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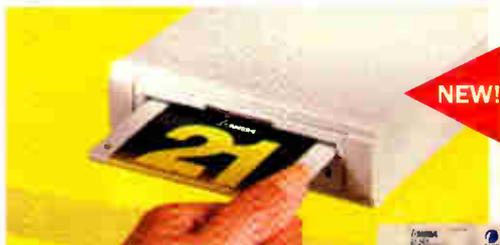
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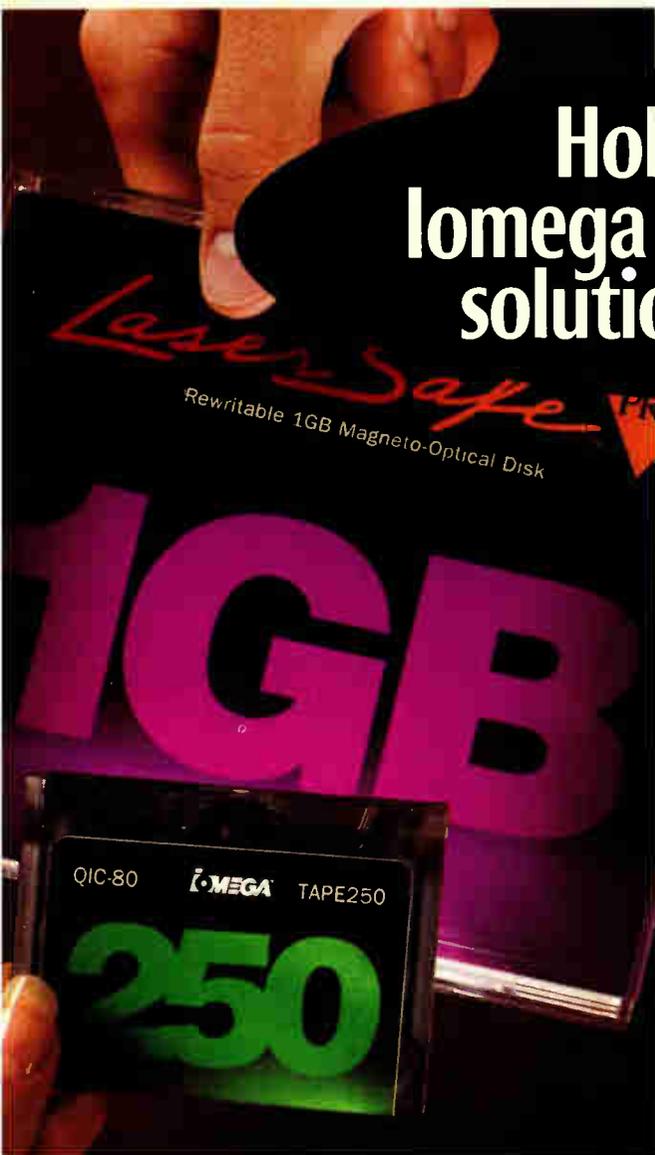
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Windows Reaches Beyond the Desktop

Six months is a long time in the computer industry, and a lifetime in the Windows market. Six months ago, when BYTE published its Fall 1992 Essential Guide to Windows, Windows for Workgroups and Video for Windows were still in beta testing and Windows NT was just a blip on the horizon. Today, the former two are in the hands of users, and Microsoft promises to formally announce the latter at Spring Comdex in Atlanta, with shipment to follow "within a few weeks."

Taken as a whole, the past half year has been a busy and potentially confusing time for Windows users. This special issue addresses some of that confusion.

Much of the confusion has centered around Windows for Workgroups and its relationship to other network operating systems on the market, especially Novell's NetWare. At BYTE, we don't view Windows for Workgroups as a replacement for NetWare, nor do we use it that way. On our editorial LAN, NetWare and Windows for Workgroups share the same wire; everyone still uses the NetWare shell and accesses the NetWare file and print servers. People also have the option of joining Workgroups workgroups, which coexist quite nicely with the NetWare LAN. Presently, these workgroups are ad hoc affairs, set up on an informal basis. Like many other organizations, we are still coming to grips with that concept known as *workgroup computing*.

In the meantime, for those of us who use it, Windows for Workgroups has proved to be the easiest and best front end we've ever had for the Novell LAN. The "net" effect of combining the two has been to make Windows and NetWare both more capable and easier to access. In our experience, these products don't compete as much as they complement each other. You can learn more about how to work with Microsoft's Windows for Workgroups in

Anne Fischer Lent's "Workgroups by the Numbers" on page 32.

The Big, Mean NT Machine

While Windows for Workgroups and NetWare can be seen as complementary products, the same can't be said about Windows NT and NetWare. NT is designed to perform the same back-end functions that are the hallmark of NetWare—and of

other high-end operating systems, such as Unix (in its many guises) and OS/2. These functions include not only such familiar ones as standard file and printer sharing, but also some that will be-

come increasingly important as LANs assume more of the work once done by mini-computers and mainframes—namely, enterprise-wide connectivity, database services, and support for distributed applications.

The computer press has been flush with NT stories over the last few months, many of them in the "who will win" vein. Well, you can stop reading those stories now, because we already know who will win—you. NT raises the stakes in the operating-systems game and will inevitably increase the pressure on other vendors to get closer to the customer. We've already seen Open Software Foundation and Unix International move toward greater cooperation, and Novell's acquisition of Unix Systems Laboratories should only further the interoperability between NetWare and Unix (although it may confuse the message Novell sends to customers). Competition is good; it keeps vendors on their toes and customers in the driver's seat.

One vital area of competition among operating-system vendors is for the hearts

and minds of third-party software developers. Here, of course, Microsoft has already made inroads with NT. As you scan the "Windows News & Views" section beginning on page 10, however, you'll notice that most of the product announcements for NT are for development tools. End-user products that take full advantage of NT remain few and far between.

Fade to Black

Competition is also heating up on another front, one unfamiliar to many people today: digital video. Computers are wonderful communication enhancers, and digital video will take them to a new level in this regard. Before digital video becomes as ubiquitous as overhead transparencies, however, two roadblocks must be overcome.

The first roadblock is technical: We need standards for creating and playing back digital-video information. This is where the competition comes in. Both Apple and Microsoft have released software—QuickTime for Windows and Video for Windows, respectively—that controls the creation and playback of digital video in Windows. Competition

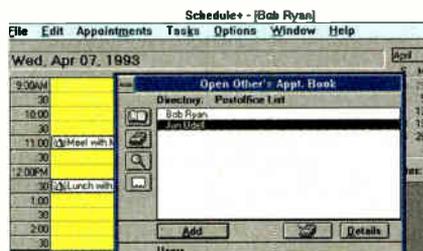
will undoubtedly keep both companies hard at work refining their offerings.

The second roadblock is perhaps harder to overcome: Although we are all bombarded with video messages every day, we're not used to thinking as video *producers*. One place to start is

with "Inside Video for Windows" on page 57, where Tom Yager provides a succinct introduction to the world of digital video as he describes the nuts and bolts of Video for Windows.

Workgroups for Windows, Windows NT, Video for Windows; it's obvious that Windows is more than just a desktop GUI. We hope you have fun exploring its many possibilities.

—Bob Ryan
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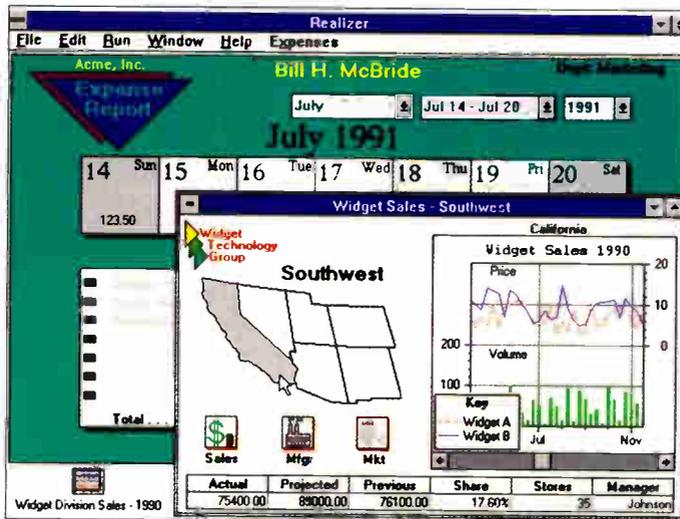
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royalty-free with the runtime module that's included. And you can generate an installation disk with the push of a button.

PC Computing said, "No other Windows BASIC can match it for power and breadth of features."



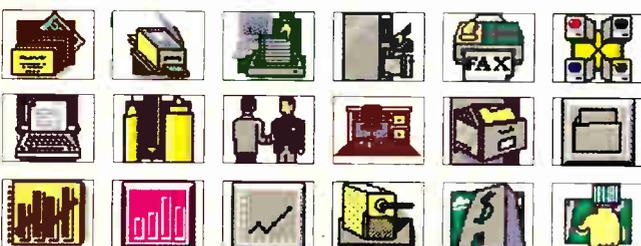
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with FormDev. It's an interactive WYSIWYG, point and click tool that generates code. With a single command you can add Programmable Application Tools like spreadsheets, charts, text editors, animation, graphics tablets and user-friendly forms. And CA-REALIZER offers many features other BASICs don't, like automatic array processing.

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	REALIZER	Visual BASIC
Interactive WYSIWYG Application & Form Designer	✓	✓
Generates User Accessible & Modifiable BASIC Code	✓	
Familiar Procedural Programming Model	✓	
Integrated Full-Featured Debugger	✓	
Single-Stepping, Call-Tree, Variable Display	✓	
Automatically Expandable Dynamic Arrays	✓	
Full Range Of Fast Array Operators & Functions	✓	
Mathematical, Statistical, Date-Time Functions	✓	
Dynamic Addition & Removal Of Form Objects	✓	
Fully-Integrated Programmable Application Tools:	✓	
Charts, Spreadsheets, Text Editors, Graphics, Animation, Scheduler	✓	
Ability To Run Multiple Applications Simultaneously	✓	
Full Support For DDE & DLLs	✓	✓
Direct MDI Support & Serial Communications Library	✓	
Import/Export Of 1-2-3, Excel, CA-SuperCalc Files	✓	
Extensive Context-Sensitive On-Line Help	✓	✓
Clip Art Library With Over 250 Bitmaps	✓	
QuickBASIC Version 7.0 Compatibility Libraries	✓	

Don't waste another day trying to figure out Visual BASIC. Leave that for your competition.

COMPUTER ASSOCIATES
Software superior by design.

CA-Realizer

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Circle 71 on Inquiry Card.
World Radio History

WINDOWS NEWS & VIEWS

FIRST IMPRESSION

CLARISWORKS FOR WINDOWS

A Mac best-seller brings nearly seamless integration to Windows

At least four kinds of people are likely customers for integrated software packages: new computer owners who need some software to get started, casual users who don't require the power of major applications, laptop owners who are conserving memory and hard disk space, and anyone who often needs to move data between different programs but is frustrated by the inevitable problems of getting separate applications talking to each other.

