carrying case protects the 860 well; it offers full access to all of the controls, including the USB 2.0 port, so you



need to remove it only to recharge the battery. The ear buds are slightly larger in diameter than the norm and did not fit well.

Gateway DMP-310

\$134.99 direct. Gateway Inc., 888-888-2075, www.gateway.com. ●●●○○

The Gateway DMP-310 is a good accompaniment to your exercise routine or your commute. It isn't the smallest USB key-style player, but it includes FM radio and voice recording in the extra size and plays both MP3 and WMA files.

The backlit screen is large and legible. The USB key portion snaps out of the battery holder, which houses one triple-A battery. The ear buds, though of better quality than we've seen with previous Gateway players, are slightly unusual, with rubbery over- and behind-the-ear clips. We didn't master the trick of getting them on until the

Hard drive player: Apple iPod Mini Flash memory player: iRiver iFP-390T

With a dazzling array of colors, features, and capacities to choose from, the portable digital music player market is alive and exciting. Two devices rose to the top.



We had begun to wonder if anyone could trump the Apple iPod at its own game. After all, Apple has had the best-of-breed hard-drive-based portable music device for several years running. It should come as no surprise that the only company able to outdesign the original iPod is Apple itself. Similar to the full-size iPod, the Apple iPod Mini carries a premium price tag, but it's one well worth paying. A speedy FireWire/USB 2.0 connection makes downloads a snap, and the new click wheel with integrated buttons is actually easier to navigate with than the original controls. The only tough decision is picking a color. The Creative Nomad MuVo2 earns an honorable mention for its insane battery life (twice that of the iPod Mini) and its excellent price.

Among the flash memory players, the iRiver iFP-390T earns our Editors' Choice award. It has a sharp design, a very easy-to-use interface, and a wealth of features that go beyond those we saw in other players. The FM tuner reception was top-notch, for example, and voice recordings were superb. A USB 2.0 interface would probably have earned it a rating of 5. We were also quite pleased with the caliber of several other flash players in this roundup. In particular, the Digitalway MPIO FY200 caught our eyes for its clever navigation abilities. The TDK Mojo 256F stuck out as well, for its fast USB 2.0 interface and cool overall appearance.

third try, but they stayed in place even with strenuous athletics and are comfortable.

The DMP-310 transfers files quickly using standard Windows file tools. The controls are simple: A four-way rocker and a menu wheel take care of everything. In some modes, moving the wheel in opposite directions cycles you through different menus, which is confusing until you get used to it. Still, access to the player's functions is better than with most.

Although you can transfer albums as folders, you can't navigate by song or album; you're limited to stepping through song by song. The DMP-310's FM radio had the worst reception of any of the players we tested; it was suitable only for strong stations. Voice recording is adequate. As with the Philips Audio Key Ring, the DMP-310's manual is on a mini CD, but an enclosed single-sheet guide can get you started. The screen is easier to read than most and is packed with information.

iRiver iFP-390T

\$160 street. iRiver Inc., 408-635-8000, www.iriver-america.com. ●●●●○

The iRiver iFP-390T is a standout among solid-state players, with a rich feature set and solid construction. It's also an adventure in injection molding; its silver case is festooned with buttons, switches, and

ports. The shape is a treat for your fingers: They'll have no trouble navigating the Forward/Back, volume rocker, and auxiliary buttons along the side, which have a better feel than those on the other players.

Rich in features, the iFP-390T has a line-in port and can rip MP3s directly from a line-level signal source, such as your stereo or the headphone output from your CD player. It also has a built-in microphone. The iFP-390T does not appear as a drive; you must use the included iRiver Music Manager or the supplied Mood-Logic software, which adds its own organizing capabilities: ripping songs, scanning your PC for music, and moving music to the player. Transfers are rapid in spite of the USB 1.1 connection.

The iFP-390T goes a little farther with each of its features than the competition. The FM tuner supports up to 20 presets and has an easy-to-navigate frequency display. You can choose the bit rate of the voice recorder or FM recorder, and the iFP-390T will tell you how much recording time you have available. The four-line screen is informative, and you can navigate the file system while a song is playing. You can also change the EQ settings and repeat and shuffle modes without menu diving. For good measure, there's also an Intro mode, which plays the first

SUMMARY OF FEATURES

Portable Music Players

FLASH MEMORY PLAYERS

■ YES □ NO	Auvi SA100	BenQ Joybee 150	Digitalway MPIO FY200	FID iRock 860	Gateway DMP-310	iRiver iFP-390T
Price	\$79.99 list	\$190 street	\$140 street	\$150 street	\$134.99 direct	\$160 street
Dimensions (HWD, in inches)	3.4 x 1.3 x 1.0	2.4 x 2.4 x 0.5	3.4 x 1.2 x 0.7	3.0 x 1.8 x 0.6	3.4 x 1.6 x 0.6	3.5 x 1.5 x 1.0
Weight (ounces)	1.1	2.4	1.5	2.4	1.8	2.1
On-board memory	128MB	256MB	128MB	256MB	256MB	256MB
Memory card support	None	None	None	None	None	None
Supported playback formats	MP3, WMA	MP3, WMA	MP3, WMA	MP3, WMA	MP3, WMA	MP3, WMA
Battery type	AAA	Rechargeable internal	AAA	AA	AAA	AA
Interface	USB 1.1	USB 1.1	USB 1.1	USB 2.0	USB 1.1	USB 2.0
FM radio	<input type="checkbox"/>	■	■	■	■	■
Voice recording	<input type="checkbox"/>	■	■	<input type="checkbox"/>	■	■
Included software	None	Q Music	Manager2, RealOne Player, Windows Media Player	MoodLogic, MP3i Creator, Musicmatch Jukebox	None	iRiver Music Manager, MoodLogic
Accessories	None	Charger, drawstring sack, line-in cable	Arm strap, belt clip, case, line-in cable, two sets of ear buds	Belt clip, nylon neck strap	Belt clip/case	Belt clip/case, line-in cable

RED denotes Editors' Choice.



10 seconds of every track.

The voice-recording quality is—in a word—superb. And FM reception is as good as you can expect when moving around. The iFP-390T has an excellent manual, with detailed instructions and illustrations that you can actually read without a magnifying glass. The unit ran for 13 hours, 10 minutes on a single double-A 1,400-mAh nickel hydride battery.

Philips Audio Key Ring

\$130 street. Philips Electronics, 800-531-0039, www.philips.com. ●●●○○○

The Philips Audio Key Ring player should probably be named the Audio Neck Pendant player. The unit is a USB key, but it's useless without the neck strap, which connects to the player by a short tether and a cable. The plastic module at the end of the neck strap has the Play/Pause but-

ton, and the other controls (Volume Up/Down and File Forward/Back) are built into the strap itself, marked by orange dots. At the top of the strap, behind your neck, is the headphone socket. We didn't particularly like wearing the player as a pendant, but the strap controls gave us no choice. We also found the strap's lack of tactile feedback bothersome.

The Audio Key Ring has a built-in battery, which charges from your system's USB port. It also comes with an auxiliary clip that holds a triple-A battery for extended play when you're away from your PC. The player's download speed was slower than that of some USB 1.1 players we tested, but not the slowest; our 30MB album took 8 minutes. The player requires a driver, which lets you transfer music files with any Windows music or file tools.

The Audio Key Ring lacks tone controls and presets. The ear buds have small, shaped projections that direct sound into your ear canals. These provide a good lis-

Good-Bye, MP3; Hello, DRM!

What's on your digital music player? Most people are content to stick with the evergreen MP3 format, perhaps unaware that second-generation audio codecs such as Microsoft's WMA, the consortium-driven AAC, and Sony's ATRAC3 can compress a song file to about half the size of an equivalent MP3 file. This lets you store more music in less space—a good thing. But they also add a wrinkle to the online music-sharing controversy that didn't exist when

MP3 was the only game in town: digital rights management.

DRM is an umbrella term for technologies that let copyright holders control how digital content is used. Virtually all DRM systems require a file format that can store licensing information along with audio/video content—which excludes MP3 and DivX, the two mainstays of unauthorized file-sharing networks.

There are plenty of differences among the various DRM systems currently in service, but most employ an architecture similar to that of Microsoft Windows Media DRM. When you purchase a WMDRM-protected song or movie online, it arrives with a set of licensing

Download this table at www.pcmag.com.

			HARD DRIVE PLAYERS		
Philips Audio Key Ring	TDK Mojo 1	TDK Mojo 256F	Apple iPod Mini	Creative Nomad MuVo2	Frontier Labs NEX IA 1GB
\$130 street	\$140 street	\$150 street	\$249 direct	\$200 street	\$250 street
3.5 x 1.0 x 0.5	6.1 x 5.3 x 2.1	3.5 x 1.6 x 0.6	3.6 x 2.0 x 0.5	2.6 x 2.6 x 0.7	3.3 x 2.5 x 0.8
2.2	3.2	2	3.4	3.5	5.5
128MB	128MB	256MB	4GB hard drive	4GB hard drive	1GB CF hard drive
None	Secure Digital	Secure Digital	None	None	CompactFlash
MP3, WMA	MP3, WMA	MP3, WMA	AAC, MP3	MP3, WMA	MP3
Rechargeable internal	AAA	AAA	Rechargeable internal	Rechargeable internal	AA
USB 1.1	USB 1.1	USB 2.0	FireWire, USB 2.0	USB 2.0	USB 1.1
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Musicmatch Jukebox	MoodLogic	RealOne Player, UniFi	Apple iTunes	Creative Organizer	Media Jukebox
None	Replacement ear cushions	Belt clip/case, wrist strap	Belt clip, charger	Belt clip/case, charger	Belt clip/case

mulated an overall frequency-response pattern that indicated less bass response than we would have liked; and the four-position tone control didn't provide enough offsetting correction. Also, the Mojo 1 reset itself sporadically, preventing us from testing it.

