

# PC MAGAZINE

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## NETWORK EDITION

### Directory Services

Novell, Banyan, and IBM  
Confront LDAP and  
Other New Technologies

### 21st-Century Storage

DVD-ROM Arrives:  
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# Notebooks

# for LESS

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# Affordable, Portable, Notebook PCs

**BY ROBERT S. ANTHONY** You get a lot more notebook for your dollar today, though you may trade lighter weight for features in these affordable models. That's not bad, con-

sidering that you still get high-speed Pentiums, 11-inch-plus displays, and large hard disks. PC Magazine Labs tests 27 value notebooks, most priced under \$3,000 .....100

COVER PHOTOGRAPH BY MERT KERIM; SCREEN ILLUSTRATION BY JESSE DOUJILLO; PHOTOGRAPH AT TOP BY THOM O'CONNOR

## ONLINE



### What's New Online

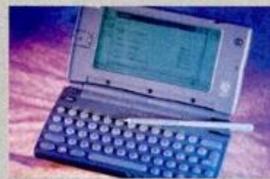
#### The New Notebooks

Join us at [www.pcmag.com](http://www.pcmag.com) for access to interactive benchmark test results and summaries of features for the notebook PCs evaluated in this issue. Also on the Web: the product of the week, the site of the week, and new InternetUser reviews.

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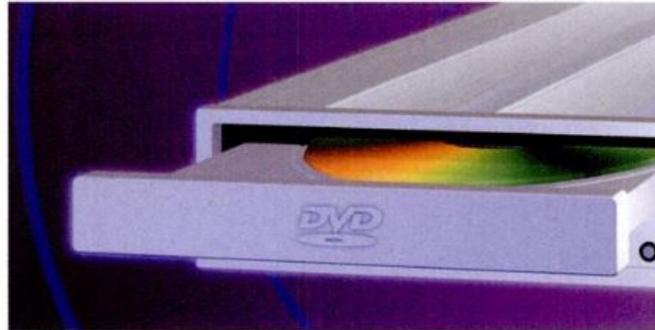
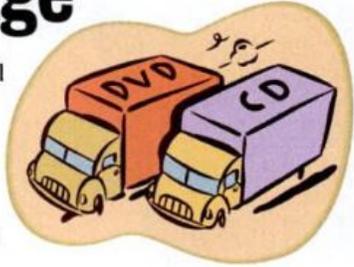
DVD AND CD-ROMS

# 21st-Century Storage

BY ALFRED POOR  
AND JAMES KARNEY

The future of storage is here: DVD disks hold 4.7GB of data and will slowly replace CD-ROM in the PC arena and laserdiscs for home entertainment systems.

Eventually, rewritable DVD will open up even more possibilities. But CD-ROM will be a viable, cost-effective option for some time to come. We test the latest generation of high-speed 10X and 12X drives ...164



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PERSONAL FINANCE SOFTWARE

# Making Your Money Make Money

BY KATHY YAKAL

It's not as bad as you think. This year's crop adds some great new features, like debt- and tax-reduction aids to make financial management more useful. In this group, you'll find more electronic



banking options, a major facelift for an old favorite, and a new face in the crowd. Connections to the Internet are better, too. If you're just jumping in, now's a good time to start .....295

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# First Looks

## Pocket Windows

These first three Windows CE systems put the computing world in the palm of your hand.—By Sebastian Rupley

Year after year, PDAs, or personal digital assistants, fail to capture the imagination of computer buyers or fulfill the rosy expectations of industry analysts, pundits, and gurus. Now one of the most far-reaching efforts to breathe life

Your Palm," January 7, 1997). Designed to operate with a compact 4MB of RAM, Windows CE is graphical computing stripped to its essentials.

Consumer electronics companies and traditional PC makers alike have rallied around the

