



**First Looks:
Windows CE
Devices Take
On Palm III**



◀ **Managed
PCs: 38 Good
Corporate
Citizens**

■ **Net Tools:
Fast Ethernet
Switches Cut
Congestion**

■ **Project
Management:
6 Programs
To Keep You
On Track**

■ **OpenGL:
High-End PC
Graphics**

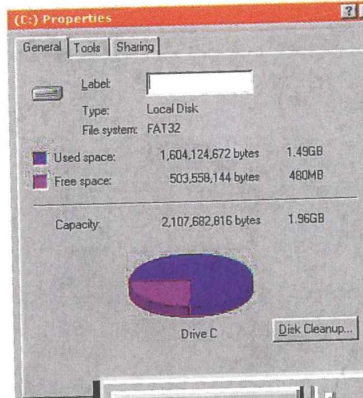
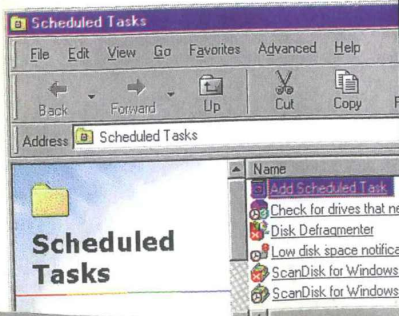
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THE INDEPENDENT GUIDE TO PERSONAL COMPUTING VOL. 17 NO. 12 JUNE 30, 1998

WINDOWS 98

WHAT YOU NEED TO KNOW

- **Faster Performance**
- **Integrated Browser**
- **USB and DVD Support**
- **Slicker Interface**



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UP FRONT

From the Editor-in-Chief	4
Pipeline	9
Letters	21
Trends	28
▶ Calling all Piloteers	
▶ Gates pumps up cable connections	
▶ Inside PC Labs	
▶ Tuning in to Web radio	
PCs	35
▶ Graphics workstations	
Software	36
▶ Disk-cloning utilities	
Peripherals	38
▶ 19- and 20-inch monitors	
▶ DVD upgrade kits	
Internet	40
▶ Web-based presentations	
Networking	42
▶ LAN analysis tools	
First Looks	45
▶ Windows CE devices take on the Palm III	



▶ Plug-ins for Adobe Photoshop	
▶ HP Printer/Scanner/Copier 380	
▶ Olympus FlashPath	
▶ SkyMap Pro	
▶ RouteFinder GPS for Windows 95	
Second Looks	79
▶ PowerDesk Utilities 98	
▶ Fixes for popular utilities	

COLUMNISTS

JAKE KIRCHNER	30
BILL MACHRONE	85
JOHN C. DVORAK	87
INSIDE TRACK	89
JIM SEYMOUR	93
BILL HOWARD	97

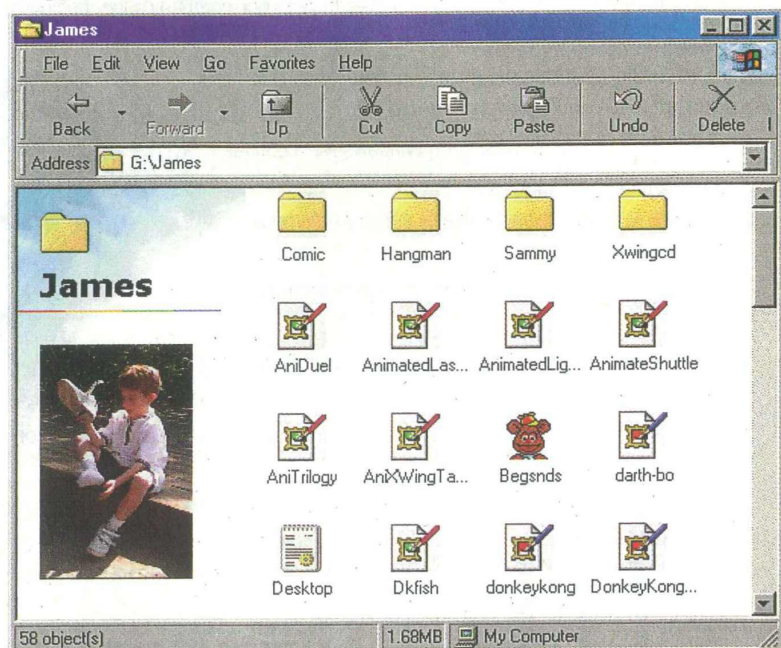
COVER PHOTOGRAPHY BY THOM O'CONNOR

COVER STORY

What You Need to Know About Windows 98

BY MICHAEL J. MILLER

We took an early look to get you started thinking about whether, when, and how to upgrade. And upgrade to what? Windows 98 or NT?100



What's New in the Interface.....	102	Portable Power.....	116
What's Better About Hardware Support.....	104	What's Improved in System Diagnostics.....	118
USB, FireWire, and More.....	104	Windows 98 Troubleshooting.....	118
What's Faster About Performance.....	112	What's Cooler about Multimedia.....	122
Loading Applications Faster.....	112	TV on Your PC.....	122
What's Different for Laptops.....	116	What's Easier for Developers.....	125

FEATURES

SOFTWARE

Project Management Keeps You on Track

BY NELSON H. KING

If your projects involve too many tasks and too many people to keep straight, here's help.....209