The TDK Mojo 1 is a nifty idea, but the implementation needs a lot of work.

TDK Mojo 256F

\$150 street. TDK Electronics, 516-535-2600, www.tdk.com. ●●●○○

The sleek, stylish TDK Mojo 256F weighs all of 2 ounces and can take an SD card for more storage—up to an additional 512MB. It's also available in a 128MB version, the Mojo 128F. A little added polish would turn this good player into an impressive one.

The 256F plays MP3, WMA, and several other formats; has an FM tuner; and records voice and FM. Its informative three-line screen has a striking blue backlight. The unit has six buttons that you press, rock, and slide to control the 256F's functions.

The fast USB 2.0 interface uses a non-standard connection on the player and requires a driver. The 256F does not appear as a drive to your system, but after you load a plug-in you can (theoretically) manage it with Windows Media Player. But the driver crashed Windows Media Player repeatedly, so we loaded UniFi, the provided download manager. It's straightforward, and transfers are rapid. A 30MB, ten-song album took less than 30 seconds to download.

You can navigate while you're playing a song, an important feature. It's a bit convoluted, though; you make some menu selections with the Forward/Back rocker and some with the Mode button. The case has openings for the side-mounted buttons, but access to all but the Play and Stop buttons is difficult. The TDK Mojo 256F's Hold switch lets you stuff it in a pocket without disturbing its settings.

FM reception is very good; the 256F was better than most at pulling in weaker stations. Its single triple-A battery gave us 8.5 hours of playing time.

tening experience and tend to stay in place better than other ear buds.

In general, we found the strap controls inconvenient. For a no-frills flash player, we would choose the less expensive Philips model without the neck strap, but the Auvi SA100 is even more cost-effective.

TDK Mojo 1

\$140 street. TDK Electronics, 516-535-2600, www.tdk.com. ●○○○○

How about a set of headphones with the music player and an FM radio built-in? The TDK Mojo 1 is all that and even more. In addition to the on-board 128MB of memory, it has an SD slot, so you can give it an instant music transfusion. That's the good news. Unfortunately, nearly everything else about the Mojo 1 could use some help.

The headphones fit comfortably over your ears, and the band goes behind your neck. One earpiece has the Start/Stop, Forward/Back, and volume controls, and the other has a mode switch and a socket for a

small FM antenna. The Mojo 1 claims to be an MP3 and WMA player, but it doesn't actually play those formats. It depends on a driver and the provided MoodLogic application to convert the files to a proprietary format. The USB socket on the Mojo 1 is standard, but transfer rates are limited to USB 1.1 speeds. Indicator LEDs tell you when the Mojo 1 is on and what mode it's in.

The control buttons felt relatively indistinguishable to our fingers; we had to stand in front of a mirror to operate them. And although it's not unusual to see people wearing ear buds or headphones, the thickness of the Mojo 1 earpieces brought the word *doofus* to mind.

Most of the digital music players we tested had almost identical audio quality, but we found that the Mojo 1 didn't sound quite as good as the others, despite a solid fit against the ears. We attempted to load our audio test tones, but MoodLogic refused to recognize them as music. Nevertheless, we sampled various music passages and accu-

duplicate it onto a portable player or other device.

DRM is poised to become the next battleground between copyright holders and consumers determined to use content on their own terms. Jon Johansen, the Norwegian teenager who posted the first DVD-encryption crack, has already begun distributing a tool that circumvents the high-profile DRM used to protect content downloaded from Apple's iTunes Music Store. Digital rights management promises to grant unprecedented control to content owners, but only time will tell whether it becomes as ubiquitous—and effective—as its proponents hope.—By Don Labriola

terms that may specify the number of times you can play the file, define an expiration date, or limit your ability to copy, download to a portable device, or burn to disc. In Microsoft's case, this data is saved in a license store embedded within Windows.

DRM-protected content is encrypted to safeguard against unauthorized usage and to prevent access by any media player that doesn't enforce its rights-management system. When a WMDRM-compliant player is asked to open protected content, it first checks the Windows license store for a valid license. If one exists, the player uses that information to decide whether to play the file, transfer it, or

Hard Drive Players



Apple iPod Mini

\$249 direct. Apple Computer Inc., 800-692-7753, www.apple.com. ●●●●○



The Apple iPod is the player by which all others are judged, from the packaging to the cables to the feel of the controls. The iPod Mini's screen, though smaller than that of the original iPod, still makes you wonder why other manufacturers can't produce displays this readable. The controls do exactly what you expect, and the iPod Mini does the right thing even when you don't expect it: turning on when you plug in the headphones, for example.

USB 2.0 makes downloads to the player quick and painless. But thrilled as we are with the player, we are not similarly charmed by Apple iTunes. It ripped more slowly than Musicmatch and other managers, it insisted on playing a CD while we ripped, and it defaulted to the AAC encoder, although both defaults could be changed via settings. iTunes is incapable of displaying file types, and the volume and playback controls were somewhere between balky and inoperative. iTunes was also agonizingly slow; ripping a CD at 192 Kbps with error correction took 53 minutes. Musicmatch did this in about 15 minutes.

The iPod Mini's new click wheel, which integrates the four buttons with the scroll wheel, is actually easier to use than its predecessor. The iPod Mini can recharge from its charger or from the USB cable. Unfortunately, neither of the iPod Minis we tested could match Apple's claimed 8-hour battery life; we got a decent 7 hours, 10 minutes on our best run.

The dock is a useful accessory, and the arm band is great for exercisers. The 3.4-ounce iPod Mini has more EQ selections than any other player, and it carries over the games, calendar, and other goodies from the original iPod. You can browse for music by artist, album, song, genre, or composer and set up your own playlists.

The iPod Mini, with accessories, costs almost as much as the full-size 10GB iPod, but we don't care. If you want cost-effective, get the Creative Nomad MuVo2. If you want premium, get the Apple iPod Mini.

Creative Nomad MuVo2

\$200 street. Creative Labs Inc., 405-742-6655, www.creative.com. ●●●●○

The Creative Nomad MuVo2 may not be as sleek as the Apple iPod Mini, but it's certainly less expensive. Both players have the same kind of 4GB Hitachi hard drive.

The slim battery pack slips into the back of the unit and is easy to replace, which

PERFORMANCE TESTS

How We Tested: Measuring Battery Life



Battery life is one of the most important characteristics of a portable music player—and one of the most variable. The batteries we tested from the players in this story fell into three categories: rechargeable, double-A, and triple-A.

We conditioned the rechargeable players by fully charging and discharging them three times before testing. We used rechargeable nickel hydride (cells for the double-A players and fresh triple-A alkaline cells for the smaller players. Rechargeable nickel hydride batteries are well worth the investment. The 1,400-milliampere-hour cells we used easily outlasted double-A alkalines, and nickel hydride batteries are available with up to 2,000-mAh capacity.

We loaded a dozen CDs' worth of music on the drive-based players and selected Repeat All, so the players would have to access the drive and not cache songs in memory. With the flash-based players, there's no power consump-

High scores are best.
Bold type denotes first place within each category.

Hours:minutes

FLASH MEMORY PLAYERS

Auvi SA100	N/A
BenQ Joybee 150	7:05
Digitalway MPIO FY200	8:30
FID iRock 860	23:45
Gateway DMP-310	11:10
iRiver iFP-390T	13:10
Philips Audio Key Ring	5:35
TDK Mojo 1	N/A
TDK Mojo 256F	8:30

HARD DRIVE PLAYERS

Apple iPod Mini	7:10
Creative Nomad MuVo2	15:30
Frontier Labs NEX IA 1GB	4:40

RED denotes Editors' Choice. N/A—Not applicable: The player was not compatible with our test procedures.

tion penalty for repeating one song or a hundred, but we filled the memory and selected Repeat All for the sake of consistency. We set the players at a rather loud 90dB and played them until they shut off. If their final throes had static or other audio flaws, we measured to the end of the clear audio.

Battery life ranged from acceptable to exceptional. The 4- and 5-hour players require some attention; you have to remember to charge them once every day or two. In the case of the Frontier Labs player, you'd be well advised to keep a spare pair of batteries in the charger.

As players pass the 8-hour mark, you don't have to think about a fresh charge as much. We were astounded by the Creative player, which uses the same hard drive as

the Apple iPod Mini yet has double the battery life. And the FID player is in a class by itself, with its all-day, all-night performance.—*Analysis written by Bill Machrone*

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PERFORMANCE TESTS

Analyzing the Sound of Music



Personal audio players may seem almost indistinguishable sonically, but differences do exist. To show this, we encoded WMA and MP3 test files at 128 Kbps. We also encoded sweep tones and pink noise files at 192 Kbps, then connected the players to spectrum analyzer software to verify that they were playing the audio spectrum accurately. The small variances we found were easily adjusted by the players' tone controls.

We listened to each player through Sennheiser HD 280 Pro headphones and through the provided headphones or ear buds. We found a significant amount of variance among the ear buds, but the results depended heavily on how well they fit the ear.

Smaller buds or rubbery ones that more fully fit the outer ear canal have better bass response; the perceived treble response is generally the same.

To verify the ear buds' frequency response, we devised the Ear 2.0, a life-size silicone rubber ear coupled with a calibrated microphone and sound level meter. We played our test files into audio spectrum analyzer software and used the Right-Mark Audio Analyzer test suite (www.rightmark.audio.org) to

verify our observations.