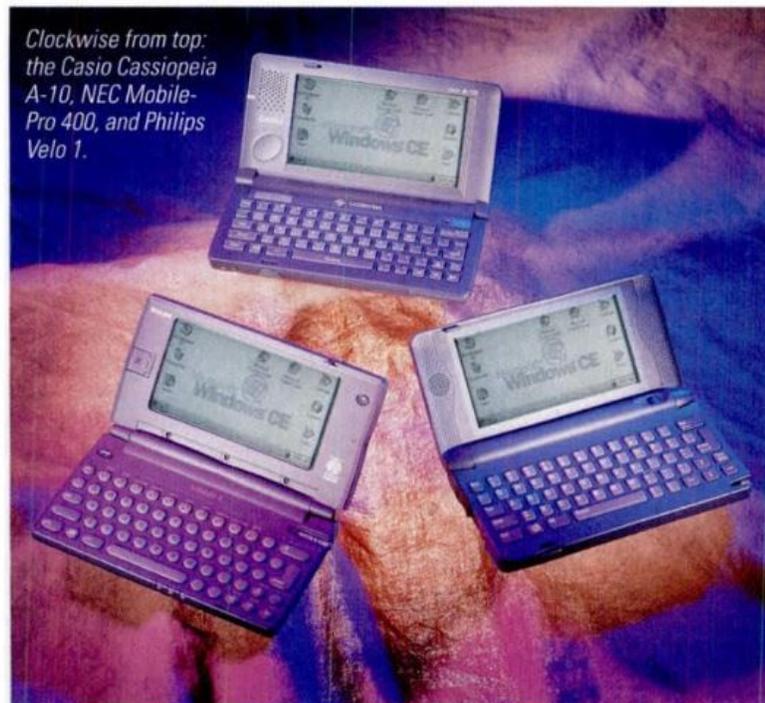
steroids to enterprise sidekicks for networked PCs priced at about \$700.

The majority of Windows CE systems will probably be users' second—and in many cases third—PC. The big bang for the buck with these miniature systems comes from their ability to take advantage of the familiar Windows interface. Earlier PDA-centric operating systems tried (without much success) to build proprietary interfaces around communications tasks and not-so-trustworthy handwriting recognition. The missing element has been applications that go beyond the standard word processor and spreadsheet programs.

These Windows CE systems, however, offer the possibility of porting just about every 32-bit Windows application ever written. Many programs have too small an audience to make it to a PDA near you. Others are inappropriate due to Windows CE's reliance on a small monochrome display.

But if only a few out of a hundred are ported to Windows CE, the number of available applications will quickly overtake those written for other PDAs.

The applications that come with these first Windows CE PDAs—Pocket Excel, Pocket Word, Version 2.0 of Internet Explorer, and an assortment of file-transfer and -synchronization utilities—are the tip of the iceberg. To add to its own Windows CE applications, Microsoft cites over 90 application developers who have Windows CE add-ons



Clockwise from top: the Casio Cassiopeia A-10, NEC Mobile-Pro 400, and Philips Velo 1.

into the moribund hand-held computer market is converging around the latest member of the Microsoft Windows family: Windows CE.

Code-named Pegasus, Windows CE is a 32-bit, multitasking operating system that has the look and feel of Windows 95. Windows users will feel right at home, from the Start button, to Windows Explorer, to the stripped-down versions of such Windows applications as Pocket Excel and Word (For more information, see "Windows in

operating system by producing a new generation of HPCs, or hand-held PCs. We got our hands on the first three devices: the \$499 Casio Cassiopeia A-10, the \$649 NEC Electronics MobilePro 400, and the \$699 Philips Velo 1. Months of speculation hinted that these svelte Windows systems would be aimed at price-conscious consumers looking for a step up from a Wizard or Boss electronic organizer, but the first HPCs offer a range of palmtops, from \$500 electronic organizers on

## INSIDE



**TAKES A LICKING:** Panasonic's new notebook, the CF-25, handles everything you can dish out. *Page 54.*

**1-800-BROWSE:** Talk and browse the Web on the run with AT&T's PocketNet Phone. *Page 64.*



**AUDIO ON TAP:** Liquid Audio's MusicPlayer delivers CD-quality sound over the Net. *Page 73.*

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**First Looks Online**  
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PHOTOGRAPH BY GEOFFREY NELSON

## Editors' Choice

### • Philips Velo 1



*Among this trio of Windows CE palmtop computers, one stood*

out by delivering the goods in terms of performance, upgradability, and peripherals. The Philips Velo 1 put it all together: It's the fastest, most expandable, most richly configured, and best designed unit of the bunch, making it our Editors' Choice for the first wave of Windows CE systems.

Unlike the competition, which opted for PC Card-based data communications, the Velo 1 stands out from the crowd by including a V.32bis modem, which is capable of a maximum throughput of 19.2 Kbps for transferring files and sending faxes. Com-

in the works, including DataViz and Puma (file-conversion and synchronization utilities), Symantec (contact-management applications), and Wright Systems (mobile forms programs).

Many of these applications aren't out yet, so some users parked in front of Pocket Excel and Pocket Word on a Windows CE palmtop may be disappointed. They should remind themselves, however, that spreadsheet and word processor programs made their way to PDAs due to the early efforts of such PDA pioneers as Hewlett-Packard (the LX series of PDAs) and Sharp (the Zaurus series of PDAs). With Windows running on these palmtops, the promise of a wave of applications ported to Windows CE can't be dismissed.

