

PC

MAGAZINE

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ADOBE'S CREATIVE MASTERPIECE

FASTEST GRAPHICS EVER!

nVidia and ATI Face Off

THE LATEST DIGITAL CAMERAS: WHAT MAKES THEM CLICK

Make New Friends With Friendster

THE INDEPENDENT GUIDE

JANUARY 2004

101

PRODUCTS YOU'LL LOVE

BEST OF THE YEAR



ZIFF DAVIS MEDIA

DESKTOPS & NOTEBOOKS • DIGITAL IMAGING • PRINTERS • UTILITIES • AUDIO • VIDEO
PERIPHERALS • HOME ENTERTAINMENT • MOBILE DEVICES & SERVICES • NETWORKING
DEVELOPMENT TOOLS • OPEN-SOURCE TOOLS • PRODUCTIVITY SOFTWARE • EDUCATION • GAMES

Shhh.
Don't tell it it's a computer.



Gateway recommends
Microsoft® Windows® XP Media Center Edition

**Introducing the Gateway® 901 Family Room Media Center.
It stores thousands of CDs. Records your TV. And will
change your mind about what a computer can do.**

\$999⁹⁹ 901 with Intel® Celeron® processor

New!

\$1799⁹⁹ 901X with Intel® Pentium® 4 processor with HT

Both the 901 and 901X combine home entertainment and home computing with the ultimate digital media center computer. They're designed to fit into the family room and let you do amazing things. Like record TV shows. Share photos and videos. Watch DVDs. And play games with more power than ever before. The 901X even digitizes and manages up to 5000 CDs and burns DVDs. It also has the amazing **Intel® Pentium® 4 processor with Hyperthreading Technology**¹ so you can do all that — at once. Pair either with our surround sound system and 42" Plasma, and your family room will never be the same.



Things that know how to play nice with PCs.



\$299⁹⁹ New!

Gateway™ DMP-X20 Jukebox Player with 20GB Drive¹

It does everything!

20GB MP3 player fits over 500 CDs! Also includes FM tuner, voice recorder and data storage.



\$199⁹⁹ New!

Gateway™ DV-S20 Pocket Multi-Cam

Double the camera.

Throw your video tapes away. Digital camcorder and 2 megapixel camera in one!

5 MEGAPIXELS



\$299⁹⁹

(after \$50 mail-in rebate²)

Gateway™ DC-T50

Compact Digital Camera

Compact. Elegant. Capable.

It packs 5 megapixels and a 3X optical zoom in one, tiny package. Includes rechargeable battery and AC adapter.

4 MEGAPIXELS



\$199⁹⁹

(after \$50 mail-in rebate²)

Gateway DC-M42 Digital Camera

High quality, small design.

The hot new Gateway DC-M42 packs 4 megapixels and 3X optical zoom into an easy-to-use elegant package. Also features movie mode.

\$99⁹⁹ New!

Gateway™ DMP-210 128MB MP3 Player¹

Music that goes where you go.

Incredibly easy-to-use and compact MP3 player. It even stores data, has an FM radio and built-in digital voice recorder.



2 MEGAPIXELS



~~\$129⁹⁹~~ **NOW \$99⁹⁹ New!**

(after \$50 mail-in rebate²)

Gateway DC-T23 Digital Camera

Tiny pocket-sized 3-in-1.

The Gateway DC-T23 gives you 2 megapixels (perfect for emailing friends) and a 4X digital zoom. 3 devices in 1: digital photos, movie clips and web cam all in a size that fits your pocket and budget.

AOL Keyword: Gateway

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The only thing it won't do is laundry.

You'll be surprised how much you can do with the first all-in-one Media Center system that combines your PC, TV, DVD and stereo and features the Intel® Pentium® 4 Processor with HT Technology!

"It has about every feature a power user or multimedia lover could want."

– The Wall Street Journal, 11/6/2003



Gateway recommends
Microsoft® Windows® XP
Media Center Edition

Starting at **\$1499⁹⁹**
Gateway® 610 Media Center

The ultimate home entertainment system.

The ultimate system includes an Intel® Pentium® 4 Processor with HT Technology¹ so you can run multiple applications at one time. It also has the latest software such as Microsoft® Windows® XP Media Center Edition 2004.

My TV lets you watch what you want when you want—even copy shows to DVD from your remote (610XL only).

My Music is like having a 1500 CD changer with built-in Napster service and FM radio.

My Video stores your home movies and digital videos so you can watch them anytime. DVD player included.

My Pictures lets you catalog all your photos, eliminate the red-eye, brighten up your pics and create slide shows with music.

Napster is back! Get 1 FREE month Napster Premium only from Gateway!²



Fits anywhere – thin as an LCD



Room rattling sound
with Integrated Subwoofer

Unless otherwise noted. Applicable taxes extra. Not responsible for typographical errors. ¹Performance may vary. See www.intel.com for additional information. ²Major credit card required. You can listen to or download an unlimited number of songs. In addition, songs can be purchased a la carte for \$0.99, while albums sell for \$9.95. For further details log onto www.gateway.com. Accessible capacity varies; GB=1 billion bytes. Copyright ©2003 Gateway, Inc. Terms and Conditions of Sale apply. Gateway.com and Gateway Country Stores, LLC are separate legal entities in the United States and other countries. Microsoft and Windows are registered trademarks of Microsoft Corporation. Ad Code: 114052

Put the Gateway Family Room Media Center together with these Gateway products for the home theater of your dreams.



◀ **\$999⁹⁹ New!**

New Gateway™ KAS-303 Home Theater System

1000 Watts of power.

The 6.1 surround sound has 60 True-Digital amplification for the ultimate home cinema experience.



~~\$349⁹⁹~~ **Now \$299⁹⁹ New!**

(after \$50 mail-in rebate*)

Gateway™ AR-230 DVD Recorder

Record your TV shows to DVD.

Record up to 6 hours on a 4.7GB DVD+R/RW disc. Includes 1394 and RCA inputs so you can turn your home movies into DVDs. Features progressive-scan DVD playback, Dolby Digital support and one-touch recording.



\$199⁹⁹

Gateway™ Connected DVD

Enjoy MP3s and photos in your living room.

Displays pictures and plays music/video from your PC with wired or wireless network connection.



◀ **\$2999⁹⁹**

Gateway™ 42"

Ultrabright Plasma TV

Beautiful bright picture.

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You didn't just make a meeting.
You made history.



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Ten offices, seven countries, one impossible deadline?
No problem. Not when you're equipped with innovations
that allow you and your team to collaborate more securely in
real-time—all from within familiar Microsoft® Office programs.
Yes, this is the kind of stuff that legends are made of.
Gear up for great moments at microsoft.com/greatmoments



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For work or play, count on the #1 selling monitor brand in the U.S. to give you the best View in the house...as well as



Stylish ThinEdge LCDs are equally at home as a solo display with versatile pivot/height/swivel adjustments to enhance productivity and reduce strain.

the office. Why? We have a better vision. We focus on one thing: delivering the best screen performance at the best price.

At the office, thousands of companies large and small have joined the visual revolution in desktop image quality, productivity and total cost of ownership with innovative ViewSonic LCD technologies. Our new ultra-thin bezel

ThinEdge™ VP Series LCDs give you unmatched performance and versatility with digital HDTV resolution, incredibly rich color and complete digital/analog connectivity. The super slim bezel minimizes the image gap in multi-display applications for continuous data display. And pivot/height/swivel adjustments on screen sizes from 17" to 21" deliver the perfect view at the right price. Factor in ViewSonic innovations like ClearMotiv™ fast response video performance and XtremeView® wide viewing angles, and you won't find a better LCD value.

At home, ViewSonic brings the same attention to perfection to its LCD TV lineup. In fact, you may never leave home again. ViewSonic's stunning new N2700w 27" LCD TV provides peerless images with incredible HDTV resolution, color and sharpness, all in a flat panel designed to impress. You'll see awesome functionality and

Uptime

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easy plug and play compatibility with PCs, cable and HDTV set-top boxes, VCRs, DVDs, game consoles, camcorders and more. There's even picture over data so you can watch a movie while surfing the Internet.

See the Difference® that makes ViewSonic displays #1 in the U.S. for price and performance*. More than a thousand industry awards for technical innovation (and just plain coolness) demonstrate our single-minded dedication to visual technology advancement.

Enjoy the complete visual solution. Visit ViewSonic.com today. And improve the View wherever you work or play.

Downtime

*Leading stand-alone, branded monitor by sales (CRT and LCDs combined). (Supply/Stanford Resources Monitark® and Flat Panel Monitark® 2Q03 report). Specifications and pricing subject to change without notice. Corporate names and trademarks stated herein are the property of their respective companies. Copyright © 2003 ViewSonic Corporation. All rights reserved. [11416-01E-1]/03]



NORM MEYROWITZ
PRESIDENT OF PRODUCTS



WEB DEVELOPERS ARE USING OUR MX PRODUCTS
IN WAYS WE NEVER DREAMED. JUST IMAGINE
WHAT THEY'LL DO WITH THE NEW MX 2004.

I've been endlessly amazed by the things our customers have done using our MX generation of products. And with all the new features in Studio MX 2004, it's going to be even easier and faster for them to realize their visions.

Dreamweaver MX 2004 helps you get that picture in your head turned into a web site faster than ever. That should be welcome news to the millions of web professionals who use Dreamweaver to create sites and applications. We've added things like CSS support, target browser check and improved code hinting to help you get through projects in far less time. And with Fireworks MX 2004 you can optimize web graphics up to 85% faster.

The new Flash MX Professional 2004 takes our industry standard tool for building rich content and applications to a whole new level. It really helps stretch your abilities—no matter where you fall on the designer-developer continuum. For development, we've added things like data-aware components and an extensibility layer so you can add your own features. For design, we've added high-quality, long-format video that's really impressive.

These are just a few of the new features. The products are available individually, but they really work well together in Studio MX 2004. Don't take my word for it. Download a free trial and read more at our web site.

Let me know what you dream up. norm_01@macromedia.com



Limited Time Offer.

Seven free extensions when you purchase any MX 2004 product and register it online by 12/31. A \$225 value.*

Introducing
Macromedia MX 2004.

www.macromedia.com/go/2004



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Forward Thinking

AN OPTIMISTIC OUTLOOK FOR 2004

FOR THE FIRST TIME in a long while, everyone I talk with is predicting a modest upswing for 2004. The economy is picking up, and tech spending increased near the end of 2003. I see several signs that point to a recovery in the coming year.

For starters, companies are now using older computers, and maintaining them is getting expensive. Many of these machines are simply failing, and replacing them will be less expensive than repairing them. And with the Longhorn version of Windows at least two years away, businesses will finally upgrade older Windows NT and 98 machines to Windows XP.

I'm also seeing more companies seriously considering the benefits of mobile computing, which could mean a significant uptick in sales of laptop computers, Wi-Fi networks, wireless-enabled PDAs, and PDA/phones. And this trend could drive a greater demand for network infrastructure and storage. It's a good thing for businesses that the costs of both

telecom service and storage continue to decline.



But the biggest growth opportunity is in Web services. Emerging Web service standards promise to let companies tie together existing applications within an organization, connect to outside applications, and create new ones. I don't think that one platform—Microsoft .NET or Sun's J2EE—will dominate. There are just too many apps in the corporate world for a single approach to work.

So what are the obstacles to growth in the PC industry? First, since companies got burned during the dot-com bust, people will be more cautious this time around. Businesses will need to see clear costs and benefits before they adopt new technologies. But I think the bigger obstacles are security-related. We seem to hear of a new virus or worm every week, and that is making both consumers and businesses skittish. To reap the benefits of continued growth, the industry will need to address these problems better.

A YEAR OF MIXED RESULTS

MANY GOOD THINGS HAPPENED in the computer industry in the past year, but they were balanced by

some not-so-good news. Here's my list of the nice and naughty things that occurred during 2003.

The Nice 	 The Naughty
The computer industry is on the road to recovering from its recession.	We're still a long way from the highs of the late 1990s, and many jobs are moving overseas.
Windows XP proved more stable than previous versions of Windows.	There were way too many Windows security problems and patches.
Mobile computing had its best year ever, with the Intel Pentium M driving more power in smaller form factors.	The various Intel chip names (Pentium 4, Pentium M, Mobile Pentium 4 Processor-M, and so on) confused a lot of people.
Wireless networking went mainstream; most notebooks now come with 802.11 (Wi-Fi) features.	We still need more hot spots and roaming arrangements among the wireless service providers.
AMD introduced its Athlon 64 and Opteron chips, which promise easy migration to 64-bit computing and compatibility with existing 32-bit apps.	Support from the major PC makers remains tepid.
The new Apple G5 is the most powerful mainstream computer on the market, and Panther is the most integrated OS.	Apple still has a small market share and needs to bring the G5 processor to less expensive systems.
The new Media Center PCs are a great way to view photos, listen to music, and record TV.	The Media Center PC's video quality could be better, and burning DVDs from recorded TV is difficult.
The latest Tablet PCs are fast and have innovative designs.	The tablet market is still small, and the integration of handwriting recognition could be better.
Digital cameras, camcorders, music players, and photo printers are more capable than ever.	Photo-printing costs are still too high, and no computer is really fast enough for editing video.
Paid digital music services finally got on the right track with a pay-as-you-go sales model.	The services still need a better music selection, and piracy is leading to more restrictive digital rights management.



The economy is picking up, and tech spending increased near the end of 2003.

Forward Thinking

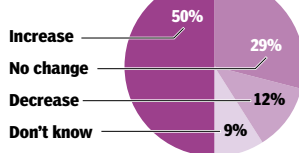
MICHAEL J. MILLER

OUR READERS' PREDICTIONS

TO CAPTURE HOW OUR READERS view technology spending, we recently started a Technology Confidence Index. In our first study this past fall, we found that half of you expect your household to increase spending on computing and consumer electronics products in the next year. And 56 percent of IT professionals we surveyed expect their companies to spend more on computing and IT in 2004 than in 2003. Far fewer people expect

The majority of readers we polled expect their households to spend more on computing and consumer electronics products in 2004 than in 2003. Readers who are IT professionals are even more confident about workplace spending.

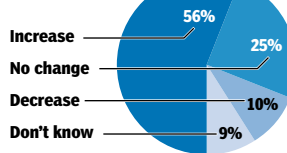
HOUSEHOLD IT SPENDING



spending to decline: 12 percent expect declines at home, and 10 percent expect declines at the office.

Among IT professionals, 52 percent plan to purchase new computers, 40 percent plan to buy networking equipment, 38 percent plan to buy peripherals, and 25 percent plan to purchase IT services. Perhaps most telling, 83 percent of the IT professionals we surveyed say that now is a good time to make major technology investments. That's a great sign for the future.

CORPORATE IT SPENDING



Source: PC Magazine Technology Confidence Index, Fall 2003 (from a survey of 4,777 PC Magazine subscribers).

THE NEW, SMALLER CAMERAS



TINY CAMERAS HAVE IMPROVED dramatically over the past year. Not too long ago, if you wanted a camera small enough to carry in your pocket, you had to sacrifice image quality.

That's no longer true. The Minolta DiMage X series was the first small camera that took good pictures, but now others have joined the scene. I recently tried the Canon PowerShot SD10 Digital Elph, a 3.5-ounce camera that comes in four colors and takes very sharp 4-megapixel photos. It offers 5.7X digital zoom (though no optical zoom) and a handy quick-shot feature.

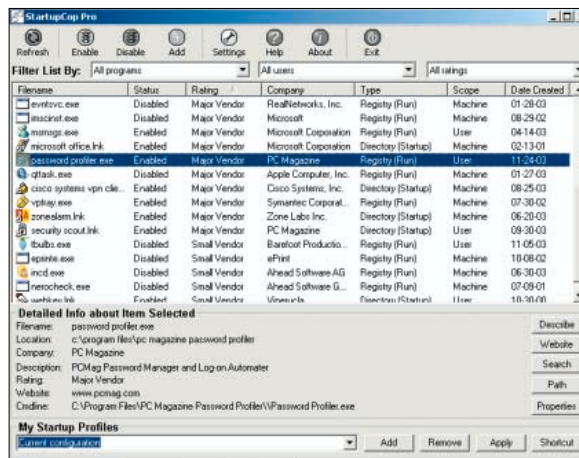
I expect top-quality cameras from Canon and Minolta, but I was more surprised by the Kyocera Finecam SL300R. This tiny camera can snap multiple pictures very quickly without the shutter lag that is so common in digital cameras. It can take 3.2-megapixel images at 3.5 frames per second (with the flash off and a fast SD card). For more details, see First Looks on page 39 and our camera technology story on page 106. The SL300R weighs 5 ounces—slightly more than the Canon SD10—but it's still quite light and slim (at about half an inch). And it twists so you can see the LCD while the lens is positioned in the other direction. It also has a 3X optical zoom and fits nicely in my pocket.

PC MAGAZINE UTILITY: STARTUP COP PRO

I DON'T USUALLY PLUG PC Magazine utilities, but our development team has come up with a couple of easy ways to see what's running on your system. Our newest utility, Startup Cop Pro, shows you everything that loads when your PC boots up and lets you enable or disable specific programs. It does a much better job than Windows Task Manager and can be invaluable when you're trying to figure out whether your system really needs to be running a program. For instance, the start-up file on my notebook includes a utility to activate the touch pad and another to turn on the modem.

We also created a Web service that feeds program information to Startup Cop Pro. It also delivers information to another PC Magazine utility called TaskPower, which shows you all of the tasks your computer is running, along with descriptions. Power users will find this an excellent way to know what's running and to remove programs.

We've tried to keep the price of our utilities low: \$19.97 a year, or \$14.97 a year for magazine subscribers. That covers access to a library of our utilities, including a new one each month. To sign up, log on to www.pcmag.com/utilities.



MORE ON THE WEB: Join us online and make your voice heard. Talk back to Michael J. Miller in our opinions section, www.pcmag.com/miller.

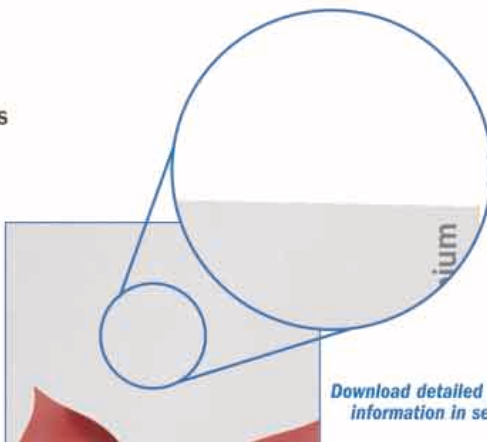
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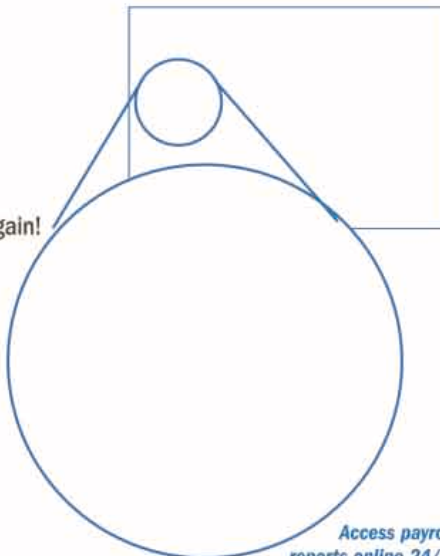
- Enter payroll data on YOUR schedule any way you like: online, phone (with no set call-in time), PC or fax.
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Access payroll reports online 24/7.

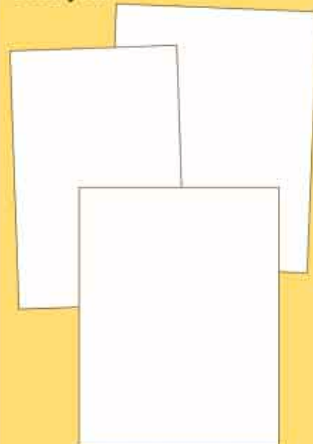
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I AM MORE THAN JUST FINS AND SNORKELS. I AM YOUR TICKET TO ANOTHER WORLD. I WANT PEOPLE TO SPEND AN AFTERNOON WITH A SEA URCHIN. I THINK DOLPHINS SHOULD HAVE THEIR OWN TALK SHOW. I THINK THE WORLD WOULD BE A HAPPIER PLACE IF IT WERE UNDERWATER. I WANT EVERYONE TO TAKE THE PLUNGE.



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THIS IS THE POWER OF THE NETWORK. NOW.



> **2:23 am.** Tech support specialist Brent Wagner explains to his mom that free, around-the-clock technical support only applies to customers.



A man wearing glasses and a light-colored button-down shirt with a CDW logo is sitting at a desk, talking on a corded telephone. He has a thoughtful expression. Behind him is a window with blue blinds. To his right is a wooden shelf filled with various bobbleheads, including a football player, a man in a suit, a man in a blue shirt, a man in a black shirt, a man in a blue shirt, a man in a blue shirt, a man in a blue shirt, and a man in a blue shirt. A red sign is in the foreground.

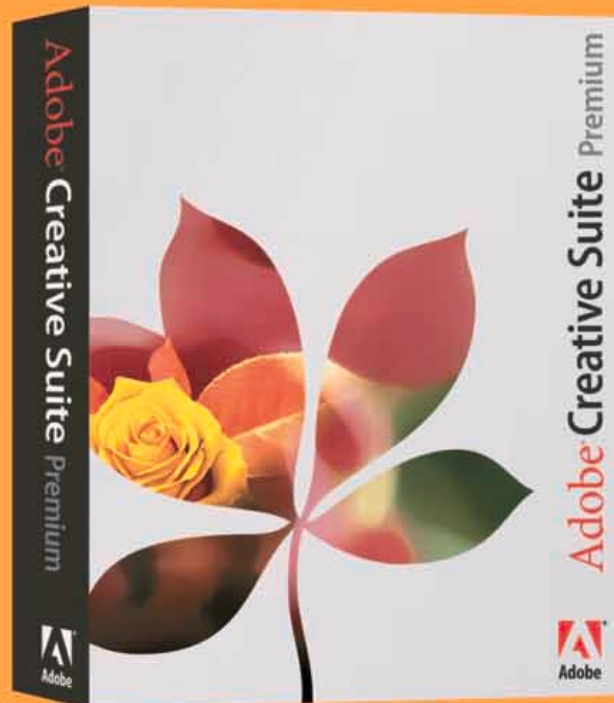
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Computer Associates BrightStor ARCserve Backup v9 for Windows

- > Enables backup to another disk volume to leverage the variable performance
- > Supports CD-RW and DVD-RW drives
- > Command line interface—runs common commands directly from the command line
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\$499.79

CDW 435961



Monitor sold separately

hp compaq business desktop d220

- > 2.66GHz Intel® Pentium® 4 processor
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- > 40GB hard drive
- > 48X Max CD-ROM drive



invent

\$649.00

CDW 545334



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THE BEST products OF 2003

Of the thousands of products we've reviewed throughout the year, these 101 are our favorites. Our list includes digital cameras, mobile phones, desktop systems, and more. Everyone from Java developers to hard-core gamers will find something cool here.

25 Pipeline

- 25 Nanotechnology and homeland defense.
- 25 Meet the motorcycle PC.
- 26 The world's smallest flying robot.
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- 28 **COMING ATTRACTIONS:** ViewSonic Tablet PC V1250, CMS Velocity Series, Maxspeed MaxBook 810, Ceiva Photo Receiver.



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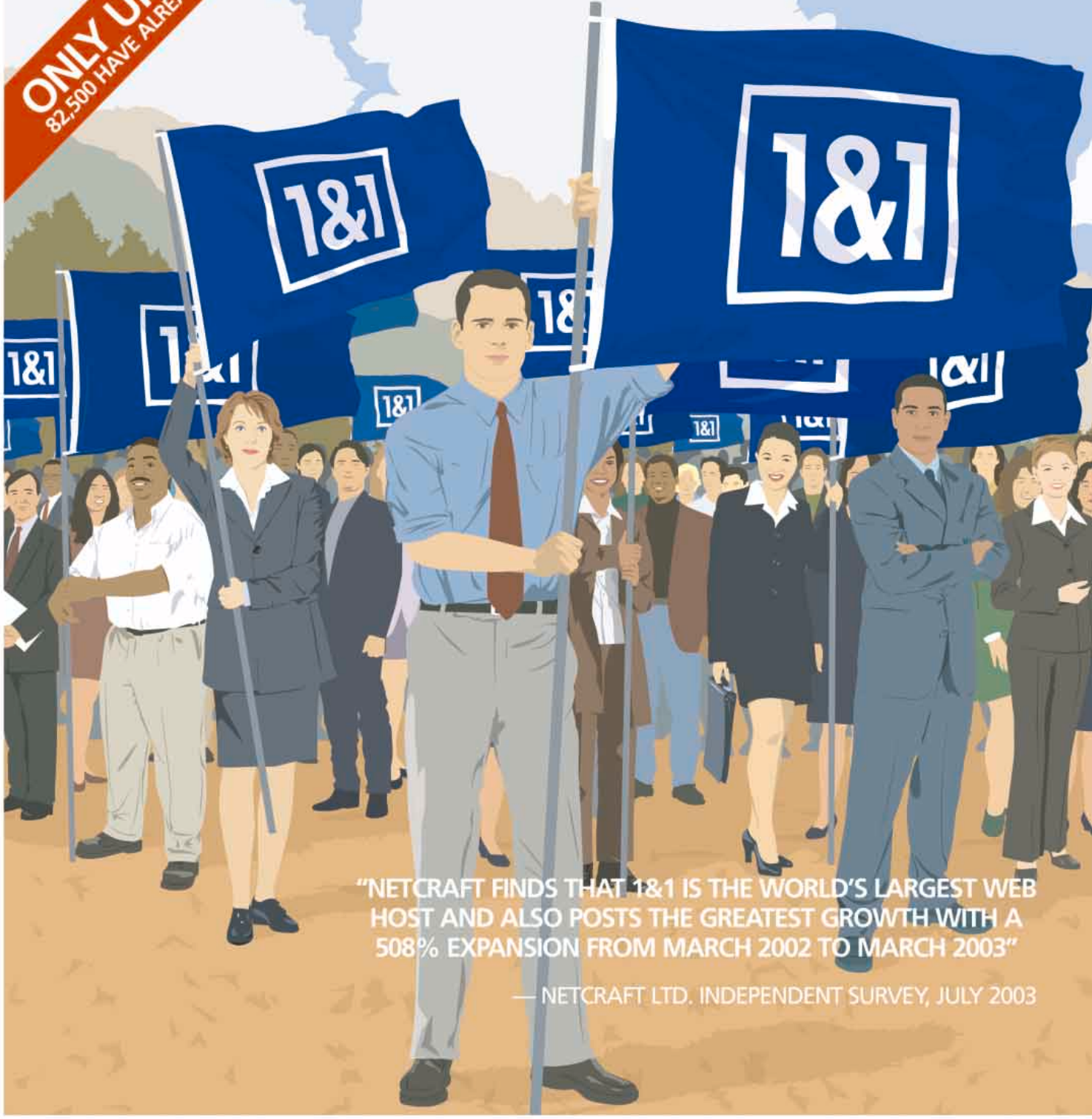
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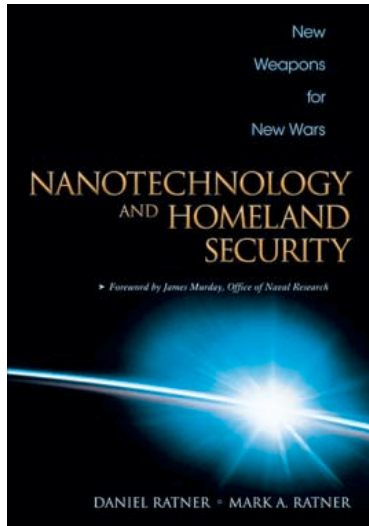
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PIPELINE

Homeland Security Gets Small

Tomorrow's tools for taking on terrorism.



Ultimately, fighting the war on terrorism may have less to do with giant aircraft carriers and more to do with atomic-scale detection and prevention systems. Nanotechnology, which is expected to transform everything from computer processors to drug delivery systems, may also be the key to homeland security, argues a new book.

In *Nanotechnology and Homeland Security: New Weapons for New Wars* (Prentice Hall, 2003), Mark A. Ratner, a professor of chemistry at Northwestern University and a noted expert in molecular

electronics, and his son Daniel Ratner, a high-tech entrepreneur, claim that current research in nanotechnology will lead to intelligent sensors, smart materials, and other methods for

thwarting biological and chemical attacks.

"The number-one thing," says Daniel Ratner, "is going to be smart sensors. These could be immensely useful in finding weapons of mass destruction, for example. Today, you need a lab, and it takes days to analyze samples. In the future, a lab on a chip with nano-based sensors could give you a result in seconds."

Such devices could also protect seaports by scanning all incoming shipping containers. Like reusable litmus paper, nanodot particles could instantly change color upon detecting the presence of anthrax DNA strands.

And when sensors aren't enough, nanotechnology could be used to minimize the effects of terrorist attacks.

"There are products coming for explosive mitigation," explains Daniel Ratner. "One is a blast-retardant foam that acts like an airbag for buildings and could be used in future construction."

While the authors believe nanotech research will be essential to homeland security, Daniel Ratner says, "The biggest advances are still three, five, and up to ten years away."—*John R. Quinn*

Research will lead to methods for thwarting biological attacks.

Roadhouse PC

IS THAT A HARLEY OR A PC? WITH one of the more innovative system designs we've seen, Portland, Oregon-based Out of the Box is selling a PC called the Think Tank, which features a patented motorcycle-inspired design.

The Think Tank is one of seven racy PC designs the company plans to bring to market. "We see the Think Tank as a work of art," says Out of the Box spokesperson David Coley.

A training-wheels version of the Think Tank sells for \$1,150, and a high-end system costs \$2,707 (including a monitor). The high-end system includes a 2.8-GHz Pentium 4 chip, a 200GB hard drive, 2GB of DDR RAM, a 15-inch LCD display, speakers with



high-end subwoofers, a DVD player, television-recording features, an AM/FM radio tuner, and Windows XP Professional.

The Think Tank isn't for everyone, but those who deem beige boxes too timid may get a kick-start out of it.—*Sebastian Rupley*

Security Spending Spree

Although IT professionals faced very tight budgets in 2003, 66 percent of them report that they increased security spending in the past year. Survey respondents say that current employees—not viruses or hackers—represent the biggest threat to technology infrastructures.

Average percentage of corporate IT budgets spent on security



Based on a survey of more than 1,600 IT professionals. Source: The Meta Group, November 2003.

TINY TRIUMPH

Marking a major milestone in the field of *nanotechnology* the science of manipulating matter at the submolecular level, scientists at the Technion-Israel Institute of Technology have used DNA to create a self-assembling nanoscale transistor, according to a report in the journal *Science*. Researchers have attached a carbon nanotube to a specific site on a DNA strand and then constructed metal nanowires out of DNA molecules at the ends of the nanotube. Proteins on the DNA strands and nanowires bind to each other without human intervention. The resulting device is a transistor that can be switched on and off by applying voltage.

Technion researchers have cautioned that building working devices from self-assembling transistors will take time. Meanwhile, several futurists, including former Sun Microsystems scientist Bill Joy, have written of the peril that could come from devices that can build themselves.

CUFFED AND STUFFED

Marking an international cybercrime sweep that involved everyone from U.S. Secret Service agents to police officers in Africa, U.S. attorney general John Ashcroft announced in November that 125 Internet crime suspects were arrested. The crimes ranged from hacking to attempting to sell stolen goods on eBay. Millions of dollars of allegedly stolen funds were collected.

Lilliputian Levitation

It's a bird, it's a plane, it's—the world's smallest flying microrobot? Engineers at Seiko Epson have created a prototype minicopter that earns the distinction.

The company demonstrated the remote-control gadget for the first time at November's 2003 International Robot Exhibition in Tokyo. The little copter levitates by using contra-rotating propellers powered by a thin, ultrasonic motor. It can balance in midair by means of a stabilizing mechanism called a *linear actuator*.

Is the device only a cutesy doohickey? An advisory from Seiko Epson says no. (The company was saying little about its invention at press time.) It is intended to showcase the



promise of *micromechanics*, a branch of miniaturization that Seiko Epson has been working on for several years.

In one scenario the minicopter, with a tiny wireless camera onboard, could function as an eye that enters a building or home following a disaster. In another recent demonstration of its micromechanics efforts, Seiko Epson staged what it claims is the world's smallest robot ballet, where many robots danced simultaneously via remote control.

This isn't Epson's first adventure into robotics. In 1993, the company's microrobot Monsieur made *Guinness World Records* as the world's smallest robot. The flying microrobot—at least for now—has the sly-me-with-imagination name FR, or Flying Robot. —SR

Apple's Wide Angle



APPLE COMPUTER CORP. FINISHED 2003 with a bang, innovating on both the notebook and desktop fronts. The company has introduced a new iMac system with a 20-inch display (see the photo), which it is billing as "the largest flat-panel display ever offered in an all-in one desktop." In addition, Apple introduced a new dual-processor 1.8-GHz Power Mac G5 desktop and lowered the price on its single processor 1.6-GHz Power Mac G5 system.

The new 20-inch iMac has a display that offers up to 1,680-by-1,050-pixel resolution, and the company claims the system has significantly more actual screen real estate than the 15-inch iMac,

so that users can view more than two full pages on-screen side-by-side. It comes with Mac OS X 10.3 Panther. A 1.25-GHz PowerPC G4 model with 256MB of DDR SDRAM costs \$2,199.

Apple's goal in using such a large screen in an iMac is to "raise the bar on what cus-

tomers can expect from an all-in-one desktop," says Phil Schiller, Apple's senior vice president of worldwide product marketing. It seems unlikely, though, that iMac displays can get much larger than 20 inches within the all-in-one form factor—even as standalone flat-panels get bigger and bigger.

The company's new dual-processor 1.8-GHz Power Mac G5 system starts at \$2,499, and the single processor 1.6-GHz model's price has been lowered to \$1,799.

Both the 20-inch iMac and the new Power Mac G5 systems are slated for reviews in an upcoming issue. —SR

I Want My Phone TV

Cell phones now include MP3 players, Web browsers, and cameras, so it was only a matter of time before television arrived. In November, Idetic announced the launch of MobiTV, part of the Sprint PCS Vision plan. MobiTV is the first service that lets you watch live TV, as opposed to video clips.

For \$9.99 a month, Sprint customers with PCS Vision service and J2ME- or BREW-enabled phones can have access to channels such as MSNBC and The Discovery Channel.

According to Idetic, video can stream to cell phones at a rate of about 1 to 2 frames per second—choppy, but viewable. And what you will see on a phone screen is exactly what you'd see on your TV: The content is not altered. Look for an upcoming review in *After Hours*. —Carol A. Mangis

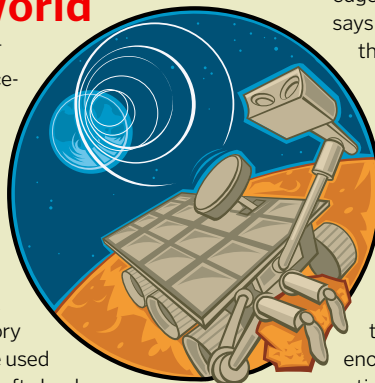


Out of This World

THE SOLAR SYSTEM'S LARGEST wireless network just got a face-lift. With \$54 million of improvements—including a new 110-foot antenna near Madrid, Spain—the Deep Space Network (DSN) is ready to support a barrage of space research in 2004.

The DSN, operated for NASA by the Jet Propulsion Laboratory in Pasadena, California, will be used to communicate with spacecrafts landing on Mars collecting comet dust, and probing the rings and moons of Saturn. Although its maximum throughput of 2.2 Mbps may seem slow compared with standard Wi-Fi networks, the DSN will be able to send signals beyond Pluto's orbit to Voyager 1.

"We can communicate with a spacecraft at the



edges of this solar system and beyond," says Jim Hodder, operations manager of the network. Data will take almost 25 hours to complete a round trip from Earth to Voyager 1.

No matter what position the Earth is in, signals can always be sent to and received by one of the three stations near Madrid; the Mojave Desert in California; and near Canberra, Australia. Only when the Sun is in the way does the system experience a communication blackout, sometimes for up to several days.

With careful planning around the Sun, however, NASA will use the DSN this January to control the Mars Exploration Rovers, telling the vehicles' robotic arms where to move and when to scoop up samples. Now that's what we call very remote control. —Jennifer Harsany

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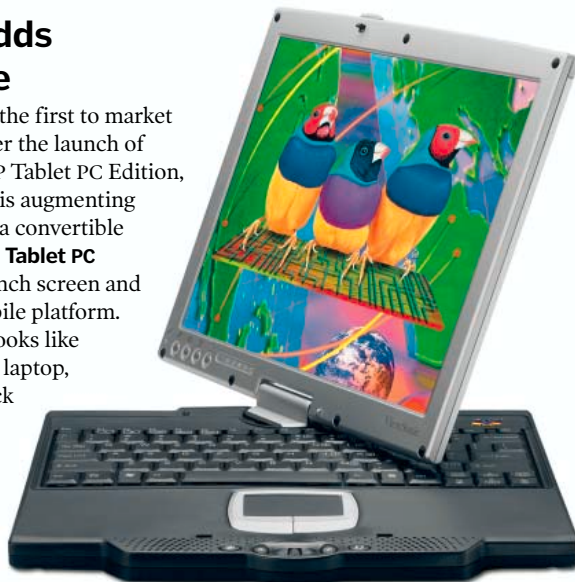
COMING ATTRACTIONS

ViewSonic Adds
A Convertible

ViewSonic was one of the first to market with tablet devices after the launch of Microsoft Windows XP Tablet PC Edition, and now the company is augmenting its slate offerings with a convertible model. The **ViewSonic Tablet PC V1250** includes a 12.1-inch screen and the Intel Centrino mobile platform. In clamshell mode, it looks like a regular ultraportable laptop, but swivel and fold back the screen, and it becomes a sub-4-pound tablet computer.

—*Jamie M. Bsales*

\$1,800 street. ViewSonic Corp., www.viewsonic.com/tabletpc.

First External
SATA Backup Drive

With the **CMS Velocity Series** drives, you really have no excuse for not backing up. The company has taken fast Serial ATA hard drives (in capacities ranging from 80 to 200GB) and put them in external enclosures. The provided PCI-slot pass-through lets

you connect the drive to the SATA connector on your PC's motherboard. The result is blisteringly fast backup speeds—up to 1.4GB per minute, versus the 250MB per minute speeds of external FireWire and USB 2.0 drives. The company's superb BounceBack Professional backup utility completes the package.—*JMB*

\$299 list and up. CMS Products Inc., www.cmsproducts.com.

Thin-Client
Notebook

The **Maxspeed MaxBook 810** may look like a traditional laptop, but it's actually a 2.9-pound portable thin-client device. Like other thin clients, the MaxBook

lets you connect to server-based applications on a variety of operating environments, including Windows, Citrix, SCO Unix, and Linux. But unlike desktop units, the wireless-equipped MaxBook lets you take your terminal to meeting rooms and other offices—anywhere your network has wireless coverage.—*JMB*

\$1,499 list. Maxspeed Corp., www.maxspeed.com.

Essential
Digicam Accessory

Digital-camera memory cards fill up fast when you're on vacation, and dumping images on your PC at the end of each day often isn't

possible. So you can invest in lots of expensive media—or go with the **Addonics MFR**. The portable 1.4-pound drive lets you transfer photos from all the popular memory card formats to its CD-RW recorder with the touch of a button—no PC required.—*JMB*

\$249 list. Addonics Technologies Inc., www.addonics.com.

You've
Got Smiles

The second-generation **Ceiva Digital Photo Receiver** displays a slide show of digital photos, which it can receive automatically each night through a telephone line. The new model allows up to 30 photos a day to be transferred.—*JMB*



\$150 street. Ceiva Logic Inc., www.ceiva.com.

Turns Stills
Into a Movie

DVD X Show lets you turn digital stills into a Ken Burns-style documentary, complete with panning, zooming, transitions, animation, and music. Once you've finished your masterpiece, you can burn it to DVD or CD to watch on your television.—*JMB*



\$39.99 direct. 321 Studios, www.321studios.com.

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F I R S T

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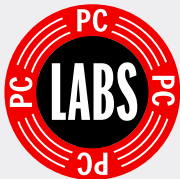
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Tax Software: Taming the Paper Tiger

BY KATHY YAKAL

THE MAGAZINE
WORLD'S LARGEST
COMPUTER-TESTING
FACILITY



How much better can they get? That's what we asked ourselves about the leading tax preparation software packages this year, given the depth and approachability we saw in the category last year. But indeed they've managed to improve, incrementally at least, delivering plain-English help on a broader range of topics and offering live advice for users with questions.

As in the past, these packages provide the tools you need to complete federal and state tax returns, doing all of the calculations required and nudging you to lay out all of your income and deductions. If that sounds pretty basic, it's anything but.

Software companies have bent over backwards to ensure that your path through the 1040 is paved with a ton of help and interpretation. Specifically, they offer the option of a step-by-step interview that asks you questions and puts the answers in the right place on forms and schedules. And when you think you're done, the software does a sweep of your return and highlights answers that may be problematic. You are then ushered to planning tools that give advice on how to minimize your tax burden for next tax year.

Help abounds, and it comes in several flavors. Unfamiliar terms are hyperlinked to explanations. Context-sensitive FAQs dot most screens, and IRS in-

structions—with intelligible interpretations of them—are available for each topic. Additional helpful text and tips flesh out puzzling content. And all of the tax law changes that have been incorporating since last year are built in. If you're still unsure of something, the leaders also offer access to tax pros who can answer a specific question or review your entire return.

This year's crop of PC-resident packages—2nd Story Software's TaxACT, H&R Blocks's TaxCut, and Intuit's TurboTax—have improved in subtle ways. Navigation is better, and the depth of questioning in some topics has been increased. In many cases, the programs' "voices" have become friendlier and less jargon-laden. These and other, smaller changes make your apprehensive journey through the 1040 a little more palatable.

Each company (not to mention a host of smaller players) also offers an online-only version for users comfortable with

an ASP model. But these services typically don't go live until January; hence they couldn't be tested for this story. The bottom line: The vast majority of filers will do very well with tax prep software, unless they're dealing with thorny topics like depreciation and the sale of securities, which require more acumen.

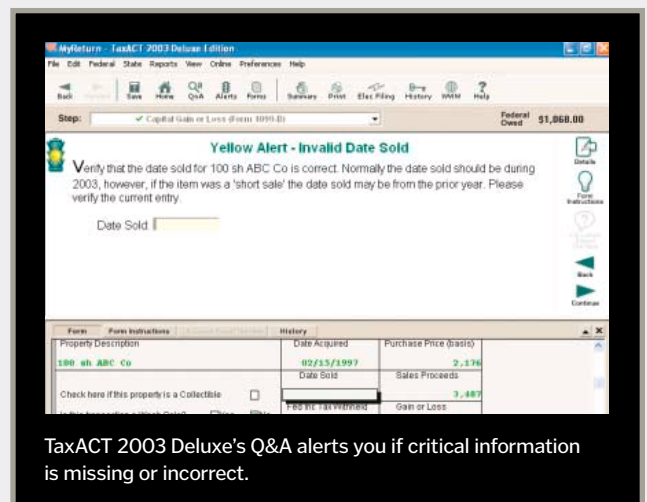
If you used either of the leaders (TaxCut or TurboTax) last year and were comfortable

with it, there's no compelling reason to switch to the other this year, as they are very evenly matched. But if you are new to such packages, our favorite (and Editors' Choice) this year, by a nose, is TurboTax. While TaxCut will more than meet the needs of the vast majority of users and is the better bargain (\$20 less expensive, not counting the free advice call buyers are entitled to), we slightly prefer the interview process and overall feel of TurboTax this time around.

TaxACT 2003 Deluxe

Over the last few years, TaxACT has built a reputation as a viable alternative to the top two tax programs. It's sleek, fast, and provides a respectable amount of guidance to taxpayers. Tax advice has been expanded this year, and the interface revamped.

TaxACT 2003 Deluxe starts out by asking about taxes already paid in, then moves into



TaxACT 2003 Deluxe's Q&A alerts you if critical information is missing or incorrect.

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WHAT THE RATINGS MEAN

- EXCELLENT
- VERY GOOD
- GOOD
- FAIR
- POOR

the Life Events screen, which asks what significant changes have occurred in your life since your last tax return. For each event checked, TaxACT generates informational screens describing its tax implications and how it is handled in your return. No other program is so thorough up front.

We also like TaxACT's new interface, which is now a close match for those of its better-known competitors. A drop-down box serves as a navigational tool, listing program topics and letting you jump to any of them. Buttons on the side also provide navigation as well as links to Help tools. A pane across the screen's bottom lets you toggle between the current form/instructions, your return history, and tax help. Unlike TaxCut and TurboTax, though, the program doesn't hyperlink unfamiliar terms or provide FAQs. But navigating around TaxACT is faster than in its competitors.

TaxACT's Q&A has grown over the years to its respectable current state. It's thorough and explains tax topics clearly for the most part in the Q&A, though we still encountered too much jargon. There are other quirks. In more than one instance, TaxACT asks you to enter a number manually from elsewhere on the return rather than pulling it in itself as the others do. Another possible drawback: On some screens, TaxACT directs you to an IRS publication. These instances are rare, though; the bulk of the Q&A is very capable.

