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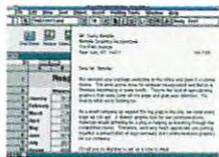


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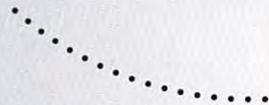
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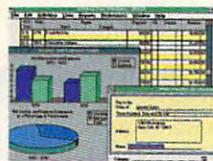


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COMPAQ

COMPUTE

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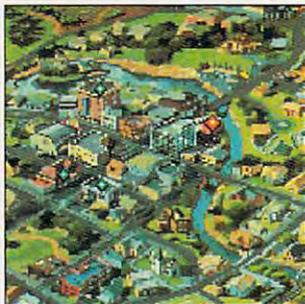
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EDITORIAL LICENSE

Clifton Karnes

In this issue we honor our industry's present, past, and future.



This issue's big story is the COMPUTE Choice Awards, and looking at the finalists, I was struck by how far the personal computer has come in the last ten years and by how critical graphical user interfaces, mice, laser printers, networking, and object-oriented programming have become to its success. Most of the software products in our finalist list are GUI based (most, in fact, run on Windows). Almost all of these programs support the mouse, and many—such as the desktop publishing and presentation programs—depend on laser printers for their final output. And communications (networking) software has become one of the fastest-growing categories in the last year. Lastly, many of these top programs were built with object-oriented techniques, and in fact, our programming-tool winner this year is an object-oriented programming language.

The interesting thing about all these innovations is that they didn't come from Microsoft, Apple, or IBM, at least not initially. They originated someplace you probably wouldn't expect—Xerox.

As most of you already know, Xerox, which was originally called the Haloid Company, invented the photocopying process. It spent 15 years developing xerography, and when it finally brought it to market, the company was rewarded with instant success. Xerox realized, however, that paper was not the future. It felt that the future of the office lay in digital—computer—technology. To help it gain a foothold in this uncharted area, Xerox founded a research institute whose broad mandate was to discover the architecture of information. It built this institute in Palo Alto, California, and called it PARC, for Palo Alto

Research Center.

To gauge just how impressive PARC's achievements were, we need to take a look at the computer situation in 1970, when PARC was founded. At this time, the mainframe computer was king, and most mainframes ran just one program at a time. As a programmer, you would create your program, punch it onto cards, and give it to a white-coated computer technician who would load it into the computer and run it. The next day or the next week, you'd get your results. In 1970, the cutting edge of computer technology was something called timesharing. In a timesharing system, there are several users connected to one computer, and each gets a portion of the computer's time. Using this model, the computer can serve more users, but with a slight degradation in performance.

At first, the researchers at PARC considered jumping on the timesharing bandwagon, but an insightful leader, Bob Taylor, saw beyond timesharing to the personal computer. In his vision, each user would have his or her own computer, connected to other personal computers so information could be shared.

Through Taylor's persistence and vision, PARC skipped timesharing and started working directly on building a personal computer. It succeeded and called its creation the Alto. It wanted the Alto to have a graphical user interface and a mouse, so it built that in. It also realized that a WYSIWYG display demanded a WYSIWYG printer, so it invented the laser printer (which is based on the xerographic process). Since laser printers were even more expensive than now (the cost for the first ones ran around \$30,000), it designed

a way to connect the personal computers to the printer using cables and protocols. It called this Ethernet, the first local area network or LAN.

To make it easy for end users to program their machines, Alan Kay and a team of researchers developed one of the first object-oriented programming languages—Smalltalk.

It would be 15 years before the world at large would see these developments reach fruition, and none of the successes would come from Xerox.

With a combination of bad timing and inept management, Xerox failed to turn even one of these miraculous inventions into a viable product. PARC's seeds bore fruit in other people's gardens, however. PARC showed the GUI-based Alto to Steve Jobs and Bill Gates, for example, and it formed the impetus for Apple's Macintosh and Microsoft's Windows. And several researchers left PARC to found their own companies to develop products based on the ideas that originated at PARC.

Why did Xerox ignore these breathtaking innovations? The answers are complex, but they're put forth well in *Fumbling the Future* by Douglas K. Smith and Robert Alexander (Morrow, 1988), which has been the basis for most of my PARC info.

The point of this bit of history is that the five most important technologies in the last 20 years were all created at PARC: the personal computer, the graphical user interface, the laser printer, the local area network, and object-oriented end-user programming. In this issue, we're honoring the winners of the COMPUTE Choice Awards, but I'd like to take a moment to honor the men and women at PARC who invented our future. □

Mission

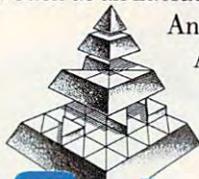


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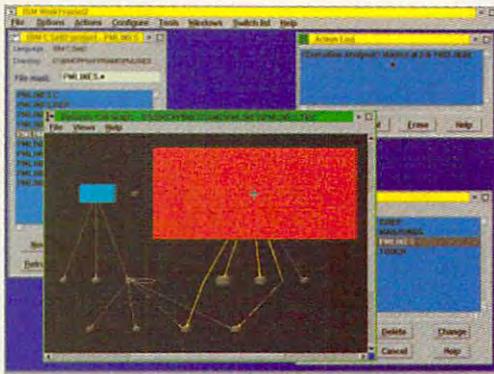


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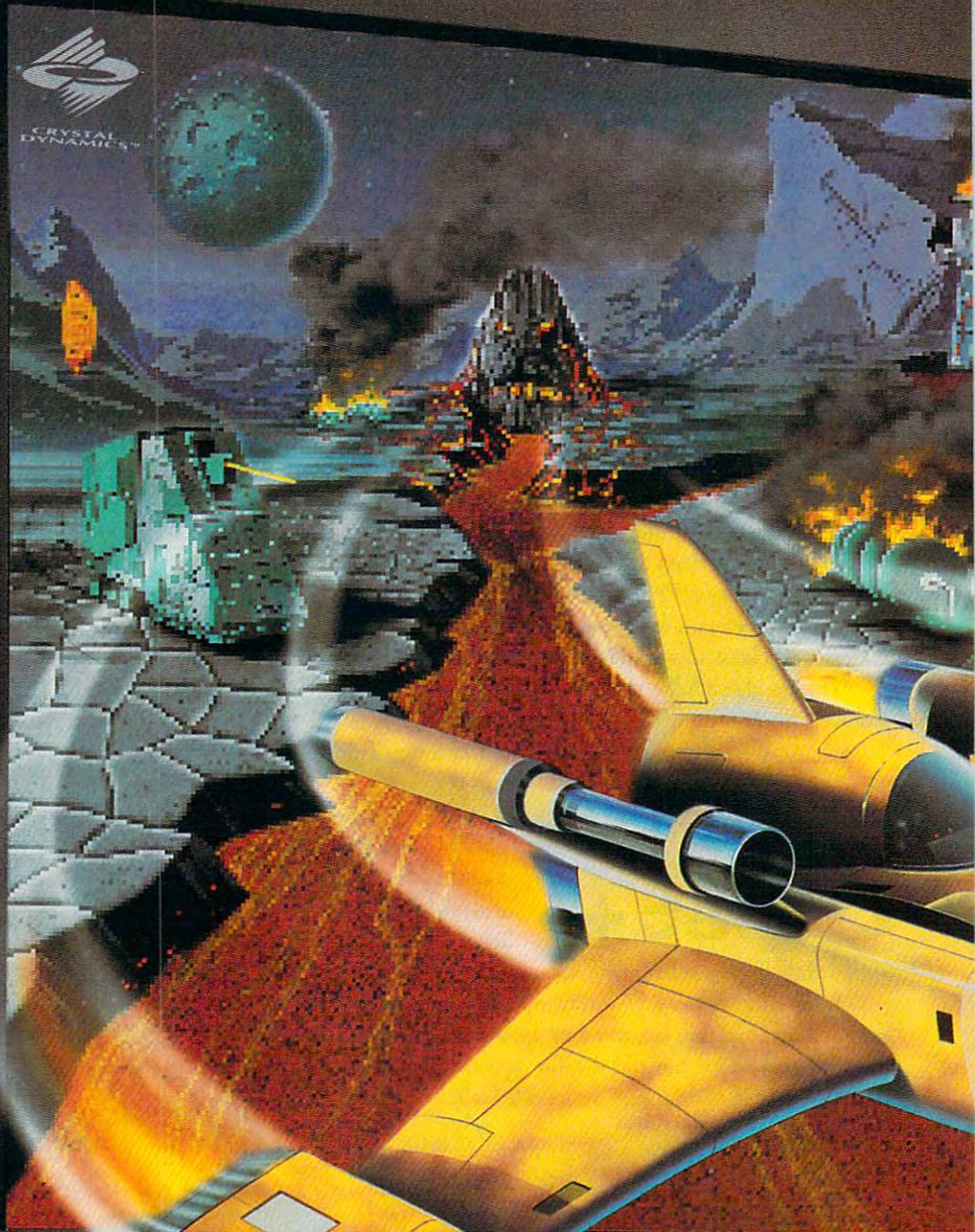
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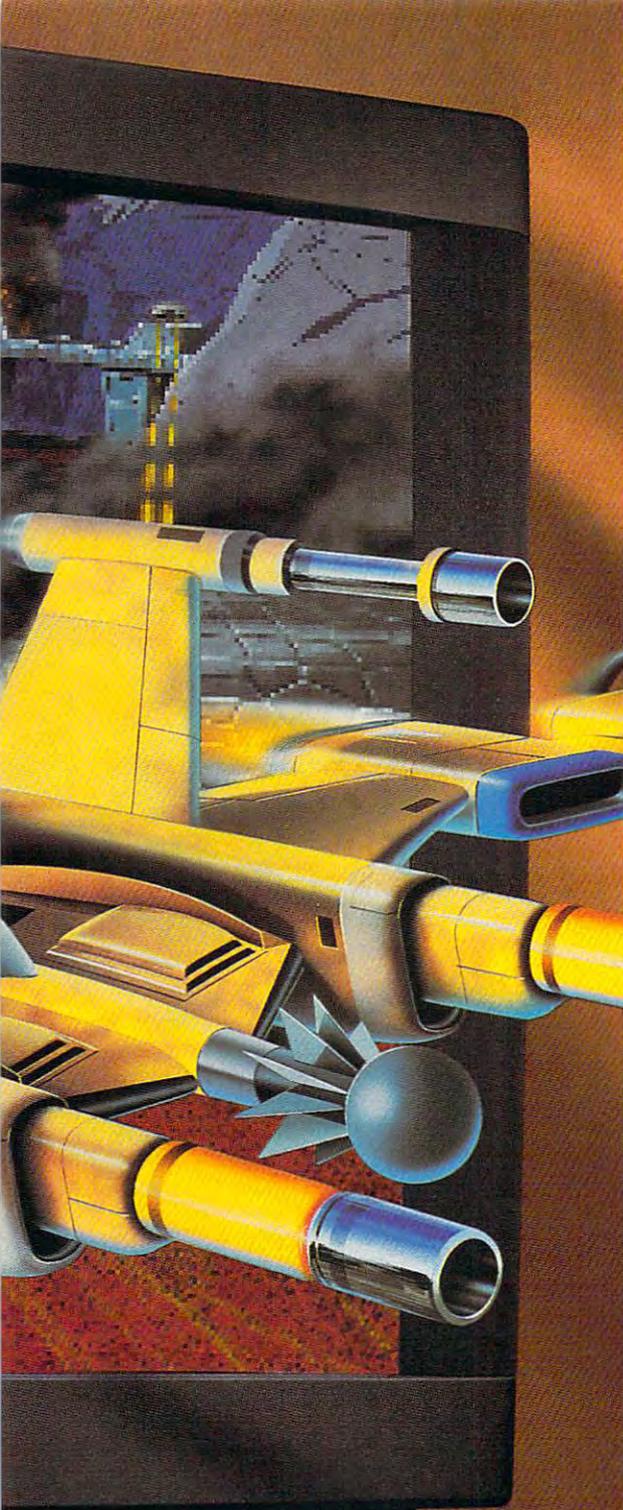
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Honoring the 25 best products of the year

COMPUTE *Choice Awards*

Each year, COMPUTE honors the best hardware and software products with the COMPUTE Choice Awards. From the hundreds of products we see annually, we select the finest in 25 categories. Every year, it gets harder to choose the finalists and winners, because the overall quality of hardware and software products is improving. Because of our lead time, each year's awards also cover products released at the very end of the previous year.

What does it take to be a COMPUTE Choice Award finalist? I always know when it's time to start picking them because I start getting phone calls from publicists asking how they're selected. Here's how it's done. We contact a few dozen people whose opinions we value—writers, editors, computer enthusiasts, industry watchers—and ask what they've seen lately that really blew them away. Some respond enthusiastically with only one or two recommendations. Others reply with several recommendations in every category. We look over the lists, make sure the products meet the editors' qualifications, and set about narrow-

ing the list. In other words, every product listed here, whether a finalist or a COMPUTE Choice Award recipient, is a winner.

The changes from other years include a heavier reliance on Windows as the operating system of choice. Less and less outstanding software is originating in DOS. More products, like Claris Works and Lotus Improv, are challenging the existing metaphors and seeking out new ways of visualizing and working with information.

In some areas, the race seems to be tightening considerably among the major contenders. In laptop computers, graphics, and desktop publishing, for example, you will see familiar names and faces from years past. But while the distinctions among products in some areas become clearer, in other areas (operating systems and environments, for example) the waters just seem to be getting muddier.

All of this is great news for software junkies. Instead of one right way of doing things, you will find many divergent ways of getting work done and having fun on your computer.

Edited by Robert Bixby



COMPUTE
CHOICE
AWARDS

Word Processor

Microsoft Word for Windows 6.0

Microsoft Word for Windows has always been king of the hill in Windows word processors. With Ami Pro and WordPerfect for Windows, both of which are excellent products, the competition's hot, but for our money, Word for Windows 6.0 is still the one to beat.

WinWord made the toolbar famous, and since the features accessed by its toolbar are at the heart of the program, let's take a quick toolbar tour. Going from left to right, you'll find buttons for opening and saving files; printing; print preview; checking your spelling; cutting, copying, pasting, and format painting; undoing and redoing; autoformatting; inserting tables; setting columns; entering drawing mode; inserting charts; showing special symbols; zooming; and calling help.

WinWord 2.0 fans will recognize several important additions in the toolbar list. The format paint button can copy formats from one paragraph to another. Undo and redo offer multiple levels, unlike the single undo in 2.0. Autoformat takes your data and formats everything from paragraphs to characters based on a style you select. The drawing button actually turns WinWord into a graphics program, which lets you draw right on the page. And the zoom tool is a combo box that lets you specify almost any scaling for your pages.

Below this toolbar you'll find the ribbon, with options for style, font, character styles (bold, italic, and underline), justification, and so on. In addition, you'll find five other toolbars you can use, customize, and display at your option.

You won't see this feature on the toolbar, but WinWord 6.0 has a built-in autocorrection module that automatically changes typos like *The* to *the* and *recieve* to *receive*. You can edit the correction dictionary to cope with your own idiosyncratic typing errors and turn this feature on or off.

Having thoroughly researched user's wants and needs, Microsoft sets a new standard in word processing with Word for Windows 6.0, a product that's amazingly powerful, intelligent, and well designed.

CLIFTON KARNES

Microsoft Word for Windows 6.0
(Microsoft)

Circle reader service number 325

10 COMPUTE DECEMBER 1993

Other Finalists

Claris Works (Claris)

Circle reader service number 326

WordPerfect 5.2 for Windows
(WordPerfect)

Circle reader service number 328

WordPerfect 6.0 for DOS
(WordPerfect)

Circle reader service number 327

Spreadsheet

Quattro Pro for Windows 5.0

The spreadsheet war continues to escalate. Each new version of the most popular spreadsheets adds features and ease of use. In a tight race this year, Lotus 1-2-3 for Windows Release 4 ran a close second, earning itself an honorable mention, but Quattro Pro for Windows 5.0 came out on top, the winner both because of its feature set and because of its unheard-of introductory price of



\$49.95 (the product will be regularly priced at \$99.95).

We've always liked Quattro's notebook feature and its easy-to-use SpeedBar. This new version has added more SpeedBars (which can be available or hidden). Borland has added a SpeedBar Designer so you can create your own SpeedBars using built-in or custom controls. The new spelling checker (available on the \$495 Quattro Pro for Workgroups version) is also a nice feature. The spelling checker suggests words and lets you build custom dictionaries—a feature we've always wanted on our spreadsheets.

Getting help with Quattro has been made more convenient, particularly as the number of items available on the SpeedBar increases. In addition to the instant help that appears when you move the pointer over an icon,

Borland has included what it calls Object Help. With Object Help it's easy to get more information about each item by simply pointing and clicking. If the short help isn't enough, just click on the Help button that appears, and you'll receive more in-depth information. It's all very convenient, and it takes us one step closer to not needing the manual.

Quattro Pro for Windows excels as an easy-to-use spreadsheet for beginners, but it's also a powerful, complex tool for those who need a full-featured number-cruncher.

STEPHEN LEVY

Quattro Pro for Windows 5.0 (Borland International)

Circle reader service number 331

Other Finalists

Lotus Improv (Lotus Development)

Circle reader service number 330

Lotus 1-2-3 for Windows Release 4
(Lotus Development)

Circle reader service number 329

Database

Paradox for Windows 1.0

Paradox for Windows is a beautifully designed database program that has something for beginners and pros alike. With its intuitive design tools, tyros can get databases up and running quickly without writing a line of code, and pros have a powerful built-in language at their disposal for demanding tasks.

When you run Paradox for the first time, you'll see what looks like a typical Windows application with a menu bar and a toolbar (Borland calls its toolbar a SpeedBar) with buttons for opening a table, form, query, report, script, or library, as well as ones for opening a folder and adding and deleting folder items.

Forms are the heart of most databases, and designing a form in Paradox for Windows is a pleasure. You can move and resize all of a form's fields, and more important, you can change a field's properties by simply right-clicking on it. When you do, you'll see a pop-up menu with a list of entries, each of which is a cascading menu, so choosing one calls a submenu.

Paradox for Windows' main competition in databaseland is Microsoft Access, and the two have been battling head to head for about a year. Both are superb programs with excellent design tools, both are easy to use, and both were COMPUTE Choice Award finalists. Our decision for the

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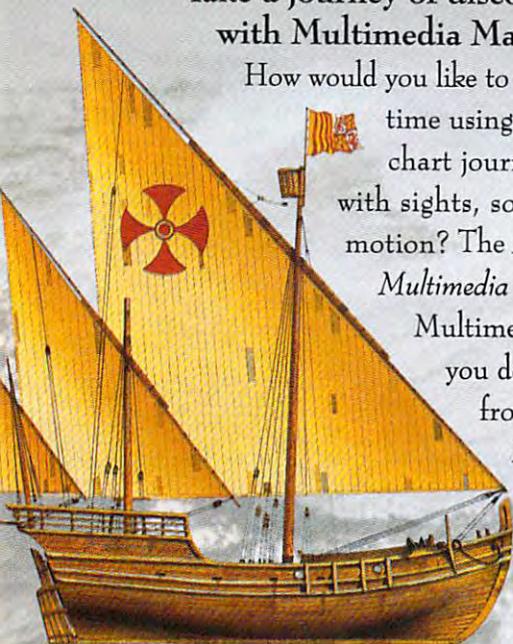


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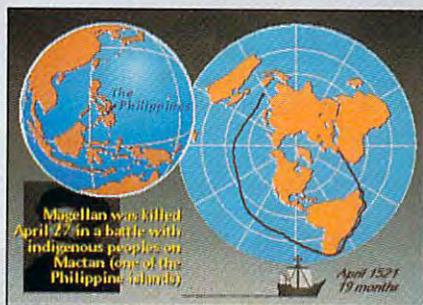
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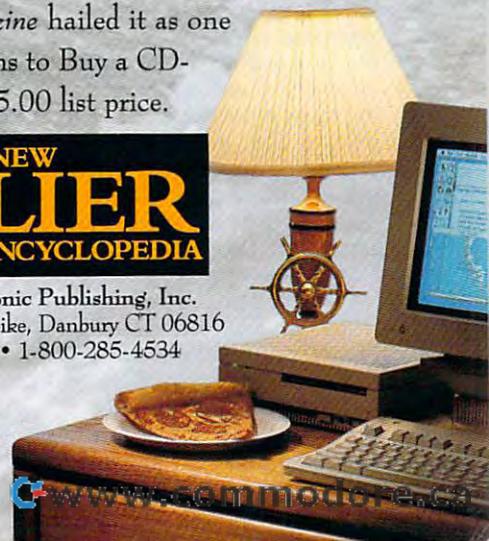
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best database came down to a choice between these two tools, and because of its innovative design, Paradox edged out Access, which still rates an honorable mention. In fact, Paradox for Windows is so well built that it's actually fun to use.

CLIFTON KARNES

Paradox for Windows 1.0 (Borland International)

Circle reader service number 332

Other Finalists

Approach 2.1 (Lotus Development)

Circle reader service number 333

FoxPro for Windows (Microsoft)

Circle reader service number 334

Microsoft Access for Windows (Microsoft)

Circle reader service number 504

SuperBase 2.0 (Software Publishing)

Circle reader service number 335

Q & A for Windows 4.0 (Symantec)

Circle reader service number 336

Communications

WinFax Pro 3.0

In just a few short years, we've become accustomed to faxing from our computers. It's remarkable that we take it for granted—that working as a fax machine should be just another function of our computers. Much of the credit should go to Delrina for its WinFax Pro.

First released in January 1991, WinFax has remained the most popular PC-based fax program and is still the best overall. The current incarnation, WinFax Pro 3.0, adds annotation and drawing tools (allowing you to mark up faxes with text and graphics), OCR (using Caere's AnyFax pattern recognition technology and a built-in spelling checker), fax document management (letting you categorize, compress, save, sort, and search both incoming and outgoing faxes), an improved phone book (offering a variety of description fields, as well as import from and export to common file formats), a cover-page designer (supporting both the Windows Clipboard and OLE), image processing (featuring antialiasing technology and random noise cleanup), scanner support (including TWAIN compatibility), and Cover-Your-Fax (providing 100 professionally drawn cover pages).

Despite all the features, WinFax Pro 3.0 is still easy to use. After a relatively painless installation, you simply switch to the WinFax printer driver and print your document as though you were sending it to a printer. WinFax

intercepts the data and sends it to your fax/data modem. It's that simple.

An honorable mention goes to Crosstalk for Windows 2.0, an already-strong Windows-based communications program with a greatly improved interface. (For a complete review of Crosstalk for Windows 2.0, see the October 1993 COMPUTE.)

DAVID ENGLISH

WinFax Pro 3.0 (Delrina)

Circle reader service number 337

Other Finalists

America Online for Windows (America Online)

Circle reader service number 338

WinCIM 1.0 (CompuServe)

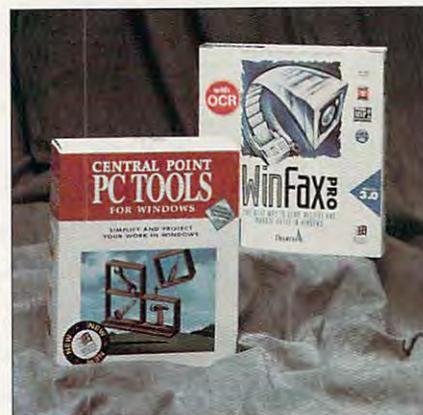
Circle reader service number 345

Crosstalk for Windows 2.0 (DCA)

Circle reader service number 340

InterNAV (General Videotex)

Circle reader service number 339



Eclipse Fax (Phoenix Technology)

Circle reader service number 342

ImagiNation (Sierra On-Line)

Circle reader service number 343

Norton PC Anywhere for Windows 1.0 (Symantec)

Circle reader service number 344

DataFAX for Windows (Trio Information Systems)

Circle reader service number 341

Money Management

Quicken 3.0 for Windows

Quicken for DOS was a big hit, and Quicken for Windows is even better. In fact, Quicken 3.0 for Windows is the best financial management program we've seen.

Quicken is a personal financial manager that, at its heart, is a checkbook program that both manages your checkbook and prints checks. It

does these things extremely well, but there's much more to Quicken 3.0. It can track your investments and manage credit card accounts and trusts, to name just a few accounts; and it can print reports that include net worth, budgets, income and expenses, and cash flow. It also keeps track of tax-deductible contributions, and it can serve as an accounting package for most small businesses. Add-on modules like Quick Invoice and Quicken Companion can handle everything from home inventory management to invoice generation, printing, and tracking.

Quicken's MDI sports a colorful toolbar with buttons for commonly used tasks. Each module presents lots of information, but the forms are so well designed that they're easy to grasp and use. And data entry is easy because almost everywhere the program anticipates what you want to do by searching incrementally and intelligently filling in fields.

Quicken 3.0 keeps its predecessors' motto of Safety First, saving your data with each entry. And it encourages you to back up your files. Add to this the ability to remind you of payments due, the best data entry forms in the business, and an interface that improves with each release, and you have an excellent program.

CLIFTON KARNES

Quicken 3.0 for Windows (Intuit)

Circle reader service number 349

Other Finalists

Kiplinger's CA-Simply Money 1.0 (Computer Associates)

Circle reader service number 346

Microsoft Money (Microsoft)

Circle reader service number 347

Peachtree Accounting for Windows 2.0 (Peachtree Software)

Circle reader service number 348

Utility

PC Tools for Windows

Central Point's PC Tools for Windows is bigger and sleeker (and more expensive) than its DOS version. It contains replacements for the Windows desktop and File Manager, a backup program, data recovery for trashed disks or files, an antivirus utility, a system analyzer, a disk optimizer, and a scripting language similar to BASIC. A scheduling program and some wildly creative but undocumented screen savers are thrown in for good measure.

Multidesk, the program's re-

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	Serif PagePlus 2.0	Aldus PageMaker 5.0	Microsoft Publisher 1.0
Auto Text Flow	⊗	⊗	⊗
Kerning	⊗	⊗	⊗
Import Pictures	⊗	⊗	⊗
Drawing Tools	⊗	⊗	⊗
Rulers, Guides	⊗	⊗	⊗
Multiple Zoom Levels	⊗	⊗	⊗
Publishing Templates	⊗	⊗	⊗
Irregular Text Wrap	⊗	⊗	⊗
Styles	⊗	⊗	⊗
Pantone® Colors	⊗	⊗	⊗
Process Color Seps.	⊗	⊗	⊗
Free Rotation	⊗	⊗	⊗
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Export as Picture	⊗	⊗	⊗
ChangeBar	⊗	⊗	⊗

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Circle Reader Service Number 120

www.commodore.ca

CPT-12

placement for the Windows desktop, contains some of the best features to be found in the product. It's arguably easier to learn and use than Program Manager, and it's demonstrably superior. The best features are Quick-Launcher and multiple desktops. QuickLauncher lets you add program or folder names to the System menu and launch them from there, sort of like desk accessories on the Macintosh.

ScriptTools, the package's macro language, is the best such Windows script language I've seen. PC Tools has a whole range of file recovery programs. The installation process gives file recovery top priority. PC Tools for Windows gives you a really big bang for the buck.

A close contender for the COMPUTE Choice Award for the best utility was Stacker 3.1. An answer for many during the difficult days following the release of DOS 6, Stacker 3.1 served to replace DoubleSpace with a faster, friendlier (and some would say safer) alternative. It's difficult to make a decision between two products so powerful and so different, but since PC Tools for Windows provides a much wider range of utilities than Stacker 3.1, we felt the Central Point Software product should receive the award and Stacker 3.1 an honorable mention. Both are excellent products, however. (A review of PC Tools for Windows can be found in the November 1993 COMPUTE. Stacker 3.1 was reviewed in the October 1993 COMPUTE and discussed in "Data Under Pressure" in the same issue.)

TOM CAMPBELL

PC Tools for Windows
(Central Point Software)
Circle reader service number 350

Other Finalists

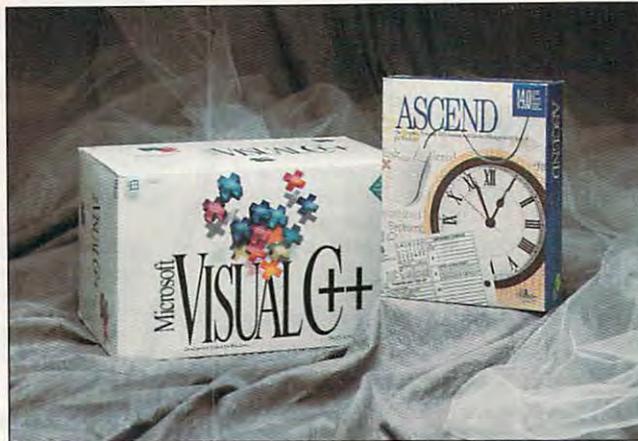
Pizazz Plus 4.0
(Application Techniques)
Circle reader service number 355
NETROOM 3 (Helix)
Circle reader service number 354
Dashboard for Windows
(Hewlett-Packard)
Circle reader service number 352
Collage Complete (Inner Media)
Circle reader service number 351
Transom (Metro Software)
Circle reader service number 358
DynoPage 1.0 (Portfolio)
Circle reader service number 353
QEMM 7.01 (Quarterdeck Office Systems)

Circle reader service number 356
Stacker 3.1 (STAC Electronics)
Circle reader service number 357

Personal Information Manager

Ascend 4.0

I can't imagine life without Ascend. There are very few programs I can say that about, but Ascend is definitely one. In fact, it's probably my most important tool. Ascend is a Windows-



based personal information manager, or PIM. And like most PIMs, it manages diverse types of information, including a prioritized daily task list, an appointment schedule, calendars, a master task list, a telephone and address book, a journal, a database, and much more.

Ascend was developed by Franklin Quest, a time management consulting company that has been teaching time management techniques and selling paper-based Franklin Planners for years. The Franklin method is based on a top-down approach to time and task management with the final goal of inner peace, something most of us feel is not only worthy and desirable, but seemingly unattainable.

Ascend's interface is a joy to use. It's a colorful MDI application, with windows for each module. To make navigating these modules easy, there's a button bar with one button for each module. You can customize this button bar and determine which buttons go on the bar and in what order.

One of 4.0's best features is drag and drop. You can drag and drop data between most modules, and most modules also support OLE. In addition, Ascend can make beautiful

printouts of your task list, appointments, notes, and more on Franklin Day Planner paper or regular-size laser paper.

An honorable mention in this category goes to Arabesque's ECCO. It has an innovative design based on outlines and is both powerful and easy to use. But with features galore, power to burn, and its intuitive interface, Ascend wins by a hair. (A full review of Ascend 4.0 can be found in the May 1993 issue of COMPUTE.)

CLIFTON KARNES

Ascend 4.0 (Franklin Quest)
Circle reader service number 359

Other Finalists

ECCO Professional
(Arabesque Software)
Circle reader service number 360
ManagePro 2.0 for Windows
(Avantos Performance Systems)
Circle reader service number 362
Sharkware 1.0 (CogniTech)
Circle reader service number 364
Lotus Organizer 1.1
(Lotus Development)
Circle reader service number 365
Info Select for Windows
(Micro Logic)
Circle reader service number 361
PackRat 5.0 (Polaris)
Circle reader service number 363

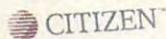
Programming Tool

Microsoft Visual C++

Visual C++ is an elegant development environment that comes with a host of superb programming tools. The heart of the system is Visual Workbench, which is the Windows-based integrated environment. It boasts a toolbar for quick access to common commands; a syntax-highlighting editor; and a Tool menu, to which you can add your own commands.

Another key tool is App Studio, which you can use to edit all your resources, including dialog boxes, icons, cursors, menus, and bitmaps. The next two major Visual C++ tools are specifically for C++ programmers: AppWizard, which is a program generator, and ClassWizard, which handles all the red tape associated with managing classes and message maps. All of these tools are more than just excellent modules; they're very well integrated and exceptionally easy to use.

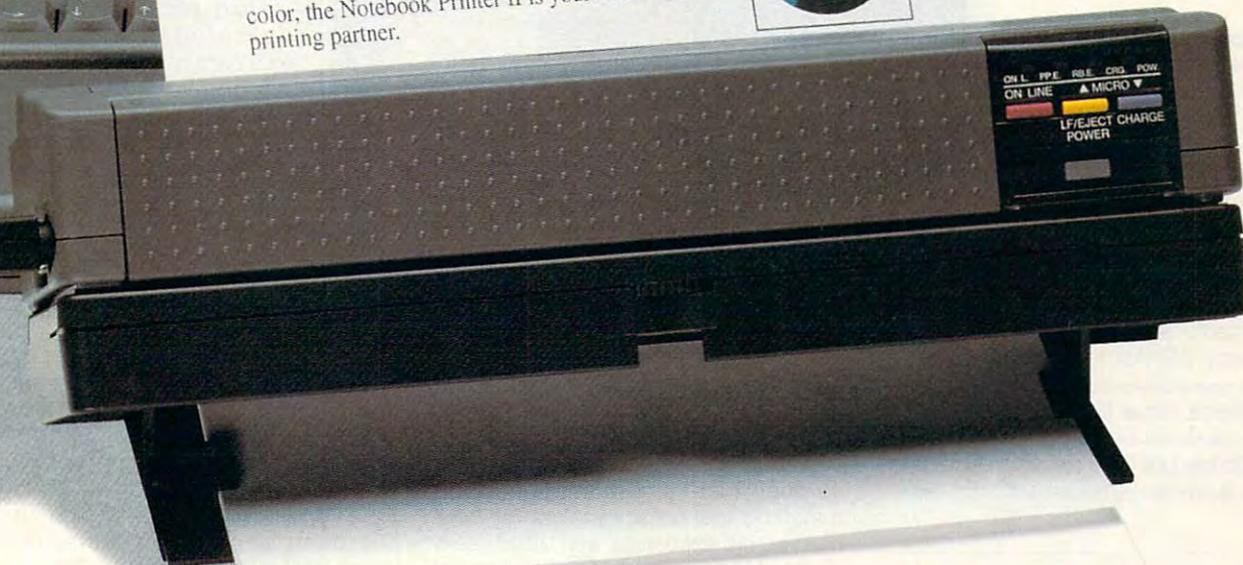
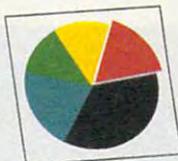
Often the key to successful development is a first-rate debugger, and here, Visual C++ shines. There's an integrated debugger, which will suf-



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office for most tasks, plus a special Windows edition of CodeView for heavy-duty jobs.