The best-known integrated package is Microsoft Works, available for DOS, Windows, and the Mac. ClarisWorks, introduced for the Mac in 1991, now lays claim to the number-one spot in the Mac market. Windows users will soon be able to buy ClarisWorks (see "Serving Up the Works" on page 105 for a review of shipping integrated packages).

Judging from my experience with an early beta copy, ClarisWorks for Windows is virtually identical to the Mac version—with its menus, dialog boxes, and tear-off tool palettes. ClarisWorks can even read files created with ClarisWorks/Mac, although Claris says the reverse won't be true until the next update of the Mac version.

The only major difference is that Claris has dropped one application from the Windows package: communications. According to the company, the communications module found

in the Mac version is not significantly different from the Terminal accessory shipped with the Windows version; therefore, including it would be redundant.

The applications included are a word processor, a spreadsheet, a flat-file database, and a drawing program that does page layout. Although these applets are not as feature-laden as the best stand-alone applications, they are surprisingly powerful.

For example, the graphics program lets you create linked text frames—movable rectangles in which you can manipulate columns of text. As you resize the frames, the text automatically flows from one linked column to another, even across page breaks. This saves you much time when fiddling with page layouts. In fact, the text frames in ClarisWorks are much like those in Aldus PageMaker. It's a critical feature that is missing from some low-end page-layout programs.

The program's database module is equally flexible. For one thing, it doesn't lock you into a predefined record structure—you can add new fields at any time. It also allows you to sort your records in various ways or just scroll through the database and select records by clicking on them. This is a fast and simple way, for example, to winnow an address book



down to a Christmas card list.

ClarisWorks' best feature is its nearly seamless integration. Some similar packages are little more than collections of programs that share a common file format, but ClarisWorks takes a different approach. Suppose you are writing a letter and

want to include a table of numbers and a pie chart. With some other packages, you might have to exit the word processor, enter the spreadsheet, create a table, exit the spreadsheet, import the table into the word processor, and repeat similar steps to create and import the pie chart.

ClarisWorks behaves more like a single application. No matter what type of document you are working on, the program lets you select any tool you want from a toolbar

that sits on the left side of the screen. To add a table to your document, you just click on the spreadsheet tool; the context-sensitive menus automatically change to reflect your choice. You can then draw a spreadsheet on your document and enter data (or paste some data

WHAT'S NEW

8 BITS STILL SOUNDS GOOD

Bucking the trend toward building sound boards according to 16-bit specifications and asking high prices, ATI Technologies (Scarborough, Ontario, Canada) and Mouse Systems (Fremont, CA) are concentrating on bettering 8-bit products and keeping the price low. Both companies' products retail for \$199 and are Windows- and DOS-compatible.

Positioning its Stereo F/X-CD primarily against Creative Labs' popular Sound Blaster and Sound Blaster Pro, ATI has designed its board to offer a wider frequency response than that of other sound boards. The increased response helps to eliminate the flat sound often produced by sound boards, according to the company. The Stereo F/X-CD's harmonic distortion is equal to 0.47 percent at 44 kHz, which ATI says is 50 percent better than the competition's. Enhanced bass output is achieved by an 8-W amplifier and a bass boost, which lets you connect nonamplified external speakers or headphones. Other features of the Stereo F/X-CD include 20-voice, four-operator stereo FM synthesis, and stereo digital playback/recording of up to 22 kHz; digital-audio sampling of up to 44 kHz in mono; a six-channel hardware mixer; a CD-ROM interface and CD audio port with Quiet CD circuitry for optional Mitsumi drives; and support for MIDI

from an existing spreadsheet).

To create a chart, you select a range of cells in the table, choose Make Chart from the spreadsheet's Options menu, and pick the kind of chart you want from a row of icons. ClarisWorks draws the chart to your specifications. Also, the chart remains linked to the table. If you change a number in the spreadsheet, the chart changes as well.

Ironically, this high level of integration can be confusing. Sometimes I would search the menus for a familiar function, only to realize that I had clicked on a different tool and brought up a different set of menus.

I was also confused by the steps required to create multipage graphics documents. You must specify how many pages you want, and although you can change your mind, you can lose some valuable work if you're not careful. On the other hand, ClarisWorks lets you create multipage spreads with ele-

ments that span the page boundaries—another feature not usually found in competing programs.

Despite a few drawbacks and curious omissions (adding a word count to the word processor would be a trivial task), ClarisWorks is an attractive solution for anyone who needs tightly integrated software at a reasonable price.

—Tom R. Halfhill

ClarisWorks for Windows \$249

System requirements:
A 386 or higher with 2 MB of RAM (4 MB of RAM recommended), DOS 3.3 or higher, Windows 3.x, about 4 MB of hard drive space, and VGA or higher graphics.

Claris Corp.
Santa Clara, CA
(408) 727-8227
fax: (408) 987-3932
Circle 990 on Inquiry Card.

via an optional MIDI box. ATI says the ALC (automatic-level control) and antialiasing filters compensate for volume levels of microphone input sound and then filter out unwanted signals.

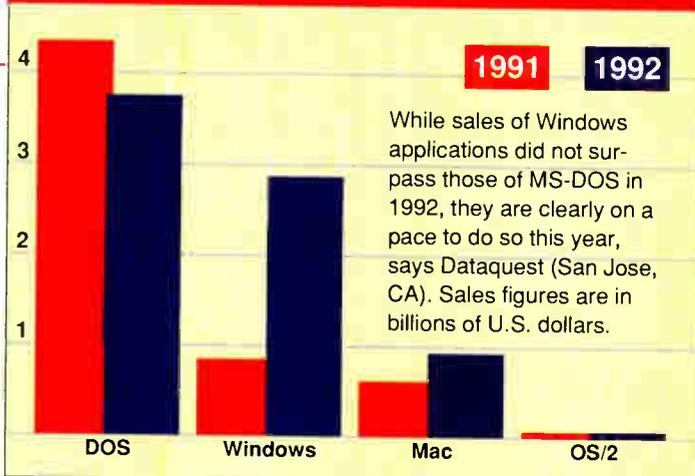
Mouse Systems has addressed the market differently. The company's SoundWave is geared toward multimedia, business, and entertainment, and it features voice annotation, text-to-speech conversion, and system sound effects. The voice annotation element lets you add verbal notes to spreadsheets, memos, charts, and E-mail, as well as to documents appearing on your PC's screen. MIDI, line-in, microphone, and speaker ports are present on the board, which also supports CD audio.

—Carol Swartz

ATI Technologies, Inc.
(416) 756-0718
fax: (416) 756-0720
Circle 991 on Inquiry Card.

Mouse Systems Corp.
(510) 656-1117
fax: (510) 770-1924
Circle 992 on Inquiry Card.

TRENDS



WHAT'S NEW

SURGE AHEAD ON THE VL-BUS

Local-bus technology improves the performance of computer peripherals by letting them take a direct line to the computer's CPU. However, proprietary—and incompatible—local-bus implementations created another problem. To address this, the VESA (Video Electronics Standards Association) developed VL-Bus, an open local-bus standard.

VL-Bus accelerator boards enhance Windows performance by incorporating a dedicated chip that removes some of the burden of CPU-intensive screen operations. VRAM (video RAM) on the boards has its own processing logic and is designed to transfer and display an image on the screen, which also adds processing power to the board.

At the heart of Diamond Computer's (Sunnyvale, CA) Viper VLB (\$549) is the Weitek P9000 accelerator chip. The Viper VLB features 2 MB of VRAM, which directly processes a variety of graphics functions. The board supports 16.7 million colors at 640- by 480- and 800- by 600-pixel resolution and up to 256 colors at 1280- by 1024-pixel resolution and 74-Hz refresh rate. Software shipping with the board includes Panacea's TurboDLD Deluxe for AutoCAD and Diamond's own Turbo Windows

drivers for Windows 3.x.

Hercules' (Fremont, CA) single-slot, 32-bit Graphite VL board (\$449 and up) is available in 85-MHz and 135-MHz video DAC (D/A converter) configurations. The two versions use Integrated Information Technology's 50-MHz AGX015 graphics accelerator. The 85-MHz DAC board has 1 MB of VRAM and displays at resolutions of 640 by 480 pixels up to 1280 by 1024 pixels.

Based on its new 64-bit MGA graphics chip, Matrox's (Dorval, Quebec, Canada) MGA Ultima (up to 1280- by 1024-pixel resolution, \$899, and up to 1600- by 1200-pixel resolution, \$1049) includes 2 MB of VRAM and MGA Impression (up to 1280- by 1024-pixel resolution, \$1299) includes 3 MB of VRAM. The boards feature base resolutions of 1280 by 1024 pixels in 256 colors (noninterlaced) and 1024 by 768 pixels in 24-bit color (interlaced). Advanced features include 3-D and laser-printing acceleration; a virtual desktop, which lets you work in a display larger than that physically available on your monitor; hardware-assisted Video for Windows, which lets you scale up the basic 160- by 120-pixel video screen to be easily visible on a 1024- by 768-pixel display; and the capability to

change resolution on the fly via a hot key.

Combining the S3 86C928 chip, 2 MB of DRAM, 1 or 2 MB of VRAM, a 135-MHz RAM-DAC, and a flash-memory-based BIOS that you upgrade via a floppy disk, Number Nine Computer's (Lexington, MA) #9GXe (\$495 and up) provides yet another route to high-performance graphics on the VL-Bus. With a programmable frequency synthesizer for software-selectable resolution and refresh rates, the #9GXe has refresh rates of up to 90 Hz. The board displays at resolutions of 640 by 480 pixels up to 1280 by 1024 pixels.

STB's (Richardson, TX) Horizon/VL (\$249), based on the Cirrus Logic GD5426 chip, has 1 MB of DRAM that has a 70-ns access time. STB, which is positioning the Horizon/VL as an entry-level accelerator, says the board can process GUI instructions up to 10 times faster than a standard VGA board. An on-board EEPROM stores monitor configuration and frequency options generated via a CLMODE utility.

—Carol Swartz

COMPANY INFO

Diamond Computer Systems, Inc.

(408) 736-2000

fax: (408) 730-5750

Circle 994 on Inquiry Card.

Hercules Computer Technology, Inc.

(510) 623-6030

fax: (510) 623-1112

Circle 995 on Inquiry Card.

Matrox

(514) 685-2630

fax: (514) 685-2853

Circle 996 on Inquiry Card.

Number Nine Computer Corp.

(617) 674-0009

fax: (617) 674-2919

Circle 997 on Inquiry Card.

STB Systems, Inc.

(214) 234-8750

fax: (214) 234-1306

Circle 998 on Inquiry Card.

FIRST IMPRESSION

MICROSOFT PROFIT EASES ACCOUNTING CHORES

For people in small businesses who simply abhor the idea of accounting, Microsoft may have a painless cure with Profit—a business management and accounting package that was developed for Microsoft by accounting specialists Great Plains Software (Fargo, ND).