Help is good, but it can't match that of its competitors. IRS instructions and excerpts

from the well-respected J.K. Lasser income tax guide provide supplemental help within the Q&A, but we'd like to see more. And TaxACT's search functions do not dig as deeply as its competitors do. Live tax advice is offered by financial professionals for a \$19.95 fee (up to 10 minutes).

TaxACT's review process flags three types of items that may need your attention. One identifies entries that may render your return incomplete or may trigger attention from the IRS. The second looks for problems that may require additional attention. And the third offers suggestions for tax savings. Additional reports let you compare filing jointly vs. separately and compare your return to national averages.

We can recommend TaxACT for taxpayers who are perhaps a little more tax-savvy than the average bear, have fairly straightforward returns, or whose software budgets are strapped. But keep in mind that if you need to add a state return program and some live advice, there go your savings.

TaxACT 2003 Deluxe

List price: \$9.95 (includes one federal electronic filing). Requires: 16MB RAM (32MB recommended); 30MB hard drive space; Microsoft Windows 95, 98, 2000, NT, Me, 2000, or XP. 2nd Story Software Inc., 800-573-4287, www.taxact.com. ●●●●

TaxCut Premium 2003

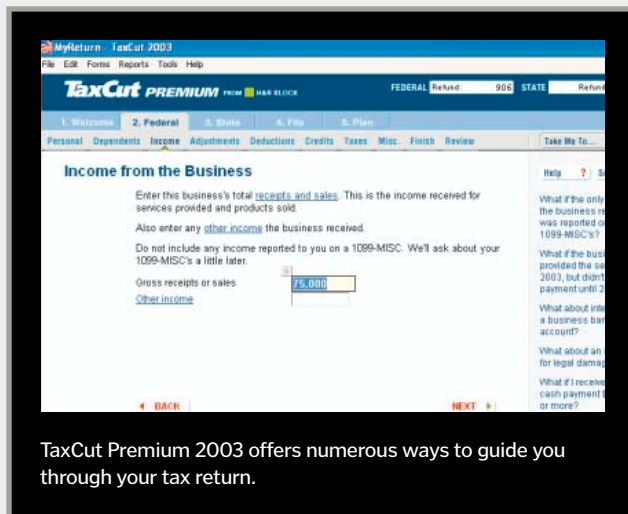
H&R Block's TaxCut Premium 2003 has seen more changes than its competitors since last year's version. Some of the changes are cosmetic, including a welcome overhaul of the program's look. Other changes

are more substantive, clarifying various elements of the 1040. In some places, steps and assistance were added; in others, they were streamlined.

If you import data from last year's TaxCut or TurboTax, a report lists all of the related entries. You can make changes directly on the screen, go to the form, or wait until you get to

the screen make it easier to get where you're going quickly.

Several kinds of help and search tools are available. Related FAQs appear on most screens. Clicking the Help button opens a dialog box with several kinds of assistance. There's program help, tax tips and advice, IRS instructions and publications, and explanations of form. The



the proper point during the interview process. You can also import data from programs like Microsoft Money and Intuit's Quicken. Other types of data can be downloaded into the program from participating financial institutions, like some retirement and investment information and W-2 info from leading payroll services.

At each new content area of your return, TaxCut displays a list of the documents you'll need for those issues. You'll also be asked to indicate which tax topics in that area apply to you so that TaxCut will visit the applicable screens. New navigational markers at the top of

Search box displays matching forms when you enter a topic, and the "shoebox" helps you search by a document's originator source.

TaxCut also does a good job of hyperlinking unfamiliar language to more thorough explanations. And for \$19.95 per incident, no matter how complex, you can use the company's Ask a Tax Advisor service, which connects you with an H&R Block professional by phone or e-mail. Even better, the Premium package includes a mail-in rebate coupon for one such call. And if you're so inclined, you can have an H&R Block tax professional review your self-

prepared return to help ensure you've taken all the deductions and credits due you (\$29.95). In all versions, technical support (for help with the program itself) is free via e-mail or phone.

What makes or breaks a tax program is the depth of 1040 coverage and how friendly and informative the interview's "conversation" is. TaxCut has made some good changes here this year, including more guidance in areas like capital gains, home sales, self-employment, and tuition expenses. New context-sensitive tax tips flesh out the details of thorny tax topics. But TaxCut has some room to grow internally. We found that some interview topics (such as the Fuel Tax Credit and Amended Return areas) are not completed, forcing you to open a form and fill it out manually.

TaxCut has always done a good job of occasionally flagging questionable entries and encouraging you to check your answers. But you'll still want to take advantage of the final error-checking and planning tools that the program offers. This segment offers two levels of feedback: errors that must be fixed before filing (like missing required information) and warnings (like a figure for state taxes paid).

As usual, when you're finished, you can either print your return or file it electronically. You can also take advantage of H&R Block's post-return planning tools. You can estimate your 2004 taxes and plan for payments, use the program's Alternative Minimum Tax Planner, and generate a tax planning report based on the return you've just completed.

H&R Block has made some good changes this year, and the program is a close match for TurboTax. It's also cheaper, especially when you consider the Premium package's included tax advisor call.

TaxCut Premium 2003

List price: \$39.95 (before a \$10 mail-in rebate). Includes one federal electronic filing, one state software

program, and one Ask-a-Tax-Advisor solution (each free after a mail-in rebate). Requires: 64MB RAM; 150MB hard drive space; Microsoft Windows 95, 98, Me, NT, 2000, or XP. H&R Block e-solutions, 800-457-9525, www.taxcut.com. ●●●●●

TurboTax Premier 2003



A decade ago, Intuit pioneered its EasyStep interview, which greatly simplified the process of preparing and filing personal income tax returns. The company has continued to hone that innovative tool and build more depth, guidance, and usability into the program every year. This year's enhancements focus on several areas, like customization, data import, and more interactive interview topics. These subtle changes help make TurboTax our favorite tax preparation package.

Intuit touched off a firestorm last year when it introduced product activation into TurboTax. After installation, you had to enter an activation code, and you couldn't load the program onto more than one PC (say, at home to do your taxes and at work to print them out) without getting an additional code from Intuit tech support. But the company heard users' complaints, and this year's TurboTax has no such limitations.

Getting started can be easier if you're able to import at least some of your tax data. This can come from financial (Quicken, QuickBooks, and others) and tax software (TurboTax or TaxCut). In addition, TurboTax also downloads data for your W-2 (salary information), 1099 (investment data), and 1098 (mortgage interest). The list of participating financial institutions has grown this year and is listed in the program.

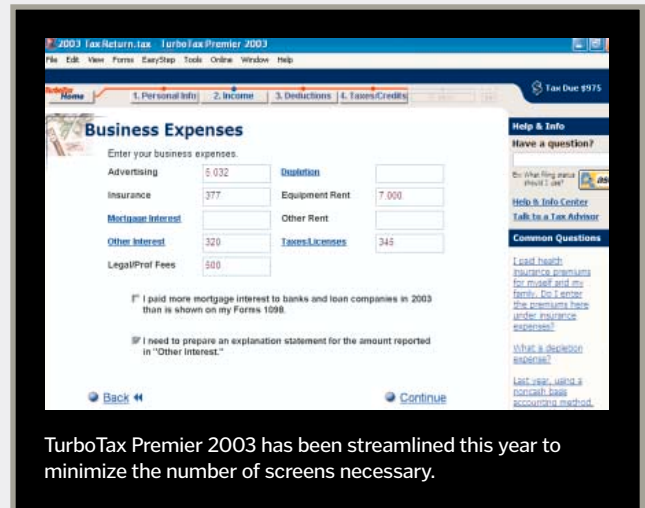
Two of this year's changes are evident early on. Taxpayers who have imported data from the previous year's version are presented with a special "Welcome Back" interview. This multiscreen process displays information as it is carried over

from the prior year for your approval, then asks if you've experienced any significant life events over the last year that would affect your taxes. These include starting a business, refinancing or purchasing a home, and receiving an inheritance. Based on your answers, TurboTax modifies the interview to include those topics.

At the beginning of each section, TurboTax asks you to

topics—opens.

Help tools are thorough. FAQs appear on almost every screen to deal with context-sensitive questions, and hyperlinks take you to explanations of unfamiliar terms. You can type entries in plain English or, if you click the Help & Info Center link, a dialog box displays links to instances where that topic appears. Topic Search—unfortunately hidden up in the Tools



TurboTax Premier 2003 has been streamlined this year to minimize the number of screens necessary.

check off tax issues that are germane to your financial situation, so that it displays topics you must complete. Intuit has shaved off the number of screens you must go through this year to save you time and annoyance. Though TaxCut is very competent at this task, we like TurboTax's structure and approach to conversing with taxpayers better. Several "experts" have been added this year to walk you through complex topics, and videos present information in a welcoming multimedia format.

Little has changed cosmetically or in terms of navigation, and that's a good thing. Buttons and menus at the top of the screen help you get where you're going should you choose not to move through sequentially (which is recommended for all of these programs) or need to back up. Click on a button and TurboTax Navigator—an index arranged by content

menu—asks for a word or phrase, then takes you to the correct screen.

For tax-related questions, you can talk to one of Intuit's in-house experts for \$19.95 per solution. As far as technical support goes, you can enter a live chat for free, but a phone call will cost you \$19.95 for 24 hours of access to the phone techs.

Whether you've been using TurboTax in the past or are a newcomer, we can recommend the program without reservation. It costs a little more than TaxCut, but the streamlined interview process is a real time-saver, and the help topics and tools are exemplary.

TurboTax Premier 2003

List price: \$59.95 (before a \$10 mail-in rebate). Includes one free federal electronic filing and one state software program (each free after a mail-in rebate). Requires: 32MB RAM; 85MB hard drive space; Microsoft Windows 95, 98, Me, NT, 2000, or XP. Intuit Inc., 800-335-1348, www.turbotax.com. ●●●●●

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Graphics Speed for Every Budget

BY DAVE SALVATOR

The world of 3-D PC gaming had a very good year in 2003. New graphics processing units (GPUs) from both ATI and nVidia pushed high-end performance farther than ever, while even sub-\$200 add-in cards began to take advantage of the latest shader-based rendering techniques, which deliver unprecedented realism. And the chicken-and-egg conundrum of shader rendering—cards supported it, but games didn't—was finally resolved with the arrival of titles such as Halo, Splinter Cell, and Tron 2.0.

The 3-D GPU market has been whittled down to only two major players: ATI and nVidia. And while these companies are involved in constant one-upmanship with each spin of the silicon, the truth is that the top-end performance we see from each vendor is very close. And since card makers generally no longer spend time tuning the graphics drivers (instead delivering the ones written for the chip by ATI or nVidia), cards based on the same GPU turn in equal performance. That means buyers are free to focus on other factors: price, video inputs, and bundled software.

HIGH-END CARDS

ATI RADEON 9800 XT

In the graphics business, there are chip makers and there are board makers. Whereas nVidia supplies GPUs and drivers to card makers to integrate, ATI plays both ends: It sells its chips to board makers but also sells its own branded bundles. For this roundup we tested the ATI Radeon 9800 XT board, which is based on the company's top-shelf chip of the same name. This GPU offers a slight performance edge over the nVidia GeForce FX 5950 in some tests,



but in general the race is too close to call.

Bundled software is on the light side in terms of volume but not quality: There's a coupon for Half Life 2, one of the most-awaited new games and a \$50 value. (The coupon code lets you download from game developer Valve's Steam online service when the game ships.) Aside from that, the only other included application is ATI's DVD player. You can also download ATI's Multimedia Center from the company's Web site, which includes a CD player, a video file player, and a media library management tool, as well as ATI's new EazyLook full-screen interface.

Installation of the Radeon 9800 XT is simple enough: Plug in the card, feed your PC a driver disc when it asks for one, and one reboot later you're in business. The Radeon 9800 XT's performance was excellent on all of our performance tests. It slightly outpaced the nearly identical VisionTek offering (which is based on the same GPU) on the Call of Duty tests. That slight edge combined with the promise of a great game make the ATI Radeon 9800 XT our current favorite card for serious gamers.

ATI Radeon 9800 XT

Street price: \$500. ATI Technologies Inc., 905-882-2600, www.ati.com.



The ATI Radeon 9800 XT looks every bit the speed demon that it is. It's our favorite high-end card.

BFG ASYLUM GEFORCE FX 5950 ULTRA

Based on the nVidia GeForce FX 5950 Ultra chip, the 256MB BFG Asylum GeForce FX 5950 Ultra is aimed squarely at the serious gamer who wants maximum performance with minimal trade-offs. The Asylum delivered very solid performance in our testing and came with a price tag (\$480) that matches its pedigree.

Installation is very straightforward thanks to the quick-start guide. But be aware that as with all GeForce FX 5900- and 5950-based cards, the Asylum eats two slots of your PC's back panel and can sometimes impinge upon a PCI card in the slot nearest your AGP slot. The GeForce FX 5950-based designs no longer suffer from the noisy fan that shipped on the nVidia GeForce FX 5800. In fact, the Asylum sports a two-fan heat sink that makes it a good candidate to be overclocked, if that's one of your hobbies. And even with this two-fan design, the Asylum was quiet.

The Asylum delivered performance numbers nearly identical to those of the other high-end cards reviewed here. Considering its higher price and thinner

software bundle (the only included utility is nVidia's DVD player applet, NVDVD), however, the others seem to be better bargains.

BFG Asylum GeForce FX 5950 Ultra

\$480 street. BFG Technologies Inc., 847-615-1955, www.bfgtech.com.



LEADTEK WINFAST A380

The Leadtek WinFast A380 is the other GeForce FX 5950 Ultra-based offering we looked at, and like the BFG Asylum, it delivers solid performance. But unlike the Asylum, the A380 arrives with a far more generous set of bundled software that includes two games and two video applications from Ulead.

The A380's installation went off without a hitch, thanks to the succinct Quick Installation guide. The board has a custom, single-fan heat-sink design that cools down not only the card's GPU but also its graphics memory. This beefier (but still quiet) thermal solution makes the A380 a good choice for PC hobbyists who might be inclined to overclock the GPU. As previously mentioned, GeForce FX 5950 cards eat two back-panel slots, and the A380 is no exception.

The software bundle includes Big Mutha Truckers and Gun Metal, both of which are decent second-tier game titles. There are also copies of Ulead DVD MovieFactory and VideoStudio 7 SE DVD, making the A380 a very good candidate for the serious gamer who would also like to get to know more about digital video. Unfortunately, the A380 does not have video inputs, so video capture will have to be done via a PCI capture card, USB 2.0, or FireWire.

In terms of performance, the A380 paced the other high-end cards here. Its attractive price (for a bleeding-edge card) and good bundle make the Leadtek WinFast A380 a fine choice.

Leadtek WinFast A380

Street price: \$440. Leadtek Research Inc., 510-490-8076, www.leadtek.com.



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**HIGH
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VISIONTEK XTASY 9800 XT 256MB

VisionTek's solid implementation of ATI's leading GPU in the VisionTek Xtasy 9800 XT 256MB represents a very competitive high-end offering that can go toe-to-toe with any of the GeForce FX 5950-based

cards, running even with or slightly ahead of the pack in our 3-D testing.

As with the ATI-branded bundle, precious little software actually arrives in the box. But there is a very welcome coupon for a free copy of Half-Life 2. Since this game will retail for

\$50, the \$500 street price of the Xtasy is effectively reduced to around \$400, which represents a good deal for one of the best-performing cards on the market.

The Xtasy includes an illustrated quick-start card that clearly shows how to install the unit, and neither the hardware

nor the software installations gave us any grief. We expected any card based on the Radeon 9800 XT to be at or near the top of the performance heap, and the Xtasy didn't disappoint, running even with the two GeForce FX 5950-based cards on our Direct3D tests. On the OpenGL

PERFORMANCE TESTS

How We Tested



Because of the increasing importance of vertex and pixel shader performance, our test mix stressed this aspect of 3-D performance more than in previous roundups. We tested at two resolutions, 1,280-by-1,024 and 1,600-by-1,200, both at 32-bit color depth. At both resolutions, we tested with 4X full-scene anti-aliasing and 8X anisotropic filtering enabled (except where noted) to increase the workload the cards had to render. We also tested the entry-level ATI Radeon 9600 SE and nVidia GeForce FX 5200 Ultra for comparison, to see how sub-\$100 cards stack up.

We tested the cards on a Velocity Micro PC with a 3.2-GHz Intel Pentium 4 Extreme Edition CPU and an 800-MHz front-side bus, with Hyper-Threading enabled. The machine had 512MB of PC3200 DDR SDRAM and a Western Digital WD1200 120GB SATA hard drive, and it was running Windows XP Professional with Service Pack 1 and DirectX 9.0b. We downloaded the latest available driver versions from each card maker's Web site.

3DMark03 consists of four subtests, each presenting a different kind of scenery. In the table, we present only the overall score. (For more on the controversy surrounding this test and nVidia's optimized drivers, see www.extremetech.com/3dmark.)

AquaMark3 is a synthetic test suite based on Massive Development's Krass game engine, which powers the game Aquanox

2. AquaMark3 makes heavy use of both vertex and pixel shaders and tests other 3-D features, such as dynamic occlusion culling and particle system rendering.

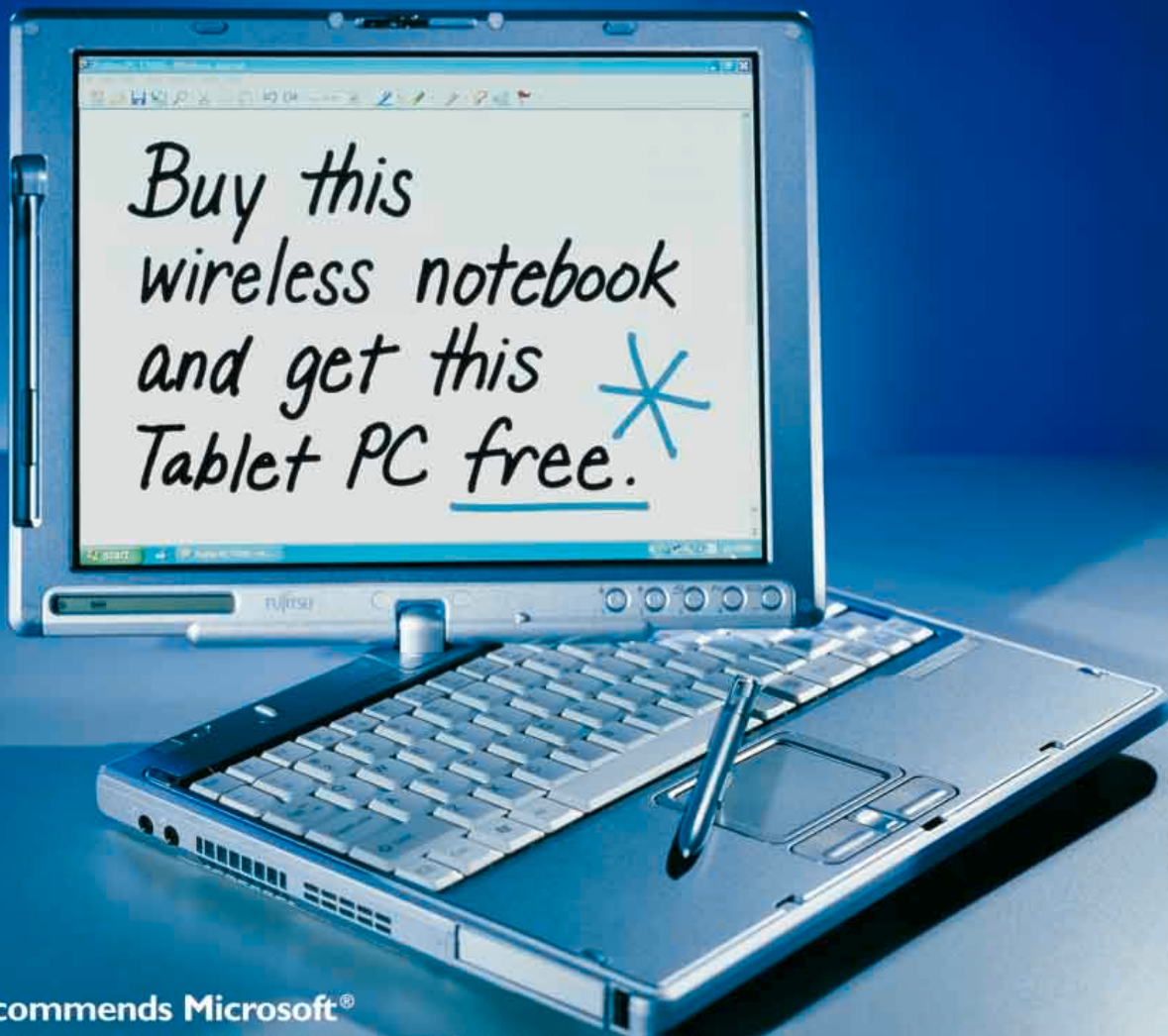
The game Splinter Cell uses Direct3D with Version 8.1-level pixel shaders (PS1.4); it is based on a heavily modified version of the Unreal Tournament engine, and it relies on shaders for its illumination and shadow rendering. We ran the game's three built-in benchmark tests, as well as one developed by Beyond3D, and for each graphics card and resolution we present the average of the four scores. We tested with 8X anisotropic filtering enabled from the driver control panel, but we disabled 4X anti-aliasing, because the game engine's shadow-rendering method is incompatible with multisampling anti-aliasing, which both ATI and nVidia cards use.

As we await the arrival of DOOM III, which will be the next big OpenGL-based game, we opted to use Serious Sam SE for the next round of testing. It employs a fixed-function pipeline (no shaders), but its high-resolution textures and expansive outdoor scenes place considerable fill-rate demands on a 3-D card, stressing both the GPU and graphics memory bandwidth. We used the Cooperative demo built into the demo version of the game.

Call of Duty uses a heavily modified version of the Quake III game engine. The developer, Infinity Ward, rewrote the Quake III renderer, and the game uses limited pixel-shader effects that rely on proprietary extensions from both ATI and nVidia. We recorded our own demo from an online multiplayer gaming session and used its playback as a test.—DS

High scores are best. Bold type denotes first place within each category. Anti-aliasing/Anisotropic filtering ▶	GPU (and driver version)	3-D BENCHMARK TESTS						GAMING TESTS					
		3DMark03		AquaMark3 (fps)		AquaMark3 (fps)		Splinter Cell (fps)		Serious Sam SE (fps)		Call of Duty (fps)	
		1,280 x 1,024	1,600 x 1,200	1,280 x 1,024	1,600 x 1,200	1,280 x 1,024	1,600 x 1,200	1,280 x 1,024	1,600 x 1,200	1,280 x 1,024	1,600 x 1,200	1,280 x 1,024	1,600 x 1,200
		4X/8X	4X/8X	Off/Off	Off/Off	4X/8X	4X/8X	Off/8X	Off/8X	4X/8X	4X/8X	4X/8X	4X/8X
HIGH-END CARDS													
ATI Radeon 9800 XT	ATI Radeon 9800 XT (Catalyst 3.9)	2,233	1,648	42	33	30	23	38	34	55	42	88	80
BFG Asylum GeForce FX 5950 Ultra	nVidia GeForce FX 5959 Ultra (53.03)	2,099	1,579	44	36	24	18	37	31	60	44	80	62
Leadtek WinFast A380	nVidia GeForce FX 5959 Ultra (53.03)	2,112	1,585	44	36	24	19	37	31	60	44	80	63
VisionTek Xtasy 9800 XT 256MB	ATI Radeon 9800 XT (Catalyst 3.9)	2,238	1,650	42	33	30	23	38	34	54	45	86	74
MIDRANGE CARDS													
Asus Radeon 9600 XT	ATI Radeon 9600 XT (Catalyst 3.9)	1,222	687	26	20	18	12	24	20	37	23	60	34
eVGA e-GeForce FX 5700 Ultra	nVidia GeForce FX 5700 Ultra (53.03)	1,216	882	27	21	14	11	24	20	38	28	69	51
PNY Verto GeForce 5700 FX Ultra	nVidia GeForce FX 5700 Ultra (53.03)	1,211	850	27	21	14	11	24	20	39	28	69	51
ENTRY-LEVEL CARDS													
ATI Radeon 9600 SE*	ATI Radeon 9600 (Catalyst 3.9)	499	N/A	12	N/A	8	N/A	6	N/A	14	N/A	23	N/A
nVidia GeForce FX 5200 Ultra*	nVidia GeForce FX 5200 Ultra (53.03)	556	N/A	10	N/A	5	N/A	16	N/A	20	N/A	23	N/A

RED denotes Editors' Choice. * Reported for comparison. N/A—Not applicable: The entry-level cards were not designed to run at this resolution.



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FUJITSU

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side, the Xstasy was somewhat slower on both games we tested. But the card's frame rates on all the game tests were playable, meaning you would see very little in the way of stuttering or hiccups in the course of playing these games.

Given its performance and the promise of a first-tier game, the Xstasy is a good value.

VisionTek Xstasy 9800 XT 256MB

Street price: \$500. VisionTek, 800-680-4424, www.visiontek.com.



MIDRANGE CARDS

ASUS RADEON 9600 XT

AsusTek's midrange offering, based on the ATI Radeon 9600 XT, is a worthy contender in the \$200 price range. It's most noteworthy for including video inputs to capture from analog video sources such as camcorders and VCRs. The company also loads its own suite of applications into the box, as well as adding a coupon for Half-Life 2. All of these features make the AsusTek entry a bargain among midrange offerings.

The card's installation process is easy, and unlike cards using the midrange nVidia GPU, the ASUS Radeon 9600 XT does not need additional power. Oddly, the software bundle doesn't include a video capture or video editing application to accompany its S-Video and composite video inputs. But AsusTek does include four of its own utilities, as well as a TWAIN driver for still-image capture via the video inputs.

Among the bundled software titles, GameFace is probably the most noteworthy. It lets you send video and audio over TCP/IP while you're playing a multiplayer game. Voice over IP isn't anything especially new to gaming, but the ability to send video is something of a novelty. To make it work, your fellow gamers must have GameFace running on their machines as well.

The ASUS Radeon 9600 XT posted very respectable performance numbers, although it did

lose a step on Call of Duty compared with the two cards based on the nVidia GeForce FX 5700 Ultra. The slowdown was more pronounced at high resolution, and the AsusTek card was also a bit slower on our Serious Sam SE test at 1,600-by-1,200. (At very high resolutions, the Radeon 9600 XT will be at a disadvantage, since the GeForce FX 5700 Ultra has a memory clock speed that's half again as fast as that of the ATI GPU.)

Still, the ASUS Radeon 9600 XT is still worth considering for the majority of users who run games at 1,280-by-1,024 or lower. AsusTek's utilities are interesting, the video inputs are comprehensive, and the coupon for Half-Life 2 is a nice bonus.

ASUS Radeon 9600 XT

Street price: \$200. AsusTek Computer Inc., 502-995-0883, www.asus.com.



Cards based on nVidia's GeForce Ultra family of chips feature fans that are quieter than before.

EVGA E-GEFORCE FX 5700 ULTRA

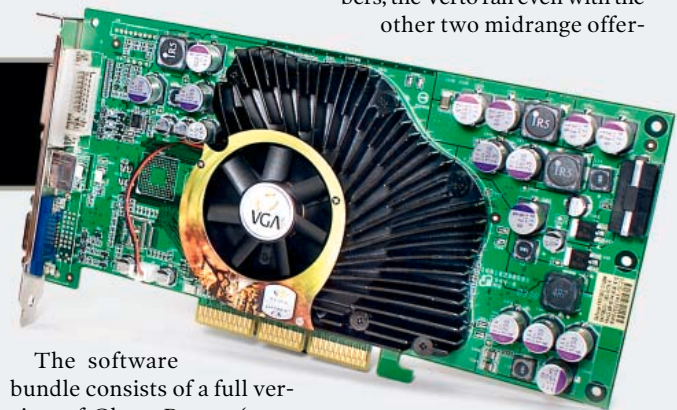
The eVGA e-GeForce FX 5700 Ultra and the PNY Verto GeForce FX 5700 Ultra are based on the same GPU and are spitting images of one another. Performance of the two is nearly identical, so what distinguishes the two cards essentially comes down to the software bundle.

For a time, nVidia found itself squarely outgunned in the all-important midrange GPU category, and the ATI Radeon 9600 Pro and 9600 XT GPUs held a marked performance advantage. But nVidia has evened the score with the arrival of the e-GeForce FX 5700 Ultra, which adds several features found in the company's flagship GeForce FX 5950 Ultra GPU.

Specifically, the e-GeForce FX 5700 Ultra now incorporates nVidia's UltraShadow technology, which is designed to accelerate the shadow-rendering method that DOOM III will use. In addition, the GPU has color,

texture, and Z compression to reduce the bandwidth load on graphics memory, which is frequently the bottleneck. These additions, plus a considerable hike in both engine and memory clock speeds, make the e-GeForce FX 5700 Ultra well worth considering.

The e-GeForce installed without trouble, and this card was unique in having what eVGA calls Automated Driver Management (ADM). This feature works similarly to Windows Update; it automatically checks eVGA's Web site to see if a newer driver is available. If so, the utility can download the driver. This is handy, since graphics drivers seemingly change with the weather but are often slow to propagate into the Windows Update system.



The software bundle consists of a full version of Ghost Recon (a very well-done tactical simulator), nVidia's NVDVD player applet, and Stardock's Window Blinds, a GUI utility that lets you customize your Windows desktop in a number of ways.

Given the number of striking similarities, the deal maker (or breaker) basically comes down to which bundled game you want. If you're more into multiplayer gaming, then the e-GeForce with Ghost Recon is the obvious choice. But if you are more into being a sneaky spy, then the PNY card with Splinter Cell is the way to go, and is our first choice.

eVGA e-GeForce 5700 FX Ultra

Street price: \$200. eVGA.com Corp., 714-528-4500, www.evga.com.



PNY VERTO GEFORCE 5700 FX ULTRA



The PNY Verto GeForce FX 5700 Ultra is a very solid midrange performer that offers an excellent bundled game (Splinter Cell) and a nice price (\$200 street). That combination makes the Verto a serious contender in the price/performance segment for buyers who can't justify the cost of a high-end card.

Installation of the Verto went smoothly. The installation CD also contains nVidia's NVDVD applet, as well as PNY's 3D World 3-D desktop interface. But the real attraction, of course, is a full version of Splinter Cell, a very well-done stealth shooter game.

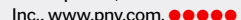
Looking at performance numbers, the Verto ran even with the other two midrange offer-

ings on the two benchmark tests, and it had nearly identical frame rates on the Splinter Cell and Serious Sam SE game tests. On Call of Duty, the Verto was notably faster at both resolutions than the Radeon 9600 XT-based AsusTek card.

If you're semiserious gamer but can't bring yourself to part with \$400 or more for your next 3-D card, the PNY Verto GeForce FX 5700 Ultra will have you good and ready for upcoming shader-enabled 3-D games. Its solid performance and inclusion of Splinter Cell make this card a very good choice.

PNY Verto GeForce FX 5700 Ultra

Street price: \$200. PNY Technologies Inc., www.pny.com.



Kyocera's Breakthrough Digital Camera

BY LES FREED

For all their improvements during the past two years, digital cameras have still presented users with trade-offs compared with film point-and-shoots—namely, slow power-up, long shutter-delay times, and sluggish response when writing to memory. But the groundbreaking **Kyocera Finecam SL300R** does away with these irritants, while delivering good 3.2-megapixel images from a tiny device.

With an innovative parallel-tasking signal-processor and image-processing technology called RTune, the unit performs better than many high-end prosumer digital cameras in terms of speed. Power-on time is less than a second, and the shutter delay is barely perceptible. Most impressively, the SL300R can shoot continuously at 3.5 frames

per second (or capture video at 30 fps) until the memory card is full—no stopping after a few frames to let the camera process the images.

Outdoors, the SL300R is a pleasure to use. The fast power-on time and lag-free shutter release makes it easy to capture moving subjects, and the 3.5-fps shooting rate is a joy. Image quality was very good for a 3MP camera. The 3X zoom lens provides a useful 38- to 115-mm (35-mm equivalent) range of focal lengths, and the 1.5-inch LCD screen is sharp and clear, even in full sunlight.

The SL300R isn't perfect, though. Its auto-focus system is below par, and the camera would occasionally refuse to focus in low light. The camera has no lens cap, and you can easily touch the front of the lens accidentally when slipping it

in and out of your pocket. We found that even a slight fingerprint caused noticeable degradation of image quality, especially in bright light.

Also, the flash is located very close to the lens, resulting in some of the worst red-eye we've ever seen. And note that to enable continuous shooting, you need to use one of the new high-speed SD cards (\$80 street for 256MB), not the 16MB card included in the bundle.

Still, there's no denying that the image processor in the SL300R advances the state of the art. If you've shied away from buying a digital camera because it simply didn't shoot like a film model, your wait is over.

Kyocera Finecam SL300R

Street price: \$380. Kyocera Optics Inc., 800-526-0266, www.kyoceraimaging.com. ●●●●●



Weighing just 5 ounces and measuring about half an inch thick, the SL300R slips easily into a pocket.



Pack for success.



YC-400 document copy stand and digital camera

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HD Media Hub Shows Promise

BY BILL HOWARD

The Roku HD1000 isn't just another digital media hub. Sure, it can play your PC-resident multimedia files on your TV and stereo, but it displays digital photos and videos in true HD resolution—up to 1,080 video lines. That's twice what standard-definition media hubs deliver.

The HD1000 works with everything from your current standard TV to enhanced-definition 480p (480 lines, progressive scan) through 720p and 1080i high-definition sets. The unit is chock-full of features: four memory card slots in front for displaying photos directly from your camera's memory card, pass-

through of component and S-Video signals, and front-panel keys that duplicate most functions of the 14-button remote.

It connects to your network via wired 100-Mbps Ethernet, or you can supply your own 802.11b wireless receiver (which connects to the unit's USB 1.1 jack). Befitting a high-end home theatre component, the \$500 HD1000 offers the best fit and finish we've seen on a digital media hub outside of some \$2,000 devices.

Digital photos viewed on 720p and 1080i HD monitors were dazzling in their detail. You'll want photo images of at least 2 megapixels resolution (lest the quality of the display outstrip the quality of your images), and the zoom feature shows off the advantages of 4MP-or-better cameras. Roku offers sets of Art Pack images (\$69 per Compact Flash card), including classic art paintings, accurate clocks (Roku syncs with the NIST atomic clock), an aquar-



With its stunning 1,080-line resolution, the Roku HD1000 is a media hub for the HDTV set.

ium, and nature scenes.

Digital video looked great in HD, too—if you can find any beyond Roku demos; even movies shot with DV camcorders (and rendered as MPEG files) aren't nearly HD quality. MP3 music playback wasn't any better or worse than on the leading products from HP, Prismiq, Linksys, and SMC.

The on-screen interface is simple and easy to read from a distance, but we were disappointed by the features absent from this first iteration of the product. It doesn't support audio formats other than MP3, offer audio playlists, or display album cover art.

You also can't play back-

ground music when running slide shows, and it doesn't preserve the directory structure when reading music or photos on your PC's hard drive. In other words, all your music is queued up alphabetically, rather than by album or genre. Ditto for photos: If you have them in sub-directories by date or subject matter, they won't necessarily come up that way.

The company plans to address such feature gaps soon, so HDTV owners should wait for the upgrade. For the rest of us, the media hubs from Prismiq and SMC are better choices.

Roku HD1000

Direct price \$500. Roku LLC, 866-400-7658, www.rokulabs.com. ●●●●

Serve a Mirra Image of Your Digital Media

BY KONSTANTINOS KARAGIANNIS

Server appliances are nothing new and nothing for home users to get excited about—usually. With the **Mirra Personal Server M-120** (\$499 direct), you can share data, music, photos, and video with anyone you choose—worldwide. It's a terrific concept, manifested with a few rough edges we'd like to see smoothed out in future versions.

Personal Server connects to either a routing device or gateway on your network. Your Windows 2000 or XP PC runs the Mirra software that tells the appliance which folders to automatically back up each time you make a change to them.

The appliance is not just an external hard drive, though. You can log into it via the Web and access all the goods placed on the device. You can select SSL streaming at the Web interface to pull down important files such as financial documents, or you

can opt for faster unencrypted streaming for digital media. Even if you have a firewall, Personal Server has the ability to reach out to Mirra's Web site and make the backed-up folders available to you (or other authorized users) via a Web interface.

Installing the Mirra application is a cinch, as is registering the Personal Server

The Mirra Personal Server lets you access data and multimedia files from any Web browser.

online. The uncluttered app gets you going quickly, recommending folders for automatic backup but letting you choose any you wish. You can share the folders with others by entering their e-mail addresses into a list and then selecting them as recipients for a particular folder's invitation message.

In this first edition, some

functions are missing. Tops on our list is a Cancel button. To stop a backup in progress, you have to drill into the folder using the bare-bones File pane, then remove the backup folder from the list. Even then, the file being backed up will go on its slow

way to a folder that technically doesn't exist.

And we do mean slow. A gigabyte of data takes about 30 minutes to back up initially; fortunately, subsequent changes to indexed files are much faster. If you need to fill the 120GB device with files right off the bat, it will take a couple of days. Filling a USB 2.0 drive of the same size takes a couple of hours. Also note that you can't put just any kind of media on the server.

Files have to be under 2GB in size, which may pose a problem for those wanting to back up DVD or hard drive image files.

The Mirra Personal Server is an affordable way to accomplish some digital media magic that most users never thought possible for their home networks.



Mirra Personal Server M-120

Direct price: \$499. Requires: Pentium III CPU, Microsoft Windows 2000 or XP, broadband, Ethernet hub. Mirra Inc., 650-940-1800, www.mirra.com. ●●●●

Compaq Goes for Gamers

BY KONSTANTINOS KARAGIANNIS

We could hardly believe our eyes when the **Compaq X09 Gaming PC** showed up at our labs. Abandoning the safe (read: boring) look of Compaq's traditional tower chassis, the X09 is housed in a wavy metal case that doesn't try to hide who it's going after. Gaming enthusiasts are sure to notice the X09 when walking by it in CompUSA—the only outlet for this configuration—and Dell is likely to notice the direct challenge to its Dimension XPS systems.

On our Content Creation Winstone 2004 test, the X09 performed on a par with other gaming machines. On gaming tests, the X09 trailed our recent Editors' Choice gaming box, the Velocity Micro ProMagix DX-W

("High-End Entertainment PCs," November 25, 2003).

Numbers don't tell the complete story, of course. In real-world use, the X09 is a delight. Gaming, even at 1,280-by-1,024, is fluid. The 240GB total storage is fine, and the optical drives (8X DVD+RW and 16X DVD/CD-RW combo) are top-notch. There's even a memory-card reader that supports most card types.

The X09 features nVidia's top-of-the-line 256MB GeForce FX 5950 Ultra. To provide wonderful sound output and front-panel inputs, Compaq went with the Audigy 2 ZS. The system matches these solid components with Klipsch ProMedia Ultra 5.1 speakers for PC sound about as good—and, at 500 watts total, about as loud—as it gets. The 17-inch LCD panel is analog, and noticeably so. When view-



The X09 doesn't look like a traditional Compaq PC—and that's the point. The company is hoping to win over gamers.

ing 2-D images and text, the display just is not as sharp as the digital units we've tested.

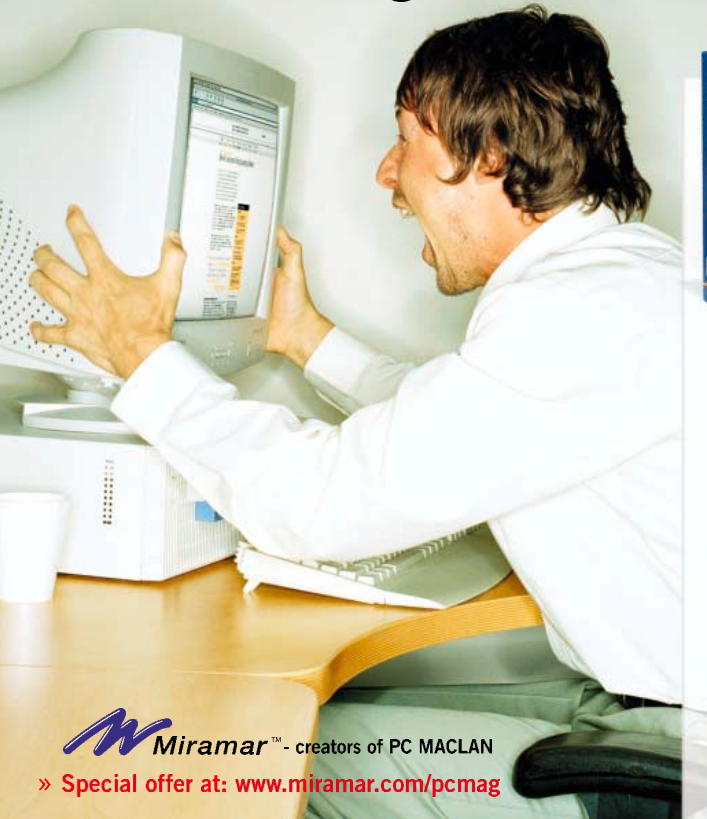
Do note that comparable Alienware and Dell gaming machines are actually \$300 or so cheaper. But if you're looking to walk home today with some gaming power, CompUSA now has a way for you to do so.

Compaq X09 Gaming PC

With 3.2-GHz P4, 1GB 400-MHz DDR SDRAM, two 120GB 7,200-rpm SATA drives (RAID Level 0), 8X DVD+RW, 16X DVD/CD-RW combo drive, 256MB nVidia GeForce FX 5950 Ultra, 17-inch LCD monitor, Microsoft Windows XP Pro, \$3,980 street. Hewlett-Packard Co. (available from CompUSA), 800-266-7872, www.compusa.com.

OVERALL ●●●●● ●●●●● ●●●●● ●●●●● ●●●●● ●●●●● ●●●●● ●●●●● ●●●●● ●●●●● ●●●●● ●●●●●

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Adobe Creative Suite: Indispensable Software At an Irresistible Price

BY LUISA SIMONE

With the release of **Adobe Creative Suite Premium Edition**, Adobe is poised to do for print production what Macromedia Studio did for Web production: offer an indispensable software collection at an irresistible price.

Adobe Creative Suite is an amazing value. For only \$1,229 (direct), you get new versions of Photoshop, Illustrator, InDesign, and GoLive. You also get Acrobat 6.0 Professional and the company's new file-management utility, Version Cue (see the sidebar). If you own any Adobe collection or any previous version of Photoshop, you can upgrade to the new suite for \$749. Designers who work exclusively in print can drop Acrobat and GoLive from the mix and purchase Standard Edition for \$999 (\$549 upgrade).

But Creative Suite is much more than a clever pricing scheme. The programs share core technologies (such as the Adobe Color Engine and OpenType support) that deliver consistent results across applications. And the improved abilities of all the applications to import native PSD, AI, and PDF files results in a streamlined workflow.

Creative Suite isn't perfect. Despite a significant convergence toward a standard interface, there are still UI inconsistencies between applications. And due to differing development cycles, Acrobat doesn't yet take advantage of Version Cue. Also, some advanced functions (like 3-D objects in Illustrator or Version Cue file tracking) require memory well beyond the 512MB typically found in desktop systems. But professional designers will easily see past these small caveats and recognize the financial and artistic value that Creative Suite offers.

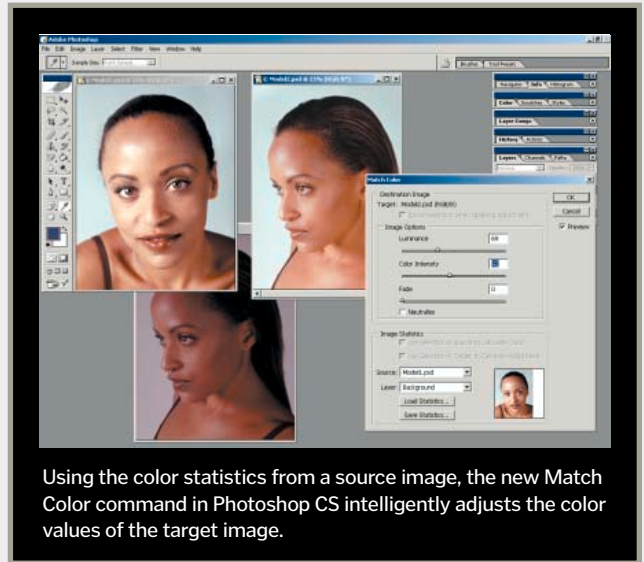
ADOBE PHOTOSHOP CS



The release of Photoshop CS (\$649 direct when bought separately, or \$169 to upgrade) offers truly useful file management functions and pre-processing tools to jump-start the digital image workflow. Photoshop 7.0 introduced a visual browser, which was really a limited-function lightbox. In this release, most of the browser's limits have been removed. New browser features, which include the ability to edit XMP metadata, add keywords, and create multi-criteria searches, let you intelligently funnel images into production or out to clients.