The thing that really won me over to Visual C++, however, was the small executables it produced. The development environment is important, but code quality is the supreme test of a compiler, and Visual C++ is tops in this category. Visual C++ really is next-generation programming.

CLIFTON KARNES

Microsoft Visual C++
(Microsoft)

Circle reader service number 366

Other Finalists

RoboHELP 2.0 (Blue Sky Software)

Circle reader service number 370

Borland C++ for OS/2
(Borland International)

Circle reader service number 367

Microsoft Developers' Network CD (Microsoft)

Circle reader service number 368

Microsoft Visual Basic 3.0 (Microsoft)

Circle reader service number 369

WinScope 1.01 (The Periscope Company)

Circle reader service number 371

lets you create your own Additions.

A floating control palette changes as you change modes, always keeping the most appropriate tools a mouse click away. You can now rotate and skew text and graphics, giving you new flexibility. And no more boring black-and-white: PageMaker 5.0 has



built-in support for creating process color separations and includes a variety of color libraries from PANTONE, Trumatch, and others.

The program now has more than 40 import filters, and PANOSE font-matching technology makes for trouble-free file exchange with other users of the Windows and Mac versions of the program.

PageMaker was almost knocked out of the ring by QuarkXPress, but version 5.0 brings it back punching. (A review of PageMaker 5.0 can be found in the October 1993 COMPUTE.)

DENNY ATKIN

Aldus PageMaker 5.0 (Aldus)

Circle reader service number 372

Other Finalists

Compel (Asymetrix)

Circle reader service number 375

QuarkXPress for Windows 3.1 (Quark)

Circle reader service number 377

Harvard Graphics for Windows 2.0
(Software Publishing)

Circle reader service number 376

WordPerfect Presentations 2.0 for DOS (WordPerfect)

Circle reader service number 378

top publishing program that's easier to use than Microsoft Publisher 2.0.

Most desktop publishing programs are so hard to use that people spend hours designing a simple newsletter or brochure. Publisher's PageWizards can design your newsletters, brochures, banners, greeting cards, and business forms for you; all you do is choose the appropriate options. For example, to design a brochure, you might choose modern style, side-fold, picture on the front, and mailed, and Publisher takes care of the rest.

In addition, Publisher includes a new online adviser, called Cue Cards, which provides step-by-step design help with the click of a mouse, and Quick Demos, which provides onscreen demonstrations of a variety of desktop publishing tasks.

This latest version of Publisher has greatly improved typography (you can now hyphenate text and wrap text around graphic objects) and a more powerful Word Art (you can now use this stand-alone special-effects type program with any TrueType font). It's also the first Microsoft application, other than Visual Basic, to support OLE 2.0.

Microsoft Publisher 2.0 ships with 17 PageWizard design assistants, 35 professionally designed templates, 20 TrueType fonts, 100 border designs, and 125 clip art images. Its power and ease of use make Publisher a great way to get started with desktop publishing.

An honorable mention goes to PagePlus. Although this program's price fits into the Personal Desktop Publishing category, its feature set makes it a real contender in the professional arena. (See this month's "Productivity Choice" for an in-depth look.)

DAVID ENGLISH

Microsoft Publisher 2.0 (Microsoft)

Circle reader service number 379

Other Finalist

PagePlus (Serif)

Circle reader service number 374

Professional Desktop Publishing

Aldus PageMaker 5.0

PageMaker 5.0 reclaims the venerable program's position as king of the desktop publishing hill. This latest release addresses nearly every complaint that users had about earlier versions, as well as adding a host of new features.

Gone are the quirks, such as problems with some high-color modes and a menu that would handle only a limited number of fonts. Added is a powerful suite of new features and an improved interface that can make page layout easier than ever. Whether you're publishing a church bulletin or a national magazine, you'll find this newest PageMaker has the capabilities you need.

The biggest improvement in PageMaker 5.0 is its ability to open multiple publications simultaneously, allowing you to compare documents or drag and drop elements between them. Aldus Additions is a set of macros that add functions such as automatic drop caps, running headers and footers, booklet generation, and page sorting; a new macro language

Personal Desktop Publishing

Microsoft Publisher 2.0

You can pay more money and get more features (PageMaker 5.0) or even pay less money and get more features (PagePlus), but you can't buy a desk-

Illustration

CorelDRAW! 4.0

Corel has begun an ambitious effort to upgrade CorelDRAW! annually and retain its previous version on the market for sale at a discounted price. This is both extremely generous and extremely savvy. Any unsold copies of

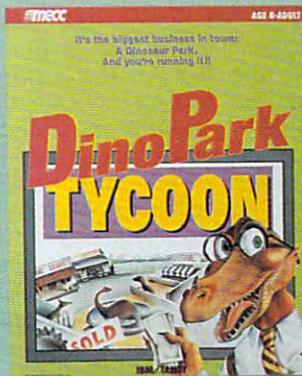


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Circle Reader Service Number 113

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the previous version can be cleared from the distribution channel while a completely revamped version is introduced. Corel has proven itself generous and savvy throughout the reign of CorelDRAW! as the top-selling Windows illustration and design software, and version 4.0 is no exception.

Corel is intent on pulling light years ahead of its competition. Despite the addition of new fractal fills and powerlines, CorelDRAW! 4.0 doesn't represent a massive overhaul of last year's 3.0 version, but throughout the program you can find important improvements. Each of its companion programs has also gone through an evolutionary change—adding and reorganizing in a general housekeeping effort.

One completely new feature in the package is CorelMOVE!, an animation product that makes creating animated panels for your CorelSHOW! presentations much simpler.

CorelDRAW! added pages, allowing you to create a publication of up to 999 pages. This makes CorelDRAW! the most graphically intensive desktop publishing package ever. Among its many other attributes, the package has a graphical database and text editor (inside CorelDRAW!), including thesaurus and spelling checker) and a spreadsheet (within CorelCHART!). These enhancements put CorelDRAW! in competition in virtually every other software arena.

ROBERT BIXBY

CorelDRAW! 4.0 (Corel)

Circle reader service number 380

Other Finalists

Fractal Design Painter 2.0
(Fractal Design)

Circle reader service number 384

Morph for Windows
(Gryphon Software)

Circle reader service number 387

1st Design (GST Software)

Circle reader service number 381

Graphics Works (Micrografx)

Circle reader service number 385

Micrografx Designer 4.0 (Micrografx)

Circle reader service number 383

Pixar One Twenty Eight (Pixar)

Circle reader service number 382

Typestry for Windows (Pixar)

Circle reader service number 388

Visio (Shapeware)

Circle reader service number 389

ImagePals (U-Lead Systems)

Circle reader service number 386

18 COMPUTE DECEMBER 1993



Operating System

Nobody won. Put yourself in our place. Considering all of the problems people had with DOS 6 and the fact that there were only a few improvements over DOS 5 (and most of those in the form of utilities), we felt that we couldn't in good conscience give it the COMPUTE Choice Award. A new version of DOS 6 looms in the near future, but it's too late to give it the thoroughgoing testing we'd require to make sure it didn't have problems as bad as (or worse than) the current version.

To be fair, the problems DOS 6 experienced were generally as a result of improper use of perfectly functional utilities and commands. However, a modern operating system shouldn't lead a user into a quagmire.

GeoWorks Ensemble 2.0 is a huge improvement in features and power over its predecessor, but it has been an insular environment with applications lacking the kind of innovation third-party developers would bring. It was designed for trailing-edge machines, and its makers no longer seem interested in competing head to head with Windows.

Windows NT and NetWare 4.0 are network operating systems of limited interest at most to a majority of our readers.

OS/2 2.1 has proven itself to be a favorite of techies, at last living up to its claim of being a better Windows than Windows and a better DOS than DOS (see "Personal Productivity" in this issue for a user-oriented review of this operating system), but there's a dark cloud on the horizon. Microsoft is now free to make alterations in DOS and Windows that will make future applications incompatible with OS/2. So, while version 2.1 is fairly compati-

ble with DOS 6 and Windows 3.1, it looks like a long game of catch-up for OS/2 and its users in the future.

Though we decline to choose an operating system or environment for the COMPUTE Choice Award, you shouldn't hesitate to employ any of these products for your personal use, as appropriate to your equipment and your work.

ROBERT BIXBY

Finalists

GeoWorks Ensemble 2.0
(GeoWorks)

Circle reader service number 391

OS/2 2.1 (IBM)

Circle reader service number 393

DOS 6 (Microsoft)

Circle reader service number 390

Windows NT (Microsoft)

Circle reader service number 394

NetWare 4.0 (Novell)

Circle reader service number 392

Desktop Computer

Dell 466/M

Our winner in this category is the Dell 466/M. But as often happens in the computer industry, that model was superseded after less than a year on the market. However, its replacement, the Dell OptiPlex 466/MX, embodies all the qualities that made the 466/M a COMPUTE Choice Award winner—and packs some new innovations as well.

The blazing 486DX2/66 system was the fastest that we tested in our recent 486 Test Lab, and its local-bus video turned in one of the fastest 3D-Bench results we've ever seen. We chose the Dell 466/M because it sported a top-of-the-line feature set at a midrange price. Along with its fast processor, it also has an easily updatable Flash-ROM BIOS; automatic port sensing (if you plug in a modem card at COM2, for instance, it will remap the second motherboard port to be COM3); a case which can be opened without a screwdriver; five open slots and five drive bays, allowing for plenty of expansion; and sockets for 72-pin SIMMs, which greatly simplify RAM expansion. Dell will install and configure any software and peripherals you purchase with the system, making it a great plug-and-play solution for the novice PC user.

The 466/MX has lightning-fast motherboard-based local-bus video, just like the 466/M. However, it also

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has two VL slots for upgrading video or for installing VL-Bus peripherals. It also sports an upgradable case, so you can purchase the slimline, three-slot model and upgrade it to the full-size five-slot setup. Although it's not the least expensive system you'll find, you'll have a hard time finding one better built or better supported.

DENNY ATKIN

Dell 466/M (Dell Computer)

Circle reader service number 395

Other Finalists

Evolution IV (ALR)

Circle reader service number 396

Quadra 840AV (Apple)

Circle reader service number 398

Gateway 2000 4DX2/66V
(Gateway 2000)

Circle reader service number 397

Laptop/Notebook Computer

OmniBook 300 and Gateway 2000 Handbook 486

The OmniBook 300 sounds almost too good to be true: a notebook computer that runs Windows, Word for Windows, and Excel from a ROM card; weighs only 2.9 pounds; and gets an incredible nine hours of battery life with continuous use. It even includes a built-in mouse that pops out when needed and slides back for traveling. It's the closest thing yet to a road warrior's dream machine.

The trade-off is a non-backlit screen. Fortunately, it's one of the best reflective LCD screens around. In bright to moderately bright light, you shouldn't have any trouble reading it, but in extremely dim light, you'll have to refrain from computing altogether or seek out the nearest light.

The OmniBook comes in two models: one with a 40MB hard drive and one with a 10MB Flash-RAM card. Both storage devices are automatically compressed by the built-in DoubleSpace compression (essentially doubling the capacity of either card), and both are PCMCIA cards (making them easy to upgrade later on). The hard drive model gives you more storage (80MB versus 20MB) for less money (\$1,950 versus \$2,375), but the Flash-RAM model can run as long as nine hours on the OmniBook's

rechargeable battery, as well as run from four ordinary alkaline AA batteries. The hard disk model can run as long as five hours on the rechargeable battery or use four lithium AA batteries.

The OmniBook is nothing short of a technical marvel, with its light weight, compact size, all-PCMCIA storage, and small hideaway mouse. If you can live with the nonbacklit screen, the OmniBook is the state of the art for high-tech traveling. (A review of the OmniBook can be found in the October 1993 COMPUTE.)

DAVID ENGLISH

Last year, Gateway introduced the Handbook, packing a C & T PC-CHIP processor, a 40MB hard drive, and a



backlit screen in a 2.9-pound package. Its portability made it an instant hit, but its CGA screen and 286-compatible processor were underwhelming in a market that had standardized on VGA and was already giving up on the 386.

Gateway responded with the Handbook 486, which maintains the original Handbook's 2.9-pound weight and compact 9.75- x 5.9- x 1.6-inch size, but gives you the computing power you expect on a desktop. This subnotebook is available in two models, one with a 25-MHz SL-enhanced 486SX and an 80MB hard drive for \$1,495 and a portable powerhouse with a 40-MHz SL-enhanced 486DX2 chip and a 130MB drive for \$1,995.

The Handbook 486 has a 7.9-inch backlit VGA display; a PCMCIA Type II slot; parallel, serial, and PS/2 ports; and a small stick-type pointing device next to the keyboard. The keyboard is almost full-size, only an inch smaller than a typical AT keyboard, and has a quiet touch that lets you take notes almost anywhere.

Both models ship with 4MB of RAM, expandable to 20MB. No floppy drive is included, but a transfer cable is included for use with Interlnk and your desktop PC.

The Handbook 486 and HP OmniBook 300 are both award-deserving portables. The Handbook has 486 power, a backlit screen, and more storage; the OmniBook has incredible battery life and the innovative pop-out mouse. With choices like these, the real winner is you.

DENNY ATKIN

OmniBook 300 (Hewlett-Packard)

Circle reader service number 400

Gateway 2000 Handbook 486
(Gateway 2000)

Circle reader service number 399

Other Finalists

Canon NoteJet (Canon)

Circle reader service number 401

Compaq Contura (Compaq)

Circle reader service number 402

Gateway 2000 Colorbook
(Gateway 2000)

Circle reader service number 403

Thinkpad 720C (IBM)

Circle reader service number 406

WinBook (Micro Electronics)

Circle reader service number 408

NCR 3150 (NCR)

Circle reader service number 404

UltraLite Versa 2.5C

(NEC Technologies)

Circle reader service number 407

Satellite T1900C (Toshiba)

Circle reader service number 405

Multimedia Hardware

Sound Blaster DigitalEdge CD and Fusion DoubleCD-16

Less than a month after the Multimedia PC Marketing Council announced the new Level 2 MPC specifications, both Media Vision and Creative Labs introduced inexpensive Level 2 upgrade kits. In keeping with the Level 2 specs, both include a 16-bit sound card capable of recording and playing back CD-quality sound, as well as a double-speed CD-ROM drive

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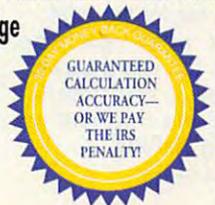
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that can play Kodak Photo CDs. Both upgrade kits are terrific buys, so we decided to let them share the award for the best multimedia hardware.

Creative Labs' Sound Blaster DigitalEdge CD includes a Sound Blaster 16 ASP, a double-speed multi-session CD-ROM drive, The Software Toolworks Multimedia Encyclopedia, Microsoft Bookshelf, Macromedia Action!, a microphone, and speakers. Media Vision's Fusion DoubleCD-16 includes a Pro AudioSpectrum 16 sound card, a double-speed NEC CD-ROM drive (model 55J), Compton's Interactive Encyclopedia for Windows, Battle Chess Enhanced, Arthur's Teacher Trouble, and The 7th Guest.

How do you choose between them? It depends on what you need in an upgrade kit. If price is important, you're more likely to get a better deal with the Fusion DoubleCD-16, which lists for \$699.00 (internal) and \$799.00 (external), as compared to the DigitalEdge kit, which lists for \$999.95 (internal). On the other hand, if you prefer a CD-ROM drive that doesn't need a caddy, need the microphone and speakers, and would like the option of upgrading your sound card to General MIDI, you might want to choose the Creative Labs package. The selection of CD-ROM titles might also sway your vote one way or the other.

Either way, you'll be ready for the more powerful Level 2 multimedia applications that will be appearing in 1994.

DAVID ENGLISH

Sound Blaster DigitalEdge CD
(Creative Labs)

Circle reader service number 409

Fusion DoubleCD-16 (Media Vision)

Circle reader service number 410

Other Finalists

UltraSound (Advanced Gravis)

Circle reader service number 415

Pro 16 Multimedia System
(Media Vision)

Circle reader service number 414

MultiSpin 74-1 CD-ROM
(NEC Technologies)

Circle reader service number 412

Pioneer 4x Speed Multiple CD
Changer (Pioneer)

Circle reader service number 413

Hello! Music (Yamaha)

Circle reader service number 411

YST-M10 Speakers (Yamaha)

Circle reader service number 416

Video Hardware

Video Toaster 4000

NewTek's original Video Toaster helped bring professional desktop video to the masses. The new Video Toaster 4000 literally brings Hollywood special-effects capabilities to the desktop.

The Video Toaster 4000 is a large expansion card that fits in a Commodore Amiga 4000 computer. The system can be run as a stand-alone or interfaced with your Windows or Mac system using NewTek's ToasterLink software. The board sports a 35-ns character generator, two broadcast-quality high-resolution 24-bit frame buffers, a four-input production video switcher, and a still store/frame grabber.

The Toaster's toolkit offers everything you'll need to create impres-



sive—or, if you're not careful, garish—videos. The Digital Video Effects (DVE) generator can wrap video on objects, and flip, spin, tumble, or warp live video. Most impressive are the animated wipes, which let you use, for example, an animated golfer's swing to transition between two video sources.

But the biggest selling point of the Video Toaster 4000 is LightWave 3D 3.0, the incredible 3-D rendering program that's available only with the Toaster. Rather than trying to describe all its capabilities—such as haze, underwater effects, detailed texture mapping, and even lens-flares—I'll instead suggest you watch the TV programs "SeaQuest DSV" and "Babylon 5." Both shows use LightWave-generated special effects instead of traditional models.

For under \$6,000 (\$2,395 if you already have an Amiga system), you can own a special-effects system that's

good enough for prime time. If the COMPUTE Choice Award isn't enough to convince you that this is the desktop video system of choice, consider this: In 1993 the Video Toaster won an Emmy Award for technical excellence.

DENNY ATKIN

Video Toaster 4000 (NewTek)

Circle reader service number 417

Other Finalists

MGA (Matrox Electronic Systems)

Circle reader service number 419

FlexScan (Nanao)

Circle reader service number 418

Printer

Hewlett-Packard LaserJet 4

Hewlett-Packard consistently offers great printers at incredible prices, and the LaserJet 4 is no exception. It's the best LaserJet ever, and it's the best value Hewlett-Packard has offered so far. With a suggested retail price of \$1,759 (if you look around, you can find one for around \$1,400), the LaserJet 4 weighs in at \$200 less than the LaserJet III. For that price, the LaserJet 4 gives you four times the resolution, 37 more fonts, much improved print quality, and over twice the speed. If you need PostScript, you can have it for the \$499 price of the PostScript Level II upgrade.

Just when you thought printers couldn't get any faster, Hewlett-Packard comes through again. The company's Printer Command Language 5 (PCL 5), the language used in LaserJet IIIs and 4s, is already faster than most other languages—especially the popular PostScript. But the addition of the TrueType font rasterizer and Windows TrueType fonts means that you don't have to wait for your computer to download fonts.

The LaserJet 4 comes with one of the fastest processors in the business: Intel's 20-MHz 80960 RISC processor. It also has increased data compression so less data has to be channeled. Hewlett-Packard's new Bi-Tronic bidirectional port transfers data at up to 156 kilobytes per second. The only thing that will hold back the LaserJet 4 is the speed of your computer. (A complete review of the Hewlett-Packard LaserJet 4 can be found in the August 1993 COMPUTE.)

WILLIAM HARREL

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Ages
3-7

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Hewlett-Packard LaserJet 4
(Hewlett-Packard)
Circle reader service number 420

Other Finalists

Primera (Fargo Electronics)
Circle reader service number 423
Hewlett-Packard DeskJet 1200C
(Hewlett-Packard)
Circle reader service number 422
Hewlett-Packard LaserJet 4L
(Hewlett-Packard)
Circle reader service number 421

Peripheral

Smart One 1442FX

Best Data Products' Smart One 1442FX fax/data modem earns its COMPUTE Choice Award by packing superior performance at a bargain price. Based on the popular Rockwell modem chip set, the 1442FX provides 14,400-bps transfers in both fax and data modes. It supports all of the popular error correction and data compression modes, such as V.32bis and CCITT V.17 fax protocol. Connected to a similar modem, the 1442FX can manage transfers of up to 57,600 bps when transferring raw text with compression active. That's 192 times faster than a 300-bps modem.

The sturdy white plastic case is of the "sit under the phone" variety; it sports eight status lights on the front. At just under two pounds with power connector, it's light enough to pack along with your laptop (and it's much less expensive than battery-powered pocket modems of similar capability).

Although the modem retails for \$319, it can be found for well under \$200 at discount retailers. At that price, can you afford not to upgrade to 14,400-bps speed?

DENNY ATKIN

Smart One 1442FX
(Best Data Products)
Circle reader service number 424

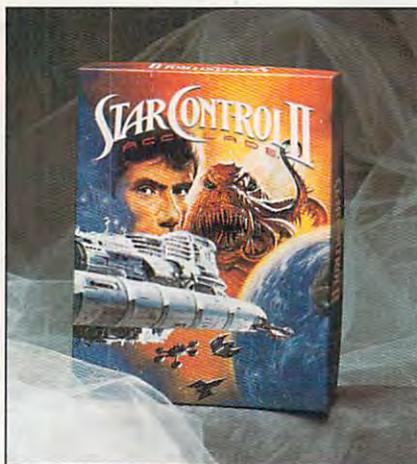
Other Finalists

PCMCIA Modem with X Jack
(Megahertz)
Circle reader service number 426
MD-5024 CD-ROM Drive (Texel)
Circle reader service number 425

Arcade Game

Star Control II

Some games are like Tetris. In just a few minutes, you can learn the rules and know 80 percent of what you



need to know in order to play. The rest is refining the rules and gaining the physical dexterity to carry them out.

Star Control II is an altogether different kind of game. With over 500 star systems and 3000 planets to explore and 18 alien races to converse with, this is no challenge-you-to-a-game-or-two-over-the-lunch-break kind of game. If you like intricately involved plots with rich details that have to be plotted on paper, this is the game for you.

It also helps if you enjoy science fiction. Star Control II is the best attempt, so far, at putting an epic science-fiction novel onto disk. No other program conveys as well the complexity of space travel and the variety of life forms we're likely to encounter when we begin to venture beyond the confines of our own neighborhood.

How does it play as a game? Despite the complexity—or perhaps because of it—you're drawn into the narrative. The graphics and sound are greatly improved over those in the original 1990 version. The arcade elements are well integrated and very playable. The bonus game, Super Melee, adds to the combat side of the scenario of aliens as either friends or foes.

This year, an honorable mention goes to Novalogic's Comanche Maximum Overkill, which features

some of the most realistic polygon graphics this side of Hollywood. (Comanche Maximum Overkill is discussed in "Going Vertical" in COMPUTE, June 1993.)

DAVID ENGLISH

Star Control II (Accolade)
Circle reader service number 427

Other Finalists

Prince of Persia 2
(Brøderbund Software)
Circle reader service number 432
The Lost Vikings
(Interplay Productions)
Circle reader service number 433
Microsoft Arcade Pack (Microsoft)
Circle reader service number 431
Comanche Maximum Overkill
(Novalogic)
Circle reader service number 429
Lemmings 2: The Tribes (Psygnosis)
Circle reader service number 430
Flashback (Strategic Simulations)
Circle reader service number 428

Simulation

Microsoft Flight Simulator 5.0

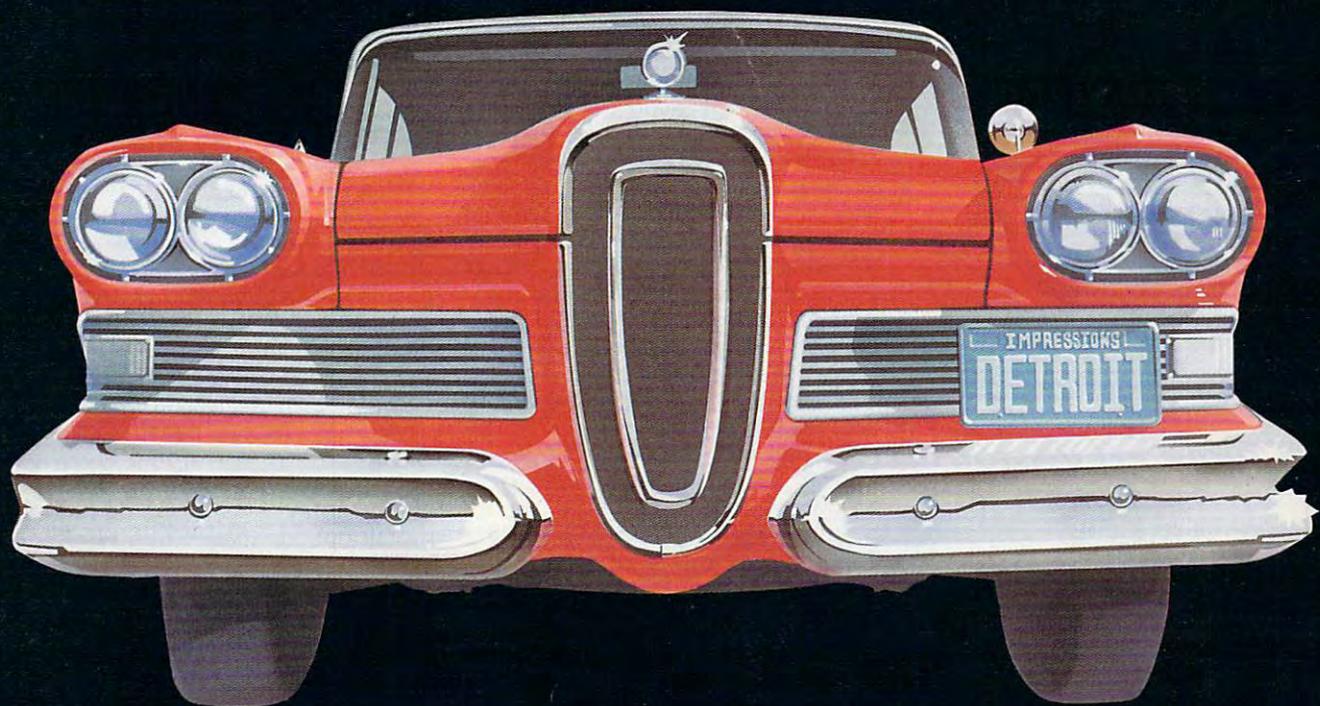
Chances are that you've seen or played Microsoft Flight Simulator. It has long been one of the most popular entertainment programs for the PC. But this is a new dawn for flight simulators. Version 5.0 takes the realistic flight characteristics of earlier releases and adds photorealistic Super VGA scenery.

The game now runs in either 320 x 400 or 640 x 480, 256-color modes. The graphics are nothing short of spectacular—glancing at the instrument panel, you'd swear that you were looking at live video from inside a Cessna. Things look much better outside the plane as well, with smooth, Gouraud-shaded aircraft and incredibly detailed scenery. This version actually wraps digitized pictures onto the scenery—taking off from Chicago's Meigs field is one of the most realistic experiences you'll encounter on today's PCs.

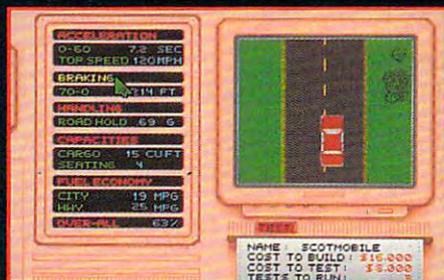
Sound has been improved as well, with digitized sound support for popular 8- and 16-bit sound cards. Even the skies have been upgraded, with beautiful orange gradient sunsets and clouds that gradually flicker into existence as you fly into them.

This isn't a shoot-'em-up game—most of the fun here is in really learning how to fly a plane and in simply flying around and looking at the pretty scenery. And there's plenty to choose

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Circle Reader Service Number 183

IBM PC VGA Screenshots

from, with New York and Paris scenery disks from Microsoft and many others coming soon from Mallard. So take off, eh?

DENNY ATKIN

Microsoft Flight Simulator 5.0
(Microsoft)

Circle reader service number 434

Other Finalists

Aces over Europe (Dynamix)

Circle reader service number 435

Car and Driver (Electronic Arts)

Circle reader service number 437

Buzz Aldrin's Race into Space
(Interplay Productions)

Circle reader service number 436

X-Wing (LucasArts Games)

Circle reader service number 443

El Fish (Maxis Software)

Circle reader service number 438

SimCity 2000 (Maxis Software)

Circle reader service number 441

Empire Deluxe (New World
Computing)

Circle reader service number 439

Rules of Engagement 2 (Omnitrend)

Circle reader service number 440

Strike Commander (Origin)

Circle reader service number 442

Fantasy Role- playing/Adventure Game

Betrayal at Krondor

A captivating story line, fantastic graphics, and special effects make *Betrayal at Krondor*, Dynamix's first attempt at fantasy role-playing, tower above the genre. Based on Raymond E. Feist's Riftwar series, the game picks up where Feist's latest book, *Darkness at Sethanon*, ends. It uses many of the recurring characters and locations from the series, so those familiar with the series will immediately fall into the action.

This complex, character-rich story unfolds as a series of nine individual chapters, the plot advancing only upon completion of specific goals in each one. These miniquests vary in size, difficulty, and clarity of mission. Segmenting the story this way gives great range to the gameplay—it's as if you're getting nine adventures in one.

Unlike in traditional role-playing games, you inherit full-bodied characters with unique personalities, rich pasts, and hopefully, prosperous futures. Rather than control every fiber of their beings, you merely make decisions—their overall strength of char-



acter determines whether the results of their actions will be positive.

Those unacquainted with Feist's complex fantasy world will have trouble following the flood of characters, race names, and locations. The manual helps, but Feist's prose is so thick with atmosphere and imagination that jumping headfirst into the fray can be overwhelming. Once you understand the background, you can really appreciate this game. Fired by literary passion and uncommon intelligence, *Betrayal at Krondor* approaches a new level of realism and enjoyment for computer fantasy role-playing games. (See this month's "Entertainment Choice" for a full review of *Betrayal at Krondor*.)

LucasArts' magnificent *Day of the Tentacle*, a B-movie science-fiction parody that skirts the lunatic fringe of comedy adventure, received an honorable mention in this category. (Look for a full review of *Day of the Tentacle* in this issue of COMPUTE.)

SCOTT A. MAY

Betrayal at Krondor (Dynamix)

Circle reader service number 444

Other Finalists

Syndicate (Electronic Arts)

Circle reader service number 452

Alone in the Dark

(Interplay Productions)

Circle reader service number 445

Eric the Unready

(Legend Entertainment)

Circle reader service number 447

Day of the Tentacle

(LucasArts Games)

Circle reader service number 446

Might and Magic: Darkside of Keen

(New World Computing)

Circle reader service number 451

Inca (Sierra On-Line)

Circle reader service number 449

King's Quest VI: Heir Today, Gone

Tomorrow (Sierra On-Line)

Circle reader service number 450

Fables & Fiends: Legend of Kyrandia,
Book I (Virgin Games)

Circle reader service number 448

The 7th Guest (Virgin Games)

Circle reader service number 453

Sports Game

IndyCar Racing

The smell of tires burning—that's all that's missing from *IndyCar Racing*. The texture-mapped graphics in this driving game are incredibly realistic, down to the decals on the cars and the skid marks on the curves.

You race on the streets of the Long Beach Gran Prix, the oval at Michigan International Speedway, and a number of other tracks, against well-known race drivers. Rain, wind, and air temperature all affect car handling. If you want to get your hands greasy, you can custom-tune your own car in the dyno-equipped garage. Beginner features such as a visible groove which shows the best line through curves will get you started; then you can switch to full realism for a serious challenge. Once you perfect your skills, you can play a human opponent over a modem connection.

After the race is over (or after a spectacular crash complete with wisps of smoke), you can watch a video replay. This game has more replay options than "Wide World of Sports"—there are views from an overhead blimp, cameras around the track, the car's cockpit, and even the front wheel of the car.

With smooth gameplay, realistic graphics, great sound, and incredible attention to detail, *IndyCar Racing* captures the checkered flag with ease.