Aimed at small businesses of about 25 employees, Profit offers accounting novices a soup-to-nuts path toward getting their businesses organized according to the GAAP (generally accepted accounting principles) that the accounting profession uses. Microsoft claims that Profit, which I previewed in a beta release, can do just that for the accounting-unaware business user. In fact, the company's goal is for Profit to work well for people with little or no accounting experience.

Profit allows novices to point and click at electronic versions of the types of reports already used in their businesses. Combined with Microsoft's Wizards help facility, which leads new users through the steps of creating ledgers, billing, and financial statements, as well as managing money, inventory, projects and employees, Profit offers a way for the uninitiated to approach the accounting dilemma.

Rather than requiring any accounting knowledge, Profit does most of the accounting basics, allowing you to simply fill in conventional business forms, such as invoices, check registers, purchase orders, and so on, while the program calculates the bulk of the accounting behind the scenes.

Profit is organized into six business-activity categories: Transactions, Cardfile, Reports, Profit Signs, Wizards, and Accounting. Of these cat-



egories, Profit Signs hits the bull's eye when you consider the ultimate goal of any small business. Since cash-flow problems often pose the greatest threat to the success of a new company, Profit provides summary reports that offer quick and easy ways to track the progress of a business.

Making a profit, after all, is the goal of a business, and Profit offers an appropriate tool to entrepreneurs who want to track profitability according to several indicators. The Profit Signs category lets you track profitability through the use of six types of reports: business summary, cash flow, sales, profit, inventory, and project. The Profit Signs reports are customizable with more than 500 variables to show information critical to business performance. Profit also has limited OLE support, letting you link information to Windows Graph. Microsoft will offer several types of product-support plans directly through Great Plains Software, although pricing plans were not available.

—Patrick Waurzyniak

Profit

\$199

System requirements:

A 386 or higher, 2 MB of RAM (4 MB of RAM recommended), and Windows 3.0 or higher.

Microsoft Corp.

Redmond, WA

(206) 882-8080

fax: (206) 936-7329

Circle 993 on Inquiry Card.

I WANT MY WINDOWS TV

Coming soon to a TV near you: Modular Windows from Microsoft—Windows that could become a standard interface for consumer entertainment and information devices. Modular Windows fits into 1 MB of execute-in-place ROM and can run on systems with only 1 MB of RAM. In late 1992, the first implementation shipped inside Tandy's CD-ROM VIS (Video Information System). You control the user interface, which has a 3-D appearance but no pull-down menus, with a hand-held remote control.

Microsoft is demonstrating even more advanced applications, including a prototype interface for interactive TV. With the software, you could watch a baseball game and, at the same time, call up player statistics or the scores of other games. Or, while watching a rock video, you could ask to see the lyrics and a list of song titles and then order a CD and have it billed directly to your cable account. These features could be built into new TVs and VCRs or, for the huge base of installed equipment, into "smart" TV-top boxes. The fate of Modular Windows lies in what kinds of deals Microsoft negotiates with leading players in the consumer-electronics, information-delivery, and content-creation fields. Microsoft's ace in the hole is that Modular Windows uses many of the same API calls as Windows 3.1 does, so developers can use their Windows code to create software for VIS and other devices.

—Andy Reinhardt

WHAT'S NEW

MULTIMEDIA MANIA

Microsoft's Multimedia Extensions to Windows 3.1 has resulted in a wave of multimedia products for PCs. You can personalize your desktop with sound effects and animated icons and cursors; enhance Windows fonts; integrate video, audio, and animation into business and personal communications; and capture and play back anything your



Erudite Software's Noise for Windows.

Windows PC can display.

DeltaPoint (Monterey, CA) offers Animated Desktop for Windows (\$59.95), a utility that lets you personalize your desktop with animated icons and cursors, as well as sound effects linked to common computing tasks. With the paint tools, you can design icons and cursors from scratch or modify your application's existing ones. Once

completed, VCR-like controls let you stack images together like frames in a movie. Animated Desktop for Windows lets you control the timing and repetition of the animated images, as well as combine them with prerecorded sounds.

Q/Media Software (Vancouver, BC, Canada) provides two presentation programs:

Q/Media Professional for Windows and Q/Media for Windows. The two programs offer a number of ways to let you create high-quality presentations. They also let you integrate video, animation, audio, imaging, graphics, and text from Windows, DOS, and Mac applications.

The higher-end product, Q/Media Professional for Windows (\$495; shipping August 1), adds authoring capabilities to create interactive presentations and multimedia titles. It also supports Microsoft Modular Windows. Q/Media for Windows (\$99) supports Microsoft Video for Windows digital video software.

Both Q/Media products feature OLE support, a time line to synchronize objects, and a slide-sorter outliner to organize presentation flow. In addition, they have more than 10 MB of animation, digital video, audio, and graphics images—clip art and sound and motion files organized into templates.

Meanwhile, with Windows' multimedia sound capabilities, you can add audio to your applications. Erudite Software's (Louisville, KY) Noise for Windows (\$49.95) lets you add audio feedback to Windows' visual feedback. You can add sound to everyday Windows events, such as min-

imizing a window or opening a file.

Taking multimedia a step further, Microsoft Video for Windows adds a standardized format for audio and video capture and playback with its AVI

(Audio Video Interleave) file format. It also lets you view digital video on a range of products from notebooks to workstations.

Among the software designed for Video for Windows, Media Merge (\$395) from ATI Technologies (Scarborough, Ontario, Canada) provides a low-cost way to integrate video into your communications. With its Scene Editor, you can cut, and paste source material. Then, with the Audio Editor, you can create, edit, and record audio to customize the finished product. The Storyboard Editor lets you add special transition effects between scenes and produce a video in AVI format to run on a desktop computer, output to videotape, or distribute using the run-time utility.



ATI Technologies' Media Merge.

A memory-resident utility for Video for Windows, Vision Software International's (Santa Clara, CA) CameraMan for Windows (\$149) lets you capture and play back Windows screen activity. It lets you continuously capture Windows screen action in AVI format. CameraMan produces a highly compressed movie in AVI format that you can edit with VidEdit and play back with MediaPlayer; both tools are included in Video for Windows.

You can also create screen shots in DIB (device-independent bit-map) format, create sequences of screen shots in DIB format, and capture the contents of the screen, a selected area, or a selected area defined by the movement of the cursor.

—Martha Hicks

COMPANY INFO

ATI Technologies, Inc.
(416) 756-0718; fax: (416) 756-0720
Circle 999 on Inquiry Card.

DeltaPoint, Inc.
(408) 648-4000; fax: (408) 648-4020
Circle 1006 on Inquiry Card.

Erudite Software
(800) 786-6473
(502) 451-7712; fax: (502) 451-7681
Circle 1007 on Inquiry Card.

Q/Media Software Corp.
(604) 879-1190; fax: (604) 879-0214
Circle 1008 on Inquiry Card.

Vision Software International
(408) 748-8411; fax: (408) 748-9584
Circle 1009 on Inquiry Card.

WHAT'S NEW

EASY BACKUP

The Windows GUI makes using some packages so easy that simple menus and a few mouse-clicks are all you need to get a job done. For example, with the DMS/IB for Windows (\$120) hard disk backup package from Sterling Software (Rancho Cordova, CA), you can easily initiate a backup or restore of your hard disk data. You do not need to understand backup theory to make appropriate backup decisions because DMS/IB automatically reviews your system and then recommends the appropriate level of backup. It also saves time and disk space through the use of a nonredundant process that delivers three levels of backup: full, incremental, and consolidate.

DMS/IB backs up to all media that a DOS drive can address. It also supports Wangtek, Archive, and Tandberg tape drives that use the QIC-50 standard, as well as SCSI devices. It can also perform automated unattended backup to a LAN file server or mainframe virtual disk using communications links.

—Martha Hicks

Sterling Software, Inc.
(916) 635-5535; fax: (916) 635-5604
Circle 1010 on Inquiry Card.

FIRST IMPRESSION

NETMODEM/E FOR WINDOWS FOR WORKGROUPS

Conspicuously absent from Microsoft's Windows for Workgroups is a way for remote users to dial in to a WFW network. Microsoft's only solution so far—a cumbersome workaround involving LAN Manager and its Remote Access Service—doesn't cut the mustard.

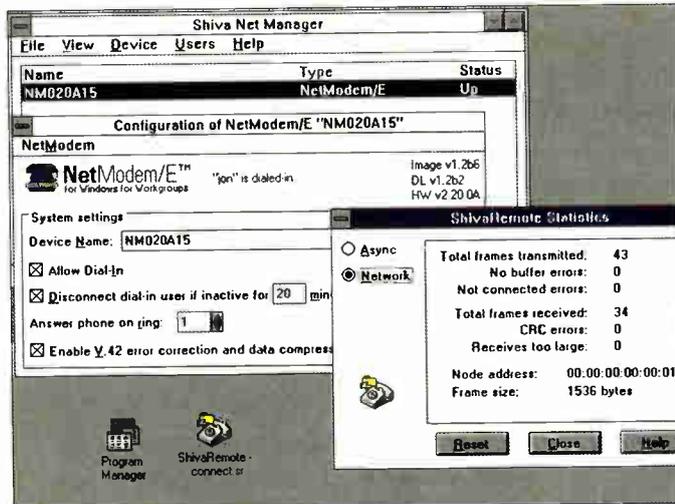
Fortunately, Shiva has come to the rescue with a version of its NetModem/E built just for WFW. Like its NetWare-oriented predecessor, NetModem/E hums along at the V.32bis rate of 14,000 bps and supports V.42bis compression and V.42 error correction that can quadruple throughput if you're dialing in from another V.42 modem.

NetModem/E connects to your WFW network by way of a snap-in "EtherModule" that can support thin Ethernet (which is what I used), thick Ethernet, or 10BaseT. Unlike the original NetModem/E, which handles dial-in, dial-out, and network-to-network routing, the WFW version only does dial-in.

Software components are Shiva Net Manager, Shiva Remote, and an asynchronous Ethernet driver that you install using normal WFW procedures (see the screen). You run Shiva Net Manager to check the status of the NetModem/E, upgrade its software, configure security (e.g., lists of users, passwords, and dial-back phone numbers), and tell it how long to retain idle connections.

Shiva Remote starts and stops the link and monitors its status at two levels: asynchronous and network. Shiva's installation program also updates WFW's virtual NetBEUI protocol driver (boosting timeouts to compensate for the slow link) and recommends that you propagate that driver throughout your WFW network. The beta version of NetModem/E I tested required me to manually edit PROTOCOL.INI to toggle between the Xircom driver I use when my WFW laptop is in the office and the Shiva remote driver I use when I take that machine home; however, according to the company, that switching will be more automatic in the final release of NetModem/E for WFW.

Although I used WFW's dual-network feature to run alongside NetWare and had both WFW and NetWare versions of the NetModem/E hooked to my office LAN, the combination didn't add up to remote dual-network access. The original NetModem/E speaks only IPX, and the WFW version speaks only Net-



Managing the NetModem/E for Windows for Workgroups.

BEUI. You can use them sequentially (after rebooting) but not together. A bilingual NetModem/E supporting both protocols (and consolidating multiple versions of the Shiva Net Manager into a single utility) would be a nice enhancement.