CA-SuperProject 4.0.....	211	Editors' Choice.....	211
Microsoft Project 98.....	212	Getting More Out of Project Management Software.....	212
Project Scheduler 7.....	216	Project Schedulers: Painless Planning.....	214
SureTrak Project Manager 2.0.....	217	Project Management Terminology.....	217
Time Line 6.5.....	221	Performance Tests.....	222
TurboProject Professional 2.0.....	221		
The Phases of Project Management.....	210		

HARDWARE

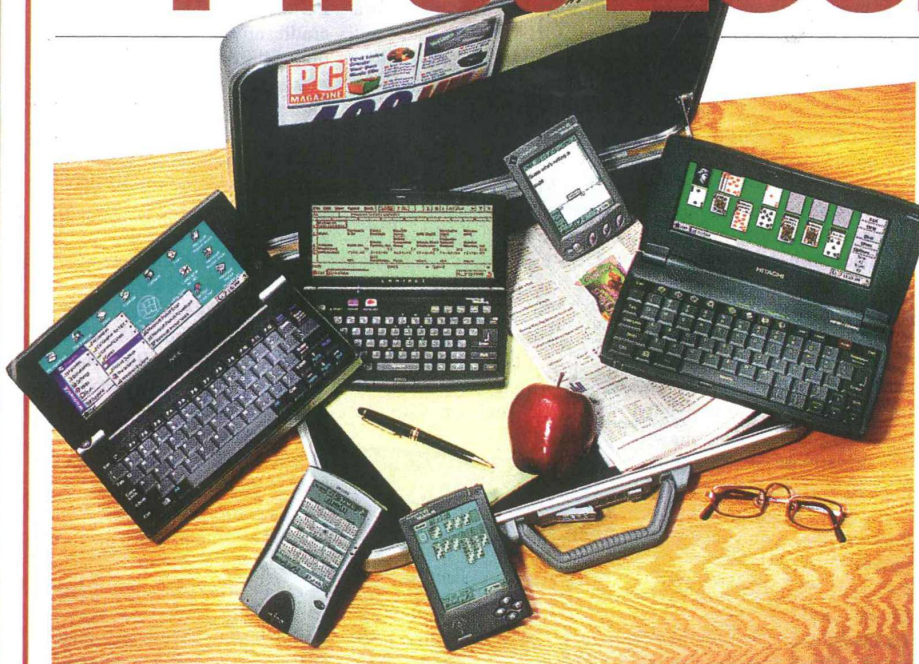
High-End PC Graphics Cards

BY JON HILL

The OpenGL standard brings respectability to the PC as a 3-D graphics platform.....191

AccelEclipse II.....	198	3-D Tasks: Typical Chores for OpenGL.....	19
Diamond Fire GL 4000.....	202	The Newest Chips: Should You Wait?.....	19
Dynamic Oxygen 402.....	202	HP Kayak XW: Stepping Up to a Workstation.....	19
ELSA GLoria-XL.....	202	Performance Tests.....	19
Intergraph Intense 3D Pro 2200S.....	206	Summary of Features.....	20
Omnicomp 3Demon MX16/16.....	206		
Editors' Choice.....	192		

First Looks



Windows CE 2.0 Cornucopia

New hand-held and palm-size PCs up the personal digital assistant ante with broader choices for productivity, reference, and communications.

By Bruce Brown

The days of look-alike Windows CE devices are ending. By early summer, an increasingly diverse lineup of Windows CE 2.0 companion PCs will be available in two of the three announced Microsoft reference design categories: hand-held PCs (H/PCs) and palm-size PCs (P/PCs).

The first shipping products in the third reference category, the Auto PC (A/PC), won't appear until the end of the third quarter of this year. And then there's the as-yet unannounced larger-size PC Companion reference design—code-named Jupiter—which is expected to rival lightweight notebook PCs. You may see the first systems by late summer or early fall of this year.

LOOKING BACK...AND FORWARD

Last year's Windows CE 1.0 H/PCs had to prove themselves against entrenched competition in a tough market. Primarily, they were competing against the wildly successful PalmPilot—the newest iteration of this product is dubbed the Palm III—arguably one of the only major success stories in the hand-held market up to that time.

The first of the CE 1.0 units were nearly identical, which worked for them as well as against them. Similarity may be good for an emerging standard, but it ultimately limits buyers' options. The new Windows CE 2.0 H/PCs and P/PCs, however, give you many more choices. You can select the companion PC that you want based on your preferences and specific needs.

Although there are less PC-centric Windows CE devices, such as golf carts and refrigerators, that will be coming with embedded processors in the future, today's new H/PC and P/PC products have a clear place and case for business, professional, personal information, and communication applications.

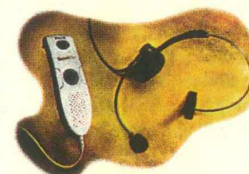
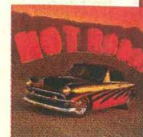
A SPECTRUM OF CHOICES

Although both the palm-size and larger hand-held Windows CE personal digital assistants (PDAs) can each be used as a standalone small personal computer, the major role of each is as a companion device. Each one is intended to be paired with a host PC, with which it can automatically synchronize personal information via serial cable or infrared connection. The two currently

INSIDE

PLUG IT IN:

The Adobe Photoshop plug-in specification paves the way for the six third-party applications, reviewed on pages 60 and 61.