DENNY ATKIN

IndyCar Racing (Papyrus Publishing)

Circle reader service number 454

Other Finalists

Links Banff Springs Course

(Access Software)

Circle reader service number 457

Front Page Sports Football Deluxe

(Dynamix)

Circle reader service number 455

Jordan in Flight (Electronic Arts)

Circle reader service number 456

World Circuit (MicroProse)

Circle reader service number 460

Microsoft Golf—Multimedia Version
(Microsoft)

Circle reader service number 458

Tony La Russa Baseball II

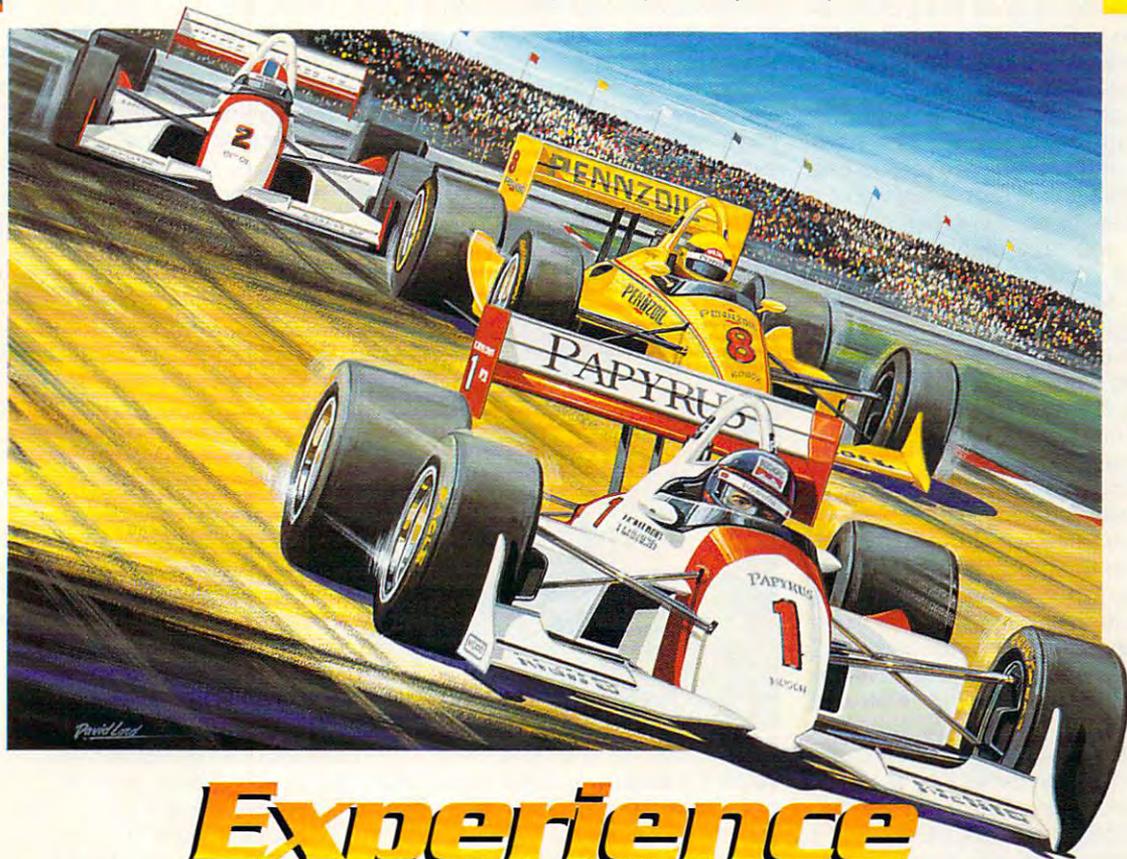
(Strategic Simulations)

Circle reader service number 459

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Circle Reader Service Number 133

Installment One of the
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Early Childhood

Arthur's Teacher Trouble

Arthur's Teacher Trouble brings Marc Brown's children's book to the computer screen with musical accompaniment, interesting animated effects, and a voice to tell the story.

Although the product is aimed at readers aged 6 to 10, you can have the story read. In that case you see the text from Brown's story highlighted onscreen as it's read in Arthur's voice. Children can read along, recognize the words, and follow the animated action as Arthur and his friends struggle through Mr. Ratburn's third-grade class and prepare for the school's big September Spell-a-thon.

All this happens when you choose to play inside the story. Doing so takes you to an interactive mode which brings the elements onscreen to life when you click on them. Each screen is a page out of Brown's book, and the animated illustrations fairly duplicate those in the small bound copy included with the software.

At every turn, the reader gets introduced to subtle humor and imaginative activities that will delight children and charm adults. Arthur teaches as it entertains and lets children become players in the storybooks they read.

The innovation and kid-oriented fun of Snap Dragon from MECC earned it an honorable mention in this category.
CAROL ELLISON

Arthur's Teacher Trouble
(Brøderbund Software)
Circle reader service number 461

Other Finalists

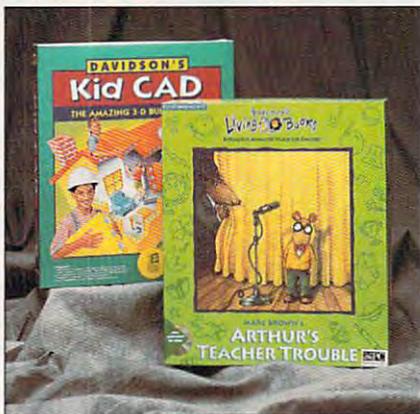
Just Grandma and Me
(Brøderbund Software)
Circle reader service number 465
Kid Pix (Brøderbund Software)
Circle reader service number 466
Bailey's Book House (Edmark)
Circle reader service number 462
Millie's Math House (Edmark)
Circle reader service number 467
Scooter Magic Castle (Electronic Arts)
Circle reader service number 469
Fatty Bear's Birthday Surprise
(Humongous Entertainment)
Circle reader service number 463
Putt Putt Joins the Parade
(Humongous Entertainment)
Circle reader service number 468
Snap Dragon (MECC)
Circle reader service number 470
Follow the Reader (Walt Disney
Computer Software)
Circle reader service number 464

28 COMPUTE DECEMBER 1993

Kids

Kid CAD

Few programs captured the editors' imaginations more immediately than Kid CAD. When Davidson representatives came to demonstrate it for us shortly before its release, we all enthusiastically anticipated playing with it. Kid CAD is basically a computer-aided design program for creating houses and other structures using predesigned building materials. It features three environments: the city, the town, and the farm. You can build with



various materials and use many different kinds of roofs. The program includes furniture for inside the home (yes, even bathroom fixtures). Have a ball creating a house that looks just like yours or put your creativity to work to design a house shaped like a swan or the number 2. You can also turn your imagination loose on the environment with landscaping tools that allow you to place shrubs and trees. Pets and people complete the scene.

The best part of Kid CAD (and the thing that makes it so immediately engaging) is that it represents your structures in three dimensions. You can move your perspective on your project, so you can see it from all sides.

And, after you've built your structure, what could be more fun than blasting it to smithereens? You can destroy your meticulously created edifice with bombs, laser beams, a lawn mower, or a bulldozer (save it to disk first, though, so you can blow it up again later).

We couldn't let The Animals! go by without an honorable mention. It's like a multimedia encyclopedia of the living world.

ROBERT BIXBY

Kid CAD (Davidson and Associates)
Circle reader service number 471

Other Finalists

Rock & Bach Studio (Binary Zoo)
Circle reader service number 480
Wild Science Arcade (Binary Zoo)
Circle reader service number 489
Island of Dr. Brain
(Bright Star Technology)
Circle reader service number 475
Lost Secret of the Rainforest
(Bright Star Technology)
Circle reader service number 477
Pepper's Adventures in Time
(Bright Star Technology)
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Turbo Science
(Bright Star Technology)
Circle reader service number 487
Where in Space Is Carmen Sandiego?
(Brøderbund Software)
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The Incredible Machine (Dynamix)
Circle reader service number 483
Eagle Eye Mysteries (Electronic Arts)
Circle reader service number 473
Science Adventure II
(Knowledge Adventure)
Circle reader service number 472
Time Riders in American History
(The Learning Company)
Circle reader service number 485
Treasure Cove
(The Learning Company)
Circle reader service number 486
My Own Stories (MECC)
Circle reader service number 478
Storybook Weaver (MECC)
Circle reader service number 481
European Racers 1.0
(Revell-Monogram)
Circle reader service number 474
The Animals!
(The Software Toolworks)
Circle reader service number 484
Stunt Island
(Walt Disney Computer Software)
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SPEAK UP!

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Reference

Microsoft Encarta Multimedia Encyclopedia

Quite simply, Microsoft Encarta Multimedia Encyclopedia is one of the best multimedia applications we've seen. While the 25,000 articles that Microsoft has taken from *Funk & Wagnalls Encyclopedia* may not be as strong as the 33,000 articles contained in The New Grolier Multimedia Encyclopedia, Microsoft has added so much additional information and organized the material so well that Encarta is easily the most browsable and usable of all the multimedia encyclopedias. Fully half the CD-ROM is made up of images and audio, with another 10 percent devoted to animations and videos.

Encarta improves on the multiple-path approach found in the other CD-ROM encyclopedias by offering a more logical structure. The overriding structure for Encarta is its 93 categories and 84 subcategories. Once in a subcategory, it's easy to view a full list of all the entries in that subcategory, browse each entry in alphabetical order, or switch to a new category or subcategory. By stressing a categorial organization, Microsoft has recognized how we learn best: by exploring a group of associated ideas and then jumping to a related group of associated ideas.

We could go on and on about the gems of wisdom you'll discover as you explore the recesses of Encarta. Suffice it to say that if you're the type of person who can spend hours in a library moving from one reference book to another, this is the one product that will make it worth your while to buy a CD-ROM drive and sound card. It's that good. (See the September 1993 issue of COMPUTE for a full review of Encarta.)

DAVID ENGLISH

Microsoft Encarta Multimedia Encyclopedia (Microsoft)

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Other Finalists

Compton's Interactive Encyclopedia (Compton's NewMedia)

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Global Explorer 1.0

(DeLorme Mapping)

Circle reader service number 496

EZCosmos for Windows

(Future Trends Software)

Circle reader service number 495

The New Grolier Multimedia Encyclopedia (Grolier Electronic Publishing)

Circle reader service number 497

Information U.S.A. (INFOBUSINESS)

Circle reader service number 498



Undersea Adventure (Knowledge Adventure)

Circle reader service number 502

Microsoft Dinosaurs for Windows (Microsoft)

Circle reader service number 499

Musical Instruments for Windows (Microsoft)

Circle reader service number 501

COMPUTERWORKS

(Software Marketing)

Circle reader service number 493

Body Illustrated: The Anatomical Guide (Spirit of Discovery)

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Distant Suns 2.0 for Windows (Virtual Reality Laboratories)

Circle reader service number 494

VistaPro 3.0

(Virtual Reality Laboratories)

Circle reader service number 503

Special Technology Award

Dual-Scan Passive Matrix Displays

If you've felt torn between stunning-but-expensive active matrix notebook displays on the one hand and less-expensive-but-harder-to-look-at monochrome or passive matrix displays on the other hand, take heart. Now you have another option—dual-scan passive matrix displays. With greater contrast and superior brightness, dual-scan displays look much better than conventional passive matrix displays, yet they use less power and cost considerably less than active matrix displays.

Part of the dual-scan performance boost comes from the screen itself. While active matrix displays use a transistor for each pixel and conventional passive matrix displays use a transistor for every eight pixels, dual-

scan displays use a transistor for every three pixels. Dual-scan performance depends also on the video chip. In the Gateway Colorbook, a Cirrus Logic 6235 16-bit local-bus chip can take credit for impressive dual-scan performance.

Viewed from an angle, a dual-scan color screen still isn't as clear and easy to look at as an active matrix screen, but if you viewed a dual-scan screen straight on, you might like it even better than some active matrix screens.

In addition to Gateway, Toshiba is already using dual-scan screens, in its Satellite T1950CS. And as other companies inevitably adopt this impressive, cost-effective technology, who knows? Monochrome notebook displays may . . . fade away entirely.

From the standpoints of both cost and performance, dual-scan passive matrix technology is bound to appeal to COMPUTE's readers. Hence, we have selected it as the best technological advance of the year.

MIKE HUDNALL

Other Finalists

Cyrix Cx486DRX²

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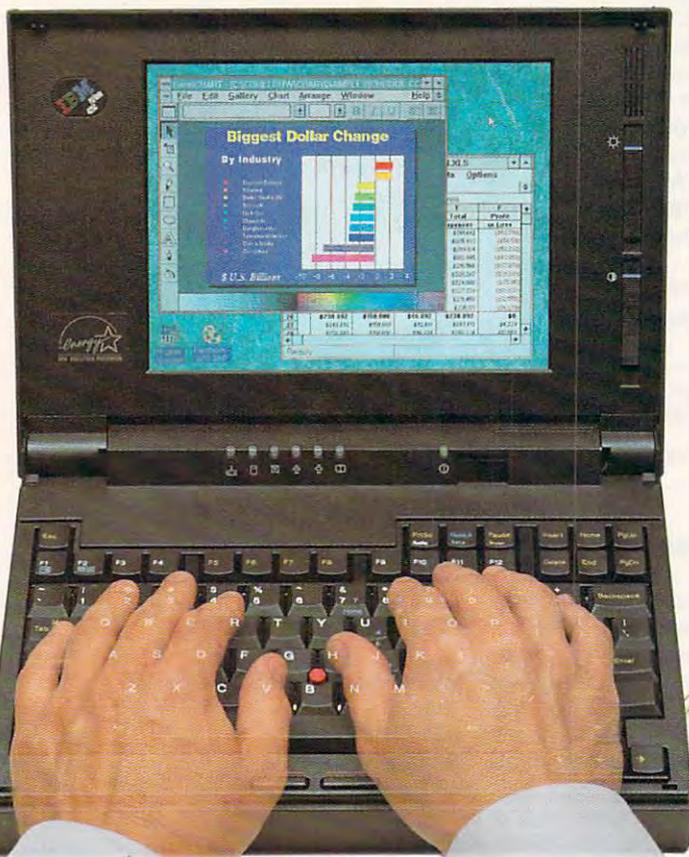
PC Magazine, Cover Story, Portable PCs, August, 1993

Presenting an amazing deal on the IBM PS/Note™. We've teamed the quality and reliability from IBM® with added features and a price breakthrough that only Micro Electronics™ can deliver.

Small and lightweight, the PS/Note operates with the Intel 486 SL processor and has the power to run demanding business software. A larger, 170MB hard drive, 4MB RAM, included fax modem and added PCMCIA capabilities give you the features you want—all at a special price. Plus, the PS/Note comes loaded with popular software and bundled extras!

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Don't miss this special offer. Act now!



Exclusive Micro Electronics Features

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A larger 170MB hard drive and built-in fax modem included! Plus:

- an Intel 486 SL/25MHz processor.
- 4MB RAM (expandable up to 20MB RAM).
- 8k internal cache
- a built-in 1.44MB 3.5" floppy drive.
- and a personalized nameplate.

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- Microsoft Windows 3.1.
- PRODIGY.
- America On-line, PS/1 edition.
- PS/1 Fitness Index and Tutorial.
- plus your choice of Quicken, WinFax Lite or Calendar Creator Plus.

Easy add-ons with PCMCIA

PCMCIA capabilities give you options for future expansion and technology. Additional memory, adapters, and hard drives are easy to install.

Superior battery life!

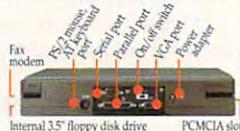
The advanced power management hardware and software give you a longer battery life. With power management enabled, you can run the monochrome PS/Note for up to five hours with the NiMH 2200 MA batteries. And there's no memory effect.

A keyboard with full-size keys—familiar to the touch

The PS/Note features an exceptional, full-size 85-key keyboard with the unique TrackPoint II pointing device. Control cursor movements with ease by moving and varying pressure on the eraser-like button.



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"Thank-You's from PS/Note" gives you discounts on travel, software and more! Offer expires 12/31/93

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Use your MasterCard, VISA, Discover Card, personal check or P.O. with credit approval.



Thank-you for your order!

Micro Electronics
a division of MEI/Micro Center, Inc.

Specifications

Size/Weight

- 11.7" X 9.3" X 1.9"
- Monochrome: 5.2 lbs. with battery
- Color: 5.8 lbs. with battery

Pointing Device

TrackPoint II

Battery

- Monochrome: up to 5 hours with power management

- Color: up to 3 hours with power management
- NiMH (no memory effect)
- 2.2 AmpHours
- 110 AC Adapter
- Quick 1-hour recharge when not in use

Advanced Power Management

- Power management hardware and software (nearly transparent to user) for longer battery life

- Automatic and manual suspend/resume button
- Integrated logic and power system planar
- Internal variable-rate charging system

Processor and Memory

- Intel 486 SL 25MHz CPU
- 4MB RAM (expandable to 20MB)
- 8k internal cache

Drives

- One built-in 1.44MB 3.5" floppy drive
- Removable internal 170MB hard drive

Software

- Comes with MS-DOS 6.0, Microsoft Windows 3.1, Microsoft Works for Windows, PRODIGY, America On-line (PS/1 Edition), PS/1 Tutorial, PS/1 Index, PS/1 Fitness, and choice of Quicken, WinFax Lite or Calendar Creator Plus

Display

- 1024 x 768 for external monitor with 512k video RAM
- Monochrome: super-twisted 64 grayscale, 9.5" LCD
- Color: 256 colorscale 9.2" STN color
- Adjustable contrast and brightness

Keyboard

- Full-function keyboard with 85 keys and 4 inverted-T cursor control keys

Modem

- Fax-9600 baud send/4800 baud receive/2400 baud modem

I/O Ports

- Serial, enhanced parallel, VGA, PS/2 keyboard/PS/2 mouse
- PCMCIA 2.0 slot

Best Notebook Values.



"Scoring high in overall value and design, the Micro Electronic's WinBook gives you a lot for your money, including an outstanding integral trackball."

PC MAGAZINE, Portable Computing Issue, August, 1993

The WinBook by Micro Electronics™ gives you the power to run Windows and a unique, ergonomic design to make it easier to use.

It features a built-in, centered trackball which allows you to control cursor movements effortlessly without having to lift a single finger off the keyboard. Full-size keys and a sloping hand rest let you work in total comfort.

The new, upgradable, fully-static design SL enhanced Intel486SX 25MHz chip enables the CPU to operate at a 0MHz low power state. The

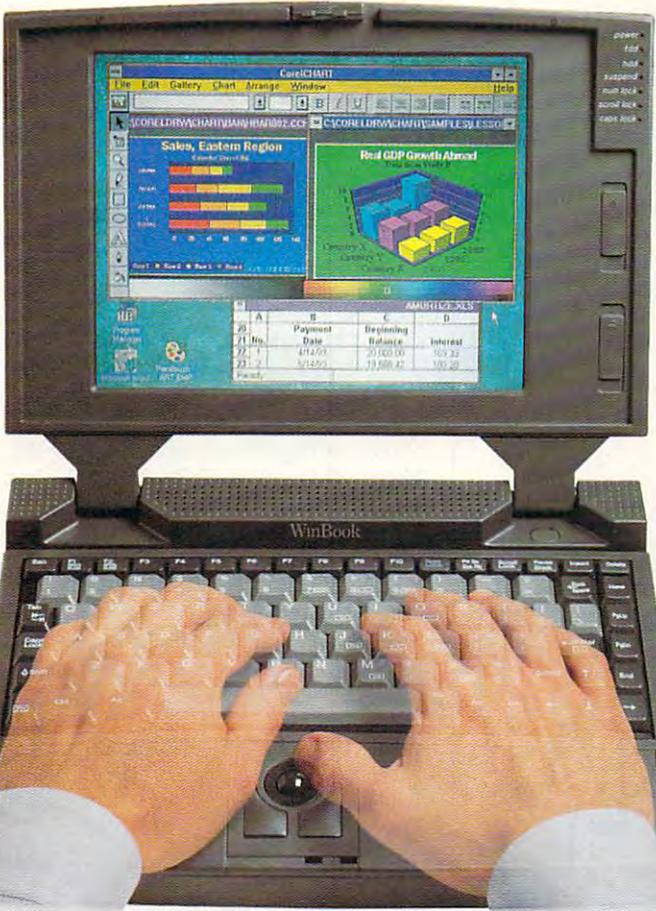
WinBook's Pico Power Evergreen chipset integrates battery and power management with a proprietary, open loop heat regulator circuit to extend battery life and prevent heat build-up. Plus, we have fine-tuned the WinBook's screen. In monochrome and in dual-scan STN color—you get sharper, clearer images with less cursor loss.

The WinBook was engineered for Micro Electronics, a division of MEI/Micro Center, Inc. MEI is America's leading direct source for computer products. Micro Center has been selling PCs for more than 14 years—longer than IBM or Compaq—with over 736,000 units sold. With over 2.2 million satisfied customers nationwide, we have developed a superior support staff including top engineers and technical specialists. So you always get the highest quality product at the lowest possible price.



Dual-button trackball centered under the keyboard

WinBook™



WinBook 486 SX Features



Ergonomically engineered

The WinBook's ergonomic features include a sloping hand rest and keyboard, plus a centered dual-button trackball—allowing you to work in total comfort away from your desk.

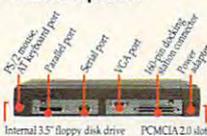
Clean, sharp color display

The WinBook's advanced, dual-scan color display gives you 99% shadow-free performance compared to other single-scan passive matrix displays. You get near active matrix quality at a passive matrix price!

The 5.4 lb. WinBook, designed by award-winning Palo Alto Design

- Includes a 9600 baud send 4800 baud receive fax/2400 baud modem.
- Fast-acting, LCD screen for less cursor loss.
- Industry-standard PCMCIA 2.0 slot for future expandability.
- 512k video RAM.

Mouse/keyboard, parallel, serial & VGA ports plus PCMCIA expansion



Docking station gives you desktop power

With the available docking station, your WinBook instantly becomes a full-function desktop computer. The two expansion slots and drive bays allow you to add peripherals such as monitors, hard drives, CD ROMs, I/O cards or an extended keyboard. It also includes parallel, serial, PS/2 mouse, external keyboard and VGA ports. And it's just \$399!

Longer battery life

The WinBook features NiMH 2200 MA batteries with gold-plated contacts. This allows it to run much longer than units with traditional NiCAD batteries—and there's no memory effect.

NEW! Intel 486 SX SL Enhanced

intel inside

Monochrome **\$1699** Dual-Scan Color **\$2399**

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Use your MasterCard, VISA, Discover Card, personal check or P.O. with credit approval.



Thank you for your order!

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Specifications

Size/Weight

- 11" X 8 3/4" X 1 3/4"
- 5.4 lbs. with battery (monochrome)
- 5.9 lbs. with battery (dual-scan color)

Pointing Device

- 16mm Alps dual-action, Microsoft-compatible trackball

Battery

- Up to 3 hours with power

management, over 5 hours with auxiliary battery (less 30 minutes for color)

- NiMH (no memory effect)
- 2200 MA with gold-plated contacts
- Worldwide auto-sensing AC adapter
- Quick 1.5-hour recharge

Processor and Memory

- SL enhanced Intel486 SX 25MHz CPU
- 4MB RAM

- Pico Power Evergreen HV chipset
- 8k internal cache

Drives

- One built-in 1.44MB 3.5" floppy drive
- Monochrome: Internal 120MB (15ms) hard drive
- Color: Internal 200MB (16ms) hard drive

Software

- Comes loaded with MS-

DOS 6.0 and Microsoft Windows 3.1

Display

- Super-twisted 64 gray-scale, 10" LCD and 1024 x 768 for external monitor with 512k video RAM
- Optional dual-scan STN color display
- Adjustable contrast and brightness
- Visible LED indicator on cover-down

Keyboard

- Full-function keyboard with 85 keys and 4 inverted-1-cursor control keys, 3.0mm keyboard spacing

Modem

- Fax-9600 baud send/4800 baud receive/2400 baud modem

I/O Ports

- PS/2 mouse interface/AT

keyboard interface

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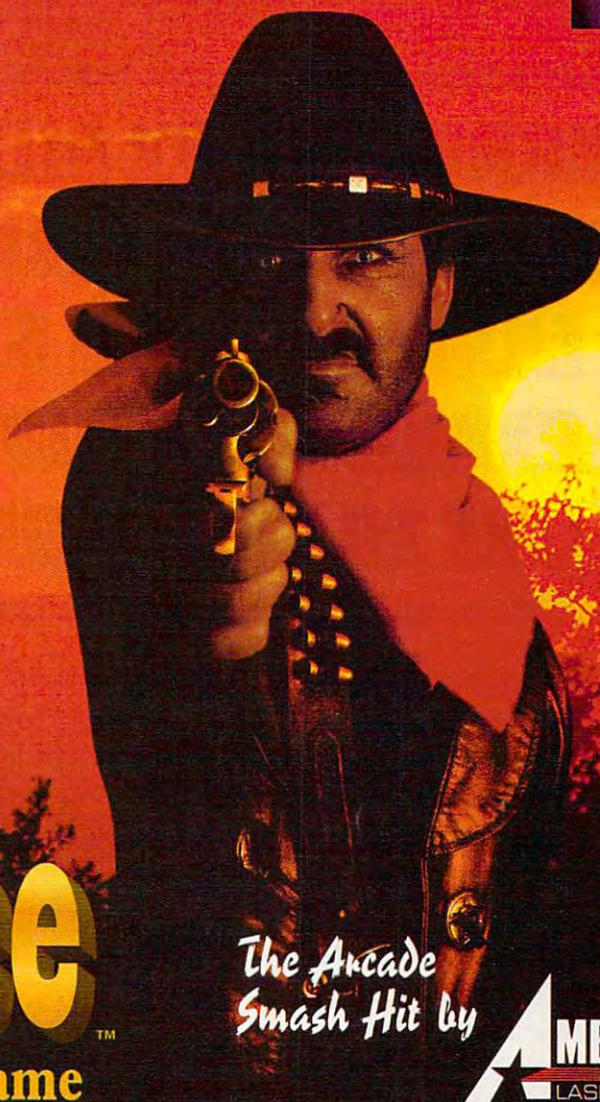


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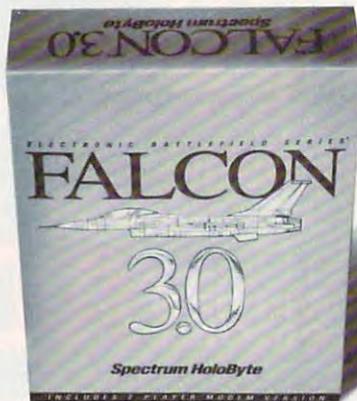
A TRUE STORY

Kuwait, May 23, 1991. Captain Dean "D-Dawg" Pennington dives to take out an Iraqi 85mm gun emplacement below. "Flares, break left!" his wingman screams. He wrenches the stick just as a SAM explodes 10 feet behind his F-16. Anti-aircraft batteries now open up all around, engulfing him. Too low to avoid the anti-aircraft, too slow to evade another SAM, he's faced with a hopeless choice and less than a quarter of a second to make it. Lighting afterburners, he rockets to safety before they can lock on again.

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With Falcon 3.0, up to six players can go mano a mano. May the best man win.



to engage in aerial tactics like bracket maneuvers.

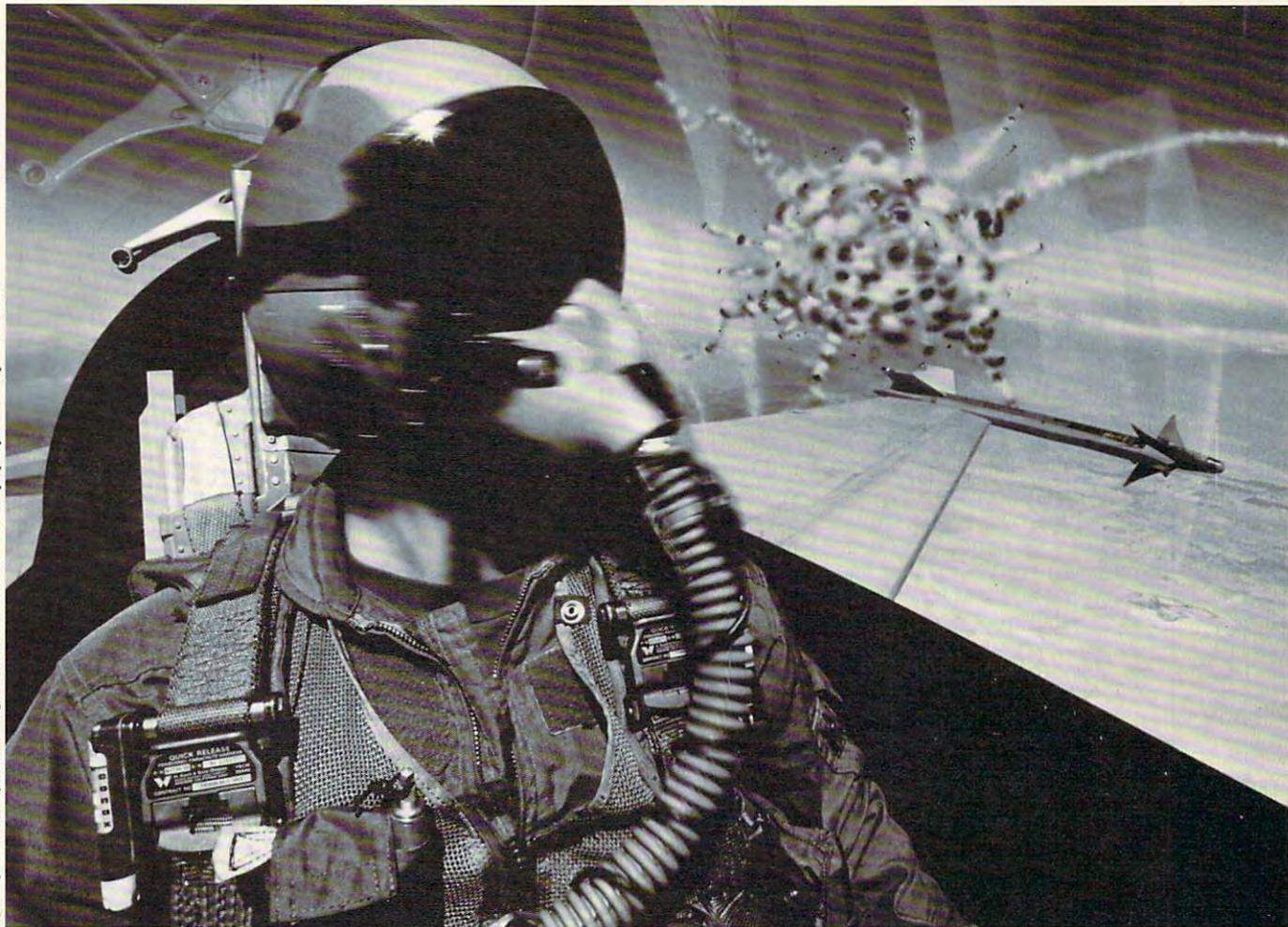
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and go on to hit the enemy in his own backyard. Fail and find the bad guys breathing down your neck.

FALCON 3.0 vs. MiG-29



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media guide to air-to-air combat called *Art of the Kill™* to help you fly like an ace. It all starts with *Falcon 3.0*.

The simulation for people who want to fly the not-so-friendly skies.

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ELECTRONIC BATTLEFIELD SERIES

The fight of your life.

Circle Reader Service Number 201

TEST LAB

Edited by Mike Hudnall
Reviews by William Harrel

Computer pundits have hailed 1993 as the year of the 600-dpi laser printer. While it's true that the high resolutions of these souped-up toner-spreaders do produce sharp graphics and halftones, if all you print is text and an occasional line-art image, don't let the hoopla obscure the reality of your needs. A 300-dpi printer will serve you just fine, thank you, and it will put much less stress on your pocketbook.

Unfortunately (or fortunately, depending on your politics), not all 300-dpi lasers are created equal. They differ widely in cost, speed, options, and yes, even print quality. This may indeed be the year of high-resolution printers, but it is also a great time to find terrific buys on 300-dpi models.

Choosing a laser printer a few years ago was much easier than it is today. Then, you had only two standards to pick from: a Hewlett-Packard LaserJet for Printer Command Language (PCL) compatibility or an Apple LaserWriter for PostScript. All the others in the printer market did their best to make comparable products, competing by offering more features at lower prices. Nowadays, good 300-dpi printers abound.

Another first for 1993 is that—if you shop around—you can buy a 300-dpi printer on the street for under \$500. Printer prices, like those of everything else in the computer and peripherals arena, are continuing to plunge. But you usually get what you pay for. Often (but not always), the economy models are slow, print quality is lacking, and options are nil. A couple of hundred dollars can mean the difference between a printer that actually fits your needs and another fraught with frustration and limitations.

One criterion for this review is

that the printer cost less than \$1,000. Most of the machines reviewed here will suit most small-office needs. However, we did ask the manufacturers to equip the printers with at least 2MB of RAM, which is not included in the \$1,000 limit.

Only the HP LaserJet 4L did not require a RAM upgrade. It ships with 1MB (most of the others ship with 512K) and the ability to compress data, which made the factory configuration more than sufficient for our tests. The Okidata OL400e ships with 512K, but it also compresses

sizes from font outlines.

The printers reviewed here use Hewlett-Packard's PCL, the language found in LaserJets (the Texas Instruments printer provides both PCL and PostScript). However, some use PCL 4, the language found in HP Series II devices (IIP, IID, and so on). And others use PCL 5, the standard used in LaserJet IIIs and 4s.

The differences between these two versions are significant. PCL 4, for example, does not support scalable fonts. To get different sizes, weights, and styles, you must send a separate font file to the printer for each one.

If you use Windows, font scaling is not a problem—it's built in. However, most DOS applications cannot scale fonts. Instead, you must keep a separate soft font file on your hard disk for each style, size, and weight you want to use. Doing so eats up valuable disk real estate and slows printing.

Another drawback of PCL 4 is limited print quality. PCL 4 does not, for example, print good halftone screens, and it cannot print reverse

type (white type on a black background). The choice between a printer with PCL 4 and one with PCL 5 seems clear.