When I dialed in from home, all the resources of the office WFW network were available. I dragged files across the link, collected and sent mail, updated my appointment book, managed the NetModem/E, and even ran ODBC (Open Database Connectivity) queries from my home machine against a table managed by the SQL Server running on a Windows NT machine in the office. (The bidirectional link supports WFW's peer-to-peer capabilities; my home machine published resources that were also visible to users back in the office.)

The mail connection, in particular, will appeal strongly to WFW users. Tethered to a LAN cable, Microsoft's Mail and Schedule+ are of limited value to users who travel frequently or work at home. Stretching that tether through the phone network is a powerful justification for the latest incarnation of the popular NetModem/E.

—Jon Udell

NetModem/E for Windows for Workgroups 1.0
\$1699

System requirements:

A Windows for Workgroups LAN and a modem-equipped remote WFW machine.

Shiva Corp.
Burlington, MA
(800) 458-3550
(617) 270-8300
fax: (617) 270-8852

Circle 1011 on Inquiry Card.

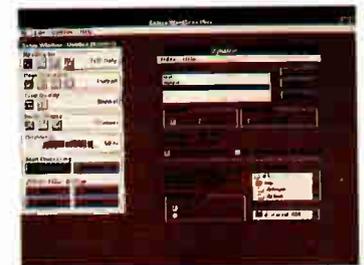
WHAT'S NEW

DEALING WITH DOCUMENTS

The Windows Edition of Mastersoft's (Scottsdale, AZ) Word for Word (\$149) supports document conversion among more than 100 personal computer and Macintosh word processing, spreadsheet, mail-merge, and data formats. It offers a file viewer that lets you see a text snapshot of your file prior to converting; the viewers support the original document's fonts, colors, text highlighting, and page layout.

A document-imaging and retrieval system, ZyLab's (Northbrook, IL) ZyImage (\$895) integrates Calera Recognition Systems' WordScan, an OCR system, with ZyLab's ZyIndex text-retrieval software.

You can scan documents, perform OCR, and immediate-



ZyLab's ZyImage.

ly index and store the document image and the recognized text. You can retrieve a document image using full-text searches. You can also integrate scanned documents with electronic text such as E-mail or word processing on stand-alone or personal computers on a network.

—Martha Hicks

COMPANY INFO

Mastersoft

(602) 277-0900
fax: (602) 970-0706

Circle 1012 on Inquiry Card.

ZyLab

(800) 544-6339
(708) 459-8000
fax: (708) 459-8054

Circle 1013 on Inquiry Card.

"I couldn't find a powerful CASE tool that was affordable. So I designed one."

JAN POPKIN, CHIEF SCIENTIST
POPKIN SOFTWARE & SYSTEMS, INC.

"I'm an engineer. And I know what it's like to need a high-performance and easy-to-use CASE tool. One that I could afford to place on every project team member's desk, not just a select few. That's why I developed System Architect."

As Chief Scientist at Popkin Software, my role is to bring the experiences of our developers to bear on the design of the best CASE tool possible. System Architect is the result."

Low Price. High Performance.

Since its introduction in 1988, System Architect (SA) has proven that many of the features



MICROSOFT
WINDOWS

offered by more expensive CASE tools are available for a fraction of the cost. There are now more than 12,000 SA copies in use at 3,000 installations worldwide.

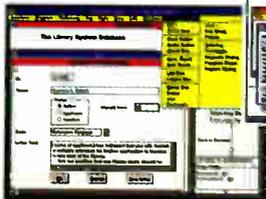
Quick And Easy.

System Architect works on IBM® and IBM-compatible PCs running MS Windows® or OS/2 PM®. It comes with an integrated data dictionary that users can customize to meet their needs. Project personnel can easily share information both on and off a network. It's so user-friendly that even from the first day you can sit down, get to work, and produce results.

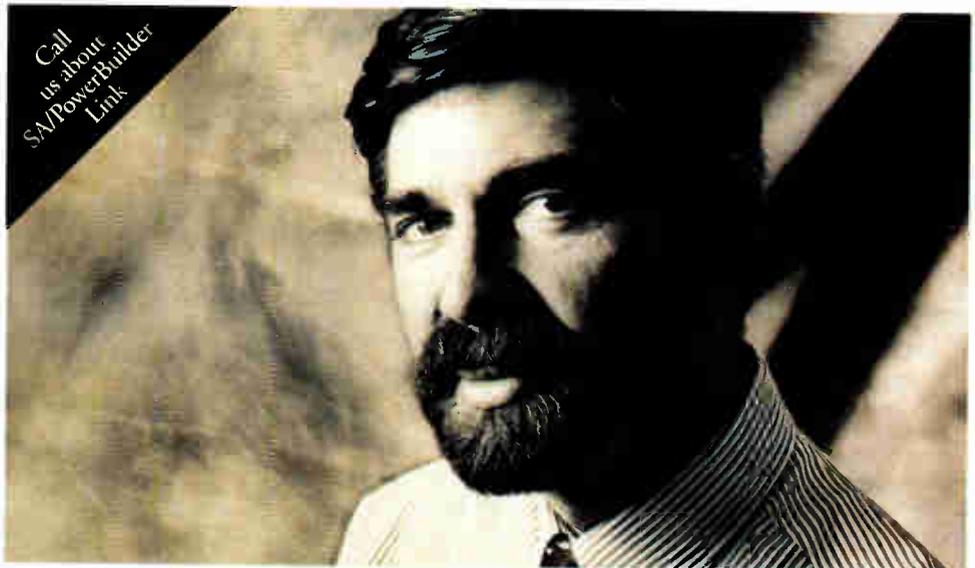
Multiple Choice.

SA works with multiple methodologies: Yourdon/DeMarco, Gane & Sarson, Ward & Mellor (real-time), Shlaer/Mellor (OO), Information Engineering, SSADM, and ER diagrams.

▼ Develop screens for GUI or character-based applications.



▲ Bring existing SQL databases into a CASE environment for simple management and/or forward engineering.



The Power To Grow.

To respond to advances in technology such as Client/Server Architecture, SA continues to grow in functionality and productivity. A few optional modules now offered are:

SA Reverse Data Engineer: Provides reverse engineering of Windows dialogs/menus and SQL databases, including DB2, Informix, Oracle, and SQL Server; provides generation of graphic screens and menus from .DLG and .MNU files; ensures new SQL database applications are built with the proper design integrity.

SA Screen Painter: Allows you to create GUI or character screens as well as to edit screens generated automatically from your SA Data Dictionary or captured from existing Windows applications; generates MS Windows dialogs, COBOL screen sections and associated data structures.

SA Schema Generator: Translates entity models from the encyclopedia into schema for DB2, Oracle, Ingres, SQL Server, Rdb, PROGRESS, Paradox, SQL Base, AS400 (SQL & DDS), Interbase, OS/2 DBMS, dBASE III, XDB,

SYBASE, and Informix. Generates Windows DLGs, and C type data definitions or COBOL data structures.

SA Object Oriented Analysis & Design (OOA/OOD): Supports Booch '91 and Coad/Yourdon.

SA Network Version: Diagram and data dictionary record locking allows multiple project members to work concurrently on the same project.

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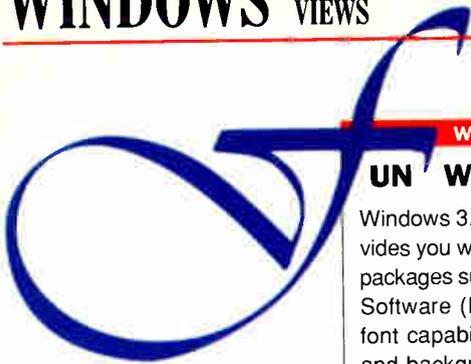
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11 Park Place, New York, NY 10007
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Circle 98 on Inquiry Card.

World Radio History



WHAT'S NEW

FUN WITH FONTS

Windows 3.1's support of TrueType and its scaling capabilities provides you with virtually unlimited font possibilities. Font enhancement packages such as TrueEffects for Windows (\$59.95) from MicroLogic Software (Emeryville, CA) let you enhance Windows' TrueType font capabilities with your choice of patterns, outlines, shadows, and backgrounds. TrueEffects for Windows prints your fonts just like any other TrueType fonts.

—Martha Hicks

MicroLogic Software
(510) 652-5464
fax: (510) 652-5040
Circle 1014 on Inquiry Card.

FIRST IMPRESSION

PERFECTLY PRESENTABLE PRESENTATIONS

WordPerfect Presentations for Windows 2.0 offers everything you need to prepare polished presentations—you can create handouts, add speaker notes to keep you on track, and even add sound. An interactive interface makes preparing presentations painless (for a roundup of presentation packages, see "Presentations to Go" on page 99).

On start-up, WordPerfect Presentations looks like a glorified Windows Paint program with icons and menus on each side of the screen. A status line near the bottom tells you what specific mouse-clicks and keystrokes accomplish at each moment. Below that line, another command line is dedicated to slide-show maneuvering. In addition, you can create custom button bars for rapid command execution or use one of the nine mode-specific button bars supplied with the program.

With WordPerfect Presentations, you can either draw your own graphics or edit imported graphics. The program's grid is capable of precise sizing in several units of measurement. You can also create custom pattern fills, draw Bézier curves, snap text or objects to paths, and edit bit-mapped images. At all times, you have access to a 256-color palette. Painting and text modes are complete enough to allow you to prepare a presentation from scratch without leaving the

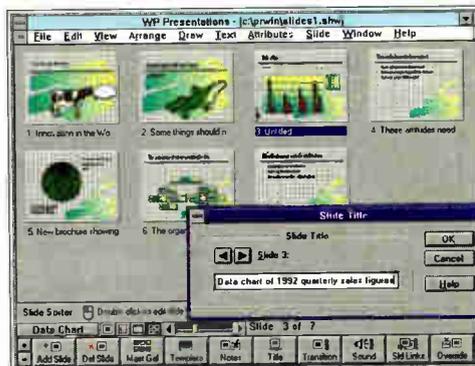
confines of the program.

What would business presentations be without charts? WordPerfect has made the charting features of Presentations basically automatic. You just input the data in the top half of your split screen and watch it appear graphically in the bottom half. You can also import data from spreadsheets and choose from various bar, scatter, flow, organizational, line, pie, and area charts.

If you need a presentation in a hurry, you can whip up one fast by using one of the 60 pre-designed Master Gallery slide shows. Each of these consists of about seven graphically consistent templates, including a title screen, background templates, charts, bulleted text, and plain text screens. You can add your own text—and graphics, if you feel creative.

WordPerfect Presentations ships with more than 1000 clip-art images. Once you have chosen a template, you can view your slide show in four modes: The *outliner* mode, which contains the text; the *slide* mode, which shows individual slides; the *slide-sorter* mode, which displays thumbnail sketches of all the slides (see the screen); and the *template* mode, which shows how the slides are linked with sound and graphical transitions.