Camera RAW functionality, previously available only as a plug-in, has now been thoroughly integrated into the product. This lets you preview unprocessed camera data in the browser. Factor in Photoshop's ability to perform more editing tasks on 16-bit-per-channel files, as well as up to 56 channels per photo, and you have an image-editing program that can deliver unprecedented quality.

Photoshop CS also streamlines the client approval process. We love Photoshop's ability to import a PDF as a separate PSD file with Acrobat comments intact! And the automated Web



Using the color statistics from a source image, the new Match Color command in Photoshop CS intelligently adjusts the color values of the target image.

Photo Gallery offers new templates that let visitors to your Web site send you interactive feedback.

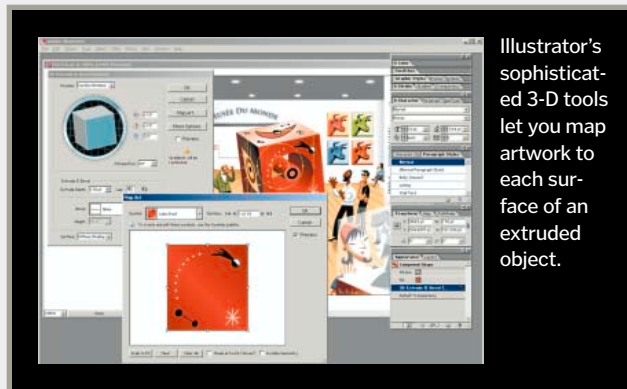
An even bigger time-saver comes in the form of Layer Comps. This new palette basically takes snapshots of the state of the Layers palette, including visibility, position, and appearance. You can then efficiently cycle through the various iterations of a design to show a client, either within Photoshop or as an exported PDF or Web Photo Gallery.

There are too many time-saving features to mention them all. Photoshop can now edit text on a path as well as text imported from Illustrator. The new Match Color command uses color statistics from a source image to modify the color values of a target image. The Shadow/Highlight correction filter lets you in-

dependently adjust shadows or highlights without affecting values in the rest of the picture, and it does so without all of the fuss and bother of using masks and adjustment layers. Video and film professionals will wonder how they lived without Photoshop's direct support of non-square pixels.

Compared with Photoshop, ImageReady boasts only a few modest improvements. One-step export to Flash is welcome. And layers now behave more like objects to make layout manipulation easier, so you can use smart guides to position elements and group layers. ImageReady also gives advanced Web developers more control over how tables are constructed in order to make the resulting HTML code easier to edit.

Are there shortcomings in Photoshop CS? Yes. Some of the new features, like Match Color and Shadow/Highlight, can't be applied as nondestructive adjustment layers. And ImageReady feels disconnected from the workflow because it lacks direct access to both Photoshop's browser and the Version Cue file management utility. But overall, the new features in this release make for a compelling upgrade and virtually guarantee that for most creative professionals, Photoshop will continue to be the first step in the visualization process.



Illustrator's sophisticated 3-D tools let you map artwork to each surface of an extruded object.

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ADOBE ILLUSTRATOR CS

Illustrator CS (\$499; \$169 upgrade) is a renowned 2-D drawing program. But this version of the program literally breaks out of the world of flat illustration and into the third dimension.

Much of the 3-D technology in Illustrator has been borrowed from an existing product—Adobe Dimensions. The 3-D functions have nevertheless been seamlessly incorporated into Illustrator. So not only can you extrude, lathe, and rotate objects, you can also save 3-D attributes as a graphic style for easy reuse. And like other Live Effects in Illustrator, 3-D effects remain editable.

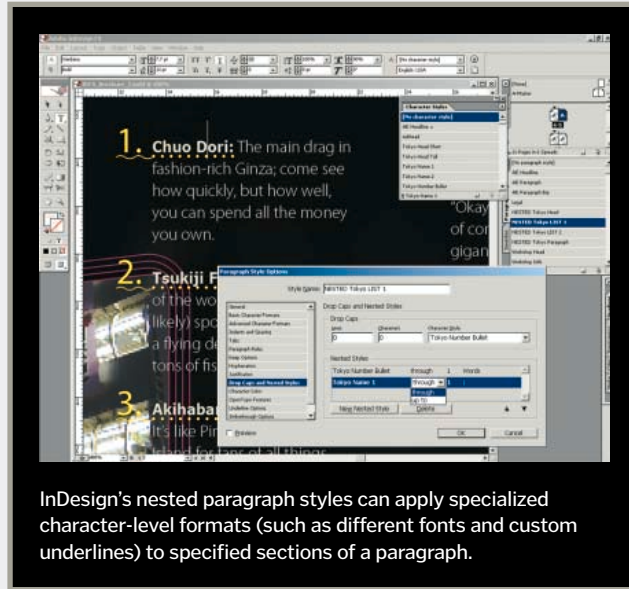
In addition, a nifty mapping function lets you apply artwork to the surface of a 3-D object. Surface mapping gives Illustrator the ability to create more realistic 3-D effects than either of its chief competitors (CorelDraw or Macromedia FreeHand).

If you feel that no upgrade of an illustration program is complete without at least one new drawing tool or special effect, rest easy. Illustrator CS offers a new Live Effect called Scribble, which quickly converts flat colors and smooth lines into a hand-drawn illustration.

Text-intensive layouts are much easier to create in Illustrator CS, thanks to true paragraph and character styles. Robust support of OpenType includes easy access to features such as discretionary ligatures, ordinals, and swash alternatives.

Many of the same automated typographic controls that were first seen in InDesign make their debut in this version of Illustrator, including a multiple-line composer, optical kerning, and hanging punctuation. The bottom line is that designers can create elegant text with virtually no effort. One drawback is that the entirely new typographic engine will force text to reflow in legacy documents.

Illustrator CS provides lots of opportunities for designers to work smarter. For example, you can now save frequently used



layouts as a template or jump-start the design process with one of over 200 supplied templates. Output options have also been enhanced. Better control over printer's marks, user-defined bleeds, support of host-based separations, and the ability to save presets all work together to streamline the prepress workflow whether you are generating PDFs or printed output.

Not surprisingly, Illustrator CS supports a number of Acrobat 6.0 features. Illustrator, for example, can preserve separate layers in an exported PDF file, making it possible for viewers to control the display of optional content, such as multilingual text or different versions of a design.

Illustrator still makes use of the traditional pasteboard metaphor that results in a single-page-per-document layout. And though advanced users work around that restriction via the page-tiling functions, the truth is that both CorelDraw and FreeHand make it easier to produce multipage documents.

There's no denying that the 3-D functions provide the wow factor in Illustrator CS. But it is the workaday PDF and print output that secures Illustrator's position as the drawing program of choice in a print production workflow.

ADOBE INDESIGN CS



The attractive pricing of Adobe Creative Suite should help InDesign CS (\$699; \$169 upgrade) get a foot in the door of many current QuarkXPress shops. This release of InDesign adds a context-sensitive control panel (also known as a measurements palette) that will make longtime Quark users feel comfortable. But in the long run, designers may choose InDesign for the ways in which it surpasses Quark, including its cutting-edge typography and integration with other Adobe apps.

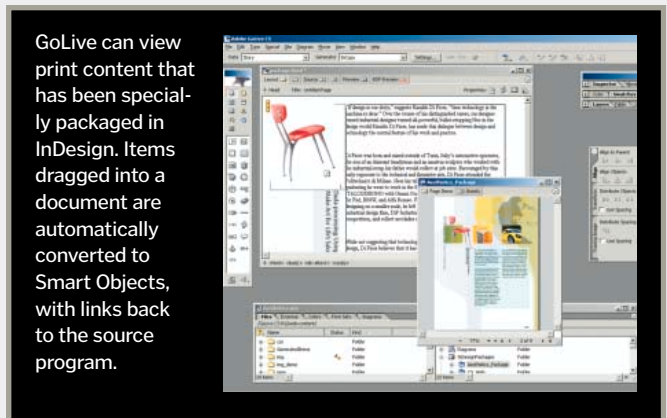
This release turbocharges InDesign's typographic functions with nested paragraph styles. Think of a nested style as a paragraph style that knows how to apply unique character-level for-

mats to specific parts of a text block, letting designers apply complex formatting to content elements.

Designers spend an inordinate amount of time on mundane tasks such as copyfitting. InDesign makes text changes easier with an integrated Story Editor. The Story Editor supplies a word-processor-style view of copy that in the finished layout may flow across several frames or pages.

InDesign CS recognizes the fact that not every print job is CMYK. So now the program imports duotone, tritone, and quad-tone artwork. And you can produce the greatest number of printed colors with the fewest number of inks by using the new mixed-ink palette to combine varying percentages of two spot colors. Whether employing process or spot colors, designers will come to rely on InDesign's ability to preview separations. The plate-by-plate preview remains interactive, so you can edit a publication in separations view in order to fix potential printing problems.

Like Illustrator, InDesign can preserve layers when generating an Acrobat 6.0 file. There are also new tools—such as embedded video and audio files, bookmarks, and buttons—that let you produce interactive PDFs. Enhanced integration with other Adobe applications include faster import of native Photoshop files and an export option that can package print assets for use in GoLive.



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ADOBE GOLIVE CS

GoLive has always appealed to graphic designers rather than coders because of its emphasis on WYSIWYG design tools. Long-standing features, such as the layout grid, continue to appeal to artists with a print production background. Indeed, GoLive CS (\$399; \$169 upgrade) delivers even more features borrowed from desktop publishing and illustration programs, such as smart guides that pop up when objects are properly aligned, and the ability to zoom in on portions of the page.

As you might expect, there is also tighter integration with other Adobe applications. For example, you no longer have to launch Photoshop in order to crop or resize a Smart Object image. Simply use tools within GoLive and watch as the picture is optimized on the fly.

Adobe is harnessing PDF and XML technology to increase the synergy between GoLive and InDesign. InDesign creates a package of assets, including threaded stories and high-resolution source images. Because GoLive has the ability to display PDF files internally, you can view the contents of an InDesign package and then drag and drop assets into a Web page.

The process isn't totally automatic, and this first implementation does have some flaws. For example, importing text brings in the entire thread—which is not optimal for Web design. However, GoLive does offer some useful controls over the import process. For example, images and graphics can be converted into Smart Objects. And text can be imported as a component, so that changes made in the original InDesign document will ripple through to the Web site.

GoLive delivers visual-editing tools for CSS, which can empower designers who have never hand-coded a style sheet to develop CSS layouts and text stylings. We found that the new live rendering window, which integrates Internet Explorer, provides accurate previews of

File Management 101

Version Cue, available only as part of Adobe Creative Suite, helps designers manage digital assets, maintain multiple versions of a file, and coordinate the efforts of team members. Version Cue can track files for both individuals and workgroups—on a single hard disk or across a network.

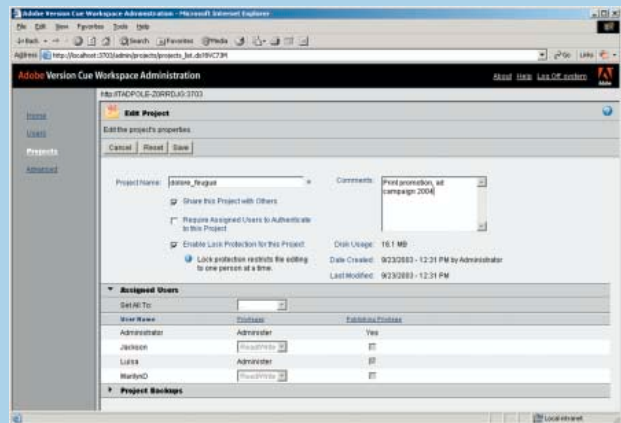
Once installed and activated, you save and open files in the Version Cue workspace using familiar commands in Photoshop, Illustrator, InDesign, or GoLive. Version Cue handles all the mundane tasks, like automatically incrementing filenames for different iterations. Users can locate a specific version by searching comments or XMP metadata, or promote an old version of a file to the current working copy.

A browser-based administration panel is control central, where the owner of a project can assign editing privileges to coworkers or cap the number of rollbacks. Version Cue offers two different modes of operation. In a trusted environment, Version Cue can allow more than one user to access an editable version of a file, though this can create conflicts that must be reconciled manually. The alternative, a more traditional check-in/check-out option, restricts access to a single editing stream.

Some of Version Cue's advantages may not be initially obvious. For example, a layout artist working with InDesign can receive real-time notification that an imported picture has been updated in Photoshop. And though it doesn't ship as part of Creative Suite, Adobe InCopy (a companion text-editing program for InDesign) works with Version Cue. Indeed, as long as a workgroup contains at least one copy of Creative Suite, any standalone version of Photoshop CS, Illustrator CS, InDesign CS, or GoLive CS can take advantage of Version Cue.

This first release of Version Cue leaves plenty of room for improvement. Currently Acrobat, though part of Creative Suite, doesn't work with Version Cue at all. And GoLive implements Version Cue functions differently from the other apps in order to respect legacy workflows developed with Adobe Web Workgroup Server, which was part of GoLive 6. Nor is there currently any way to integrate third-party programs with Version Cue.

Still, Version Cue addresses the needs of mid- to small-size studios, a market that has been ignored by full-blown content management systems. In doing so, Version Cue provides a real incentive for designers to adopt an all-Adobe workflow.—LS



Administration options in Version Cue include the ability to assign rights to users or lock down files to a single editing stream.

CSS, including constructs like pseudo classes.

Web developers can extend editing privileges to their clients via a new module, called Adobe Co-Author, which ships with GoLive CS (additional Co-Author licenses are \$89). Co-Author relies upon a rigid workflow. For example, the Web developer must specify individual items (or content containers) that can be edited with Co-Author. In addition, the end user is never presented with a live Web page but instead must modify text and upload pictures using a forms-

based UI. While this approach certainly protects the layout from inadvertent changes by end users, it lacks the flexibility inherent in its chief competitor, Macromedia Contribute (First Looks, September 16, 2003)..

All things considered, GoLive CS will not woo any dedicated Dreamweaver users, but it will continue to appeal to Adobe's core user base of graphic designers. The ability to import packaged assets from InDesign will be especially attractive to developers who must repurpose print material for the Web.

- Adobe Photoshop CS
●●●●●
- Adobe Illustrator CS
●●●●●
- Adobe InDesign CS
●●●●●
- Adobe GoLive CS
●●●●●
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●●●●●

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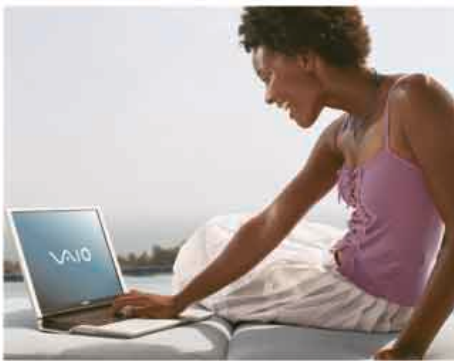
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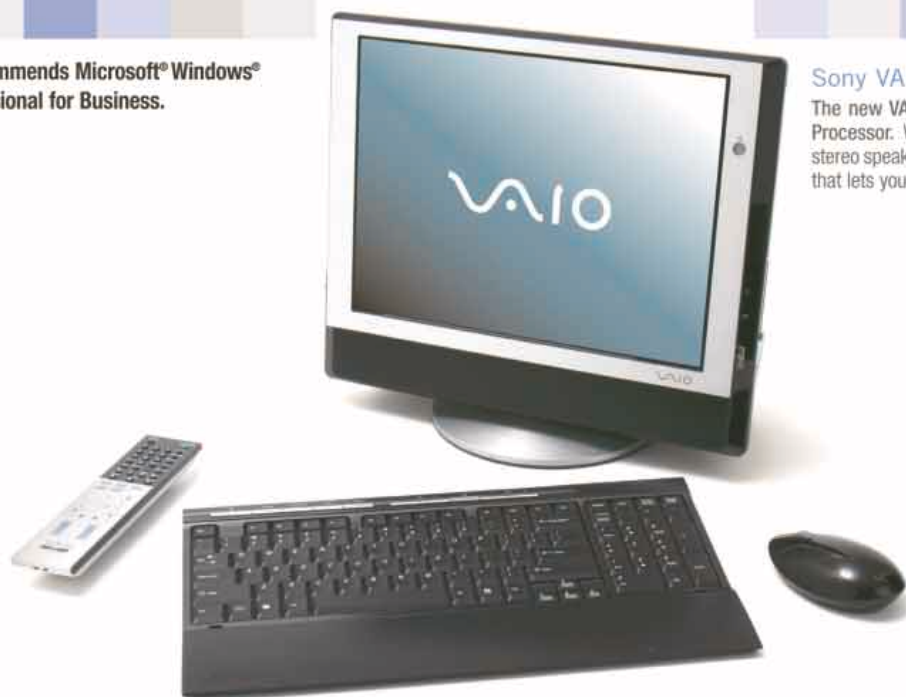
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FEEDBACK

“I don’t own a Mac, I don’t use a Mac,
I don’t care about Macs, and
I wish you’d stop writing about Macs.”



MP3 PARADIGM SHIFT

THE ONLINE MUSIC STORES you reviewed in First Looks (December 9, page 38) aren’t going to stem the tide of illegal file sharing. Music piracy is rampant and unstoppable; everyone I know does it, even my mother. Owning music has always been expensive, and the larger a collection, the costlier it is to maintain. With illegally shared music, users can roam freely, picking and choosing, going off in never-before-imagined directions of musical fancy.

The music companies are missing a fantastic opportunity. File sharers are not bound by record labels, genres, artists, or styles. This freedom should be the goal of any music technology. There’s still money to be made, albeit with a different model in place. Set up a fantastically stocked music site offering tracks for 5 cents each and \$1.00 for a factory-burned CD mixed to the user’s specifications. Include a 24-hour turnaround time and global delivery by mail. People would buy the same music over and over and send mixes all over the world. If you make a service more convenient than downloading and burning at home, people will flock to it.

The components for this model are already in place. It’s silly that the RIAA is filing lawsuits against file sharers while portable MP3 players are being marketed widely. Broadband ISPs advertise quick download times; does anyone believe they’re talking about legal media streaming and not shared files? Libraries lend out books and magazines, and this encourages a vast appreciation for and desire to own books. The same model can be applied to music tracks.

DAN BETTA

PERFECT TIMING

ARE YOU FOLKS PSYCHIC, or was it just serendipity? After struggling unsuccessfully all weekend to restabilize a Windows 98 SE system in which I stuffed 1GB of DDR memory, I received your issue of December 9 and saw the User to User item “When Adding Memory Yields Out of Memory” (page 95). The aggravation you saved me on this one hair-pulling problem alone made my entire subscription worthwhile! Thanks to all of you—and to the reader who had the same problem I did as well as the impeccable timing to ask you about it when he did.

JOE PLETT

How to Contact Us

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HIT THE ROAD, MAC

AS A LONG-TIME subscriber to *PC Magazine*, I find it unacceptable to see the ever-increasing coverage of Apple products and the Mac systems in this magazine. I guess in the strictest sense, anything that’s not a mainframe is a personal computer, but in the perception of the everyday reader, a PC is an Intel- or AMD-based machine—an IBM clone. And Macs are different. I want information about PCs, not Macs. I supervise a dozen PCs, zero Macs. I don’t own a Mac, I don’t use a Mac, I don’t care about Macs, and I wish you’d stop writing about Macs. Is there really so little left to discuss in the true PC world that you need to branch out into an entirely different operating system? Apple makes the iPod, which can be used as a PC peripheral, so review that. But don’t waste my time discussing Mac OS X. If I wanted information about Macs, I’d subscribe to *Macworld*. I paid for oranges; please keep your Apples.

CARL BALDASSO

LINUX IS A PC OS, RIGHT?

I ENJOYED YOUR ALTERNATIVE OS article (“If You Don’t Do Windows,” November 25, page 137). After getting hit by Blaster in August, I decided to replace Windows at home with Linux. I appreciated the opportunity to see how the various distributions measure up, especially SUSE and Xandros—the two distributions with which I have the most experience. Your comparison chart on page 141 created a moment of mirth when I noted that Windows is the only system that has system rollback for recovery. Maybe that’s because it’s the only OS that is unstable enough to require it?

MARY TOMICH

THE MAG IN BLACK

I APPLAUD YOUR LITTLE HOMAGE to Johnny Cash on the cover of your November 11 issue. And it appears on the Editors’ Choice Apple iPod screen—the nicest player out there—too!

MICHAEL ANDERSON

Corrections and Amplifications

■ In our review of online music stores (December 9, page 38), we reported that Napster 2.0 works with Windows 98 and Me. In fact, it works only with Windows 2000 and XP. Also, the monthly subscription price and most albums are priced at \$9.95.

■ In our First Looks roundup of Media Center PCs (November 25, page 32), we incorrectly identified the HP Media Center PC m370n as the HP Pavilion m370n. We apologize for the error.

■ In our feature “IM Everywhere” (November 11, page 136), we left “Extensible” out of the name of Jabber Extensible Communications Platform and stated that it lacks auditing and reporting capabilities. In fact, the product does offer logging and auditing capabilities out of the box.

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ExtremeTech

Fastest Geek, Again

Over the past couple of months, *PC Magazine* took its Fastest Geek competition on the road. As always, contestants raced against one another and the stopwatch to see who can build a PC the fastest from a table full of parts. We held regional events in New York, Boston, and San Jose, and we invited our regional winners to the Comdex show in Las Vegas for the final showdown and the right to be called America's Fastest Geek.

Each contestant built a 1.8-GHz AMD Athlon-based PC, provided to us by ABS Computers and equipped with an Asus A7V600 motherboard, a 250GB Maxtor SATA hard drive, and an ATI Radeon video card. The winner of each regional event won an ABS system with a 2.2-GHz Athlon 64 FX-51, two 250GB Maxtor SATA hard drives, 512MB of RAM, and an ATI Radeon 9800 graphics card. Similarly configured systems have clocked some of the fastest times we've ever recorded on our benchmark and gaming tests.

Each heat drew a big crowd. PC Magazine Labs director Nick Stam, associate editor Jeremy A. Kaplan, staff editor Daniel S. Evans, and I emceed, and we enjoyed the repartee with *PC Magazine* readers. Audience members cheered on their favorites and even helped us spot problems in the contestants' assemblies, such as an upside-down floppy disk drive cable, which caused the drive light to stay on.

We held heats throughout the first two days of Comdex, and the fastest person from each day competed against our regional champions in the grand finale on Wednesday. Twenty-one-year-old Jeremy Bergen, an information technology manager from Boulder, Colorado, was victorious, just seconds ahead of his closest competitor. We added time penalties for missing or misplaced screws, improper connections, mislocated drives, and the like, but Bergen's work was perfect—in a mere 5 minutes 11 seconds.

A few of our contestants were, shall we say, a bit less handy than others or less knowledgeable about how PCs are put together. When they clearly had little hope of finishing their heat, we allowed audience members to come up and assist them. This didn't improve their chances, but it was great fun. We kidded some of the slower contestants about timing them with a sundial or a calendar, but they took our joking in stride. (We used dnSoft Research Group's

XNote Stopwatch for our big-screen timer. It's shareware; check it out.)

As happened at our summer Fastest Geek competition, held at CeBIT New York, some of the contestants managed to destroy equipment when the Red Mist descended on them and turned caring, sensitive people into hypercompetitors. I guarantee that twisting a mouse or keyboard connector while inserting it will bend pins and will not earn you a fast time. Likewise, cross-threading a screw and twisting so hard that you break off the head is a very bad idea. One regional contestant did just that—on one of those lovely Maxtor 250GB hard drives! I had to take it home and drill it out on the milling machine.

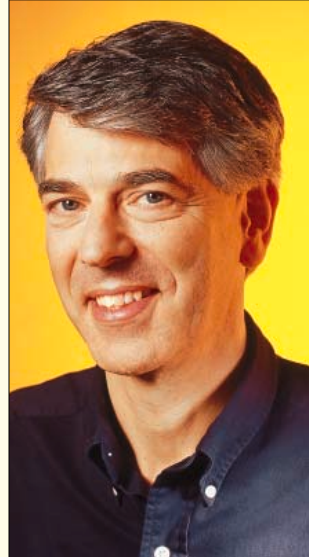
We also lost a couple of motherboards in Las Vegas, probably to static electricity caused by the dry air. The other components held up pretty well, except for the SATA cables. The ones in the machines were definitely not up to the rigors of continual insertion and removal, especially by contestants who were unfamiliar with them. We replaced several cables in the course of the event, and a SATA header on one of the motherboards bit the dust, too. I gave the remains to the heavy-handed contestant as a keepsake.

I don't think SATA connectors are inferior to parallel ATA connectors, by the way. In the vast majority of systems, the cable will be plugged in just once, and gently at that. And the speed increase over parallel ATA is most welcome.

Later in the week, the tables were turned. I was a contestant in AMD's Build Your Own PC Race for Charity, an annual event in which journalists compete to build machines, which are then donated to the schools of their choice. The builders with the top three finishing times also win cash prizes for their schools. Sadly, I finished fourth (but I did have the fastest time a few years ago). PC vendor Systemax provided the machines, NEC donated the monitors, and a number of other peripheral vendors contributed as well.

Building a PC from parts may not be a life-saving skill, but it sure can be fun—and even profitable if you're the Fastest Geek!

Bill Machrone is VP of editorial development for Ziff Davis Media. Visit his digs at www.extremetech.com. You can also reach him at bill_machrone@ziffdavis.com.

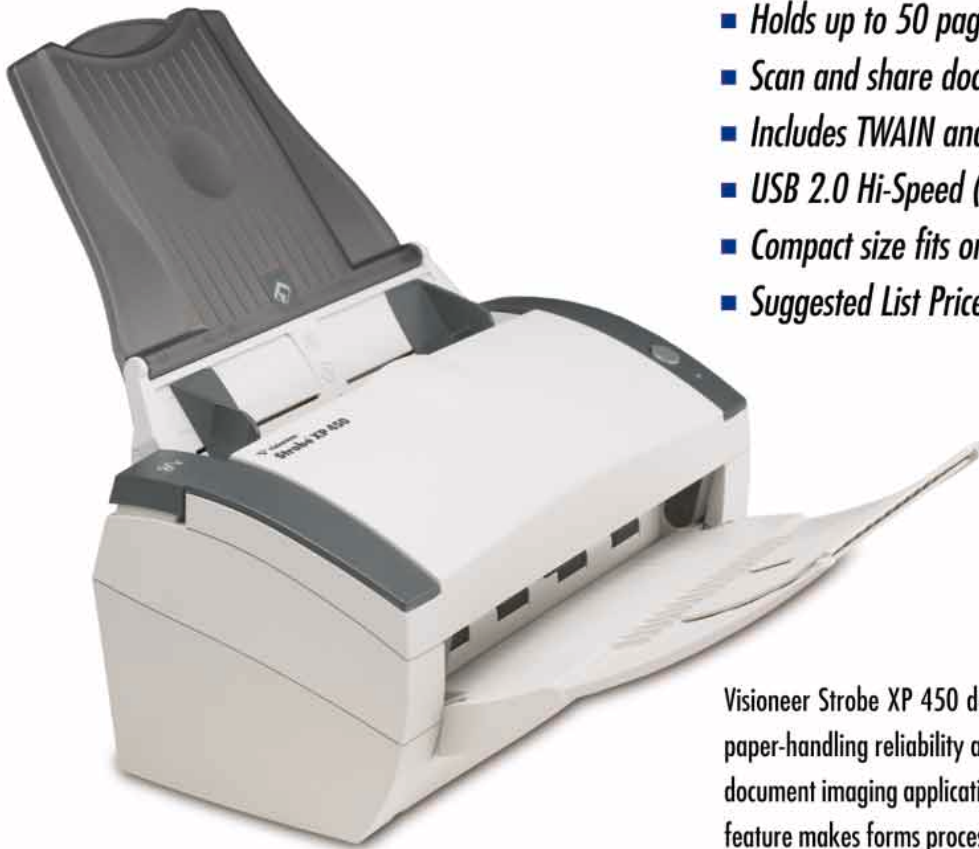


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John C. Dvorak

Fixing Comdex

Comdex is broken. I suspect this happened because of a combination of changing ownership, lost vision, and pent-up resentment of the show that has been building for a decade. The sociology could fill a book, but the show has never been liked much, and it seemed as though people everywhere were waiting for the moment when they could take it out on someone else. This year, they did.

Let me explain what I mean by “broken.” A show is broken when exhibitors find endless excuses not to exhibit. It’s broken when former showgoers stay away without worrying about hurting their businesses. It’s broken when all the buzz is negative.

A show like Comdex has to be both important and compelling. The industry needs a Comdex, and although a lot of one-time Comdex exhibitors will be going to the Consumer Electronics Show (CES) in January 2004, there is no substitute for an industry-specific show like Comdex. How many people at CES have even heard of Cat 5?

After hearing estimates of about 50,000 to 60,000 moaning Comdex attendees, I’m hoping the show will rebound. And it can. Here are some things that need to be done.

Make the show important. This is almost too obvious to mention, but the people who run Comdex can’t get it right; I’ve been to other shows where the president of the United States has made a speech. This year, Comdex made some huge marketing blunders. The main one seems to have been to make the show uninteresting by design. There was a general feeling that Comdex would not be a show with jazzy new product announcements but instead would be a show for the IT community.

The IT community? What’s that? A kiss of death, that’s what. Who wants to go to anything that’s about the IT community rather than seeing jazzy new products? I suspect someone was trying to push the interpersonal-networking hot button with this vague assertion. Instead, it pushed the panic button. No wonder big exhibitors such as Olympus were not at the show. Do they want a lot of IT-department duds in their booths? “Hello, I’m the IT manager at Gemstone Insurance. You sell cameras?” How did this concept get past the laugh-out-loud stage?

Widen the aisles. A strategy to make things look

more exciting is to make the aisles narrow. This year they were too narrow. The place was more jammed than a Comdex of old. What is the point? This trick is not working. Give us some breathing room.

Lower the price drastically. I know the producers wanted to lower the exhibitors’ costs per foot but were fearful that it would look desperate. One way to fix this is to offer discounts if exhibitors let the show producers manipulate them. An exhibitor would, for example, get 50 percent off the standard rate for any size booth if it guaranteed that it would roll out a number of new products and make the first public announcements at Comdex. The products would have to be submitted to a committee for approval. Future technologies would also be announced in exchange for a large discount.

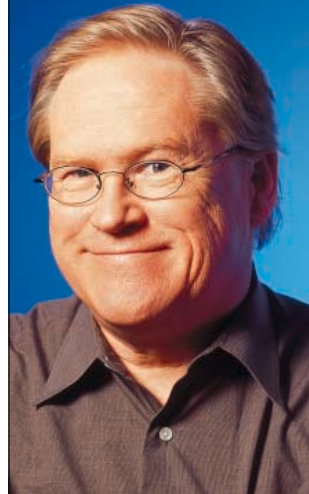
Why are we going to little shows such as DEMO (<http://demo.com>) for this sort of thing? News should be breaking at Comdex. People should be abuzz about the new products they saw there. Do the producers think this is going to happen naturally? Of course, if they stick with the boring IT theme, they are going to be toast anyway.

Subsidize some blow out parties. Maybe beat journalists are blasting the show because they are bored stiff. Does anyone in the Comdex management team actually know how to appeal to the writers who create the buzz that makes people want to come to such shows? Apparently not.

That said, it’s also possible that this show will go the way of the defunct National Computer Conference (NCC), which was once the behemoth of computer shows. Luckily, Comdex was coming up to take its place. Nothing on the horizon can take the place of Comdex. CES is already too big and cannot absorb the computer industry; it’s also off target.

The fact is that Comdex needs to be fixed. We often forget that *Comdex* stands for (and began as) *Computer Dealers Exposition*. It’s a showcase. Does anyone running Comdex even know what a *showcase* is? It has little to do with the “IT community,” that’s for sure. They’d better get off that sled before Comdex becomes better known as Bomdex.

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.



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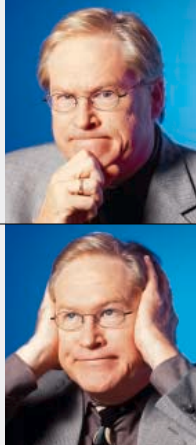
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Inside

Track



JOHN C. DVORAK

Comdex 2003 was heavily criticized by many people, but it was still better than no Comdex. The fact is that too many vendors stayed out of the show, opting for either the January Consumer Electronics Show (CES), private suites, or the ridiculous and sparsely attended Computer Digital Expo down the street from Comdex. This **wasn't helped** by the Comdex promoters, as I explained in my other column in this issue. For even more details and photos, go to www.pcmag.com and read my online Comdex column.

What I didn't discuss elsewhere is another problem that **not many people are mentioning**. Las Vegas itself is sliding back toward a **slaziness** that was disappearing when Steve Wynn dominated the scene. The town now has as many **strip clubs** as casinos. And worse, hundreds of hawkers on the streets are promoting **escort services** and foisting cards and brochures on passersby. At one point, I counted 12 of these people in a row pushing literature in people's faces. And sadly, there are **homeless** people roaming all over the place begging for money.

Then there is the **miserable Las Vegas airport**. McCarran International is a confusing maze, with poor signage and freaky routing. I tried to drop someone off there and had to make at least two **dubious** driving maneuvers to get to the terminal.

Now they've added an underground tunnel that takes you out of town. One wrong move and you're in Henderson. If things aren't bad enough, the airport is apparently **expanding** again. This is ridiculous. The city needs to build a new airport from scratch.

Speaking of expansion, Las Vegas itself is still growing. Many hotels are adding capacity, and Wynn is opening a brand-new palace. I thought the town was **overbuilt** a couple of years ago. Guess not.

And finally, there's the traffic. Driving around town **is a mess**. But you have to rent a car and drive if you want to be practical, since cab fares are simply a **rip-off**, with cabbies literally demanding huge tips. No fun.

This year, the town was pumped full of gambling tourists. Television promotions, subsidies, and perks have brought throngs of mostly **old folks from the Midwest** into town.

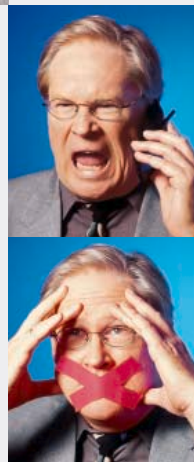
The good news: Hotel rates were \$75 for a good room, instead of the \$300 you used to have to pay when attending Comdex. The tables were full, so the casinos were happy. I won \$20.

The real buzz was at the Supercomputer Show in Phoenix. Intel promoted itself by proclaiming that more and more supercomputers use huge arrays of Intel chips. Some machines contain a **couple thousand Xeon chips**, for example.

But much of the attention was going to the up-and-coming **Opteron arrays**, which is good news for AMD. The most telling comment was found on the Web site internetnews.com. To wit: *IBM, which has embraced Intel's Itanium architecture as well as its own Power chip line for servers, unveiled a pre-packaged super cluster based on AMD's Opteron. Turek [Dave Turek, vice president of IBM's Deep Computing unit] told internetnews.com that IBM had little choice in the matter. "Customers demanded it," he said, noting that Opteron is quite a natural migration to 32-bit and 64-bit systems from x86.*

Little choice in the matter? Wow.

Meanwhile, Intel and the Lawrence Livermore National Laboratory say that they will jointly develop a supercomputer using about **4,000 Intel Itanium 2 processors**. This hummer should become the top-ranked machine next year, they say. Expect to hear more about these sorts of machines in the next few years, as people actually learn how to program them.



Much of the attention at the Supercomputer Show was going to the up-and-coming Opteron arrays, which is good news for AMD.

Another interesting development to **note** in this area is the slow emergence of Linux as the OS of choice for cluster machines.

Plastics Everywhere Dept.: In case you haven't noticed, the world of conducting polymers is creeping into the world of silicon. First, we have the OLED revolution; next, you'll begin to hear more and more chitchat about plastic, or **polymer memory**.

The leader in this technology seems to be a Norwegian company called Opticom ASA. This is the same company that runs the FAST search engine. Its subsidiary company, Thin Film Electronics, has been licensing plastic-memory patents, and Intel is the one player hoping to cash in on what is a potential windfall.

If this kind of memory works, it will be a major breakthrough, since it chews up less power, **costs nothing** to make, and can be built in three dimensions, providing gobs of capacity. If anything is going to supplant the hard drive for mass storage, polymer memory will. We'll watch this technology closely as it develops.

Intel is apparently using its facility in Hillsboro, Oregon, to develop the technology. Overlooked in all this is DuPont. Whenever anything plastic is developed, you can generally expect DuPont to enter the scene.

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On Technology

New Year's Resolutions

Here are some of my resolutions for the new year. First, give the family dog a longer name. Why? So I can deal with this forgotten-password hint: "Enter your pet's name (minimum six characters)." Goodbye, Misty; hello, Silver.

Try not to snort every time I see an applet download check box that says, "Always trust content from Microsoft." I know it's childish; I just can't help giggling when I see this.

Scroll all the way through the "Send me valuable information: Yes/No" opt-out check boxes when I register products online. For example, RealNetworks nicely checks *No* for the check boxes you see on-screen. But you can easily miss hidden boxes that are not checked.

Set up at least one dummy e-mail account solely for the purpose of capturing "valuable special offers" that come when I mistakenly check Yes. I'd also like to use name variants so I can trace who sold which name to what list.

Every time I install or upgrade music-player software, look for the box that says, "Make me the default music player." It's there somewhere, and it's invariably prechecked in the affirmative for you.

Back up my data more often and move the backups off-site. I used to think a detached garage was far enough off-site, but that was before entire streets burned in southern California brushfires last fall. I'll use the office, a safe-deposit box, or a relative.

Print out my passwords and put them someplace safe but accessible in case I die or become incapacitated, so my family can retrieve the information.

Make a list of online payments that repeat in perpetuity, so my family can discontinue them if I'm not around to do it myself.

The moment I open a new software box, write down the serial number of the CD, because I know I'm going to misplace the CD sleeve with the number on it. And complain to vendors that don't print serial numbers on their CDs (which is just about all of them) or that don't at least make peel-off labels that you can stick on the CDs.

Complain to vendors that print their 16- or 20-digit serial numbers so small that you can't read them and so faint that you can't distinguish between 0 and O or G, B, and 8.

Only buy gear and gadgets my family can figure out how to use when I'm away. PC and consumer electronics vendors make two big mistakes: One is not hiring usability experts, and the other is hiring such people and not listening to them. Either way, most products are too hard to use. You don't pay \$350 for a Bose clock radio for the sound; you pay for those big, rubbery buttons on top that are so easy to figure out.

Buy market-leader road-warrior peripherals. It's not that LG phones aren't as good as Nokia or Samsung phones; they just aren't as popular. With a market-leader product, if you use an all-in-one charger, you'll have better luck finding the right adapter tip.

Believe in total cost of ownership and buy accordingly. We all talk a good game about TCO, but too often we're seduced by the lower purchase price of a product that invariably costs more over the long haul. A Leitz tripod my family has owned for 35 years still works flawlessly and turned out to be worth every penny of its \$100 price.

Buy well-made blank CDs and DVDs, not cheap off-brand media. All discs are relatively inexpensive, anyway, when on sale and after the rebate.

Send in the rebate coupon the minute I'm sure I won't return the product.

Complain to vendors that persist in playing the rebate game rather than lowering prices. The one that gets me is Dell: A direct vendor shouldn't be doing rebates. And why doesn't Dell just send me the check automatically on the day the return period ends?

Consider leasing my next car, not buying it. Car technology moves ahead very quickly, so maybe I should be in a new car every three years. Five-year-old navigation systems are no better than five-year-old PCs.

Buy new instead of upgrading. I'm my own worst enemy here; I think I'm conserving the environment or something if I keep an old PC going. I should stop if the old PC needs two or more upgrades. A bigger hard drive, more memory, and Windows XP cost more than \$200. A cheap new PC is \$400.

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.



Too often we're seduced by the lower price of a product that invariably costs more over the long haul.

SOLUTIONS

Memories that Last

Will your grandkids be able to figure out what those shiny round discs in the shoebox in the attic really are? **BY LEON ERLANGER**

Back when people stored printed photos and paper documents, there was never concern that future generations would have any problem understanding their basic structure, assuming the paper didn't disintegrate. Even faded or yellowed prints are easy enough to read. Similarly, when you come across film negatives, you have a good idea of what's on them.

CDs full of digital photos and other files, however, aren't as easy to tell from meaningless junk discs, unless they're somehow marked and organized for posterity. We'll discuss ways to ensure that the contents of your discs are readable down the road and how to set up a backup plan to keep your archives safe. Technologies can become obsolete, but intelligent planning based on current trends and smart archiving practices can preserve your memories for decades to come.

PRESERVING DIGITAL CONTENT

Printing is a good way to keep a tangible record of your precious files, and we'll discuss it in more detail later. For digital files, there are many file formats in use and no assurances that any will survive for 30 years. But most digital photographs today are stored in JPEG format, the compression standard used by most consumer digital cameras and supported by just about all the current imaging hardware and software. There are countless JPEG files in use today. The digital-imaging industry is very unlikely to drop support for it for a long time, even after better things come along. Store at least one copy of all your photos as a JPEG.

JPEG uses lossy compression, which means that a decompressed image is not exactly the image you started with. Shoot and store your photos at the highest quality and resolution your camera allows. If you plan to manipulate your images, con-

vert them to a lossless format—such as TIFF—while you edit, then save them back to JPEG when you are finished. TIFF

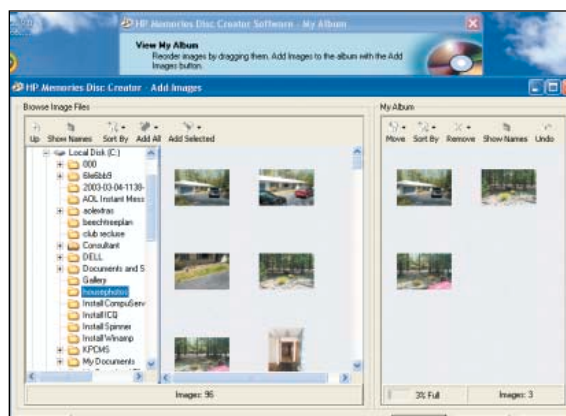


FIGURE 1: Memories Disc Creator, bundled with HP's digital-imaging products, is a useful package for archiving digital photos to CD or DVD.

files are typically huge, however, so use this format sparingly.

Store your JPEGs and TIFFs on your hard drive in read-only format, so you don't unintentionally overwrite them. Set files to *Read only* by right-clicking on them in Windows Explorer, selecting *Properties*, and checking the labeled box.

For digital audio, the most content by far is stored in MP3 format. There may be

advantages to other audio formats, but MP3 has the widest support. If you want an uncompressed format, WAV is the most widespread.

For archiving digital movies, look to Hollywood, which supports MPEG-2 overwhelmingly. Some digital-editing packages output to MPEG-1, a close brother to MPEG-2, and any player that supports MPEG-2 can also read MPEG-1. What about the emerging MPEG-4 and JPEG 2000? It's too early to tell how successful and widespread these standards will be.

STAY ORGANIZED

Once you have all your digital files, how do you organize them so you can find them later? Different applications organize content in different ways, and there's no way to ensure that the product you use years from now will be able to

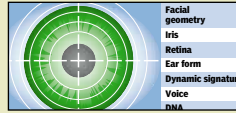
read the organization information—*metadata*—used by your current software. For now, the best way may be to type up a list of photo captions and any other information you want and store that file on your CD in plain text format. You can also print a list of the files or a thumbnail sheet to put in the CD's case.

You should also be aware of two brand-new

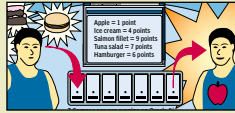
specifications, one from the Optical Storage Technology Association called MPV (MusicPhotoVideo) and one from Microsoft and Matsushita (Panasonic's parent company) called HighMAT. MPV is an XML-based format for organizing digital media files into albums and playlists. The standard is backed by ACD Technologies, HP, Imation, Olympus, and Roxio, among others. HighMAT has a similar function and is already supported by Windows XP, Windows Media Player 9 (with a plug-in), Windows Movie Maker 2, and several Panasonic DVD players. If these formats gain wide acceptance, your future software will



64 Office: Text boxes aid complex Word layouts.



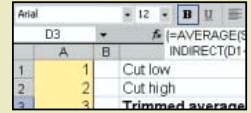
66 Security Watch: Biometric systems.



68 Internet Business: WeightWatchers.com.



70 Internet Professional: Flash Remoting.



75 User to User: Tips and tricks.

MAKING TECHNOLOGY WORK FOR YOU

probably be able to read their metadata.

What about your financial records? You may want to print them to PDF, a file format used by many organizations for long-term archiving. The PDF standard will continue to evolve, but Adobe has made a commitment to support older versions down the road. You can generate PDFs by installing Adobe Acrobat Standard (\$299 direct) or Professional (\$449) and using its *Print to PDF* feature or by using Adobe's Create Adobe PDF Online service (<http://createpdf.adobe.com>). There are also inexpensive software apps (see "PDFing Cheap," in our issue of August 5) that let you print to PDF. You won't be able to manipulate the data in PDFs, but you'll most likely be able to read it and print it out for years to come.

Once you choose the right file formats, protect your files. If you're connected to the Internet, make sure you have a hardware or software firewall to keep outsiders away. Back up your files frequently, run an antivirus package, and keep the virus definitions up to date. And don't forget to keep up with Windows security patches.