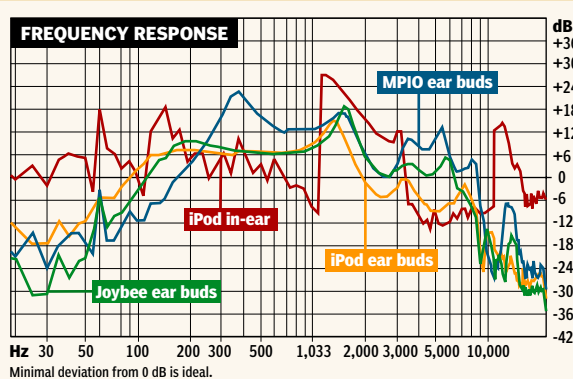
We selected four of the more interesting models for comparison. Getting repeatable results in earphone or speaker measurements is a challenge, but we verified our conclusions with another testing suite and several listeners. The iPod ear buds were generally the best-sounding and most comfortable. They also outperformed in bass response.

The MPIO ear buds, by comparison, were much stronger in the low midrange and weaker in the bass. The result was a tinny sound. The BenQ ear buds, not as strong as the iPods in the bass, gave a pleasant sound without the earth-pounding lows.

The oddball in the group was the Apple In-Ear phones (a \$39 upgrade), which fit snugly into the ear canal. Bass response depends on a good fit, and Apple provides three sizes to best fit your ears. Consumers either love or hate these phones. You can see why from the frequency response curve: The bass was very powerful, but the overall response is marred by dips and peaks.—*Bill Machrone*



Now hear this: testing audio.



should help you avoid some of the problems facing Apple's older iPods. And despite the small battery, it powered the MuVo2 for more than 15 hours; the player uses cache extensively and rarely accesses the hard drive. The fast USB 2.0 interface lets you move music to and from the MuVo2 quickly and easily.

The included Creative Organizer software rips only to MP3, but it plays and transfers WMA files just fine. The program adheres to Windows standards, creating a folder in My Music for each new album.

If you're a minimalist, you'll like the MuVo2's controls: There are just two. A four-way rocker lets you move back and forward or adjust the volume up and down; pressing it accesses the menu. A separate button starts or pauses play and is also the power switch. The two-line display is backlit. And unlike some products we've looked at, you can navigate to other music while your current selection is playing.

The carrying case has a belt clip and is well padded, but it blocks access to the controls. The ear buds lack a volume control or remote, and there's no FM receiver

or recording functions. If you don't mind a bit of thickness and bulk, though, this player is very easy to live with.

Frontier Labs NEX IA 1GB

\$250 street. Frontier Labs America, 866-752-9565, www.frontierlabsamerica.com. ●●●●●

The Frontier NEX IA 1GB has good features and sound quality, and it's easy to use. But it lags behind the other players in size, weight, battery life, and speed.

The NEX IA's 1GB CompactFlash hard drive has only a quarter of the capacity of the tested Apple iPod Mini and Creative Nomad MuVo2. You navigate with a four-way rocker switch and a Mode button. The interface is straightforward, and the screen shows eight lines of folders or songs. While playing, the NEX IA displays song titles and elapsed time, along with volume level and battery condition. It has an FM receiver and a voice recorder, and it can also record from the radio.

Individual over-the-ear headphones are comfortable and provide excellent bass. A remote control on the cord duplicates the NEX IA's front-panel controls. The NEX IA

takes 20 seconds to boot up, and the initial screen gives you a choice of player, radio, or—disconcertingly—format.

The nylon carrying case has a belt loop and a clear window for the display. It blocks access to the controls, but that's not a problem if you're using the remote.

Although the NEX IA is easy to operate, file transfers are somewhat slower than the usual USB 1.1 crawl: A 30MB folder with 10 songs took 15 minutes to download. The NEX IA doesn't support playlists, but it navigates easily among folders, subfolders, and songs. You can drag and drop songs with Windows file tools and music managers, and you can navigate to another song or folder while a song is playing.

As with all these players, the headset cord is the FM antenna. You'll experience static as you move around, but the NEX IA's tuner is satisfactory for strong stations. Recorded voice quality is fine.

Using double-A alkaline batteries, the NEX IA played for 3 hours 20 minutes. Nickel hydride battery cells rated at 1,400 mAh improved the time to 4:40, which was still the shortest battery life we measured. ☰

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Micromirrors. Electrophoretic spheres. Organic diodes. Stephen Hawking's shopping list? Props from a science fiction movie? Wrong! You'll find these technologies inside the latest computer and projector displays.

This year marks the end of the CRT's dominance on the desktop: LCDs have now taken the lead in unit sales. In this story, we'll introduce you to display technologies that make the CRT seem prehistoric. These developments go far beyond conventional LCDs and CRTs. Giant plasma screens have reached sizes measuring up to 76 inches diagonally. Projectors use a range of technologies, from LCDs to Digital Light Processing. And the same technologies are finding their way into rear-projection displays.

Driving many of the innovations is the quest for sharper images on tiny mobile devices and giant TV screens alike—both places where CRTs don't play. A CRT's volume typically increases by a factor of eight when the horizontal screen size doubles. As a result, CRTs become unwieldy as the screens get larger. By contrast, the small

Five hot new developments that promise image quality and versatility you never thought possible.

By Alfred Poor

Illustration by Aaron Piland

footprint and thin dimensions of an LCD or plasma panel save space and look cool.

Displays often consume the lion's share of a mobile device's power, but improved technologies have helped reduce the amount of electricity they require. This gives engineers the choice of using a smaller battery, and thereby reducing the device's size and weight, or using the same battery but offering longer life with each charge. Bistable displays, which consume just tiny sips of power, are es-

pecially promising in this endeavor.

Dozens of novel display technologies just over the horizon hold out the prospect of higher-quality and lower-cost displays. For example, research is well under way toward "printing" displays with ink jets or with thermal transfer techniques. And exotic materials such as carbon nanotubes may be used to create wafer-thin CRTs.

But you don't need to wait for "maybe someday" to take advantage of hot new technologies. Currently available displays and projectors keep improving, offering better images at constantly falling prices. On the following pages, we explain the most exciting developments in five technologies that are already starting to show up in products you can buy now.

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- 118** OLED: The Thinnest of All
- 119** DLP: Wide-Screen Action
- 120** Bistable: Ideal for Mobility

LCD: A Faster Flat-Panel

FLAT-PANEL LCD TVs are all the rage, owing to their sleek, handsome designs, but it turns out they're not ideal for watching moving images. That's because the liquid crystal molecules in LCD panels move relatively slowly from one orientation to another. As a result, video or games played on an LCD can look smeared. You're actually better off with a CRT for those things, because the response of the phosphors to the electron beam in a CRT is nearly instantaneous. But continual improvements to the responsiveness of liquid crystal are helping speed up the on-screen action.

Liquid crystals have the special ability to twist light waves (see the diagram). A typical LCD uses a polarizing layer between the liquid crystal layer and the backlight to screen out all light waves except those oriented in a single plane. Another polarizing layer in front of the panel transmits only the light waves oriented in a different plane. In between, the liquid crystals either let the light pass through untwisted or twist the light so that the plane of the waves matches that of the second filter. This allows the light to be transmitted or blocked on demand.

An LCD panel may take an average of 16 to 25 milliseconds to change from white to black and back to white again. And these are the best-case measurements; changing from one shade of gray to another can take three to four times as long as that. This isn't a serious issue for images that don't move, such as word processing documents or spreadsheets, but a slow response time can be a problem when the LCD is used as a television.

One promising solution tricks a cell into

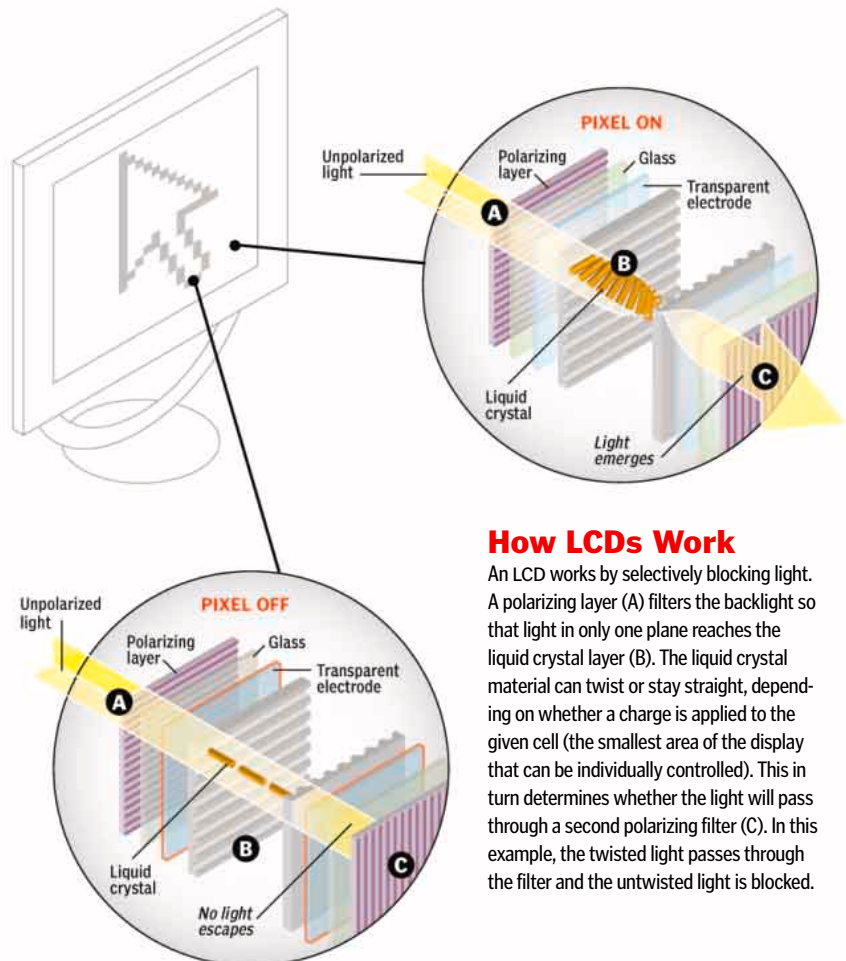
changing more rapidly by giving it an initial charge greater than what it needs to achieve the correct shade of gray. This technology is often called *overdrive* or *feed-forward*. Taiwan-based AU Optronics has developed another solution, known as Intrinsic Property technology, that enables liquid crystals to move faster.