It is easy to add, delete, and



In the slide-sorter mode, you can see your presentation and easily change the order of the slides by dragging and dropping individual slides. You can change the background style by simply selecting a different master slide show.

juggle slides; for example, if you're almost finished with your presentation but are using the pre-designed templates and decide you want a different background, you simply head back to the Master Gallery and click on a different style. Your text remains intact.

Of the 40 or so ways to blend slides graphically, my favorite transitions are side weave, snake, scroll, wipe, and pour. To automate the presentation, you can instruct the program to move to the next slide after a specified period of time. If you prefer manual control, just link the transitions to mouse-clicks.

Adding sound is easy, but you need a sound card. WordPerfect Presentations ships with more than 100 MIDI files that loop or fade. It also supports digital-audio files. You can link a different clip to each slide or have one cycle repeatedly. You can even set the entire presentation to loop.

Many features of WordPerfect Presentations make it interactive, such as slide linking and the presentation highlighter. Slide linking lets you link any one slide to another with a

keystroke or mouse-click. You choose whether to see the linked slide. The highlighter lets you draw on the slides during the presentation.

When you're finished, you can create a run-time file of the slide show. Run-time files include the necessary data to run your presentation on a compatible system without the WordPerfect Presentations application.

WordPerfect for Windows is not a program you can learn in an hour; however, it won't take long for you to feel comfortable with its impressive array of capabilities.

—Selinda Chiquoine

WordPerfect Presentations for Windows 2.0
\$495

System requirements:

A 386 or higher and at least 4 MB of RAM recommended.

WordPerfect Corp.
Orem, UT
(800) 451-5151
(801) 222-5000

fax: (801) 222-5577

Circle 1015 on Inquiry Card.

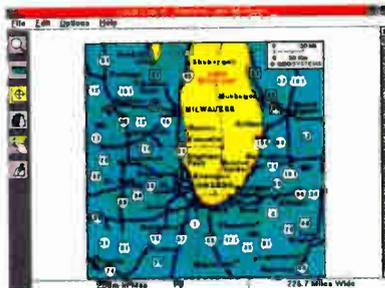
WHAT'S NEW

PUTTING WINDOWS ON THE MAP

Windows' visual environment lends itself to visual analysis and presentation. And what's more visually informative than a map?

MapInfo's (Troy, NY) Maps&Data (\$395) is a low-cost mapping package for desktop personal computers that can display data geographically to present an informative view of business situations and trends. Maps&Data features geographic, demographic, and statistical data; graphics and design elements such as colors, symbols, fill patterns, and borders; charts and graphs; and drawing tools.

You can import and export



Strategic Mapping's Local Expert.

data files in dBase, Lotus, and Excel formats; select data according to user-defined parameters for further analysis; and thematically shade boundary maps and display statistical data with graduated symbols, pie charts, and bar charts. In addition, you can zoom in or out on geographic views; create point maps that correlate data to a geographic location; display data about a coun-

try, state, county, or city; and label geographic points with text and data.

Strategic Mapping's (Santa Clara, CA) Local Expert (\$99) is designed to be a comprehensive personal travel assistant for mobile computer users. The affordable mapping package gives you fingertip access to the best restaurants, sporting events, nightlife, shopping, and recreation in the U.S. and abroad.

Local Expert provides street-level maps of major business areas with city-specific information. The package lets you choose only the cities to which you plan to travel, along with recommendations and descriptions of activities for each location you plan to visit. It also provides more than 140 categories of interest for each city, with locations available for more than 100 cities in the U.S.,

Europe, the Far East, and other areas.

Using a notebook computer, for example, you can familiarize yourself with your new surroundings using Local Expert maps. You can then search for specific locations. Local Expert includes a core set of regional maps for the world that includes major U.S. and European highways, plus utilities to locate places, ZIP codes, and area codes; measure distances; and import data onto a map.

—Martha Hicks

MapInfo
(518) 274-6000
fax: (518) 274-6066
Circle 1016 on Inquiry Card.

Strategic Mapping
(408) 970-9600
fax: (408) 970-9999
Circle 1017 on Inquiry Card.



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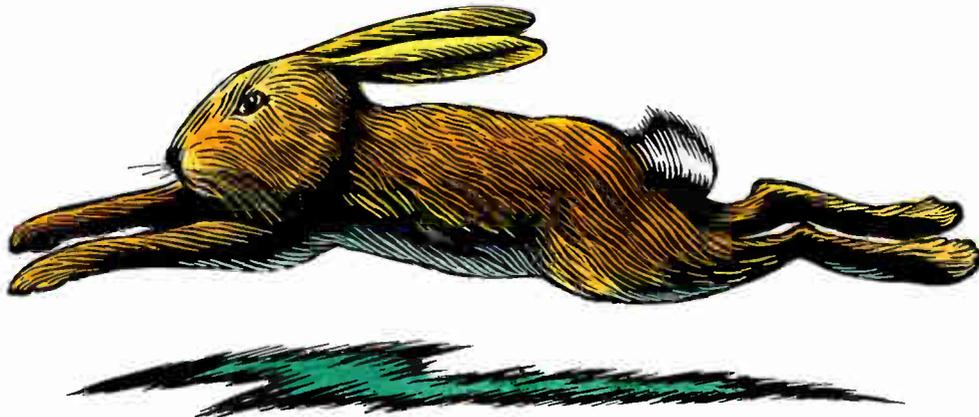
Call one of these to find the address of your nearest distributor:
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Recognita Corp. of America 1156 Aster Avenue, Suite F Sunnyvale CA 94086 Phone: 1-408/241-5772 Fax: 1-408/241-6009
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WHAT'S NEW

WINDOWS: THE GOOD AND THE CAD

When asked what advantages Windows brings to the CAD environment, IMSI's (San Rafael, CA) president Martin Sacks said, "The benefit that Windows brings to a CAD environment is its visual representation of drawing methods. For example, you can visually emulate drawing elements such as lines, ellipses, and circles directly on a PC screen."

The Windows version of IMSI's 2-D CAD software package, TurboCAD Professional 1.0 (\$395), offers Parametric Programming and an Automated Design programming language that automates repetitious design or drafting work. The program also lets you preset and define hot keys for all functions; import and export INT, DXF, and IGES files; and import ASCII text files. Features include 13 dimensioning methods and more than 40 hatch patterns. You can operate all the features of TurboCAD using a mouse (or a digitizer), the keyboard, or a combination of both.

A gray-scale painting program for Windows, called Fractal Design Sketcher (\$144 or £99) from Letraset Software Products (London, U.K.), offers natural-media drawing tools, such as pencils, chalks, charcoals, crayons, erasers, calligraphy pens, spray paint, and an assortment of paint brushes for oils and watercolors. The program also includes drawing surfaces, such as a range of paper and canvas textures, to which you can apply a customized angle of light reflection.

The cloning feature lets you re-create an image manually or automatically, and the Tracing Paper effect lets you rework an image and save the new image independent of the original. Photo retouching features include rotatable and resizable fiskets for masking. You can posterize, solarize, sharpen,

soften, distort, flip, and rotate images. Fractal Design Sketcher also lets you control contrast and brightness and import Type 1 and TrueType fonts as stencils. You can also scale, rotate, and file the text outlines with special effects, such as textures or photographs.

CADworks (Cambridge, MA) offers two Windows-based CAD packages—Drawbase for Windows, a CAD program with integrated database management, and a companion product, DecisionBase, a decision-support software program. Albert Moulton, president of CADworks, says, "The graphical user interface makes life much easier when switching between our CAD software programs and other Windows applications."

The CAD component of Drawbase for Windows contains 2-D drafting and 3-D design features. The package's integrated database manager can produce material schedules, cost estimates, space charge-backs, and other reports based on the Drawbase CAD layouts. A tablet interface provides direct access to system commands and the Windows tear-off toolbox menus let you customize the layout of the on-screen menus to position frequently used commands on-screen.

The Toolbar provides easy access to status information, such as drawing format, scale, and units, as well as immediate access to strategic data management information. The Win-



CADworks' Drawbase for Windows.

dows version also offers redlining, a function that attaches graphics and notes to drawings.

Drawbase for Windows is available in modules, which range in price depending on features: Drawbase 2000, \$2200; Drawbase 3000, \$3300; Drawbase 4000, \$4400; and Drawbase 5000, \$5500.

The companion product, DecisionBase (\$500 per license or \$2500 in packages of six), allows you to view CAD drawings and extract database information, which you can analyze for strategic and planning purposes. You can select layers to display, zoom in, back zoom, and pan around the CAD drawings to view graphics information in detail. The Database Reports feature can display information from your active drawing or multiple drawings you have stored on disk or on a network.

When you select a graphics object, the corresponding database record appears on-screen. As you browse through data-

base records, DecisionBase highlights the corresponding graphics object on your CAD drawing. After you view a database record, the Search and Locate feature allows you to zoom in automatically to the associated object in the CAD drawing. With the Annotate function, you can then place detailed notes on a CAD drawing and track this information in DecisionBase's on-line database manager.

According to Looking Glass Software (Inglewood, CA), Cheetah 3-D (\$349.95) gives you all the features you expect from great rendering software, including multiple light sources; Phong, Gouraud, and Flat shading; four viewing modes; 3-D sweeps and extrusion modeling; and basic animation capabilities. The program also provides a file navigator, support for complex objects, and multiple object rendering, which lets you select and render an image at low resolution.

The program also includes multiple-area rendering, selective ray tracing, separate modeling, super sampling anti-aliasing, and support for complex objects. Cheetah 3-D performs at resolutions of 640 by 480 pixels, 800 by 600 pixels, and 1024 by 768 pixels. The software produces true-color (i.e. 24-bit) images at each resolution.

—Martha Hicks

COMPANY INFO

CADworks, Inc.
(617) 868-6003
fax: (617) 354-3057
Circle 1018 on Inquiry Card.

IMSI
(415) 454-7101
fax: (415) 454-8901
Circle 1019 on Inquiry Card.

Letraset Software Products
+44 71 9283411
fax: +44 71 4012427
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(310) 348-8240
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ND
NEURON DATA

TRENDS

MICROSOFT DEMONSTRATES OLE 2.0

By the time you read this, Microsoft should have released the final SDK (Software Development Kit) for OLE 2.0 for 16-bit Windows, which will allow developers to add OLE 2.0 functionality to their Windows applications. Microsoft has already shown technology previews of the Windows implementation of OLE 2.0 at trade shows. The company is also planning to release a version of OLE 2.0 for Mac developers this summer.

OLE refers to object linking and embedding, where an OLE-compliant word processing program can contain a live object (e.g., a spreadsheet chart) that was created in another program such as Lotus 1-2-3 for Windows. Because the object is linked, when you change the object in the spreadsheet program, it becomes updated in the word processing program as well.

Microsoft says OLE 2.0 will improve on version 1.0 in a number of ways; for example, one complaint users made regarding OLE 1.0 was that its implementation in applications was sometimes confusing. If you wanted to update a chart embedded in a word processing document, you had to click on the chart and launch the application that created the object. Once you did that, you were no longer working with the chart in the context of how it would appear in the word processing document. Instead, you were editing the chart within the spreadsheet program. If you made the chart bigger, there was no way to tell if it would fit on the word processing document's page unless you quit the spreadsheet and jumped back into the word processing document. Needless to say, some users found the jumping back and forth to be painfully monotonous.