ARCHIVING MEDIA

What's the best way to archive your files? A look at today's technology shows that CD-R is the way to go. CD-ROM has been the medium of choice for storing, distributing, and exchanging music and photo collections for years, and you can be reasonably assured that there will be devices to read CDs for many years to come. What about DVD? Not yet. The standards war between the DVD+R/RW and DVD-R/RW camps has yet to be fully resolved.

CD-R media last significantly longer than rewritable CDs (CD-RW). CD-Rs have been widely tested and with the right care are projected to last anywhere from 50 to 100 years—even longer than CD-ROMs. But there are differences among CD-R products. Some say gold disc dyes provide more longevity, but there's no hard data to substantiate that claim. The best protection is to use discs from major brands—such as Fuji, Kodak, Mitsui, or TDK—which use protective

coatings, instead of local retailer brands. And store them in hard plastic cases, too. Be aware, also, that the shelf life of a blank CD-R is only five years, so use your discs ASAP. Use a felt-tip pen to label your discs and avoid adhesive labels, which may cause your discs to wobble and make them unreadable.

Here are some other tips for CD storage:

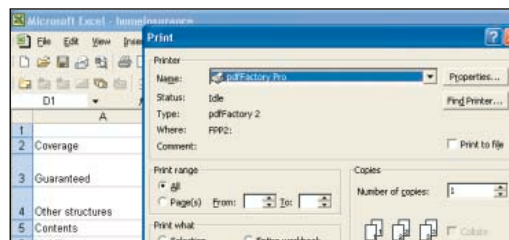


FIGURE 2: You can print just about any application file to PDF for archiving.

- Use software such as Roxio's Easy CD & DVD Creator, which offers bit-by-bit verification of the copied files.
- Make two CDs of each batch of photos or music and store one set in a separate location. You may want to have each copy on a different brand of CD, in case one of them deteriorates faster than expected.
- Periodically make a "best of" photo CD, so you don't have to search through dozens or hundreds of discs to find the photos you really want.
- Keep CDs in a cool, dry place, away from sunlight and humidity.

LOOKING GOOD ON PAPER

Storing prints of your beloved photos is a great way to insure against digital-storage problems later on.

Based on accelerated testing in several laboratories, ink jet prints using certain combinations of inks and paper may last as long as 75 to 80 years without fading. Accelerated testing subjects prints to heat, ultraviolet light, and humidity (the tests assume that they're framed under glass and exposed to light for around 12 hours a day), then projects their life based on their response. It's imperfect, as there's no way to tell how the acceleration will affect re-

sults and there's no equivalent test for photos that will be stored in albums or shoeboxes, but it's the best predictive method available today. You can safely assume, however, that photos exposed to less light will last longer than the rated number of years.

Based on test results and vendor suggestions, the key is to use combinations of the printer manufacturer's inks and paper. For example, prints using Epson DuraBrite inks and Epson Matte Paper HeavyWeight, DuraBrite Ink Glossy Photo Paper, and Epson Photo Quality Ink Jet Paper may last up to 80 years. You can use any HP 57 or HP 58 color cartridges and HP Premium Plus Photo Paper for photos with a maximum rated life of 73 years. Prints made with third-party inks show dramatically reduced longevity; many are rated at only three to five years! HP's printers also come with Memories Disc Creator, a useful utility for archiving photos to CD.

Today's ink jet prints actually have longer rated lives than traditional silver halide prints, but if you prefer the older approach, find a service that will produce regular prints from your digital photos. Shutterfly uses Fuji printers and Fujicolor Crystal Archive paper, which has a rated life of 60 years. Here are some other photo storage tips to keep in mind:

- If you're displaying photos, frame them under anti-UV glass, away from sunlight.
- Store your photos in an album, preferably a three-ring binder, as strapped books can put pressure on the photos, causing them to stick together.
- Keep photos in a cool, dry, dark, well-ventilated place that's safe from pets and flooding—not the basement or the attic.
- Visit www.pcmag.com for more archiving tips.

You can preserve your precious digital files for years to come, but not without taking the right measures today.

Leon Erlanger is a freelance author and consultant.

Create Columns Using Text Boxes In Word

With text boxes, your graphics will stay where you put them. **By M. David Stone**

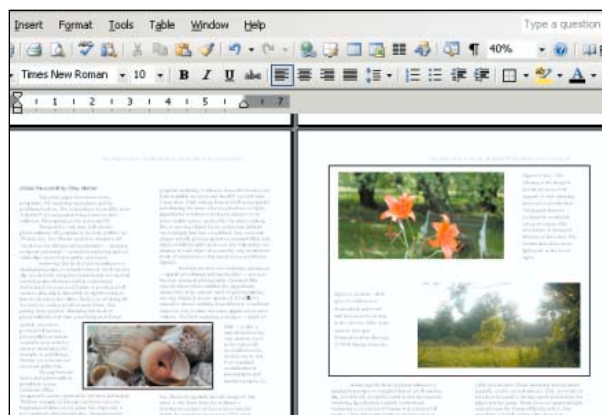
Almost anyone who has ever tried this can tell you that creating a document with two or more columns in Microsoft Word and then trying to insert photos or graphics that span columns can be a frustrating experience, with graphics unexpectedly jumping from page to page when you move them. The reason graphics jump around is that Word anchors each graphic to a specific paragraph and then constantly recalculates where everything should go as you edit. (You can choose to anchor a graphic to a page instead, but it will still jump around on the page for the same reason.) One way to minimize this is to divorce the anchor paragraphs from your text by using text boxes to create columns, rather than using the *Format | Columns* command.

You start by creating a new, blank document and choosing *View | Print Layout*. Create at least three blank pages, hitting Enter to add a paragraph to each, then Ctrl-Enter to add a page break. Make sure Word is set to show nonprinting characters by toggling with Ctrl-Shift-*. Each page should show a paragraph symbol to indicate a single blank paragraph. Word uses these paragraphs to anchor the text boxes—including the text boxes the graphics will go into.

Move the cursor to the paragraph mark on the first page, and choose *Insert | Text Box*. If you see an area with the text *Create Your Drawing Here*, hit Esc to close it. Then click and drag to create a text box on the left-hand side of the page. Don't worry about the size, but don't cover the paragraph mark that indicates the blank paragraph on the page. With the cursor again at the paragraph mark, insert a second text box on the right-hand side of the page. (If the cursor is in the text box, you can click anywhere on the page outside of the text box to make the cursor go to the paragraph.) Now move the text box to cover the paragraph mark and try moving between text box and page again. The cursor will still return to the paragraph mark, and you'll

see it blinking through the text box.

Click on the text box on the left side and choose *Format | Text Box*, then choose *Size*. You can define any size that seems appropriate, but a good place to start is 9 inches high by 3 inches wide. Next, choose the *Layout* tab, then the *Advanced* button. Assuming you've set 1-inch mar-



TO WRAP TEXT around images, use three text boxes to define each column. Size and position the text boxes so one set is the same height as the graphic, then narrow those two boxes to make room for the graphic in between.

gins, set *Horizontal to Alignment, Left, relative to Margin*, and set *Vertical to Absolute Position, 1 inch below Page*. Repeat these steps for the text box on the right side, but with a horizontal setting of *Right, relative to Margin*.

Select both text boxes by clicking on the outer edge of one, then (depending on the version of Word) holding down Ctrl or Shift as you select the other. Copy and paste them to your other pages. Now copy and paste your text into the left text box on the first page. You'll see only as much text as can be shown in the box, but don't worry, it's all there.

If you're not familiar with linking text boxes, invest some time in seeing how the feature works. If the *Text Box* toolbar isn't showing, choose *View | Toolbars | Text Box*. With the cursor in the first text box, click on the *Create Text Box Link* button

in the toolbar. Mouse over the text box on the right side and click to link the boxes; the text will flow to the second box. Once the text boxes are linked, you can add or edit text, and it will automatically flow from one text box to the next.

If you explore this feature a bit, you'll see that you can link any given text box to any other box in any order. You can also break links by selecting the text box you're linking from and choosing *Break Forward Link*. Once you're comfortable with the link feature, you have the tools you need to create complex formats. Remove any links you've created and start formatting your document.

Details from this point onward depend on the document. If you want to insert a

graphic that spans both columns and is on the bottom third of the first page, for example, click and drag the bottom of each text box to shorten the length to, say, 6 inches high, and make room for the graphic. Then move to the paragraph on the page itself and insert a new text box that the graphic will go in. Position the new text box below the two already on the page, and size it appropriately—at about 2.75 inches high by 6.5 inches wide in this case. Insert the

graphic in the text box. Then link the first column text box to the second and link the second to the first column text box on the next page. Work your way through the document this way, formatting one page at a time, then linking the text boxes.

Alas, Word is limited to a maximum of 32 linked text boxes in a single chain. For documents that need more, you'll need to divide them into short, independently formatted sections or you won't be able to edit the text without manually copying and pasting text between chains of text boxes. If it's not practical to divide the document into sections, make sure you've finished all your writing and editing before dividing the text into separate chains of text boxes.

M. David Stone is a contributing editor of PC Magazine.



Lighten Up.

It wasn't so long ago that if you wanted to bring your data with you, your hardware had to come too. Well, that's all in the past now thanks to the new SanDisk Cruzer™ Mini. At under half an ounce, the Cruzer Mini goes anywhere, and with up to 256MB of flash memory, it takes a lot with it. Hi-speed USB 2.0 compliant, SanDisk's Cruzer Mini lets you transfer data faster than ever before. And at less than 8mm thick, all it needs is a single USB slot. Just drag, drop, and go. It's all about convenience – no extra hardware, no worries.

So whether you're installing utilities or updating print drivers for the umpteenth time, you can take your files with you wherever you go – and you won't even need your dolly.



For more information on SanDisk Cruzer Mini, visit www.sandisk.com/pcmagazine

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SECURITY WATCH

THE LOOKOUT

NEW PATCHES

On November 11, Microsoft issued patches for several severe security flaws, many of which allow for remote code execution. Hardest hit in this month's batch of patches is Internet Explorer, which contains five newly discovered vulnerabilities. Three of the flaws are related to the cross-domain security model in the browser. Another flaw concerns the manner in which the browser passes zone data to XML objects. The final weakness in IE affects drag-and-drop operations during dynamic HTML events. All of these flaws affect IE 5.01, 5.5, and 6, including IE 6, Service Pack 1. For more details, see "Microsoft Issues Security Patches" at www.eweek.com/article2/0,4149,1379661,00.asp.—Dennis Fisher

Biometric Security

Someday biometric systems may play an important role in securing all kinds of systems, but they're not foolproof yet. **By Brett Glass**

One of the most common causes of network security breaches is easily guessable or insecure passwords. Many users choose common names or words that are in any dictionary; others use the same passwords everywhere or write them down where they can be discovered. Wouldn't it be great if you never had to remember another password? This is one of the claimed benefits of *biometrics*—technologies that let machines recognize you via one or more physical features. Devices are now available that can examine users' fingerprints, facial features, and irises; some even attempt to identify individuals by examining their gaits as they walk.

The good news is that such devices are coming down in price; some, like the fingerprint recognition devices built into some mice and keyboards, are easily affordable for average consumers. The bad news is that, as with all new technologies, many of the current biometric systems are not quite ready for prime time. A recent article on *PC Magazine's* sister site, ExtremeTech (www.extremetech.com/print_article/0,3998,a=27687,00.asp), describes ways in which its authors were able to spoof a wide variety of systems. They foiled some face recognition systems—which try to match facial features such as

the distance between one's eyes and the sizes of one's nose and mouth—with still photographs; the authors likewise fooled iris sensors by placing a still photo over a different person's eye.

Fingerprint sensors are equally easy prey. For ExtremeTech authors, fooling these devices was sometimes as simple as breathing on the sensor, making a previous user's latent fingerprint visible.

Most second-generation systems now under development attempt to overcome such tricks by trying to ensure that what they are seeing is really a live person (or part of one). For example, some facial recognition systems now check to see whether the subject blinks now and then, or whether his pupils contract in response to bright light. Newer fingerprint recognition systems may try to detect the capacitance of the human body. But there are clearly more refinements to be made. At least one system that was programmed not to respond to still photographs was foiled when a laptop playing a digital video of a live human being was displayed in front of the camera.

The developers of gait recognition systems—still being researched at Georgia Tech, MIT, the University of Maryland, and the University of Southampton in England, among other institutions—hold

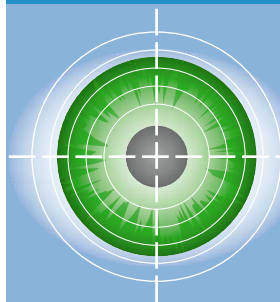
out high hopes for their products, claiming that they can recognize a subject's gait even when the subject is wearing heels, has a limp, or displays a Monty Python-esque "silly walk." But so far, the systems are too new for their accuracy and usefulness to be fully assessed.

Attempts made to use biometrics to identify individuals in public places have therefore been entirely unsuccessful. In a famous test, Tampa police fed mug shots into a face recognition system and tried to pick out criminals from among the more than 100,000 attendees of Super Bowl XXXV; they also hooked up the system to video cameras on the streets of Tampa's Ybor City Latin district. According to the Electronic Privacy Information Center (www.epic.org), the software wrongly identified several individuals as wanted felons but did not lead to a single arrest.

Clearly, promoters of biometrics need to work on both the technology and answers to some of the ethical issues it raises. Biometrics will probably have a role in authentication systems in the future, in combination with other technologies. There's a general consensus among security experts that the best authentication systems will one day combine multiple components: Something you are (biometrics or photo ID), something you have (a key or token), and something you know. So, even if biometric systems do become common, you may still need to remember a few passwords.

Brett Glass is a freelance consultant, author, and programmer.

Popular Biometric Methods



BIOMETRIC TRAIT	DESCRIPTION
Fingerprint	Congenital finger lines and pore structure
Hand and finger geometry	Measurements of fingers and palm, including length, width, thickness, and surface area
Vein patterns	Vein structure on the back of the hand
Facial geometry	Size and position of specific facial features, such as the eyes, nose, and mouth
Iris	Pattern of the iris
Retina	Pattern of the retina's vein structure
Ear form	Shape and dimensions of the visible portion of the ear
Dynamic signature	Signature shape with pressure and speed distribution
Voice	Vocal traits such as pitch, timbre, and accent
DNA	Unique DNA code of the individual
Odor	Chemical composition of an individual's odor

Source: Dr. Manfred Bromba, Bromba GmbH.

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A diagram for Nero Recode 2. It shows a stack of DVD discs on the left and a stack of CD discs on the right. A large arrow points from the DVD discs to the CD discs. The text 'nero RECODE 2™' is at the top. Below the arrow, it says 'DVD to CD', 'DVD-9 to DVD-5', and 'many DVDs to DVD'.

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DVD-9 to DVD-5
many DVDs to DVD

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INTERNET BUSINESS

Log On, Slim Down

At WeightWatchers.com, a well-equipped back end is helping thousands of people shed the pounds. **By Alan Cohen**

You may be done with the holidays but chances are your waistline isn't. The new year means new resolutions, new diets, and new business for the Web's premier weight-loss site, WeightWatchers.com.

"We'll get just under 10 million page views a day in January, compared to 7 million on a normal day," says Sean Foster, vice president of marketing for WeightWatchers.com, a New York-based company that runs 18 sites in 15 countries, including subscription-based sites in the United States, Canada, and the United Kingdom.

While you're counting calories, WeightWatchers.com has been counting dollars: It turned profitable in 2002, three years after the site's launch—and just a year after introducing its pay services. Much of the success can be attributed to an intensive focus on technology.

Indeed, of the 200 employees at WeightWatchers.com—a licensee of Weight Watchers International (the weight-loss behemoth that runs thousands of in-person meetings worldwide)—roughly 90 of them work on the technical side, including 22 coders. Although the site offers content like tips and recipes to lure visitors, the interactive tools are what drive the subscriptions (which cost \$12.95 or \$14.95 per month, depending on the plan). The privately held company, however, does not release subscriber numbers.

The site offers personalized tools to track what you eat, what you should eat, and how your weight loss is coming along. Subscribers can factor in their exercise regimens, integrate specific recipes (the site's library contains over 1,000) into their personal meal plans, and even calculate how weight-loss-friendly (or unfriendly) their own family recipes are. The site also offers suggestions for trimming the calories in Aunt Sally's

apple pie or Grandma's oatmeal cookies. Subscribers pay for these tools, but the tools don't come cheap for the site, either: WeightWatchers.com's annual site development investment is more than \$20 million, roughly a quarter of the company's projected 2003 revenues.

Because the site is so transaction-oriented—continually reading, writing, and updating information for each subscriber—its back end has been designed as a redundant, horizontally partitioned database, with the U.S. site running Oracle 9i Database software on a rack of seven Compaq servers. Three or four independent servers are used for the international sites. "Our tools are constantly recording transactional information, and Oracle's clustered database is good for that," says Mike Laginestra, the company's vice president of engineering. On the front end, 40 Compaq Web servers running Microsoft .NET keep the U.S. site humming, with another 10 servers dedicated to the global sites.

All of this technology, however, is of little good without the subscribers who use

and pay for it. And WeightWatchers.com has a tremendous advantage over diet-site rivals—its name. Although the site is a separate company, it can take advantage of the enormous visibility of Weight Watchers International, not to mention the larger company's huge retail presence (44,000 meetings in 30 countries) and \$70 million annual marketing budget.

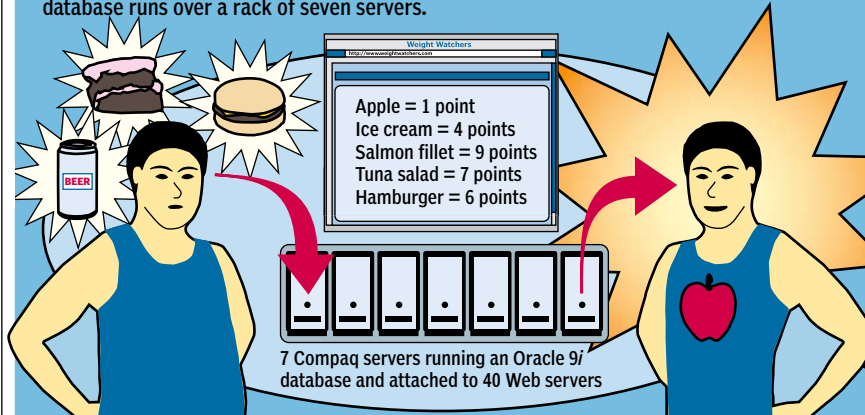
Every one of the 1.5 million people who attend Weight Watchers meetings is a potential online subscriber. "There's a tremendous number of consumers who come through their meetings," says Foster, "so we have the meeting leaders explain what's on the site, and we put information about the online component in the meeting reading materials."

The cross-marketing works the other way, too. The site has a meeting finder (type in a ZIP code and find the meeting closest to you) and even offers prepayment of dues for some meeting locations. "We take a very reciprocal view, figuring out what we can do online and off-line to support each other," says Foster.

The company is looking beyond Weight Watchers meetings for its customers, too. Although the \$12.95-per-month plan is designed to complement the in-person meetings, the \$14.95 plan is aimed at users who either can't or don't want to sit through the group sessions, offering the same online tools but adding information from the meetings. You won't get the camaraderie of fellow dieters, but no one will weigh you on a scale, either.

What's on the Menu?

WeightWatchers.com's Points Tracker tells you how diet-friendly some 20,000 food items are. Other tools let you build low-calorie recipes and track your weight loss. To handle all the transactions and constantly update each user's personalized database, an Oracle 9i database runs over a rack of seven servers.



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Flash Remoting

Macromedia's technology lets browser-based applications easily interact with servers. **By Richard V. Dragan**

Macromedia estimates that its Flash player has been downloaded a whopping 500 million times worldwide. With such a huge cross-platform client base, developers would love to take advantage of the platform for more than cute, self-contained applets. But until recently, this was difficult if not impossible. Thanks to the new capabilities of Macromedia Flash Remoting MX, Macromedia's popular platform can do better than "cute," talking effortlessly to servers running Java, Microsoft .NET, or Web services.

If you've used Macromedia's platform for animation or forms development, you know that Flash excels at creating a rich client experience. In contrast, traditional Java (or J2EE) applications in browsers tend toward the thinner side, with application logic running on a server. Flash Remoting doesn't change the rich, client-side focus of the platform. But it means that Flash clients can now reach enterprise systems on a server.

To develop applications that can use Flash Remoting, you must install the Flash Remoting gateway on your application server. The gateway module is distributed for a variety of today's J2EE app servers, with a separate version for .NET. With Macromedia JRun 4 and ColdFusion MX 6.1 server products, remoting is built-in.

On the client side, you need Flash Player 6 or higher in addition to Flash Remoting MX Components. These client libraries, which consist of a handful of new ActionScript classes, manage the conversation between your Flash clients and the gateway on your server, which in turn connects to server resources.

The range of server resources you can reach is impressive. Talking to Java components is effortless, and you can also call up .NET code from Flash. ActionScript achieves this by mapping its own data types to those in Java and .NET on a

server automatically through the Flash gateway, which takes care of the overhead of executing remote calls.

The coding strategy is to obtain an object that refers to your Flash Remoting gateway, then look up Java or .NET objects or Web services by name. With this "live" reference to the server resource, you then call the custom methods to do the real work of remote programming. Retrieving results from these remote calls is a little trickier: You must write separate code snippets for intercepting status or error events.

By now you're probably familiar with Web services, the XML-based protocols that package function calls across different systems, using SOAP for messaging. Support for standard Web services in Flash is readily available; the server-side module takes care of the details of making SOAP-based calls. But though SOAP is clearly the industry standard, it can be problematic, because it requires a fair amount of network bandwidth for sending bulky XML-based text messages via HTTP. In its place, Flash Remoting offers a clever proprietary technology called

Action Message Format (AMF), which uses compressed binary messages for maintaining the conversation between the Flash player and the remote server gateway. This AMF solution reduces bandwidth requirements, but its real advantage is in the simplicity it offers developers: By packaging all remote calls the same way, Java, .NET, and Web service calls can all be treated the same on the client.

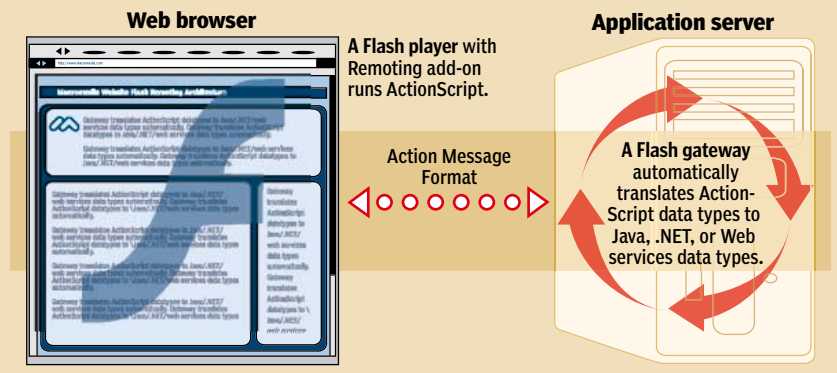
Building applications with Flash Remoting means dividing up a project into different tiers during the development cycle. Web designers (even Flash animation aces) aren't likely to have the programming experience to tackle enterprise APIs for Flash Remoting. Consequently, project managers will have to ensure that their IT departments get involved with help for connecting to existing enterprise APIs.

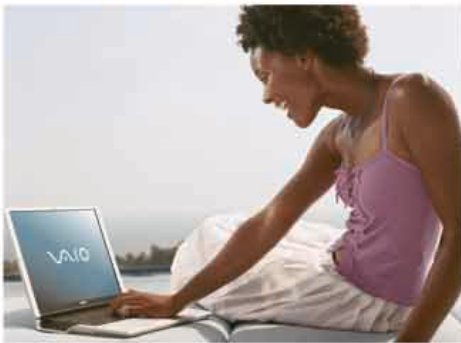
For smoother project management, Macromedia recommends adopting the model-view-controller approach. The view, or user interface part, is still the province of your Web designers. Client programmers take on the new ActionScript objects once the visual design is in place; this is the *controller* logic. The *model* is the data already inside corporate systems, which the new remoting APIs help put in play. With this divide-and-conquer approach, Flash Remoting lets clients reach server systems without getting in the way of creating great-looking interactive Web applications.

Richard V. Dragan is a contributing editor of PC Magazine.

Flash Remoting Architecture

Macromedia Flash Remoting MX lets Flash scripts within Web browsers communicate with Java, Microsoft .NET, and Web services on application servers, opening up Macromedia's popular client platform to enterprise systems.





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USER TO USER

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Custom URL Shortcut Icons Lost

I put shortcuts to some of my favorite Web pages in the *Quick Launch* area of the taskbar. Initially, each icon was different. The Yahoo! icon was a red *Y!*, for instance. I didn't choose the icons; they were the icons that appeared when I dragged the URL out of the address bar. Now all the icons have reverted to plain IE icons, so the only way I can distinguish among them is by remembering the position of each icon or by waiting for the ToolTip to appear. I've tried deleting the icons and making new ones, but that didn't work. Is there a way to get the original icons back and keep them from disappearing?

JOAN DYER

When you add a Web site to your *Favorites* list, Internet Explorer checks to see whether the site has a *favicon* defined. If so, IE displays the favicon next to the item in the *Favorites* menu. IE does the same when you drag and drop a URL to create a shortcut. The icons, however, are stored with your temporary Internet files. If you clear the cache or if the icons are pushed out by newer files, you lose them. To get around this problem, you can create a local copy of each icon and associate it with the shortcut.

The easiest way for a Web site to define a favicon is to include a file named *Favicon.ico*



HERE ARE some examples of favicons.

in the root folder. For example, type *www.yahoo.com/favicon.ico* in your browser's address bar and you'll see that red *Y!* icon. Right-click on it and choose *Save Picture As* from the drop-down menu to save a copy. Right-click on the shortcut and choose *Change icon* to connect the local copy to the shortcut. You'll only have to do this once for

each shortcut. Keep in mind that some Web sites define favicons using a different technique, one that doesn't lend itself to downloading them manually.

You could also use *PC Magazine's* utility *FavOrg* (www.pcmag.com/utilities) to make local copies of your *Favorites* icons automatically. As an extra benefit, the utility will identify any that are no longer valid links. After making local copies, drag a new copy of each link from the *Favorites* menu to the *Quick Launch* toolbar.—Neil J. Rubenking

Better Averages Without Extremes

In your issue of October 28 ("Averages Without Extremes in Excel," page 81),

you presented a technique for calculating the average of a range of cells while omitting one or more of the

highest or lowest values. Your technique required the addition of an extra column. I came up with an array formula that doesn't require any extra cells. Let's assume the same situation as the original, with the data cells in a range named *Bal*, the number of low items to cut off in *D1*, and the number of high items to cut off in *D2*. Enter this formula and press **Ctrl-Shift-Enter**.

```
=AVERAGE(SMALL(Ba1,ROW(INDIRECT(D1+1&"": "&COUNT(Ba1)-D2))))
```

Let's look at the formula from the inside out. Suppose there are 20 items in the range named *Ba1*, that *D1* (the low cutoff) is 3, and that *D2* (the high cutoff) is 2. The expression *D1+1&"": "&COUNT(Ba1)-D2* resolves to *4&"": "&18*, which is equivalent to *4:18*. The

INDIRECT function converts this text into a reference that can in turn be passed to the **ROW** function. **ROW** normally returns the row number of a cell passed to it or the row number of the first cell in a range. But because we have created an array formula, **ROW** returns an array representing all row numbers in that range: {4;5;6;7;8;9;10;11;12;13;14;15;16;17;18}.

The array in turn is passed as the sec-

ond argument to the **SMALL** function, which would then become **SMALL(Ba1,{4;5;6;7;8;9;10;11;12;13;14;15;16;17;18})**. Again, because this is an array formula, **SMALL** returns an array containing the fourth-smallest value, the fifth-smallest value, and so on to the eighteenth smallest value. The array contains all

	A	B	
1	1	Cut low	4
2	2	Cut high	1
3	3	Trimmed average	120
4	4	Average	1090.5
5	50		

AN ARRAY FORMULA that doesn't require any extra cells is an elegant way to find a trimmed average.

values in the range named *Ba1* except the lowest three and the highest two, precisely the values we were looking for. The **AVERAGE** function returns the average of the values in this array.

SHANE DEVENSHIRE

Many readers wrote in with ideas on better ways to calculate an average. Some erroneously assumed that the data in the *Ba1* range was sorted. Some assumed (as we did in the October 28 article) that the *Ba1* range contained only unique values. If more than one cell contained the *N*th smallest or largest value, such formulas would return the wrong result. A few readers pointed out the **TRIMMEAN** function, which can trim a specified percentage of values equally from top and bottom. But the array formula shown here is by far the most elegant of those solutions.

You do need to ensure that the low cutoff and the high cutoff don't overlap, or else you'll get a wildly incorrect result. Suppose the low cutoff is 17 and the high cutoff is 16, which is clearly impossible, since there are only 20 items. The range passed to the **ROW** function will be *18:4*, which is treated exactly the same as *4:18*. The result will be precisely

Favicons are stored with your temporary Internet files.
If you clear your cache, you lose them.

By default, Windows remembers the last 400 folder settings, but you can raise the limit.

the same as if you had chosen to cut three low values and two high values.

For more on array formulas, see "Excel's Array Formulas" (www.pcmag.com/article2/0,4149,1265433,00.asp).—*NJR*

Making the Best of WEP

I keep hearing that WEP (Wired Equivalent Privacy) is too weak a security scheme for wireless networks, but I'm not prepared to throw out my old access point and card to buy new ones with better security. Recognizing that WEP is imperfect, how can I best take advantage of whatever security WEP provides my home network?

LARRY MAYER

Using WEP instead of more sophisticated security schemes like WPA (Wireless Protected Access) is a little like putting a padlock on a door. It won't stop someone who is determined to break in, but it will discourage anyone who isn't willing to make an effort. Here's a check list of things that will make breaking through WEP harder. Not all of the following features are available on all 802.11b hardware, but you should take as many of these steps as your hardware allows.

- Check the manufacturer's Web site for the latest firmware, which may have additional security features.
- Make sure your access point is set to require WEP, not just use it as an option.
- Set WEP for the highest-level encryption that you can. Alas, 128-bit encryption may not work among products from different manufacturers (the IEEE standard is 64 bits), but it's worth a try. In an informal test, we were pleasantly surprised to find that the 128-bit encryption in a Linksys WAP11 access point works with the 128-bit encryption in a D-Link PC Card.
- Don't use default settings for SSID (Service Set Identifier), your administrator password, or the WEP key. And avoid using a password that the teenage hacker across the

street might guess—such as your dog's name. As with any password, mix some numbers and letters and change the settings on a regular basis.

- Disable the automatic SSID broadcast feature.
- Set your hardware to refuse connections from systems with SSID set to *Any*.

• Look for a feature that lets you define the MAC addresses to accept, and make sure that the only addresses in the list match the addresses for the systems you want to connect. MAC addresses (unique identifiers for network components), can be spoofed, but this is another hurdle for a would-be hacker to jump over.

There are further steps you can take, but they are more than a home network is likely to need. The steps mentioned here are enough to keep out anyone who isn't highly motivated to break in.

If your equipment is less than a year old, you may be able to upgrade and install WPA. Check out "Wireless Security: WPA Step by Step" (www.pcmag.com/article2/0,4149,1277020,00.asp).—*M. David Stone*

A Solution for Windows XP Folder Amnesia?

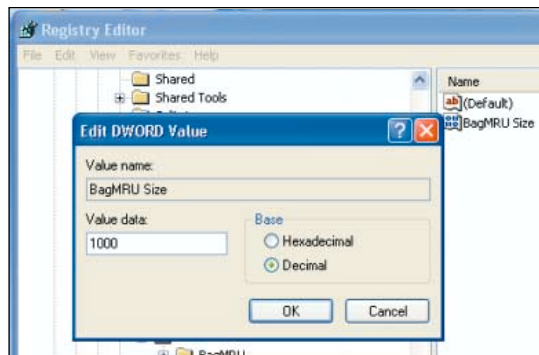
I've been using my Windows XP computer for about 18 months. For the past couple of months, Win XP has refused to remember my folder settings. I've checked in *Folder Options* and the box titled *Remember each folder's view settings* is checked. But when I open folders that I previously changed the *View* settings on, their appearance does not reflect the settings I chose. What's going on?

CHRIS LOMBARDI

This has been a thorny problem for years. *PC Magazine* even created a small utility called ViewFix to force Windows 95 systems to use specific view and sorting settings consistently. With each successive Windows version, we hope the problem will go away. Instead, it only seems to get worse, and earlier solutions like ViewFix have stopped working. A solution may be in sight, however, at least for Windows XP. The solution is difficult to verify, so if you find it successful (or unsuccessful) please let us

know in our discussion forum (<http://discuss.pcmag.com>).

By default, Windows XP remembers the last 400 folder settings. After 400, it's supposed to discard the oldest settings, so that it always remembers the most recent



YOU CAN CHOOSE how many folder settings you want Win XP to remember.

400. In some cases, however, it just stops remembering new settings when the number of settings hits 400. Note that the steps that follow will clear all your old folder settings so Windows XP can remember more, and this method also raises the limit higher than 400.

1. Launch REGEDIT from the *Start* menu's *Run* dialog.
2. Navigate to the Registry key HKEY_CURRENT_USER\Software\Microsoft\Windows\Shell. If this key is not present, skip to step 8.
3. If a subkey named BagMRU is present, delete the entire subkey.
4. If a subkey named Bags is present, delete the entire subkey.
5. Look for a value named BagMRU Size (with a space between BagMRU and Size).
6. If this value is not present, select *New | DWORD Value* from the *Edit* menu and name the new value BagMRU Size.
7. Double-click on the BagMRU Size value, choose *Decimal*, and enter the desired number of folder settings for Win XP to remember (for example, 1,000).
8. Navigate to the Registry key HKEY_CURRENT_USER\Software\Microsoft\Windows\Shell\NoRoam. If present, repeat steps 3 through 7.

That should cure Windows XP's faulty memory. The OS will "forget" all existing folder settings, but from this point onward, it should remember them correctly.—*NJR*

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If we print your tip, you'll receive a PC Magazine T-shirt. We regret that we cannot answer letters individually.



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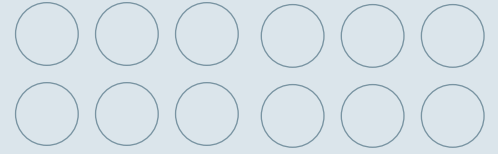
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THE

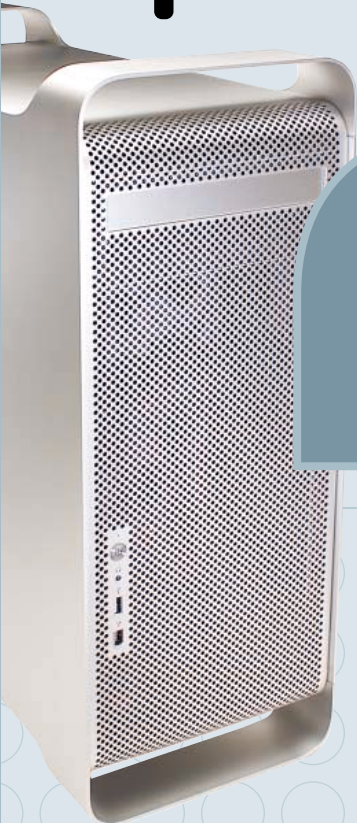


BEST

PRODUCTS

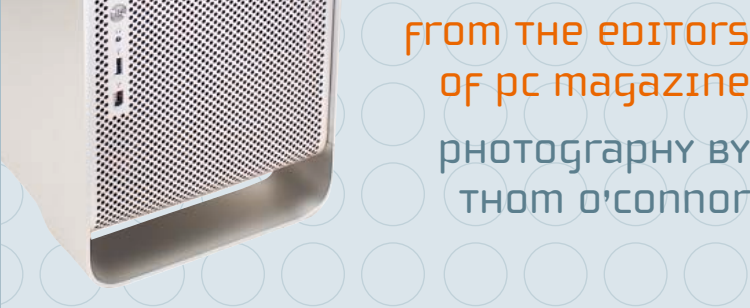
OF

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from the editors
of pc magazine

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THOM O'CONNOR





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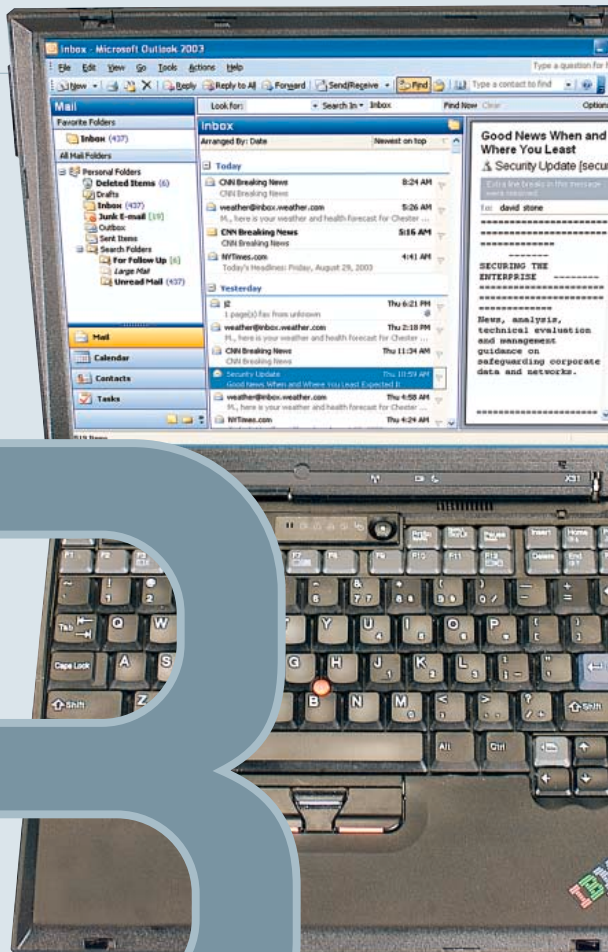
Powerful and easy (or at least easier) tools for all your building needs.

100 Games

Dazzling graphics and sound—and live competition—make gaming more fun.

100 Education & Reference

Games that help you learn and tools to look things up.



DESKTOPS

Apple Power Mac G5

Two 2-GHz PowerPC G5s, 1GB DDR SDRAM, 160GB SATA hard drive, DVD-R/CD-RW SuperDrive, 20-inch wide-screen LCD (1,680-by-1,060), \$5,126 direct. Apple Computer Inc., 800-692-7753, www.apple.com.

Think Macs are slow? The Apple Power Mac G5 has the horsepower to hang with any of the leading Windows PCs. During testing at PC Magazine Labs this fall, it even outperformed the competition in many cases.

Of course, Apple continues to excel in other areas. The Power Mac provides impeccable surround sound, whether you hook it to an AV receiver via the bundled Toslink cable or simply attach Apple's 5.1 speakers. It offers an 800-MHz FireWire port and a DVD-R drive, great ways to capture and burn video. But the real story is the speed.

HP Compaq Tablet PC TC1100

1.0-GHz Pentium M, 512MB DDR SDRAM, 40GB hard drive, 10.4-inch XGA display, \$2,399 direct. Hewlett-Packard Co., 800-752-0900, www.hp.com.

So you want a tablet—one of those portable computers that act like legal pads—but can't choose between the keyboard-equipped "convertible" models and the thinner, lighter "slate" machines. You need the HP Compaq Tablet PC TC1100.

At first, the TC1100 looks like a convertible: You can lift and swivel its 10.4-inch display to use the machine like a notebook. But flip a latch and you can lift the display from the keyboard and transform the system into a svelte slate. Here's the best of both worlds,



A

A Velocity Micro ProMagix DX-W

3.2-GHz Pentium 4, 1GB DDR SDRAM, two 36GB RAID 0 hard drives, one 200GB hard drive, DVD±RW and CD-RW drives, 19-inch CRT, \$3,240 direct. Velocity Micro, 800-303-7866, www.velocitymicro.com.

The Velocity Micro ProMagix DX-W is the essential gaming machine—and more. That gorgeous see-through chassis is only the beginning. The ProMagix lives up to its good looks, running even the most demanding PC games and multimedia applications with breathtaking aplomb. Peering into its chassis, you'll find a 3.2-GHz Pentium 4 processor, a gigabyte of DDR memory, and a *trio* of hard drives, as well as an nVidia GeForce FX 5950 chipset for crisp 3-D graphics and video, and top-of-the-line audio hardware.

eMachines T2865

2.08-GHz Athlon XP 2800+, 512MB DDR SDRAM, 160GB hard drive, DVD±RW and CD-ROM drives, 17-inch CRT, \$928 direct. eMachines Inc., 801-401-1419, www.emachines.com.

eMachines is known for low-cost PCs, but this is ridiculous. The eMachines T2865 includes a 17-inch CRT monitor, a 160GB hard drive, and two optical drives, including a DVD±RW drive. The system even has a memory card reader for shuttling files to and from digital devices. Less than \$1,000 buys a heck of a lot of PC.

along with one of the few screens that look good from any angle.

HP Pavilion zd7000

3.2-GHz Pentium 4, 512MB DDR SDRAM, 60GB hard drive, DVD+RW drive, 17.1-inch WXGA display, \$2,618 list. Hewlett-Packard Co., 800-752-0900, www.hp.com.

Yes, it's heavy. Yes, it's big. But it's a wonderfully powerful piece of machinery. Weighing 9.3 pounds and measuring 1.9 by 15.8 by 11 inches, the HP Pavilion zd7000 incorporates a 3.2-GHz Pentium 4 processor, a 60GB hard drive, a built-in DVD+RW drive, and a 17.1-inch LCD. You even get the sort of high-quality Harman Kardon speakers rarely found in a notebook. When HP says "desktop replacement," it means desktop replacement.



B

B HP Media Center PC m370n

2.8-GHz Pentium 4, 512MB DDR SDRAM, 160GB hard drive, DVD+RW and CD-RW drives, 128MB ATI Radeon 9200, 17-inch LCD, \$1,998 direct. Hewlett-Packard Co., 888-999-4747, www.hp.com.

The HP Media Center PC m370n is a full Windows desktop—and a television, a DVD player, an FM and Internet radio, and a personal video recorder (free—eat your heart out, TiVo). And thanks to the new Microsoft Windows XP Media Center Edition 2004 and a remote control, it's nearly as easy to use as your favorite consumer electronics devices.



C Apple PowerBook G4 17-inch

1.33-GHz PowerPC G4, 512MB DDR SDRAM, 80GB hard drive, DVD-R/CD-RW SuperDrive, 17.1-inch wide-screen display, \$2,999 direct. Apple Computer Inc., 800-692-7753, www.apple.com.

How on earth does Apple do it? Like the HP Pavilion zd7000, the Apple PowerBook G4 includes a 17.1-inch LCD, a DVD burner, and a massive hard drive. But unlike its enormous competition, the PowerBook is only an inch thick and weighs less than 7 pounds.

Apple must be skimping in other areas, you say? Not in the slightest. The PowerBook has 512GB of DDR SDRAM, two USB ports, and two FireWire ports, one of which supports the new 800-MHz standard. You also get built-in Gigabit Ethernet, 802.11g, and Blue-

tooth adapters. In short, you get everything but a thick, heavy chassis.

D IBM ThinkPad X31

1.4-GHz Pentium M, 256MB DDR SDRAM, 40GB hard drive, CD-RW/DVD drive, 12.1-inch display, \$2,124 direct. IBM Corp., 888-746-7426, www.ibm.com.

The IBM ThinkPad X31 proves that *no-compromise ultraportable* is not an oxymoron. Weighing only 3.6 pounds and measuring just 1.2 inches thick, the X31 has a power-saving 1.4-GHz Pentium M processor, a 40GB hard drive, a CD-RW/DVD-ROM combo drive (using an optional dock), and a 12.1-inch display. That doesn't impress you? IBM also includes a Gigabit Ethernet adapter, Bluetooth, and hardware for using both 802.11b and 802.11a wireless networks.

Best of all, unlike many ultraportables, the X31 provides plenty of battery life—nearly 5 hours during testing at PC Magazine Labs this past spring. IBM even managed to squeeze in a full-size keyboard. What more could you want?

NOTEBOOKS



D

AMD Athlon 64

Advanced Micro Devices Inc., www.amd.com.

In September, the AMD Athlon 64 brought 64-bit computing to the desktop (and the notebook). This chip, AMD's fastest-performing CPU for 32-bit gaming, content creation, and business applications, provides stellar performance. Furthermore, users can run both 64- and 32-bit applications natively on the same system—a very big accomplishment.

Intel Pentium M

Intel Corp., www.intel.com.

Slow a chip's clock rate without sacrificing performance and you'll get a notebook that runs cooler and longer. The Intel Pentium M, the processor part of Intel's mobile-platform architecture Centrino, promises just that. With the ultra-low-power version currently running at 900 MHz and the standard version at 1.7 GHz, the Pentium M is as quick as a "faster" Pentium 4 processor. At the same time, the Pentium M grants many a notebook more than 5 hours of battery life.



IBM ThinkPad T41

1.6-GHz Pentium M, 512MB DDR SDRAM, 40GB hard drive, DVD/CD-RW drive, 14.1-inch display, \$2,059 direct. IBM Corp., 888-746-7426, www.ibm.com.