Another problem with LCDs is that image brightness and colors can change as your viewing angle changes. CRTs have a distinct advantage here, because they emit light from the surface of the screen, sending out light in all directions. Liquid crystal molecules are rod-shaped, however, so when they are aligned with each other, the image may look distorted if not viewed straight on. (Think of being able to see



through window blinds only when you're at the correct angle.)

One solution, referred to as *multi-domain*, is to divide each liquid crystal cell into multiple regions and build microscopic structures that cause the molecules to tilt in different directions. Although the individual areas still look different if you change the viewing angle, the average light from each cell has the correct brightness and hue from a wider range of viewing angles.



How LCDs Work

An LCD works by selectively blocking light. A polarizing layer (A) filters the backlight so that light in only one plane reaches the liquid crystal layer (B). The liquid crystal material can twist or stay straight, depending on whether a charge is applied to the given cell (the smallest area of the display that can be individually controlled). This in turn determines whether the light will pass through a second polarizing filter (C). In this example, the twisted light passes through the filter and the untwisted light is blocked.



BRIGHTER IDEAS

- The base alignment layer is angled in multiple directions to provide a "pre-tilt" to the liquid crystal molecules, increasing the range of viewing angles.
- Liquid crystal cells have become faster in response, either from improved liquid crystal materials or from improved driving circuitry that increases the electrical charge used to switch the cells.

LCOS: Now Showing on TV



ONE WAY TO COAX liquid crystals into responding fast enough for moving images is to make them on silicon wafers. But this would be prohibitively expensive for a notebook-size screen, and a tiny display measuring just an inch diagonally would be too small to view directly. When magnified, though, the tiny display can create a much larger image. And here is where *liquid crystal on silicon* (or LCOS, pronounced “el-koss”) comes in.

Manufacturing thin liquid crystals requires the individual cells to be extremely small, but this presents new problems. In order to get fast and accurate response from the cells in a high-resolution device, an LCD must have an active-matrix backplane. This means there must be at least one transistor behind every subpixel. For a display with 1,024 by 768 pixels, with red, green, and blue subpixels, this amounts to at least 2,359,296 transistors.

Most direct-view LCD panels—those in notebooks and desktop monitors—use inefficient but inexpensive amorphous silicon backplanes that are well suited for large displays. Unfortunately, amorphous silicon is limited in how close together transistors can be placed. LCOS displays are created on more efficient pure silicon crystal wafers, allowing transistors to be much smaller and closer together.

The larger transistors on amorphous silicon block some light from being emitted, which limits the density of pixel placement; this in turn limits resolution. The portion of each pixel that can transmit light, expressed in terms of the *aperture ratio*, determines how bright the display can be. If you make an LCD using a silicon crystal wafer, transistors become much smaller. This makes for thinner liquid crystal cells, which react more rapidly to changes in electric current.

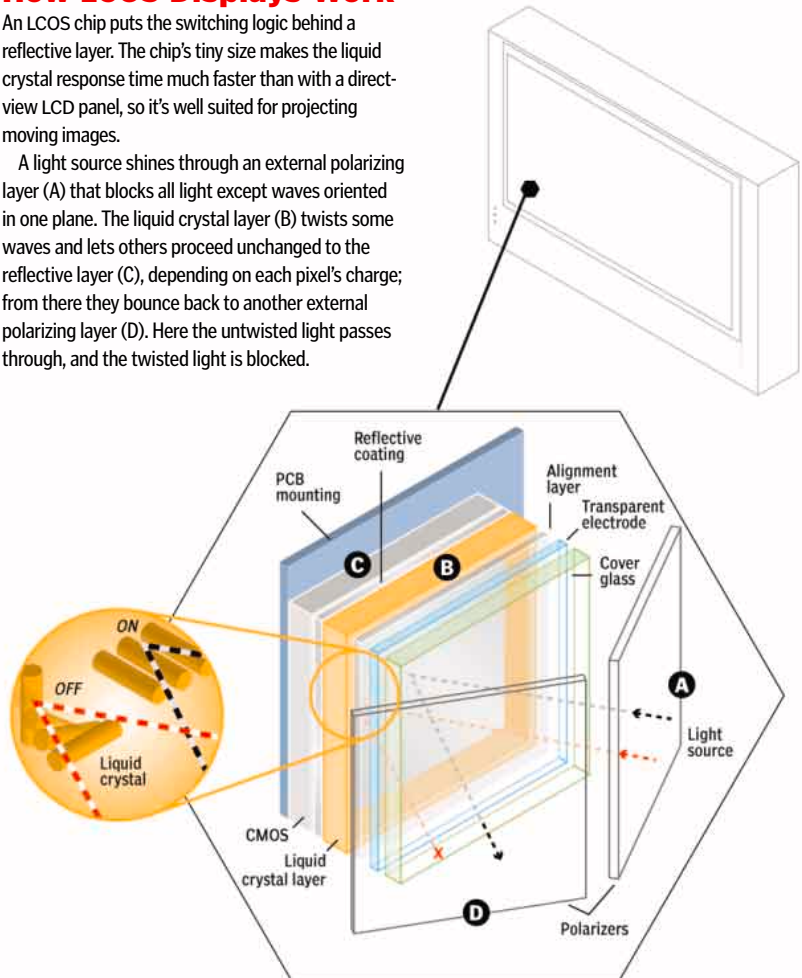
That’s exactly what’s happening in rear-projection televisions (RPTVs), a market in which LCOS is starting to compete effectively with DLP (see page 119). Unlike most LCD panels, LCOS panels are reflective rather than transmissive. The active matrix of transistors is fabricated on the silicon crystal substrate, then covered by a thin reflective layer before the liquid crystal material is placed on top. This means that all the light striking the cell can be reflected without obstruction.

The biggest obstacle LCOS faces now is

How LCOS Displays Work

An LCOS chip puts the switching logic behind a reflective layer. The chip’s tiny size makes the liquid crystal response time much faster than with a direct-view LCD panel, so it’s well suited for projecting moving images.

A light source shines through an external polarizing layer (A) that blocks all light except waves oriented in one plane. The liquid crystal layer (B) twists some waves and lets others proceed unchanged to the reflective layer (C), depending on each pixel’s charge; from there they bounce back to another external polarizing layer (D). Here the untwisted light passes through, and the twisted light is blocked.



a lack of volume production. When the volume picks up, prices should go down. A few years ago, the panels cost about \$600 apiece. Prices have fallen to about \$200, but they will have to drop below \$100 to make the prices of finished displays competitive with those of units based on other technologies.

Intel made a big splash at the Consumer Electronics Show in Las Vegas this January when it announced its commitment to manufacturing LCOS products. This step

not only validates the technology but also could be a harbinger of higher-volume production in the near future.



BRIGHTER IDEAS

- Manufacturers have been able to improve production efficiency and increase volume, which has helped lower prices for the imaging chips.

OLED: The Thinnest of All



THINK *THIN DISPLAY* and you probably think of an LCD panel. But an up-and-coming display technology that uses *organic light-emitting diodes* (OLEDs) is actually much thinner than an LCD—even thin enough to be placed on a plastic film. Since each subpixel in an OLED is controlled individually, you get an image that's sharper than on a CRT and potentially of better quality than on an LCD. OLEDs are as responsive as CRTs, so you don't get any smearing from slow pixel response times.

The inorganic cousin of the OLED is commonplace: LEDs are the glowing lights on most digital clocks. They emit a great deal of light using relatively little power, last

much longer than incandescent bulbs, and are more rugged. An LED emits light from a seam between two layers of different materials, which is fine for small points of light but not for large displays. OLEDs emit light *through* the layers, so many can be fabricated next to each other for large displays.

High-resolution displays have been slow to emerge, but the Kodak EasyShare LS633 camera has a 2.2-inch OLED panel. This full-color, active-matrix OLED display is clearly superior to an LCD in terms of viewing angle and image quality under low-lighting conditions.

One of the problems with active-matrix OLEDs is that they require two transistors



BRIGHTER IDEAS

- Developers have improved the lifetime and color emission of the OLED materials. They have also succeeded in using amorphous silicon substrates with OLEDs, despite their lower electron mobility compared with more expensive polysilicon substrates.

per subpixel. Until recently, only expensive polysilicon backplanes were used for OLED production, because of their greater electron mobility. But researchers have started creating OLED structures on cheaper amorphous silicon substrates. In fact, IDTech—a joint venture between Chi Mei Optoelectronics and IBM—has demonstrated a 20-inch full-color OLED panel on an amorphous silicon substrate.