NEW RECOGNITION:

VXI's Parrott and Philips' SpeechMike make voice recognition a whole lot easier. For the reviews, see page 64.

FLASH FLOPPY:

The Olympus FlashPath floppy disk adapter enables you to transfer digital images to your PC. See page 68.



More Products Reviewed...

L&H Voice Xpress Plus.....	56
HP Printer/Scanner/	
Copier 380	68
EndNote 3.0	73
ProCite 4.0	73
SkyMap Pro	76
RouteFinder GPS for	
Windows 95 2.0	76

First Looks Online

For daily just-in-time reviews of shipping products, check out First Looks Online at www.firstlooks.com



PHOTOGRAPH BY THOM O'CONNOR

First Looks

available types of devices break out by size and function: The smaller-format P/PCs are for reference and taking notes; the larger but still compact H/PCs are for additional productivity and communications.

For this roundup, we tested the first three P/PCs on the market, as well as three of the newest H/PCs. All of the models will be shipping by the time you read this or shortly thereafter. In the P/PC category, we looked at a production line sample of the Casio Cassiopeia E-10 (\$400 street); and near-production versions of the Everex Freestyle (three different models, \$330 to \$500 street), and the Philips Nino 300 (two versions, \$400 to \$500 street).

You'll pay more for an H/PC device—but you'll also get more. Here, we review the Hitachi HPW-200EC (\$900 list), the NEC MobilePro 750C (\$900 street), and the Novatel Contact (\$1,000 street). Both the Hitachi and Novatel systems were tested in almost final versions; the NEC was a final market model from the first manufacturing run.

P/PCs: ONE-HANDED COMPUTING

If you want the smallest device that you can get for handwriting or voice-recording short notes and storing information about contacts, tasks, and appointments, the palm-size P/PC is the PDA for you. Just think of them as Windows-centric PalmPilots with voice recorders. These devices weigh from 5 to 7 ounces, measure roughly three-quarters of an inch thick, 3.3 inches wide, and about 5 inches deep, and come with 4MB to 8MB of RAM and 8MB of ROM. The operating system and standard applications are all stored in ROM, leaving RAM available for user-added applications and data.

Each P/PC has an integrated microphone and speaker with a standard voice recorder. Designed for use with one hand only, these devices have buttons on the front and on one or more sides (depending on the model), and

all have at least one integrated handwriting recognition program, in addition to an on-screen, pop-up keyboard. Like H/PCs, each P/PC has an infrared transceiver and a serial communications port. P/PCs also include standard docking cradles with serial cables for synchronizing data with host PCs.

Microsoft's reference design requires CE devices to have a CompactFlash slot, initially intended for memory and BIOS upgrades. In fact, all P/PCs currently on or near-ready for the market have larger, Type II CompactFlash slots to accommodate upcoming thicker CF cards that will function as modems, pagers, and next year, even tiny hard disks.

The monochrome, backlit, four-shade P/PC display has a resolution of 240 by 320 pixels, and measures 2.3 inches wide by 3.1 inches high, or 3.9 inches diagonally. The whole screen is available for application display, unlike 3Com's Palm devices, each of which have an identical-size display but reserve the lower three-quarters of an inch as an input area. Also, Palm devices support only 160-by-160 resolution.

Seeking higher resolution on a small screen may seem like a self-defeating endeavor. But in an impressive demonstration of what can be done on a small screen, the standard P/PC calendar application has a 12-month display mode that shows the entire year at once. To access a day-view screen, just tap on a given date.

Standard Microsoft applications for the P/PC platform include Windows CE OS 2.01, Windows CE Services 2.1, Pocket Outlook (calendar, tasks, and contacts), Inbox, Note Taker,

Voice Recorder, World Clock, CIC's Jot handwriting recognition software, Solitaire, and a calculator.

A standard application, Channels, is used for off-line Web browsing. Content is downloaded from special Mobile Channel content providers such as MSNBC. But to use this feature, you must have Internet Explorer 4.0 on your host PC; content is downloaded onto the

host and then copied to the P/PC during synchronization for later browsing—a good way to catch up with the

With automatic synchronization, if you work on a standard PC with a P/PC in its docking cradle, any changes you make during the day on your calendar, task list, or contact manager are automatically copied to the P/PC as they are made. Whenever you leave for the day or go to a meeting, you just lift the P/PC from the cradle and the data on stored therein is current.

While you're away from your desk, any updates or additions that you make are likewise transferred to the host PC as soon as you put the P/PC back in its dock. This feature synchronizes automatically with Microsoft Schedule+ 7.0a, Microsoft Outlook 97 and Outlook 98, and the Microsoft Exchange client. Third-party software is available to enable synchronization with other PIMs.

With so much in common, you're probably wondering what differentiates one P/PC from the next. The three we review here are indeed generally similar but vary in action and placement of the controlling buttons. The differences are also in the design of their respective docking cradles and in the bundled bonus software.

Casio Inc.