Are desktop replacement notebooks too bulky for your tastes? Ultraportables too skimpy?

What you're looking for is an IBM ThinkPad T41, a mainstream notebook that balances perfectly between the worlds of big and small. It weighs a reasonable 5.3 pounds and is only an inch thick, and it offers enough high-end hardware to satisfy almost any road warrior.

You also get IBM's usual array of built-in wireless adapters, support for 802.11 "a," "b," and "g," and a six-cell battery. The T41 is not the most powerful notebook available. It's not the most portable, either. But we think it's just right.



processors

A Canon EOS Digital Rebel

\$900 street; with 18- to 55-mm lens, \$1,000. Canon U.S.A. Inc., 800-652-2666, www.usa.canon.com.

In the ever-competitive digital-camera market, the Canon EOS Digital Rebel stands out as the only entry-level digital SLR camera. At \$900, the Digital Rebel offers an entrance into the world of digital SLR photography for not much more than a high-end point-and-shoot camera.

The Digital Rebel accepts all existing Canon EOS lenses, but the impressive new 18- to 55-mm lens (a \$100 option) is the first in a forthcoming line of lenses that use a modified mount, which reaches farther into the camera body. Canon says this new mount paves the way for other smaller, less expensive lenses designed specifically for the Digital Rebel.

DIGITAL



B HP Scanjet 4670 See-Thru Vertical Scanner

\$200 street. Hewlett-Packard Co., 800-752-0900, www.photosmart.com.

The first thing you'd say about the HP Scanjet 4670 See-Thru Vertical Scanner is "Cool!" And who could blame you? This versatile, easy-to-use 2,400- by 2,400-ppi scanner could easily be mistaken for a picture frame or even a flat-screen monitor.

The 4670 consists of a rectangular, silver-colored plastic bezel sandwiching two transparent polycarbonate sheets, the whole affair measuring three-quarters of an inch thick and weighing a mere 3 pounds.



Canon EOS 10D

\$1,500 street. Canon U.S.A. Inc., 800-652-2666, www.usa.canon.com.

The Canon EOS 10D uses the same CMOS sensor and produces images nearly identical to those of the red-hot Digital Rebel. For an extra \$600 (and nearly half a pound in weight), the 10D gives you a more rugged body made of a magnesium alloy, much greater control, and a faster, more sustained burst mode. If features like these are important to you in your film days, you'll want them when you go digital.

Minolta DiMage A1

\$1,200 street. Konica Minolta Photo Imaging U.S.A. Inc., 201-825-4000, www.minoltausa.com.

Combining a world-class lens with excellent performance in a compact package, the Minolta DiMage A1 is the best all-in-one prosumer digital camera. We love the 7X zoom lens, whose 28- to 200-mm range (ex-

pressed in terms of 35-mm film equivalents) is nearly perfect.

The A1 also uses Minolta's Anti Shake technology, which moves the image sensor to counteract camera movement, so you can shoot blur-free shots at slower shutter speeds than would otherwise be possible. The A1's fast-charging lithium ion battery pack provides enough power for all-day use, and its top shutter speed is an impressive $1/16,000$ second—fast enough to stop a speeding race car.

Adobe Photoshop Elements 2.0

\$99 direct. Adobe Systems Inc., 800-833-6687, www.adobe.com.

Okay, so it came out in 2002. Adobe Photoshop Elements 2.0 is still our favorite image editor for mainstream users. It delivers all the power of Adobe Photoshop, but in an extremely intuitive interface that includes walkthroughs for common tasks and automatic fixes.

Picasa 1.6 with Hello!

\$29 direct. Picasa Inc., www.picasa.net.

Picasa doesn't have all the power of Adobe Photoshop Album, but it's remarkably simple to use for finding, managing, and viewing your photos. Now that the latest update—1.6—has added integration with the company's free peer-to-peer photo-sharing service Hello!, Picasa is also the easiest way to share photos with friends and family. Hello! lets you send pictures back and forth, browse them together, and chat in an IM-like window.

SendPhotos

\$39.95 direct. Novatix Corp., www.novatix.com.

Now that you're taking hundreds of digital photos, you probably want an easy way to e-mail them—without the hassle of finding images on your hard drive and resizing and positioning them. SendPhotos works with Microsoft Outlook 2000, Outlook XP, and Outlook Express by automatically embedding the photos of your choice in an e-mail message. It also works with other e-mail programs, including Web mail services.



Adobe Photoshop Album 2.0

\$49.95 direct. Adobe Systems Inc., 800-833-6687, www.adobe.com.

Adobe Photoshop Album 2.0 is a good thing that's only gotten better. The photo management software delivers an interface organized around key tasks, batch-fix capabilities, and the ability to send photos directly to phones and PDAs.

This new version retains the timeline across the top and includes new features, such as a slider control that lets you set the size of thumbnail images, and the ability to create a hierarchical structure for organizing tags. You can crop images, adjust color levels, and much more. Best of all, with Photoshop Album 2.0 you can now select multiple images at once and run Auto Fix, avoiding the tedious task of editing one image at a time.

IMAGING

Pentax Optio 550

\$600 street. Pentax U.S.A. Inc., 800-877-0155, www.pentaxdigital.com.

Whether you're an old hand with digital cameras or a newbie, you can't go wrong with the Pentax Optio 550. This 5-megapixel compact camera includes a focusable diopter in its optical viewfinder (useful for eyeglass wearers) and offers double exposures, time-lapse photography, and macrofocusing under 1 inch. In fact, it has almost every digital-camera feature, mode, and parameter you can think of.

Despite its complex feature set, the Optio 550 is easy to use, with well-marked controls, most of them easy to reach one-handed. For those who prefer to tinker, the Optio 550 has a variety of manual controls for exposure, white balance, saturation, contrast bracketing, and more. Want to simplify? The unit offers nine program modes, a panorama assist, and mode defaults that stick.



Club Photo

Club Photo Inc., www.clubphoto.com.

Club Photo can print your digital photos on some pretty unconventional media—cookies, jigsaw puzzles, magnets, even tie tacks. Too gimmicky? Plenty of more traditional items are available, such as T-shirts, coasters, and mugs. For the purist, photo prints are available, from 4- by 6-inch prints to 30- by 40-inch posters.

MORE ON THE WEB

For links to in-depth reviews of these products, visit *PC Magazine's* home page at www.pcmag.com.

printers

A Canon MultiPass MP730

\$400 street. Canon U.S.A. Inc., 800-652-2666, www.usa.canon.com.

Providing high-quality output, excellent print speed, slots for five types of memory cards, and separate cartridges for its color inks, the Canon MultiPass MP730 is the best multifunction printer of the year. The MP730 is a full-featured MFP, including a fax modem and an automatic document feeder. Its only slow area is scanning, but the loss of speed is offset by the excellent scan results. The MP730's combination of output, features, and performance leaves other MFPs far behind.



A

Canon i960 Photo Printer

\$200 street. Canon U.S.A. Inc., 800-652-2666, www.usa.canon.com.

Only one of the many available personal photo printers we've tested can also squeak by as a light-use ink jet printer: the Canon i960 Photo Printer. This is a terrific photograph printer with high speed, a wide color range, and a claimed maximum resolution of 4,800 by 1,200 dpi.

Optimized for printing photos, the i960 is not stellar for standard business printing. It's slow with text, and the text is fuzzy, but the results are good enough that many photographers will find this the only printer they need.



B

B Epson Stylus Pro 4000

\$1,800 street. Epson America Inc., 800-462-7766, www.epson.com.

With stellar output like the Epson Stylus Pro 4000's, you'll never have to think about using a professional print service. Its speed is class-leading and its prints exhibition-quality. It can take virtually any type of medium, up to 17 inches wide and 1.5 mm thick. Just bear in mind that its size (14 by 33 by 30 inches and 83.7 pounds) may strain the limits of your desk.

Xerox Phaser 7300/DN

\$4,199 direct. Xerox Corp., 877-362-6567, www.xerox.com.

The Xerox Phaser 7300/DN, our pick for the best color laser printer of 2003, isn't actually a laser printer. It creates prints using a set of four LED arrays that expose the CMYK imaging drums. After a ridiculously easy installation (with automatic network detection), the 7300/DN blows away competing printers in terms of speed and offers excellent print quality, with natural-looking photos and visible fine details.

Adobe Creative Suite

Standard, \$999 list; Premium, \$1,229. Adobe Systems Inc., 800-272-3623, www.adobe.com.

It's only fitting that Adobe bundle the applications graphics professionals depend on (Photoshop and Illustrator, for starters) into an integrated suite—like Microsoft Office for the graphics pro. Adobe Creative Suite includes new editions of Adobe's standard-setting applications, as well as the new Version Cue file management feature.

QuickBooks Premier 2003

Single user, \$499.95 list. Intuit Inc., 800-446-8848, www.quickbooks.com.

More customizable and easier to use than ever, QuickBooks Premier 2003 provides more tools to help with day-to-day transaction processing and record-keeping. Highlights include income and expense forecasts and expert analysis.

PRODUCTIVITY SOFTWARE

PaperPort 9

PaperPort Deluxe 9, \$99.99 direct; PaperPort Pro 9 Office, \$199.99. ScanSoft Inc., 888-372-1908, www.scansoft.com.

PaperPort 9 is the best way to manage documents, electronic files, and Web pages. You can browse through file thumbnails and stack pages into multipage documents.

Adobe Acrobat 6.0

Acrobat 6.0 Standard, \$299 list; Acrobat 6.0 Professional, \$449; Acrobat 6.0 Elements, 1,000-seat license, \$28 per seat. Adobe Systems Inc., 800-272 3623, www.adobe.com.

Although many applications now let you create PDF files, none compare with Adobe Acrobat. With Acrobat 6.0, you get improved collaboration and tracking tools, enhanced security features, and a powerful search tool.

TypePad

Basic \$4.95 a month. Six Apart Ltd., www.typepad.com.

TypePad lets you quickly build a blog that would make even Howard Dean proud. It excels at handling photographs, and you can post from a WAP-enabled phone.



Microsoft Office 2003

Microsoft Office Professional Edition 2003, \$499 list. Microsoft Corp., www.microsoft.com.

The latest version of Microsoft Office Suite has improved XML support, letting the Office apps integrate into databases and other applications. New collaboration tools, such as Shared Workspaces, let users "meet" and collaborate electronically, within Office apps.



More to love about the NEC MultiSync® LCD 60 Series. 19" more to be precise.

Intelligent ergonomics

Features like height-adjustable stands* help the LCD 60 Series integrate easily into any environment.

Intelligent power management

Low power consumption and a vacation switch cut costs.

Intelligent electronics

NaViSet™ self-diagnosing circuitry and user-friendly settings for total control.

Intelligent visual quality

NEC innovations ensure minimal fatigue and ultimate color accuracy.

*Available on select models.

Larger fonts, better readability and a more comfortable viewing experience make the NEC MultiSync LCD1960NX the ideal choice for more productive computing. With a viewing area comparable to a 21" CRT monitor, ergonomic height/tilt adjustable base and a range of intelligent features, our new 19" model rounds out the affordable NEC MultiSync LCD 60 Series of 15", 17" and 18" sizes.

The LCD1960NX features a thin frame, Rapid Response™ technology for full-motion video display and No Touch Auto Adjust™ for optimal screen settings upon initial power-up. Its space-saving chassis, touch integration capabilities and low total cost of ownership add the value and versatility you've come to expect from the #1 brand of stand-alone flat-panel monitors. It's sure to be love at first sight.

Learn more about the NEC MultiSync LCD 60 Series at www.necmitsubishi.com or call 888-NEC-MITS.

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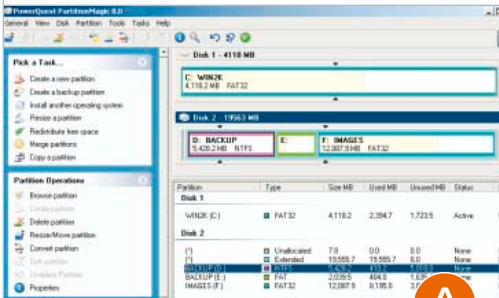
NEC MultiSync monitors.
Bright outside. Brilliant inside.

UTILITIES

A PartitionMagic 8.0

\$69.95 direct. PowerQuest Corp., www.powerquest.com.

With today's supersize hard drives, it's hard to imagine life without PartitionMagic 8.0. Using this application, you can easily create, copy, resize, and modify drive partitions—without losing any data. And it offers several tools you won't find in competing products. It can modify your system's Registry and Start menu so the system can easily find programs that have moved to new letter drives.



VMware Workstation 4

\$299 direct. VMware Inc., 877-486-9273, www.vmware.com.

It's like building your own Matrix. Using VMware Workstation 4, you can construct an entire virtual computer network *inside* your Windows PC, complete with virtual machines, each equipped with its own hodge-podge of virtual hardware and running its own virtual operating system.

Qurb 2.0

\$29.95 direct. Qurb, 650-286-4287, www.qurb.com.

Qurb 2.0 is an antispam utility that does an impressive job of blocking unsolicited e-mail using little more than a whitelist, compiling a list of people you know you want mail from and routing mail from other sources to a quarantine folder. Unlike other whitelisting tools, Qurb actually makes your life easier, automatically building a near-perfect whitelist by trolling

your Outlook client for addresses.

Google Toolbar

Free. Google, www.google.com. With the Google Toolbar, a sliver of an app that integrates with Microsoft Internet Explorer, you can query the world's most popular search engine without having to type www.google.com. The latest version lets you search Google Groups, Froogle, and more, and also gives you a decent pop-up blocker and form filler.

Lightning Download 1.1.1

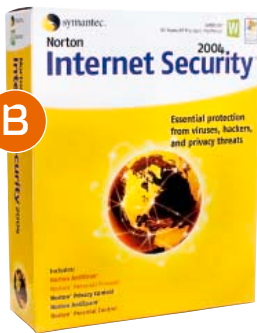
\$19.95 direct. Headlight Software Inc., www.lightningdownload.com.

As its name implies, this program lets you download files really, really fast. It doesn't give you a Web-based storage drive, an extra feature available with some Lightning Download competitors. But who cares? It's cheap. And did we mention that it's really, really fast?

PopUpCop 2.0.2.31

\$19.95. EdenSoft, www.popupcop.com.

PopUpCop polices more than just pop-ups. This slick Internet Explorer add-on can block all sorts of unwanted things that may fall from the Web onto your desktop, including ActiveX controls, Java applets, Flash movies, background sounds, and GIF animations.



B

B Norton Internet Security 2004

\$69.95 list. Symantec Corp., 408-253-9600, www.symantec.com.

With Norton Internet Security 2004 all your bases are covered. NIS 2004 supplements Norton AntiVirus, the best around, with the excellent Norton Personal Firewall, which now includes ad blocking and

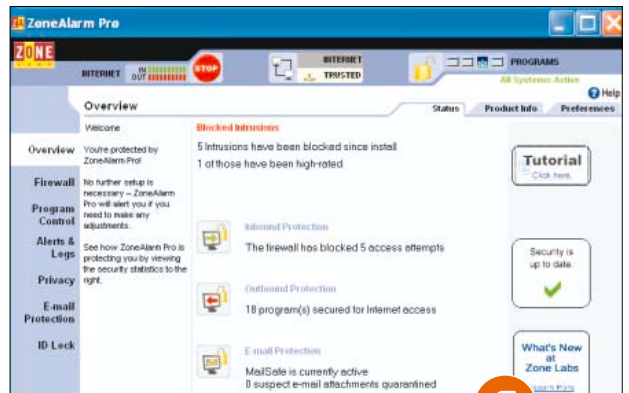
privacy controls.

Norton AntiSpam, which integrates into Microsoft Outlook and Outlook Express as well as Eudora, helps filter spam out of your in-box, and Norton's new, configurable Parental Controls feature lets you set up access privileges and filter Web sites and news-groups.

Norton AntiVirus 2004

\$49.95 direct. Symantec Corp., 408-253-9600, www.symantec.com.

Not looking for a firewall? You still need to protect yourself from viruses, and Norton AntiVirus 2004 is the best solution. The latest version also scans for and removes spyware, including adware and key loggers, as well as nasty dialer programs.



C

C ZoneAlarm Pro 4.0

\$49.95 direct. Zone Labs Inc., www.zonelabs.com.

ZoneAlarm Pro 4.0 is an excellent, powerful personal firewall that also provides ad-blocking software and e-mail security tools to quarantine dangerous attachments and prevent worms from sending mass mailings from your machine. The clincher is that all these tools are neatly integrated, which isn't the case with Symantec's Norton Personal Firewall 2004.



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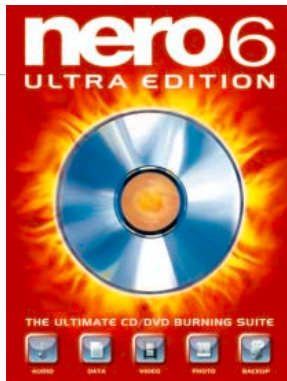
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Snagit 7.0

\$39.95 direct. TechSmith Corp., www.techsmith.com.

Maybe you've noticed that the Print Screen key on your keyboard doesn't actually print the screen; instead, it takes a screen grab—of everything on your screen—which you can copy into an image editor. If you're familiar with this and you need more screen capture options, you'll want Snagit, which can capture rectangular and nonrectangular portions of your screen, grab an image from an MPEG-4 video stream, and even record a running AVI video of screen activity.



Nero 6 Ultra Edition

Download, \$69.99 direct; boxed, \$99.99. Ahead Software Inc., www.nero.com.

The powerful Nero Burning ROM Module, for burning CDs and DVDs, is the heart of Ahead's Nero 6 suite, letting you copy all sorts of audio and video onto all sorts of discs. But the package also includes Nero Wave Editor (for editing audio files), Nero

Cover Designer (for labeling your discs and their cases), and several new tools for video capture and editing, multitrack audio production, and even system backup.

GoToMyPC Corporate 4.0

For 10 PCs, \$227 a month. Expertcity Inc., 888-259-3826, www.expertcity.com.

GoToMyPC is still the easiest way to get remote access to your computer from any Java-enabled browser on the Web, including Pocket PC and smart-phone browsers. Simply launch the GoToMyPC Web page, then type in your username and a pair of passwords, and you're on a system that could be anywhere.

SpyBot Search & Destroy

Free. PepiMK Software, www.safer-networking.org.

SpyBot Search & Destroy outstrips the competition at nearly every aspect of detecting and removing the spyware that may be lurking on your PC. Although in testing, SpyBot was subpar at detecting key loggers and Trojans, it excels at keeping you informed about actual spyware—that stuff piggybacking on your shady shareware. Download your copy today, and consider sending a few bucks to the developer, Patrick Kollam. He deserves it.

AUDIO

A Rio Cali

256MB player, \$200 street. Rio Audio, a Digital Networks North America company; 800-468-5846, www.rioaudio.com.

The Rio Cali is the latest player in a line that dates back to the original MP3 player, the Rio PMP. The small, durable Cali is a perfect choice if you're looking for an MP3 player to work out with—it even includes an armband—or take with you when you're on the go. It provides 256MB of flash memory (expandable to 512MB) and

simple controls that are well designed for easy use. The Cali also includes some welcome extras like a stopwatch feature and an FM tuner.

B Apple iPod

40GB player, \$499 direct. Apple Computer Inc., 800-692-7753, www.apple.com/ipod.

The Apple iPod wasn't the first hard drive music player, but it quickly became the most popular. The most recent iPod provides a staggering 40GB of hard drive space, letting you store hundreds and hundreds of CDs in a slender device that fits easily in your pocket. The FireWire port makes transfers fast and easy (USB 2.0 is also supported with a separate docking cradle), and it allows the iPod to double as a removable storage device. The design maintains the stylish white-on-metal look, with some nice enhancements to the interface.



Creative Labs Sound Blaster Audigy 2 Platinum

\$250 street. Creative Labs Inc., www.creative.com.

In the world of sound cards, the Creative Labs Sound Blaster Audigy 2 Platinum has it all: superb sound quality, multi-channel 24-bit/96-kHz recording and 24-bit/192-kHz playback, and 6.1-channel Dolby Digital EX support. Musicians will appreciate all the I/O options, such as FireWire and SPDIF ports; gamers will like the sophisticated effects.

Napster 2.0

\$0.99 per song, direct; \$9.99 per album (in most cases). Roxio Inc., www.roxio.com.

No longer a free-for-all outlaw, Napster 2.0 is now the best service for buying music online, with a catalog of over 500,000 tracks from major and minor labels. Napster has a fantastic interface for browsing through albums, and it also offers a streaming service for \$9.99 a month.

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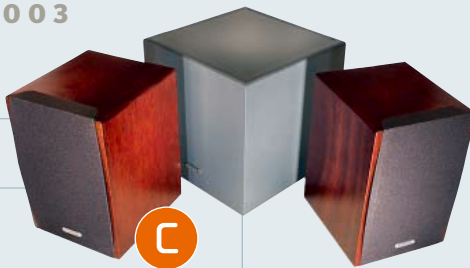
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AUDIO

C Klipsch ProMedia GMX D-5.1

\$300 direct. Klipsch, www.klipsch.com.

This is the best set of gaming speakers we've seen to date. Comprising five attractive satellites, which can be positioned as precisely as you wish, and an optional subwoofer, the Klipsch ProMedia GMX D-5.1 speakers offer all the features a gamer could want. A controller provides access to the system's analog, coaxial, and optical inputs and lets you adjust dynamic-range compression, route stereo input to all six speakers, or choose between the built-in Dolby Pro Logic II and Dolby Digital decoders.

**Cambridge SoundWorks MegaWorks 215**

\$400 direct. Cambridge SoundWorks Inc., www.hifi.com.

You'll have a hard time finding computer speakers that deliver more precise and transparent sound than the Cambridge SoundWorks MegaWorks 215. This powerful three-piece speaker system comes in your choice of gorgeous hardwood finishes. You get a pair of oversize Newton M50 satellites, which contain 1-inch silk tweeters, 5.25-inch midrange drivers, and 60-watt amps. The BassCube 821 module, also included, has a hefty 150-watt amplifier and an 8-inch cone.

**DVD XCopy Platinum**

\$149.99 list. 321 Studios, 866-383-2679, www.321studios.com.

With all the legal controversy surrounding the issue, it's tough to find all the necessary tools to back up DVDs. With 321 Studios' DVD XCopy Platinum, however, you just insert a DVD and press a few buttons. To deal with the space limitations of writable DVD media, XCopy lets you exclude some elements, compress titles, and split movies across discs.

Archos AV320 Video Recorder

\$550 street. Archos, www.archos.com.

This portable device includes a 20GB hard drive that lets you record (off a TV), store, and play back MPEG-4 video and MP3 audio, as well as store and display JPEG photos.

CyberLink PowerDVD 5 Deluxe

\$69 direct. CyberLink Corp., 510-668-0118, www.gocyberlink.com.

Previous versions of software DVD player PowerDVD were impressive. Version 5 introduces technology to make movies look even better on LCD monitors by determining areas that need enhanced brightness, contrast, and saturation. The audio features are first-rate as well, with Dolby Surround support.

VIDEO

muvee autoProducer

\$39.95 direct. muvee Technologies Pte. Ltd., www.muvee.com.

To transform your home movies quickly into something worth watching (without spending all your waking hours editing video), check out muvee autoProducer, which automatically converts raw footage into music videos, full of attractive transitions set to your choice of music.

ATI Radeon 9800XT

\$499 direct. ATI Technologies Inc., www.ati.com.

If money is not an issue and you want the best 3-D performance available on the desktop, look to the ATI Radeon 9800XT. With a

412-MHz engine clock, this card's performance is first-rate, but its features are what really sets it apart. For example, the new OverDrive technology can automatically overclock the card for peak performance.

ATI Radeon 9600XT

\$200 street. ATI Technologies Inc., www.ati.com.

For the best 3-D performance on a budget, look to the ATI Radeon 9600XT. It offers solid gaming performance for \$200 and includes some nice extras, including composite and S-Video inputs (for capturing video), a handful of graphics utilities, and a copy of Half-Life 2.

**A Canon Optura 20**

\$999 list. Canon U.S.A. Inc., 800-652-2666, www.canonv.com.

The Canon Optura 20, a MiniDV camera, is loaded with features, including 16X optical zoom and a manual focus ring. Common shooting controls are intelligently laid out. More important, the Optura has simply the best image quality we've seen from a MiniDV recorder—and that's what matters most.

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Best of 2003



A Apple iSight

\$150 street. Apple Computer Corp., 800-692-7753, www.apple.com.

The Apple iSight is a typical Apple product: Its very high price is outweighed by its beauty. Connected to your Apple computer via a FireWire cable, this small cylindrical Webcam captures 640- by 480-pixel images in 24-bit color. It is one of the few Webcams in its class that automatically focus on objects, supporting a range of 3 inches to 15 feet away.

B Logitech Quickcam Pro 4000

\$99.95 direct. Logitech Inc., 800-231-7717, www.logitech.com.

Not all Webcams are created equal. If quality takes priority over low price, you'll want the Logitech Quickcam Pro 4000. Using CCD technology, this USB-based camera provides high-quality 640-by-480 images. The Quickcam Pro 4000 includes some nice extras, such as a built in microphone and a convenient button that lets you snap 1.3-megapixel still images. The included software lets you capture both still and video images, and it supports motion detection.



C HP DVD Movie Writer DC3000

\$349.99 direct. Hewlett-Packard Co., 888-999-4747, www.hp.com.

With the HP DVD Movie Writer DC3000, you get everything you need to stream video from a VCR or analog camcorder to your PC and write it to disc. Just connect the device to your PC's USB port, then attach your VCR or camcorder via the audio and video ports and away you go. Want to edit your video? No problem: HP bundles a copy of ArcSoft's ShowBiz.

Maxtor OneTouch

200GB, \$299.95 direct. Maxtor Corp., 408-894-5000, www.maxtor.com.

The name doesn't lie. With the Maxtor OneTouch—an external device that connects to your PC via USB or FireWire port—you can back up all your system data with just the press of a button. Not interested in backup? The OneTouch is also an easy way to boost your machine's hard drive capacity.

Memorex Dual Format DVD Recorder

\$229 list. Memorex Products, 877-474-8548, www.memorex.com.

It's cheap and it's fast. What more could you want from a DVD writer? The Memorex Dual Format DVD Recorder writes as fast as any other DVD burner in its class. And in case you do want more, Memorex includes a host of helpful software applications for copying discs and editing pictures and video.

D Samsung SyncMaster 171N

\$500 street. Samsung Electronics Co. Ltd., 800-726-7864, www.samsungusa.com/monitor.

You can get a brilliant 17-inch LCD monitor for less than \$500—witness the Samsung SyncMaster 171N, which comes close to rivaling high-end CRTs in color accuracy and even retains a distinct image when you view it from acute angles.



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E Logitech diNovo Media Desktop

\$249.95 list. Logitech Inc., 800-231-7717, www.logitech.com.

Toss out your old keyboard and mouse; it's time for the Logitech diNovo Media Desktop, a set of input devices for the computer junkie. This includes a wireless keyboard, a wireless mouse, and a wireless MediaPad—a quick and easy way to play music and videos, choreograph slide shows, and send instant messages. Thanks to a built-in Bluetooth adapter, you can even use it to IM through your cell phone.

**InFocus LP120**

\$2,699 direct. InFocus Corp., 800-294-6400, www.infocus.com.

It's a projector that fits in your shirt pocket: The InFocus LP120 is no larger than a pack of cigarettes and weighs less than 2 pounds. In fact, it's not much bigger than its own remote control. But when used in dark room, the LP120 renders wall-size computer and video images with remarkable skill. It even offers a zoom control and lens focus.

**F****Gyration Ultra GT Cordless Optical Mouse**

\$80 street; with full-size keyboard, \$100; with compact keyboard, \$110. Gyration Inc., www.gyration.com.

With the Gyration Ultra GT Cordless Optical Mouse, you don't even need a flat surface; you can navigate in Windows simply by waving your hand through the air. The device includes a dual-axis gyroscope that can detect motion in three dimensions. Included software lets you assign new tasks to particular hand gestures; quickly jerking the mouse to the left, for instance, could mimic your Web browser's Back button.

F Kensington PocketPro Wireless Mouse

\$50 street. Kensington Technology Group, 650-572-2700, www.kensington.com.

Some mice travel better than others. What sets the Kensington PocketPro Wireless Mouse apart is that when you are ready to leave for home, the PocketPro packs up ever so nicely. You simply unplug the L-shaped wireless receiver from your laptop's USB port and tuck it away inside the mouse. And when you do, the mouse automatically turns off; no need to worry about having the batteries die unexpectedly.

HOME ENTERTAINMENT

Netflix

\$19.95 a month. Netflix, www.netflix.com.

The first subscription DVD rental service is still the best. It has an extensive selection of titles (most of which are readily available) and customized pages that display movies based on your previous rentals. You can browse lists of recommendations to refine Netflix's suggestions by rating films you've seen or indicating that you're not interested.

Netflix has far more distribution centers than competing services, allowing it to deliver movies to you much quicker; movies typically arrive at your home in just two days. And best of all, you can keep DVDs

as long as you want (with a limit of three titles in your possession at any given time), which means no more late fees.

Prismiq MediaPlayer

\$249.95 direct. Prismiq Inc., 888-880-1583, www.prismiq.com.

Bridging the gap between your computer and your home entertainment system, the Prismiq MediaPlayer is the media hub that does everything. Using your home network, the MediaPlayer can play your MP3 collection on your home stereo, stream video from your computer to your television screen, and even access the Internet on your TV.

**A****A Sharp 37" Aquos LCD TV**

\$6,499.95 list. Sharp Electronics Corp., 800-237-4277, www.sharpusa.com.

The top-of-the-line Sharp Aquos is the best large-screen LCD TV we've seen. It boasts excellent image quality, with accurate colors and plenty of detail. It also has a good assortment of features, such as a zoom-to-fill-screen option for 4:3 content and a breakaway controller box with cable inputs.



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MOBILE DEVICES & SERVICES



A Motorola MPx200 with Windows Mobile Software

\$300 street, plus monthly service fees. AT&T Wireless, 866-732-2468, www.attwireless.com.

The Motorola MPx200 is the first device in a new generation of Smartphones that run the new Microsoft Windows Mobile 2003 software. The Smartphone is primarily a phone, but it targets anyone who also wants to access Outlook contact data, mail, and messaging quickly. The operating system is more lightweight than a PDA OS; the phone is easy to use, and it offers quick, one-hand operation.

open-source TOOLS

Nessus Network Security Scanner

Free. GNU GPL, www.nessus.org.

Nessus Network Security Scanner offers a free and extremely thorough way to scan your network for vulnerabilities. This cross-platform utility offers an overwhelming number of configuration and scanning options.

Open Wiki 0.78

Free. Open Wiki, www.openwiki.com.

Open Wiki provides a hassle-free way to host your own wiki, with support for XML-based

style sheets and RSS for searching and syndicating content.

SUSE Linux Professional 9.0

\$79.95 direct. SUSE Inc., www.suse.com.

In the realm of Linux, SUSE Linux Professional 9.0 strikes the best balance between simplicity and power. Administrators will appreciate its corporate focus, while its attractive interface and help options make it a fine choice for mainstream users. (Note that SUSE was recently acquired by Novell.)

GoodLink

\$2,000 per server, direct, plus a monthly charge per user. Good Technology Inc., 866-723-4663, www.good.com.

Good Technology's GoodLink solution is an easy, reliable way for Microsoft Exchange users to send and receive e-mail from just about anywhere. The server supports its own wireless handheld, the Good G100, as well as the Handspring Treo 600 and the RIM BlackBerry 950 and 957.

Handspring Treo 600

\$700 street (with service activation, \$500). palmOne Inc., 888-565-9393, www.handspring.com.

The Palm OS-based Handspring Treo 600 is the best hybrid

PDA/phone available. The Treo is barely larger than a cell phone and gives a good balance of emphasis on both PDA and telephone features—and it has a thumb-style QWERTY keyboard. The icing on the cake is a 640-by-480 camera.

Palm Zire 21

\$100 street. palmOne Inc., 888-565-9393, www.palmone.com.

You don't need to spend big bucks on a PDA. The Palm Zire 21 is an affordable PDA that includes the latest Palm OS and applications. It may not have all the flashy frills of high-end PDAs, but it does a great job at all the standard tasks.



B Sony Clié PEG-UX50

\$650 street. Sony Electronics Inc., 888-222-7669, www.sony.com/handheld.

More than a PDA, the new Sony Clié PEG-UX50 is a personal entertainment organizer. The sleek Clié runs Palm OS and comes with a digital camera, Wi-Fi, Bluetooth, a QWERTY keyboard, and MP3 playback. The screen swivels and folds flat against the keyboard for use as a standard PDA.

HP iPAQ Pocket PC h4350

\$500 street. Hewlett-Packard Co., 800-345-1518, www.hp.com.

The HP iPAQ Pocket PC h4350 is the first Pocket PC device with an integrated keyboard. It's reasonably priced, and it's our pick for Pocket PC users who spend time writing e-mail on the go. It runs the new Windows Mobile 2003 for Pocket PC and includes built-in Wi-Fi and Bluetooth support.



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networking

NetScreen-SA 1000

50 users, \$9,995 list. NetScreen Technologies, 408-962-8200, www.netscreen.com.

The NetScreen-SA 1000 (which was called the Neoteris Access 1000 when we last reviewed it, August 19, 2003) is a convenient alternative to traditional VPN technology. With an intuitive interface and preconfigured application support, the appliance is easy to install, quickly providing Web-based remote access to a broad mix of intranet resources.

Microsoft Windows Server 2003

Enterprise Edition, with Microsoft .NET Framework 1.1 and 25 client licenses, \$3,999 direct. Microsoft Corp., 425-882-8080, www.microsoft.com.

Microsoft Windows Server 2003 Enterprise Edition, along with the .NET Framework, is a strong base for any IT organization's deployment and development needs. Support for up to 8 CPUs and 32GB of memory address space (32 CPUs, 512GB RAM in the 64-bit edition) makes this release the most versatile yet.

A Dell PowerEdge 1750

\$4,973 direct. Dell Inc., 800-999-3355, www.dell.com.

The Dell PowerEdge 1750 is an innovative IU rack-mountable server that delivers high reliability, manageability, and strong performance. Unique features—such as two power supplies that do not block existing PCI slots, seven fans that automatically adjust their own speeds, and a case that opens like a book to provide easy access for service—make this server an attractive choice.

Linksys WRT55AG

\$299 list. Linksys Group Inc., 800-546-5797, www.linksys.com.

The Linksys WRT55AG wireless router seems to have it all: quality, performance, and excellent software. It has both 802.11a and 802.11g radios, allowing “a,” “b,” and “g” clients to connect concurrently—useful in a mixed environment. The WRT55AG can be configured to use 64-, 128-, or 152-bit encryption on 802.11a and 64 or 128 bits on 802.11g.



development TOOLS



Macromedia Studio MX 2004

\$899 direct. Macromedia Inc., 415-252-2000, www.macromedia.com.

Though the individual apps in Macromedia Studio MX 2004—such as Dreamweaver MX 2004, Fireworks MX 2004, Flash MX 2004, and FreeHand MX—are excellent on their own, they're more impressive together. Studio MX boasts support for CSS handling to provide a more consistent look and feel across the studio applications. True integration of the apps lets you, for example, modify attributes of a Flash element from inside Dreamweaver.

Covigo Platform 3.0

Symbol Technologies, www.symbol.com.

Developing for a mobile world has gotten a lot less frustrating. Based on Java standards, Covigo (recently acquired by Symbol Technologies) tackles the issue of multimode development by building on a single code base, supported by multiple hardware devices and application types.

A FileMaker Pro 6

\$299 direct. FileMaker Inc., 800-325-2747, www.filemaker.com.

FileMaker Pro 6 simplifies database design by hiding concepts like fields and relational tables under an intuitive interface. It provides handy templates and wizards, and it lets you drop Excel spreadsheets directly into the program.

SQL Anywhere Studio 9

\$399 direct. Sybase Inc., 925-236-5000, www.sybase.com.

SQL Anywhere Studio 9 eases mobile development with new OLAP features, improved cache management, and flexible synchronization options. Impressively, its database footprints can be as small as 50K each.

WebTrends Reporting Service

\$1,000 a month and up. NetIQ Corp., www.webtrends.com.

WebTrends Live Enterprise Edition is an indispensable tool that analyzes a site's clickstream to see what's working and what's not.

JBuilder 9 Enterprise

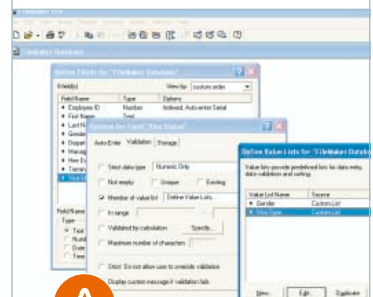
\$3,500 direct. Borland Software Corp., 800-632-2864, www.borland.com.

JBuilder 9 Enterprise is an ideal Java programming environment, offering pop-up advice for fixing Java errors and a helpful new comments tool. Along with world-class EJB (Enterprise JavaBean) entity bean modelers, JBuilder 9 Enterprise supports a wealth of open standards.

Macromedia Contribute 2

\$99 direct. Macromedia Inc., 415-252-2000, www.macromedia.com.

Macromedia Contribute has carved out a niche as a tool for non-Web designers who need to maintain Web sites. It offers some high-priced features like check-in/check-out, file versioning, and rollback. To edit Web pages, simply browse to a site, make alterations right in the Web browser, and publish the changes.



Big kahuna protection

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Little fish affordability

games



A

A Madden NFL 2004

\$49.95 list. PlayStation 2. Electronic Arts Inc., www.easports.com.

Boasting great graphics and elaborate game play, Madden NFL 2004 (available on most platforms) is the most realistic football game going. With this version, EA Sports has much improved the program's online gaming, offering instant messaging, new tournament features, improved ranking systems, and the new Fair Play system, which penalizes plug pulling and other unsportsmanlike techniques.

Savage: The Battle for Newerth

\$39.99 list. PC. S2 Games LLC, www.s2games.com/savage.

Savage: The Battle for Newerth combines aspects of the real-time-strategy and first-person-shooter genres. Players clash online in a battle that pits barbaric humans against highly evolved animals. Each side's commander issues orders to team members, who can decide whether to obey.

Orbz 2.0

\$19.95 direct. PC. GarageGames, www.garagegames.com.

Like many of the best computer games, Orbz 2.0 is simple and terribly addictive. In this 3-D action/arcade game, you score points by launching your orb into floating stars, playing against computer-controlled bots or online opponents.

Halo: Combat Evolved

\$49.99 direct. Microsoft Xbox./Microsoft Corp., www.microsoft.com.

Since its release in 2001, Halo has been one of the most praised games for the Xbox. In 2003 it came to the PC, packed with new weapons, online content, and multiplayer competition.

Second Life

\$14.95 a month, direct. PC. Linden Research Inc., www.secondlife.com.

Second Life is the most intriguing virtual world we've seen. The environment is stunning—and as a user, you can help build it. Your avatar is completely customizable, and you can make changes to the world itself. Although you can do battle in special areas of Second Life, the game is really designed for those who would rather build a 3-D replica of the Eiffel Tower than knock one down.

Microsoft Flight Simulator 2004

\$50 street. PC. Microsoft Corp., www.microsoft.com/flightsimulator.

The best flight game is better than ever as Microsoft commemorates the hundredth anniversary of the Wright brothers' first powered flights. You can pilot 20 historic flights, including the Wright Flyer's first launch. This version offers dynamic weather, improved scenery for more than 24,000 airports, and 3-D cockpit controls.



education & reference



A

A Zoombinis Island Odyssey

\$20 street. Riverdeep—The Learning Company, 415-763-4700, www.zoombinis.com.

Zoombinis Island Odyssey is entertaining and educational. In it, kids solve math and logic puzzles on a mission to save the island from ecological disaster.

Math Mission: The Race to Spectacle City Arcade, The Amazing Arcade Adventure

\$19.95 list each. Scholastic Inc., 800-246-2986, www.scholastic.com.

Early math education doesn't get better than the Math Mission games from Scholastic. Kids grapple with modern problems in the missions, with more than a dozen challenges in each game. Skills include piecing together shapes to raise a building and multiplying and dividing to fill customers' orders at a market.

Microsoft Encarta Reference Library Plus DVD 2004

\$69.95 list. Microsoft Corp., 425-637-9308, www.microsoft.com/encarta.

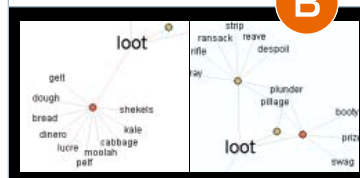
This year's update to Microsoft Encarta Reference Library is incremental, but it incrementally improves the best reference library we know. Encarta is packed with rich, well-presented, and frequently updated content, which is what reference is all about.

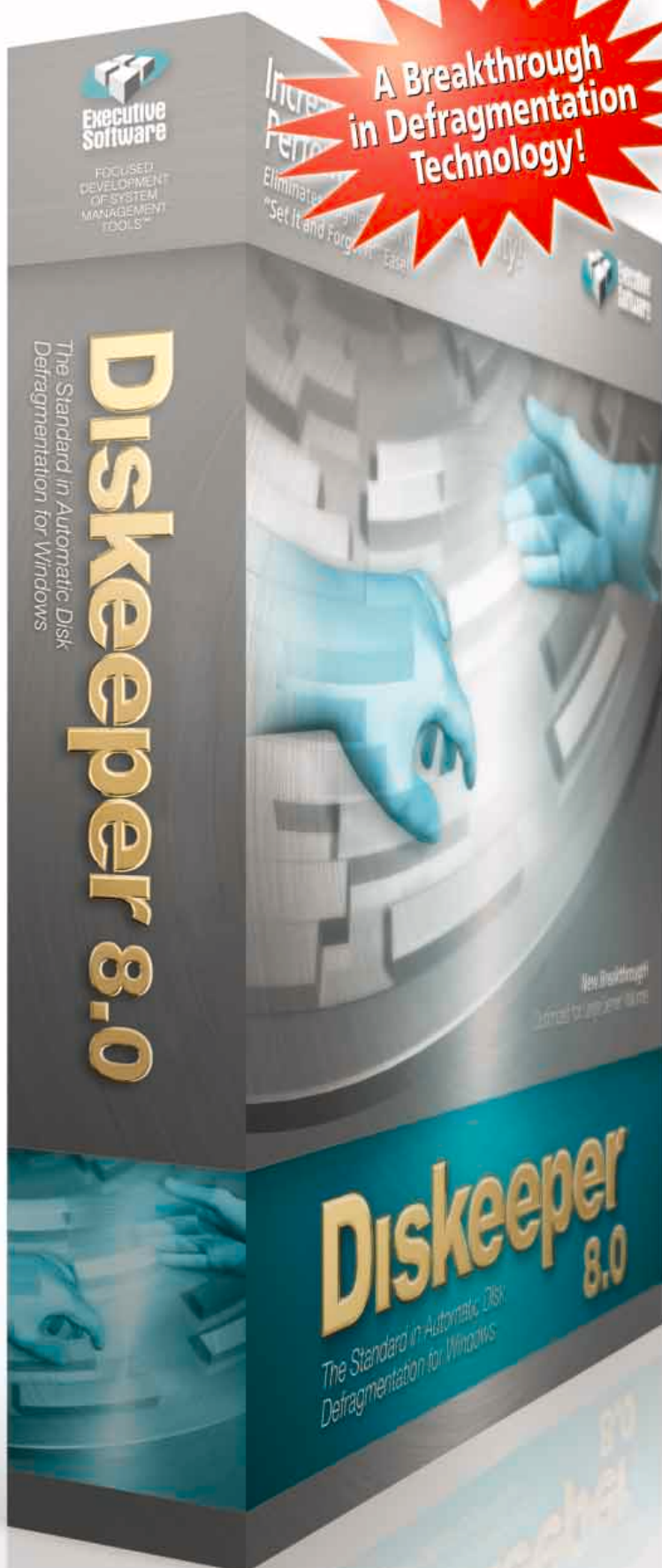
B Visual Thesaurus

\$29.95 direct. Plumb Design, www.visualthesaurus.com.