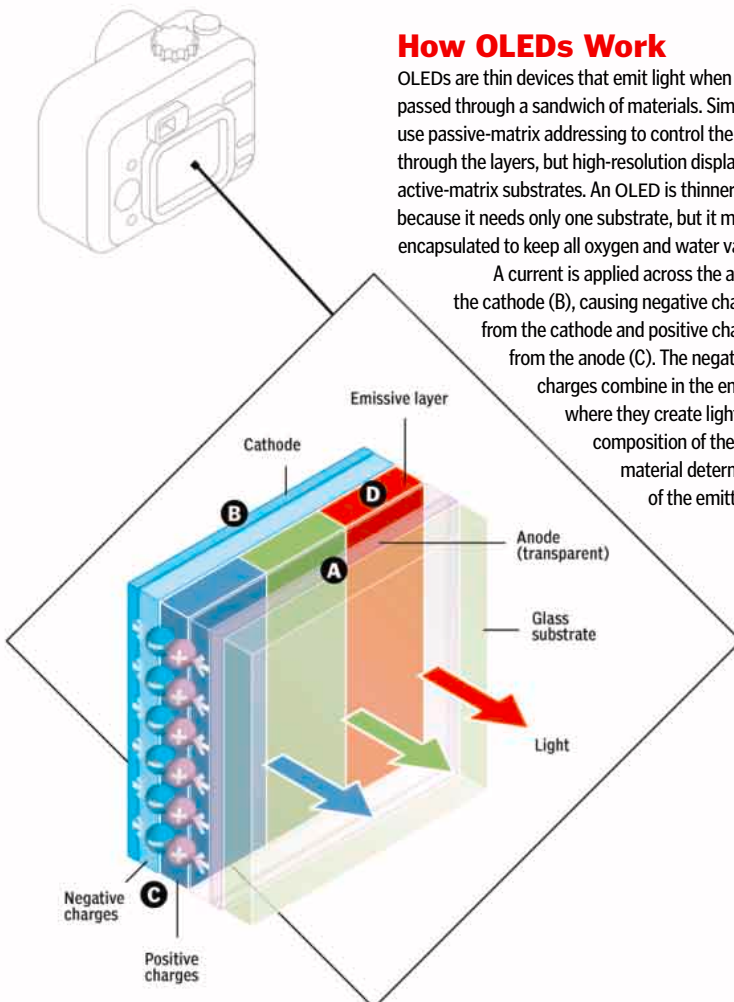
Another problem is the lifetime of the OLED materials. In the display industry, lifetime is measured as the length of time it takes for the display to drop to one-half its initial brightness. Last year, red and green OLED materials had lifetimes of only 10,000 to 15,000 hours, but the big problem was that blue materials had lifetimes of less than 1,000 hours. This meant that the color of the panel would shift rapidly toward yellow as the blue materials dimmed.

Both corporate and academic research efforts have gone a long way toward improving the lifetimes of OLED materials. Red and green materials now last for 20,000 or more hours, though blue materials continue to lag behind. Many companies are making considerable investments in OLED research, and we can expect steady progress on these and other problems that must be resolved before large-scale OLED display production begins.

How OLEDs Work

OLEDs are thin devices that emit light when a current is passed through a sandwich of materials. Simple displays can use passive-matrix addressing to control the flow of current through the layers, but high-resolution displays require active-matrix substrates. An OLED is thinner than an LCD, because it needs only one substrate, but it must also be encapsulated to keep all oxygen and water vapor out.

A current is applied across the anode (A) and the cathode (B), causing negative charges to move from the cathode and positive charges to move from the anode (C). The negative and positive charges combine in the emissive layer, where they create light. The chemical composition of the emissive material determines the color of the emitted light.



MORE ON THE WEB

To read reviews on the latest display products, point your browser to www.pcmag.com/displays.

DLP: Wide-Screen Action



TEXAS INSTRUMENTS has established a strong foothold in projection displays with its innovative technology *Digital Light Processing* (DLP). This technology, which uses tiny mirror chips, already dominates lightweight data projectors and is making inroads in the home entertainment market for both front- and rear-projection systems.

A DLP chip is built like a memory chip, using semiconductor components fabricated on a silicon substrate. On top of each bit storage device, however, is a microscopic square mirror, called a Digital Micromirror Device (DMD). The mirror is attached to a hinge, which lets it rock back and forth depending on whether a 0 or a 1 is stored at the transistor below it. Measuring about 1 inch diagonally or smaller, this kind of chip can have high resolutions: One model has 1,280-by-720 resolution, suitable for wide-screen entertainment displays.

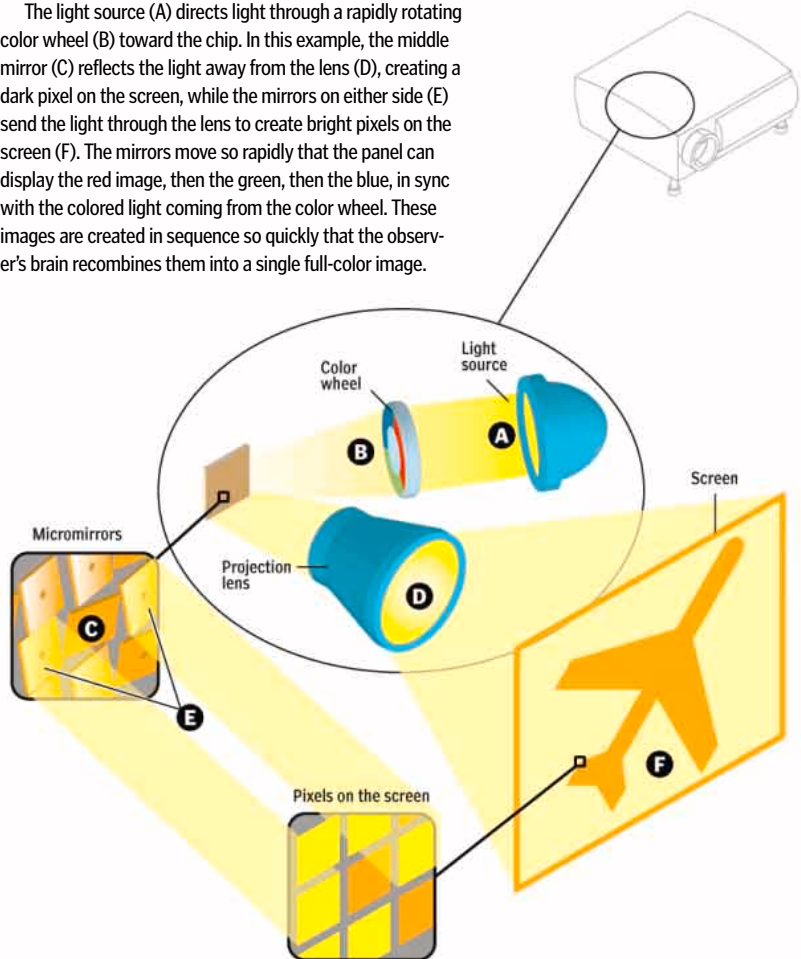
The mirrors can switch on and off as fast as several thousand times per second. Engineers have taken advantage of this rapid response time to develop full-color displays by combining a single imaging chip with a color wheel divided into red, green, and blue sections. The three different-colored images alternate so rapidly that the human brain combines them into a single full-color image.

Filtering the source light so that only red, green, or blue light is transmitted means that at least two-thirds of the available light is blocked. This is a problem in projectors, where brightness is crucial. Engineers realized that by adding a clear segment to the wheel, they could shine bright white light on the imager to make white

How DLP Works

DLP uses microscopic mirrors to deflect light toward or away from the projection optics. This micro-mechanical design can fit more than 1.3 million Digital Micromirror Devices on a chip with just a 0.9-inch diagonal. The mirrors' extremely fast response time makes DLP well suited for entertainment displays. Many projectors produce full-color images using single DLP panels.

The light source (A) directs light through a rapidly rotating color wheel (B) toward the chip. In this example, the middle mirror (C) reflects the light away from the lens (D), creating a dark pixel on the screen, while the mirrors on either side (E) send the light through the lens to create bright pixels on the screen (F). The mirrors move so rapidly that the panel can display the red image, then the green, then the blue, in sync with the colored light coming from the color wheel. These images are created in sequence so quickly that the observer's brain recombines them into a single full-color image.



BRIGHTER IDEAS

- DLP chips are being made with increasingly high resolutions and with wide aspect ratios for home entertainment displays.
- The color wheel in single-chip displays has been improved with a color recovery system that increases brightness and a color drum design that results in a smaller and quieter projector.

and light shades of color brighter.

Texas Instruments also developed the Sequential Color Recapture system, which uses a color wheel with spiral-shaped segments. Instead of being absorbed by the filter material, the unwanted light is reflected back into a rod-shaped integrator that reflects the

light back toward the wheel. There, a portion of it strikes the segments of another color, and the recaptured light is passed through to the DLP imager.

In terms of reliability, this technology looks promising: The chips have been tested for more than 1 trillion cycles with no signs of hinge failure in the mirrors.

Bistable: Ideal for Mobility



THE MOST EXOTIC of all display technologies is the bistable display, which has the uncanny ability to retain on-screen images even after the power has been turned off. As the term *bistable* implies, the picture elements are stable in two (or more) states. The display needs power only when the content changes. Unlike the other display technologies we've covered, bistable displays can use more than one technique to achieve this goal.

The power efficiency that a bistable display can bring to a PDA is significant, since you often need to display the same information you saw the last time you looked at your PDA's screen. Research by Motorola has shown that a battery can last over 600 times as long on a device with a bistable display as on one with a regular LCD.