The only reason you really need PostScript is to print PostScript graphics (which are the formats used by many clip art packages) or to proof output intended for imagesetters (typesetting equipment), color-proofing printers, and slide recorders.

Printer engines are rated at pages per minute (ppm), such as 4, 6, 8, and 10 ppm. The most common printer engines are built by Canon. However, all the ppm rating really measures is how fast the engine churns sheets of paper through the machine, which says nothing about how quickly the printer's processor rasterizes them. Also important to printer

**"It is a great
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find terrific buys
on 300-dpi
models."**

data. It completed all but our most memory-intensive test. After we added 1MB of RAM, bringing it up to 1.5MB, there was nothing we couldn't get it to do. Depending on the printer, the others require extra expense to equip them to print a full page of text and graphics.

Due primarily to font-handling options, printer languages were once a very important consideration in buying a printer. A few years ago, you needed a PostScript printer to take advantage of scalable outline font technology. Today's software solutions, such as Adobe Type Manager (ATM) and Windows' TrueType, have taken on much of the font-rendering burden. No longer is it necessary for a printer to support scalable fonts to print text at all weights and



Brother HL-6T—\$895 suggested retail price (SRP) for base unit, \$149 SRP for MB-600 memory upgrade board with 0MB, \$319 SRP for MB-620 board with 2MB, \$699 SRP for MB-640 board with 4MB, no price as yet for PostScript options
Warranty: two years, parts and labor

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BROTHER HL-6T

Brother International's entry in the economy printer market—the HL-6T—is one of the fastest printers reviewed. It turned in second- or third-place times on all four of my tests. Setting the printer up requires a minimum amount of fuss, and the documentation is clear; you'll be ready to go in no time. Simply slide the combination toner-developer cartridge into the front of the printer, and you're off and running.

The printer is light and relatively small, capable of fitting neatly on most desktops. Built around Canon's 6-ppm engine, the HL-6T resembles LaserMaster's Win-Printer, which is a popular high-resolution printer. One thing I don't like about the HL-6T's design is that the input and output trays extend from the front of the machine, causing them to take up about twice as much room as they should. Also, the front-mounted lid is a little flimsy. It's too easy to close it improperly, which could damage the printer.

Instead of PCL 5, the HL-6T uses PCL 4, emulating the LaserJet IIP; so it has some limitations, such as an inability to print reverse type. To get around this problem, you have to create graphics and import them into your documents—a hassle. However, print quality is good. The Photoshop halftone I printed on

the HL-6T is one of the best. Text (though a bit heavier from this printer than from some of the other printers) is crisp and clean. Both small and large type print well. And the CorelDRAW! drawing, which contains a graduated fountain-fill background, looks good. There is minimal banding in the continuous light-to-dark background.

This printer ships with more resident fonts than the others (48), as well as 12 TrueType fonts for scalable output from Windows apps. I found installing the Windows printer driver and fonts a snap. The LED is clear and easy to see, and the front panel is easy to figure out. I made most selections without even cracking the manual.

The HL-6T supports up to 4.5MB of RAM, but the 2.5MB configuration I tested sailed through the tests. Brother has made installing the extra memory quite easy—all you do is loosen one screw, slide the lid back, and snap in a couple of SIMMs.

When the printer is used with the bundled Windows printer driver, a data compression routine makes for faster printing, and the printer requires less memory. But here's the real benefit of this technology: When you use the Windows Print Manager (Windows' built-in spooler), control of the computer returns more quickly. The driver also lets you switch the high-speed parallel interface on and off, download fonts (as either permanent or temporary), and adjust graphics print quality.

The HL-6T is also one of a few printers to support a bidirectional parallel port. This option keeps you apprised on your monitor of the printer's status and progress during a print job. It notifies you, for example, when the printer runs out of memory or needs paper.

Again, my only objections to this printer are that its trays take up a little too much space and the printer itself could be just a little sturdier. I also think that it should support PCL 5. Otherwise, the

speed are the amount of RAM it contains and the speed of the processor. Most of the printers reviewed here have 16-MHz processors, which are quickly becoming the slowest in the industry today but are quite adequate for most desktop environments.

To test these printers, I first judged how easy they are to set up and use. I then ran a series of real-world tests, which included four documents: a 20-page Microsoft Word for Windows file, a 4-page Aldus PageMaker newsletter, a full-page CorelDRAW! drawing, and an Adobe Photoshop gray-scale photograph. The tests were designed to gauge speed and test print quality—which are, after all, the most important considerations when buying a printer.

The tests were performed with Windows Print Manager turned off so that my 486/33 would dump the print data directly to the printer. I began each timing when I clicked on OK and ended it when the final page reached the output tray. The accompanying graphs show you the results of these tests.

The results are interesting, as well as valuable if speed is a factor in your purchasing decision. In addition to these test results, this month's Test Lab includes reviews of each product, a table of features so that you can compare these printers head to head, and a sidebar with suggestions for buying a printer. Read on. Surely there's a printer here that can meet your needs.

WILLIAM HARREL

TEST LAB



HL-6T is a great value. (Editor's note: Since the writing of this review, Brother has introduced the HL-6V, a 6-ppm, 300-dpi printer that does support PCL 5. Its suggested retail price is \$995.)

Circle Reader Service Number 243

CANON LBP-430

Canon's LBP-430 is almost identical to Hewlett-Packard's LaserJet 4L. The two printers look almost exactly alike, have the same Canon 4-ppm engine, and support PCL 5. The LBP-430 comes out of the box ready to print. All you do is pull the tab on the toner cartridge, slide in some paper, and let 'er rip. It's as simple as setting up the toaster for breakfast.

Where this printer really excels over the others in this month's Test Lab is in its setup utility and documentation. The setup utility, a Windows-based application that installs and configures the printer driver automatically, asks all the right questions and takes all the guesswork out of the installation. During the installation process, it displays graphics that acquaint you with the printer while you wait for files to copy and decompress. What could be easier? After installing the printer, you can use the setup utility as needed to control various options, such as printing a test page, changing the default font, and setting density.

The online documentation is the best I've seen. It has eight well-illustrated topics—Setup, Paper Handling, Software Issues,

**Canon LBP-430—\$799 SRP for base unit, \$700-\$1,000 for PostScript capability through Freedom of the Press software, pricing on 2MB and 5MB upgrade options available by calling vendor
Warranty: two years, parts and labor**

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Adding Memory, and so on—that not only explain all concepts quite well but also demonstrate procedures with drawings and actual photographs of the printer. Each topic receives quite thorough coverage, and you can navigate the online book by using the table of contents menu or search terms, as you would with the Windows Help system. I tried and tried to think of issues not covered in the online material—without success.

If you're short on desk space, you'll appreciate the compactness and small footprint of this printer. Need to move your printer around? This one is light and easy to move. And it saves power, thanks to an automatic sleep mode that, after 15 minutes of inactivity, cuts power consumption down to a bare minimum.

The printer has its own built-in resolution enhancement technology, which Canon calls Automatic Image Refinement (AIF). AIF helps prevent jaggies in large text and the curved and diagonal lines in graphics. The one-button control panel is easy to figure out and use—the list of conveniences goes on and on. This is simply a nice printer.

Though middle-of-the-road in speed, the LBP-430 prints very well. Text is clear at both large and small sizes. Gray-scale halftones are as good as or better than those from any of the other printers reviewed here. I could find nothing to complain about.

Where it falls short of the HP LaserJet 4L, however, is in the way that it handles memory. With the HP model, I could complete all my tests with 1MB RAM; the LBP-430 required 2MB. Apparently, it doesn't compress data as well as the LaserJet 4L. Luckily, it holds up to 4MB, which is 2MB more than the LaserJet 4L (although that printer would probably never need more than 2MB to print anything).

For a number of reasons, this is a great printer, and you can buy it at a reasonable price.

Circle Reader Service Number 244

BEFORE YOU BUY

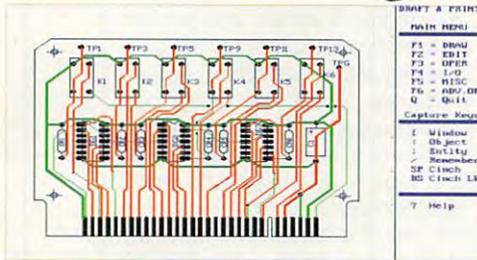
Never before have printer vendors offered so much for so little. Some of the printers in this review are just as good as or better than machines that cost twice as much or more a year or two ago. The device you should buy depends primarily, of course, on what you intend to do with it.

Most home office and small-business applications need an all-around, dependable machine that prints good-looking text and an occasional graphic at a reasonable speed. Most of the printers reviewed here fit that bill nicely. However, five of them stand out: Hewlett-Packard's LaserJet 4L, Canon's LBP-430, Epson's ActionLaser 1500, Okidata's OL400e, and Brother's HL-6T. All are good, durable printers; but since the HP, Epson, and Canon models support PCL 5, they're more attractive if you'll be printing text special effects (such as reverse type).

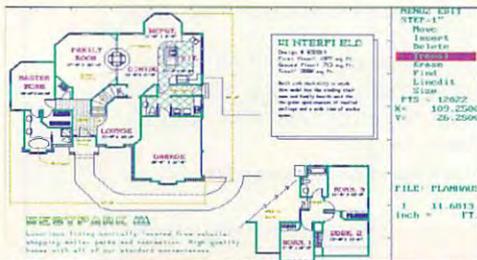
If you need a heavy-duty printer with lots of upgrade options, you should choose either the Lexmark or Star Micronics offering. Again, the Star Micronics LS-5EX's support for PCL 5 makes it a little more attractive. Finally, if you plan to do desktop publishing and will be printing EPS graphics or using your desktop laser as a proof printer, the Texas Instruments microWriter is a good choice. Some of the other printers offer PostScript, but none of them can give you PostScript and AppleTalk support for less than \$1,000.

—WILLIAM HARREL

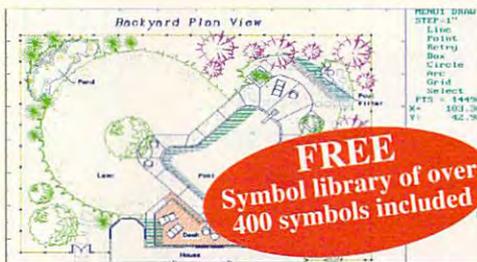
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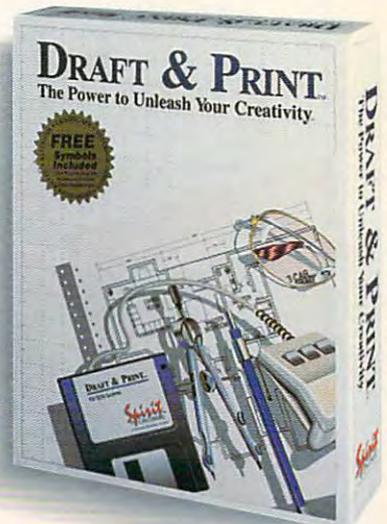
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EPSON ACTIONLASER 1500

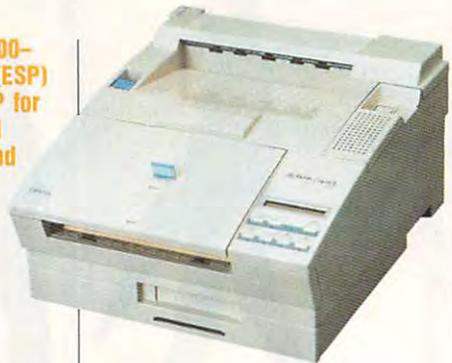
Epson's ActionLaser 1500 is a good printer with some limitations. Though lacking in a few of the frills found in the more recently released printers, such as Brother's HL-6T and HP's LaserJet 4L, it does support PCL 5. It doesn't come with its own printer driver with bidirectional port controls, but it's a little faster than most of the other printers reviewed here. It's easy to set up and use, and Epson has made it sturdy, light, and compact enough that it won't push you off your desk.

During setup, I encountered only one problem—installing the RAM upgrade. The printer's design forces you to remove too many screws and parts. Furthermore, rather than installing convenient SIMMs, you must press in memory chips, which, without practice, isn't foolproof. On the other hand, I found loading the toner-developer unit almost as easy as switching on the conveniently front-mounted power switch.

The real question is, of course, how well does it print? And again the ActionLaser has its pros and

**Epson ActionLaser 1500—\$600–\$699 estimated street price (ESP) for base unit, \$750–\$850 ESP for review model with 3MB RAM
Warranty: two years, parts and labor**

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cons. Similar to HP's Resolution Enhancement technology (REt), Epson's built-in Resolution Improvement Technology (RIT) sharpens your output. RIT fills in the gaps around the edges of text and graphics so that the resolution seems higher than it really is.

The ActionLaser prints text as well as or better than any of the other printers reviewed here. Look closely, and you'll find slender and straight strokes on small type. Curves are crisp. Even under a magnifying glass, the type doesn't exhibit any misplaced toner—not always the case with other printers. Large text really does look as though it's printed at a higher resolution than 300 dpi. Monotone graphics look great.

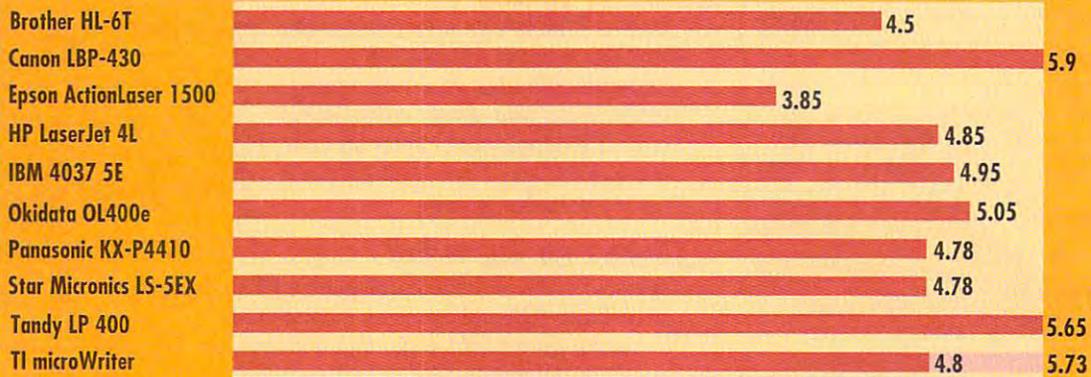
However, the ActionLaser can-

not print gray-scale photographs nearly as well as some of the other printers. True, 300-dpi printers do not do photographs well, anyway. But when I tested the ActionLaser, the results were less than I'd expected. The photos looked muddled and washed out, with light spots too light and dark spots too dark. The manual warns that you should turn RIT off when printing gray-scale images, but I tried it both ways and saw little or no difference. If you plan to print many gray-scale screens or photographs, you shouldn't be using a 300-dpi laser.

These shortcomings aside, I liked this printer. It's sturdy and fast, it prints text well, and it's easy to use.

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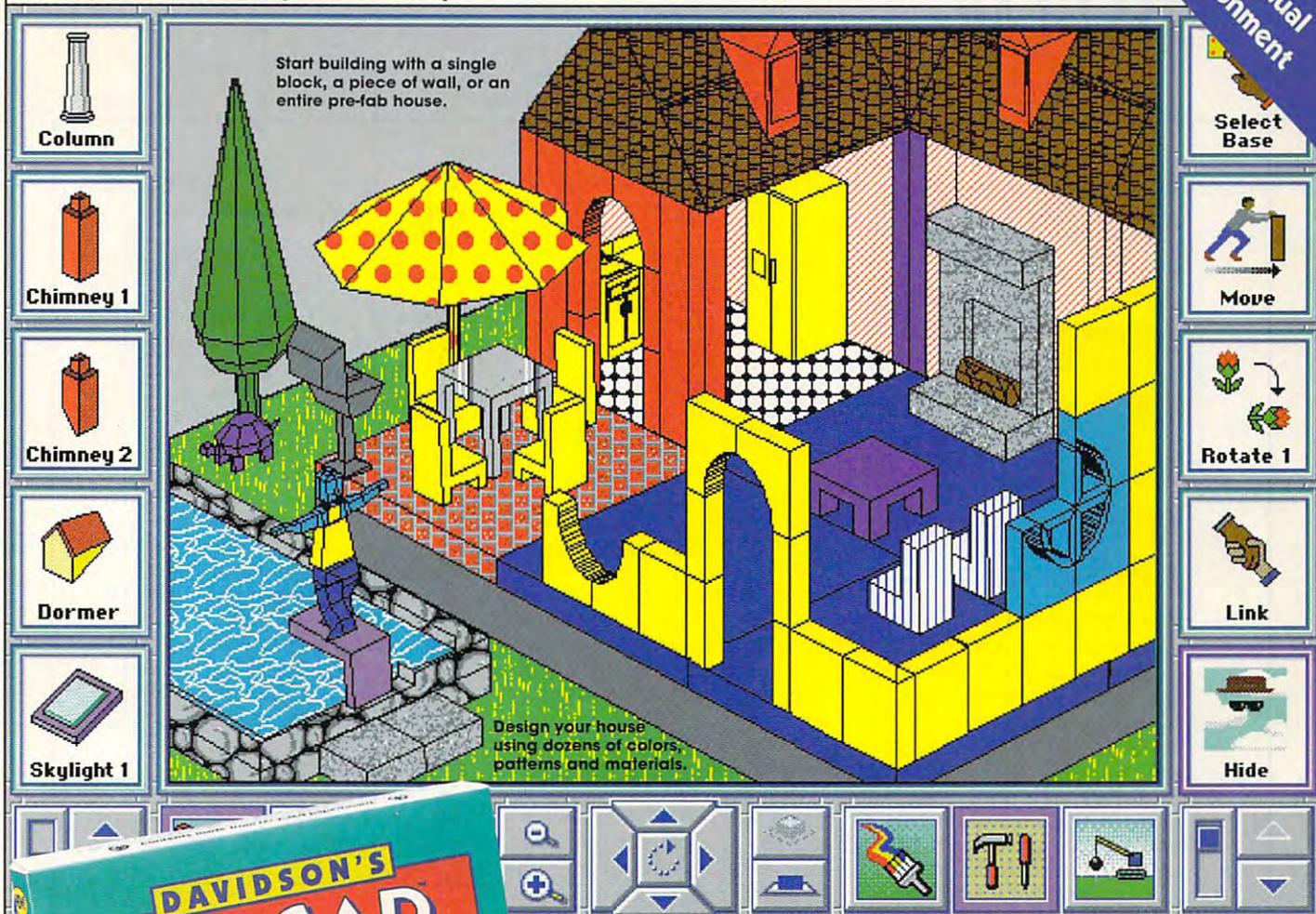
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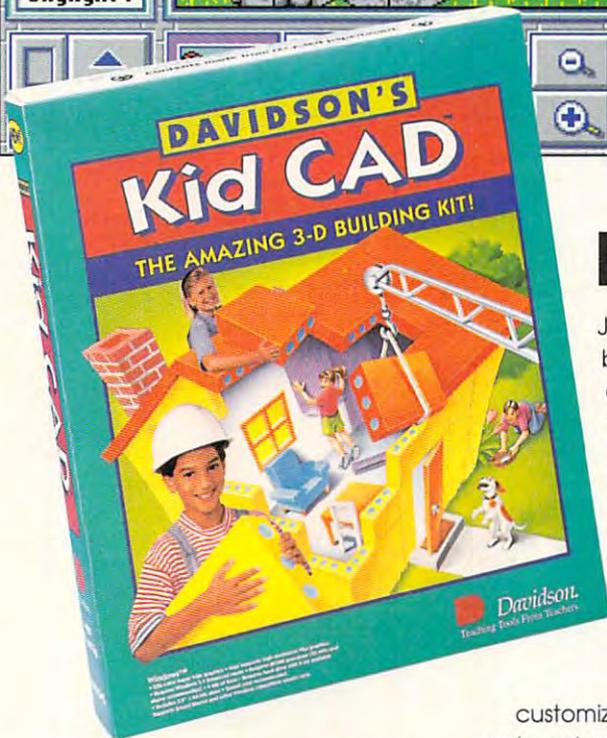
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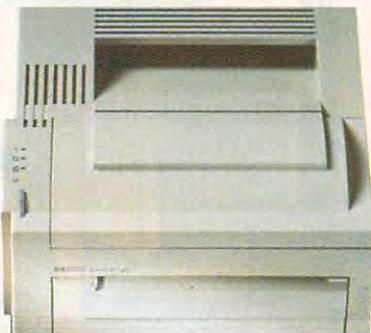
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TEST LAB



HEWLETT-PACKARD LASERJET 4L

Hewlett-Packard's economical LaserJet 4L is almost everything a personal desktop laser printer should be: light, small, easy to set up, and easy to use. The manufacturer provides great documentation as well as an online reference that helps with everything from setup to downloading fonts and using the printer with various software applications.

It's tough to find anything to criticize about this printer. All the features I like in the Brother HL-6T—the bidirectional parallel port, the easy font downloading, the graphics quality, the resolution control, and so on—are here, as are several other interesting and helpful options. About my only complaint is that this printer turned in slightly slower printing times than some of the others.

Of all the printers in this roundup, the LaserJet 4L is the only printer that ships in a standard configuration with enough memory to perform our tests. It has 1MB of RAM, which you can upgrade to 2MB. This doesn't sound like much, but HP's Memory Enhancement technology (MET) compresses data, effectively doubling the capacity of the installed RAM. Hence, 1MB is like 2MB, and so on. Sound too good to be true? I tried, but I could not overload the memory in this printer.

HP's exclusive Resolution Enhancement technology (RET) works similarly to Epson's RIT. However, I found the LaserJet

Hewlett-Packard LaserJet 4L—\$849 SRP for base unit, \$99 SRP for 1MB RAM
Warranty: one year, parts and labor

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4L's technology more satisfactory, whether printing text or graphics. Frankly, the LaserJet 4L prints as well as or better than any of the other printers reviewed here. In fact, it prints text as well as the 600-dpi Lexmark I use regularly, and its halftones (though obviously 300-dpi) are great.

Some other HP options also help to make this a standout printer. Intelligent On/Off turns the printer off after extended periods of idleness. EconoMode allows the printer to use 50 percent of the usual amount of toner when printing drafts, proofs, internal memos, or any other documents that don't require top quality. HP's toner cartridge comes with superfine toner, which also enhances print quality. And with HP's Reduce/Reuse/Recycle design, the manuals come on recycled paper, and you're encouraged to recycle the toner cartridges, on which HP pays the return postage.

Finally, unlike any of the other printers reviewed here, the LaserJet 4L contains the Enhanced PCL 5 found in the LaserJet 4, which provides a faster printing speed than that of the IIIP (which the LaserJet 4L replaces), and Intellifont scaling. Scaling allows you to use HP's Intellifont format to print at any point size (similar to PostScript Type 1 fonts). The LaserJet 4L has 26 resident Intellifont typefaces.

Again, this is a great printer at a great price. If you're looking to break into the laser printer world, this one opens the door painlessly and with style.

Circle Reader Service Number 246

IBM 4037 5E

Like the Epson laser printer, the 4037 5E is a mixture of good news and bad news. Immensely simple to set up, it comes with a DOS-based utility that checks to make sure you've set up the printer correctly and then installs printer drivers for most popular applications, including WordPerfect, Windows, and Word. This printer is fast, but in its native emulation—IBM's PPDS—print quality isn't up to par, and its HP LaserJet emulation isn't always adequate, either.

Lexmark makes installing a memory upgrade in this printer quite simple. Just open a door and slip in a SIMM. You'll find installing the font card and the flash memory option (which allows you to download permanent soft fonts) just as easy. Flash memory comes in both 0.25MB and 1MB modules. You can use it to

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—MIKE HUDNALL

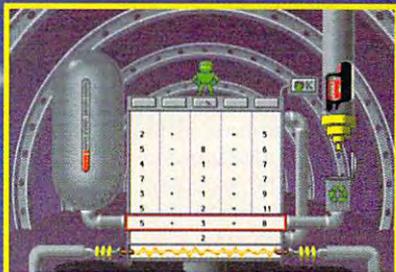


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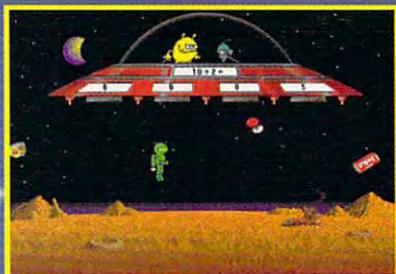
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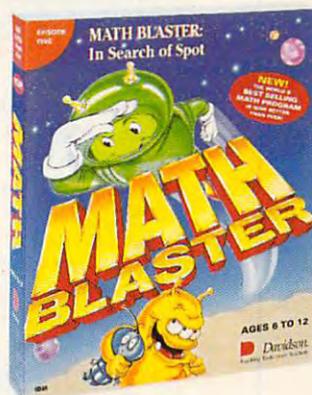
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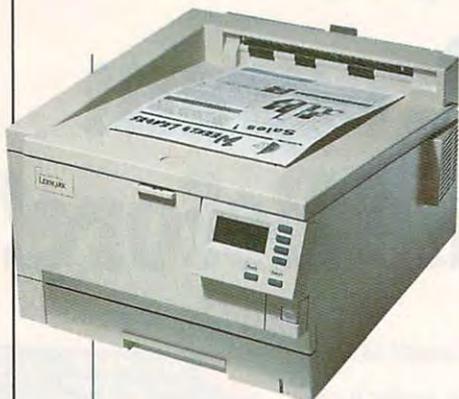
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send fonts to the printer in advance of print jobs, which can save time when printing. However, the flash memory works only in PPDS mode, which means you don't benefit from it when using the printer in HP LaserJet emulation. The font card, which provides 23 scalable resident fonts, is a great option also, but it, too, works only in PPDS mode.

These PPDS options are great for printing text; however, this printer does not print halftone screens very well at all. In the CoreIDRAW! test, the printer produced entirely too much banding (obvious abrupt transitions from one shade to another) no matter how I adjusted the print pattern and contrast. The

CoreIDRAW! drawing printed much better in PCL mode, but PCL 4 leaves something to be desired. The 4037 5E was not able to print some newsletter pages in PCL mode with 2.5MB RAM. It ran out of memory.

This printer does, however, have some attractive features. The LED is large, and the logically arranged buttons make changing emulation and other choices easy. The large paper tray has an indicator on the front that lets you know when you're getting short on paper. It does not, however, support legal-size pages. You'll have to buy an optional tray for that. I found text quality great at large and small sizes, in both PPDS and PCL modes.

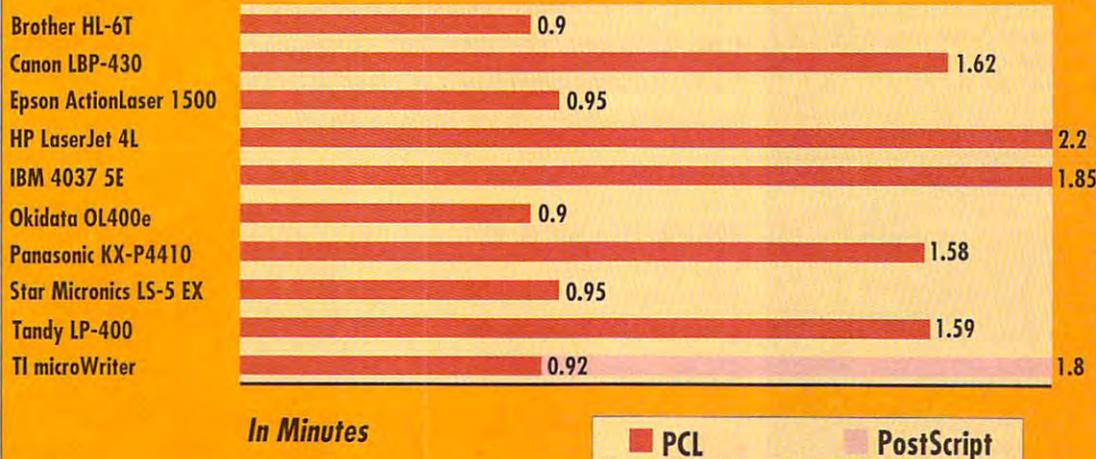
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This is a big, sturdy printer capable of handling heavy-duty jobs. Like HP's printers, IBMs always have great documentation. The 4037 5E is no exception. I found the documentation thorough and the illustrations exceptional and helpful. And the online utility makes setting up, programming, and font downloading a snap. This printer is not as sophisticated as some of the others, and it has a few frustrating quirks; otherwise, it's a dependable machine worth considering.

Circle Reader Service Number 247

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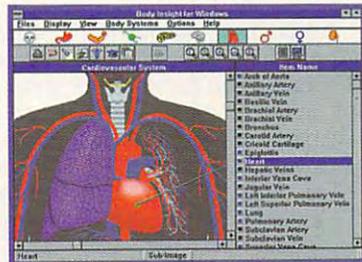
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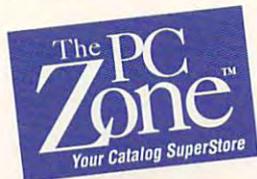
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TEST LAB



OKIDATA OL400E

If you need a fast printer that prints well and takes up an incredibly small portion of your desktop, you should take a good long look at this one. In fact, if your computer workspace is limited, this could be the printer for you. It has a lot of options squeezed into a small package, and I like it.

Like HP's LaserJet 4L, the OL400e compresses data, thus requiring less memory. It comes standard with 512K, and surprisingly, this is enough for most print jobs. Only while printing the most stringent of the newsletter pages did it peter out. Even then, it finished most of the pages, defaulting to Courier only at the bottom of the most complicated page. After I installed another megabyte (which was simply a matter of sliding a card into the back of the printer), I could not overload the OL400e. This printer holds up to 4MB of RAM, which most desktop applications would never use.

The OL400e placed in the top three on all four of the speed tests, and I found the print quality excellent. The only drawback was this printer's use of PCL 4, which meant that it could not print the reverse type in the newsletter. Other than that, text and graphics printed crisp and clean, with clear, definitive strokes and minimal stairstepping. The gray-scale photograph printed as well on this printer as on anybody else's, and the

**Okidata OL400e—\$699 SRP for base unit
Warranty: one year, parts and labor;
five years on LED printhead**

**OKIDATA
532 Fellowship Rd.
Mt. Laurel, NJ 08054
(609) 235-2600**

CorelDRAW! drawing had minimal banding.

Like the HP and Brother printers, the OL400e talks back to your computer. For example, if the printer runs out of memory or paper or encounters another problem, it displays a message in Windows. Although this really is not a network printer, these messages are particularly helpful when the printer is in another room or not in plain sight, such as on a multiple-tiered computer stand where the printer is hidden by the shelf that holds the keyboard.

You won't believe how light and small this printer is. It's almost small enough to pack up and take with you. Lifting it out of the box, I wondered about its sturdiness. But paper runs through it smoothly, and all the parts and doors fit precisely. There's no reason to believe it won't last. Okidata's engineers deserve a lot of credit.

The OL400e's use of PCL 4 places it a little behind HP's LaserJet 4L in options and quality. Another drawback is that at press time there was no way to get PostScript output from it. However, Okidata says a PostScript option is in the works. Aside from these grievances, there's no rea-

**Panasonic KX-P4410—\$769 SRP for base unit, \$150 SRP for 1MB RAM
Warranty: one year, parts and labor**

**PANASONIC COMMUNICATIONS & SYSTEMS
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Secaucus, NJ 07094
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(201) 348-5200**

son not to consider this printer. If it supported PCL 5, I would consider it the best printer in this bunch, hands down.

Circle Reader Service Number 248

PANASONIC KX-P4410

My first impression of this printer was that it was big and sturdy—and that it is. The Panasonic KX-P4410 is, however, a little long in the tooth and in need of upgrading. For example, its separate toner and developer cartridges make it somewhat more difficult to set up than the others. And adding memory requires too much disassembly. The KX-P4410 supports PCL 4, which means print quality and options are lacking, and it has only five resident fonts. But then, if you use Windows, resident fonts aren't a big issue. What you get with the KX-P4410 is a well-built workhorse that's liable to last just about forever.

The more I played with this printer, the more it reminded me of the HP LaserJet Series II, which was a fine printer in its day. In fact, most of those built and sold several years ago are still around, and several HP dealers have backlogs of companies that want to lease used ones. However, the Series II does not support scalable fonts, and halftone screen patterns are blotchy, as is the case with this printer. It's not the ideal device for



printing camera-ready art.

The KX-P4410 scored near or at the bottom of my speed tests, and type and graphics are a little stairstepped and fuzzy. This is not to say that the quality is not acceptable; it's just not as good as with the others. The documentation is very thorough, though a bit too technical for an entry-level printer. It's obvious that at one time this was not an entry-level model.

This printer is not really suitable for desktop publishing and other graphics-intensive work. However, if you need a workhorse capable of turning out page after page of text day after day, this one will serve you well. It would hold up very nicely in an operation printing lots of in-house word processor, spreadsheet, and database documents. It would also be a good printer for generating a lot of copies of the same document.

Circle Reader Service Number 249

STAR MICRONICS LS-5EX

If you need a sturdy printer offering easy setup, PCL 5, good print quality, and speed, take a

Star Micronics LS-5EX—\$989 SRP for base unit, \$1,144 SRP for review unit with 2MB RAM, \$225 for Truelmage upgrade (requires 1MB RAM)

Warranty: two years, parts and labor

STAR MICRONICS AMERICA
420 Lexington Ave., Ste. 2702
New York, NY 10170
(800) 447-4700

look at the LS-5EX.