Visual Thesaurus offers an engaging way to explore the English language. You enter a word and then choose a path. Type in *booty*, for example, and follow the *loot* path (as opposed to the *prize* and *plunder* paths), then you can choose to go with *lucre*, and so on. ☰

B





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NEW! IBM ThinkPad R40

Distinctive IBM Innovations:

- Access Connections – Easiest wired and wireless connectivity
- 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 SDRAM
- 20GB⁵ hard drive
- Ultrabay™ Plus CD-RW/DVD-ROM combo
- IBM UltraNav™ – TrackPoint® and touch pad
- 1-yr system/battery limited warranty⁶

\$1,279*

▶ NavCode 289793U-M548

Recommended Option:

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

NEW! IBM ThinkPad T41

Distinctive IBM Innovations:

- Access Connections – Easiest wired and wireless connectivity
- 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 SDRAM
- NEW! 40GB hard drive with IBM Hard Drive Active Protection System
- Ultrabay Slim CD-RW/DVD-ROM combo
- Only 1" thin* • 4.5-lb travel weight⁵
- 1-yr system/battery limited warranty⁶

\$1,769*

▶ NavCode 2378DHU-M548

- ServicePac® Service Upgrade:⁷
3-yr Onsite Repair/9x5/Next Business Day Response #30L9195 *243

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IBM ThinkPad® R40

Distinctive IBM Innovations:

- 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
- 15" XGA TFT Display (1024x768)
- 256MB DDR SDRAM⁵ • 40GB⁶ hard drive
- Integrated Ethernet and modem
- Ultrabay™ Plus CD-RW/DVD-ROM combo
- IBM UltraConnect™ Antenna for increased signal strength
- 1-yr system/battery limited warranty⁷

\$1,449*

NavCode 2897B4U-M548

ServicePac® Service Upgrade:⁸
3-yr Depot Repair
#30L9192 *132

IBM ThinkPad R40

Distinctive IBM Innovations:

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

System Features:

- Intel Centrino mobile technology
- Intel Pentium M processor 1.50GHz²
- Intel PRO/Wireless Network Connection 802.11b³
- 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™ TrackPoint® and touch pad
- 1-yr system/battery limited warranty⁷

\$1,679

NavCode 2897GAU-M548



NEW! IBM ThinkPad T41

Distinctive IBM Innovations:

- Access IBM – IBM help at your fingertips

System Features:

- Intel Centrino mobile technology
- Intel Pentium M processor 1.40GHz²
- Intel PRO/Wireless Network Connection 802.11b³
- Microsoft® Windows® XP Professional
- 14.1" XGA TFT Display (1024x768)
- 32MB ATI® Mobility RADEON™ 7500 graphics
- 256MB DDR SDRAM⁵ • 40GB hard drive
- Integrated Gigabit Ethernet and modem
- Ultrabay Slim CD-RW/DVD-ROM combo drive
- IBM UltraConnect Antenna for increased signal strength
- Only 1" thin⁴ • 4.5-lb travel weight⁴
- 1-yr system/battery limited warranty⁷

\$1,769

NavCode 2378DHU-M548

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

NEW! IBM ThinkPad T41

Distinctive IBM Innovations:

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

System Features:

- Intel Centrino mobile technology
- Intel Pentium M processor 1.60GHz²
- Intel PRO/Wireless Network Connection 802.11b³
- Microsoft® Windows® XP Professional
- 14.1" SXGA+ TFT Display (1400x1050)
- 32MB ATI Mobility RADEON 9000 graphics
- 256MB DDR SDRAM⁵ • 40GB hard drive
- Ultrabay Slim CD-RW/DVD-ROM combo drive
- 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 warranty⁷

\$1,939

NavCode 2379DJU-M548

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

IBM ThinkPad X31

Distinctive IBM Innovations:

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

System Features:

- Intel Centrino mobile technology
- Intel Pentium M processor 1.40GHz²
- Intel PRO/Wireless Network Connection 802.11b³
- Microsoft® Windows® XP Professional
- 12.1" XGA TFT Display (1024x768)
- 16MB ATI Mobility RADEON graphics
- 256MB DDR SDRAM⁵ • 40GB hard drive
- Integrated Ethernet and modem
- Integrated IEEE 1394 FireWire
- 5.5-hr Li-Ion battery⁴
- 3.6-lb travel weight
- 1-yr system/battery limited warranty⁷

\$1,599

NavCode 2884CRU-M548

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

IBM ThinkPad X31

Distinctive IBM Innovations:

- Access Connections – Easiest wired and wireless connectivity

System Features:

- Intel Centrino mobile technology
- Intel Pentium M processor 1.60GHz²
- Intel PRO/Wireless Network Connection 802.11b³
- Microsoft® Windows® XP Professional
- 12.1" XGA TFT Display (1024x768)
- 16MB ATI Mobility RADEON graphics
- 256MB DDR SDRAM⁵
- 40GB hard drive
- Integrated Gigabit Ethernet and modem
- Integrated IEEE 1394 FireWire
- 5.5-hr Li-Ion battery
- 3.6-lb travel weight
- 1-yr system/1-yr battery limited warranty⁷

\$1,799

NavCode 2884NRU-M548

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

IBM ThinkPad X31 Solution Pack

Distinctive IBM Innovations:

- Access Connections – Easiest wired and wireless connectivity

System Features:

- Intel Centrino mobile technology
- Intel Pentium M processor 1.40GHz²
- Intel PRO/Wireless Network Connection 802.11b³
- Microsoft® Windows® XP Professional
- 12.1" XGA TFT Display (1024x768)
- 16MB ATI Mobility RADEON graphics
- 256MB DDR SDRAM⁵ • 20GB hard drive
- 5.5-hr Li-Ion battery
- 1-yr system/battery limited warranty⁷

Accessories Included:

- UltraBase™ X3 media slice
- Ultrabay Plus CD-RW/DVD-ROM combo

\$1,799

NavCode 28852WU-M548

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

IBM ThinkPad X31 Solution Pack

Distinctive IBM Innovations:

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

System Features:

- Intel Centrino mobile technology
- Intel Pentium M processor 1.60GHz²
- Intel PRO/Wireless Network Connection 802.11b³
- Microsoft® Windows® XP Professional
- 12.1" XGA TFT Display (1024x768)
- 16MB ATI Mobility RADEON graphics
- 256MB DDR SDRAM⁵ • 40GB hard drive
- Integrated Gigabit Ethernet and modem
- 5.5-hr Li-Ion battery
- 3-yr system/1-yr battery limited warranty⁷

Accessories Included:

- UltraBase X3 media slice
- Ultrabay Plus CD-RW/DVD-ROM combo

\$1,999

NavCode 2885PWU-M548

ServicePac® Service Upgrade:
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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 Hyper-Threading Technology 2.60GHz
- Microsoft® Windows® XP Professional
- 256MB DDR SDRAM¹
- 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 warranty²

\$849 NavCode 843294U-M548

ServicePac® Service Upgrade:
3-yr Onsite Repair/9x5/4-hr Response
#41L2732 **1229**

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 SDRAM¹
- 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 warranty²

\$919 NavCode 843298U-M548

ServicePac® Service Upgrade:
3-yr Onsite Repair/9x5/Next Business Day Response
#30L9199 **199**

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 2.60GHz
- Microsoft® Windows® XP Professional
- 256MB DDR SDRAM¹
- 40GB hard drive • CD-ROM
- Intel Extreme Graphics 2
- Gigabit Ethernet-integrated
- Norton AntiVirus 2003 OEM Edition
- Lotus SmartSuite Millennium license
- 3-yr limited warranty with limited onsite service³

\$1,079 NavCode 8187D9U-M548

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

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 SDRAM¹
- 40GB hard drive • CD-ROM
- Intel Extreme Graphics 2
- Gigabit Ethernet-integrated
- Norton AntiVirus 2003 OEM Edition
- Lotus SmartSuite Millennium license
- 3-yr limited warranty with limited onsite service³

\$1,199 NavCode 8187EJU-M548

ServicePac® Service Upgrade:
3-yr Onsite Repair/24x7/4-hr Response
#41L2740 **1159**

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 2.60GHz
- Microsoft® Windows® XP Professional
- 256MB DDR SDRAM¹
- 40GB hard drive • CD-ROM
- Intel Extreme Graphics 2
- Gigabit Ethernet-integrated
- Norton AntiVirus 2003 OEM Edition
- Lotus SmartSuite Millennium license
- 3-yr limited warranty with limited onsite service³

\$1,099 NavCode 818326U-M548

ServicePac® Service Upgrade:
3-yr Onsite/9x5/4-hr Response
#41L2734 **1129**

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 SDRAM¹
- 40GB hard drive • CD-ROM
- Intel Extreme Graphics 2
- Gigabit Ethernet-integrated
- Norton AntiVirus 2003 OEM Edition
- Lotus SmartSuite Millennium license
- 3-yr limited warranty with limited onsite service³

\$1,259 NavCode 818336U-M548

ServicePac® Service Upgrade:
4-yr Onsite/9x5/4-hr Response
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IBM recommends Microsoft® Windows® XP Professional for Business.

IBM Think Express Program.

Select and purchase IBM Think Express products, designed and priced for small and medium businesses.

IBM Service Upgrades

Protect your notebook with IBM ThinkPad Protection service. It covers accidental damages like drops, spills or damage to your ThinkPad LCD display. (Not available in all states; ask your sales representative for details.)¹²

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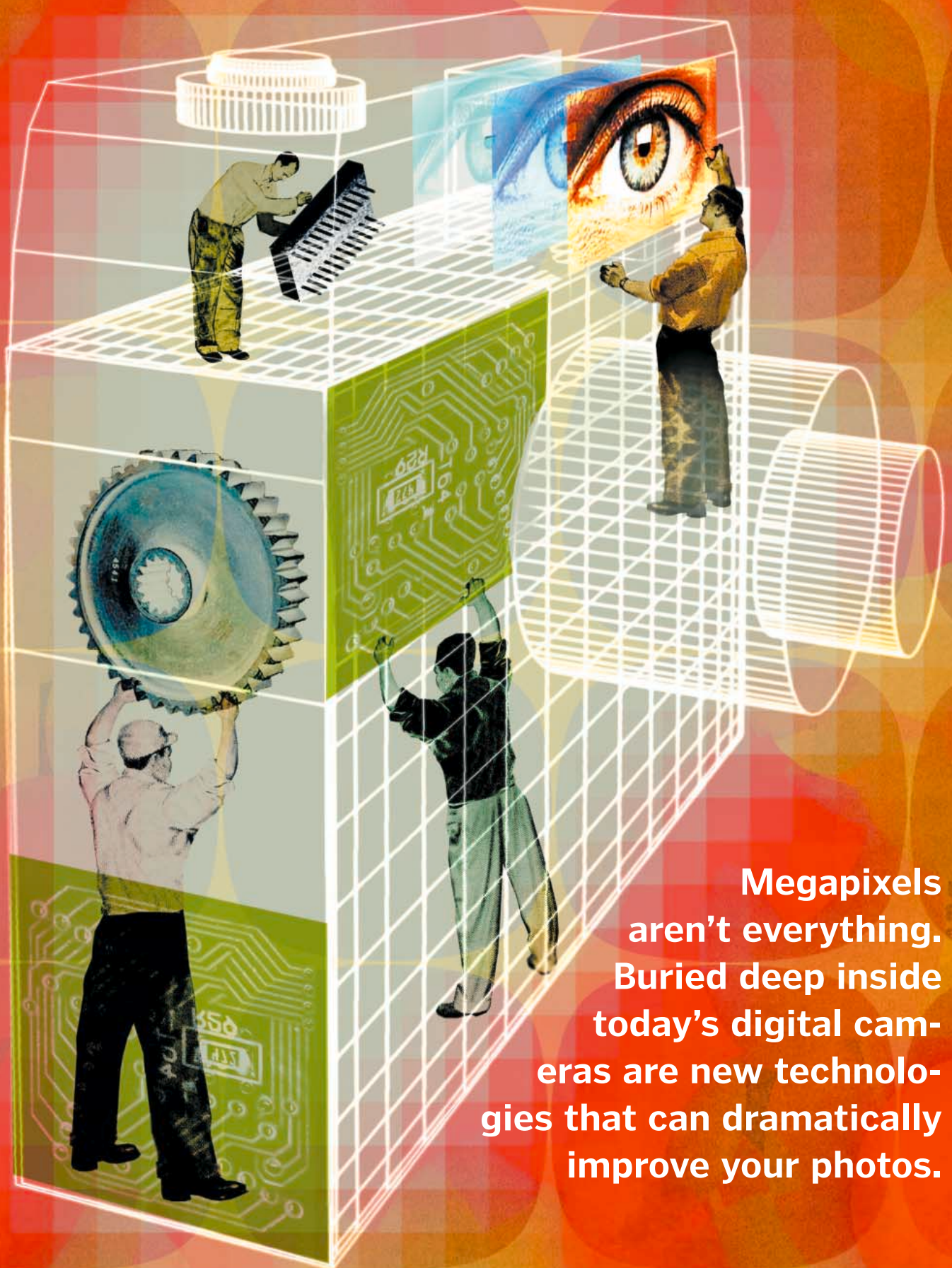
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**Megapixels
aren't everything.
Buried deep inside
today's digital cam-
eras are new technolo-
gies that can dramatically
improve your photos.**

LOOK into THE CAMERA

By Les Freed • ILLUSTRATION BY BRIAN STAUFFER

Take a walk through the digital-camera department of a consumer electronics store and you may find yourself dazed and confused. Sure, you know that more pixels are better, but there's a lot more going on behind the lens of a digital camera than many buyers realize.

Just a few years ago, we were wowed by the first 2-megapixel sensor. Today, 4MP cameras are entry-level, and 8MP consumer cameras hit the shelves just in time for the 2003 holiday season. The extra pixels deliver improved resolution and detail, and that means more lifelike images.

But pixels aren't everything. Camera makers are transforming the basic idea of how image sensors work, with their eyes on better dynamic range and color accuracy, higher resolution, and faster image capture. They've also developed innovative ways to deal with mundane problems such as camera shake and poor lighting—and even a low-tech problem like dust.

Digital cameras have changed the way we document and archive our lives and are on track to surpass film cameras in unit sales for the first time in 2003. Whether you're in the market for yourself or someone else, a basic understanding of new sensors and processing technologies can go a long way. On the following pages, we give you snapshots of seven of the hottest new developments.

IN THIS STORY: Technologies that tame...

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108 Weak Dynamic Range	112 Dust Particles	114 Slow Start-Up and Shutter Lag
109 Inaccurate Color		

Our contributors: **Les Freed** is a contributing editor of *PC Magazine*. Associate editor **Jeremy A. Kaplan** and PC Magazine Labs project leader **Glenn Menin** were in charge of this story.

PROBLEM: Image artifacts
SOLUTION: Foveon X3 Pro 10M



Available **in** THE SIGMA SD-10

THIS MAY COME AS a surprise, but the CCD and CMOS image sensors in most digital cameras are color-blind. They don't see color at all; they are monochromatic. To sense color, they use a mosaic of colored dots—typically red, green, and blue—to make individual pixels sensitive to a single color. This multihued *mask* is overlaid on top of the image sensor, with one dot per pixel.

The main drawback to a mosaic sensor is that the mask of colored dots reduces the sensor's effective resolution. A mosaic sensor produces three separate images—one image each for red, green,

and blue. Most cameras use two green pixels for each red or blue pixel, because most of the image detail is in the green spectrum. As a result, a typical 6-mega-pixel sensor produces 3 million green pixels, 1.5 million red pixels, and 1.5 million blue pixels.

Using a process called *Bayer interpolation*, a camera's firmware combines the red, green, and blue pixels to create a color image. This process computes an RGB color value for each pixel by analyzing the intensity of the neighboring pixels. The resulting image has the same number of RGB pixels as the sum of the pixels in individual red, green, and blue images.

For the most part, mosaic sensors work very well; they are used in virtually every digital camera on the market. Unfortunately, the interpolation process introduces undesirable artifacts into images,

including color aliasing and jagged edges on sharply defined objects.

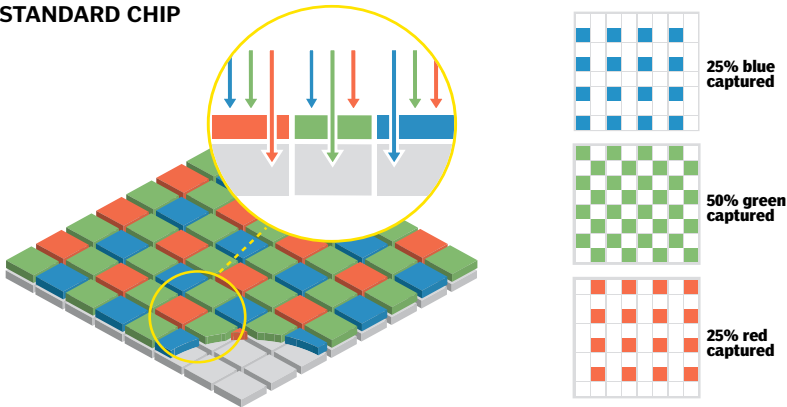
The Foveon X3 Pro 10M image sensor is unique in that unlike a monochromatic mosaic sensor, it is sensitive to all three primary colors. The X3 uses three layers of light-sensitive material, so each pixel is sensitive to red, green, and blue light. Foveon sensors don't have (or need) mosaic masks, and they don't use Bayer interpolation, because Foveon sensors produce an RGB value for each pixel.

When the X3 was introduced in 2002, industry analysts predicted the death of the mosaic sensor. Yet nearly two years later, only a single camera manufacturer—Japan's Sigma Corp.—is building cameras with the X3 sensor. The new Sigma SD-10, a digital SLR, uses the latest version of the X3, which offers better low-light sensitivity and improved image noise reduction. But many camera makers have a large investment in Bayer sensors. Several of the larger manufacturers—notably Canon, Fuji, Kodak, and Sony—make CCD and CMOS image sensors for themselves and also sell them to other camera makers. These companies view Foveon as a competitor rather than a partner, so the clever X3 faces an uphill battle.

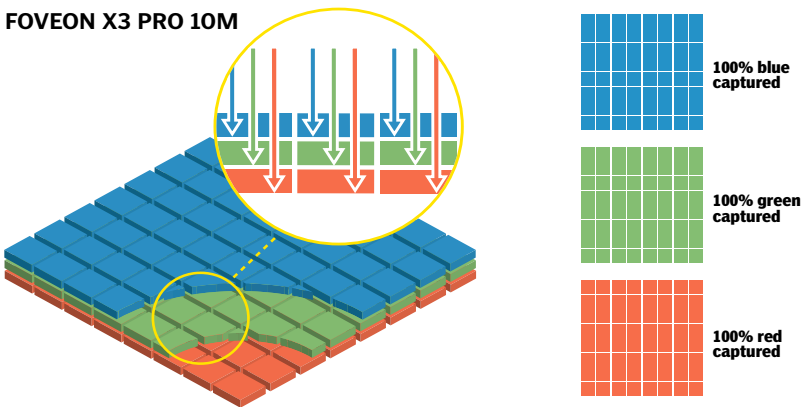
A RESOLUTION REVOLUTION

A mosaic pattern of colored dots on a single layer of silicon (top) lets standard sensors see color, but the setup impairs the resolution of the chip and may introduce artifacts. The new Foveon X3 Pro 10M (bottom) uses three layers of silicon, one to detect each color's wavelength, eliminating the interpolation step needed with the mosaic pattern and increasing the effective resolution.

STANDARD CHIP



FOVEON X3 PRO 10M



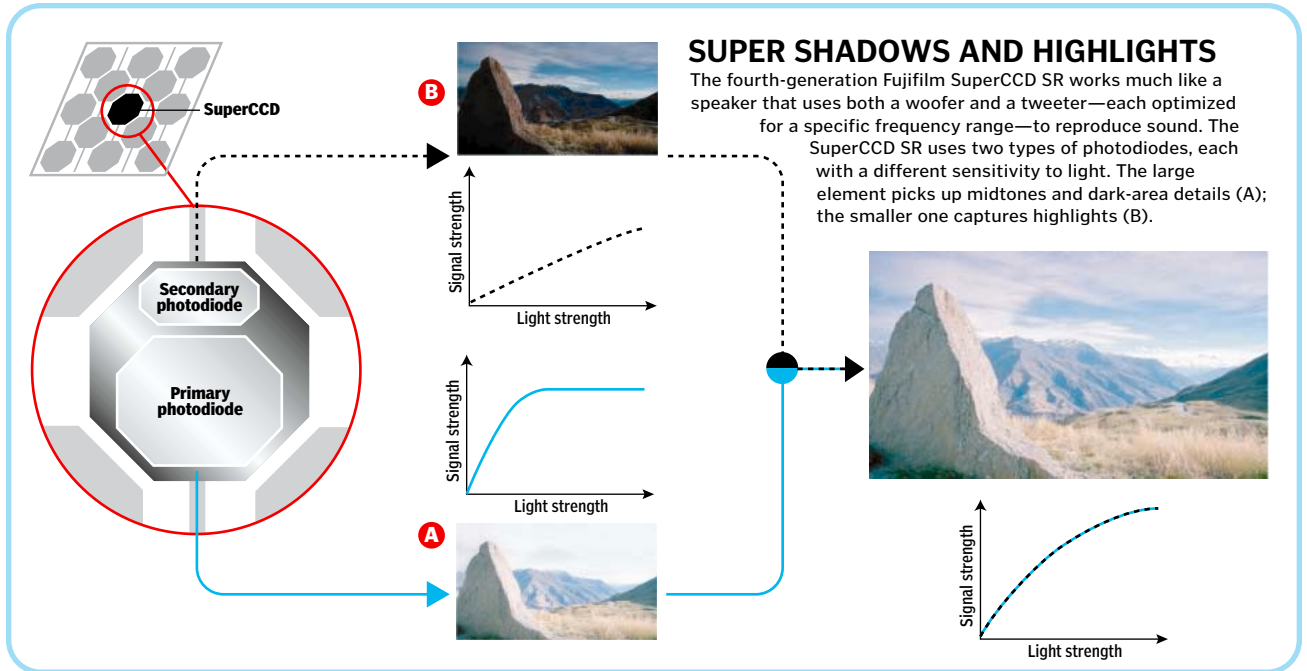
PROBLEM: Weak dynamic range
SOLUTION: Fujifilm SuperCCD SR image sensor

Available **in** THE FUJIFILM FINEPIX F700



DIGITAL CAMERAS have made tremendous strides in image quality and ease of use in the past few years, but they still haven't caught up to film models in some areas. Color negative film still offers dynamic range (the number of measurable steps between the darkest and lightest elements in an image) superior to most digital images. Cameras with weak dynamic range have trouble reproducing small details in dark areas of an image.

As the world's second-largest film manufacturer, Fujifilm knows a thing or two about film. The company's color negative film uses a mixture of high- and low-sensitivity silver halide crystals. The low-sensitivity crystals provide most of the image detail, while the high-sensitivity



crystals supply additional detail in dark areas. Together, the two deliver increased dynamic range and better shadow detail than cheaper consumer films with uniform-size crystals.

For several years, Fujifilm's high-end digital cameras have featured the company's SuperCCD image sensor technology. Where conventional CCD image sensors use a rectangular array of square pixels, the SuperCCD uses a honeycomb array of octagonal pixels. According to Fujifilm, the novel pixel arrangement maximizes the size of each individual pixel, resulting in higher sensitivity and lower noise.

The new Fujifilm SuperCCD SR sensor borrows an idea from the company's color negative film. It keeps the honeycomb pixel concept, but each pixel in the new sensor consists of two separate photodiodes called an *S-pixel* and an *R-pixel*. The larger *S*-pixels have higher light sensitivity than the smaller *R*-pixels. The SuperCCD SR combines the images from the two kinds of photodiodes to produce an image with more dynamic range than those generated by sensors with a single type of pixel.

So far, Fujifilm offers only one camera with the SuperCCD SR sensor: the pricey, pocket-size Fujifilm FinePix F700 (\$800 list). We'll have to wait a few months to see whether Fujifilm can bring its SuperCCD SR prices back down to Earth.

PROBLEM: Inaccurate color
SOLUTION: Sony RGBE Image Sensor

Available in **THE SONY CYBER-SHOT DSC-F828**



MOST DIGITAL CAMERAS on the market today use an RGB color filter array. Sony's new 8-megapixel CCD image sensor, due to appear in the upcoming Sony Cyber-shot DSC-F828 7X zoom camera (\$1,100 street), uses an innovative four-color Bayer mask. It uses the traditional red, green, and blue filters, plus a fourth color that Sony calls *emerald*—though it looks like cyan to us.

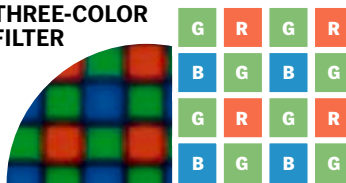
Some manufacturers already use four-color masks. For example, many Canon and Nikon point-and-shoot cameras use a cyan/yellow/magenta/green mask. But Sony claims that its RGBE mask offers more accurate color reproduction, with a color response that closely matches the color perception ability of the human eye.

The new Sony sensor is the latest salvo in the megapixel wars. With 8 million effective pixels, the chip packs in more pixels than any other two-thirds-inch CCD image sensor. And because Sony is one of the major chip makers, you can expect to see the Sony CCD in products from other manufacturers in the future.

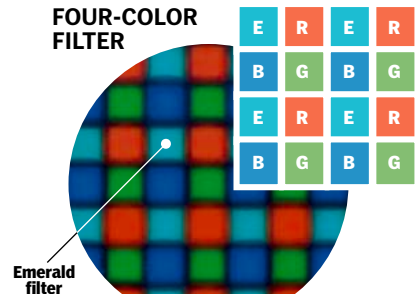
IN LIVING COLOR

Most digital cameras lay red, green, and blue filters over the pixels in their image sensors to glean color information from light (left). The Sony RGBE Image Sensor (right) uses four colors rather than three, adding an emerald filter for more accurate color reproduction.

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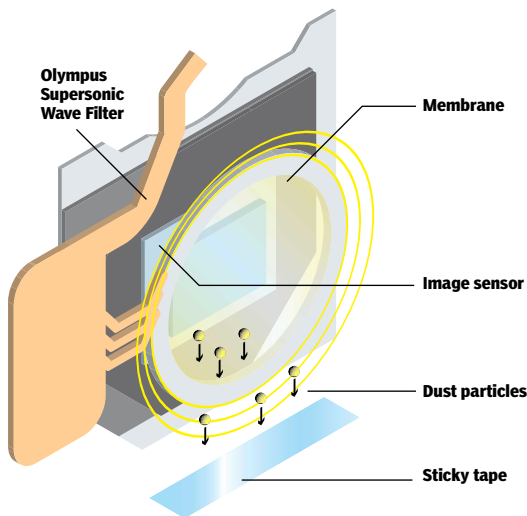


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SHAKE IT OFF

Dust on a lens is a problem. Dust on a CCD is a greater issue, requiring a visit to the local repair shop—until now. To seal out dust, Olympus has designed the Supersonic Wave Filter. At boot-up, a camera using this system vibrates a membrane, shaking off accumulated dust and capturing it on a piece of sticky tape.



PROBLEM: Poor contrast
SOLUTIONS: HP's Adaptive Lighting Technology; Foveon's X3 Fill Flash; Kodak's Digital SHO

Available
 in

THE HP PHOTOSMART 945, THE SIGMA SD-10, AND A PHOTOSHOP PLUG-IN, RESPECTIVELY



IF YOU'VE EVER TAKEN a digital photo of a high-contrast scene, such as a portrait of a person with a bright sky behind the subject, you've probably been disappointed with the results. Image sensors have very good dynamic ranges, but they don't handle high-contrast scenes very well.

To be fair, part of the problem is the JPEG image file format, which stores only 8 bits of data per primary color. A camera's image-processing chip has to compress the sensor's dynamic range into the JPEG format's limited 8-bit RGB color space.

The contrast problem isn't limited to digital cameras. Strongly backlit scenes have more contrast than any camera—film or digital—can handle. Professional and serious amateur photographers often use a technique called *fill flash* to help brighten the foreground subject. But many casual photographers don't even know their cameras have a fill flash, much less how to use it. And even if they do, fill flash often introduces its own set of problems, including harsh shadows and red eye—not to mention the limited effective range of most built-in flash units.

Three new technologies from Hewlett-Packard, Foveon, and Kodak help to ease the contrast crunch by analyzing and adjusting an image's tonal range to preserve shadow detail without blowing out bright highlight areas.

HP's Adaptive Lighting Technology is an in-camera technology, currently available only in the HP Photosmart 945 camera. The Photosmart 945 includes a feature called *digital flash*, which does exactly what its name implies—without actually using the camera's flash. The unit's digital flash boosts the brightness of dark areas without sacrificing detail in the brighter areas of the image.

The Photosmart 945 offers two levels of digital flash: a low setting for moderate-contrast subjects and a high setting for high-contrast scenes. HP warns—and our testing confirms—that the high setting will increase noise in the dark areas of photos. And since the effect is performed inside the camera, it is applied to the stored image file, so you can't reverse it later.

Foveon's X3 Fill Flash is applied via a software application after the image is taken. Cameras that use the Foveon chip record their images in a RAW file format instead of the more conventional JPEG for-

MORE ON THE WEB: If you find some terms in this story confusing, read our special glossary. And for reviews of digital cameras that use the technologies in this story, as well as dozens of others, log on to our site: www.pcmag.com/cameras.

mat. RAW image files contain the actual image sensor data as recorded by the camera, and RAW images can (and usually do) contain more than 8 bits of data per pixel.

Foveon's X3 Fill Flash can be applied to any X3 image file using Foveon's Photo Pro software, which is included with Foveon-based cameras. X3 Fill Flash is implemented as an adjustable slider that brings up the detail in shadow areas of an image. The slider lets you add just the right amount of fill flash to each image.

Kodak's Digital SHO is an Adobe Photoshop plug-in that does an amazing job of salvaging over- and underexposed digital images. It's also useful for adjusting the tonal range of high-contrast images. The filter analyzes and adjusts tonal range using a before-and-after display to preview the effect. Digital SHO is a Photoshop plug-in, so it works with virtually any type of digital image from any camera, as well as film scans. The other two technologies are more limited in their usefulness, since they are bound to specific image types.

PROBLEM: Dust particles
SOLUTION: Olympus Supersonic Wave Filter

Available
 in

THE OLYMPUS E-1



SINGLE-LENS REFLEX (SLR) cameras with interchangeable lenses are popular with serious amateur and professional photographers. Unfortunately, digital SLR cameras are very susceptible to dust. And if dust particles get inside the camera while you're changing lenses, they can stick to the image sensor and show up as dark spots in every photo you take.

Once dust sneaks into your camera, it will stay there until it is removed. Since digital image sensors are very delicate, some camera manufacturers recommend that shutterbugs bring dirty cameras into a service center for cleaning. As a result, many SLR users are reluctant to change lenses, especially when shooting in windy or dusty conditions. This, of course, detracts from their cameras' versatility.

The new Olympus E-1 digital SLR camera tackles the dust problem head-on with its Olympus Supersonic Wave Filter. The front of the E-1's image sensor is protected from dust by a movable membrane

connected to an ultrasonic transducer. During the camera's power-up cycle, the transducer vibrates the membrane at ultrasonic speeds. The motion of the membrane shakes off any dust, which is captured by a piece of sticky tape.

During our recent testing of the E-1, we took thousands of pictures with dozens of lens changes without a single dust spot in any of our images. Now there's no excuse for not cleaning up your photos.

PROBLEM: Camera jitter

SOLUTION: Minolta's
Anti-Shake

Available **in** THE
MINOLTA
DiMAGE
A1



AN OLD RULE OF THUMB says that you can get a sharp image from a handheld camera only when the shutter speed is the same as or faster than your lens's focal length. For example, to get sharp pictures on a 35-mm camera with a 300-mm lens, you need to shoot at $\frac{1}{300}$ second or faster to eliminate camera shake.

This indisputable rule explains millions of blurry pictures. As much as you'd like to have that shot of the baby hippo in the shade, the light is too dim, the shutter speed is too slow, and let's face it, you just can't beat the laws of physics.

Some camera manufacturers—notably Canon and Nikon—offer stabilized-image lenses for their digital and film SLR cameras. The finely tuned motion sensors in these lenses can detect the slightest camera movement. The sensors are connected to tiny motors that move a glass element inside the lens in the opposite direction, thereby canceling out the motion.

The net effect of these lenses is that they let you break the shutter speed rule with impunity—to a point. The Canon IS (Image Stabilized) lens and the Nikon VR (Vibration Reduction) lens let you shoot at about one-quarter to one-eighth the shutter speed of a nonstabilized lens. The problem is that these lenses work only on Canon and Nikon SLR cameras.

Minolta's new Anti-Shake technology, incorporated in the Minolta DiMAGE A1, provides the same advantages as optical image stabilization technology, but it operates in a whole different way. The A1 has two motion sensors, just like the Canon and Nikon lenses. But instead of

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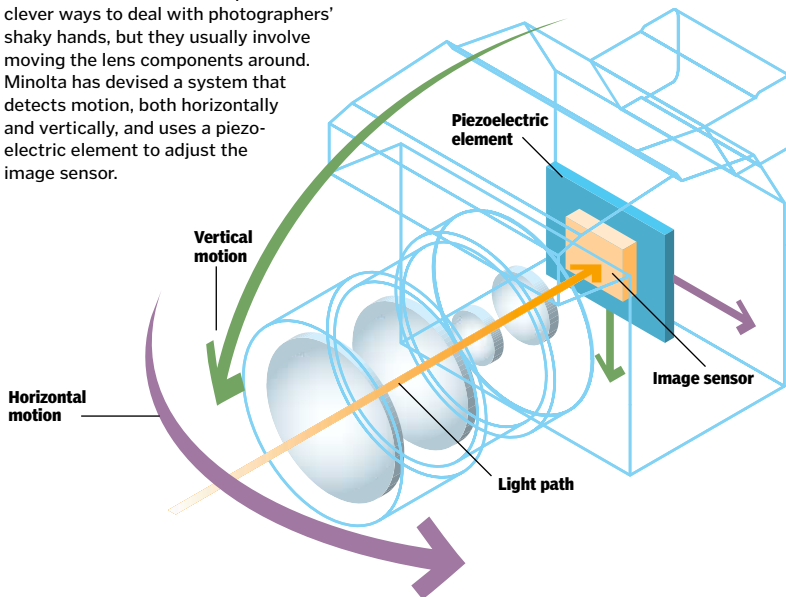
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CAMERA TECHNOLOGY

GOING STEADY

Manufacturers have come up with several clever ways to deal with photographers' shaky hands, but they usually involve moving the lens components around. Minolta has devised a system that detects motion, both horizontally and vertically, and uses a piezoelectric element to adjust the image sensor.



moving a glass element in the lens, the Minolta camera uses a piezoelectric element to move the CCD image sensor itself and counteract camera motion.

This extremely clever approach uses less power than optical image stabilization. During our recent testing of the Minolta DiMage A1, we got sharp images at shutter speeds as low as $\frac{1}{30}$ second, even with the lens zoomed all the way out to an effective 200-mm focal length.

PROBLEMS: Slow start-up and shutter lag
SOLUTION: Kyocera's Rapid Tuning Technology

Available **THE KYOCERA FINECAM S5R AND SL300R**



WE ALL HATE WHEN this happens: You spot a great photo opportunity and turn on your digital camera. But by the time it's ready to shoot, the moment has passed, lost forever. Or worse: You're at your kid's baseball game. The camera is on, and you're ready to take the picture. As your child leaps up to make the game-winning catch, you press the shutter release—and capture a nice image of the outfield fence, about 1 second after the catch.

Slow start-up and shutter lag plague many compact digital cameras. Although camera makers improve responsiveness with each new generation of cameras, most digital cameras are slower to respond than their film counterparts.

Two new cameras from Kyocera eliminate both of these problems—and some others—using a new technology called Rapid Tuning Technology, or RTune. The RTune system uses multiple, custom-built analog and digital processors that handle noise reduction, analog-to-digital conversion, JPEG compression, and memory card management as separate tasks. The result is that RTune-equipped cameras are as fast and responsive as some expensive digital SLR cameras.

Despite their tiny sizes, the Kyocera Finecam S5R and Finecam SL300R can shoot continuously at an amazing 3.5 frames per second and 3.0 fps, respectively, until the memory card is full. The SL300R can also capture VGA (640-by-480) video at a full 30 frames per second until the memory card is full.

RTune goes a long way toward making cameras faster and more responsive, but it doesn't help reduce shot-to-shot times when you're taking flash pictures, and it doesn't improve the speed of your camera's autofocus system. ■



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Take a Meeting

ONLINE

BY LEON ERLANGER

The new generation of Web conferencing services beats long lines at the airport any day.

Business travel has taken a beating in the past few years from the 1-2-3-4 punch of the September 11 terrorist attacks, the recession, the SARS epidemic, and the war in Iraq. The number of business trips Americans took fell almost 7 percent from 2001 to 2002 and dropped a further 4 percent in 2003, according to the Travel Industry Association of America. Not only have companies slashed travel budgets, even for travel-dependent departments such as sales and marketing, but people have also become less enthusiastic about spending time aboard airplanes.

Yet we live in a global economy, and people in far-flung locations still need to meet. Increasingly, they're doing so via Web conferencing services, which let both small and large groups of people share presentations and documents in real time over the Web. The services also deliver handy tools for collaboration, including chat rooms, whiteboards, document annotation, application sharing, Web polls, and Web tours. With most of the services, the audio portion of the conference is handled via standard phone conferencing.

Given the cost savings that Web conferencing can deliver, the market is positioned to take off in the next few years, growing from \$544 million in 2003 to \$2.2 billion by 2007, predicts the Radicati Group, a consulting and market research firm.

"Web conferencing emerged as a renegade application," says Andy Nilssen, senior analyst for Wainhouse Research. "Anyone with a browser, an Internet connection, and a credit card could fire up a Web conference without special equipment or the blessing of senior management." Increasingly, however, companies are embracing the technology not only to reduce travel expenses but also to speed up decision making by allowing the right people to collaborate instantly, no matter where they happen to be.

a. The presenter sets up the meeting.

b. The presenter's console during the meeting.

Web seminars, or *Webinars*, are also taking off for everything from sales events to education. The conferencing vendors are responding with tighter security, including SSL encryption, management tools for administrators, and installed solutions that can be set up behind a corporate firewall. *Webcasting* reaches an even larger audience than *Webinars* by broadcasting a one-way Web presentation and often using content delivery networks such as Akamai and Digital Island for faster throughput. (For descriptions of some of these high-end solutions, see the sidebar "Conferencing for Big Business.")

We tested four leading Web conferencing services—

IN THIS REVIEW

119 Genesys Meeting Center ●●●●

120 Microsoft Office Live Meeting ●●●●

125 Raindance Web Conferencing Pro Seminar ●●●●

126 WebEx Meeting Center ●●●●

Genesys Meeting Center, Microsoft Office Live Meeting, Raindance Web Conferencing Pro Seminar, and WebEx Meeting Center—as vehicles for small meetings and team collaboration. All of them offer the standard tools—Web-based PowerPoint presentations, document sharing and annotation, application sharing, whiteboarding, and chat—but they differ in multimedia features, meeting management tools, and integration with telephone conferencing.

Only Genesys and WebEx could show slide transitions, play the audio and video integrated with our test PowerPoint slide presentation, and conduct live videoconferencing. Genesys and WebEx were also the only services that could connect the names of Web participants with the telephone numbers they used to dial into the audio conference, easily allowing presenters to mute, unmute, and dismiss callers through a Web console.

We also found variations in the meeting management tools used to

assign moderators, presenters, and attendees, and to grant individual rights to annotation and application sharing during the conference. In these capabilities, WebEx stood out as the most complete service.

Microsoft's acquisition of PlaceWare and the addition of *Office* to the name of its Live Meeting service signals the company's strategy of integrating Web conferencing with other desktop Office applications. But WebEx offers the best integration right now, with a download that lets you start a Web conference and share documents directly from Office applications, such as Excel or PowerPoint, or by right-clicking on a document file. All but Raindance can integrate scheduling and conference initiation with Microsoft Outlook. And both Genesys and WebEx let you start a Web conference from your instant-messaging window.

Eventually, Web conferencing may become just another feature within other productivity applications. But if you want to meet on the Web today, you need one of the services we review here.

HOLDING A MEETING

- The Web presenter **UPLOADS A SLIDE SHOW, IMAGE FILES**, and any other files to be shared during the meeting to the Web conferencing service. He or she also completes the invitee list, schedules the meeting, and creates any polls or quizzes. An e-mail with a Web page link and telephone number is automatically sent out to all participants.
- The Web conference presenter **CONTROLS WHAT APPEARS ON PARTICIPANTS' SCREENS** (usually a slide show presentation or an application demo), has a list of who's attending (sometimes showing phone numbers), sees feedback from the participants such as "hand raising," and can sometimes dial out through the software to start a meeting.
- PARTICIPANTS CAN VIEW** presentations, speak over a telephone conferencing system, raise their hands with an on-screen icon, and sometimes urge the presenter to speed up or slow down. They can also engage in chat, whiteboarding, and polls.

c. The participant's view of the meeting.



PARTICIPANTS CAN BE ANYWHERE in the world, and some services let them transmit live video of themselves and receive live video of the presenter.

Genesys Meeting Center

33¢ per minute per seat (not including recordings). Genesys Conferencing, www.genesys.com. OVERALL RATING: ●●●●●

At just 33¢ per minute per participant, Genesys Meeting Center is a very competent service that works well for occasional small Web conferences, without forcing you to pay for unused time. Although Genesys claims that its telephone conferencing integration is the best on the market, we found WebEx's as good or better. Also, Genesys conferences are limited to 100 participants for audio and 250 for Web access, in contrast to the 2,500-participant limit the other services claim.

Genesys Meeting Center is the only service besides WebEx that could display live video and show the transitions and integrated audio and video on our test PowerPoint slide show. The

WEBEX MEETING CENTER

Thanks to its tight integration with Microsoft Office and other desktop applications, as well as its advanced Web-based call control, WebEx Meeting Center stands above the pack. Its videoconferencing and extensive array of tools for meeting management and collaboration sweeten the package.



Despite WebEx's clear superiority, other services had some strong points. Genesys Meeting Center is a very competent service with nice phone integration, multimedia, and collaboration features. We like Microsoft Office Live Meeting's slick Windows client and its excellent administrative features for large enterprises. And while RainDance Web Conferencing Pro Seminar is adequate for basic Web conferencing, we're looking forward to the release of RainDance's upcoming K2 product, which should take the service several steps beyond where it is today.

service converts PowerPoint into dynamic HTML to accomplish this last feat. In addition to the usual polling offered by the other services, Genesys lets you create quizzes and surveys. The latter can be used before, during, or after conferences to gather information about your participants, and you can view the results later. You can also annotate slides, share applications, work on a whiteboard, and send documents to participants.

When you sign up for an account, Genesys sends you an e-mail message and, through snail mail, a "credit card" with your meeting and personal identification numbers, which you retain for all your subsequent conferences. To enter the service, you go to www.genesys.com and choose a button for either moderator or participant log-on. To access a meeting, participants and presenters type in the meeting number, while the moderator must enter the PIN.

Moderators have full control over the conference. Presenters must be assigned by moderators and can make presentations, polls, Web tours, and so on, as well as chat with participants and set up chat rooms for private chats. Participants get rights only to certain features (such as annotations) when these are granted by the presenter or moderator. In some cases, as when sharing an application, the moderator or presenter can grant control only to one participant at a time.

Once logged on as a moderator, you can see what meetings are scheduled and prepare and

upload your presentation materials. You schedule meetings using the Web scheduler or Outlook plug-in, or by clicking on the Quick Meeting button for an instant meeting. You can then dial out to participants or alert them via e-mail to dial in.

Each participant is given an ID, which can link the individual's Web connection to the phone connection. The moderator or presenter can then use call control features such as muting, unmuting, and dismissing participants over the Web. These features are also available via the phone keypad. Unlike with Microsoft Office Live Meeting, however, you can't create an access-control list of permitted users.

Moderators can get help from customer service at any time without hanging up. We found customer service very helpful.

Genesys strongly recommends that you prepare all your meeting materials in advance. Although bringing up a new presentation or poll during a conference is possible, it's not as easy as with the

other packages. Scheduling and Outlook integration work well, though WebEx is more full-featured. The Meeting Center interface is not as Windows-like or elegant as that of Live Meeting or even WebEx. It is functional, however, and it has some nice features, such as emoticons that participants can use to tell the moderator or presenter to speed up or slow down and to indicate when they agree, disagree, or applaud what is being shown, or have a question.

Genesys offers a hosted archive of meeting recordings at \$200 for the first 90 days and \$100 for each 90 days thereafter. Zipped electronic recording files from an FTP site are \$100, and a CD of a recorded meeting costs \$50 delivered.

The bottom line: Genesys Meeting Center is a very capable service, though it's not as full-featured as WebEx.

Microsoft Office Live Meeting

Presenter edition, \$75 per seat per month or 35¢ per minute. Microsoft Corp., www.microsoft.com/livemeeting. ●●●●●

Microsoft recently acquired PlaceWare, a major Web conferencing player, and immediately put its mark on the service by adding a slick Windows client and offering it as part of Office 2003. It's the most elegant and easiest to learn of any of the services we tested. Surprisingly, it doesn't offer full integration with Office applications, though Microsoft hinted to us that integration is on the way. For now, WebEx offers the best integration with Office.

Microsoft Office Live Meeting falls short of Genesys Meeting Center and WebEx in terms of rich media integration and conference management tools.

There's no videoconferencing, no way to show PowerPoint slide transitions or integrated PowerPoint video, and no audio call control integration unless you work with an audio conferencing service that supplies it. Microsoft set us up with Encounter, which offers this feature, but unlike Genesys and WebEx, Live Meeting did not let us link the Web participants' names with their phone numbers. So although we could mute and unmute conferees over the Web, we had to know their phone numbers ahead of time to do so.

GENESYS MEETING CENTER offers excellent call control over the Web, allowing you to mute, unmute, and dismiss participants simply by clicking on their names.