Casio Cassiopeia E-10

The Casio Cassiopeia E-10 P/PC stands out from the crowd with its silvery gray, industrial-design-style case. The unit has four buttons on the bottom front of the case, below the screen: a power/backlight button, and function buttons for the Calendar, Contact, and Task applications. The remaining control buttons on the left side of the unit include an Action button with a roller dial for item selection, an exit button, and a button to start the voice

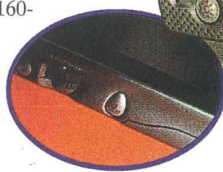
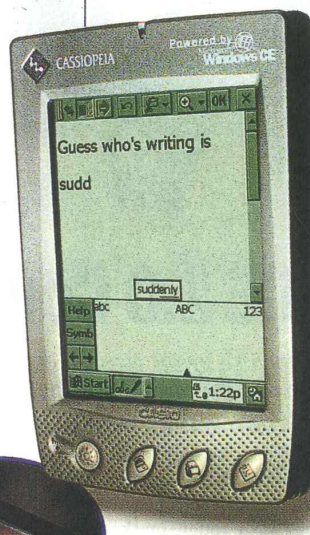
Casio Cassiopeia E-10

Street price: \$400

Casio Inc., Dover, N.J.; 800-962-2746; 973-361-5400

www.casio.com

Choose 413 at www.pcmag.com/infolink



ACTION! The Cassiopeia's side-mounted Action button lets your scroll through and select items on-screen.

news or other content during a commute or daily walk.

You have three major options for synchronizing data between a P/PC and a host PC. You can activate synchronization manually, start automatically on connection, or set synchronization to monitor connected devices and update information that's out of date. In the latter case, data that is changed on either the host or CE device is updated automatically on the other system.

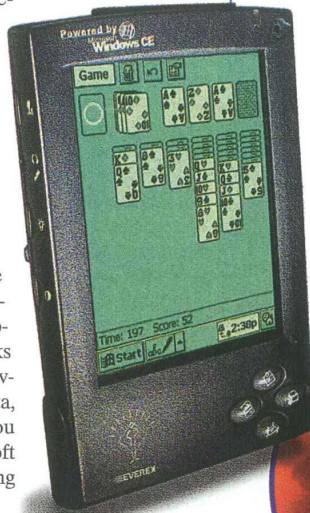
recorder. The E-10 also has an earphone jack so you can listen to voice notes in privacy.

Powered by a 66-MHz NEC VR4111 CPU, the E-10 has 4MB RAM, which is expandable via the CompactFlash slot. The two-piece docking cradle has a dark-gray base and a removable, clear plastic upright support. We found that the support piece really isn't necessary; removing it makes the base easier to pack for travel. The E-10 weighs 5.5 ounces and measures 0.7 by 3.2 by 4.9 inches.

As the only shipping model of the P/PCs tested here, the Casio is the best representative of how well handwriting recognition, voice re-cording, and application synchronization works in the product category. Whenever you want to enter or edit data, a tap on the task bar lets you choose between the pop-up soft keyboard or the Jot handwriting recognizer.

The Jot recognizer works with natural keystrokes or with one-stroke characters. A quick online reference demonstrates how to create characters correctly. A 14,000-word dictionary tries to anticipate the words that you are writing, with pop-up selection options for quick word

completion. The standard version of CIC's Jot uses a limited part of the screen for input, but a full-screen version is available for \$24 via the company's



Everex Freestyle

List price: \$329 (4MB); \$399 (8MB); \$499 (8MB w/modem)

Everex Systems, Inc., Fremont, CA; 888-725-6724; fax: 888-725-6329; freestyle.everex.com
Choose 414 at www.pcmag.com/infoclink.

approximately 16 minutes per megabyte of storage.

Bonus software with the E-10 (provided on a CD-ROM) includes the SmART Commander command-and-control program, bFAX Express, LandWare's Financial Calculator, Tetris CE, Quicken Expensable, MeetingMinder, File Find Utility, and the Casio Digital Camera Viewer.

The E-10 is rated to run from 25 to 40 hours

on two triple-A alkaline batteries. Like all Windows CE palm-size PCs, the Casio unit also has a small, coin-size lithium ion battery as a backup. An AC adapter is not standard but is available as a \$20 option. The

company doesn't sell rechargeable batteries for the E-10, but the device will run on standard triple-A nickel hydride rechargeable cells.

Additional options for the E-10 include a 19.2-Kbps modem adapter that fits in the docking cradle (\$99), a variety of cases, replacement stylus (\$5.25), stylus/pen combination (\$10.50), and three CompactFlash memory cards (4MB, \$80; 8MB, \$130; 16MB, \$180).

Like the other P/PCs and H/PCs, the Casio is backed by a one-year warranty. Live technical support is available from 7:00 to 6:00, weekdays. Casio doesn't have a specific replacement or repair-time policy, but according to the company, it treats all service requests on an expedited basis for quick turnaround.

Everex Systems Inc.

Everex Freestyle

Two models of the Everex Freestyle will be on the shelves for sale by the time you read this. The Freestyle Associate A-10 model with 4MB RAM has a list price of \$329; the Manager A-15 with 8MB RAM is expected to sell for \$399; and the top-of-the-line Executive model (available in June) with 8MB and with a

RECHARGE IT: The Everex Freestyle comes with rechargeable batteries, plus an AC adapter.