OLE 2.0 fixes that through in-place editing. When you click on an OLE object, you can edit the object within the context of its client document. In the previous example, if you wanted to edit the chart in OLE 2.0, the only thing that would change would be your program's menu bar: Instead of your menu being launched into a spreadsheet, the spreadsheet menu would simply replace your word processing program's menu. Once you finish making your changes, the menu reverts to the word processing menu; thus, you can instantly view the effect of an edit as it relates to other elements of the document.

Other features of OLE 2.0 are its use of the right mouse button and instant updating. If you are working on a word processor and are viewing a small portion of a spreadsheet created in and linked to Excel, you can use the right mouse-click to maximize the view of the spreadsheet file. In OLE 1.0, if you edited an object, you had to specifically update your edit so that it was reflected in the OLE client application; according to David Seres, group program manager at Microsoft's interoperability group, in OLE 2.0, all edits will be instantaneous.

Another important feature of OLE 2.0 is link tracking. Under the current version, if you move a client to another directory, the client/server link is broken. OLE 2.0 will offer the ability to move the consumer of an object around without it losing its link to the provider. Regarding nested objects, Seres said that there's nothing to prevent developers from using OLE 2.0 to tunnel directly to a nested object without requiring a user to double-click through multiple applications, but he added that OLE 2.0's guidelines will advise developers not to do so.

—Dave Andrews

UPDATES

Clock Manager 1.2A

\$49.95

Event-scheduling software

Graphical Dynamics, Inc.

Seattle, WA

(206) 935-6032; fax: (206) 935-2464

Circle 1022 on Inquiry Card.

NEW FEATURES: support for event-processing scripts written in Windows Interface Language; automation of complex, multistep processes; and more options for scheduling recurring events.

Distinct TCP/IP for Windows 3.0

\$495

TCP/IP connectivity software

Distinct Corp.

Saratoga, CA

(408) 741-0781; fax: (408) 741-0795

Circle 1023 on Inquiry Card.

NEW FEATURES: easier installation and configuration, the capability to install only the portions of the program you need, and the RPC client/server's ability to run over TCP or UDP.

FirstApps 2.0

\$99.95

Windows utilities

hDC Computer Corp.

Redmond, WA

(206) 885-5550; fax: (206) 881-9770

Circle 1024 on Inquiry Card.

NEW FEATURES: memory, resource, and disk viewers; a file compression program with viewing and updating capabilities; updated versions of five file management tools.

Instant Database 2.0

\$95

Data management software

Asymetrix Corp.

Bellevue, WA

(206) 462-0501; fax: (206) 455-3071

Circle 1025 on Inquiry Card.

NEW FEATURES: improved support for mailing labels, multimedia capabilities, new forms, and an auto-dialer.

Maximizer for Windows 1.1

\$249 (single user)

Contact management software

Richmond Technologies & Software, Inc.

Burnaby, BC, Canada

(604) 299-2121; fax: (604) 299-6743

Circle 1026 on Inquiry Card.

NEW FEATURES: record locking, multiple instances of the program running simultaneously, capability to transfer data between Maximizer databases, group scheduling, and increased security.

Why 8 out of 10 professionals choose OmniPage Professional.

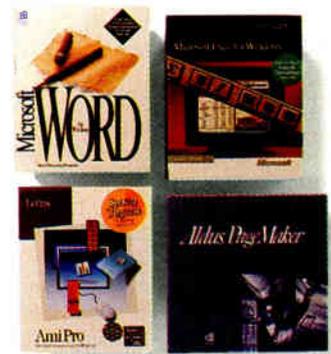
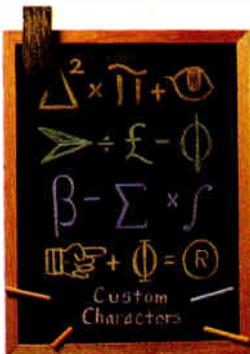
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Only *OmniPage* features AnyFont, HP AccuPage,™ and Caere AnyPage™ technologies, so it handles any page of text – even when your coffee cup gets in the way.

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trial version of *OmniPage*, including those from Hewlett-Packard, Epson, Microtek,™ and Apple. Why would they be any different than the rest of us?

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WHAT'S NEW

STICK TO THE FAX

According to Sean Shultz of Trio Information Systems (Raleigh, NC), "From a fax standpoint, the Windows environment offers built-in TrueType fonts and printing capabilities. Under Windows, you can grab information from the screen, add a cover sheet, merge in information from oth-

Windows application to any fax machine in the world, using any Class 1 or Class 2 fax modem. You can enter phone numbers by hand or choose them from a personal phonebook of more than 8000 entries. RapidFax automatically dials the number, generates a cover sheet (which you create and store), and signals you when the transmission finishes.

RapidFax lets you send faxes to one or more groups of individuals. It also automatically redials and lets you schedule faxes for transmission during off-peak hours. In addition, you can

merge text, graphics, tables, and charts in your fax documents, and you can send faxes in standard (196 by 98 dpi) or fine mode (196 by 196 dpi).

Two other versions of RapidFax—RapidFax Pro (\$99) and RapidFax Gold (\$129)—have all the features of RapidFax, as well as RapidLink data communications software, which offers full background operation, batch dialing, function-key macros, and custom screen configuration. In addition, RapidFax Gold adds OCR capabilities to RapidFax. RapidFax OCR can convert fax documents into editable text.

You can use Prisma-Fax, Prisma Office's (Slough, Berkshire, U.K.) stand-alone or network fax package to create, transmit, and receive faxes from within Windows applications. You can create standard corporate and personal headers within Prisma-Fax using popular word processing packages. The software provides an on-screen directory of incoming and outgoing faxes. You can print any incoming fax. Prisma-Fax (stand-alone version: \$188 and up or £130 and up) supports major modems and networks. *continued*

Trio Information Systems' DataFax.

er documents, and press Send."

Trio Information Systems' DataFax lets stand-alone and network users send faxes (single user: \$79 or \$129 with OCR and Search and Find; network version: \$595 for five users). The Captive icon that appears on your screen's upper right corner lets you clip data from any Windows application, instantly append a fax address, and send it on its way, without leaving your application. You can send faxes from within word processors, databases, or spreadsheets.

DataFax also offers OCR capabilities that can automatically process faxes on receipt, on demand from any queue in the DataFax system, or while viewing the fax. After you process fax images with the OCR features, you can export them in 12 popular applications formats. The routing feature redirects faxes on a network, the rejection feature lets you block certain incoming numbers to prevent junk faxes, and the relaying feature relays incoming faxes to an alternate number.

The Complete PC's (San Jose, CA) RapidFax for Windows (\$79) lets you send and receive faxes from within any

UPDATES

MindFrame 4.0

\$199.95

Visual information management and decision-making software

Virtual Scket Technology

Dallas, TX

(800) 238-2285

(214) 823-7988; fax: (214) 360-9581

Circle 1027 on Inquiry Card.

NEW FEATURES: GUI; facilities for zooming, grouping, alignment, sizing, and other layout parameters; parsing and searching functions; induction of rules from data with sensitivity analysis of dependent variables; pattern match searches; and vertical and horizontal hypertext linking.

Myriad for Windows 2.0

\$595

Document-viewing software

Informative Graphics, Inc.

Phoenix, AZ

(602) 971-6061; fax: (602) 971-1714

Circle 1028 on Inquiry Card.

NEW FEATURES: hyperlinking for connecting an area on a document with a new image or text; Softhooks technology for integrating information and graphics with document management systems; DDE and DLL support; customizable plot-queuing mechanisms with a network or at a single personal computer; support for 256 colors for CGM, PCX, and GIF images; and enhanced printing performance with support for vector devices through Windows drivers.

PC/TCP 2.2 for DOS and Windows

\$400

TCP/IP for PC software

FTP Software, Inc.

North Andover, MA

(508) 685-3300; fax: (508) 794-4477

Circle 1029 on Inquiry Card.

NEW FEATURES: enhanced speed and flexibility of the basic transport; automatic installation; and PCTCPNET, a Windows front end that provides print redirection and management through Windows 3.1's file manager or through FTP Software's own network-control panel.

Remotely Possible/Dial 2.1

\$199

Remote-control and file-transfer software

Avalan Technology

Holliston, MA

(800) 441-2281

(508) 429-6482; fax: (508) 429-3179

Circle 1030 on Inquiry Card.

NEW FEATURES: a 3-D-look user interface; status meters for file transfers; support for true color; and user-configurable reboot, inactivity, and delay timers.

When protecting your software against piracy and unauthorized use, make sure that your protection system has all the following qualities:

A GOOD HARDWARE KEY



Hardware-based software protection systems are now the standard worldwide. However, not all keys are the same. A good key should have all the following features:

- ✓ Compatibility and transparency. The key should work without any problem on your customers' computers. The user should be able to forget the key after connecting it.
- ✓ Unbreakable electronics. A customized ASIC (Application Specific Integrated Circuit) component should be integrated in the key. This prevents reverse engineering and makes cracking virtually impossible.
- ✓ A unique and inaccessible software developer's



code burnt into the ASIC. (This code should not be held in the key's memory, where it can be read and altered.)

- ✓ A Read/Write Memory inside the key should be available on demand. The memory should be writable in the field, on any PC, without any special programming equipment.
- ✓ Very low power consumption, enabling the key to work even under the worst power conditions, on PCs and laptops, with or without a printer.

POWERFUL SOFTWARE

- ✓ A Linkable Protection Module with which calls can be made to the key from any point in the protected program.
- ✓ An "Envelope" installation program. Such programs enhance security while making it possible to protect a software even without its source code.
- ✓ Sophisticated antidebugging and encryption mechanisms.



HASP® - The Professional Software Protection System

HASP® OFFERS YOU ALL THESE FEATURES AND MORE:

HASP was designed by a team of computer experts, professional cryptologists, and electrical engineers. As a result, HASP keys are supported by what is probably the best software in the market, and the HASP system has worked on every computer it has been tried on. In addition to all the features mentioned above, HASP provides:

- ✓ A Full Authorization System for protecting dozens of programs using only one key.
- ✓ A Pattern Code Security System (PCS) enabling parallel processing of multiple calls by the Linkable Protection Module.
- ✓ A Virus Detection option that can be incorporated in the protected program to check whether it has been infected by a virus.
- ✓ Several HASP keys can be connected (daisy-chained) one behind the other.

NETHASP- THE ULTIMATE SOFTWARE PROTECTION FOR NETWORKS

- ✓ Only one NethASP key is needed to run a protected program from many stations in a network. NethASP provides full support for protecting DOS and WINDOWS software under network environments, including Novell dedicated & non-dedicated servers, Lan Manager, Lantastic, Banyan, DLink, and NET-BIOS based LANs.

WHAT OTHERS ARE SAYING ABOUT US:

In all the products we tested, except the HASP, we could see through the encrypting and questioning procedures... and crack them.