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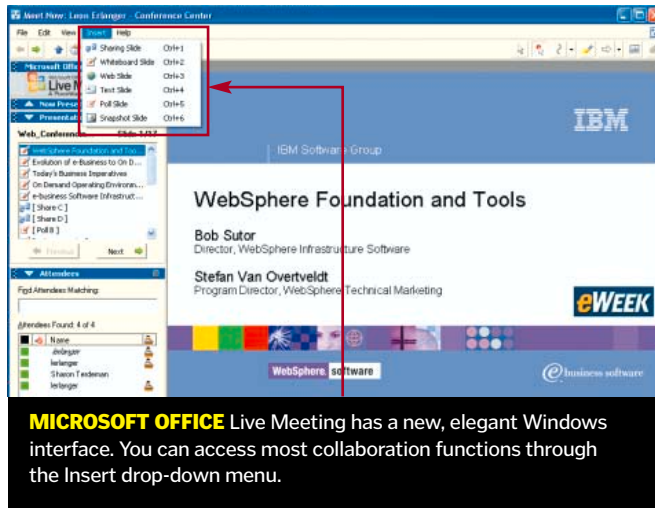
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Outlook integration is available with a download. But unlike with WebEx's, which lets you schedule meetings while you're off-line, you have to be connected to the Internet to use it.

Assigning conference privileges is also bare-bones. In each conference, presenters have full rights, while attendees' rights are limited. You can't promote an attendee to presenter status during a meeting, though you can assign attendees certain presenter privileges en masse—not individually—and you can give an attendee control of your desktop.

We also found it cumbersome to record meetings. You have to input the audio conferencing information into a separate recording console. Input the wrong numbers and you probably won't know that anything is wrong until after the conference is over.

What you do get with Live Meeting is excellent administration for large organizations. An administrator can assign rights to meeting organizers and create and manage rights for groups of users. The administrator can also assign rights both at the organizer level (organizers can schedule meetings) and at the mem-



ber level. You can create groups of members, as for accounting or human resources departments. Live Meeting let us limit meetings to members of the access-control lists we created—a valuable security feature. Reporting features are also comprehensive.

Once you're in a meeting, navigating is almost effortless. With the exception of recording, this was hands down the best interface of the bunch. It's a Windows application, and it feels like one, with intuitive menus, keyboard shortcuts, and the ability to drag panes around the desktop.

Everything in Live Meeting is a slide. You insert a sharing slide to share an ap-

plication, a whiteboarding slide to fire up the whiteboard, and so on. You can also cut and paste slides between two PowerPoint documents during your conference—a feature we didn't find in other services—or preview slides before you show them to the group.

A seating chart for the presenter shows feedback from attendees, such as "speed up" or "slow down," using a range of colors. Meeting participants can chat with one another individually or with the whole group, and a question-

and-answer panel gives meeting participants a way to ask the presenter questions. The presenter can then answer them individually or present a question and the answer to the whole group, give a questioner the floor to lead a discussion, or mark the most important questions for later attention. Finally, there's a nice Print to PDF option for printing out presentation slides.

Microsoft Office Live Meeting offers some very elegant capabilities, but it lacks others we'd like to see. Microsoft will certainly integrate Live Meeting more tightly with Office in the future, so expect upcoming versions to fill in the gaps.

SCORECARD



We base each service's **preconference scheduling and setup** rating on an evaluation of scheduling tools, including Outlook integration, registration forms, and address books, as well as preconference rights assignment and materials preparation. The **Web conference management** rating indicates how well the host can manage participants and materials during a conference, including assigning temporary rights to presenters and participants. **Collaboration** covers the effectiveness of such tools as presentation sharing, annotation, application sharing, Web tours, chat, Q&A, and polling. For **video-**

conferencing, we consider the dependability of the video feed, as well as how many cameras can be accommodated at once. For **audio integration**, we look at such factors as the moderator's ability to mute, unmute, and dismiss users and, in general, manage call control over the Web. A good rating for **recording** means that the service can archive a variety of the meeting's aspects, such as voice, pictures, Web tours, and application usage. For **administration and reporting**, we rate the completeness of tools for managing access roles and the types of reports offered. Our **interface** rating reflects how smoothly and intuitively the features can be accessed.

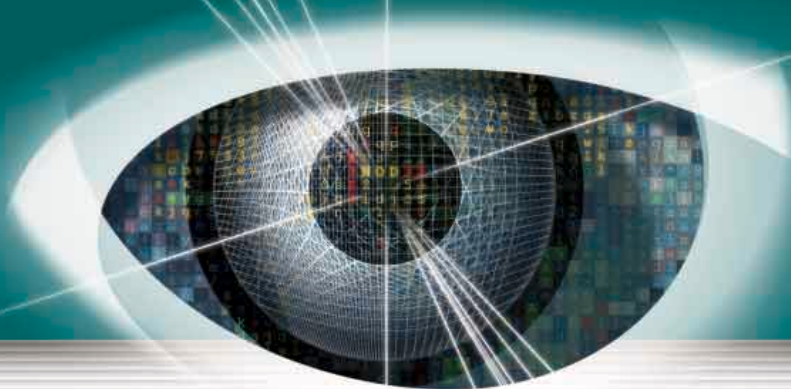
	Preconference scheduling and setup	Web conference management	Collaboration	Videoconferencing	Audio integration	Recording	Administration and reporting	Interface	OVERALL
Genesys Meeting Center	●●●●	●●●	●●●	●●●	●●●●●	●●●●	●●●●	●●●	●●●
Microsoft Office Live Meeting	●●●	●●	●●●	N/A	●●	●●●	●●●●●	●●●●	●●●
Raindance Web Conferencing Pro Seminar	●●	●●●	●●	N/A	●●●	●●●●	●●●	●●●	●●
WebEx Meeting Center	●●●●	●●●●	●●●●	●●●●	●●●●●	●●●●	●●●●	●●●●	●●●●

RED denotes Editors' Choice. N/A—Not applicable: The product does not have this feature.

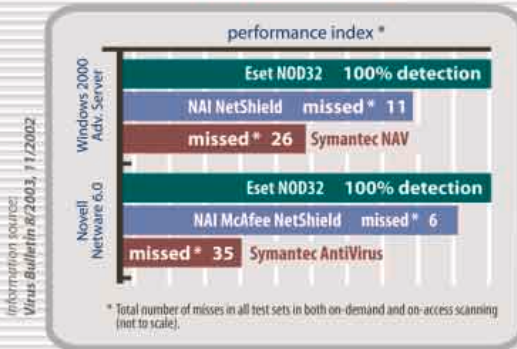


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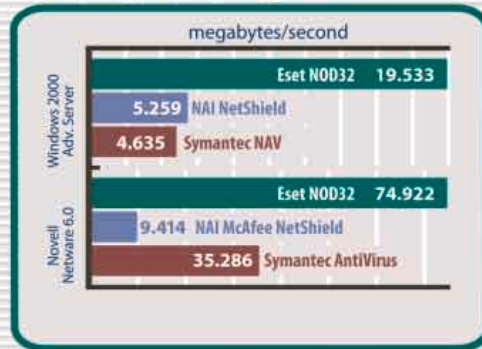
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CONFERENCING FOR BIG BUSINESS



What if your company wants to broadcast multimedia presentations to thousands of viewers? What if it wants the control that comes with managing its own on-site conferencing system? In these cases, the services reviewed in our main story don't fill the bill. And some organizations may prefer to run hardware appliances for their voice and video-conferencing needs. Here are summaries of services and products from some of the major players.

INSTALLED SERVER SOFTWARE

IBM Lotus bundles its Web conferencing software into **Lotus Instant Messaging and Web Conferencing** (\$48 per user), formerly known as Lotus Sametime. A clusterable server version (\$31,842 per CPU) offers unlimited scalability, or you can choose a service hosted by IBM (starting at \$8,000 for 100 users). The product offers two Java-based clients: one that runs in a browser, and the Meeting Room software client, which can now run on Linux and Unix as well as Windows.

Web Conferencing supports application sharing, whiteboarding, live audio, and video that can take advantage of a BeHere TotalView High Res 360-degree video camera. By default, the software uses the Domino directory server, but it can also use LDAP. (IBM Corp., 888-746-7426, www.lotus.com.)

Linktivity's **WebDemo Enterprise** (starting at \$3,249) is server software that lets you host your own meetings, which can include chat, application sharing, polling and quizzing, file transfer, record and playback, VoIP, document management, and desktop streaming. (Linktivity, 800-809-1245, www.linktivity.com.)

Macromedia's **Breeze** presentation platform targets enterprise training and corporate communication and lets you deliver multimedia using familiar tools. The **Breeze Live** component (\$83 per user per month, including video and archiving) can present Microsoft PowerPoint slides, live and recorded video, Macromedia Flash animations, screen sharing, audio, and text chat. (Macromedia Inc., 800-470-7211, www.macromedia.com.)

Centra Software's **Centra 7** (starting at \$50,000 for up to 50 named seats) is server software for Web meetings, seminars, virtual classes, and high-quality Voice over IP. The company also offers Centra Knowledge Composer Pro for creating Webcasts consisting of text, graphics, audio, video, animations, quizzes, simulations, or HTML files. (Centra Software Inc., 781-994-1168, www.centra.com.)

WEBCASTING

Avacaster 4.0, available either as a service (\$850 per month for ten concurrent users) or as a server you attach to your

network (\$21,000 for the first year's license for 25 concurrent users), combines Webcasting with Web conferencing. Based on Macromedia's Shockwave technology, it lets you tailor streaming audio and video to both low- and high-bandwidth attendees, and it also converts PowerPoint slide shows to Flash. Q&A, quizzes, polls, and chat are all included, as are Web conferencing features like application sharing, Web touring, and whiteboarding. (Avacast Corp., 866-282-2278, www.avacast.com.)

Infinite Conferencing does multimedia Webcasting that can be viewed with either Real or Windows Media and on Windows or Macintosh PCs. It provides phone conferencing, which starts at \$1,200 for up to 500 participants (up to 2 hours, with or without operators). The service can brand the conference page for you and archive your presentation for 3 months. Pricing for streaming video starts at \$1,650 for 1 hour (up to 50 participants). Online text Q&A and polling are supported, as are PowerPoint presentations. (Infinite Conferencing, 877-627-0861, www.infiniteconferencing.com.)

Sprint provides Web-based tools for large-scale presentations, Webinars, training, and other broadcasts—even if you need to reach over 25,000 viewers. **Sprint Online Presenter** delivers interactive presentations, including online polls and Q&A sessions. Pricing starts at 26¢ per minute per user with a minimum of 30 users. Sprint Streaming lets you broadcast live or prerecorded audio or video content over the Internet and archive your videoconference. (Sprint, 800-370-6105, www.sprintbiz.com.)

HARDWARE

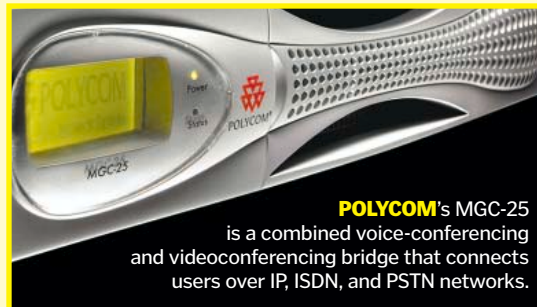
Mediasite LiveRL (\$22,000), from Sonic Foundry, is a complete presentation recording and broadcasting system for businesses, educational institutions, and government. The system includes all the hardware and

software you need to record, distribute, archive, and view multimedia-enhanced Webcasts. Its browser-based viewer, Live Navigator, offers interactive features like Q&A, polling, and navigation for presentations. (Sonic Foundry Inc., 877-783-7987, www.sonicfoundry.com.)

Polycom has long been a leader in phone conferencing hardware. **Polycom Web Office** (\$600 per seat, with a five-seat minimum) is an integrated voice, video, data, and Web communications system that takes advantage of the company's MGC multipoint conferencing appliances (starting at \$22,000), which can bridge ISDN and IP networks.

Polycom also offers WebOffice for desktop portal access to instant messaging and data, audio, and video conferencing. (Polycom, 800-765-9266, www.polycom.com.)

—Michael W. Muchmore

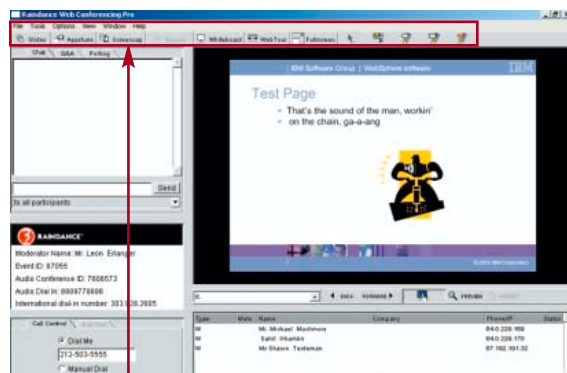


POLYCOM's MGC-25 is a combined voice-conferencing and videoconferencing bridge that connects users over IP, ISDN, and PSTN networks.

Raindance Web Conferencing Pro Seminar

\$131 per seat per month with a 12-month contract.
Raindance, www.raindance.com. ●●●●●

Raindance Web Conferencing Pro Seminar is the only service in this review that doesn't yet offer Outlook integration. It also lacks videoconferencing, slide transitions, and video integration with



RAINDANCE WEB Conferencing Pro Seminar's interface provides access to most collaboration functions via buttons arrayed across the top of the display.

PowerPoint presentations. Even adding materials during a conference isn't as easy as it should be. But what's there works well, and the interface, while not as intuitive as that of Live Meeting or WebEx, didn't take long to master.

To get to your conferencing page, you go to <http://seminar.raindance.com>, where you can log on as either the moderator or a participant. Unlike with the other services, all participants must set up accounts in order to take part in a meeting. Though these accounts are free, it still means filling in a long registration form and creating a password.

Once on the main page, moderators can start a meeting instantly or schedule one for the future. They can also upload presentations and create polls. As with Genesys, you're well advised to prepare and upload your presentation and other seminar materials in advance. It's not impossible to create or upload them while you're in a conference, but that takes a lot more time and effort than with WebEx and Live Meeting.

Raindance lets you limit the number of participants in a meeting and assign a password to each meeting. You can also appoint presenters, limit attendance to a predefined list of participants, and com-

pose questions to be answered at registration. Though Raindance claims to offer Web-based call control, it shows a given Web conference participant's name and phone number separately. So, as with Live Meeting and Encounter, you must know each person's phone number to mute or unmute participants over the Web. For security, you can limit the view that participants see to a small region of the application you're sharing.

Raindance offers both chat and Q&A, so you can answer each questioner individually, publish the question to the group, delete the question, or flag it for a later response. And you can designate co-moderators during a conference.

Early in 2004, Raindance plans to introduce a new audio, Web, and video conferencing service, nicknamed K2. The company claims K2 will have integration with Outlook, full support of animations and

presentation transitions, multipoint videoconferencing, an interface with context-sensitive task panes, and granular permissions for larger enterprises. It will be available in a scalable architecture, either as an application service provider (ASP) or in a hybrid ASP/on-site configuration.

Raindance is not as sophisticated as the other services we reviewed, but we look forward to the release of K2, which sounds like a big leap forward.

WebEx Meeting Center

Standard version, \$100 per seat per month; Pro version, \$200 per seat per month. WebEx Communications Inc., www.webex.com. ●●●●●



Owning over 60 percent of the market, WebEx is the Web conferencing service to beat. The new version of WebEx Meeting Center is fully loaded and earns our Editors' Choice hands down. For more targeted needs, WebEx also offers Training Center for education, Support Center for customer support, and Event Center for large Webcasts.

Of all the services we evaluated, it offers the best integration with Microsoft Office. A special download adds a dropdown menu to all your Office applications, so you can crank up an instant con-

TRANSFORMATION



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SUMMARY OF FEATURES

Web Conferencing Services

Download this table at www.pcmag.com.

■ YES □ NO	Genesys Meeting Center	Microsoft Office Live Meeting	Raindance Web Conferencing Pro Seminar	WebEx Meeting Center
Price	33¢ per minute per seat (not including recordings)	Presenter edition, \$75 per seat per month or 35¢ per minute	\$131 per seat per month with a 12-month contract	Standard version, \$100 per seat per month; Pro version, \$200 per seat per month
Scheduled/instant conferences	■ ■	■ ■	■ ■	■ ■
Recurring conferences	■	■	□	■
Can schedule conference from Microsoft Outlook	■	■	□	■
Can start conference from instant-messaging client	■ (MSN Messenger)	□	□	■ (Yahoo! Messenger)
Can start conference from other Office desktop applications	□	□	□	■
CONFERENCE MANAGEMENT AND COLLABORATION				
Can dial out to attendees	■	□	■	■
Can mute attendees via phone/Web	■ ■	Optional Optional	■ ■	□ ■
Previews slides/Displays transitions	□ ■	■ □	■ □	■ ■
Moderator can assign another presenter during conference	■	□	■	■
Slide shows can include video/audio	■ ■	□ □	□ □	■ ■
Polls/Quizzes	■ ■	■ □	■ □	■ □
Web tours	■	■	■	■
Annotations/Whiteboards	■ ■	■ ■	■ ■	■ ■
Application sharing/Text Q&A	■ ■	■ ■	■ ■	■ □
Videoconferencing/Meeting minutes	■ ■	□ □	□ □	■ ■
Attendee can chat with presenter/group	■ ■	■ ■	■ ■	■ ■
Attendee can chat with individual attendees	■	■	□	■
Can record presentation/audio/chat	■ ■ ■	■ ■ ■	■ ■ ■	■ ■ ■
Can download/post recordings on conference site	■ Optional	■ ■	■ ■	■ □
CONFERENCE SECURITY				
Administrator/moderator roles	□ ■	■ ■	■ ■	■ ■
Presenter/attendee roles	■ ■	■ ■	■ ■	■ ■
Meeting password/Access-control list	■ □	■ ■	■ ■	■ ■
Can encrypt conference via SSL	■	■	■	■
Can dismiss user/lock meeting	■ ■	■ □	■ ■	■ ■

RED denotes Editors' Choice.

ference that shares whatever document and application you're working in. You can also start a conference to share any file in any application by right-clicking on the filename and choosing *Share in WebEx Meeting*, or start a *One Click Meeting* using a desktop icon.

WebEx allows multipoint videoconferencing with up to four cameras concurrently (you can change who is shown during the meeting). And it's the only one, aside from Genesys, that could play the video and audio integrated into our test PowerPoint presentation.

To play audio and video this way, you have to download and install a special toolkit that plugs into PowerPoint and adds menus for inserting videos and other items into presentations. If you insert video and audio in the normal PowerPoint way, they won't show up in WebEx, since WebEx trans-

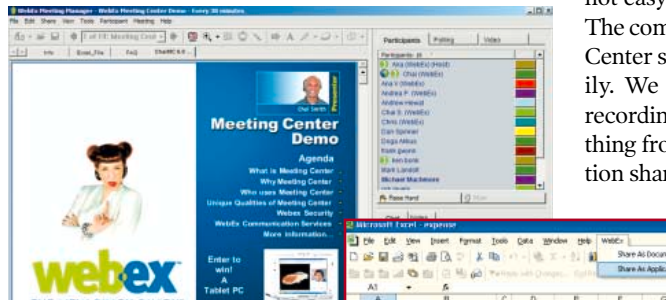
lates everything into its own Universal Communications Format. In the late pre-release version of WebEx Meeting Center we reviewed, integrated video was a bit erratic, but WebEx reps claim it will work consistently in the final release. Like Genesys, WebEx was able to show our slide transitions.

WebEx has pulled ahead of Genesys in teleconferencing integration. WebEx effortlessly linked our Web conferees with their phone numbers and allowed us

to mute, unmute, or dismiss participants over the Web simply by right-clicking on their names in the participant box.

WebEx had the best Outlook integration of any service we tested, allowing us to add a short registration from within Outlook and to distribute a full meeting transcript—including the agenda, a participant list, meeting notes, the presentation, and all chatting and polling information—after the meeting. You can also record meetings and download the recordings, though it's not easy to post recordings to a Web site. The company's Training Center and Event Center services let you do this more readily. We had quick success at creating recordings in WebEx that included everything from presentations to chat, application sharing, and Web tours.

The WebEx interface isn't as effortless as Live Meeting's, but it's more powerful. Assigning rights to participants and making them presenters or hosts is a simple matter of right-clicking on their names



ONLY WEBEX offers a downloadable add-in that lets you strike up a Web conference from inside a Microsoft Office application.

SHARING MOMENTS AT KODAK



Global travel expenses are never a pretty picture, especially for a company like Eastman Kodak. With headquarters in Rochester, New York, and product developers located in Gifu, Japan, a business trip for just one person can cost thousands of dollars.

Given its widespread workforce of almost 70,000 employees, coupled with a global customer base, Kodak was a natural fit for Web conferencing services. After a few years of hiring independent contractors to run training and other large Web events—and using NetMeeting on occasion—Kodak realized that its scattershot approach was not only adding unnecessary expenses but also complicating its IT infrastructure.

So in January 2000 the photography giant settled on WebEx, and it has been pleased with the results. This year Kodak saved over \$1 million in travel expenses, enjoying a total return on investment of over 200 percent. Kodak uses three WebEx services: Meeting Center, Support Center, and Event Center. With these tools, Kodak makes company-wide announcements and updates employees on changes in benefits. Its human resources department recently conducted a series of meetings concerning a new benefits package.

The company also holds virtual meetings with global clients and provides remote customer support for photo finishers. "Customers can contact the service technicians and get computer-related problems solved on the spot," says Ronald Auble, technology manager of Kodak. "In the past, it required an expensive and time-consuming service call to get the same result." Other employees are using WebEx to educate retailers about imaging products.

The initial rollout of WebEx limited meetings to only 30 participants. Today, Kodak can host an unlimited number of participants in Web conferences. Of course the solution isn't perfect. In events with around 2,500 connections, important visual clues such as body language are missing. And while Kodak plans to evaluate the use of streaming video, the broadband-hogging technology will most likely be reserved for troubleshooting equipment problems.

Despite these minor drawbacks, WebEx has been an easy-to-use solution for Kodak. "For those new to virtual meetings, a computer-savvy person is comfortable hosting meetings within an hour," says Auble. "And in 2 or 3 hours, computer-phobic people are hosting meetings."

Kodak now holds about 1,400 meetings per month, and the number is growing. Employees have become more comfortable with Web conferencing and are even developing new ways to use it. Talk about turning around a negative situation!—*Jennifer Harsany*

in the Participant window and selecting the desired attributes. During a meeting, you can easily open and run presentations, conduct polls and Web tours, and share applications, though there's little capability for premeeting preparation. WebEx has two options for sharing Web content. One lets you share a single Web page, and another lets you take participants on a tour.

The service makes great use of its advanced switched network, but the quality of streaming video was erratic at best.

Sometimes it worked exceptionally well; other times it took a long time to load and then froze. But we had the identical experience with the other services offering video. This performance kink could be ironed out in the final release.

We did miss a formal Web-based Q&A capability and an easy way to post recordings to our WebEx Web site. Despite these quibbles, WebEx Meeting Center offers the best combination of features and ease of use among all the four services we tested. ■

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Our contributors: **Leon Erlanger** is a freelance technical writer. **Jennifer Harsany** is a *PC Magazine* intern. Associate editor **Michael W. Muchmore** was in charge of this story.

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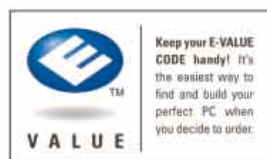
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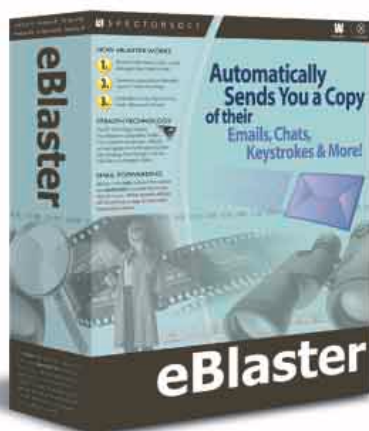
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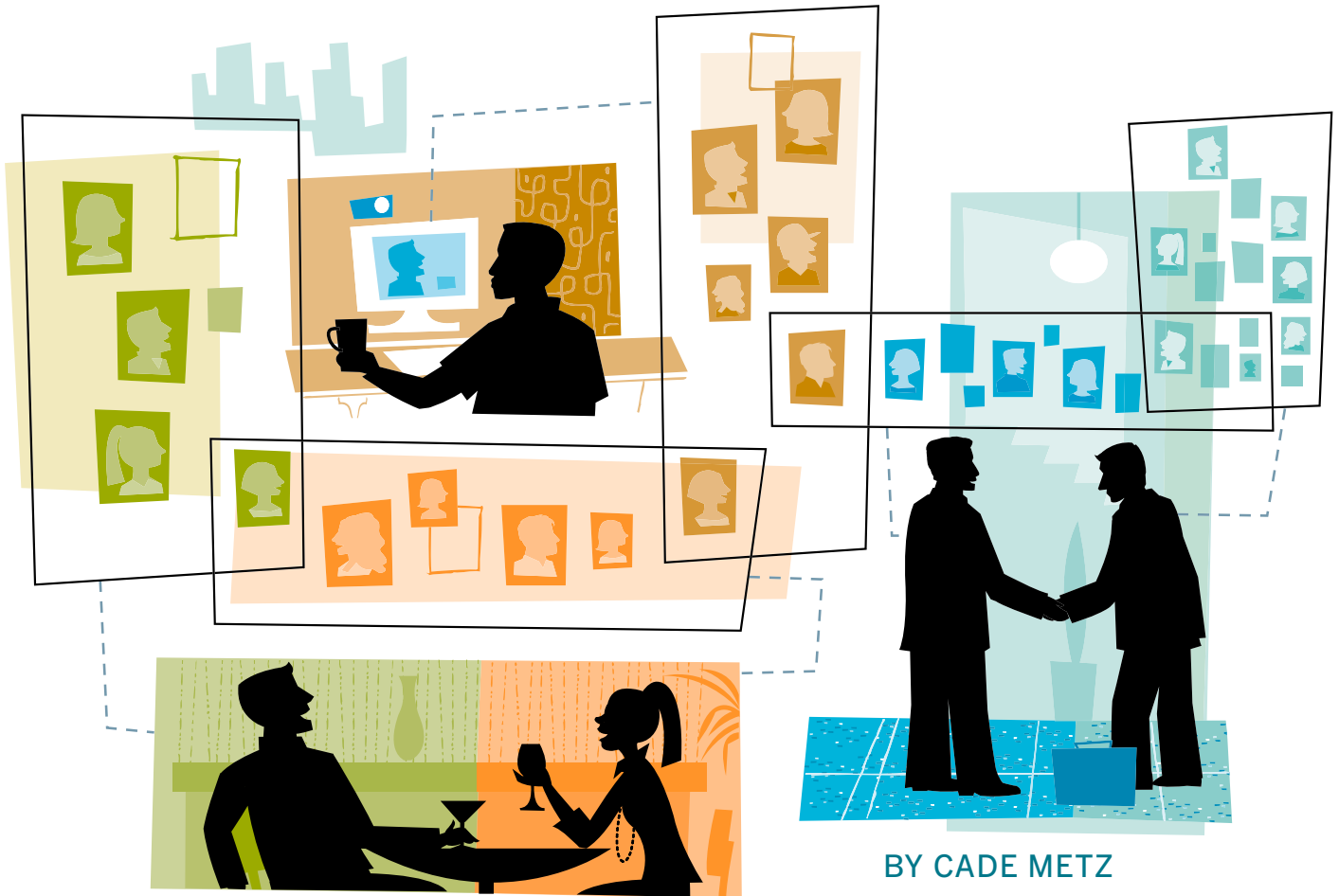
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BY CADE METZ

Make Contact

SAN JOSE ENTREPRENEUR KEN TOREN NEEDED A SALES DIRECTOR. HE WAS LAUNCHING REDMEDIC (WWW.REDMEDIC.COM), A COMPANY THAT GIVES USERS QUICK ONLINE ACCESS TO THEIR MEDICAL AND INSURANCE RECORDS. ACROSS TOWN, TINA MITIGUY WAS LOOKING FOR A SALES DIRECTOR POSITION

at a health-care and technology company. Unbeknownst to either of them, the two were connected by friends and colleagues. Ken knew someone who knew someone who knew someone who knew Tina.

A year ago, they may have never met. Ken might have posted a want ad that Tina would never see. Tina may have felt uncomfortable asking friends for job-hunting help. Had they met, it would likely have been after days of phone calling. As it turned out, however, each had registered on a fledgling Internet service called LinkedIn, and they met with almost no hassle. LinkedIn told Ken that Tina was only four degrees away, and with the site's help, he asked their mutual friends and colleagues to introduce them. Today, she's REDmedic's sales manager.

Introduced by Stanley Milgram in 1967, the theory of six degrees of separation, which supposes that you're just a half-dozen introductions away from anyone you want to

meet, has found the Internet. Sites like LinkedIn, which take hold of the six-degrees concept and put it to practical use, let you take advantage of chains of acquaintances to contact people down the line. They're known as *social-networking services*. Such services use the Internet to help users expand their networks of personal and business relationships.

The process is simple. After joining one or more of these sites, you send messages to people you know, asking them to join. They in turn invite people they know, and so on. In this way, you construct an enormous network of people to whom you have personal links.

With some sites, you have direct access to anyone in your network. In others, you can contact someone only by requesting an introduction through a mutual acquaintance or chain of acquaintances. The basic idea is always the same. When you contact someone, you're not contacting a complete

IN THIS STORY

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stranger. The person has a reason to trust you. And you have reason to trust that person.

The sites we review here are similar in concept but different in implementation. LinkedIn and Ryze focus on building professional relationships as well as helping you find a new job, hire new employees, hunt down new business partners, or seek professional advice. Others, like Friendster and Friendzy, are more geared toward after-hours relationships. They're great for finding a date or a new group of friends. Tribe.net has a feature that lets members come together in discussion groups, or Tribes.

All the services in our roundup, except Ryze, are in beta, so it's hard to say whether they will prosper. Their effectiveness comes down to how many people use them. Friendster boasts 3 million users; none of the others has even approached 100,000. The basic idea at the heart of the sites is certainly a sound one, though. Just ask Ken and Tina.



You can search Friendster's gallery via keyword for people with common interests.

ALL REVIEWS
BY RICHARD V. DRAGAN

Friendster (beta)

Free. Friendster Inc., www.friendster.com. ●●●●●

Friendster is a veteran in the social-networking field, having started over a year ago. The strength of the site is its vibrantly eclectic collection of members—over 3 million of them.



Although you can search for anyone on Friendster, you can contact only connected friends (even if they're several degrees away). If you have a falling-out or are bothered by a particular member, you can delete others from your network, thus stopping direct contact.

Although Friendster focuses on relationships, it can be used in other ways. Members can create dummy accounts representing institutions, such as high schools, colleges (first name *Harvard*, last name *University*, for example), and even companies, then add them as friends. A quick search revealed friends for many well-known colleges, which members can link to, creating ad hoc

alumni groups. This workaround gives members an ability that is already built into Tribe.net, with its customizable groups for alums and businesses.

Friendster's look is simple—a stark contrast to edgier choices such as Friendzy. And there isn't much here in the way of extra content. Again by contrast, Friendzy offers member stories and polls, and Tribe.net's thriving forums can keep restless members interested. Friendster does promise more bells and whistles soon, including support for events. According to Friendster CEO Jonathan Abrams, "tons of features" are in the works for once the site's performance, which was noticeably sluggish in testing, is brought up to speed for launch.

Signing up with Friendster is easy and entails little risk to your privacy. Members can quickly move on to inviting other friends to join or searching the user base for new friends. Members already in relationships can designate themselves "just here to help" and facilitate introductions between their single friends.

To find Friendster members, you can search the site's impressively extensive galleries by obvious characteristics like age, gender, and marital status, as well as geographical location (including distance from a city, for example).

Friendster's free-form profile doesn't include many prefab categories for searches, but it's fun to explore the profiles, which many Friendster users clearly spend a good deal of time crafting and fine-tuning. Users list interests, with each turning into a hot link in their profiles. When you click on a link, you get a list of everyone in your network with similar interests. While this feature can be hit-or-miss (a potential contact may have listed *cycling* instead of *biking*, as you did), members soon get the hang of it.

Our contributors: **Cade Metz** is a senior writer and **Richard V. Dragan** is a contributing editor of *PC Magazine*. Associate editor **Sean Carroll** and *PC Magazine* Labs project leader **Neil J. Rubenking** were in charge of this story.

SCORECARD



Since the purpose of a social-networking service is to grow your personal or professional network, it has to have a sufficiently large **population** of members to draw on.

The **appropriate privacy** controls vary, depending on the type of service. For professional networking, it's important to limit who can connect with you, while personal networking can be more open. In both cases, the ability to ban unwanted connections is important.

Comprehensive, searchable **user profiles** help members decide whether to connect with one another. Finally, we expect services to offer a variety of methods for **making connections**—comparing your address book with existing member lists, searching by common interests, and setting up real-world meetings.

	Ease of use	Population	Appropriate privacy	User profiles	Making connections	OVERALL
Friendster	●●●	●●●●●	●●●●	●●●●	●●●●	●●●●
Friendzy	●●●	●●	●●	●●●●●	●●●●	●●●
LinkedIn	●●●●	●●●	●●●●●	●●●●	●●●●	●●●●
Ryze	●●●●	●●●	●●●●	●●●●	●●●●	●●●●
Tribe.net	●●●	●●●	●●●●●	●●●●	●●●●	●●●●

Chances are, if you know people doing social networking, they have accounts at Friendster. It's a lot easier to link to members than to invite new people to join. For now, Friendster's appeal is its simple and effective interface and its diverse user base. Being the first to market and grabbing such a large audience makes Friendster hard to beat.

Friendzy (beta)

Free. Friendzy, www.friendzy.com. ●●●●●

Friendzy may be new to the game (the newest here, anyway), but this promising entry has an eye-catching design and creative spirit poised to catch the eye of any 18- to 35-year-old Web surfer looking to make personal connections. The preview version has fewer features than Tribe.net, for example, but it has more than Friendster and even more in the works. What Friendzy does have shows promise. The site has farther to go than some of its competitors, however, especially in the areas of membership critical mass and privacy features. We also came across a few clunky interface problems.

The site's strengths are its striking visual design and extensive personal profile detail: There are more categories of personal interests (favorite books, movies, causes, and more) here than with any other site in this roundup. And like Friendster, Friendzy lets you enter comma-separated interests, each of which becomes a hot link in your profile. You can search other members' categories, though the search screen forces you to choose just one field to search, which is restrictive.

You can view members in your personal network through four degrees of connection, though in the beta version, viewing

friends isn't a cumulative process. Users at the third degree of connection are shown without the second and first, which is awkward. There also doesn't seem to be a way to break links to specific friends.

More troubling is the fact that in this beta, Friendzy gives users little control over personal contact settings. There's

no way to uninvite or disconnect current friends once they've been invited. At least Friendzy promises not to disclose your account information to third parties.

Friendzy keeps things light and energetic (when we saved our profile, for example, Friendzy replied with "Excellent," instead of the standard "OK"). Its bright, multicolored interface is always interesting and definitely on target for its

professed younger target demographic.

Like Friendster and Tribe.net, Friendzy provides a complete in-site messaging system. The site includes user-defined polls, always a staple of online dating sites, improved by letting individuals design and distribute their own custom polls. Users can also post stories, which other users can comment on. A separate section of the site (called Friendzine) publishes recent stories and polls. Such features, which are clearly intended to build a community and keep members coming back, lack the depth of Tribe.net's forums.

Friendzy plans to generate revenue via partner relationships and its listing facility. There's a job listing section, but it has quite a ways to go before it's ready for launch. In the beta version, we found no listings for anything in New York City, for example. This illustrates one of the real problems with Friendzy: Seeking friends on a social-networking site with less than 10,000 members (compared with Friend-

Try Them All

Since only one service reviewed in this roundup is out of beta, it's too soon to declare an Editors' Choice. In addition, none of the services we looked at is drastically different from any other in

terms of feature sets; all of them do a very good job at facilitating contacts. And all the sites are free to join, so choose the ones that interest you. But be careful not to harangue all your friends to follow you to every site, or you may not be able to call them friends much longer.

That said, there are some recommendations we can make. Executives should try LinkedIn. At best, it could be incredibly useful. At worst, the site guards your privacy and doesn't waste your time. Ryze is a very strong site for business users of less exalted levels, and it's a very mature product—the only one we reviewed that's a full-release version.

Tribe.net is strong in the personal-network space; its Tribes feature brings an additional element to social networks, adding the ability to create discussion groups that allow for more levels of interaction with like-minded users.

Friendzy looks like it has the potential to go far, but we recommend one of the other sites until Friendzy addresses its problems with privacy control.

Friendster, the oldest of the sites here, is one of the least feature-rich. Yet it has 3 million users—more than 50 times as many as its nearest competitor. Until the others catch up, Friendster will be the 3-million-pound gorilla of social networking, and those curious to see this concept in its full glory have to at least try the service. And if the others don't catch up, Friendster will be the place to be regardless of its features—or lack thereof.



The screenshot shows the Friendzy website interface. At the top, there are navigation links: HOME, ABOUT FRIENDZY, FAQ, and TERMS OF USE. Below that, there are buttons for INVITE OTHERS and SEARCH FOR PEOPLE. The main content area features a section titled "What's Happening?" with a poll question: "Hey, hey, hey, hey! Extra, Extra, Read all about it. Take thought provoking new polls about fashion, politics and things like, 'which way do you hang your toilet paper?'" Below the poll, there are two columns: "Stories" and "Member Polls". The "Stories" column contains a story about David Letterman's girlfriend, and the "Member Polls" column contains a poll about favorite action movie stars.

Friendzy keeps users interested with Friendzine, a place for users to post stories and polls.



The Real World

Sites like Friendster, LinkedIn, and Ryze feed off real-world relationships. They grab social networks you've forged with handshakes and face-to-face conversations and move them online, using the Web to fine-tune and expand them. But the Internet can also drive social interaction in the opposite direction. It can gather strangers from the far reaches of cyberspace and throw them together in the real world.

Such is the mission of Meetup (www.meetup.com), a free Web service that brings together like-minded strangers, letting them organize face-to-face gatherings, or *meetups*, at local coffeehouses, bars, and bowling alleys. Since its launch in June of last year, more than 780,000 people have signed up for the service, organizing meetups involving nearly 2,400 topics in over 600 cities around the world. It brings together pug lovers in Portland, raw-foodists in Toronto, and Ultima players in Singapore.

This summer, Meetup was discovered by the Howard Dean campaign, famous for its Internet savvy, and the site was soon facilitating huge monthly meetings for supporters of the presidential candidate. To date, nearly 140,000 people are registered for Dean meetups. Competing campaigns have followed suit.

The rise of Meetup is mirrored by another Internet phenomenon: the *flash mob*. Like a meetup, a flash mob is a real-world gathering that is organized over the Internet. But it's not about strangers sharing similar interests. It's about strangers participating in performance art. People gather suddenly, perform an activity, and disperse as suddenly as they arrived.

The first flash mob was organized via e-mail by a Manhattanite called Bill. This past June, nearly 200 people gathered in the home furnishings department at Macy's, each requesting a "love rug for their suburban commune." Later, another flash mob materialized on a rock in Central Park, making loud bird noises. *The New York Times* reported on an early-August flash mob in Berlin, describing nearly 40 people who took out their cell phones in the middle of a city street, shouted "Yes! Yes!" and then burst into applause. Several Web sites soon popped up to help organize such gatherings, including www.flashmob.com and www.flashmob.co.uk.

The Internet is often criticized for supplanting real-world interaction. It encourages people to spend more time in front of their computer screens, the argument goes, and less time in front of each other. But sometimes, the pendulum swings the other way.—CM

ster's 3 million) can be a lonely endeavor.

Friendzy is betting its agile, energetic mix will draw an audience. Its attractive design and promising features make it look like a reasonable contender. On the other hand, its lack of privacy features is worrying. This, combined with its tiny membership at press time, tells us that Friendzy has yet to prove itself. The number of users and depth of content are key in social networking, and Friendzy has a lot of catching up to do in both respects.

LinkedIn (beta)

Free. LinkedIn Ltd., www.linkedin.com. ●●●●●

More of a well-heeled social club than a friendly free-for-all, LinkedIn is the most exclusive site we reviewed. This professional-oriented site is also the least likely to bother members with trivia. Like Ryze, LinkedIn targets business users, but at a higher level—meaning upper-echelon managers and executives.

A quick search of LinkedIn's 40,000 members revealed over 700 VPs, over 140 CTOs, and over 500 CEOs; such stats

might cause executive recruiters—or job seekers—to prick up their ears. If LinkedIn can maintain its cachet of exclusivity, it'll be an impressive way to make important contacts for those in senior positions.

Mere mortals, however, aren't likely to see this high-level A-list—at least not without a custom invitation from on high. LinkedIn's stringent privacy policy is appropriate to its professional bent. The site does a good job of protecting its clients from public view, though you can opt to allow other users to contact you directly.

A more common option for beginners is to search for current and former colleagues and contacts already linked up to LinkedIn. A handy feature lets you compare your Outlook address book against a list of current members, expediting the process of inviting people from the outside and building your business network from the ground up.

LinkedIn has a no-nonsense, all-business user interface. There are no forums, specific listings for job opportunities, or extra content here (as with Ryze and Tribe.net) beyond statistics about your network, including percentages of users who fall into categories (like job seekers and hiring managers) and distribution by industry and geography.

LinkedIn gives you excellent control of searches by name, title, geography, and industry type. You'll see only people in your network (those you're linked to by a chain of friends), however, so it's important that you cultivate connections. Once you locate a source, you can approach contacts about a job or other opportunity via a request page. In this beta version, users can have three outstanding requests at a time.

The governing principle is that persons of influence will be selective about passing along references, which are handed off to other contacts for approval. For three degrees of separation, you need two people to approve your request to approach a potential employer with a résumé, for example. When you sign in to your account, you're informed of outstanding reference requests, which you can accept or reject. Should a request be rejected, the person who asked for it is never informed who rejected it. This decreases the chances that inappropriate requests will be simply rubber-stamped.



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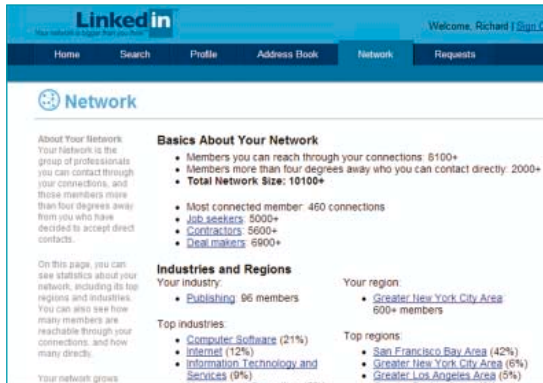
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LinkedIn users can network with industry leaders—but only after an introduction.

While there are no profile photos for LinkedIn members, testimonials in the form of endorsements from other members can add weight to user profiles. According to LinkedIn, such endorsements significantly increase the odds of making successful contacts. Favorite contacts can be stored in an address book, though unlike the other services, LinkedIn doesn't have an extensive messaging system.

LinkedIn could change the way executive recruiting is conducted. As a gener-

al-purpose job site, it can undoubtedly work. And if you're fortunate enough to gain entrée to its elite client list, it's a great resource for tapping venture capital, senior management, and technical expertise.

Ryze

Free; Gold subscription, \$9.95 a month. Ryze Ltd., www.ryze.com.



The only nonbeta service in our roundup, Ryze is a feature-rich site for business people who want to network. Its many minor features make Ryze an effective grab bag for professionals, whatever stage their careers are in.

Signing up for a basic membership with Ryze is simple and free. Members post nuts-and-bolts information and an optional picture, as well as descriptions of their careers. "What I have" and "What I need" sections let members be creative and occasionally witty. Visual style isn't Ryze's strong suit, and some pages (such as the main page) feel cluttered.

Inviting new members is easy with

the help of an excellent Outlook address book importer—the best in the roundup. You can also locate existing members to ask them to become first-degree friends. Search capabilities for locating members are basic and include keyword searches to match titles, interests, and regions.

That's fine, but the fact that without a \$9.95 per month Gold membership you can't read the search results is not so hot. An advanced search on New York members told us that there were 100 matches, and that we'd have to upgrade to see them. This seems to make a basic membership fairly useless.

Ryze keeps networks tight, with "friends of friends" as the outer ring in your network—a reasonably conservative limit for business contacts, which keeps requests for contacts close to home. Ryze lets you edit your network easily, quickly adding or removing members. Unlike with Tribe.net, Ryze's editing feature is all-or-nothing: You can't block members while maintaining them as contacts. You can selectively disclose contact information, like e-mail addresses and phone numbers, to individual members, letting you easily make contacts and still maintain your privacy.

SUMMARY OF FEATURES

Social Networking

Download this table at www.pcmag.com.