SUMMARY OF FEATURES

Windows CE 2.0 PCs

PALM-SIZE HAND-HELD	Casio Cassiopeia E-10	Everex Freestyle	Philips Nino 300	Hitachi HPW-200EC	NEC MobilePro 750C	Novatel Contact
Price of tested configuration	\$400 (street)	\$329 (list)	\$400 (street)	\$900 (list)	\$900 (list)	\$1,000 (street)
Weight (ounces)	5.5	5.3	7.3	28.9	28.8	22.4
Size (HWD, inches)	0.7 x 3.2 x 4.9	0.7 x 3.2 x 4.8	0.8 x 3.4 x 5.3	1.3 x 10 x 5.2	1.4 x 9.6 x 5.4	1.2 x 7.6 x 4.7
Processor/speed (MHz)	NEC VR4111 / 66	NEC VR4111 / 66	Philips R3910 / 75	Hitachi SuperH-3 / 100	NEC VR411 / 80	Hitachi SuperH-3 / 80
Standard/maximum RAM	4MB / 4MB	4MB / 8MB	4MB / 8MB	16MB / 32MB	16MB / 32MB	8MB / 32MB
ROM	8MB	8MB	8MB	12MB	16MB	16MB
Battery type	Alkaline	Nickel hydride	Nickel hydride	Lithium ion	Lithium ion	Lithium ion
Number and size	2 AAA	2 AAA	2 AAA	1 proprietary	1 proprietary	1 proprietary
Rated life (hours)	25-40	20	10-12	10	8-10	8-12
Display type	4-shade gray-scale	4-shade gray-scale	16-shade gray-scale	256-color	256-color	4-shade gray-scale
Diagonal size, in inches/resolution	3.9 / 240 x 320	3.9 / 240 x 320	3.9 / 240 x 320	8.1 / 640 x 240	8.0 / 640 x 240	7.1 / 640 x 240
Modem speed (Kbps)/type	19.2 / In cradle	33.6 / In cradle	19.2 / External	33.6 / Internal	33.6 / Internal	14.4 (wireless, 19.2) / Internal
Standard or optional	Optional	Optional	Optional	Standard	Standard	Standard
Expansion	Compact Flash Type II slot	Compact Flash Type II slot	Compact Flash Type II slot	PC Card Type II slot, Compact Flash slot	PC Card Type II slot, Compact Flash slot	PC Card Type II slot, Compact Flash slot
Repair or replacement turnaround policy	Varies	72 hours	72 hours	72 hours	72 hours	Depends on reseller

First Looks

33.6-Kbps modem in a folding docking cradle will sell for \$499. Our test system, the Freestyle Associate A-10, weighs 5.3 ounces, and measures 0.7 by 3.2 by 4.8 inches, making it the lightest and smallest of the P/PCs.

The Freestyle Associate is the least expensive P/PC here, but it doesn't come with a docking cradle. A serial cable for direct connection is included, however, as are rechargeable triple-A nickel hydride batteries and an AC adapter/charger. Depending on the type of activity and backlight use, a full charge is rated at up to 20 hours of continuous use. The Manager and Executive models each come with a folding cradle for packing convenience; the cradle with the Executive model includes the modem and has an additional battery compartment (also available in the Manager) to power the modem.

This unit has four application buttons in a diamond pattern on the front of the case, with the Action and recorder buttons on the left side. A feature unique to the Associate is a standard internal vibrator, which can be set to alert—along with a visible light—when signaling upcoming appointments. A natural application is to use P/PCs as pagers (with third-party CF pager cards expected soon); with its standard vibrating alarm mode, the Associate has a lead on other products in this roundup. Another unique feature is a combination earphone/microphone jack for use with a headset.

In addition to the standard Windows CE software, the company bundles Microsoft Outlook 98 with the Freestyle models. Options include the folding cradle (\$49.99 list), cradle with modem (\$169.99), 4MB memory upgrade (to the maximum 8MB, \$129.99), extra rechargeable batteries (\$19.99), AC adapter (\$24.99), serial cable (\$19.99), and stylus three-pack (\$9.99).

Everex backs the Freestyle

Associate with a one-year warranty. Live technical support is available from 11:00 to 9:00 weekdays, and the company offers a 72-hour repair or replacement policy.

Philips Mobile Computing Group

Philips Nino 300

Philips Mobile Company Group continues the style-setting stance it took with the Philips Velo H/PC with the Nino 300—the sleekest of the first batch of Windows CE P/PCs. Two versions will be available: one with 4MB RAM for \$400 and the other with 8MB of RAM and a clip-on 19.2-Kbps modem for \$500. The tested 4MB version was a preproduction model but had a finished case.

At 7.3 ounces and measuring 0.8 by 3.4 by 5.3 inches, the Nino is the largest of the first three Windows CE P/PC models. Except for the power button, which is on the lower front of the case, all application and control buttons are on the two sides of the device. The Nino's case is a combination of light silvery colored metal with black rubber side pieces. The middle of the case is tapered, which both looks good and makes the unit easy to hold. Although the Nino is longer than the Casio and Everex models, in practice the extra length has a practical result, giving you a place to rest your palm if you use the stylus for writing on the screen.