The LS-5EX rated in the top three on all four tests, and its print quality is as good as that of any of the other printers. But the real story behind this printer is upgrade options. For a few extra dollars you can transform this machine from a modest personal laser into a powerful workhorse. It has the highest maximum memory configuration of all these printers—7MB. You can get a 500-page input tray; the toner cartridge has a 4500-page print duty cycle; and, with the PostScript upgrade, the printer supports AppleTalk, which makes it a great network printer.

There's also a Truelmage upgrade available. Truelmage is Mi-

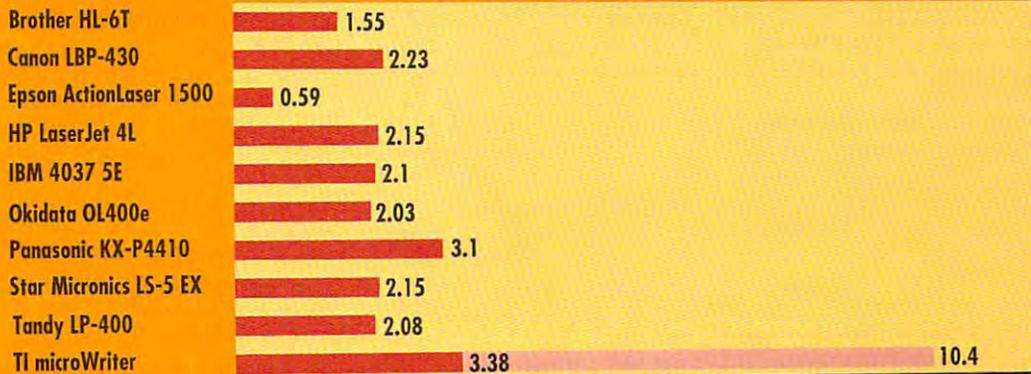


crosoft's PostScript clone, which may or may not eventually catch on and become popular. The printer comes with 15 TrueType fonts, which you can use with Windows.

All this power comes at a price. This is a big, bulky printer, not nearly as compact as the Okidata or HP offering. The thorough manual becomes a bit technical in places, with much information on programming the printer.

I like the convenience of the LED and button panel. The LED is easy to read, and the buttons are easy to figure out. Also, when you press a button, the printer gives you instructions on what to do next. For example, when you press the test button, a message

CORELDRAW! DRAWING



In Minutes

■ PCL

■ PostScript

TEST LAB



flashes on the LED, telling you to hold the button for two seconds to print a test page. This printer is full of neat little features.

Also worth discussing are the speed and print quality of the LS-5EX. While the Epson printer turned out slightly faster times on most of the tests, the LS-5EX output looks a little better. In addition to sharp, crisp type, the graphics are quite good for a 300-dpi printer. This is attributable to the Star Micronics Resolution Enhancement Procedure (REP). REP increases horizontal resolution to 600 dpi, which helps fill in curved and diagonal edges.

The only way to test how well these resolution enhancement routines work is to analyze the output. Using a magnifying glass, I examined text and graphics from the printers using these routines. The Star Micronics model had slightly more stairstepping in diagonal strokes than the other printers; I noticed this stairstepping in A's, W's, and so on. But the differences in resolution are not noticeable without magnification.

About the only problem I encountered was upgrading the memory. And it was really more of a hassle than a problem—too many parts to take off. Other than that, it's a great printer.

None of the other printers in this Test Lab are as sturdy as the LS-5EX or offer as many upgrade options. If your printing needs go beyond the modest abilities of a personal desktop laser, you should consider the LS-5EX.

Circle Reader Service Number 250

**Tandy LP 400—\$799.00 SRP for base unit, \$199.99 SRP for 1MB RAM
Warranty: one year, parts and labor**

**RADIO SHACK
1500 One Tandy Center
Fort Worth, TX 76102
(817) 390-3011**

TANDY LP 400

This printer is easy to set up and has great documentation. I had it up and printing in a very short time. Like the Panasonic printer, though, this machine has a few limitations that make it less than ideal for all applications.

The LP 400 requires a lot of memory to print a page of text and graphics, and it emulates the HP IIP, which limits output options and quality. Like the other devices in this review that do not support PCL 5, it cannot print reverse type and does not support scalable fonts—unless, of course, you're printing from Windows, which has its own font-scaling technology. Also, this printer's halftone screens aren't as clear as those from some of the other printers reviewed in this roundup. And it's a little slower than most of the other printers, but not excruciatingly so.

The LP 400 prints too dark, and character spacing is not very good. Often, characters print too close together or overlap each other. You don't get the fine character strokes produced by some of the other printers, such as the Epson, HP, and Okidata models. But the thick strokes do eliminate stairstepping in large text. This is also helpful when you print graphics with lots of arcs or diagonal lines. The LP 400 did print the gray-scale photograph and graphics well, especially for a PCL 4 machine.

To its credit, this printer doesn't take much space on your desktop. The LED is easy to read, and the buttons are easy to figure out and use. Printing font

and test pages is easy, as is simple programming, such as changing interfaces and emulation modes. The memory upgrade is literally a snap; all you do is slip in a couple of SIMMs. In addition, Tandy has a great support team.

The LP 400, like the Panasonic model, is built very well, and it should last a long time under a heavy workload, where some of the other light, compact models may not prove as durable. I think it would be best suited for an office that generates lots of documents for its own consumption, such as interdepartmental reports or memos.

Circle Reader Service Number 251

TEXAS INSTRUMENTS MICROWRITER

Of the ten low-cost printers reviewed here, only Texas Instruments' microWriter comes standard with PostScript, making it the printer of choice for desktop publishing. PostScript is required for printing PostScript graphics and for proofing output intended for imagesetters, color-proof printers, and slide recorders. The microWriter also emulates the HP IIP, making it an all-around, good printer for home and small business. And with its support for AppleTalk, you can use it with a Macintosh or on a network.

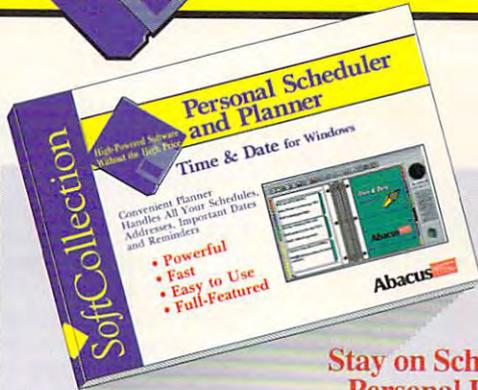
The advantages of PostScript are many. For example, the newsletter used to test these printers had two EPS images on the front page. None of the other printers could print them properly—all that printed were low-resolution screen representations of the images. Also, draw programs such as CorelDRAW! create certain effects that non-PostScript printers cannot print.

The microWriter is a huge, sturdy thing. It comes out of the box easily and I found it a snap to set up. The one that I tested came configured with 2MB of RAM (the amount required for our tests); con-

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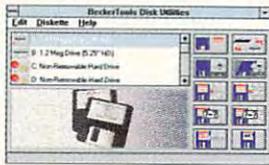
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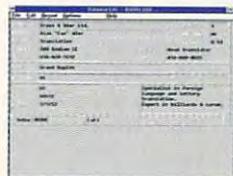
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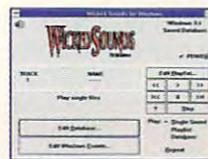
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for 65 PostScript fonts
Warranty: one year, parts and labor**

**TEXAS INSTRUMENTS
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sequently, I didn't have an opportunity to evaluate the memory-upgrading process. However, 2MB is seldom enough memory for a PostScript printer, and the microWriter is no exception. In PostScript mode, it was not able to complete the full-page CorelDRAW! drawing and a couple of the newsletter pages. Also, the shortage of memory caused numerous timeout errors from Windows. I finally had to set the Retry option in the Windows PostScript driver to over 300 to get the newsletter to print.

PostScript printers print faster with more memory. The graphs in

this Test Lab show how slow the microWriter is with only 2MB. I didn't test it with more than 2MB, but the printer would undoubtedly print faster with twice as much memory. A drawback of the microWriter is that it can hold only 4MB of RAM. While this is enough for most applications, graphics applications could require more.

Note, however, that the printer had plenty of RAM for the HP emulation tests. It turned in respectable times in HP mode, except on the CorelDRAW! drawing. For some reason it was too slow on that one. But then, I had a similar anomaly with the HP LaserJet 4L, which fell way behind on

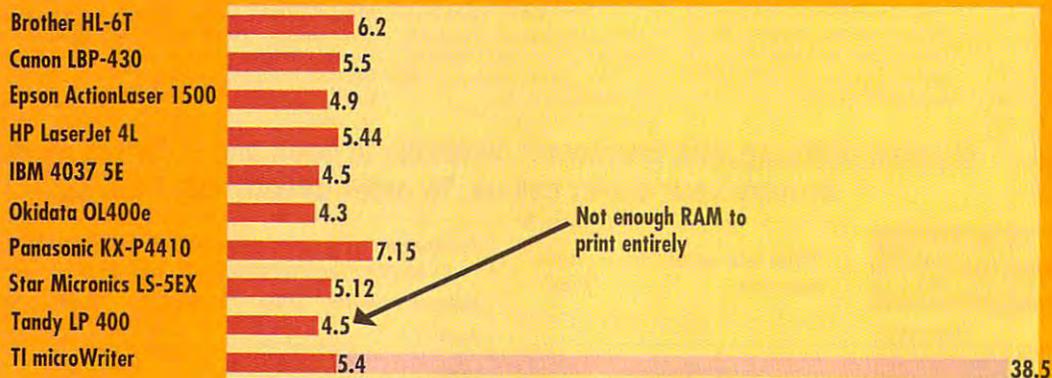
the gray-scale test but performed respectably on the others.

The microWriter documentation, though sparse, is clear. It covers the basics, and these days few users need more. There is, however, an optional reference manual that contains HP programming and PostScript interpreter information. The standard PostScript configuration is 17 Type 1 fonts, which you can upgrade to 65. There is also a 2MB font upgrade that adds several PCL fonts to the base IIP configuration.

Although some of the printers in this review are sleeker and have a few more sophisticated features than this one, PostScript makes the microWriter an excellent value—even if you do have to spend a little extra to get enough memory. Some of the other printers here offer PostScript upgrades, but in most cases you'll have to upgrade the memory, too. If you don't need graphics or desktop publishing capabilities, one of the other printers may be better suited to your application. But if you print graphics often, you should consider the microWriter.

Circle Reader Service Number 252

PAGEMAKER NEWSLETTER



In Minutes

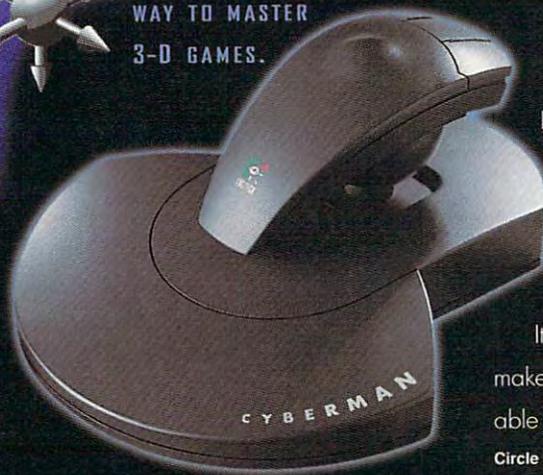
■ PCL

■ PostScript

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TEST LAB

Printer Features

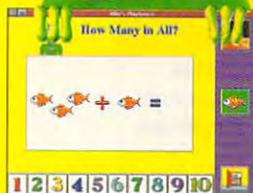
	Brother HL-6T	Canon LBP-430	Epson ActionLaser 1500	HP LaserJet 4L	IBM 4037 5E
Memory options	up to 4MB	up to 4MB	up to 5MB	up to 2MB	up to 4.5MB
HP LaserJet emulation	PCL 4	PCL 5	PCL 5	Enhanced PCL 5	PCL 4
PostScript	optional	no	optional	no	no
Epson FX80 emulation	yes	no	yes	no	no
Input tray capacity	150	100	150	100	150
Output tray capacity	100	50	100	50	100
Envelope feeder	yes	yes	yes	yes	yes
Optional paper tray sizes	250	no	250	no	400
Resident fonts	48	15	27	26	16
Recyclable toner cartridge	no	yes	no	yes	yes
Toner cartridge life (in pages)	3500	3000	6000	3000	3500
Cost per page (in cents)	2.7	0.28	2.7	0.3	3.2
Pages per minute	6	4	6	4	5
Windows printer driver	yes	yes	yes*	yes	yes
Interfaces supported	serial & parallel	parallel	serial & parallel	parallel	parallel
Microprocessor	MC68000	National Semiconductor	MC68000	MC68000	MC68000
Microprocessor speed	16 MHz	14.6 MHz	16.67 MHz	16 MHz	10 MHz
Engine life (in pages)	300,000	100,000	180,000	indefinite	3500
Engine manufacturer	Canon	Canon	Minolta	Canon	Lexmark
Weight (in pounds)	21.5	15.4	15.5	29	24
Dimensions (in inches)	13.8x16.5x9.1	14.5x14.8x6.2	8.9x14.5x18	14.5x14x6.5	9.7x15x17.6

*Must use the HP IIP Windows driver.

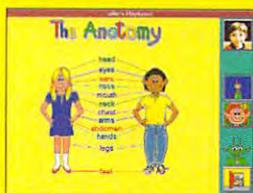
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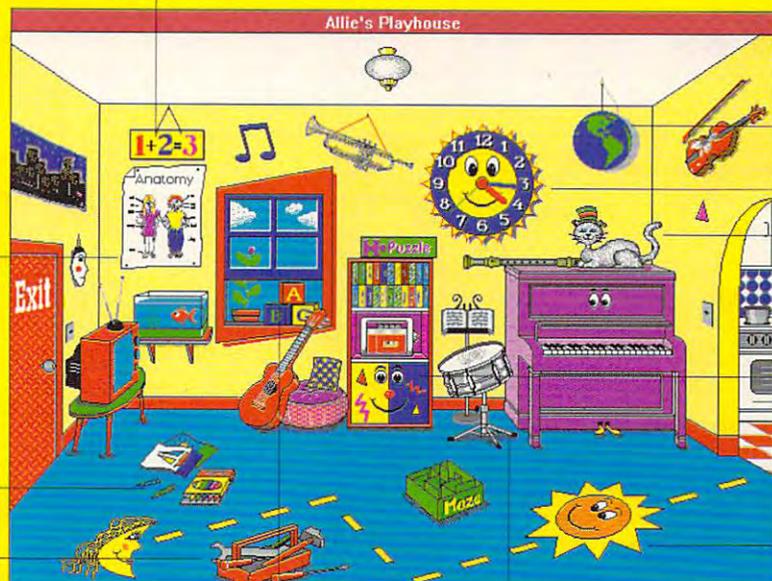
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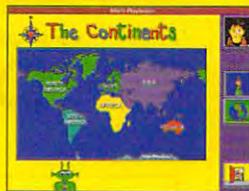
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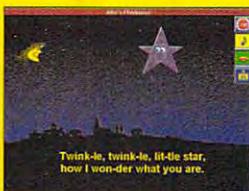
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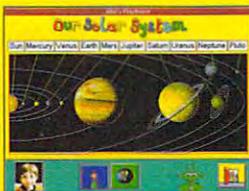
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Printer Features

	Okidata OL400e	Panasonic KX-P4410	Star Micronics LS-5EX	Tandy LP 400	Texas Instruments microWriter
Memory options	up to 4MB	up to 4.5MB	up to 7MB	up to 2.5MB	up to 4MB
HP LaserJet emulation	PCL 4	PCL 4	PCL 5	PCL 4	PCL 4
PostScript	no	no	optional	no	yes
Epson FX80 emulation	no	no	no	no	no
Input tray capacity	100	200	200	100	200
Output tray capacity	100	100	100	100	100
Envelope feeder	yes	yes	yes	yes	yes
Optional paper tray sizes	legal	200	250 & 500	300	250
Resident fonts	57	5	22	14	17
Recyclable toner cartridge	no	no	no	no	yes
Toner cartridge life (in pages)	2000	3000	4500	1500	2500
Cost per page (in cents)	1.4	3.3	2.4	3.8	4.8
Pages per minute	4	5	5	4	6
Windows printer driver	yes	yes*	yes	yes*	yes*
Interfaces supported	serial & parallel	parallel	serial, parallel, & AppleTalk	parallel	serial, parallel, & AppleTalk
Microprocessor	LSi	National Semiconductor	i809600SA	MC68000	MC68000
Microprocessor speed	32 MHz	15 MHz	16 MHz	20 MHz	16 MHz
Engine life (in pages)	150,000	180,000	150,000	150,000	indefinite
Engine manufacturer	Okidata	Matsushita	Fuji/Xerox	TEC	Samsung
Weight (in pounds)	13.5	29.8	29.7	28.7	33
Dimensions (in inches)	12.6x14.2x6.3	14.6x15.5x9.3	10x13.9x15.5	7.75x14.25x16	10.4x13.8x14.8

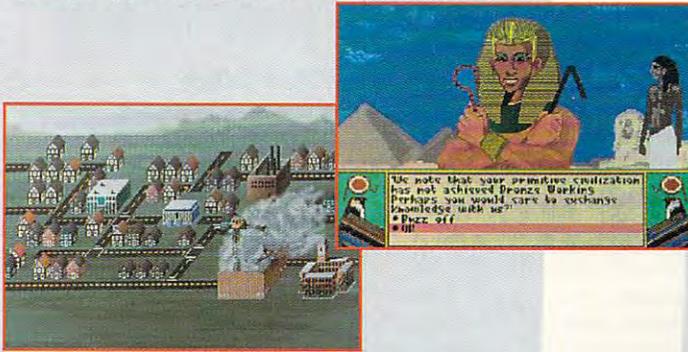
*Must use the HP IIP Windows driver.

Games For The Power-Hungry

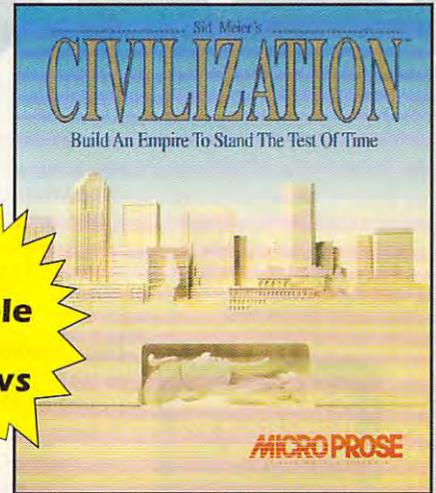
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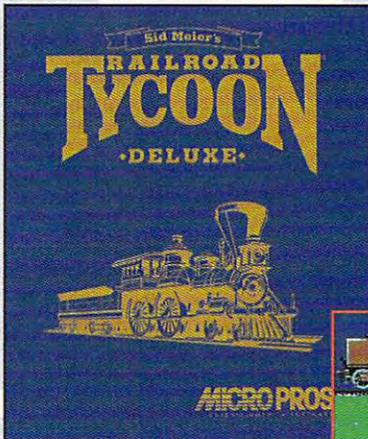
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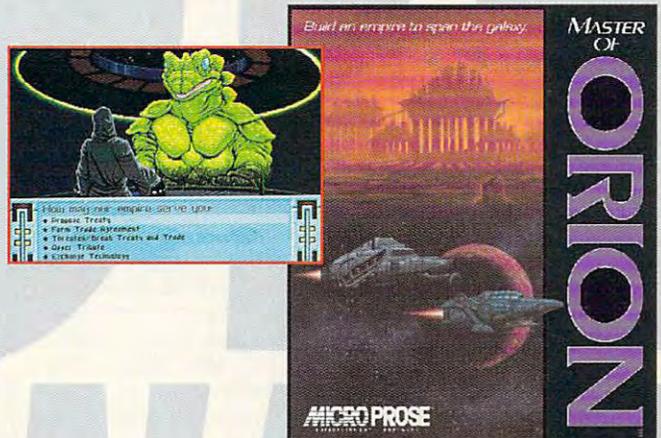
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NEWS & NOTES

Jill Champion Booth

That Time of Year . . .

It's the time of year when the world starts to sing—except for those of us still entrenched in that American tradition of suffering yearly panic attacks over what unique and meaningful gifts to give each other. For those seeking truly not-what-someone-would-expect-Santa-to-bring ideas, read on.

Help Someone Find a Job

If you have a job-hunting friend or know a soon-to-be college grad in training for the rat race, something to make the job search easier could be the best gift under the tree. **JOBHUNT** from Scope International is an aggressive software package (more to the point than figuring out the color of your parachute) that provides something essential to every job search: full contact information, including current names, addresses, telephone and fax numbers, and company descriptions for more than 5000 potential employers across the country. Job hunters can search through the database by region, job function, or Standard Industrial Classification (SIC) code. The program quickly prints personalized or mail-merged cover letters, job applications, and any letter typed in. Just attach a résumé and mail. Suggested retail price is \$49.95. Look for **JOBHUNT** at your local retailer or contact Scope International, P.O. Box 25252, Charlotte, North Carolina 28229-5252; (800) 843-5627, (704) 535-0617 (fax).

Encourage Green Computing

Help your friends save money while turning their PCs into green machines with **PC Energy Saver**, a hardware/software combination that helps make PCs more energy efficient. They consume less power, thus cutting utility bills. It con-

sists of a unique power strip and TSR software, and it connects to any IBM-compatible computer monitor, keyboard, and printer running under DOS or Windows. The product senses when the system is no longer in use and automatically switches it into a power-saving standby or "sleep" mode; however, it's ready for use the moment the user presses a key or moves the mouse. The system complies with the EPA's Energy Star guidelines for reducing PC power consumption. At only \$89.95, the device is much less expensive than a new, energy-saving PC—and it slashes the cost of powering one to a mere \$20 a year. Contact **PC Green Technologies**, 1 Centerpointe Drive, #210, La Palma, California 90623; (800) 984-7336, (714) 228-2239 (fax).

For the Absent Baseball Fan

You know how some people insist on leaving the computer turned on, even when they're outside mowing the lawn? Well, this is the perfect gift for them—especially if they're baseball fans. **Lights Out Sports Fans** is a major-league baseball screen saver that gives you year-round, 24-hour action on the computer screen—while you're busy doing other things! First, you choose your default home and visiting teams from among the 28 major-league logos; then, you select your screen-saver action from any of ten different game plans. For example, you can pit any team against another, mix National and American League players on the same team, play games using actual stats, give your home team the advantage, or let the computer slug it out by itself. And if you choose, the program produces all sorts of authentic ballpark sounds—even if

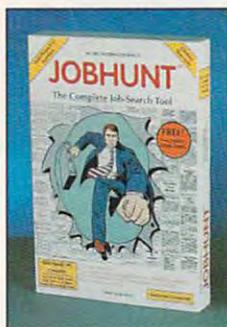
there's no one there to hear them! Suggested retail price is \$55. For more information, contact **Quadrangle Software**, 305 East Eisenhower Parkway, Suite 208, Ann Arbor, Michigan 48108; (800) 253-8397, (313) 769-1695 (fax).

Virtual College

There's no campus, student body, or classroom per se, but the four credit hours and six-week educational experience are quite real. It's **New York University's Virtual College**, part of the school's continuing education program. For a fee of \$1,933, anyone in the world with access to a PC and modem can sign up. According to NYU, the Virtual College is merely another sign of the times—"a virtual college preparing employees for tomorrow's virtual organizations." Telecommuting and teleconferencing are becoming the norm for many employees, replacing the traditional work environments, and the Virtual College is merely an extension of this trend, teaching skills necessary for jobs of the future. Using **Lotus Notes**, a group-communications program provided free to each person who enrolls, students collaborate online during the six-week period—at any time of day or night—and participate in the development of a major systems project. All work is conducted from the individual's own home or office PC. For more information, contact the **NYU Information Technology Institute**, 48 Cooper Square, Room 104, New York, New York 10003; (212) 998-7190.

Personal Greetings

If you'd like to produce your own greeting cards, these ideas might help streamline the process so you can get down to the *real* business of searching for gifts. **PaperDirect** is of-



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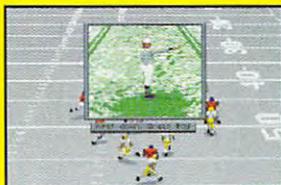
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tired? Give him a rest. Your quarterback isn't cutting it? Trade 'em. Hate Dallas? Make 'em wear pink.



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NEWS & NOTES

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Stop settling for someone else's holiday greeting; PaperDirect sells the cards you can call your own.

of more than 60 templates that eliminate having to fuss with things like margins and borders. For prices, quantities, samples, and a current

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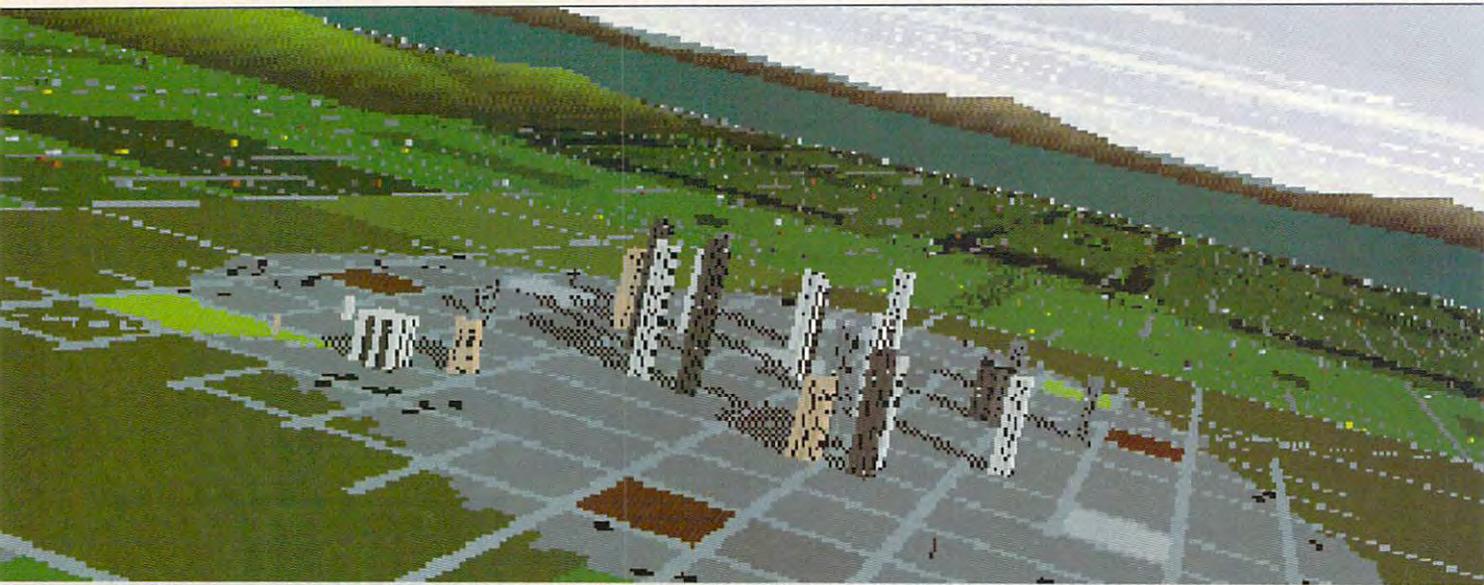
One Man's LAN

For the person who works with more than one PC and wants LAN capabilities without the usual complexities and cost, One-Man-LAN is the answer.

Mimicking a LAN file server, this neat new product from PC InterConnect lets you access programs installed on secondary PCs as though they were installed on your primary PC, and it allows you to print from secondary machines.

There's no need to throw away your old computer—your spare PC's hard drive can be used to augment your system as an additional drive for your primary PC, as well as for disk caching.

One-Man-LAN is easy to



install, runs quickly, and is completely DOS compatible (and it isn't limited to interconnecting just two PCs). The suggested retail price is \$199 for a two-PC configuration, including hardware, software, documentation, toll-free customer support, Stack-er, and the latest version of PC-Kwik disk-caching software. Contact PC InterConnect, 106 Library Plaza, 15 North 100 East, Provo, Utah 84606; (801) 374-8880; (801) 374-2306 (fax).

A Whiteboard for the PC

Slightly more expensive than your basic whiteboard but with many more applications, SoftBoard is a nifty new peripheral device that lets you combine using a

whiteboard with your desktop computer. Whatever you write on the SoftBoard surface with the special SoftBoard colored markers, which are included with the package, is simultaneously displayed on your PC or Mac. The data can then be saved, printed, used in another application, or shared with other users in realtime—even those in multiple locations. Suggested retail price is \$2,995. Contact Microfield Graphics, 9825 Southwest Sunshine Court, Suite A-1, Beaverton, Oregon 97005; (800) 334-4922, (503) 641-9333 (fax).

The Gift of Knowledge

You say you've run out of money by now? Just tell stu-

dents (and anyone else on your list who could benefit from good research sources) about the two new R. R. Bowker online biographical directories. The most recent editions of *Who's Who in American Art* and *Who's Who in American Politics*, in addition to the previously released *American Men and Women of Science*, can now be accessed as part of file 236 on DIALOG Information Service.

Known collectively on DIALOG as the Bowker Biographical Directory, the three subfiles can be accessed individually or in combination for vital information such as professional experience, educational background, professional affiliations, honors and

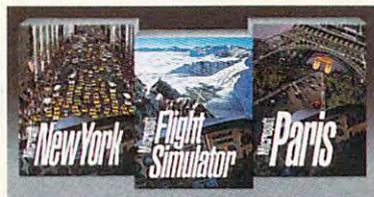
awards, special areas of interest, personal data, and even mailing addresses.

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Adding a Toaster to your PC, translating technobabble, scanning beer bottles, putting a hard drive where your printer should be, and changing cats into docs

Toast

Is NewTek making a version of the Video Toaster for PCs? When will it be shipping?

BRETT REAGAN
SULLIVAN, MO

It's been out for a while. NewTek makes a version for the PC and for the Mac. But in these versions the Video Toaster just uses the PC or Mac as an input device. All the real work is done by an Amiga computer built into the Video Toaster.

Foreign Language

I'm planning to purchase a new computer, but when I check the advertisements, I find many things that confuse me. Would you mind explaining the following for me?

1. Windows accelerator
2. SIMM
3. Cirrus Logic 1-meg VESA card
4. VESA Lb IDE controller
5. Local-bus technology
6. 486 DX/33 VESA
7. 386 DX/40 AMD

Can a modem receive and send faxes? Can a scanner create text files? What should I know and notice when I purchase a new computer? And do you have a fax number?

LAWRENCE LI
ETOBICOKE, ON

That's quite a list. We'll do our best.

1. Windows takes a lot of processor time away from your CPU, resulting in reduced performance for most computers. A Windows accelerator takes over the processing needed to refresh the screen, leaving more time for the CPU to do its job.

2. SIMM chips are a special kind of RAM designed to be easy to replace and upgrade.

3. VESA is a standards organization whose purpose is

to make sure Super VGA standards are maintained. Although we can't be sure, we suspect that the VGA card you're asking about is equipped with 1MB of RAM (for lots of colors at high resolution) and follows the VESA standard. However, its description might mean that the video card is on the local bus. You should clarify this point with the sales department.

4. Lb is an abbreviation for local bus. Instead of having its IDE controller on the expansion bus, the computer has its IDE controller on the local bus.

5. Local-bus technology is technology that places peripherals that might otherwise be on the 8-MHz expansion bus on the local bus, which usually operates at the same speed as the processor. This gives peripherals such as video cards and hard disk controllers a little extra scoot.

6. Listing VESA alongside the processor is probably an indication that the machine has a local-bus connector, in this case a VESA local bus (as opposed to the Intel local bus, an alternative standard).

7. AMD is a maker of 386 chips. The manufacturer lists AMD so you'll know that the computer isn't an Intel-based machine.

A data/fax modem can receive and send faxes (some data/fax modems are send-only, so you should check before buying). Unless they're designated as data/fax or fax modems, modems can only send and receive computer files.

Scanners can only import images. Many manufacturers make computer software that can turn images into text—if they're images of text, that is.

We can't tell you in this brief space what to look for in a computer, though we frequently run articles on that subject. The two most important things in considering a pur-

chase are to buy from someone who will honor a guarantee and to buy enough computer to do your work.

Our fax number is (919) 275-9837.

On the Bias

I need to hand-scan beer bottles (I collect them). But none of the scanners I've seen can scan a curved surface.

STEVE MILLER
ARNPRIOR, ON

We're running your letter in the hope that someone will have a solution to your problem. If you have phenomenal control over your hands, you could scan the bottle with a flatbed scanner, being careful to roll the bottle in such a way that it's always directly above the light bar. This would be one case where a slow scanner would be preferable. If you have any suggestions for Mr. Miller, please write to "Feedback," and we'll forward your ideas to him.

The Big Squeeze

Should I buy a SyDOS removable-cartridge hard drive? My hard disk keeps filling up. Also, one of the things that confuses me is that the external disk drive hooks to the parallel port. Does that mean I just unplug my printer?