CT Magazine (Germany) May '90

MemoHASP: ...of all the protection devices tested is without any doubt, the one which combines the best features.

PCompatible (Spain) Dec. '90

Trying to crack a program... that was protected utilizing all of HASP's features - is like searching for the Holy Grail.

Micro Systems (France) Dec. '90

PC dongles... come with varying claims as to their transparency. The majority suffer from problems when a printer is connected... the DESkey and HASP-3 are not affected...

Program Now (Britain) May '92

Of all keys tested, HASP is the most ambitious one... the quality of HASP manufacturing seems excellent.

PC Compatible (France) June '92



OPERATING ENVIRONMENTS

- ✓ **PC:** DOS, WINDOWS, OS/2, SCO UNIX, SCO XENIX, INTERACTIVE UNIX, AIX, AUTOCAD, DOS EXTENDERS, LANS
- ✓ **MAC (ADB port):** System 6.0.5 and up
- ✓ **NEC (Serial Port):** DOS, WINDOWS

AND THE BOTTOM LINE:

We offer some of the most competitive prices in the market. There are no hidden costs! Since 1984, HASP has enabled thousands of software producers in more than 40 countries, including several Fortune 500 companies, to protect their software.

Please call us for our HASP evaluation package.



North America: 200 Broadhollow Rd., Suite #207
Melville, NY 11747, USA
Tel: 800-223 4277
516-424 5100
Fax: 516-424 8300

International Office: ALADDIN KNOWLEDGE SYSTEMS LTD.
15 Beit Oved St., Tel-Aviv, Israel
P.O.Box:11141 Tel-Aviv 61110,
Tel: 972-3-5375795
Fax: 972-3-5375796

- Australia Conlab Pty. Ltd., Tel: 3 8985685 ■ Belgium Akkermans bvba, Tel: 3 2338826 ■ CSFR ATLAS Ltd., Tel+Fax: 2 766085 ■ Chile Micrologica S.A., Tel: 562 222 1388 ■ Denmark SC Metric a/s, Tel: 42 804200 ■ France Logidata Intl., Tel: 50707375 ■ Germany CSS GmbH, Tel: 201 749860 ■ Greece Unibrain SA, Tel: 1 6856320 ■ Holland Akkermans BV, Tel: 45 241444 ■ Italy Partner Data S.r.l., Tel: 2 33101709 ■ Korea Dae-A Engineering, Tel: 2 848 4481 ■ New Zealand Training, Tel: 4 5666014 ■ Poland System Tel: 061 45065 ■ Portugal Futurmatica Lda., Tel: 1 4116269 ■ South Africa D Le Roux, Tel: 11 886 4704 ■ Spain PC Hardware, Tel: 3 4493193 ■ Switzerland Opag AG, Tel: 61 7112245 ■ Taiwan Tecco Ltd., Tel: 2-555 9676 ■ Turkey Mikrobeta Ltd., Tel: 4-4677504

Circle 62 on Inquiry Card.

World Radio History

The groupware version of Prisma-Fax (\$718 or £495) allows network users to send and receive faxes without leaving their personal computer or workstation. They can also access the telephone book facility, as well as update or amend it. The telephone book also includes full search facilities. Other features allow you to incorporate existing documents and information into Prisma-Fax documents from within your Windows applications. You can schedule fax transmissions to send single faxes to multiple destinations and program the dispatch of nonurgent faxes at less-expensive rate periods or at specific times.

You can view faxes on screen as they will appear in hard copy and view dif-

ferent faxes simultaneously in individual windows. Fax-logging facilities automatically update and ensure that you have a record of all faxes sent and received.

—Martha Hicks

COMPANY INFO

Prisma Office Ltd.

+44 753 810899

fax: +44 753 810903

Circle 1036 on Inquiry Card.

The Complete PC

(408) 434-0145

fax: (408) 434-1048

Circle 1037 on Inquiry Card.

Trio Information Systems, Inc.

(919) 846-4990

fax: (919) 846-4997

Circle 1038 on Inquiry Card.

TRENDS

DEC WANTS TO BE FASTEST

DEC's first Alpha "PC" system, capable of running Windows NT, will be a tower system with six EISA slots and five bays running on the DECchip 21064 at 150 MHz. The system will be in the \$7000 to \$10,000 price range. The company says that in 1994, it plans to release a desktop system based on a low-cost implementation of an Alpha chip. DEC says the system will offer about two to three times the performance of systems based on an i486 system and could bring Alpha technology under the \$3000 mark.

DEC says this implementation of Alpha will not be done at the sacrifice of performance. However, the estimated performance of two to three times better than the i486 could put it in competition with Intel's Pentium. DEC officials haven't yet announced at what speed the chip will run. Meanwhile, Intel officials say the Pentium will be made available at a variety of processing speeds, so it's difficult to say at this point which processor will offer the most power.

However, if the chip's performance is comparable to that of the Pentium, DEC will find itself engaged in a price war with Intel, at least on the Windows NT platform. If you add the systems that will be based on the Mips R4000 family of chips, it becomes apparent that someone who wants to run Windows NT will be able to choose from a wide range of systems and processors on which to do so. Even better, the competition among vendors could get fierce, conceivably resulting in a price war similar to that waged in the summer of 1992, when vendors were announcing price cuts on 386- and 486-based PCs on a daily basis. That's good news for prospective Windows NT buyers (and for Microsoft, which would love to see a price war for Windows NT systems), but not so good for the hardware vendors. In terms of bargain prices, the summer of 1994 could be as hot as the summer of 1992.

—Dave Andrews

UPDATES

Searcher Professional for Windows 2.0

\$59.95

File and text-search utility

Cognitronix

Poway, CA

(619) 549-8955

Circle 1031 on Inquiry Card.

NEW FEATURES: faster searches; drag-and-drop operations; and capability to create ZIP files. Free Launch replaces Task Manager, and File Tree lets you initiate searches by double-clicking on folders.

Superbase 2.0

\$795

Relational database management software

Software Publishing Corp.

Santa Clara, CA

(408) 988-7518

Circle 1032 on Inquiry Card.

NEW FEATURES: improved Windows interface; visual design tools for rapid applications development; and extensions to Super Basic.

Windows Express 4.0

\$99.95

Application and file management software

hDC Computer Corp.

Redmond, WA

(206) 885-5550; fax: (206) 881-9770

Circle 1033 on Inquiry Card.

NEW FEATURES: status bar; task list; System Information window; improved menu editing; and an upgraded icon editor.

WinMail 1.5

\$495 (five-user pack)

E-mail software

Powercore International, Inc.

Manteno, IL

(800) 237-4754

(815) 468-3737; fax: (815) 468-3867

Circle 1034 on Inquiry Card.

NEW FEATURES: NetWare integration; keystroke-/mouse-compatible DOS client; viewers to display attached documents; support for latest MHS standard; and rules-based message filtering.

WinMaster 1.5

\$129.95

Productivity software

PC-Kwik Corp.

Beaverton, OR

(503) 644-5644; fax: (503) 646-8267

Circle 1035 on Inquiry Card.

NEW FEATURES: runs as Windows shell; full icon support; auto-start features; font control; and keyboard/function-key shortcuts.

The Heavyweight Champion Of Windows Comm Software Just Became Even More Of A Knockout.

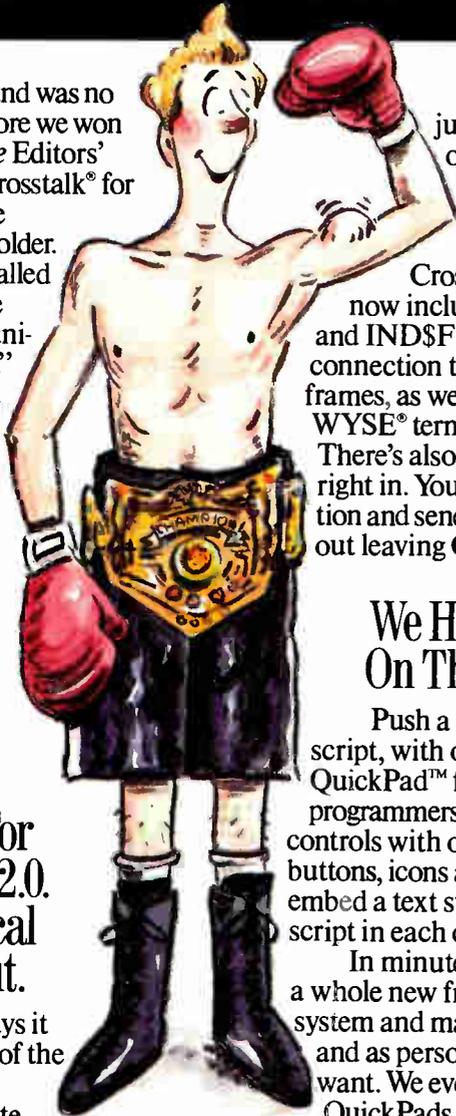
The first round was no contest. Long before we won the *PC Magazine* Editors' Choice Award, Crosstalk® for Windows was the undisputed title holder. *Software Digest* called it the "best of the graphical communications packages." *InfoWorld* named it "Product of the Year." And it won the *Windows Magazine* Readers' Choice Award.

But for all its power, we knew it had the potential to pack an even bigger wallop.

New Crosstalk For Windows 2.0. A Technical Knockout.

PC World says it "jumps far ahead of the last version" and "advances the state of the art in modem software." And you can see the difference the

minute you start it up. The interface is more functional, more convenient and just downright fun to use. A new QuickBar™ tool menu turns common tasks like downloading a file into a simple matter of clicking on an icon. And it follows Windows™ 3.1 interface standards to the letter.



But we didn't just put a new face on an old program. We also taught it a lot of new tricks.

For instance, Crosstalk for Windows now includes FTTERM and IND\$FILE support for connection to IBM® mainframes, as well as HP® and WYSE® terminal emulation. There's also a text editor built right in. You can edit information and send it out again, without leaving Crosstalk.

We Hit It Right On The Button.

Push a button and run a script, with our new object QuickPad™ feature. Even non-programmers can design custom controls with objects such as buttons, icons and pictures. Then embed a text string or an entire script in each object.

In minutes, you can design a whole new front end for a host system and make it as friendly—and as personalized—as you want. We even include pre-built QuickPads for accessing and navigating the major on-line services.

Now's The Time For You To Get Pumped Up.

You can have multiple comm sessions running at once—working on a VAX® link while you're connected to CompuServe®, for instance. You can remap your keyboard by moving keys on a graphical keyboard layout. Just drag and drop.

“Crosstalk for Windows sets the performance bar even higher for competitors in the Windows communications market.”
—PC World, October 1992

You can even import dialing directories from the DOS version of Procomm Plus™ (We want to make everything easy for you, including switching to Crosstalk.)