The Nino's standard ovoid docking station has an attached cable for serial connection to a host PC. Rechargeable triple-A nickel hydride batteries are also included,

with a 10- to 12-hour rating (depending on usage), along with an AC adapter/charger.

An application unique to this system is Pocket Commander, which trains the Nino to respond to commands to launch applications. In addition to the standard soft keyboard and Jot handwriting recognizers, the Nino also comes with a T9 embedded soft keyboard, a technology used with some telephones that enables using just a few on-screen keys for data entry. Other standard software includes Nino

Converter, smART Writer, Pocket Commander, and Expense Manager.

Options for the Nino include the modem (\$90), Nino

H/PCs: TWO-HANDED PRODUCTIVITY

H/PCs look like slightly shrunk traditional notebook PCs, with clamshell displays and real keyboards. Earlier this year, the first Windows CE 2.0 H/PCs appeared from Hewlett-Packard, NEC, Philips, and Sharp. The first color displays came with the HP 620LX and Sharp Mobilon HC-4500; the first "wide-body" model with a more typist-friendly keyboard and wider screen came about in the NEC MobilePro 700.

The newest H/PCs from Hitachi Home Electronics, NEC Computer Systems Division, and Novatel Wireless join the ranks of earlier Windows CE 2.0 H/PCs, differentiating themselves with larger color screens and the biggest keyboards yet on the Hitachi HPW-200EC and NEC MobilePro 750C. A communications double-header can be had with the Novatel Contact, which integrates both a cellular digital packet data (CDPD) wireless modem and a fast landline modem.

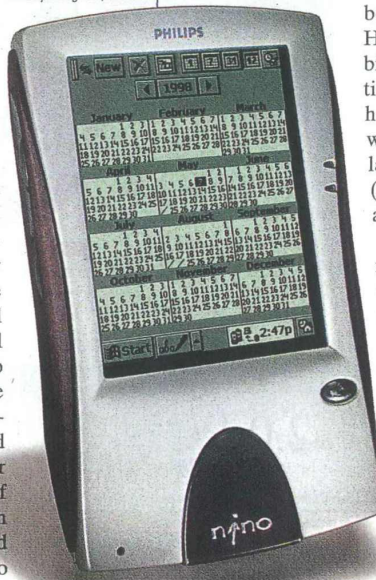
The Hitachi and NEC models give you the ability to create and edit information relatively comfortably, and with their integral VGA ports and modems, they offer a convenient way to run presentations and communicate with the office. Novatel takes communications a big step further—even away from phone lines—making the Contact the ultimate hand-held for people who need to be connected at all times.

Current H/PC models vary more than P/PCs. The three H/PCs in this roundup weigh from 22 to 29 ounces; and measure 1.2 to 1.4 inches high, 7.6 to 10 inches wide, and 4.7 to 5.4 inches deep. They include 8MB to 16MB of RAM, and all three models are expandable to 32MB. The internal screen resolution is 640 by 240 (also known

Philips Nino 300

Street price: \$400 (4MB);
\$500 (8MB w/modem)

Philips Mobile Computing Group,
Campbell, CA;
888-275-8356, 418-558-2200;
nino.philips.com
Choose 415 at
www.pcmag.com/infolink



Dock (\$40), Nino-to-PC traveling cable (\$30), traveling AC adapter (\$35), rechargeable battery pack (\$40), car charger (\$20), and Compact Flash memory cards (pricing was not available at the time of our review).

Philips supports the Nino with a one-year warranty, 9:00 to 3:00 weekday live technical support, and a 72-hour repair or replacement policy.

First Looks

as half-VGA), on screens that measure from 7.1 inches diagonal (Novatel) to 8.1 inches (Hitachi).

Powered by proprietary lithium ion battery packs, the three new H/PCs each have rated battery lives of 10 to 12 hours, depending on use, which in the case of the Hitachi and NEC will vary by use of the backlight; and with the Novatel model, with the amount of use of the wire-

H/PCs have VGA-output display potential, but only when using Pocket PowerPoint. Not all H/PCs have standard VGA ports, though single-purpose or dual-purpose jacks that support VGA output are included in the three reviewed units.

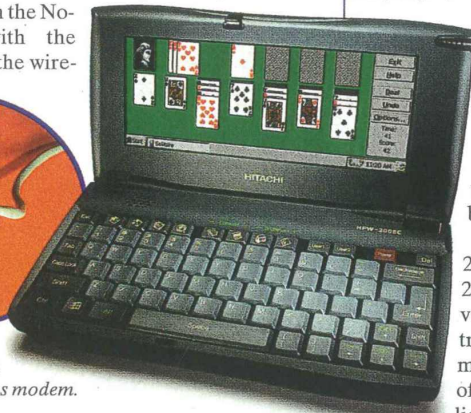
Hitachi HPW-200EC

List price: \$900

Hitachi Home Electronics (America) Inc., Norcross, GA; 800-241-6558; 770-279-5600; www.hitachi-ce.com Choose 416 at www.pcmag.com/infolink.



COMMUNICATE: The HPW-200EC has an integrated 33.6-Kbps modem.



less modem as well as the display backlight. The three H/PCs also have one Type II PC Card slot and a CompactFlash slot.