For now, bistable displays are mostly limited to use as retail store signage, but that's an excellent start. Store management can change the prices on different products automatically, without requiring staff to go around and change all the shelf-price signs by hand. As costs decrease, we expect to see similar displays in a broader range of applications.

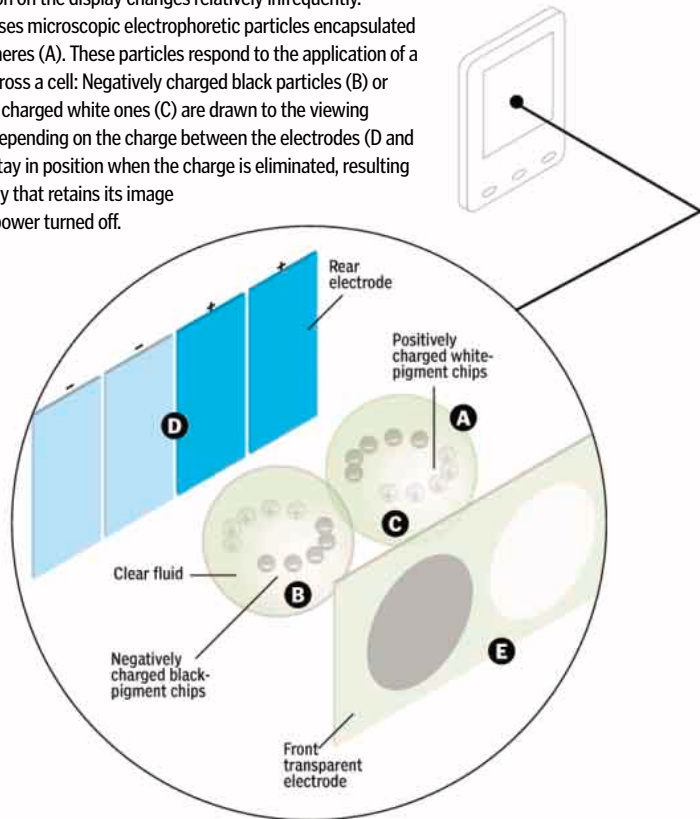
Several companies have developed bistable displays that work differently. E Ink has partnered with Philips to create a display that uses electrostatic charges on tiny spheres suspended in a plane. One side of each sphere is black, the other is white, and each side is attracted to an opposite electrical charge. When a charge is placed across the front and back layers of the panel, the spheres respond. Run the charge one way and the white sides show; run it the other way and the black sides show. Turn off the power and the spheres stay in their current orientation.

Philips has started up a subsidiary, Polymer Vision, which creates bistable dis-

How Bistable Displays Work

Bistable display technology is one of the newest technologies to become commercially available. There are a number of different approaches, but they all share the ability to retain an image even when the power to the display has been turned off. This makes them especially useful for portable, battery-powered devices where the information on the display changes relatively infrequently.

E Ink uses microscopic electrophoretic particles encapsulated in tiny spheres (A). These particles respond to the application of a charge across a cell: Negatively charged black particles (B) or positively charged white ones (C) are drawn to the viewing surface, depending on the charge between the electrodes (D and E). They stay in position when the charge is eliminated, resulting in a display that retains its image with the power turned off.



plays using E Ink technology on active-matrix plastic substrates. E Ink displays will be used in a new Sony e-book product that ships in Japan this April.

A different route to bistable displays comes from the French company Nemoptic, which has developed an approach using standard liquid crystal material. This material normally loses its image when the electrical charge is removed. The company has developed a way to break the alignment bond of the bottom layer of the

liquid crystal substrate, so that it can come to rest in its alternative state. Nemoptic has licensed the technology to Picvue in Taiwan, where mass production for an e-book began last year. ☰

OUR CONTRIBUTORS: Alfred Poor is a lead analyst for *PC Magazine*. Executive editor Carol Levin and associate editor Michael W. Muchmore were in charge of this story.



BRIGHTER IDEAS

• A variety of other bistable display technologies are being developed. At press time, Sony just announced an e-book reader, Libri'e, that will use a Philips electronic ink display.

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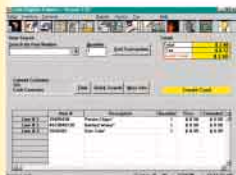


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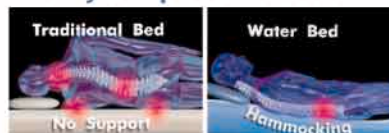
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The Memory Foam Ultra mattress topper is cut into a grid pattern combining six different zones for variable support and a better night's sleep.

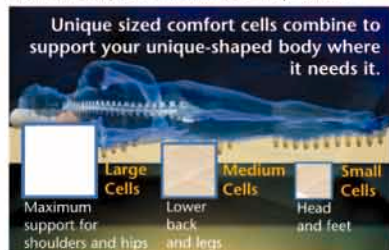
It's 3 a.m. You have exactly two hours until you have to get up for work, and you still can't seem to fall asleep. At this point, the phrase "tossing and turning" begins to take on a whole new meaning for people whose mattresses simply aren't giving proper support anymore. Your mattress may dictate your quality of sleep. Even if you merely suspect that your mattress may be outdated, that's when you need to take action. Some mattresses fail to support your spine properly, which can result in increased pressure on certain parts of your body. Other mattresses, sporting certain degrees of visco-elastic foam, can sometimes cost you well over \$1000. Now, one of the world's leading manufacturers of foam products has developed an incredibly affordable mattress topper that can actually change the way you sleep. Introducing the future of a better night's sleep: The Memory Foam Ultra mattress topper.

Sleep Better™...Wake up to a better morning. The Memory Foam Ultra mattress topper is designed to give you a better sleep surface. Not only does it support each region of your body, but it's also temperature sensitive. With its various-sized "comfort cells,"

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The 2-inch thick temperature-smart foam adjusts to your shape.

the 2-inch thick Memory Foam Ultra mattress topper combines six zones to support specific body area weight, which promotes a better night's sleep. The largest cells support your lower back and midsection, while the medium-sized cells support the shoulders, lower back and legs. The smallest cells support your head and feet. Combined, these zones provide variable support from head to toe. By using visco-elastic foam, the Memory Foam Ultra mattress topper also molds to your body contours to help prevent tossing and turning during the night. When you lie down on this amazing material, the heat and pressure sensitive foam reacts to your body's weight and temperature, so that it molds to your exact body shape. This means that whether you sleep on your back, stomach or side, your weight is evenly distributed and your spine remains in a neutral position. Other surfaces support your body at the shoulders, hips and legs only. This causes your spine to sag in other areas, which can often result in discomfort, and even back pain. You'll wake up rested, relaxed and ready to take on the day. Anyone who suffers from insomnia and back pain due to mattress discomfort can benefit from this technology.

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Try it for yourself today! The Memory Foam Ultra mattress topper can change the way you sleep. Promote proper spine positioning, while enjoying relief from insomnia and back pain with this full-body support. It comes with a 5-year manufacturer's limited warranty and TechnoScout's exclusive in-home trial. If you are not completely satisfied, simply return it within 60 days for the full purchase price.

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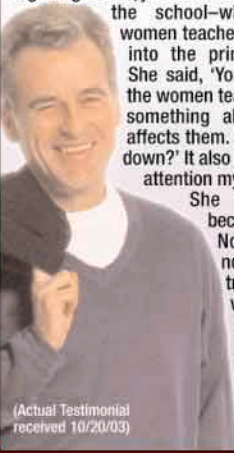
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Dr. Cutler is a biologist and President of Athena Institute, **co-discoverer of human pheromones** in 1986 (*Time* 12/1/86; *Newsweek* 1/12/87). Ph.D. from U. of Penn, post-doc Stanford, authored 35+ scientific papers, 6 books, and wrote the **pheromone chapter** in a medical textbook.

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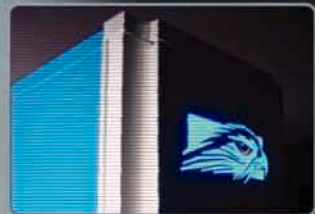
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AFTER HOURS

TECHNOLOGY ON YOUR TIME

Wellness on the Web

BY WILLIAM VAN WINKLE

With the heavy-eating holidays behind us and summer just around the corner, we're all a bit more critical of what we see in the mirror. Want to do something about your winterized body—or just give your fitness level a tune-up? We did the heavy lifting for you by checking out dozens of diet and exercise Web sites. Here are seven that can help you keep to your healthful commitments and achieve your goals.

Active.com

Maintaining fitness solo on a treadmill is fine for some, but many people need social interaction to stay motivated. Active.com is a nationwide clearinghouse of sporting event information—from table tennis to triathlons. You can do free searches by sport, month, and location. To register for an event on Active.com, the

site generally charges a 6.5 percent fee. Or join the ActiveAdvantage program (\$49.95 a year), an athletics-related membership-buying program

for everything from airfare to track shoes, and the other fees will be waived.

Access to content on Active.com is free, and the site offers a wealth of articles on all types of exercise, nutrition, and general health. ActiveWomen is a special information and news area dedicated to women's health and training. The site has a few interface quirks to iron out, but use it and you'll never again wonder where you can meet other people interested in your favorite sporting activities.

Active.com. ●●●●○

The Diet Forum

People who want to try out the online weight loss scene at minimal cost should consider The Diet Forum, a basic site devoid of flash (or Flash); it offers more links to other diet sites than to its own helpful articles. The Diet Forum is all about providing you with personalized diet plans.

Initially, you answer questions about your body, habits, likes, dislikes, and so on. The site produces seven weeks of customized meal plans. You get low-fat recipes, shopping lists, and a fast-food guide, so occasional cheats won't demolish your efforts.