PAT SIMMONS
GULFPORT, MS

Ah, the ever-cramped hard disk. If only someone would come up with an acceptable solution. An accordion drive, perhaps, or a balloon drive that expands when the pressure inside becomes too great. The SyDOS will probably solve your problem, but rather expensively. The cartridges aren't cheap. Generally, appliances other than printers that use your parallel port have a pass-through connector that allows you to use your printer at the

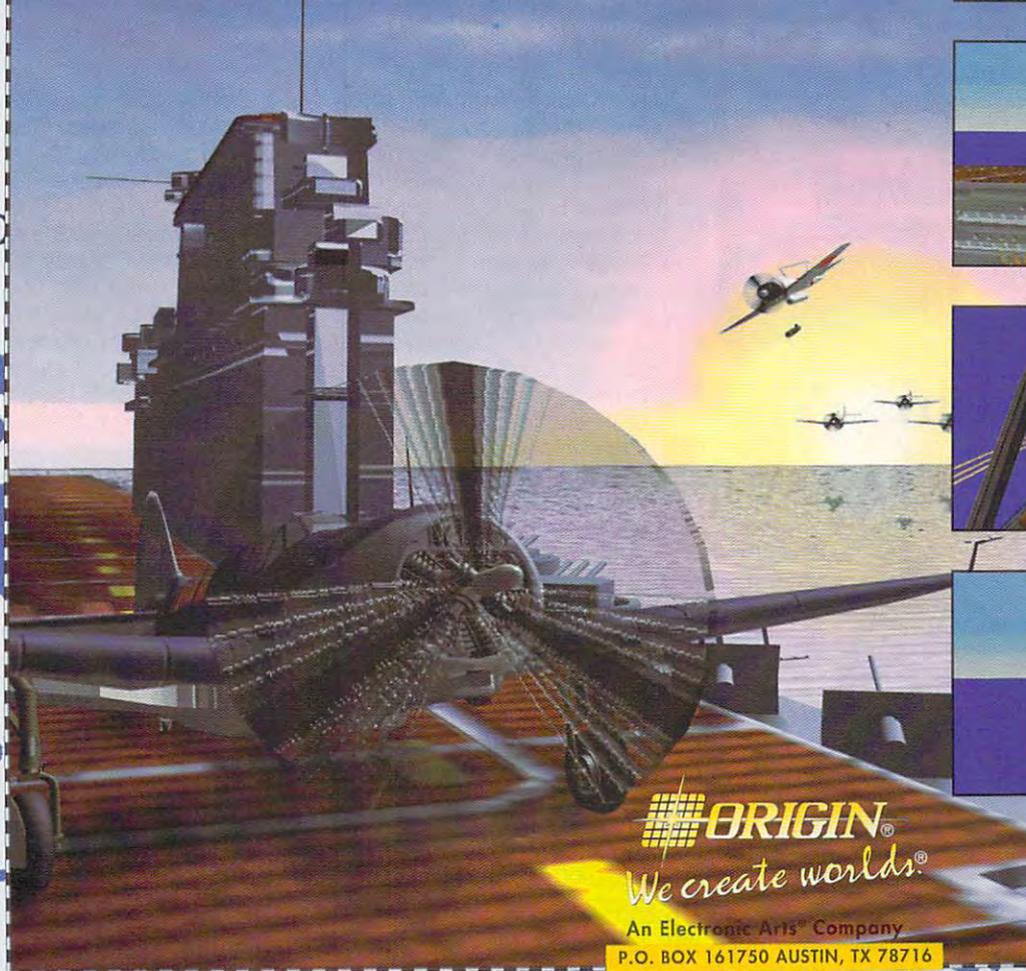
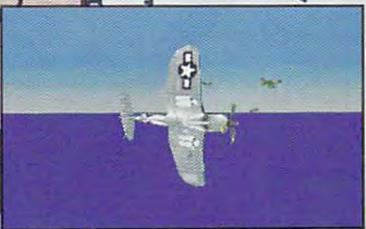
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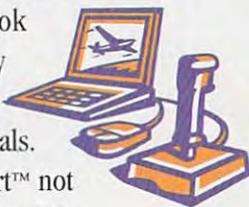
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FEEDBACK continued from page 62

same time. Check with SyDOS to be sure, but we expect that you would at least have the option of installing a pass-through plug.

It would seem that using Stacker or DoubleSpace would solve your problem, but these programs are only temporary solutions. Recently, we became aware of a product called Infinite Disk (Chili Pepper Software, 1630 Pleasant Hill Road, Suites 180-200, Atlanta, Georgia 30136-7411; 404-339-1812; \$189). It tracks disk use and compresses infrequently used files. Rarely used files are offloaded to floppies. The operating system thinks the offloaded files are still on the disk, though. When you access a file that's been offloaded, Infinite Disk prompts you to insert the floppy that contains the file, and the file is accessed as if it were on the hard disk.

Undoc DOS

I've discovered an undocumented DOS 5 command: Truename. It returns the current drive and directory.

JAMES HEMPHILL
CHARLOTTE, NC

Conversion

I upgraded from a Canon Cat word processor to a PC. All my valuable word-processing files are on Canon-format disks which the PC can't read. How can I transfer the files?

GUNTHER DOERFERT
KINGSPORT, TN

We receive many letters like yours from people who purchased various kinds of dedicated word processors. The disks these word processors use are frequently the same disks used by PCs, so it would seem logical that the PC should be able to read them. Generally, this isn't the case, however. Word processors use their own formats, which are completely alien to the PC. Canon said that the Cat was fitted with a telephone plug for telephone communications, but it was very sketchy on how the hookup could be effected. According to Canon, you could convert your word processor files to ASCII and then modem them to a PC, but that's not recommended because "You would lose a lot of data." Clarifying this point, Canon said that you'd lose both formatting and text.

If you know someone who has a scanner and OCR software, you might print out your text files and then have your friend scan the printouts. That would also result in some loss (no OCR is 100-percent accurate).

There are companies that convert information from one disk format to another for a fee. If any readers know of a company that transfers information from Canon, Brother, Panasonic, or Smith-Corona word processors to PC disks, please send us that information, and we'll forward it to Mr. Doerfert and other readers who have similar file conversion problems.

Do you have a question about hardware or software? Have you discovered something that could help other PC users? If so, we want to hear from you. Call our special "Feedback" line: (900) 884-8681, extension 7010201 (sponsored by Pure Entertainment, P.O. Box 186, Hollywood, California 90078). The call will cost 95 cents per minute, you must be 18 or older, and you must use a touch-tone phone. Or you can write to "Feedback" in care of this magazine. Readers whose calls or letters appear in "Feedback" will receive a free COMPUTE baseball cap while supplies last. We regret that we cannot provide personal replies to technical questions.

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INTRODOS

Tony Roberts

CHOOSING THE RIGHT PATH

The PATH statement is an integral part of your computer's operating system. Know its secrets, and it can make your system work much faster and more efficiently.

If you have trouble understanding the PATH statement and why it's there, consider this real-world example.

I have the habit of setting my car keys in only three places: on my desk, on my dressing table, or on a certain kitchen shelf. When I'm ready to go motoring and my keys aren't in my pocket, I check my desk, my bedroom, and the kitchen; 99 percent of the time, the keys turn up. By following my path, I can quickly achieve the required result.

DOS's PATH statement is similar: It describes places on your system that are most likely to hold executable files. Type a command at the DOS prompt, and the system checks the current subdirectory and then each of the subdirectories listed in the PATH to try to find the program you want to execute. By limiting the search path, you prevent the system from churning through the whole disk.

One of the problems with PATH statements, however, is that they tend to outgrow themselves. Prior to DOS 6, the PATH statement was limited to 127 characters. When you install software, the program often suggests that you add its subdirectory to the PATH statement. Eventually, the PATH line becomes too long and is truncated.

The major benefit of having a subdirectory in the PATH is that any program in that subdirectory can be executed from anywhere in your system without your having to enter the full path name. But the prob-

lem with a long PATH statement is that every time you execute a command, the system looks through all the subdirectories listed in the PATH; a long list can slow things down.

The best solution is to be stingy about what you put in the PATH. In most cases, include only subdirectories that must be available on a system-wide basis—DOS and Windows subdirectories for example. Also, create a BATCH subdirectory and put it on the PATH.

For all of your software, create a startup batch file in the batch directory. Have the batch file CD (Change Directory) to the appropriate subdirectory, and then start the application. Finally, upon termination of the application, have the batch file CD back to the root directory.

This system allows you to start any program with a simple command, and it allows the system to find and execute commands more quickly.

You've probably noticed the double dot (..) entry that appears when you ask for a directory listing of a subdirectory. This entry represents the parent of the current subdirectory. If you place the double dot entry in your path, you can start programs from the parent of whatever subdirectory happens to be current.

This can be a useful strategy if your hard disk data is structured properly. Some people install programs in one subdirectory and then store data in a subdirectory one level below the program. For example, if your word processor is in C:\WORDP, you might keep your document files in C:\WORDP\DOCS. With the double dot entry in the PATH, you could always start the word processor while the WORDP\DATA subdirectory was current. The same holds

true for spreadsheet, database, and other data.

The PATH entry might look like this: PATH C:\;C:\DOS; C:\WINDOWS;...; C:\BATCH

If you use Windows, you've surely discovered that a lot of Windows software wants to be on the path. If you take it off, it just doesn't work right. But why have all those huge subdirectories on the path when you're working from DOS?

The solution is to use two paths, one for DOS and one for Windows. Start Windows from a batch file that toggles between the two path statements for you. Here's how it works.

If you type *path* at the DOS prompt, DOS will show you the current path statement. The sample batch file fragment below uses the DOS redirector technique to copy the current PATH statement to a batch file. Then a new path, which points to Windows software, is established, and Windows is run. When you leave Windows, the system returns to the root directory and calls the batch file that was created by the first line of the program. Because that file contains an image of the previous PATH statement, the original PATH parameters are restored.

```
PATH > C:\BATCH\OLDPATH.BAT
PATH C:\WINDOWS;C:\ALDUS;
C:\PM4;C:\EXCEL;C:\DESKSCAN
C:\WINDOWS\WIN %1 %2 %3 %4
C:
CD \
CALL C:\BATCH\OLDPATH
```

If none of this suits you and you own DOS 6, you can create PATH statements longer than 127 characters by including a PATH line in your CONFIG.SYS file. But once your long path is established by the CONFIG.SYS, you can't modify it from the DOS prompt or a batch file or it will be cut to the first 127 characters. □

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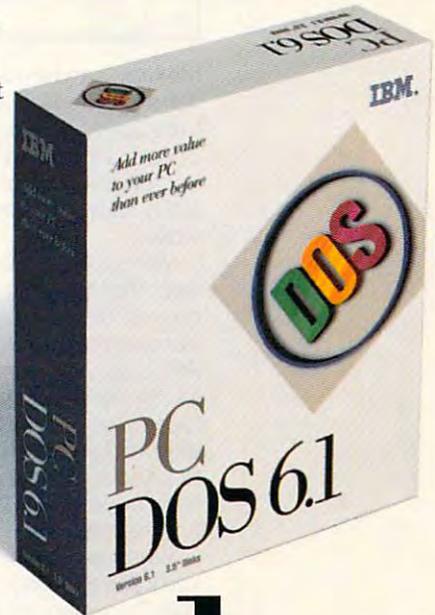
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Enhanced editor	x	
Program scheduler	x	

WINDOWS WORKSHOP

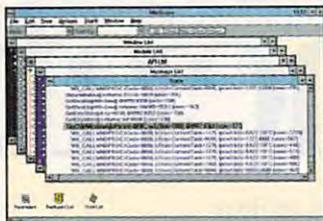
Clifton Karnes

WINSCOPE

If you spend your spare time peeping through other people's windows, you're liable to wind up in jail. But if you confine your voyeurism to other people's Windows *programs*, you're liable to become a Windows guru.

But what kind of binoculars do you use to see through the curtains, shades, and screens that hide what's going on behind the scenes in Windows? The answer to this question came recently from Periscope, a company famous for

WinScope lurks on your desktop and spies on messages, API calls, hooks, and more.



making hardware and software debugging equipment. Last June, it introduced WinScope, a Windows debugging and diagnostic tool that can literally show you how Windows works.

WinScope is a Windows app that lurks in the background on your desktop and traces a program's messages, API calls, and hooks, as well as ToolHelp notifications and Debug kernel messages. It's akin to Microsoft's Spy and Borland's InSight, but it goes way beyond both in power and features.

When you run WinScope, you'll see that it's an MDI (Multiple Document Interface) program with a toolbar and a host of child windows. The Messages window shows a hierarchical list of all Windows messages. When you're tracing a program, you can tell it to record all messages, or you can select a small group. The API window likewise lists all of the Windows 3.1 API functions (in-

cluding the undocumented ones from Schulman's *Undocumented Windows*), and you can have WinScope record all API calls or a subset. Two of the most important remaining windows let you select the modules and windows you want to trace.

At this point, you might be thinking that WinScope is complicated to use, but it's much easier to use than it may seem at first. Let's walk through a short WinScope session to see what it's like.

Recently, I wanted to find out how Windows Task List (called Task Manager in 3.0) tiles the windows on the desktop. I'd searched the 3.1 SDK documentation and couldn't find an API call that looked like it would perform this crucial task. WinScope might provide an answer, I thought, and it did. In fact, it gave me more information that I asked for.

The easiest way to trace a program in WinScope is to choose Load Application from the File menu. I did this, and from the file browser I chose TASKMAN.EXE. WinScope ran Task List, minimized itself, and started tracing. I pressed Task List's Tile button and, since that was the only thing I needed to check, pressed the Ctrl-Alt-S key combination that toggles WinScope's tracing on and off (as with most options in WinScope, you can customize this hot key).

I double-clicked on the WinScope icon to make it full-screen and started examining the Trace buffer. The Trace window displays messages and functions, including return values, and gives the time each event occurred relative to the previous event. Parameters, handles, and just about all the information you'd ever need are there.

Even though Task List was on my desktop for only a few

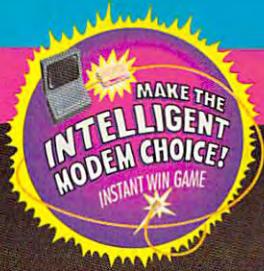
seconds and I pushed only one button, the program and Windows generated a zillion messages and function calls. This is normal. There's a lot going on behind the often-simple scenery in Windows, and a program like WinScope shows you how much is happening.

The Trace buffer was far too large to scan line by line, so I decided to try WinScope's Find command. The first thing I did was to search for the word *tile* from the top of the buffer, but I started getting all of the stuff dealing with displaying the Tile button. I wanted to find the sequence of events that started with pressing the Tile button, so I decided to search from the bottom of the buffer up. I hit pay dirt doing this.

There was the API call I was looking for: TileChildWindows. But I hadn't been able to find this call in my references. I double-right-clicked on the function name to automatically call up the 3.1 SDK Help and was told that no function by that name existed. Aha! It must be undocumented! I took a look at *Undocumented Windows*, and there it was! And there was something very interesting just above the call to TileChildWindows—a call to GetKeyState with a parameter of 10. I checked, and the key represented by 10 is the Shift key. Now, why was Task List checking the status of the Shift key? I experimented, and sure enough, when I held down the Shift key and pressed the Tile button, the windows on the desktop tiled horizontally instead of vertically. WinScope had revealed an undocumented API call and an undocumented feature!

This is just one simple example of the kinds of things you can discover with WinScope. It's without a doubt the coolest Windows discovery tool I've ever seen. □

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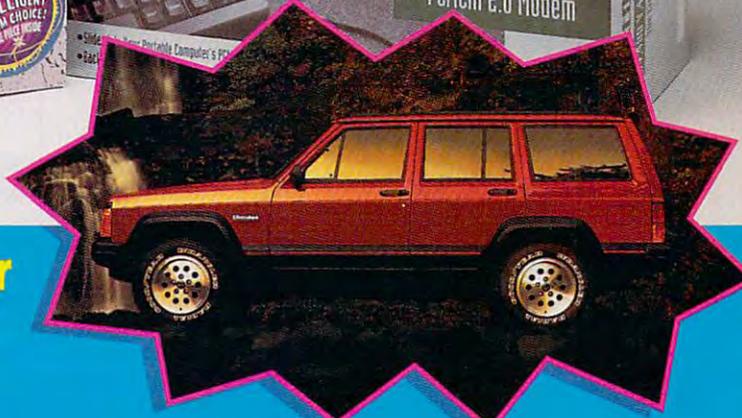
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PROGRAMMING POWER

Tom Campbell

VISUAL BASIC 3.0

I had planned to discuss Windows Help files this month, but the unexpected appearance of Visual Basic on my doorstep last Friday changed my whole weekend—and this month's column.

Microsoft hasn't given us Visual Basic programmers call-backs yet. What it has given us is database programming integrated neatly into the language itself, so easy to use that it constitutes a programming revolution. What with the ridiculously simple serial communications and graphics support in the Pro edition, the new database-handling features give Visual Basic an unparalleled bang for the buck. A heck of a lot of fun, too.

It's been widely reported that Visual Basic 3.0 has the database manipulation engine from Microsoft Access built in. What the press hasn't figured out yet is that the result is in many ways better than Access itself! At the core of Visual Basic 3.0 is the data control. Pluck it from the Visual Basic toolbox and drop it on your form, and it appears, innocently enough, as a set of four VCR-style buttons. Press F4 to bring up the data control's property list and set the DatabaseName property to the name of a database file (it can be from Access, Paradox 3 or 3.5, dBASE III+ or IV, or Btrieve). You now have a list of the tables and fields in the database at your disposal without having to type or remember whether the field was called Last or Last Name. (An Access or Btrieve file can contain more than one table—what most people call a database—but the other products hold only one table per file.) Choose the table you want in the RecordSource property just by paging through it with the arrow keys. In a new ap-

plication, this control will be the first one, and it will be given the default name Data1.

Now, for each field you want on the form, use a text box control. It has a new property called DataSource, which you'll set to the name of the table, and a DataField property, which you'll set to the name of the field you want it to display.

Finally, you might wish to add a few command buttons. Double-click on one and give its Click procedure this line of code.

Data1.Recordset.AddNew

This will be the New button to add records, so give it the caption New. Another button will contain this code for its Click procedure.

Data1.Recordset.Delete Data1.Recordset.MoveNext

You now have a working database manager that will let you add and remove records with all the Windows trimmings of mousing, font control, and WYSIWYG printing. Oh, and you can give away as many copies of the program as you wish. Suddenly, the cost threshold for a developer to create and distribute robust, easy-to-use Windows database applications has dropped from about \$1,000 to a couple of hundred. The Visual Basic Professional edition lists for several hundred more and is well worth the money, but the Standard edition is an unbeatable value. If you're an old database hack or plan to make a living off creating Visual Basic 3.0 database applications, go for the Pro, but if you're working with a tight budget, the Standard will do fine.

What's extraordinary is that it's actually easier to create a simple database application in Visual Basic than in Ac-

cess. The generic button code you just saw, for example, doesn't work in Access, which needs a frightening agglomeration of intricate Access Basic statements and Windows API calls to do the same thing. And Access won't let you attach code directly to a button the way Visual Basic has always done. You must first create a macro and then attach that macro to a button. In some ways the macro approach is more flexible; Access even stores its macros in standard Access database files so they're easier to share among applications. In all, though, I'm more comfortable with the Visual Basic direct manipulation approach. It's more natural to think of an object having code attached to it than to think of going through an intermediary such as a macro. Visual Basic 3.0 also handles some of the common "error" conditions automatically that Access doesn't. It won't bother you when you click the next record button at the end of the database (excuse me—table), whereas Access treats that as an error and puts up a message offering to halt the macro attached to that button.

That's not nearly all, of course. The language now has support for database manipulation, and it doesn't stint anywhere. The manuals, borrowed from the already superb Access documentation, are chock-full of realistic examples that leave nothing to chance. Only Paradox offers similarly elegant and simple database handling in its language, but ObjectPAL, the Paradox language, ain't BASIC.

If you're a Visual Basic programmer who missed out on the \$89 Access deal last year, don't feel left out. Fill out your 3.0 update card and send it in right now. □

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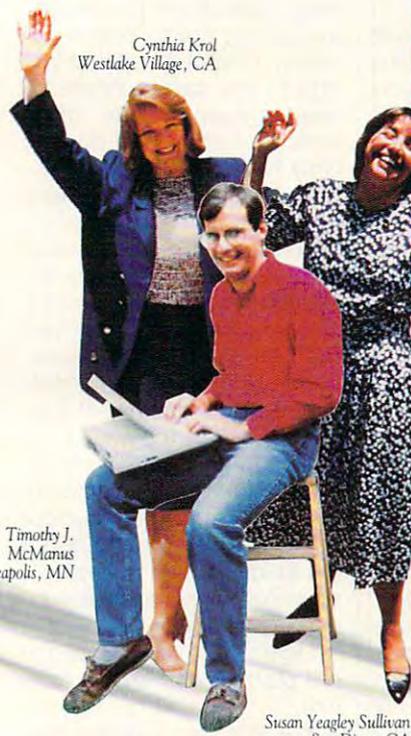
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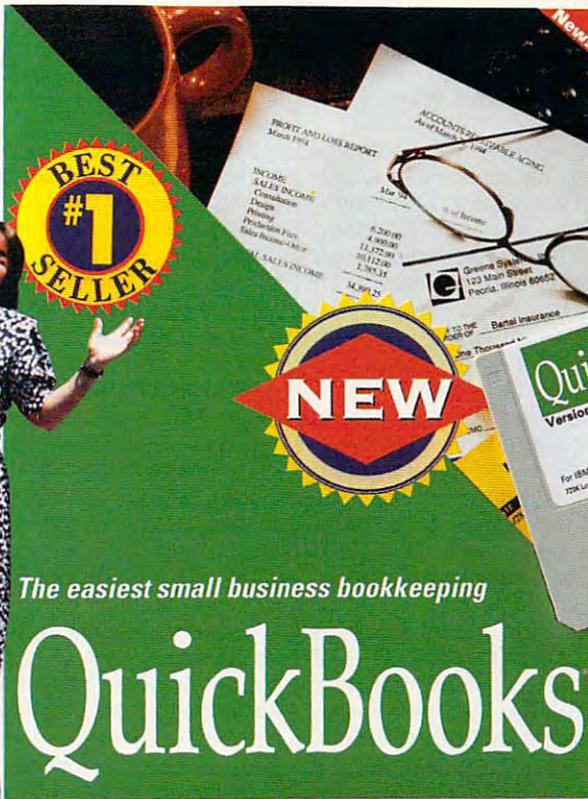
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HARDWARE CLINIC

Mark Minasi

WINDOWS VIDEO

This month, I'm reporting on my experience with the new Video for Windows capture boards and recording software.

Since January I've worked with the Creative Labs Video Blaster, the Supermatch Video Spigot (which has been acquired by Creative Labs), and the Intel Indeo. Of the three, I like the Spigot best. As I explain how all this works, you'll see why.

PC video is playing catch-up with Macintosh video. A couple of years back, Apple introduced a technology called QuickTime, which allows you to record and play movies on your Mac. The images are small—most QuickTime movies run in a window about 160 pixels by 100 pixels.

Many video capture boards can capture 640- x 480-pixel or 320- x 200-pixel videos, but the recommended size (and the default on some of these systems) is 160 x 100.

If you need to be able to capture video at 320 x 200 or greater size, you'll pay a price in processor speed. One of the fastest video capture boards, the Intel Indeo, can handle no more than 320- x 200-pixel capture when it's placed in a 66-MHz DX2 computer. The same goes for the Spigot when it's installed in a 50-MHz DX.

Is 320 x 200 good enough? It's better than 160 x 100. But there's a significant trade-off between the size of each screen and the number of screens captured per second. At 160 x 100 pixels, the boards can capture up to 25 screens per second. At 320 x 200 pixels, the speed drops to about 15 screens per second. To perceive a series of still pictures as smooth action, the human eye needs to see them at a rate of at least 32 screens per second.

At higher resolutions, the problem becomes even more bothersome. I've tried capturing 640 x 480 screens, but even at speeds as low as five screens per second, the boards couldn't keep up.

Despite its problems, animation at 320 x 200 is good enough to serve as an accompaniment to a stored voice message. The files store both voice and video; their extension is AVI (Audio/Video Interleaved).

Although Windows video is admittedly an early technology, that doesn't mean you should ignore it. I've found it useful for producing digital still pictures. I deliver technical seminars on PC troubleshooting, support, and maintenance. I develop course books filled with advice, warnings, and anecdotes. For years the books have lacked photographs. My staff includes people with excellent drawing skills, and drawings often get the point across, but sometimes nothing but a photograph will do.

You'll get heartburn if you try to create videos with these capture boards, but you can easily make color stills with almost all of them—and that's why I've come to love them.

I recently ripped the hard disk section out of one of my course books and replaced it with a how-to section on SCSI. Anyone who's used SCSI knows that one of the most annoying things about it is the profusion of cable types in the SCSI world. Believe it or not, you hook up two SCSI devices with any one of four different kinds of cables, depending on what the maker of the SCSI peripheral felt like using. Most SCSI host adapter boards have connectors for two of those cable types. Before you venture to link together a daisychain of SCSI peripherals, you should know what

connectors to look for. What's the best way to include pictures of the cable types and some common adapters? Digital stills.

Using a regular video camcorder, I walked around my office, borrowing cables and shooting them from different camera angles. Then I hooked up the camcorder to the video capture board and replayed the tape into the PC.

When I found shots that I liked, I just clicked on the Capture Single Frame option. Instantly, I had a 24-bit BMP image of the cable. When an image wasn't quite clear enough, I enhanced it using Gray F/X, a terrific image enhancer (with, unfortunately, one of the worst user interfaces in the world). Then I used Paint Shop Pro, probably the best shareware image processor for Windows, to convert the image to gray scale, popped the image into my document, and voilà! Instant illustration. This, by the way, is one reason that I don't like the Intel Indeo board. It won't do single-frame captures without some fiddling around. Both the Spigot and the Blaster will do single-frame captures without any trouble.

Here's what you will need to get started with image capture.

- A Windows-capable machine of at least 25-MHz speed (486 preferred)
- RAM of 8MB–12MB for most capture boards (16MB is actually bad for most capture boards—see below)
- At least a 256-color capability for video under Windows, 16-million-color (24-bit) capability preferred
- Plenty of available hard disk space for capture
- A video capture board
- Some source of VHS or Super VHS video signals (either a VCR or a camcorder)
- A Windows-compatible

Windows video has arrived, along with a Pandora's box of troubles—and a diplomat's pouch of compromises.

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— John Ricca, Falls Church, VA

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sound board (optional)

It's a hefty list, but it's not as bad as it looks. Let's start with the PC. It should have a fair amount of CPU horsepower because of the volume of data running through it. You can use a 386, but this is one case where having a 486 will really pay off in speed of execution.

You'll need a video board capable of working with a lot of colors, or at least a lot of grays. The number of colors you'll see is determined by your video board and the kind of video driver you use. Drivers for 256 colors are common these days, so if you've got Super VGA, use the 256-color drivers.

Screen resolutions above VGA's 640 × 480 are not nec-

essary, and they'll slow down the capture process unnecessarily, so use 640 × 480 with 256 colors as your video mode when working with video capture. The next step up for many video boards is a 16-million-color (24-bit) mode. You can live without a 24-bit mode, but there will be times when you'd like to have it, so keep the drivers around (if your board can use them). You won't use the 24-bit mode most of the time because, as you'd expect, it slows processing speed. Under no circumstances should you try to do Windows video capture with a 16-color board.

For the best video speed, look for a video accelerator—one that interfaces via local

bus, if possible. Although video speed is important, it seems that no video is fast enough to satisfy the Microsoft Video for Windows program. Every time you start it up with a new video driver, it runs a speed benchmark on the video board and always finds it lacking. Even what may be the fastest Windows video available (an ATI VLB Mach 32) was deemed too slow for Video for Windows. I have concluded that there's just no satisfying this program.

When you buy a disk drive for use with Windows video, buy more than you think you'll need. I once recorded ten minutes of normal VHS video, only to find that it took up 160MB of disk space. Not everything

is going to take up that much space, but 3.75MB for each second of recording will convince you to keep your videos brief.

Now that I've told you to buy the most computer that you can lay your hands on, you might expect that I would proceed to recommend lots and lots of RAM, but surprisingly, many video capture boards will not work if you have 16MB or more.

Most video boards are overlay boards. They contain 1MB of RAM, which is used to store data, and they must share that 1MB with the CPU. It's the primary vehicle for communication between video capture boards and the CPU. This megabyte of RAM must sit somewhere in

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the memory address range below the 16MB mark.

Most 386DX and 486DX clones only offer memory expansion options of 4MB, 8MB, 16MB, 20MB (possibly), and 32MB. But if your machine has 16MB or more of RAM, there isn't any room for the megabyte on the video capture board. As a result, you're limited to 8MB as a maximum amount of memory. True, some major-brand computers offer 12MB because of their proprietary memory structures, but that's not a heck of a lot better than 8MB. It's ironic that you need a Windows Ferrari in order to do video capture, but when it comes to RAM, you're a pedestrian.

This memory debacle is an-

other reason to love the Spigot. It doesn't have one of those silly memory buffers. All it needs is an 8K area that fits somewhere between 640K and 1024K, which is child's play to configure (at least when you compare it to the other alternatives). The Indeo has similar requirements, but it seems to have some undocumented use of memory that causes it to conflict with other boards; I've spent many an afternoon laboring to make my Intel Indeo board work with my Intel Express 32 Ethernet card.

Once you've got the right machine, you need the right input signals. Most video boards will accept either VHS or Super VHS signals as input. A Super VHS

source is a better choice, as it provides higher-quality input—or does it? As it turns out, the question of improved resolution is relevant only on tape playback. If you're piping the camera's output straight into the capture board, it doesn't matter whether you've got an 8-mm, VHS, or Super VHS camera. An inexpensive VHS camera will do as well for direct input as a more expensive camera. So, you can save some money on your input device.

A much better way to spend your money would be to acquire a VCR with an above-average pause capability. That makes it easier to extract a single frame from a sequence. Although capture boards are generally able to

grab single frames on the fly, it's nice to have a rock-solid picture on the screen to capture. If you don't have a good pause, you can still get a good motionless video image by putting your camera on a tripod and taking about two minutes of video of a motionless subject.

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Do you have a tough hardware problem you'd like Mark to tackle? Let him know about it by calling (900) 285-5239 (sponsored by Pure Entertainment, P.O. Box 186, Hollywood, California 90078). The call will cost 95 cents per minute, you must be 18 or older, and you must use a touch-tone phone. □

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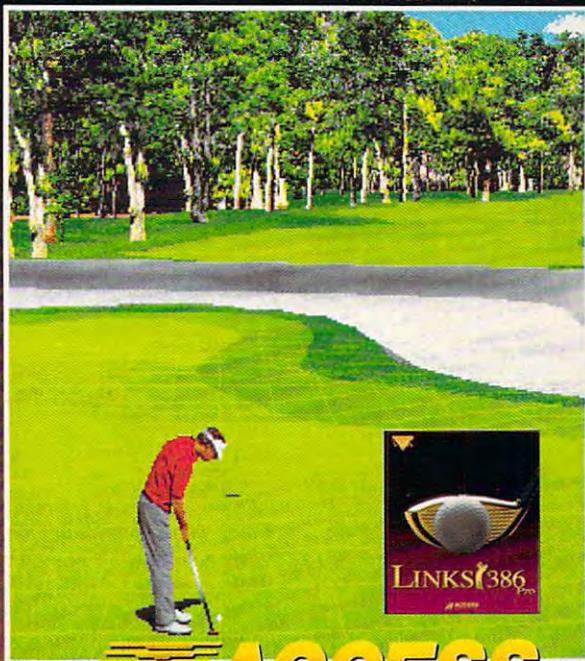
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TIPS & TOOLS

Edited by Richard C. Leinecker

Simple Blocks

"Tips & Tools" in the October 1992 issue contained a technique for embedding an ASCII character 255 in a subdirectory so that someone couldn't casually enter the subdirectory and look around.

It's a major pain to use the numeric keypad to create these directories and enter them. That's why I created three batch files—MDD, RDD, and CDD—that create and use these extended directories. (Please note that CDD is an internal 4DOS command. If you are using 4DOS, give this command a different name.)

Use them only when you want security. Just use the command MDD instead of MD, the command RDD instead of RD, and the command CDD instead of CD. You won't be able to name directories with extensions, since the extension is where the ASCII character 255 is embedded.

Where you see <Alt+255> in the listings, you should hold down the Alt key while typing 255 on the numeric keypad. When you release the Alt key after typing in the value 255, a blank character will be inserted into the batch file. You won't be able to see this character, but it'll be there protecting your directories. Here is MDD.BAT.

```
@ECHO OFF
IF "%1"=="*" GOTO USAGE
SET TMPSUB=%1.<Alt+255>
MD %TMPSUB%
GOTO END
:USAGE
ECHO This creates a directory
ECHO with a non-ASCII character
ECHO embedded in it. You can
ECHO type only eight characters
ECHO and no extension. The
ECHO non-ASCII character is
ECHO embedded in the extension
ECHO portion of the directory
ECHO name.
```

```
GOTO END
:END
SET TMPSUB=
```

Here is RDD.BAT.

```
@ECHO OFF
IF "%1"=="*" GOTO USAGE
SET TMPSUB=%1.<Alt+255>
RD %TMPSUB%
GOTO END
:USAGE
ECHO This removes a directory
ECHO with a non-ASCII character
ECHO embedded in it. You can
ECHO type only eight characters
ECHO and no extension. The
ECHO non-ASCII character is
ECHO embedded in the extension
ECHO portion of the directory
ECHO name.
GOTO END
:END
SET TMPSUB=
```

And finally, here is CDD.BAT.

```
@ECHO OFF
IF "%1"=="*" GOTO USAGE
SET TMPSUB=%1.<Alt+255>
CD %TMPSUB%
GOTO END
:USAGE
ECHO This enters a directory with
ECHO a non-ASCII character
ECHO embedded in it. You can
ECHO type only eight characters
ECHO and no extension. The
ECHO non-ASCII character is
ECHO embedded in the extension
ECHO portion of the directory
ECHO name.
GOTO END
:END
SET TMPSUB=
```

RICHARD C. LEINECKER
REIDSVILLE, NC

Remove Multiple Files

I work with DOS and UNIX, and the UNIX rm (remove) command should have been included with DOS. It deletes several files (or file groups) at once.