H/PCs have a broad range of standard software, including Calculator, Pocket Internet Explorer, Pocket Outlook (which includes calendar, contacts, inbox, and tasks), Solitaire, Voice Recorder, World Clock, and a suite of applications known as Pocket Office, including Pocket Word, Pocket Excel, and Pocket PowerPoint.

Pocket PowerPoint enables H/PCs to serve as portable presentation machines, easily hooked to a portable LCD projector for the ultimate in presentation portability. PowerPoint presentations still need to be created on a conventional PC with the full-blown Microsoft PowerPoint application, but finished applications—including slides and notes—can be downloaded and converted to Pocket PowerPoint format for display on the H/PC screen or externally via a VGA-out port. All

Hitachi Home Electronics

Hitachi HPW-200EC

By just one-tenth of an inch in diagonal screen size, and 1-millimeter greater distance from key-center to key-center, the Hitachi HPW-200EC has just

a barely bigger screen and slightly wider keyboard than the NEC MobilePro 750C. Our test system was a late preproduction unit, although shipping models will be in stores before you read this. The Hitachi is powered by a 100-MHz Hitachi SuperH-3 CPU and has 12MB of ROM.

The HPW-200EC weighs 28.9 ounces and measures 1.3 by 10 by 5.2 inches. The 17-mm key-center distance between its 74

keys is just 2 mm less than a standard keyboard. The keyboard is large enough; many people will feel comfortable typing on it for a moderate amount of time. The only design compromise that is questionable is the location of the right shift key to the right of the

Up Cursor/PgUp key—the extra pinkie reach to hit the right shift key is an initial nuisance, requiring adjustment for people who use conventional keyboards.

The 256-color, 640-by-240 display on the HPW-200EC is very bright and very clear. Separate contrast and brightness adjustments provide a wide range of control. There is no backlight key to turn off the backlighting to conserve power, however. Using the 50 percent to 200 percent zoom capability in Pocket Word and Pocket Excel, you can get a lot of work done without feeling very constrained with the unit.

A single port on the Hitachi HPW-200EC does double duty as the VGA-out and serial I/O port, which means that you cannot have both types of connections simultaneously. The VGA-

out cable is not standard but comes as a \$69 option. Other options include an extra AC adapter (\$39), 16MB memory upgrade card (\$199), serial cable (\$49), rechargeable battery pack (\$79), and stylus two-pack (\$9).

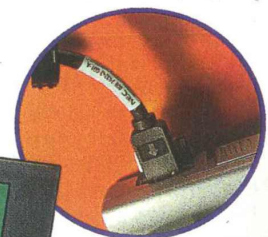
In addition to the standard Windows CE 2.0 H/PC software, the Hitachi comes with Hitachi Memo Pad and PC Screen Capture, bSquare bFAX Professional, Odyssey Computing BizCalc, Compuserve Sprynet, LandWare Pocket Finance, CIC Speller, and Microburst Virtual Courier. A one-year warranty is backed by 9:00-to-5:00 technical support and a 72-hour repair or replacement policy.

NEC Computer Systems Division

NEC MobilePro 750C

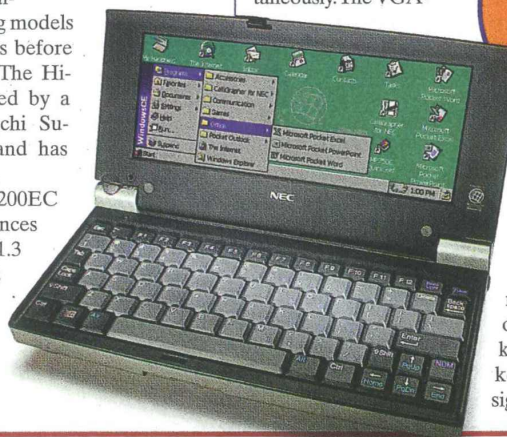
The NEC MobilePro 750C, which is similar in size to the previously introduced monochrome MobilePro 700, is another portable productivity companion. The silver-cased 750C is powered by a 80-MHz NEC VR4111 CPU and has 16MB of ROM. Weighing in at 28.8 ounces with batteries, this machine measures 1.4 by 9.6 by 5.4 inches. Our test unit, a production model with all systems functional, performed flawlessly.

At 8.0 inches on the diagonal,



PICTURE THIS: NEC includes a VGA-out cable with the MobilePro for presentations.

the 750C's screen is almost the same size as that of the Hitachi. Its 16mm key pitch for the 80-key keyboard is a single—but significant—millimeter less



First Looks

than the HWP-200EC's key pitch. The unit's keyboard arrangement doesn't suffer from the remote right shift key found on the Hitachi model, making up for the slight difference in key pitch by a more natural reach for the shift key. The MobilePro also has two Alt and two Ctrl keys, unlike the Hitachi which has only one of each.

The NEC screen has contrast control keys and a backlight mode key to select normal and full backlighting. On a test on an airplane, the screen was sufficiently bright with the backlight on low-power mode. According to the manual, running at full backlight mode consumes battery power at twice the rate of normal mode.

The NEC MobilePro 750C has separate serial I/O and display ports, and the VGA-out cable is included as a standard accessory. Options for this system include an extra AC adapter (\$34), serial cable (\$14), VGA cable (\$19), rechargeable battery (\$69), stylus three-pack (\$6), and leather carrying case (\$29). A 32MB RAM upgrade costs \$299, but requires discarding the standard 16MB card, which makes upgrading more costly than one would expect.