The Diet Forum doesn't place unreasonable boundaries on your food options

or require the purchase of special foods or supplements. If you have the willpower to stick to your plan, you will lose weight. The seven-week plan costs \$19.95, with lifetime site access, and the price includes access to an online log for tracking your progress daily.

Diet Forum, www.dietforum.com. ●●●●○

NEWS

Simply Super: See How She Lost 120 lbs!
 First there was Spider-Man. Then there was the Daredevil and the Hulk. Well, more our fellow and great the new superheroes of dieters... the incredible Shrinking Woman... our very own eDiets success extraordinaire, Yolanda E!

During a 30-month span, this determined dieter zoomed from 267 to 147 pounds. Furthermore, she stopped squeezing into skintight size 28s and began sporting comfortably snug size 10s!

SHOPPING

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 Get The Accessories
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 free samples
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EDIETS.COM

DietWatch

This comprehensive site covers the usual diet and exercise information but does so with flair. DietWatch lets you select one of four basic diet types: unrestricted (best for maintaining weight), low-cholesterol, reduced-carbohydrate (not as extreme as diets like Atkins), and vegetarian. But the site lets you customize any plan to suit your needs, even if you're already on a plan such as Jenny Craig or The Zone. DietWatch's simple, focused approach is still educational and effective.

You get logs, charts, and feedback scores to help you see your progress on a daily and monthly basis. The exercise area, replete with text and illustrations, is great for beginners. We also like the positive-visualization clips in the Meditation Room, the large forum and chat areas, and the health-related news, on top of the normal article, recipe, and newsletter fare.

DietWatch offers two pricing options: \$39.95 for a two-month program or \$99.95 for a full year. Each additional month costs \$14.95.

DietWatch.com Inc., www.dietwatch.com. ●●●●○

WHAT THE RATINGS MEAN

- EXCELLENT
- VERY GOOD
- GOOD
- FAIR
- POOR

dietwatch
 see yourself succeed! ● SIGN UP ● TAKE A TOUR ● OUR EXPERT PLAN ● MEMBER LOGIN

Weight loss doesn't get any easier...

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 Delicious, healthy, designed by professionals
 Exercise Programs
 To get you going and keep you going
 Support & Motivation
 When you need help, it's there!

JOIN US TODAY! TAKE A TOUR GET STARTED HERE

Why DietWatch?
 Follow one of our low carb, low fat, low cholesterol, vegetarian diets or bring the diet of your choice. Our DietWatch Planner makes your diet succeed! [Get more](#)

How can DietWatch help me with my Low Carb Diet? [Learn more](#)

Awards
 Best of the Web 2003
 "It doesn't get any easier... The look and feel of an online planner."

Success Story
 "Thank you DietWatch! DietWatch member dnp205 has shed 40 pounds and 10 inches from her waist!"
 This is Dasha's real graph!

DIETWATCH

eDiets.com



The most extensive site we reviewed, eDiets.com is flexible enough to fit just about anybody's needs. You'll find an avalanche of articles, Q & A's, and success stories.

Members start by picking 1 of 16 diet plans (we recommend the excellent eDiets Plan) and an exercise regimen. You get weekly meal plans, recipes with shopping lists, and caloric breakdowns. eDiets also makes it easy to synchronize a partner with your diet plan. The exercise program has animations that show how to do exercises correctly.

The community area is equally wide-ranging. On top of chat rooms, scheduled online group meetings, and forums, there's a buddy program called Circle of Winners that lets experienced members volunteer as mentors for newbies or for anyone who needs extra encouragement. Experts in a number of fields are available to answer members' questions.

Pricing at eDiets gets a bit complicated. One common scenario is to pay \$5 per week for a diet plan, then purchase fitness and recipe options, each costing an additional \$1 a week. If you don't need a plan, you can purchase the recipe and fitness options à la carte for \$2 per week. In view of the massive amount of help, structure, and support that eDiets provides, this is a fair rate. Our only complaints are that the site has recently spent an inordinate amount of space promoting the Atkins Diet, and the shopping and "free offer" content is too prominent.

eDiets.com Inc. ●●●●●

Weight Watchers Online

Weight Watchers Online serves up simplicity and easy-to-achieve results in large portions. You can use this site as an ac-

cessory to Weight Watchers' traditional meetings or as a standalone service. You won't be isolated from peer support; when we dropped into a chat room, the 14 visitors there were discussing how to make diet-friendly tacos.

The foundation of Weight Watchers is the *Points* system. Every food has a given number of *Points*, based on calories, fat, and fiber content. Depending on your age, weight, and height, Weight Watchers tells you how many *Points* you should consume



in a day. In addition, you get a number of *FlexPoints* each week, for when you have to fudge (sometimes literally). You can also earn *ActivityPoints* with exercise to supplement your food points.

Weight Watchers Online is easy to navigate, with practically no commercial clutter. The recipe and restaurant resources are useful, but there is no option for generating a weekly shopping list. You can, however, customize meal plans. Success stories are much more prominent than news and articles on the site—which is fine, given how easy it is to find such content elsewhere. We did hit a few error messages in the chat area, and the service lags behind DietWatch and eDiets.com in its exercise offerings. To join, there is a \$29.95 sign-up fee plus a charge of \$14.95 per month, or you can pay a flat rate of \$59.95 for three months with no additional fees.

WeightWatchers.com Inc.,
www.weightwatchers.com.
●●●●●

Yoga Learning Center

Although you can find a lot of information about yoga on the Web, the Yoga Learning Center is the first online yoga studio. This site adds a spiritual element to physical



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health that's refreshing to those who don't care about washboard abs and counting carbs. The YLC has video and audio practices suited to people of all skill and fitness levels.

A growing library of streaming audio and video content comes courtesy of yoga instructors. You can search by teacher, experience level, media type (audio, audio meditation, or video), and benefit, such as weight loss, back pain relief, or stress reduction. Sessions can be up to an hour long. The site also offers a handful of informative articles and a fledgling forum section.

For \$17.95 a month, you have unlimited access to the site and all its contents. You won't find dietary advice or log calendars, but compared with the cost of attending regular yoga classes or amassing a yoga DVD collection, the YLC's approach is very reasonable.

Yoga Learning Center LLC, www.yogalearningcenter.com. ●●●●●

Advantage Diets

If other diet plans aren't working, and you suspect that your real problem is more than skin (or cellulite) deep, then individual attention from the live counselors at Advantage Diets (www.advantagediets.com) may be right for you. The cost of customizing and implementing a diet plan, along with initial online counseling sessions, averages \$125 to \$500. Content on this site is pretty sparse, but it's really not the main reason you come here.

The process starts with the Myers-Briggs Type Indicator personality assessment, the premise being that to tailor a diet plan to fit your needs, you first need a decent grasp of your behavioral patterns. "I believe a major reason online diet sites are having such success is because most people don't have the time to get to an appointment but can manage online interaction," says Roberta Schwartz Wennik, site owner and registered dietitian. "A computer-generated program cannot provide feedback to a client's concerns. That, to me, is a very major part of weight loss counseling."

GEAR & GAMES

I, Robot

It's no Terminator, but the **Wow Wee RoboSapien** still packs a robotic punch. The 14-inch automaton has excellent articulation and can perform 67 functions, including picking up, throwing, and karate-chopping things, all of which you program with an easy-to-use remote. Both touch- and sound-sensitive, this synthetic simian can yawn, whistle, and even dance a jig, making it one of the most humanlike robots we've seen.—*Dan Avery*

\$99 list. Wow Wee,
www.wowwee.com.



Scan as You Go

If portability is paramount, the **Planon DocuPen** portable scanner is the cat's pajamas. Just place it flat against the item to be scanned, press a button once for 100 dpi or twice for 200 dpi, and swipe it down the page for full-line scans. It's Twain-compliant, it attaches easily to your PC, and it comes with simple-to-use Paperport 8.0 SE software. Smooth scanning does take practice (especially for lefties), and scans are black-and-white only.—*Sally Wiener Grotta*

\$199.99 list. Planon
System Solutions Inc.,
www.docupen.com.



Sexy Librarian

The Mac OS X-only **IntelliScanner Collector** is a handheld bar code scanner designed to catalog your collection of DVDs and videotapes, CDs, video games, and books, combined with software that uses an online database to look up details on your media. You can flag which DVDs have been lent to friends and export your database to Palm PDAs, spreadsheet software, and the Web. The Collector can't figure out audiocassette tapes or comic books. But scanning still beats typing any day.—*Sascha Segan*

\$199 direct. Intelli Innovations Inc., www.intellisw.com.



Sonic Lounging

The **Pyramat PM300** is a young gamer's sonic dream: You can feel the sound without having to buy massive speakers and a subwoofer. It doesn't provide surround sound—just stereo—but as you lounge on the Pyramat PM300 while playing, sounds reverberate through your skull or your torso, whichever part is in contact with the speaker-filled cushion. Make sure you have plenty of floor space!—*Joel Santo Domingo*

\$149 list. Pyramat LLC, www.pyramat.com.



Legal Aid

BY CAROL ELLISON

Whether you're filling out legal forms, planning your estate, or applying for a loan, CD-based advice can cut your legal costs to a fraction of what you would pay if you walked into a law office cold. All these programs warn you, however, that they can't replace human lawyers. Not yet, anyway.

Family Lawyer 2004 Deluxe Home and Business

This CD packs in the legal forms, from wills to intellectual property agreements for business. And it's the only program we reviewed that secures your personal documents with password protection and encryption, giving it an edge over the other.