To use it, you just type *rm* followed by the files you want to delete. If you wanted to de-

lete all of the EXE files that start with *R*, as well as the TXT files, you'd type *rm r*.exe *.txt*. Here's a batch file that gives you the *rm* command in DOS. Put it somewhere in your path, and use it anywhere. Its name is RM.BAT.

```
@ECHO OFF
IF "%1"=="*" GOTO USAGE
IF "%1"=="/*?" GOTO USAGE
:START
IF "%1"=="*" GOTO END
REM Remove ECHO Y I from the
REM following line if you want to
REM be prompted for each
REM wildcard delete.
ECHO Y |DEL %1
SHIFT
GOTO START
:USAGE
ECHO This batch file deletes
ECHO the files (or file groups).
ECHO Wildcards are allowed.
ECHO Example: RM *.TXT
R*.EXE
:END
```

PARIN KADAKIA
REGO PARK, NY

Disable Break

In the January 1992 issue, you published a tip that gave four lines to add to the AUTOEXEC.BAT file for computer security. This works fine unless someone knows that pressing Ctrl-Break will abort the batch file.

To fix this loophole, you can redirect the input and not let the batch file try to abort. All you have to do is add the line CTTY NUL before the four lines and the line CTTY CON after the four lines.

Here's my version.

```
CTTY NUL
:START
IF EXIST B:KEY.BAT GOTO
END
GOTO START
:END
CTTY CON
```

MICHAEL L. MARTIN
ADDRESS UNKNOWN

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nonkeyboard
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bringing a
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from hard
disk disaster**

More Time

Here's one more way to get your computer to print the time without stopping to request the correct time. These programs, QTIME.COM and QDATE.COM, simply get the time and date and print it on the screen.

You can type these files in using the DOS Debug command. Make sure the DOS program called Debug is in your path or the current directory. In these examples, the italic text is what the computer prints; the roman text is what you should type. One way to be sure you get these programs exactly right is to have someone read the numbers to you as you type them in. Another way suggested by one of our readers is to read the numbers into a tape recorder and then play them back as you enter the program code.

`debug qtime.com`

File not found

```
-e 100 b4 09 ba 74 01 cd 21 b4
-e 108 2c cd 21 8a c5 3c 0c 7e
-e 110 08 2c 0c c6 06 85 01 70
-e 118 90 d4 0a 80 c4 30 04 30
-e 120 8b d0 86 d6 80 fa 30 75
-e 128 02 b2 20 b4 02 cd 21 8a
-e 130 d6 cd 21 b2 3a cd 21 8a
-e 138 c1 d4 0a 80 c4 30 04 30
-e 140 8b d0 86 d6 b4 02 cd 21
-e 148 8a d6 cd 21 b2 3a cd 21
-e 150 b4 2c cd 21 8a c6 d4 0a
-e 158 80 c4 30 04 30 8b d0 86
-e 160 d6 b4 02 cd 21 8a d6 cd
-e 168 21 b4 09 ba 85 01 cd 21
-e 170 b4 4c cd 21 43 75 72 72
-e 178 65 6e 74 20 74 69 6d 65
-e 180 20 69 73 20 24 61 24
```

-RCX

CX 0000

:87

-W

Writing 0087 bytes

-Q

If you run the Checksum program (the most recent version of Checksum was published in "Tips & Tools" in the July 1993 issue) on QTIME.COM,

the number 15164 will appear on your computer screen.

`debug qdate.com`

File not found

```
-e 100 b4 09 ba 69 01 cd 21 b4
-e 108 2a cd 21 8a c6 d4 0a 80
-e 110 c4 30 04 30 8b d0 86 d6
-e 118 80 fa 30 75 02 b2 20 b4
-e 120 02 cd 21 8a d6 cd 21 b2
-e 128 2f cd 21 b4 2a cd 21 8a
-e 130 c2 d4 0a 80 c4 30 04 30
-e 138 8b d0 86 d6 b4 02 cd 21
-e 140 8a d6 cd 21 b2 2f cd 21
-e 148 b4 2a cd 21 81 e9 6c 07
-e 150 8a c1 d4 0a 80 c4 30 04
-e 158 30 8b d0 86 d6 b4 02 cd
-e 160 21 8a d6 cd 21 b4 4c cd
-e 168 21 43 75 72 72 65 6e 74
-e 170 20 64 61 74 65 20 69 73
-e 178 20 24 24
```

-RCX

CX 0000

:7b

-W

Writing 007b bytes

-Q

If you run the Checksum program on QDATE.COM, the number 14344 will appear.

BRADLEY M. SMALL
GREENSBORO, NC

What Do You Do?

Recent problems with my PC have forced me to take a crash course in computer crashes. What do you do if everything fails? There are some steps that you can follow. First, you should always be prepared. Make sure you have a complete backup and an emergency boot disk that contains your current AUTOEXEC.BAT and CONFIG.SYS files as well as FDISK.COM and FORMAT.COM. To help recover, you should also have a printout of your Setup screen. To get the printout, go to Setup, turn on your printer, and press the Print Screen key. If you have advanced setup screens, also do printouts of these. Keep your emergency boot disk up-to-date and put it and your Set-

up printouts in an envelope beside your computer. If you lose the envelope, make a new emergency kit immediately.

When you discover that you can't boot from or access your hard disk, you'll be prepared. Boot from your emergency floppy, go to Setup, and compare the contents of the Setup screen to your printouts. Make any necessary changes, and try rebooting from your hard disk.

If your hard disk still won't respond, turn off your computer, pull the plug, and pull your boards, one by one. Press all the chips on the boards, pull and immediately replace all of the jumpers (pulling the jumpers and replacing them will ensure there is good contact), and gently rub a pencil eraser on the contacts of the board along the edge that goes into the expansion-bus slot. Pull and immediately replace all cables. Then try rebooting from your hard disk again.

If you still can't boot, Fdisk and Format /s your hard disk. Run Spinrite or some other diagnostic software to make sure all of your bad sectors are marked. If the computer still won't boot from the hard disk, it's time to call a technician. There's probably something wrong with the disk mechanically or electrically.

ROBERT BIXBY
GREENSBORO, NC

If you have an interesting tip that you think would help other PC users, send it along with your name, address, and Social Security number to COMPUTE's Tips & Tools, 324 West Wendover Avenue, Suite 200, Greensboro, North Carolina 27408. For each tip we publish, we'll pay you \$25-\$50. All tips submitted become the property of General Media International. □

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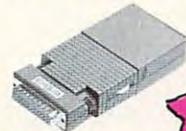


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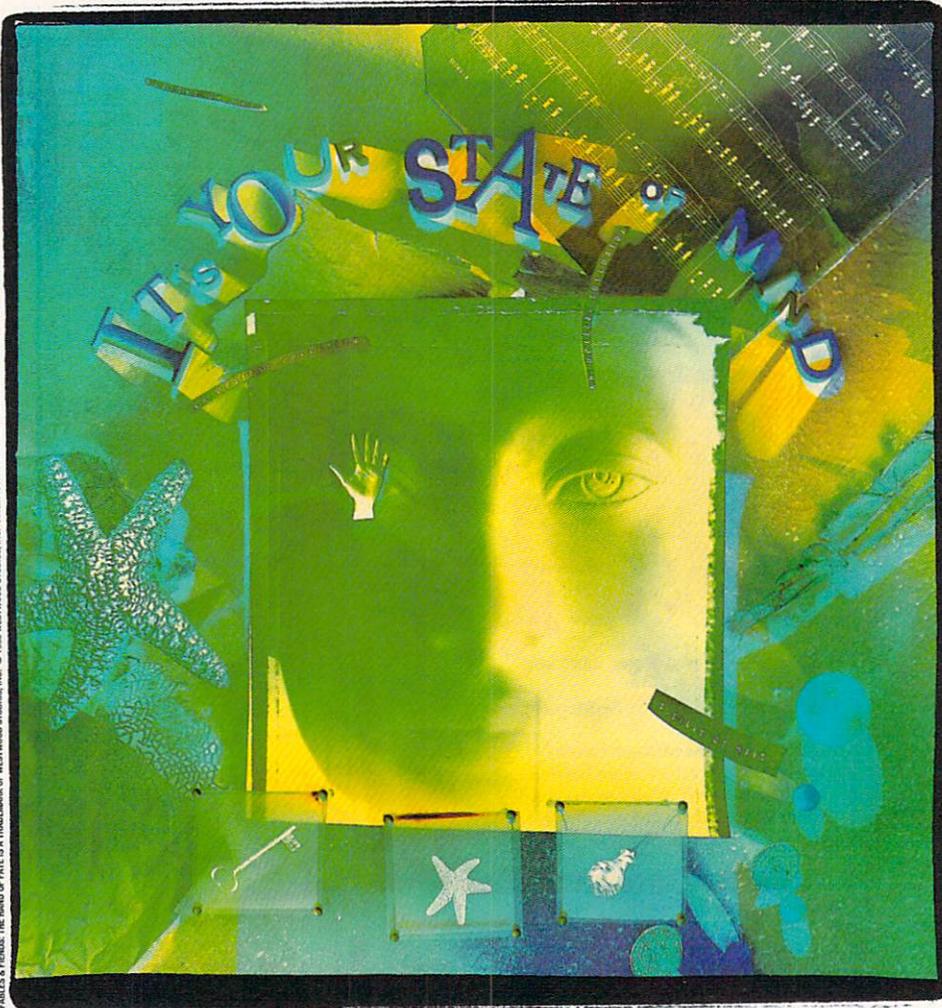
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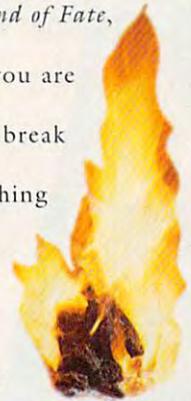


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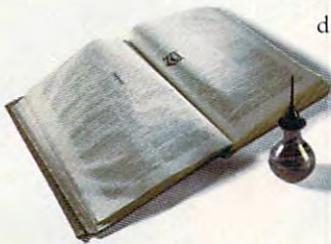
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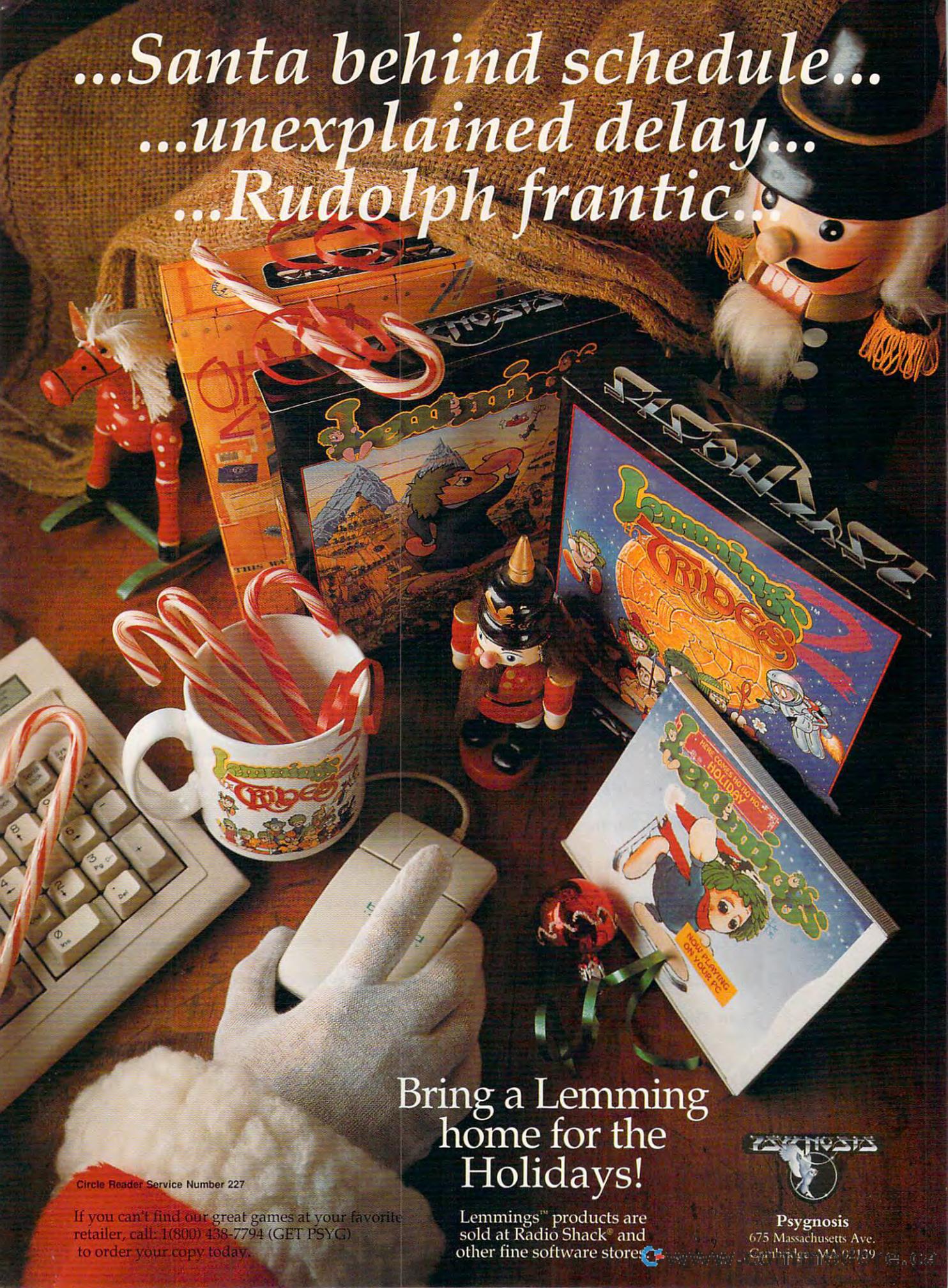
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BIRTH OF A FAST FORWARD NEW ART FORM?

BY DAVID ENGLISH

Recently, I had a stimulating talk with Bob Able, who might best be described as a new-media maven. He developed his craft in both commercial and documentary films (his experience includes working with Stanley Kubrick on the star gate sequences for *2001: A Space Odyssey* and with David Wolper on the award-winning "Making of the President" television series).

More recently, he headed the large team of creative artists and programmers that created the most impressive multimedia title I've ever seen. It's called *Columbus: Encounter, Discovery and Beyond*. *Columbus* stands head and shoulders above the usual PC-based multimedia titles. Because it was created for IBM's Ultimedia platform, it features higher-resolution graphics and higher-quality sound than have generally been available with MPC-based multimedia titles.

What does Able see as the future of multimedia? Not surprisingly, he views the possibilities of multimedia through the eyes of a filmmaker. He stresses that full-motion video is technically just around the corner, yet we haven't learned how to combine the art of narrative with the tools of the medium. No one knows how to tell a story in multimedia.

I think Able has put his finger on what's wrong with many of today's computer games—and where these new interactive movies might lead us. In narrative films, the story and characters are everything. The best films, such as Welles's *Citizen Kane*, Kubrick's *2001: A Space Odyssey*, Gance's *Napoleon*, Eisenstein's *Potemkin*, and Kurosawa's *The Seven Samurai*, use technique to tell the story. *Kane*'s flamboyant editing and composition, *2001*'s stark realism, *Napoleon*'s emotionally charged camera movements, *Potemkin*'s dynamic editing, and *Samurai*'s restrained lyricism serve the story's narrative line, help create the story's tone, and further the development of the characters.

While many of today's multimedia games dazzle us with their fluid motion (*The 7th Guest*), imaginative graphics (*Spaceship Warlock*), and photorealistic characters (*Hell Cab*), we're still in the early stages of

developing a vocabulary for the new medium.

As a student in the Department of Cinema Studies at New York University, I attended a fascinating series of courses on D. W. Griffith. Each semester, we looked at a single year of Griffith's work. As we viewed the films in chronological order, we could see Griffith try different techniques, such as closeups, tracking shots, and parallel editing (two similar stories told simultaneously). Griffith would never use these techniques for their own sake—they would always be used to serve the story. During those early years, Griffith developed these techniques until he had refined much of today's vocabulary of filmmaking.

In a similar way, today's multimedia developers are attempting to develop a vocabulary that grows from the peculiarities of their new medium. Whereas a closeup is used in film to bring you closer to a character's point of view, multimedia artists might use the interactive nature of the medium to let you choose the character's personality that most closely resembles your own. Whereas a tracking shot opens up the space of a film narrative and signals where the story will soon lead, multimedia artists might use three-dimensional sound to signal a similar shift in direction. And whereas parallel editing allows a filmmaker to weave two similar stories into a third, more complex story, we may see multimedia products with a variety of interlocking stories that the viewer can run chronologically, by character, or by location (as opposed to simply having three alternate endings).

Able has shifted his energies from film to multimedia because he instinctively believes in the potential of multimedia. Hundreds of creative people have chosen a similar path for the same reason. It took 30 years for film to develop into a true art form, but I'm betting that this time things will move much faster. We're on the verge of having software titles with full-screen, full-motion video—by the year 2000, the medium should be firmly in place. With people such as Bob Able trying to figure out what makes multimedia tick, we may be witnessing the birth of the twenty-first century's greatest art form.





MULTIMEDIA PC

BY DAVID ENGLISH, PHILLIP MORGAN,
AND LISA YOUNG

It's been a great year for multimedia. Sound cards and CD-ROM drives are selling so fast that stores can't keep them on the shelves. Level 2 MPC upgrade kits (with 16-bit sound cards and double-speed CD-ROM drives) have pushed down the prices of Level 1 upgrade kits to less than \$400. The trickle of CD-ROM software has turned into a flood of titles. In short, multimedia products are in demand, and they make great gifts.

While we've refrained from including the most expensive multimedia products, such as fully equipped multimedia PCs (\$1,500 and up) and The Oxford English Dictionary on CD-ROM (\$895), we've also refrained from cramming in lots of inexpensive but useless multimedia products. If you're not prepared for the sticker shock, you might pool your resources with friends or family members.

It'll be worth it—despite the expense. Imagine the delight on your loved one's face when that strange oblong package turns out to hold a pair of stylish multimedia speakers, or that tiny flat box—which was sure to be an audio CD—turns out to be a top-selling multimedia title.

To simplify things, we've divided the 50 products into three basic categories: multimedia hardware, CD-ROM software, and disk-based multimedia software.

Multimedia Hardware

1. Sound Blaster Digital-Edge CD. If you've waited to upgrade your PC to a multimedia PC, you're in

luck. Now you can upgrade to a higher standard. Creative Labs offers a multimedia upgrade kit that meets the new Level 2 MPC specifications. The \$999 package includes a Sound Blaster 16 ASP, a double-speed multisession CD-ROM drive, The Software Toolworks Multimedia Encyclopedia, Microsoft Bookshelf, Macromedia Action!, a micro-

phone, and speakers. Creative Labs, (408) 428-6600.

2-3. Fusion Double CD-16 and Pro 16 Multimedia System. Media Vision has two Level 2 upgrade kits. The Fusion Double CD-16 (\$799 external, \$699 internal) includes a Pro Audio-Spectrum 16 sound card, a double-speed NEC CD-ROM drive (model 55J), and four CD-ROM

applications (Compton's Interactive Encyclopedia for Windows, Battle Chess Enhanced, Arthur's Teacher Trouble, and The 7th Guest). The Pro 16 Multimedia System (\$1,199) includes a Pro Audio-Spectrum 16 sound card, a double-speed NEC CD-ROM drive (model 84JD-1), and eight CD-ROM applications (Compton's Interactive Encyclopedia for Windows, Battle Chess Enhanced, Mantis, Civilization, Macromedia Action!, Mayo Clinic Family Health Book, PC Karaoke, and Where in the World Is Carmen Sandiego? Deluxe). Media Vision, (800) 348-7116.

4-5. Sonic Sound. Suddenly, DSPs (Digital Signal Processors) are showing up in sound cards and fax/data modems. The 16-bit Sonic Sound sound card uses its DSP for General MIDI wave table synthesis (32 simultaneous stereo instruments) and—with an upgrade option—extended MIDI and speech recognition. The basic package also includes Sound Blaster and Ad Lib support, as well as connectors for SCSI CD-ROM, MIDI, and joystick. Diamond Computer Systems; (408) 736-2000; \$299 for Sonic Sound, \$129 for the upgrade option.

6. Maestro 16vr. If you like to play games, check out the 16-bit Maestro 16vr sound card, which also uses a DSP for voice recognition and General MIDI instrument sounds. You receive a special voice recognition version of Interplay's Star Trek: 25th Anniversary, along with the



**50
Great
Multimedia
Gift Ideas**

usual Sound Blaster and Ad Lib support; connectors for SCSI CD-ROM, MIDI, and joystick; and utility software. This version lets you control the game with verbal commands, which you give using the provided microphone headset. Computer Peripherals, (805) 499-5751, \$299.

7-9. Hello! Music!. Looking for a plug-and-play MIDI upgrade for your sound card? Consider Hello! Music! (\$449.00). It includes an external General MIDI module that you can hook up to your computer's MIDI interface or serial port, as well as a selection of MIDI software from Passport (Trax, a MIDI sequencer program; MIDI Player, a MIDI jukebox program; and QuikTunes, a collection of preprogrammed MIDI tunes). Optional accessories include the CBX-K3 49-key MIDI keyboard (\$299.95) and the CBX-S3 powered monitor speakers (\$399.95). Yamaha, (714) 522-9011.

10-12. A pair of multimedia speakers. What would multimedia be without a good set of speakers? They should be magnetically shielded so you can place them on either side of your computer screen and self-powered so you don't have to rely on your sound card's inferior amplifier. Yamaha (714-522-9011) sells an excellent pair for \$149, called the YST-M10. For a top-of-the-line sound, check out the Altec Lansing Multimedia ACS-300 (Altec Lansing Consumer Products, 800-258-3280, \$400 a pair) and the Power Partner 570 (Acoustic Research, 800-969-2748, \$475 a pair).

13. Extra CD-ROM caddies. You can never have too much money or too many caddies. If you have young kids around, it's a good idea to keep your most frequently used CD-ROMs in their own caddies. There's nothing like trying to scrape peanut butter and jelly off your CD-ROMs to convince you to have plenty of extra caddies. Many places

charge \$10 or more for a caddy, but if you shop around, you can find them for \$5 or less.

CD-ROM Software

14. Microsoft Encarta Multimedia Encyclopedia 1994 Edition For Windows. Microsoft has taken the articles from *Funk and Wagnalls New Encyclopedia* and enhanced them with generous portions

of photographs, audio, video, and animation. The program's interface makes it easy to find your way through this huge amount of information. You can explore events chronologically, geographically, or conceptually, or you can search for associated ideas using the nine categories and 84 sub-categories. Microsoft, (800) 426-9400, \$395 (\$99 until December 31st).

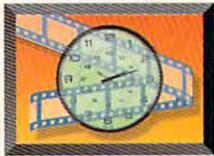
15. Compton's Interactive Encyclopedia for Windows. This new CD-ROM version of Compton's Encyclopedia uses images, maps, graphs, audio, and video to make the text come alive. One new feature lets you store open windows as a virtual workspace. Compton's NewMedia; (619) 929-2500; \$395 for CD-ROM version, \$498 for combined CD-ROM and printed version.

16. The New Grolier Multimedia Encyclopedia. Make learning fun for yourself and your children with the latest version of this multimedia encyclopedia. Video, animation, sound, and a raft of color and black-and-white Super VGA images bring the excitement of CD-ROM technology to the complete text of The Academic American Encyclopedia. Grolier Electronic Publishing, (800) 356-5590, \$395.

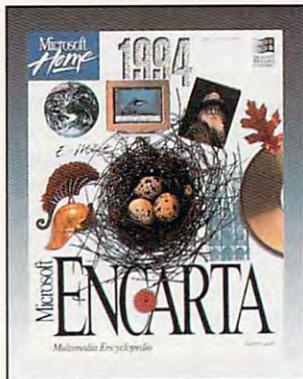
17. Microsoft Dinosaurs. Get detailed descriptions of the lives of 80 dinosaurs and dozens of other prehistoric creatures with nearly 200 articles and more than 1000 illustrations and photographs. With hot-linked text to connect you to more than 800 pop-up windows, you can explore the material at your leisure or take a series



**This year,
create some real
excitement.
Give a multimedia
gift.**



MULTIMEDIA PC



Microsoft Encarta (number 14) of guided tours. Microsoft, (800) 426-9400, \$79.95.

18. The Animals!. Visit the San Diego Zoo in the comfort of your own home. You and your child can explore all of earth's biomes to learn about familiar and exotic animals in their natural habitats. This single CD-ROM is packed with 82 videos, 1300 color pictures, 2500 pages of text, and 2 1/2 hours of sound data. The Software Toolworks, (800) 234-3088, \$119.95.

19. Microsoft Cinemania '94 Interactive Movie Guide For Windows. Search for your favorite movie titles, actors, and directors with this top-selling CD-ROM film reference. Cinemania includes all 19,000 capsule reviews and ratings from Leonard Maltin's *Movie and Video Guide*, thousands of entries from *The Motion Picture Guide* and *The Encyclopedia of Film*, and movie stills and audio clips from major motion pictures. Microsoft, (800) 426-9400, \$79.95.

20. SI CD-ROM Sports Almanac. With 26 categories of sports information, this title from *Sports Illustrated* can satisfy the most voracious stats

appetite. It's a compilation of 1991 stats, awards from 1931 to the present, obituaries, profiles, and dozens of SI articles. It also lists year-by-year records for each sport. Sports Illustrated, (800) 593-6334, \$59.95.

21. Monarch Notes on CD-ROM. For years, *Monarch Notes* have helped demystify the classics for students. Now you can have the entire collection on a single CD-ROM. Search for a word, name, or phrase from any of the nearly 200 titles—many of which are long out of print. The collection also includes recorded voice passages, pictures, and drawings. Bureau Development, (201)

Delorme Mapping, (207) 865-1234, \$169.

23. Mayo Clinic Family Health Book. More than just a book on CD-ROM, this layman's health reference is an impressive use of multimedia. The program gives you the complete text of the 1400-page book, hundreds of color photos, animation, voice, video, and hypertext. Its text is nontechnical but thorough. Interactive Ventures, (612) 686-0779, \$99.95.

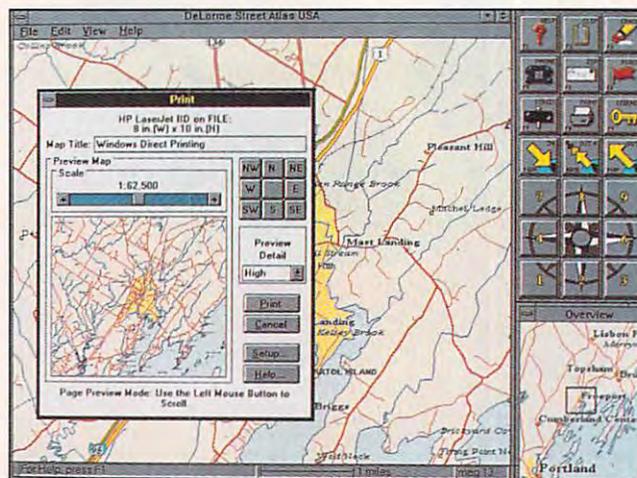
24. Mavis Beacon Teaches Typing: Version 2.0 for Multimedia. The CD-ROM version of the top typing program adds digitized speech and digital audio music. Multimedia Mavis offers verbal dictation of ten

tal fly-throughs, over an hour of Video for Windows movies, and more than a thousand full-screen fractal images. Create your own fractals with the program's Fractal Creator, which works with 30 different fractal-generating formulas and 125 different color palettes. Deep River Publishing, (207) 871-1684, \$49.95.

26. Nautilus. This CD-ROM magazine offers traditional bulletin board information enhanced with CD-quality pictures, music, animation, and film clips. You can also use Nautilus to establish two-way access with Metatec's own online service, which is similar to CompuServe and GENie. Along with the typical magazine material, you'll receive shareware, freeware, fonts, programming tips, and utilities. Metatec Discovery Systems; (614) 761-2000; \$9.95 for a single disc, \$119.40 for a 12-disc subscription.

27. The 7th Guest. This is the first CD-ROM game too large to fit on a single disc (it ships on two). Realistic video-generated characters, high-resolution 3-D-rendered backgrounds, and an excellent musical score make this computer game seem like an interactive movie. Solve the logical puzzles as you move through a haunted mansion in search of clues. Virgin Games, (714) 833-1999, \$99.99.

28. Hell Cab. This ultra-photorealist game features state-of-the-art 3-D graphics, sound effects, and music. The plot involves a New York City cab driver (he's really a devil trainee), prehistoric jungles, Nero's



Street Atlas USA from Delorme Mapping (number 22)

808-2700, \$99.

22. Street Atlas USA. Browse through the streets of your youth without leaving home. Street Atlas USA uses the U.S. Census Bureau's TIGER files to map every street in the country. You can search by ZIP code, telephone number, or street name.

prerecorded letters and lets you add your own. There's also a self-running overview and demonstration of the program. The Software Toolworks, (415) 883-3000, \$99.95.

25. Fractal Ecstasy. View the amazing patterns that make up fractal images. The program includes frac-

Explore.

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Nine unique entry paths are available – one to suit every style of learning. With Virtual Workspace™ open multiple articles, pictures, videos, sounds and animations to expand your understanding. Idea Search guides you through a network of over 33,000 articles such as...

On CD ROM for Windows™, DOS and Macintosh®.

ALL NEW
1994
EDITION



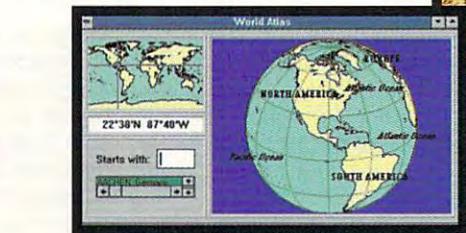
RELATIVITY
SPACE TRAVEL
VACUUM



Access U.S. and world history through the new multi-level, dynamic timeline. Click the time period of your choice and open related articles and multimedia displays.

To bring learning alive, there's nothing like full-motion video and sound. People remember almost

three times more with multi-sensory stimulation over reading alone! *Compton's* features over 200 multimedia clips including videos, animations, sounds, and exclusive slide shows – plus over 7,000 images.

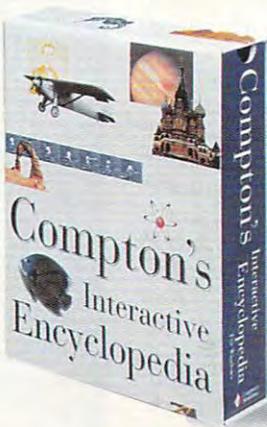


Start with an astronaut's view of the globe. Click on any region and zoom in for a closer look. Move from continents to countries, to cities – with each level bringing you greater detail.

It's a big universe. And with *Compton's Interactive Encyclopedia™*, you can explore it daily. With the click of a mouse you can experience a space shuttle launch – in full-motion video and sound. Click again, and you'll discover the history, technology and people who made it possible. The same easy access can take you from science to nature, history, people and places. *Compton's Interactive Encyclopedia™*, chosen easiest-to-use, offers a

world of knowledge through videos, animations, narrated slide presentations, audio and quickly referenced text. Still, the most compelling reason for choosing *Compton's* is this: Your children. You're giving them a tool that can increase their comprehension, stimulate curiosity and enhance motivation. Yes, and *Compton's* is fun, too. And that's what learning should be! Visit your local retailer or call 800-862-2206 for more information.

Circle Reader Service Number 240



2320 Camino Vida Roble
Carlsbad, CA 92009 (800) 826-2206



www.commodore.ca





MULTIMEDIA PC

Rome, and the trenches of World War I. Your goal is to make it back to the airport with your soul intact. Time Warner Interactive, (800) 593-6334, \$99.99.

29. Microsoft Golf for Windows, Multimedia Edition. For the golfer with a

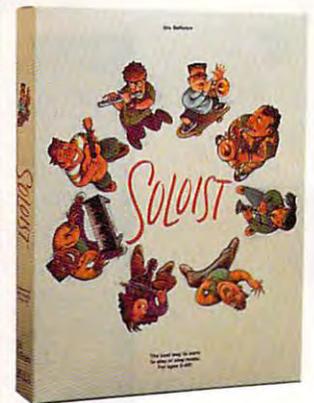
book. The CD-ROM's spoken dialogue and text also enhance the game. Sierra, (800) 326-6654, \$79.95.

31. European Racers. Build your plastic model car with the help of a high-resolution CD-ROM. The package comes with one model

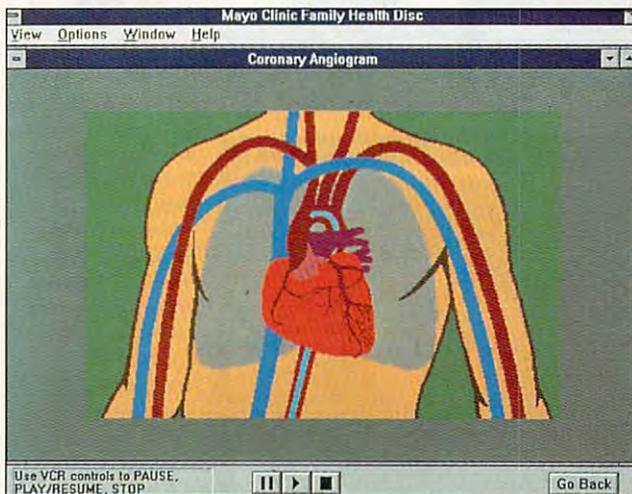
and listen to the story, or choose the Let Me Play button to interact with the characters. Brøderbund Software, (800) 521-6263, \$69.95.