The weak link in the PDA chain remains the obligatory small, monochrome LCD panels. The tiny, rudimentary screens that adorn these units don't exactly afford panoramic views of Web pages; for that matter, they don't even offer even the luxury of color. After years of using large color monitors or

portable active-matrix screens, many will be turned off by the 640- by 240-pixel, gray-scale screens that each of these PDAs use to display information.

#### TO EACH HIS OWN

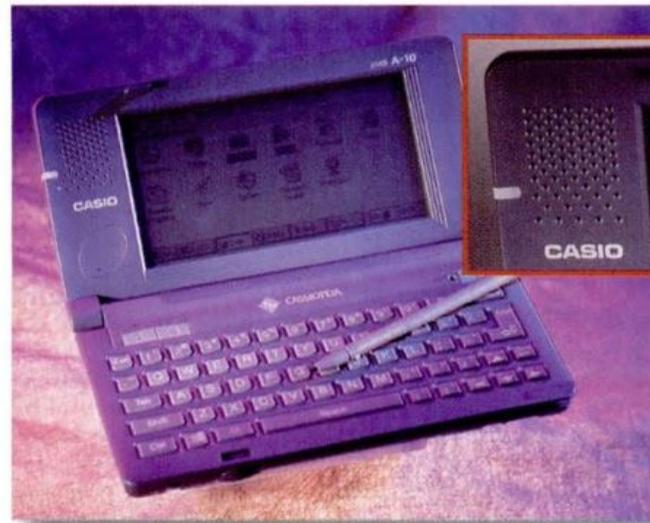
The three systems we tested had a lot in common. Each fits easily into a jacket's breast pocket, a briefcase, or a handbag, weighs in at about three-quarters of a pound, and runs on a pair of AA

batteries with its MIPS R-3900 CPU, it was the fastest of the three at a variety of common tasks. And there's the bonus of the Velo 1's Voice Memo application, which turns the built-in microphone and speaker into a usable recorder for brief voice memos or sound bites. The Velo 1 also includes a copy of Intuit's Pocket Quicken, a boon to those who want to jot down expenses electronically or review the family's finances.

Both Casio's Cassiopeia A-10 and NEC's MobilePro 400 aimed lower on the PDA scale. The Cassiopeia A-10, which comes with 2MB of RAM (compared to 4MB for the other two systems), is basic through and through, while the MobilePro puts its emphasis on providing file-transfer and -synchronization utilities.

Despite its higher cost, the Velo 1's built-in modem, excellent expandability, top-flight performance, and unique software applications earn our nod as the best of the first group of Windows CE systems. The Velo 1 gives us hope that PDAs may catch on.

batteries for about 20 hours of use. Two particular inconveniences stand out, though: You must have e-mail filtered through a POP3 server, and you have to input data by using a combination of the unit's cramped (but serviceable) QWERTY keyboard and its stylus on the pressure-sensitive screen. During evaluation, we frequently found ourselves finger-tied and wondering what to do with the stylus.



**BLUE-LIGHT SPECIAL:** At just \$499, Casio's Cassiopeia A-10 set the pace as the least expensive Windows CE system available.

Although these PDAs look alike from a distance, a closer examination shows that each has a different focus and configuration. The Velo 1, which is clearly positioned for the enterprise user, was the only PDA to include a built-in V.32bis modem; the others depend on PC Card modems for communications support. In addition, the Velo 1 is the most expandable, with a maximum RAM ceiling of 36MB, while the others top out at 8MB of RAM. To many this may sound like semiconductor overkill, but we envision complex database and communication applications that may need this much memory.

As far as software goes, each system also goes its own way. For example, the Cassiopeia comes with a financial calculator that can help you with bond interest or mortgage payments, while the MobilePro adds a CD-ROM-based set of utilities for synchronizing data with a desktop or mobile PC. The Velo 1 comes with both Pocket Quicken home finance software and a handy voice memo application for storing and organizing recorded sound bites.

#### NECK-AND-NECK

Despite being based on a range of different processors, these three first-generation Windows CE units didn't reveal huge performance differences. Nevertheless, the Velo 1 was a consistent overachiever. The Cassiopeia uses the Hitachi SH-3 architecture, while the MobilePro and Velo 1 are based on NEC's V-series and the MIPS R-3900 series, respectively. Under a variety of testing conditions, they all felt snappy and quick to respond to input from either the pen or keyboard. They're all instant-on devices, which removes the tedium of waiting for Windows to load before you get

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