Video tutorials dispel the mysteries of legalese and provide tips. Help is also available from three PDF textbooks and a law dictionary. You get a useful financial calculator, a home inventory worksheet for tracking valuables, and three months' access to delayed stock quotes as a bonus.

Family Lawyer reminds you that it's not a lawyer substitute. But it does offer access to a legal service and discounted fees after you register.

\$29.99 list. Broderbund, www.broderbund.com. ●●●○

The screenshot shows the 'Estate Manager' software interface. At the top, there are tabs for 'Started', 'My Profile', 'Estate Manager', and 'Will Writer'. Below the tabs is a 'Print' button. The main content area is titled 'Estate of Annibell Allis' and contains sections for 'Personal Information' and 'Assets'. The 'Personal Information' section includes fields for 'Testator's Name and Date of Birth' (Annibell Allis 8/16/1952), 'Spouse's Name and Date of Birth' (Arthim Allis 6/28/1944), 'SSN' (578-46-2998), and 'No Children'. The 'Assets' section is divided into 'Real Estate' and 'Titled Personal Property'. The 'Real Estate' table has columns for 'Description', 'Address', 'Value', and 'Notes', with one entry for a 'condo' valued at '\$315,000'. The 'Titled Personal Property' table has columns for 'Description', 'Location', 'Value', and 'Notes', with two entries: '1999 Mercedes garage' valued at '\$20,000' and 'Toyota Corolla garage' valued at '\$18,000'. Each entry has an 'Edit' button next to it.

HOME & BUSINESS ATTORNEY 2004

Kiplinger's Home & Business Attorney 2004

Home & Business Attorney adds personal documents—for divorce and bankruptcy, business agreements, loans, and more—to the estate-planning resources in Kiplinger's WillPower (reviewed next). Helpful windows explain how to fill out more than 150 state-specific documents.

This program excels in the breadth of business contracts it offers—particularly for technology businesses—but it's not without bugs. Still, the usefulness of the contracts far outweighs any annoyance.

\$29.95 list. H&R Block e-Solutions, www.kiplinger.com. ●●●○

Kiplinger's WillPower

This program concentrates strictly on estate planning. It provides 17 different documents, from wills and living trusts to health-care advance directives, powers of attorney, and executors' checklists. FAQs clear up basic issues, such as the difference between a will and a living trust.

You start by entering personal information to build your estate profile. The program analyzes the information and makes recommendations on what to do to secure your estate, avoid probate, and minimize estate taxes. Using Estate Manager, you can review and edit the information and then generate the documents you need.

\$29.99 list. H&R Block e-Solutions, www.kiplingerswillpower.com. ●●●○

Quicken WillMaker Plus 2004

This estate-planning program also includes documents for promissory notes, notices to terminate credit cards, and child-, elder-, and pet-care agreements. Choose a document and the program presents relevant information and steps you through filling out the document.

Each document is cross-referenced to a paper manual and online help. You can also get plain-English answers to legal questions using the legal encyclopedias and dictionaries at www.nolo.com. You can edit your documents in the on-screen preview and export them in RTF format. Best of all, updated documents reflecting changes in the law are posted monthly to the Nolo site.

This program bests the others with its legal breadth and ease of use, but it lacks password protection, a key feature for sensitive personal documents.

Boxed, \$49.95 list; download, \$39.95. H&R Block e-Solutions, www.nolo.com. ●●●○

The screenshot shows the 'Quicken WillMaker Plus 2004' software interface. It features a form titled 'INFORMATION ABOUT THE VITAL RECORDS OFFICE' with the instruction 'Fill in the information about the agency to which you're sending the request.' The form includes fields for 'Name of the Agency' (Test company), 'Address' (3303 Hyde Park Ave), 'City' (Cincinnati), 'State' (Ohio), and 'Zip Code' (45209). There is also a field for 'Number of copies you're requesting:' with an 'Example: 3' below it.

QUICKEN WILLMAKER PLUS 2004

QUICK CLIPS

Silent Storm

In Silent Storm, a tactical, turn-based strategy game, you maneuver soldiers like chess pieces through various WWII



theaters. Squads have to work together, taking advantage of each member's individual abilities, to accomplish missions. Despite a lack of multiplayer options and the somewhat weak campaigns, Silent Storm's game play and fully interactive environments are stellar.—Daniel S. Evans

\$49.99 list. Encore Software, www.encoresoftware.com. ●●●○

Mondo!

Mondo!, for kids age 9 to 15, combines journaling with scrapbooking in a colorful, intuitive interface; it's easy to combine text with

photos, videos, and sound. While kids are having fun, they're also learning the basics of layout, graphics, and communications. You can create up to 100 different password-protected log-ons, so

lots of kids can maintain their own private journals on the same system—a cool classroom project.—SWG

\$29.95 list. My World Software, www.myworldsoftware.com. ●●●○

KumaWar

This online game transforms you from news voyeur to virtual participant. A full-blown news organization covers real-life ongoing conflicts, such as the capture of Saddam Hussein, and incorporates them into a third- or first-person tactical shooter. Each week a new mission is added. You can play out the events as part of a single-player or cooperative multi-player campaign or fight it out in team-based multiplayer mode. Some environments are a bit bland, but that's probably because of the need to get them ready so quickly.

—Peter Suci

\$9.99 monthly subscription. Kuma LLC, www.kumawar.com. ●●●○



BACKSPACE

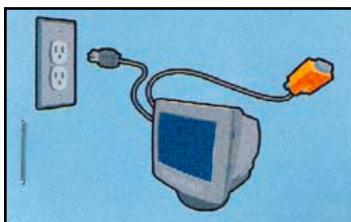
FINDING FUNNIES FROM THE FABULOUS FIFTIES

Edited by Don Willmott

CONGRATULATIONS.

You've already got FlashMX, so thetruth.com should launch automatically and you'll probably never even read this page. Theoretically, we could write anything we'd like here and it wouldn't matter. We could write about our feelings, or give instructions for excess backhair removal. We could just go on and on in a foreign language – it wouldn't even have to make any real sense. Je n'est pas une boulangerie forte. See, we have no idea what that means.

«A simple "congratulations" would have sufficed. (www.thetruth.com)



«This meaningless monitor diagram became even more meaningless when we discovered it came from the package for an HP USB cable.

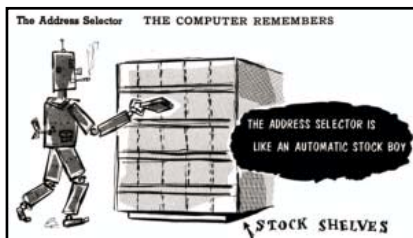
15 ACTUAL QUESTIONS ASKED BY MSN

- Did Jesus Have a Wife?
- Can Bananas Be Frozen?
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- What Was J-Lo Thinking?
- Will You Two Last?
- Do We Need Eyebrows?
- Is Britney Nervous?
- Male Birth Control Coming?
- Which Red Is Right for Lips?
- What's the Use of Dating?
- Are Elderly Spoiled?
- Your Child: Too Chubby?
- Why Are We Suing So Much?
- OK to Exercise Barefoot?
- Why Do Knuckles Crack?

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«From the 1958 book *Basics of Digital Computers*. Note the cigarette.

»Someone in the Bush White House has a nutty sense of humor. (www.whitehouse.gov)

Trivia Quiz

Q1. What President delivered the first State of the Union Address?

- George Washington
- John Adams
- Thomas Jefferson
- James Madison
- Franco Harris

answer



«Just another one of those automatic windows that are too helpful for their own good. (BizRate.com)

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Winners this issue: Conor Doyle, Jim Dunkelberger, James Kight, Felix Linvi, Dung Nguyen, and Bitali Porokhov.

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*Based on trading in a HP LaserJet 4500 printer in "good" condition; actual trade-in price may vary. Please visit CDW.com/ptradein for a trade-in quote. *Receive \$100 Okidata mail-in rebate with purchase of the C5100n; offer ends 5/31/04. *Receive \$50 Brother mail-in rebate with the purchase of the HL-2700CN; offer ends 6/30/04. *Bundle offer expires 5/31/04. Bundle consists of Lexmark C510 printer (CDW 585935) and Lexmark 144000E External Print Server (CDW 522898). Customer understands that CDW is not the manufacturer of the products purchased by customer hereunder and the only warranties offered are those of the manufacturer, not CDW. All pricing is subject to change. CDW reserves the right to make adjustments to

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CDW 585935

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High Yield Toner Cartridge Black-\$119.99 (CDW 585945)

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Lexmark Additional 1 Yr Extended Onsite Warranty-\$375.95 (CDW 205959)

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\$799 CDW 454440

-100 Mail-in rebate*

\$699 Your Price

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Recommended supplies and accessories:

Oki Type C6 Toner Cartridge Black-\$44.92 (CDW 467599)

Oki Type C6 Toner Cartridge Color-\$109.20 (CDW 467598, 467597, 467596)

Oki Duplexer-\$330.00 (CDW 465295)

Oki C5100 Additional 1Yr Overnight Extended Warranty-\$198.72 (CDW 491964)

Brother HL-2700CN

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- Up to 2400x600 dpi
- Network ready
- 64MB standard memory
- 1 yr onsite warranty standard

\$799 CDW 570441

-50 Mail-in rebate*

\$749 Your Price



brother 

Recommended supplies and accessories:

Brother Toner Cartridge Black-\$169.99 (CDW 573269)

Brother Toner Cartridge Color-\$164.99 (CDW 573271, 573272, 573273)

Duplex Unit For HL-2700CN-\$799.99 (CDW 586077)

Brother HL-2700CN Additional 1 Yr Onsite Warranty-\$609.99 (CDW 585461)

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