33. Arthur's Teacher Trouble. Like Just Grandma and Me, Arthur's Teacher Trouble is an interactive children's storybook that combines animated effects, musical accompaniment, and narration in a choice of languages. It teaches young readers (ages 6-10) as it entertains with subtle humor. Brøderbund Software, (800) 521-6263, \$59.95.

rangements and chord progressions. SuperJAM! is appropriate for both beginner and experienced musi-



Soloist (number 35)



Mayo Clinic Family Health Book (number 23)

CD-ROM drive, what could be better than a golf game on CD-ROM? The new multimedia version includes video "flybys" of each hole, a personal video golf pro who offers advice for each hole, and video demonstrations of swinging and aiming techniques. The program is compatible with the many Links Championship Courses from Access. Microsoft, (800) 426-9400, \$64.95.

30. King's Quest VI. In this latest release in the King's Quest series, King Alexander attempts to rescue Princess Cassima from the evil Vizier. He travels among a mysterious set of islands, whose lush graphics were hand-painted and then scanned into a computer for the look of a story-

book. The CD-ROM's spoken dialogue and text also enhance the game. Sierra, (800) 326-6654, \$79.95.

31. European Racers. Build your plastic model car with the help of a high-resolution CD-ROM. The package comes with one model

kit, a Porsche 911 Slant Nose, but the CD-ROM includes the simulation software for three additional kits, which you can buy separately at toy stores and hobby shops. The program shows your model rendered in 3-D-polygon animation, provides step-by-step assembly instructions, and includes a racing track where you can square off against five onscreen competitors. Revell-Monogram, (708) 966-3500, \$69.95.

32. Just Grandma and Me. This interactive children's storybook helps your child explore language and learn to read while having fun. Accompanying Grandma and Little Critter to the beach, your child can choose the Read to Me button to watch the animation

Disk-based Multimedia Software

34. SuperJAM!. Create instant melodies. The program includes an onscreen piano keyboard that can be controlled with your mouse or computer's keyboard; an Eas-O-Matic MusicMaker, which makes it easy to make musical decisions; 30 musical styles that include rock, pop, dance, classical, samba, and jazz; and ready-made musical ar-

rangements and chord progressions. SuperJAM! is appropriate for both beginner and experienced musicians and works with any MIDI instrument. Blue Ribbon Software, (404) 315-0212, \$129.

35. Soloist. This computer game makes it easy to learn melodic sight-reading. Simply hook up a microphone to your sound card, select your instrument and skill level, and play or sing the notes that the program displays on your screen. Soloist doesn't



Microsoft Cinemania '94 Interactive Movie Guide (number 19)

require MIDI, offers 36 levels of play, and includes a chromatic tuner to help you tune your instrument. Works with any musical instrument—even your voice. Ibis Software, (415) 546-1917, \$59.95.

36-42. A Sound Source Unlimited sound clip package. Sound Source Unlimited offers a variety of popular sound clips to liven up your Windows environment. Each package ships with a utility that lets you associate sounds with your Windows system functions, such as startup, shutdown, General Protection Error, and application launch. Current collections include Star Trek (\$59.95), Star Trek: The Next Generation (\$59.95), 2001: A Space Odyssey (\$59.95), Terminator 2: Judgment Day (\$47.95), Total Recall (\$47.95), Star Wars (\$37.95), and The Wizard of Oz (\$37.95). Sound Source Unlimited, (800) 877-4778.

43. *Sound Blaster: The Official Book.* Pamper your Sound Blaster with a book of its own. This paperback includes tips and tricks to enhance playback and recording, as well as a troubleshooting guide that shows you how to resolve joystick difficulties, interrupt conflicts, and volume problems. You also get a 3 1/2-inch disk with dozens of sound files, dozens of songs and musical jingles, and several popular Sound Blaster utilities. Osborne McGraw-Hill, \$29.95.

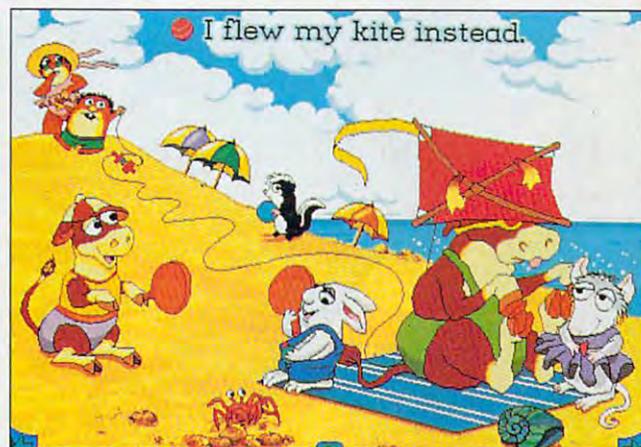
44. The Turtle Tools for Multimedia. Looking for an inexpensive way to get into digital audio, MIDI, and CD audio? Take a look at The Turtle Tools for Multimedia.

It includes WaveTools, an audio-recording, -editing, and -playback application; Midisoft Session, a MIDI sequencer; KeyPlayer, a program that lets nonmusicians play and record music using just the computer keyboard; Sound-Attach, a utility that lets you attach WAV and MIDI files to Windows system functions; and SoundBank, a CD-ROM with over 300 sound effects in five different formats. Turtle Beach Systems, (717) 843-6916, \$89.

45-46. A professional-quality sound-editing program. Sound-editing packages such as Wave for Windows 2.0 (Turtle Beach, 717-843-6916, \$149) and Sound Forge 2.0 (Sonic Foundry, 608-256-3133, \$179) let you alter sounds in ways that recording studios would have killed for just 10 or 15 years ago. We're talking about high-quality stereo recording direct to your hard drive, with cut-and-paste editing and nondestructive digital effects, such as echo, reverb, flange, fade, reverse, volume, and pan.

47. The Norton Speedrive. If your CD-ROM drive can't keep up with your CD-ROM programs, you might need a software cache for your drive. DOS's SMARTDrive doesn't cache CD-ROM drives, but The Norton Speedrive does. For owners of Level I MPC and subMPC CD-ROM drives, it may be the least expensive way to keep up with today's more demanding CD-ROM programs. Symantec, (800) 441-7234, \$99

48. Netroom 3. Are your multimedia drivers taking up



Brøderbund's *Just Grandma and Me* (number 32)

so much memory you don't have room for your programs? Netroom 3 loads your sound card, CD-ROM, software cache, network, and other device drivers into upper memory—leaving as much as 630K for your applications. The latest version adds a cloaking technology that can move your System and Video BIOS into extended memory. Helix, (718) 392-3100, \$99.

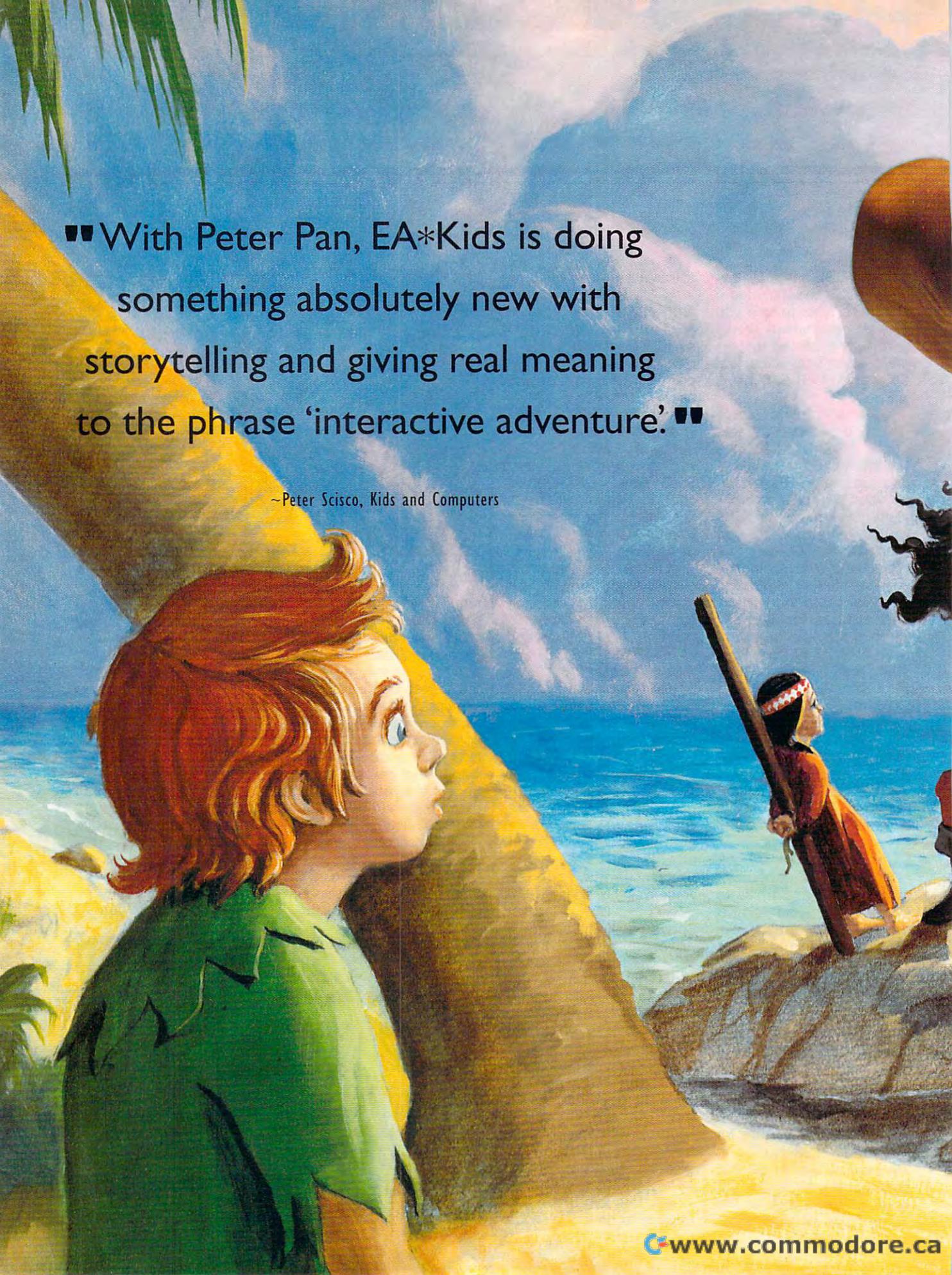
49. Matinee. This is the first screen saver to bring full-motion video to your PC. The disk-based version (\$49.95) features 38 clips,

including monsters, cartoons, go-go dancers, and killer sharks. The CD-ROM version (\$59.95) includes over 250 video clips in categories ranging from bikinis to sci-fi. Access Softek, (510) 848-0606.

Only 49 multimedia gift ideas? Don't forget a subscription to COMPUTE (COMPUTE Publications, 800-727-6937, \$12.97 for 12 issues). With our new multimedia section and regular multimedia coverage in the rest of the magazine, you'll be fondly remembered throughout the coming year. □



Matinee from Access Softek (number 49)

A painting-style illustration of Peter Pan on a tropical beach. Peter Pan, with his characteristic red hair and green tunic, is in the foreground, looking towards the right. In the background, a Native American woman in a red dress and headband stands on a rock, holding a long wooden staff. The scene is set against a backdrop of a blue sky with soft clouds, a blue ocean, and a large palm tree trunk on the left. The overall style is reminiscent of classic children's book illustrations.

■ With Peter Pan, EA*Kids is doing something absolutely new with storytelling and giving real meaning to the phrase 'interactive adventure.' ■

~Peter Scisco, Kids and Computers



Remember the sense of wonder you felt as you watched Peter Pan discover he could really fly? Well, in Peter Pan, A Story Painting™ Adventure from EA*Kids™, it's your child's imagination that really soars. Boys and girls ages 5-9 become the "hands of the animator," to help Peter save Wendy from the evil Captain Hook. Along with the Paintbox



(Actual computer screen shot)

Pals™ children actually change events in the story, expanding their reading, problem-solving and decision-making skills like never before.

It's the kind of fun your children will return to again and again. Unless of course, you're playing it yourself.

To order a FREE EA*Kids demo disk or videotape call 1 800 KID-XPRT.

For IBM® compatibles, Macintosh® and 3DO®. Available on floppy disk and CD-ROM.



THE KIDS SOFTWARE EXPERTS

Circle Reader Service Number 165



NEW MULTIMEDIA PRODUCTS

EDITED BY LISA YOUNG

Clear the Floor

Instead of going to the gym, you can now just turn on your computer for a personalized aerobics workout. *Fitness Partner*, released by Computer Directions, develops customized workouts based on your weight-loss or muscle-toning goals.

The CD-ROM compiles your workout from 75 full-motion video exercises and includes video and audio instruction from Roni Smaldino, an IDEA-certified aerobics instructor. *Fitness Partner* can design as many as nine personalized routines for ten different users. The program also electronically tracks seven different measurements and goals for each person.

You can design your own routine by mixing and matching the 75 exercises, setting the speed and number of repetitions for each movement, and choosing your favorite music. If you're unfamiliar with a particular exercise, you can use the learning mode to find out how to perform a movement.

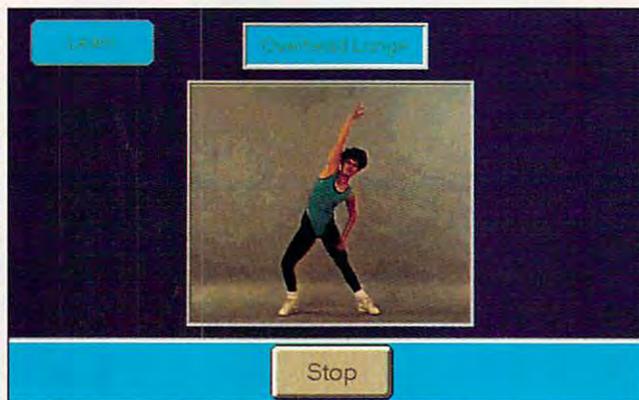
Computer Directions
(209) 435-5777
\$69.95

Circle Reader Service Number 530

New Entry-Level Multimedia PC

If you've been thinking about buying an entry-level multimedia computer, this could be the time to do it. Radio Shack has introduced the Tandy Multimedia Personal Computer, a fully equipped 80486-based multimedia PC priced at less than \$1,600.

The package includes a Photo CD-compatible CD-ROM drive, a Sound Blaster



Get in shape with the *Fitness Partner* CD-ROM.

Pro 8-bit audio card, Super VGA graphics, 4MB of RAM (expandable to 64MB), a 130MB SmartDrive hard disk, and two 16-bit expansion slots.

The Tandy Multimedia PC ships with several multimedia programs, including *The Animals!*, *The Software Toolworks World Atlas*, *Toolworks Reference Lib-*

rary, and *America Online*. The package also includes DOS 6, a multimedia version of Windows 3.1, and a multimedia version of Microsoft Works for Windows.

Radio Shack
(817) 390-3011
\$1,599

Circle Reader Service Number 531



The Tandy Multimedia Personal Computer from Radio Shack

No More Sacrifice

Why should you have to settle for an 8-bit sound card just to save money? With Media Vision's Pro Audio 16 Basic, you can add CD-quality sound to your computer for less than \$200.

Compliant with both MPC Level 1 and Level 2 standards, the Pro Audio 16 Basic offers 16-bit stereo digital audio recording and playback to 44.1 kHz, an on-board FM synthesizer, a software-controlled mixer, MIDI support, and a game port. It also supports DOS, Windows 3.1, Windows NT, OS/2 2.1, and NextStep, and it's compatible with the Pro AudioSpectrum 16, Sound Blaster, and Ad Lib sound cards.

The Pro Audio 16 Basic package includes DOS and Windows software, including Media Vision's Pocket Tools (which allows recording, editing, and mixing under Windows 3.1), *Dinosaur Adventure* from Knowledge Adventure (which lets you explore the prehistoric era of dinosaurs through full-motion video and stereo sound), and a QuickStart installation program.

Media Vision
(800) 845-5870
\$199

Circle Reader Service Number 532

Sight and Sound

Sony has introduced two computer peripherals designed to bring multimedia and video conferencing applications to the PC. The PCS-V2 and PCS-V4 combine audio and video components into a single compact unit that fits on top of a

INTERACTIVE HORROR MOVIE

HERE NO ONE RESTS IN PEACE.

Dracula is back, driven by revenge and a hunger for human blood. Follow a trail of vampire brides, corpses, and wolf tracks through the streets of London. You direct the drama, suspense, and passion as you are drawn into a world of evil where every decision and action you make is inextricably tied to the fates of those you love.

From the creators of
Sherlock Holmes Consulting Detective™

Dracula

UNLEASHED™

Contact your local retailer or call 1-800-877-4266.



Over 90 minutes of captivating video and an original gothic soundtrack draws you into the center of the action.



Over 150 riveting scenes propel you down multiple pathways toward the final confrontation.



Unique interactive experience that you've never encountered before.



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AVAILABLE ON CD-ROM FOR PC AND MAC

Circle Reader Service Number 219



NEW MULTIMEDIA PRODUCTS



Pro Audio 16 Basic

desktop computer monitor.

Both products have a high-quality color video camera, unidirectional microphone, speaker, volume control, and audio mute switch. You can vertically adjust the camera and manually activate a privacy shutter to disengage the video capabilities. The PCS-V4 will be available with a full-duplex echo cancellation feature to reduce unwanted echo.

The PCS-V2 and the PCS-V4 work with most types of computers and can be networked in a number of ways. They can also function as audio and video input devices for other mul-

timedia applications.

The PCS-V2 is scheduled to ship in November, while the PCS-V4 should be released sometime in 1994.

Sony
(201) 930-7194
\$999—PCS-V2
Price TBA—PCS-V4
Circle Reader Service Number 533

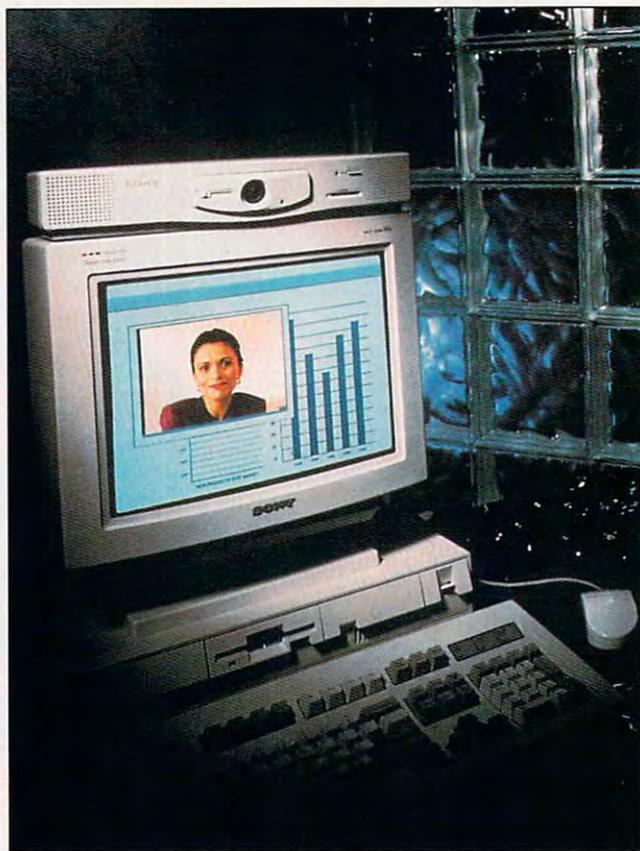
Monitors That Sing

If you're looking for a monitor to use with multimedia and CD-ROM applications, consider the Brilliance 15, an autoscanning monitor with stereo audio capabilities built in.

The Brilliance 15 includes a stereo amplifier, speakers, headphone jack, and user-adjustable volume control. It has a maximum resolution of 1024 x 768 at 72 Hz. It also uses a 0.28-mm dot pitch, as well as a flat, square, black matrix tube for high contrast and brilliant color rendition.

Other high-performance display functions include Constant Vertical Raster, which automatically maintains the correct vertical image height for all display modes, and Advance Monitor Deflection Control, which allows fast, stable switching between display modes without disturbing transient distortion effects.

The Brilliance 15 is backed by a two-year parts-and-labor war-



Sony's new PCS-V2 multimedia camera

ranty and has a mean time between failures of 50,000 hours.

Philips Consumer Electronics
(800) 835-3506
\$699
Circle Reader Service Number 534

Lights, Camera, Interaction

VirtualCinema, from HyperBole Studios, is a technology that creates three-dimensional, interactive films on CD-ROM. It uses live actors, gives you a 360-degree perspective of the environment, and lets you peek into the minds of the characters. According to the company, you actually

think the characters' thoughts and recall their memories.

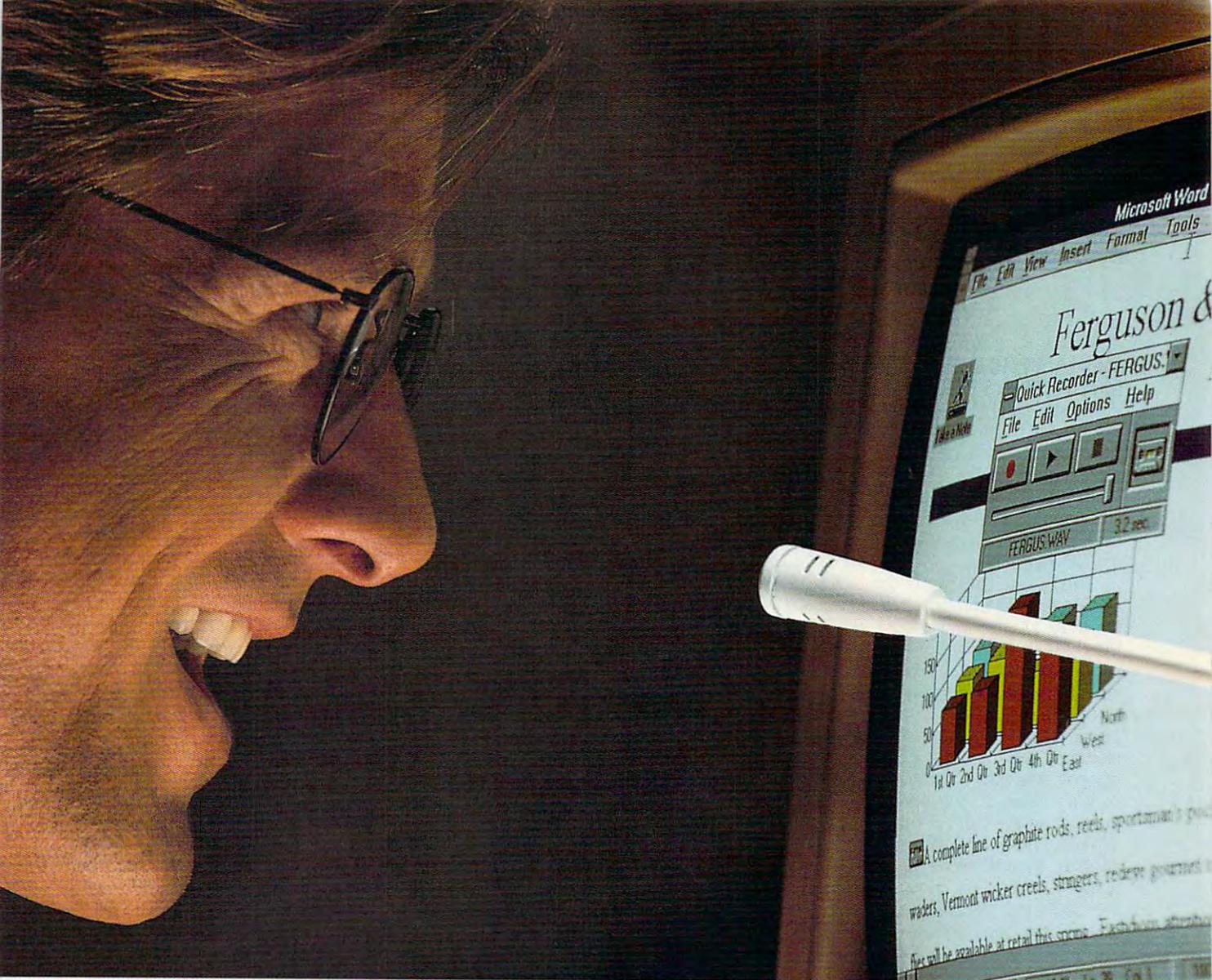
With VirtualCinema, you can go at your own speed, repeating sections or following interesting tangents. Several popular types of interactive films are planned, including drama, comedy, and science fiction.

HyperBole plans to begin shipping its first VirtualCinema product by Christmas, with more titles scheduled for release in 1994. □

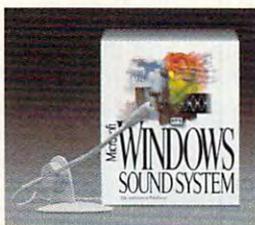
HyperBole Studios
(206) 451-7751
Price TBA
Circle Reader Service Number 535



Phillip's Brilliance 15 Monitor



FIRST WE MADE WINDOWS. NOW IT'S TIME TO TALK.



With the new Microsoft® Windows™ Sound System, just tell your computer what you want it to do. You can customize your system to respond to your personal spoken commands. Even our new directional microphone knows exactly who you are.

This full set of audio software has lots of options, too. Spice up presentations with music or quotes.

Or proofread numbers as the computer reads them back.

All for the price of a game.

You can also get this software with the sound board included. So go visit your nearest reseller to see what's creating all the conversation.

Microsoft
Making it easier



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www.commodore.ca



MULTIMEDIA SPOTLIGHT

By David English

MEDIA VISION PRO 16 MULTIMEDIA SYSTEM II

It used to be easy to choose a multimedia upgrade kit. If the package had an MPC label, you knew the sound card and CD-ROM drive would be capable of playing the latest CD-ROM titles.

This year, the decision became more complicated. On May 17, the Multimedia PC Marketing Council announced its Level 2 MPC specifications. Now you have to choose between Level 1 components (the earlier standard) and Level 2 components (the new standard).

With Level 2, the sound card changes from 8-bit to 16-bit (for CD-quality sound), the CD-ROM drive runs twice as fast (delivering 300K per second), and your video card should be capable of displaying a resolution of 640 x 480 with as many as 65,536 colors (Level 1 requires only 640 x 480 with 16 colors). A Level 2 computer should be at least a 25-MHz 486SX with 4MB of RAM and a 160MB hard drive, while Level 1 calls for only a 16-MHz 386SX with 2MB of RAM and a 30MB hard drive.

As you can see from the Level 1 computer requirements, a change has been long overdue. Most CD-ROM software is already optimized for Super VGA (640 x 480 with 256 colors) and at least a 486SX processor. The latest titles that use Video for Windows and QuickTime for Windows video clips need Super VGA and a double-speed CD-ROM drive. Rather than leading the market, Level 2 simply reflects the demands of today's multime-

dia software.

Just one week after the MPC Marketing Council announced the Level 2 specifications, Media Vision introduced two Level 2 upgrade kits: the Fusion DoubleCD 16 (\$699 internal, \$799 external) and the Pro 16 Multimedia System II (\$1,199 internal). Both include NEC double-speed CD-ROM drives—though the drive in the Pro 16 II kit has an access time of 250 milliseconds, while the drive

in the Fusion kit has an access time of 350 milliseconds. The Pro 16 II kit also includes more bundled applications (eight rather than four) and more specialized audio software, such as a MIDI sequencing program, a professional audio editor and mixer, and a voice recognition program. The Fusion kit is designed for people on a budget who might be new to multimedia, whereas the Pro 16 II kit is designed for people who want to experiment with computer-based audio and are willing to pay more for higher-quality components.

In this review, we'll look at the Pro 16 Multimedia System II. Its sound card is the improved Pro AudioSpectrum 16 with two output plugs—one for speakers (which uses the built-in amplifier) and one for an external amplifier (which bypasses the built-

in amplifier). It's capable of CD-quality sound when sampling in stereo at the full 44.1 kHz, though you'll probably need a 486 to record cleanly at that rate. The card is well shielded and provides a clear sound with low background noise. It's compatible with games that support Sound Blaster and Ad Lib sound cards, it has joystick and SCSI connectors, and it has separate microphone and line input jacks. While external MIDI is supported, you'll have to buy Media Vision's MIDI Mate adapter to use it. The MIDI Mate converts the joystick connector into one joy-

stick, one MIDI IN, one MIDI THRU, and two MIDI OUT connectors. The CD-ROM drive is NEC's double-speed 84JD-1. It has the usual Level 2 throughput of 300K per second, has an exceptional access speed of 250 milliseconds (Level 2 requires 400 milliseconds; Level 1 requires only 1000 milliseconds), and is Photo CD multisession compatible (a Level 2 requirement). Because it's an internal drive, you'll need a free drive bay in your computer.

As I mentioned before, Media Vision has tailored this package for computer users who like to experiment with sound. Accordingly, you'll find a variety of powerful audio utilities, including separate DOS

and Windows applications that let you record, play, and edit high-quality stereo sounds, and separate DOS and Windows applications that let you play your audio CDs. Other utilities let you compress and decompress audio files, control Windows programs with your voice, record and edit MIDI files, and convert text to spoken words.

As with many MPC upgrade kits, you'll also receive a generous bundle of CD-ROM software. The Pro 16 II kit includes Compton's Interactive Encyclopedia for Windows, Mayo Clinic Family Health Book, Where in the World Is Carmen Sandiego? Deluxe, Battle Chess Enhanced, Mantis, PC Karaoke, MacroMedia Action!, and Civilization. Finally, you'll receive a disk-based multimedia presentation program, Action 2.5 for Windows.

This is quite a hardware and software package. The sound card and CD-ROM drive sound terrific and should easily handle today's more demanding Level 2 multimedia titles. The QuickStart installation software makes it relatively painless to configure the hardware for your system, the audio utilities are powerful and well selected, and the bundled applications represent an excellent value. If you're in the market for a high-quality Level 2 upgrade kit, you can't go wrong with Media Vision's Pro 16 Multimedia System II.

Media Vision
(800) 348-7116
\$1,199

Compute Reader Service Number 550



Pro 16 Multimedia System II



Around here nice guys don't finish last - they don't even finish. Better know how to drive or Catfish Louie and company will take turns making your Backroad Racer a pile of twisted, burning wreckage. Then taunt you as you watch instant replays of your wipeouts. Video clips give hints and make threats while you try to outrun cops and race on four different tracks. Use 3-D animated instructions to build a model of your car so it's easier to identify the torched remains. Available for IBM on CD-ROM.



The model makes the game better. The game makes the model better.™

Video clips just like this one make the game extra bad. But in a good way.

After you
build your
car you can
follow all
traffic laws
and be a safe
& courteous
driver.



*{Of course, you
could also go play
an action-packed
game of hopscotch
with your sister.}*



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PRODUCTIVITY CHOICE

If you're looking for an inexpensive page-layout program that outshines even the high-end DTP packages, this program is for you.

William Harrel

PAGEPLUS 2.0

Serif's PagePlus consistently leads the other economy desktop publishing packages in useful features. Version 1.0 provided spot color separations when none of the developers of other under-\$200 packages thought users needed them (but soon found out that users demanded them), and it supported full incremental text rotation at a time when you couldn't find it anywhere else, even in the high-end heavyweights, Ventura Publisher and PageMaker.

Version 2.0 again pushes PagePlus ahead of the competition with process color separations, a PANTONE color palette, drag-and-drop text, incremental graphics rotation, OLE support, and a nifty table editor.

This surprisingly powerful program makes page layout remarkably easy. An example is its versatile style sheets. Similar to the same feature in a word processor, style sheets let you format paragraphs or selected blocks of text by simply assigning a predefined style tag to them.

Some other low-end page-layout packages don't support style sheets, and creating long documents with their many different text formats is entirely too much work. Some high-end DTP programs, such as Ventura Publisher and Frame Maker, have style sheets, but you need a lot of perseverance and tenacity to define and use their style sheets. PagePlus 2.0 simplifies the process by doing away with a zillion options most people don't use.

Also impressive is the text frames feature. It makes it a snap to jump text to different

sections of a document, such as different pages in a newsletter. You can also export the document elements you create in PagePlus as a graphics file and import them into other applications, a feature not found in other layout packages. You could, for example, create an ad or a graphic in PagePlus and include it in a WordPerfect document, such as a business proposal.

ChangeBar is another winning feature. It lets you easily assign colors, borders, and other attributes by clicking on icons. ChangeBar is context-sensitive, meaning that it changes to accommodate the currently selected tool. When you select the Text tool, for example, icons and text boxes for changing fonts, point size, and alignment are displayed. You can't beat PagePlus's ChangeBar for convenience.

The rulers are now movable. You can drag them like a T square anywhere in the doc-

ument window to measure and resize elements. If you want to draw a six-inch line, for example, you can pull down the rulers to measure it. The ability to pull the rulers into your layout greatly enhances your ability to achieve precision. High-end DTP and draw programs have supported this option for a while; it's nice to find it in an economy package.

OLE support lets you keep your documents current by upgrading imported elements as they change in the source applications, and the Table Editor (a slick little program that puts PageMaker's utility of the same name to shame) is OLE-aware; you can edit your tables from inside PagePlus by simply double-clicking on them. You can also keep objects pasted from other programs, such as a Lotus spreadsheet chart, current automatically. With OLE, each time the chart changes, it's updated in your layout.