NEC also bundles an impressive amount of bonus software with the MobilePro 750C, including bSquare bFAX and bPRINT, Paragraph CalliGrapher for NEC, JetForm Filer Pro and Filer Centra, Compuserve Sprynet, Puma Intellisync, Symantec PC Anywhere, CIC QuickNotes, M-Systems TrueFFS, and Microburst Virtual Courier.

The NEC one-year warranty comes with two features unmatched by the other vendors: 24-hour live technical support and 72-hour door-to-door repair or replacement of a defective unit. A three-year UltraCare warranty extension for \$85 is a bargain.

Novatel Wireless Inc.

Novatel Contact

If you must stay in touch all the time—a necessity for an increasing number of mobile workers—the Novatel Contact gives you that opportunity. Otherwise a fairly ordinary hand-held PC device with a 7.1-inch diagonal, four-shade monochrome backlit screen, the 80-MHz Hitachi SuperH-3-powered Contact charges to the front of the communications brigade.

currently in great flux, although monthly flat rates comparable to landline ISP rates are expected as business grows and service expands.

To connect to the Internet via the Contact's wireless modem, you simply tap on the Contact Modem Connection icon on the Windows CE desktop. The modem first connects with the wireless carrier and then launches Pocket Internet Explorer. From there, you can surf the Web or download information from

Novatel Contact

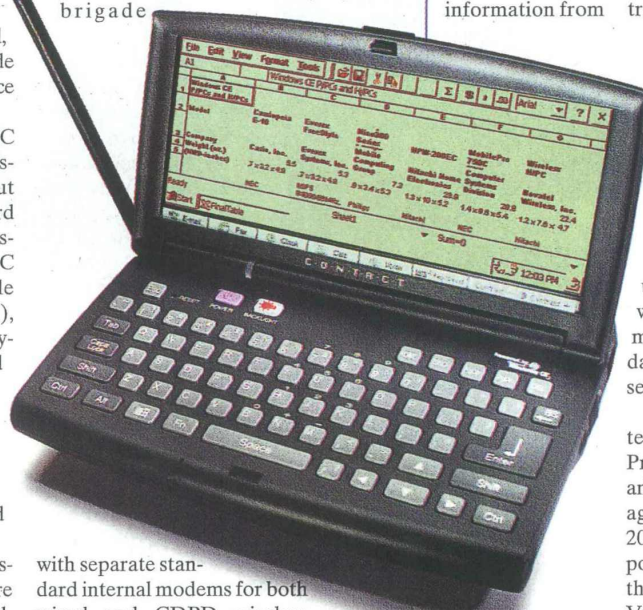
Street price: \$1,000

Novatel Wireless Inc.,
San Diego; 888-888-9231,
800-675-2638;

www.novatelwireless.com

Choose 418 at

www.pcmag.com/infoclink



with separate standard internal modems for both wired and CDPD wireless communications. This unit is slightly more expensive than both the NEC MobilePro 750C and the Hitachi HPW-200EC, but you get a lot of bang for that extra 100 bucks.

Neither of the Contact's integrated modems is a speed demon: The wired modem is a 14.4-Kbps model, and the wireless modem has a maximum rate of 19.2 Kbps. To use the wireless modem, you'll need to subscribe to a CDPD wireless service, currently available in most but not all major metropolitan areas. Wireless rates are

information service carriers.

In testing, our preproduction test model was able to connect quickly and successfully to PC Magazine Online, although the very slow modem required patience when downloading a relatively graphics-rich Web site. The point, however, is that this portable device already brings you all of the productivity and connectivity benefits of the Windows CE H/PC platform—and then on top of that—also lets you browse the Web, download information, and send and re-

ceive e-mail. And you can do all of this while you're away from AC power and conventional phone lines.

At 22.4 ounces, the Contact is relatively light compared with the larger Hitachi and NEC models; the unit's dimensions are also more compact at 1.2 by 7.6 by 4.7 inches. The AC adapter, on the other hand, is surprisingly large at 1.25 by 2.2 by 3.75 inches, which is similar to or larger than the dimensions of many full-size notebook PC adapters. This AC adapter adds another 10.4 ounces to the Contact's total travel weight.

The monochrome blue-green screen is reasonably visible, with a backlight button on the keyboard and contrast controls on the lower margin of the display itself. The Novatel's small chiclet-style keys are placed close enough together that you'll want to avoid using this unit for lengthy writing or data input. For remote editing, note-taking, and data entry, however, it will serve fine.

Software bundled by Novatel includes bSquare bFAX Professional, bSquare View, and the Wireless Modem Manager. Like the Hitachi HPW-200EC model, the serial I/O port on the Contact doubles as the VGA-out port; again, the VGA-out cable is optional. No option prices were available at the time of our evaluation, but the option list will include the VGA-out cable, as well as an earphone/microphone combination (which use a single dual-purpose jack), cradle, stylus pack, DC car adapter, and a leather case.

Novatel will back the Contact with a one-year warranty and live technical support on weekdays from 11:00 to 7:00. Repair and return policies will be set by resellers, which in some cases may include wireless service carriers.