■ YES □ NO	Friendster	Friendzy	LinkedIn	Ryze	Tribe.net
Basic price/Premium subscription	Free / N/A	Free / N/A	Free / N/A	Free / \$9.95 a month	Free / N/A
Release version	Beta	Preview	Beta	Full release	Beta
Personal or professional focus	Personal	Personal	Professional	Both	Both
Population	> 3,000,000	< 10,000	40,000	60,000	43,000
PRIVACY					
Can limit profile information to unconnected/indirectly connected members	■ □	■ ■	■ ■	■ ■	■ ■
Can block unwanted connections	■	□	■	■	■
PERSONAL PROFILE					
Location/Hometown/Birthday	■ ■ ■	■ ■ ■	■ ■ □	■ ■ ■	■ ■ ■
Occupation/School information/Interests	■ □ ■	■ ■ ■	■ □ □	■ ■ ■	■ ■ ■
Favorite books, movies, music, and more	■	■	□	□	■
Links to home page/Blog	□ □	■ □	□ □	■ ■	■ □
PROFESSIONAL PROFILE					
Current job title/Employer	□ □	□ □	■ ■	■ ■	■ ■
Specialties	□	□	■	□	■
Work-based endorsements	□	□	■	□	□
Job-related requests for referrals	□	□	■	■	□
MAKING CONNECTIONS					
User can import friends from address book	■	□	■	■	■
Searches for members by name/e-mail	■ ■	■ ■	■ ■	■ ■	■ ■
Searches for members by interests/gender/relationship status	■ ■ ■	■ ■ ■	■ □ □	■ ■ □	■ ■ □
User can connect with members by:					
Testimonials from friends	■	■	■	■	■
Asking for introduction	■	■	■	■	■
Suggesting a match	■	■	□	□	■
Message boards	■	■	□	■	■
In-person events	■	□	□	■	■
N/A—Not applicable: The service does not offer this feature.					

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after closing
my office door

Ryze includes many simple community features, like threaded general discussion for half a dozen forums and a simple messaging client, as well as an address book of frequently contacted friends. Ryze is more approachable than LinkedIn; for example, any Gold member can create a custom



Ryze facilitates networking not only online but also in person by helping organize events.

forum, called a *network*. Unlike Tribe.net's, Ryze's forums aren't categorized, so they're a bit chaotic; but they can be made friends-only.

One superb feature: Ryze members can post invites to events for in-person networking. Many major U.S. cities have upcoming Ryze events. You can RSVP online and view lists and photos of attending members. This can help you target potential business contacts.

Ryze's inventive spirit shows in a new feature called Datanet, which Ryze still deemed experimental at press time. With Datanet, members can tweak their network nodes of member links directly. With so many of these ad hoc features, Ryze runs the risk of becoming a hodgepodge. But the net effect is that the site is more than the sum of its individual features.

Along with Friendster, Ryze is the most mature site in this roundup, and its approachability combined with its generous feature set and broad member base makes it a worthwhile consideration for professionals. Our main reservation is that the site's membership fee is likely to limit growth severely, and critical mass is

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crucial. To be fair, none of the other sites reviewed here is out of beta yet, but only LinkedIn seems to be considering a paid membership model, which is more appropriate for that network, considering its exclusive clientele.

Tribe.net (beta)

Free. Tribe Networks Inc., www.tribe.net. ●●●●●

Striking an excellent balance between a relationship and general-interest site, Tribe.net showcases some of the best aspects of social networking. Tribe.net's well-thought-out approach to controlling access to members and its thriving forums make it a compelling experience. Some of the service's best features, however, are hard to find; the interface needs some tweaking before the site comes out of beta.

When you join Tribe.net, you set up a personal profile with the usual basic information, along with adding photos. As you use the service, you also join different Tribes, or interest groups, which then help define your profile. Besides Tribe membership, photos, and basic facts, profiles also include a "Why you're here" section, where members can describe what they're looking for online.

One reason for members to keep visiting the site is the Tribes that they can create—groups around a vast range of topics. We found busy Tribes devoted to music, gaming, politics, and relationships, to name a few. At press time there were over 5,000 Tribes.

The Tribes resemble discussion groups, but they can be moderated by their founders, and they require membership, so you don't have to endure as many *flames*, or obnoxious messages. We like the ease with which you can access a particular Tribe from outside the site via a URL (for example, <http://creativewriting.tribe.net> gets you to the creative writing forum).

Tribe.net excels at letting members manage the depth of connections, with a good balance between privacy and accessibility. For example, you can search for other members not only by basic information, like name, gender, and profession, but also by degrees of connection ranging from immediate friends through four degrees of separation. When you log on, you see the number of connections for each degree.

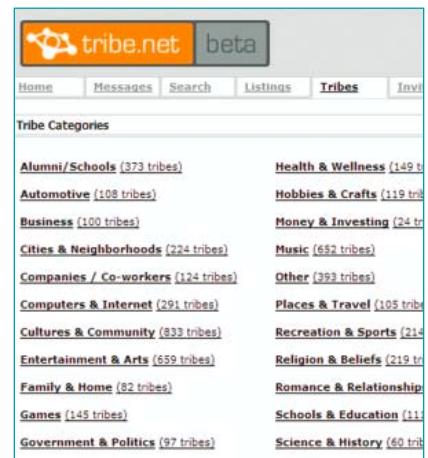
We also like the ability to block members easily. This prevents unauthorized

intrusions from troublemakers or the inadvertently (or unwisely) invited. In fact, Tribe.net offers excellent control over privacy and contact settings. You can selectively hide your gender, age, location, and online status in your profile. And when blocking messages from members of your network, you can elect to maintain them as "friends," so that you don't lose the part of your network they link you into. Of course, you can easily delete former friends from your network as well.

There are two other ways in which Tribe.net's fine control can be immediately useful. First, the service includes listings for merchandise, services, and job opportunities. When you add a listing, you can specify its scope and whether it should reach your immediate friends or the entire network. (At press time, site-wide selling was free, but a pricing scheme that is scaled by volume is planned.) Listers can also specify that e-mail be sent to selected friends (though we hope this is used carefully, to avoid spam).

Tribe also features event announcements. Members can advertise upcoming parties, concerts, business icebreakers, or other events easily and reach select audiences. Judging by the range of upcoming events featured on the site, Tribe.net already has an active following in many cities.

Tribe.net is a worthwhile implementation of social networking that mixes pleasure and a little e-business to keep members coming back. The site will be a strong contender in the personal-network space if it can make up some of the distance from Friendster's enormous head start. ☰

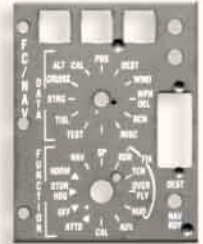
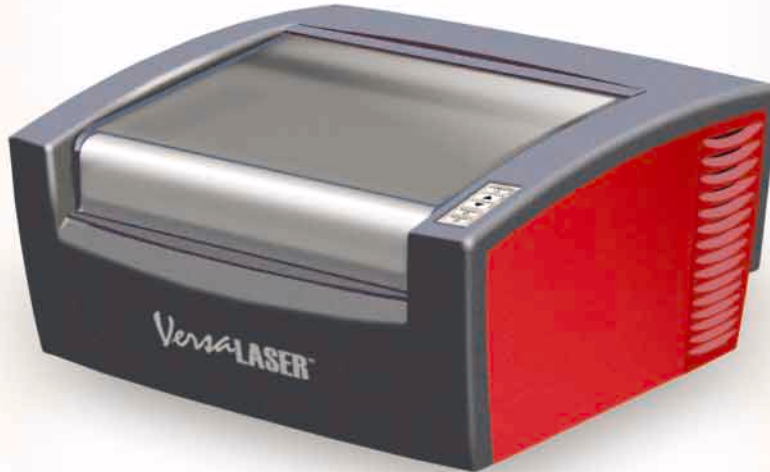


Tribes.net's forums (known as Tribes) let users create and sound off in custom forums.

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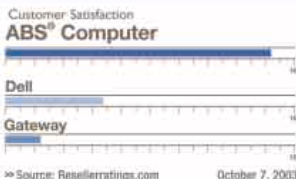
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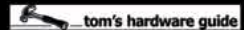
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PC Magazine
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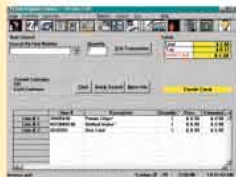
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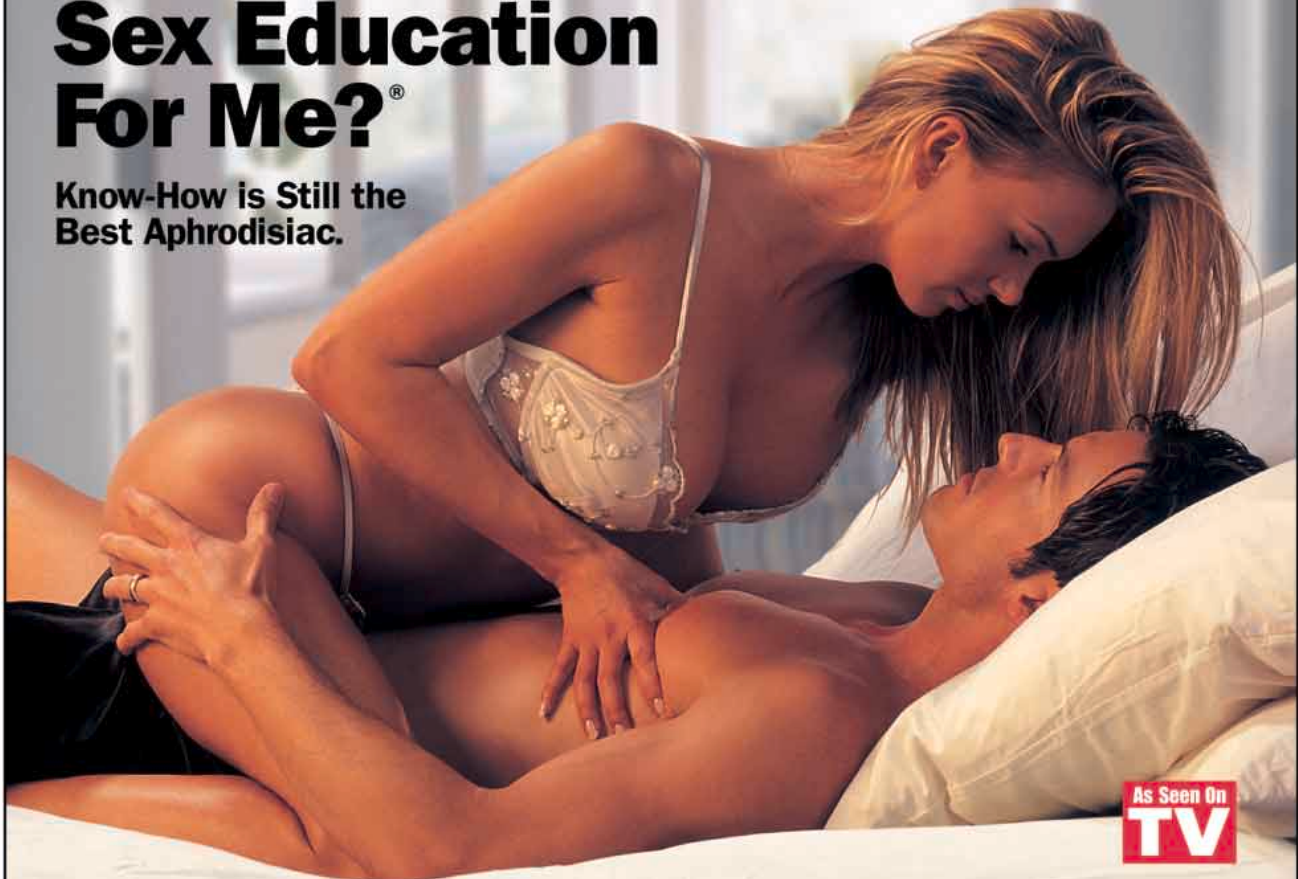
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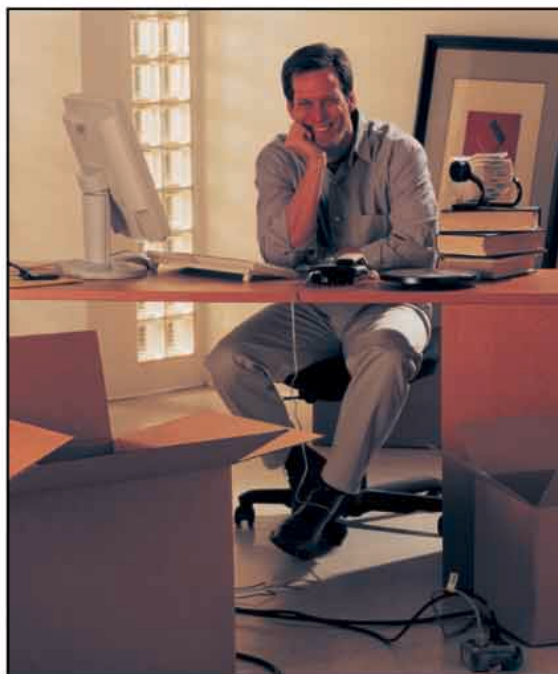
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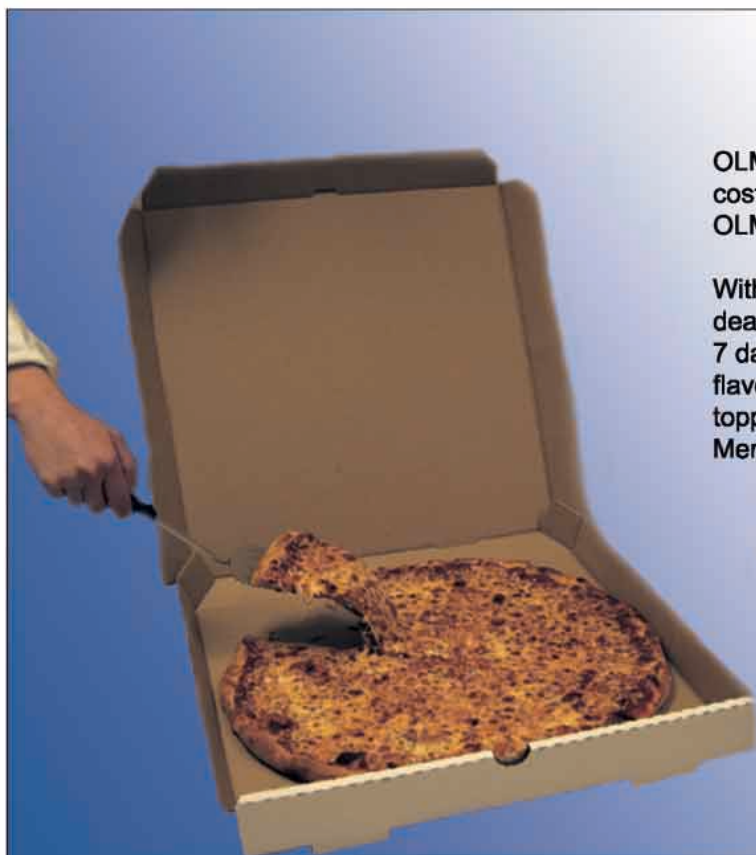
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TECHNOLOGY ON YOUR TIME

War and PC

BY PETER SUCIU

The monumental struggle that was the Second World War has been the setting for many computer games over the years. Why it remains so compelling is obvious: No fictional villains could be as vile and evil as those of Nazi Germany, and no other historical conflict had such evenly matched combatants. • These games let you relive the conflict and free the world from tyranny, while also showing you that WWII could easily have had a very different outcome. With an onslaught of new titles, the daring deeds of the greatest generation continue to live on.

Airborne Assault: Highway to Reich

Fans of traditional board games, with hexagonal battlefield maps and icon-based units, can still find plenty of pieces to move—even in this digital age. For *grogards* (slang for war gamers) who are looking for this type of action, Airborne Assault: Highway to Reich rushes to the front line.



This turn-based strategy game focuses on the infamous Operation Market Garden, in which a daring plan to end World War II resulted in units of the British Airborne being all but destroyed as they went a bridge too far. Airborne Assault features a detailed order of battle down to the company level, in-game briefings, and features you won't get from a board game: realistic sound effects and auto-save. Best of all, there are no pieces to put away. \$50 street. Matrix Games, www.matrixgames.com. ●●●●●

Battlefield 1942: Secret Weapons of World War II

All World War II games are basically “what if” scenarios, but this expansion pack goes to the extreme, introducing more than a dozen experimental and fantastical weapons and vehicles. The result is like a retro 1940s-style look at the future, with jet packs, rocket planes, and superheavy tanks. Although all of these weapons are actually based on real-world experiments, Battlefield 1942: Secret Weapons of World War II has a science-fiction feel.

The original Battlefield 1942 continues to be one of the most popular online shooters. With eight new maps, new period small arms, and new objectives, fans can happily multiply their “what ifs.” \$50 street. Electronic Arts Inc., www.ea.com. ●●●●●

Blitzkrieg

The real-time strategy (RTS) genre, which includes terrific titles like Age of Empires and Command & Conquer, has never been adapted well for the Second World War. Dozens of games have fared worse than the French army in 1940.

Blitzkrieg is the best of the lot, and you can play armchair general and lead German, Russian, or Allied forces into battle. But even with more than 200 3-D vehi-



BATTLEFIELD 1942

cles, hundreds of buildings, and dozens of infantry unit types, the game play is predictable and unrewarding; the 80-plus individual missions aren't compelling or exciting enough, except maybe for hardcore RTS fans.

\$40 street. CDV Software Entertainment AG, www.cdv.de. ●●●●●

Call of Duty

Europe wasn't liberated by an individual but rather by countless citizen soldiers, each fighting to reach a common goal. Unlike previous World War II action games, this first-person shooter isn't about lone-wolf assaults or over-the-top operations but instead focuses on realistic engagements where computer-controlled squads will help you get the job done.

You'll see the front lines through the eyes of American, British, and Russian soldiers as you take part in 24 diverse missions. These include sabotage behind enemy lines, rescue of captured comrades, and all-out frontal attacks on heavily defended positions. Call of Duty provides the most realistic settings yet seen in a World War II game, with authentic weapons,

vehicles, and uniforms. Gramps and his buddies may have told you what it was like, but this is as close as you'd proba-

WHAT THE RATINGS MEAN

●●●●● EXCELLENT
 ●●●● GOOD
 ●●●●● VERY GOOD
 ●●●● FAIR
 ●●●● POOR

bly want to get to living it. \$50 street. Activision Inc., www.activision.com. ●●●●●

Combat Mission II: Barbarossa to Berlin

Traditional war gamers, especially those who enjoy old-school board games, are often turned off by action-packed shooters. But here is a game that successfully combines real-time game play with turn-based strategy. The result is a WWII title that focuses on detailed planning and realistic tactical elements yet is still packed with gripping action.

Recreating the massive Russian campaign from 1941 through the final German holdout in Berlin, *Combat Mission II: Barbarossa to Berlin* features hundreds of infantry and vehicle types, more than 50 missions, and crisp 3-D graphics with realistic weather effects and day/night cycles. Also included are a user-friendly map editor and a quick battle creator, so do-it-yourselfers can prolong the action on the Russian front. \$40 street. CDV Software Entertainment AG, www.cdv.de. ●●●●●

Commandos 3: Destination Berlin

The motley crew from the first two *Commandos* games are back, and this time they aren't stopping until they get to Berlin. The third installment of this action/puzzle game again puts you in charge of a mismatched yet highly trained team of Allied soldiers who must



CALL OF DUTY

go behind enemy lines on the most daring of missions. *Commandos 3: Destination Berlin* includes notable historical locations such as Omaha Beach, Stalingrad, and even Gestapo headquarters, but the game play remains an arcade-style romp. This isn't a straight-out action game but one that involves timing, cunning, and stealth—so it's not for every taste. No one said the life of a commando is easy. \$50 street. Eidos Interactive Ltd., www.eidos.com. ●●●●●

Hidden & Dangerous 2

Here is another take on the squad-based teamwork that existed throughout the Second World War. *Hidden & Dangerous 2* has you leading a team of highly trained British commandos through nine campaigns that span the globe, from the humid jungles of Southeast Asia and harsh North African deserts to the frozen tundra of Norway.

You can play in either first- or third-person views, while you equip your troops with a variety of period weapons and gear. The game focuses heavily on the preplanning portion of each mission, in which you determine your teams' orders, waypoints, and objectives. But in war, the best-laid plans of mice and keyboards don't always work out, so react quickly or watch your casualties mount.

\$50 street. Gathering, www.gathering.com. ●●●●●

Medal of Honor Allied Assault: Breakthrough

The latest expansion for Electronic Arts' impressive *Medal of Honor Allied Assault* falls short. Although the action focuses on the often overlooked Italian campaign—as well as on early engagements in

North Africa—this II-mission expansion pack feels too much like a rehashing of past glories.

Breakthrough's linear single-player game play doesn't provide enough variation and often places you in a role where you think it is up to you to save the free world single-handedly. Fortunately, a new multiplayer mode in which you must rescue and free captured teammates, as well as several new maps for traditional team death matches, may well be enough for hard-core fans of the series.

\$30 street. Electronic Arts Inc., www.ea.com. ●●●●●

Secret Weapons Over Normandy

We couldn't have a WWII game roundup without including a flight simulation, but the problem with this genre is that it tends to be too challenging for many players. *Secret Weapons Over Normandy*, however, focuses on actual locations, realistic aircraft, and highly relaxed airplane physics, so you can quickly get into the air and take part in some intense dogfighting.



COMBAT MISSION II

Included are more than 20 aircraft types from the European and Pacific theaters, including secret and experimental planes. And with more than 30 missions, you'll have plenty of opportunities to prove you've got the right stuff.

\$50 street. LucasArts, www.lucasarts.com. ●●●●●

Squad Assault: West Front

Graphically, *Squad Assault: West Front* is a game that's easy to like. And *World War II* buffs will no doubt find the attention to detail enthralling. Realistic elements including weapons, armor penetration, and the combat system are well modeled but might be too intense for casual gamers.

The emphasis on small-unit tactics on the western front (as the name suggests) makes for a solid multiplayer arena. Even though the computer will put up a good fight, this is the kind of game best played against another human; you can both enjoy a cold one while deciding the fate of the free world.

\$50 street. Matrix Games, www.matrixgames.com. ●●●●●



BLITZKRIEG

GEAR & GAMES

Mobile Mousing

The best mouse is a no-nonsense extension of your hand, free of tangling cables and tricky interfaces. The **Logitech Cordless Optical Mouse for Notebooks** comes pretty close to that ideal.

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A 6-foot range and six-month battery life ensure that the mouse will be ready when you are.

—Sascha Segan

\$39.95 list. Logitech Inc.,
www.logitech.com.



Apple Style Goes Wireless

The sleek **Apple Wireless Keyboard and Mouse** combine the clean look of the Apple iMac with powerful technology. Both communicate via Bluetooth and use Advanced Frequency Hopping. They feature 128-bit encryption and strong power management to maximize battery life. But the keyboard has only four specialized buttons. The mouse isn't well designed for either hand and has only one button. It's like putting a turbo engine in a tricycle.—Troy Dreier

Keyboard, \$69 list; mouse, \$69. Apple Computer Inc.,
www.apple.com. ●●●●●

Private Browsing

For about the same price as a regular USB flash memory device, the **StealthSurfer** comes with Netscape Browser 7.0 and privacy software.

You can surf the Web and securely store e-mail, downloads, and other files, along with your Web-browsing history and Internet cache, on the device. When you remove the StealthSurfer from a PC, all of your files go with you. The StealthSurfer will appeal to anyone who uses public, borrowed, or rented PCs.—Bruce Brown

64MB, \$50 direct; 128MB, \$80; 256MB, \$130. StealthSurfer,
www.stealthsurfer.biz. ●●●●●



Ports in a Storm

You can never have too many USB ports—especially if they are conveniently located, as in the new **Belkin Hi-Speed USB 2.0 7-Port Hub**. This slim hub features five horizontal ports along the back and two more on top. When moving more than 200MB of data, we saw no performance degradation. This is an excellent combination of form and function.

—Craig Ellison

\$50 street. Belkin Corp., www.belkin.com.



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The Right Move

By Peter Suci

Chess can be challenging to learn—and so can finding a worthy opponent. The newest generation of PC chess games successfully tackle these problems. Although playing against a human opponent remains the truest test of skill, these titles help you hone your abilities and master the board.

Chess Advantage III

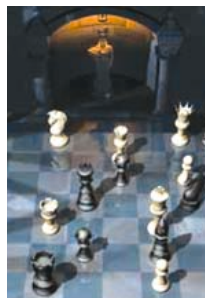
This five-in-one chess simulation offers something for every taste, from the traditional game play of Chessmaster 7000 to the playful themed action of LEGO Chess and the extreme Combat Chess. In one package are hundreds of tutorial levels, along with hundreds of chess-set choices and scalable AI, so games can become more challenging as your skills improve. A downside is that the interface and controls are far from standardized across the different games. But in all the diversity, you're bound to find something that appeals to you. \$19.99 list. Encore Inc., www.encoresoftware.com. ●●●●●



CHESS ADVANTAGE

Hoyle Majestic Chess

Built around a solid chess simulation is a deep adventure that spans eight chapters. Your goal is to stop the tyranny of Sargon. To do so, you must raise an army of chess pieces, learn the basic movements of each, and then take part in mini-challenges that put your skills to the test. Even novice chess players will quickly dispatch the early threats, but later challenges might be trying even for veterans of the game. After completing the adventure, you can take part in traditional chess matches against the computer, or take the game online. As with other Hoyle games, online connectivity is simple, and you should have no trouble finding opponents to match your skill level. \$30 street. Vivendi Universal Games Inc., www.majesticchess.com. ●●●●●



HOYLE MAJESTIC



PLAY CHESS FRITZ 8

Kasparov Chessmate

Chess champion Garry Kasparov has managed to hold his own against both man and machine. The game with his name on it features a straightforward chess instruction program that begins with simple explanations of the rules and focuses on opening and endgame strategies at different levels. The easy levels are a bit too simple, and the computer can make terrible moves. But the difficult levels are almost impossible to win—and the AI adviser gives some truly bad advice. On the multiplayer front, though, Kasparov is among the



KASPAROV CHESSMATE

best of the lot. You can play on MSN's Zone.com, and versions for Pocket PC and Palm OS 3.5 or later are included to let you make moves on the go. \$30 street. Riverdeep—The Learning Company, www.riverdeep.net. ●●●●●

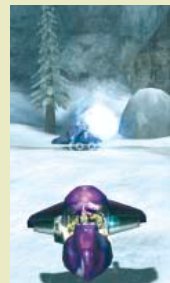
Play Chess Fritz 8

A better introduction to the timeless game is Play Chess Fritz 8, which includes a complete tutorial for beginners and novices and still provides solid tactical advice for skilled players. Fritz 8 teaches fundamentals for all levels, with tips for opening, midgame, and endgame moves. The photo-realistic 3-D graphics have zoom and tilt functions, so you can examine the board from multiple angles and preview your options with a hint feature. This game includes a one-year membership to PlayChess.com, so if you're striving to be a grandmaster (or at least to challenge one), this is the game for you. \$40 street. Viva Media LLC, www.viva-media.com. ●●●●●

QUICK CLIPS

Halo: Combat Evolved

The shooter that put the Microsoft Xbox on the map comes to the PC—and gains much in the translation. Higher-resolution graphics, finer mouse and keyboard control, six new multiplayer maps, and additional multiplayer weapons and vehicles improve on a game considered by many the best shooter ever. The single-player game is identical to the multiplayer version, including the occasionally repetitive level design. But with the quality of the whole package, the few minor niggles can easily be overlooked.—*Rich Brown*
\$50 street. Microsoft Game Studios, www.microsoft.com/games. ●●●●●



Cakewalk Mediaworks

Cakewalk Mediaworks delivers a lot of utility for a relatively low price. You can organize photos, music, video, and data; create multimedia slide shows and Web-ready photo albums; and burn CDs and DVDs. The package includes all the features of the popular audio recording and restoration program Cakewalk Pyro. Perhaps the best selling point: All the features are integrated within a single interface.—*Carol A. Mangis*
\$79 list. Twelve Tone Systems Inc., www.cakewalk.com. ●●●●●



Dark Fall: The Journal

Dark Fall: The Journal, a puzzle-solving horror game, depends heavily on ambience, and its sound effects and voice-overs are quite good. The puzzles are intelligent and well planned. Fans of the genre will be pleased, but the game has missed the boat by a few years, hearkening back to when titles like Myst and The Seventh Guest reigned supreme.—*Sonya Moore*
\$19.99 list. Dreamcatcher Interactive Inc., www.theadventurecompanygames.com. ●●●●●

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Edited by Don Willmott

List of 55 Most Wanted Iraqis and Their Status

The Associated Press
Published: Aug 19, 2003

The 55 most-wanted Iraqis and their status, according to U.S. Central Command. Thirty-six are in custody, 15 remain at large, two have been confirmed killed and two have been reported killed.

-No. 1: Saddam Hussein, president.

-No. 2: Qusai Hussein, Saddam's son. Killed July 22.

-No. 3: Odai Hussein, Saddam's son. Killed July 22.

-No. 4: Abid Hamid Mahmud al-Tikriti, presidential secretary, Saddam's cousin. Taken into custody June 17.

-No. 5: Ali Hassan al-Majid, presidential adviser, Revolutionary Command Council member. Also known as "Chemical Ali." Possibly killed.



▲ Here's one Iraqi who really shouldn't be too hard to find. (Tampa Bay Online)

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(Please select all that apply)

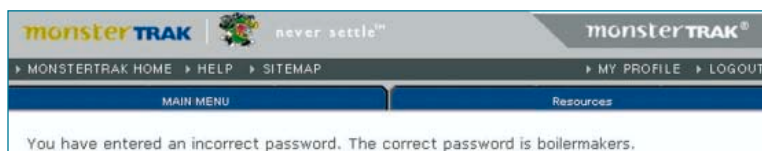
- I have purchased a printer in the past 3 months
- I am employed in public safety and/or a government agency
- I am African American or Hispanic
- I suffer from Bipolar disorder
- I drive a Honda or Acura sports car
- Someone in my household suffers from Schizophrenia
- I eat large rice cakes
- None of the above

Start survey!

▲ Funny thing is, there's probably someone out there who can answer yes to all of the above. (Greenfield Online survey)



▲ And how exactly will you see this dialog box? That is a puzzlement. (IBM ThinkVisionmonitor installation)



◀ Yo, buddy, thanks for the tip! (MonsterTrak site)

▼ The USB-powered innovations keep coming. How about that wrist massager? (Cyberguys! site)



▶ You'd better behave, or you'll get a potato chip right in the.... (Yahoo! SBC DSL site)

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Notebook Essentials, Budget Friendly – Starting at 7.2 lbs*

- Intel® Pentium® 4 Processor at 2.40GHz¹
- Windows® XP Home Edition
- 14.1" XGA TFT Display
- 256MB Shared² DDR SDRAM
- 20GB Hard Drive
- 8x DVD-ROM Drive
- Integrated Intel® Extreme Graphics
- 65Whr Li-Ion Battery (8-Cell)
- Internal Fax Modem and NIC Included
- Productivity Pack including WordPerfect® and Money®
- 6 Months of America Online® Membership Included³
- 1-Yr Limited Warranty⁴; 1-Yr Mail-In Service

\$949 Ask about our financing plans
for qualified customers
E-VALUE Code: 19182-D81209n

Recommended Upgrades:

- 24x CD Burner/DVD Combo Drive, add \$49
- 15" XGA TFT Display, add \$50
- 512MB Shared² DDR SDRAM, add \$100
- 3-Yr Limited Warranty⁴; 3-Yr At-Home Service⁵; add \$179

The Inspiron 1100 notebook. It's hard to take your eyes off this stylish little number. And its beauty isn't only skin deep. Inside you'll find an Intel® Pentium® 4 processor clocking speeds up to 2.40GHz! That kind of performance never goes out of style. But its most stunning feature? Check out the price. And, of course, it's backed by Dell's award-winning service and support. Order one today and soon you'll be creating quite a stir.

Dell recommends Microsoft® Windows® XP Professional for Business

Best Budget Notebook

Inspiron 1100

Computer Shopper

The Top 100 Products of 2003

—November 2003



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A little something for everyone



Dell recommends Microsoft® Windows® XP Professional for Business



Home Desktops & Notebooks

DIMENSION™ 2400 DESKTOP

Essential Technology. Affordable Price

- Intel® Pentium® 4 Processor at 2.40GHz with 533MHz Front Side Bus
- Microsoft® Windows® XP Home Edition
- 256MB Shared® DDR SDRAM at 333MHz
- 40GB Hard Drive (7200 RPM)
- 17" (16.0" v.i.s., .27dp) E773 Monitor
- Integrated Intel® 3D Extreme Graphics
- 16x DVD-ROM Drive
- Integrated Audio
- Desktop Speakers
- 56K Data Fax Modem; Integrated 10/100 Ethernet
- WordPerfect® Productivity Pack
- 6 Months of America Online® Membership Included¹
- 1-Yr Limited Warranty¹; 1-Yr At-Home Service¹

\$699 Ask about No Payments for 90 Days for well-qualified customers!¹
E-VALUE Code: 19183-D51206m

DIMENSION™ 4600 DESKTOP

Exceptional Performance

- Intel® Pentium® 4 Processor at 2.66GHz with 533MHz Front Side Bus
- Microsoft® Windows® XP Home Edition
- 512MB Dual Channel DDR SDRAM at 333MHz
- 80GB Hard Drive (7200 RPM)
- 17" (16.0 v.i.s., .27dp) E773 Monitor
- Integrated Intel® Extreme Graphics
- 48x CD Burner/DVD Combo Drive
- Integrated 5.1 Channel Audio
- Stereo Speakers
- 56K Data Fax Modem; Integrated 10/100 Ethernet
- WordPerfect® Productivity Pack
- 6 Months of America Online® Membership Included¹
- 1-Yr Limited Warranty¹; 1-Yr At-Home Service¹

\$999 Ask about No Payments for 90 Days for well-qualified customers!¹
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DIMENSION™ 8300 DESKTOP

Cutting-Edge Performance

- Intel® Pentium® 4 Processor with HT Technology at 2.80GHz with 800MHz Front Side Bus
- Microsoft® Windows® XP Home Edition
- 512MB Dual Channel DDR SDRAM at 400MHz
- 80GB Hard Drive (7200 RPM)
- 17" (16.0 v.i.s., .27dp) E773 Monitor
- 128MB NVIDIA® GeForce FX 5200 Graphics Card
- 48x CD Burner/DVD Combo Drive
- Sound Blaster® Audigy™ 2 (D) Sound Card
- Dell™ A425 Speakers with Subwoofer
- 56K Data Fax Modem; Integrated Intel® PRO 10/100 Ethernet
- WordPerfect® Productivity Pack
- 6 Months of America Online® Membership Included¹
- 1-Yr Limited Warranty¹; 1-Yr At-Home Service¹

\$1569 Ask about No Payments for 90 Days for well-qualified customers!¹
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INSPIRON™ 1100 NOTEBOOK

Notebook Essentials – Budget Friendly

- Intel® Celeron® Processor at 2.30GHz¹
- Microsoft® Windows® XP Home Edition
- 14.1" XGA TFT Display
- 256MB Shared® DDR SDRAM
- 20GB Hard Drive
- 8x DVD-ROM Drive
- Integrated Intel® Extreme Graphics
- 65Whr Li-Ion Battery (8-Cell)
- Internal Fax Modem and NIC Included
- WordPerfect® Productivity Pack
- 6 Months of America Online® Membership Included¹
- 1-Yr Limited Warranty¹; 1-Yr Mail-In Service

\$799 Ask about No Payments for 90 Days for well-qualified customers!¹
E-VALUE Code: 19183-D81207n

INSPIRON™ 5100 NOTEBOOK

Perfect Balance of Performance and Price

- Intel® Pentium® 4 Processor at 2.66GHz¹
- Microsoft® Windows® XP Home Edition
- 15" XGA TFT Display
- 512MB DDR SDRAM
- 30GB Hard Drive
- 24x CD Burner/DVD Combo Drive
- 32MB DDR ATI's MOBILITY™ RADEON® 7500 AGP 4X Graphics
- 96Whr Li-Ion Battery (12-Cell)
- Internal Fax Modem and NIC Included
- WordPerfect® Productivity Pack
- 6 Months of America Online® Membership Included¹
- 1-Yr Limited Warranty¹; 1-Yr Mail-In Service

\$1279 Ask about No Payments for 90 Days for well-qualified customers!¹
E-VALUE Code: 19183-D81212n

INSPIRON™ 5150 NOTEBOOK

Enhanced Performance

- Mobile Intel® Pentium® 4 Processor at 3.06GHz¹
- Microsoft® Windows® XP Home Edition
- 15" SXGA+ TFT Display
- 512MB DDR SDRAM
- 60GB Hard Drive
- 24x CD Burner/DVD Combo Drive
- 32MB DDR NVIDIA® GeForce™ FX Go5200 AGP 4X Graphics
- 96Whr Li-Ion Battery (12-Cell)
- Internal Fax Modem and NIC Included
- WordPerfect® Productivity Pack
- 6 Months of America Online® Membership Included¹
- 1-Yr Limited Warranty¹; 1-Yr Mail-In Service

\$1699 Ask about No Payments for 90 Days for well-qualified customers!¹
E-VALUE Code: 19183-D81216p





Small Business Desktops

NEW DIMENSION™ 2400 DESKTOP

Economical, Essential Technology Desktop

- Intel® Pentium® 4 Processor at 2.40GHz
- Windows® XP Home Edition; Productivity Pack including WordPerfect® and Money®
- 128MB Shared® DDR SDRAM
- 40GB (7200 RPM) Ultra ATA/100 Hard Drive
- Integrated Intel® 3D Extreme Graphics
- 48x CD-ROM; Integrated Audio
- Integrated 10/100 Ethernet
- 1-Yr Limited Warranty; 1-Yr On-Site Service¹
- Monitor Not Included

\$499 as low as **\$14/mo.**, (46 pmts.²)
E-VALUE Code: 19183-S51204y

Recommended Upgrades:

- Dell™ Personal Inkjet Printer J740, add \$79
- 15" E151FP Flat Panel Display, add \$300

NEW OPTIPLEX™ 160L DESKTOP

Network-Optimized, Value Business Desktop

- Intel® Pentium® 4 Processor at 2.40GHz with 400MHz Front Side Bus
- Windows® XP Professional
- 128MB Shared® DDR SDRAM
- 40GB (7200 RPM) Hard Drive
- Integrated Intel® Extreme Graphics
- 48x CD-ROM
- Integrated 10/100 Ethernet
- 1-Yr Next Business Day On-Site Service¹
- Monitor Not Included

\$599 as low as **\$16/mo.**, (46 pmts.²)
E-VALUE Code: 19183-S31205y

Recommended Upgrades:

- 3-Yr Next Business Day On-Site Service; add \$99
- NEW 17" E172FP Flat Panel Display, add \$369

DIMENSION™ 4600 DESKTOP

Exceptional Performance Desktop

- Intel® Pentium® 4 Processor with HT Technology at 2.60GHz with 800MHz Front Side Bus
- Windows® XP Home Edition; Productivity Pack including WordPerfect® and Money®
- 256MB Dual-Channel Shared® DDR SDRAM
- 40GB (7200 RPM) Ultra ATA/100 Hard Drive
- Integrated Intel® Extreme Graphics 2
- 48x CD-ROM; Integrated Audio
- Integrated Intel® PRO 10/100 Ethernet
- 1-Yr Limited Warranty; 1-Yr On-Site Service¹
- Monitor Not Included

\$699 as low as **\$19/mo.**, (46 pmts.²)
E-VALUE Code: 19183-S51206y

Recommended Upgrades:

- Dell All-In-One Printer A940, add \$129
- 3-Yr Limited Warranty/ 3-Yr On-Site Service; add \$149



Small Business Notebooks

INSPIRON™ 5100 NOTEBOOK

Mobility and Performance – Starting at 7.2 lbs.²

- Intel® Pentium® 4 Processor at 2.60GHz¹
- Windows® XP Home Edition; Productivity Pack including WordPerfect® and Money®
- 15" XGA TFT Display
- 256MB DDR SDRAM
- 30GB Hard Drive
- 16MB DDR ATI® MOBILITY™ RADEON™ 7500 AGP 4X Graphics
- Fixed Internal 8x DVD-ROM Drive
- Internal Modem and NIC Included
- 1-Yr Mail-In Service
- Serial and Parallel Ports Not Included

\$1069 as low as **\$29/mo.**, (46 pmts.²)
E-VALUE Code: 19183-S81210

Recommended Upgrades:

- USB 200e Port Replicator with Ethernet, add \$119
- 2-Yr On-Site Service¹ plus CompleteCare™; add \$158

LATITUDE™ D500 NOTEBOOK

Small Business Value Notebook – Starting at 4.8 lbs.²

- Featuring Intel® Centrino™ mobile technology
- Intel® Pentium® M Processor at 1.30GHz
- Intel® PRO Wireless 2100 802.11b 11Mbps® Mini-PCI Wireless Card
- Windows® XP Home Edition
- 14.1" XGA TFT Display
- 128MB Shared® DDR SDRAM
- 20GB Hard Drive
- Integrated Intel® Extreme Graphics Up to 64MB Shared™ System Memory, Internal Modem and NIC Included
- Serial and Parallel Ports Included; 1-Yr Mail-In Service

\$1149 as low as **\$31/mo.**, (46 pmts.²)
E-VALUE Code: 19183-S71211

Recommended Upgrades:

- Windows® XP Professional, add \$60
- 3-Yr Next Business Day On-Site Service; add \$298

INSPIRON™ 600m NOTEBOOK

Thin and Light – Starting at 5 lbs.²

- Featuring Intel® Centrino™ mobile technology
- Intel® Pentium® M Processor at 1.40GHz
- Intel® PRO Wireless 2100 802.11b 11Mbps® Mini-PCI Wireless Card
- Windows® XP Home Edition; Productivity Pack including WordPerfect® and Money®
- 14.1" XGA TFT Display
- 256MB DDR SDRAM; 30GB Hard Drive
- 32MB DDR ATI® MOBILITY™ RADEON™ 9000 AGP 4X Graphics
- Modular 8x DVD-ROM Drive; Internal Modem and NIC
- Serial and Parallel Ports Included; 1-Yr Mail-In Service

\$1349 as low as **\$37/mo.**, (46 pmts.²)
E-VALUE Code: 19183-S81213

Recommended Upgrades:

- Dell™ TrueMobile™ 300 Bluetooth Internal Card, add \$49
- Dell™ Laser Printer P1500 Printer, add \$249



Small Business Servers & Workstations

NEW POWEREDGE™ 400SC SERVER

Small Business Value Server

- Intel® Celeron® Processor at 2GHz
- Upgradable to Intel® Pentium® 4 Processor at 3.20GHz with 800MHz Front Side Bus²
- 128MB 333MHz ECC DDR SDRAM (Up to 4GB)
- 40GB (7200 RPM) IDE Hard Drive
- Upgradable to 240GB of Internal Hard Drive Storage
- Embedded Intel® PRO Gigabit® NIC
- 1-Yr 24x7 Dedicated Server Phone Tech Support
- 1-Yr Next Business Day On-Site Service¹
- Small Business Pricing

\$399 E-VALUE Code: 19183-S21203

Recommended Upgrades:

- PowerConnect™ 2016 16-Port Ethernet Switch, add \$89
- System Including Windows® Small Business Server 2003 (256MB SDRAM Min. Required);² now \$999

POWEREDGE™ 1600SC SERVER

High-Speed Small Business Server

- Intel® Xeon® Processor at 2GHz
- Dual Intel® Xeon® Processor Capable (Up to 3.06GHz)
- 128MB DDR SDRAM (Up to 4GB)
- 36GB (10K RPM) SCSI Ultra320 Hard Drive
- Upgradable to 876GB of Internal SCSI Hard Drive Storage
- Embedded Intel® PRO Gigabit® NIC
- Six PCI Slots (2-64/100MHz, 2-64/66MHz, 2-32/33MHz)
- 1-Yr 24x7 Dedicated Server Phone Tech Support
- 1-Yr Next Business Day On-Site Service¹
- Small Business Pricing

\$699 as low as **\$19/mo.**, (46 pmts.²)
E-VALUE Code: 19183-S21206

Recommended Upgrades:

- PowerConnect™ 2024* 24-Port Ethernet Switch, add \$129
- System Including Windows® Small Business Server 2003 (256MB SDRAM Min. Required);² now \$1299

DELL™ PRECISION™ 360 WORKSTATION

Maximum Performance, Single Processor Workstation

- Intel® Pentium® 4 Processor with HT Technology at 2.60GHz with 800MHz Front Side Bus
- Windows® XP Professional; Mini-Tower Chassis
- 256MB Dual-Channel DDR SDRAM
- 40GB (7200 RPM) IDE Hard Drive; 48x CD-ROM
- 64MB NVIDIA® Quadro NVS 280 AGP 8X Graphics
- Integrated Intel® PRO 1000MT Gigabit® NIC
- Lifetime 24x7 Dell Precision™ Dedicated Tech Support
- 3-Yr Next Business Day On-Site Service¹
- Monitor Not Included

\$999 as low as **\$27/mo.**, (46 pmts.²)
E-VALUE Code: 19183-S51209y

Recommended Upgrades:

- 3-Yr Same-Day 4-Hour (5x10) On-Site Service; add \$199
- 17" Dell UltraSharp™ 1703FP Flat Panel Monitor, add \$479

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