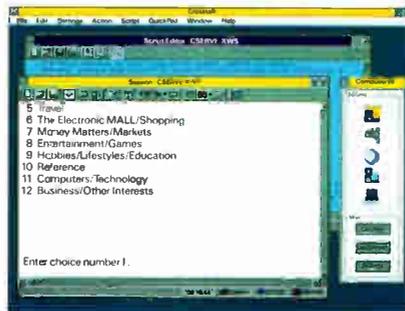
So climb into the ring. Registered users of Crosstalk for Windows and Procomm Plus can upgrade for only \$49, by calling our toll-free number.* Go a round or two with Crosstalk for Windows 2.0, and you'll know why it's the winner and still champion. To upgrade or for more information, call

1-800-348-3221, ext. 25DD:**

CROSTALK

Another Communications Solution From DCA®

*Offer expires June 30, 1993, and is available in U.S. and Canada only. Must show proof of ownership. **If outside the U.S., call (404) 475-8380. ©1992 Digital Communications Associates, Inc. All rights reserved. DCA and Crosstalk are registered trademarks and QuickPad and QuickBar are trademarks of Digital Communications Associates, Inc. Windows is a trademark of Microsoft Corporation. All trademarks are the property of their respective owners.



Windows within Windows: QuickPads float on your screen, ready to run entire scripts at the push of a button.

Circle 76 on Inquiry Card (RESELLERS: 77).

World Radio History

WHAT'S NEW

WINDOWS NT: A DEVELOPING MARKET

Last January, Microsoft hosted a conference for Windows NT tool developers, giving them preliminary information on the new operating system, its requirements, and its capabilities. Last July, the company hosted a Windows NT Professional Developers Conference in San Francisco. To help ensure that applications running under NT are plentiful when the new operating system ships, Microsoft has also made the preliminary version of its Win32 SDK (Software Development Kit) for Windows NT easily available to thousands of developers. So it's not surprising that a sampling of NT products includes software aimed at developers.

Richard Smith, president of Phar Lap Software (Cambridge, MA), said, "The major operating systems of today, DOS and Windows, were designed eight to 12 years ago, so they lag way behind our current hardware capabilities. We've now got bigger disks, displays, and memory and faster CPUs than ever before. As a true 32-bit operating system, Windows NT exploits the power of the 32-bit chip."

Version 2.0 of Phar Lap Software's QuickStart for Windows NT (free) lets you build Win32s applications entirely under DOS/Windows 3.1. The product lets you get familiar with and port applications to Windows NT without having to learn the whole Win32 API. QuickStart runs Windows NT tools under DOS or the Windows 3.1 DOS box, so you can create and run Win32s applications under Windows, rather than rebooting between Windows NT for developing and Windows for testing.

XVT Software's (Boulder, CO) XVT Portability Toolkit for NT (for i486 systems, \$1450) lets you build a single C or C++ application and then recompile it to major GUIs without rewriting code. The XVT Portability Toolkit abstracts numerous low-level native calls into single XVT calls and allows you to write directly to the native toolkit, ensuring that your applications will have the look and feel of the native environment.

Neuron Data (Palo Alto, CA) has ported its Open Interface portable GUI builder to Windows NT. The GUI development tool (contact Neuron Data for pricing information) provides applica-



Phar Lap Software's QuickStart for Windows NT.

tion portability across standard windowing environments, including Windows, NT, Motif, Presentation Manager, Open Look, and the Mac OS. Open Interface provides a superset of widgets of the native toolkits (e.g., tables, text edit, menus, and buttons). The superset library architecture allows robust GUI development with look-and-feel independence that increases programming productivity for multiple-platform development. You can easily port an application to any windowing environment without rewriting programming code.

Mercury Interactive (Santa Clara, CA) offers an automated testing system that uses the company's patented output synchronization and text-recognition technologies for NT software developers. TestRunner for Windows NT (per seat cost for a typical installation, about \$30,000) can improve the quality of your NT applications, reduce the time it takes to finish your products, and lower overall costs, according to the company. The package can automatically verify and validate the features and functions of NT applications without relying on or interfering with the tested system's CPU, memory, or operating system. If an unrecoverable system error occurs, the program can power down and restart the system under test and then continue the evaluation process.

TestRunner for Windows NT allows you to create verification subroutines for individual functions and then combine them to create a separate test for each possible program permutation. In addition, you can use the function-specific test subroutines to benchmark or stress-test software during development to verify the performance and stability of your changes.

—Martha Hicks

WHAT'S NEW

WINDOWS UTILITIES

According to Dan Baumbach, president and CEO of Canyon Software (San Rafael, CA), "Most utility programs have been command-line driven, but with Windows, they have to be more visual, and what they do has to be made very apparent. PC programmers have had to learn how to see things in a visual way, which they never had to do before."

Canyon Software's Drag And View 1.0 utility allows you to view files in their native formats. You drag files from the Windows File Manager to the program's icon. The software then opens up a window displaying the first file in the group in its native format. In addition, Drag And View lets you look at the other files in the group by choosing them by name from the Windows Filelist menu.

You can view multiple files simultaneously by opening up additional windows and adding files to other Filelist menus by dragging them to any open window. Drag And View also lets you minimize, maximize, and close windows and search for specific text. The \$25 package includes the Drag And View Fileman Launcher, which runs the Windows 3.1 File Manager and up to 10 support applications together.

People with poor motor control or visual impairment can access Windows by using a switch (i.e., a simple on/off device) or switches, rather than a mouse. Switch Access to Windows from the ACE (Aids to Communication in Education) Centre (Oxford, U.K.) presents mouse operations, such as drag and click, as a series of on-screen icons. As the program's highlighter scans across and then down the screen, you press the switch when the cursor is positioned over the appropriate command. As with standard Windows, Switch Access to Windows allows you to run several applications at the same time.

COMPANY INFO

Mercury Interactive Corp.
(408) 987-0100; fax: (408) 982-0149
Circle 1039 on Inquiry Card.

Neuron Data
(800) 876-4900
(415) 321-4488; fax: (415) 321-3728
Circle 1040 on Inquiry Card.

Phar Lap Software, Inc.
(617) 661-1510; fax: (617) 876-2972
Circle 1041 on Inquiry Card.

XVT Software, Inc.
(303) 443-4223; fax: (303) 443-0969
Circle 1042 on Inquiry Card.

The program presents Windows-based applications in a similar manner as on-screen icons known as Selection Sets. Selection Sets, which are pre-defined for you, are available for Word for Windows, Microsoft Write, Microsoft Works, and Broderbund's KidPix. In addition, Switch Access to Windows includes a Designer Facility that lets you produce customized Selection Sets. You can also choose to access the program using a direct pointing device or a trackball.

The \$362 (£250; or run-time version \$109, or £75) package includes a serial-switch box, standard Selection Sets, Selection Sets for portable machines with monochrome LCDs, and enlarged Selection Sets for visually impaired users or users who have mouse-pointing difficulties.

Springtime Software (Waltham, MA) provides the first four tools in its series of Windows utilities: WindList, MagWind, BitView, and BtnAid. WindList (\$39.95) is a Task Manager replacement tool that emphasizes information about and control of windows. You can set up customized brief and detailed views of your current windows. The show button quickly identifies any selected window and the info button accesses

lists of modules, tasks, and window classes. WindList can launch programs and remember previous programs and directories in alphabetical order.

A screen magnifier, MagWind (\$19.95) can remember the location and size of its viewing window from session to session and can change the magnification. BitView (\$15.95) is a bit-map viewer that can paint the bit map in a window or on the entire screen, display the internal structure of the bit map (i.e., header, color table, and bits), and report the number of distinct colors the bit map uses. BtnAid (\$59.95) is a DLL that displays simulated 3-D graphics and text on standard Windows push buttons. The utility can render engraved and embossed color images and monochrome text.

—Martha Hicks

COMPANY INFO

ACE Centre

+44 865 63508
fax: +44 865 750188

Circle 1043 on Inquiry Card.

Canyon Software

(415) 453-9779
fax: (415) 459-4904

Circle 1044 on Inquiry Card.

Springtime Software

(800) 458-2829
(617) 894-9455

Circle 1045 on Inquiry Card.

THE REAL COST OF WINDOWS

How much is that upgrade to Windows? The Microcomputer Managers Association has released a report that details the average cost required per unit in upgrading from a non-GUI environment (e.g., MS-DOS) to a GUI environment (e.g., Windows). According to the study, the average cost, not including networking hardware and software, was about \$3300. The cost of the hardware upgrade averaged \$1102. Training and service/support averaged about \$675 each, and new software cost was about \$835. Priscilla Tate, president of Technology Forum and spokeswoman for the MMA, said the MMA conducted the survey in 1992 to get a realistic estimate of the cost of moving a user to a GUI environment.

"The cost is high. Unquestionably high," Tate said. If the cost is so expensive, why upgrade? She adds, "Mostly they said... because they thought it was the strategic direction for their company and that their users told them they were more productive."

—Dave Andrews

TRENDS

IS WINDOWS NT ROADWORTHY?

As the release of the first commercial version of Microsoft Windows NT nears, the subject is creeping into more and more high-tech discussions—but not when it comes to taking Windows NT on the road. For example, DEC is not placing a high priority on Windows NT portables, at least not when it comes to its 64-bit Alpha platform.

"I don't think too many people are going to be taking Windows NT on the road," said David Price, spokesman for the Windows NT group at DEC. In general, part of the problem with Windows NT for portable systems, whether running on Intel-, Mips R4000-, or Alpha-based systems, will be the large RAM and hard disk space the operating system will require. Several manufacturers of laptop PCs said the minimal RAM configuration for Windows NT will be 16 MB. The bigger problem for DEC is the power of the Alpha processor. DEC, or another semiconductor designer, needs to come out with a low-power version of the Alpha chip before vendors can start building Alpha portables. The DECchip 21064 running at 200 MHz typically dissipates a whopping 30 W at 3.3 V and draws an average power supply of 9 amperes. It dissipates about 23 W at 150 MHz.

DEC says you will likely have to wait until the 1995 time frame to buy an Alpha-based portable running Windows NT. You won't have to wait that long to run Windows NT on Intel-based portables, however. Dell's John Biebelhausen, manager of portable systems, said that bringing an Intel-based Windows NT portable to market is simply a case of adding a larger-capacity hard drive and more RAM to today's typical 486-based portable or notebook system.

"It's quite doable," Biebelhausen said. "There's no unique hardware things you have to be concerned about with Windows NT," he said on the Intel platform. However, Biebelhausen said that in talks he's had with consultants and analysts about PCs and Windows NT, "there's not a lot of discussion about Windows NT on portables." The reason for this, he said, is that Windows NT is not positioned as a mobile-computing system. It's more an operating system designed to foster shared data among PCs connected over a network at the office, he added. Biebelhausen also said that a likely portable-computing solution for Windows NT will be a notebook computer and a docking station. None of Dell's current offerings was Windows NT-ready, but when NT is widely available, Dell will have a number of portable systems ready for sale, he said.

Rob Cheng, director of product marketing for Gateway 2000, said the company already sells 486-based portables that you can upgrade to 20 MB of RAM. The cost of such an upgrade varies due to fluctuations in the price of memory, but a typical upgrade from 4 MB of RAM to 20 MB would cost around \$1000, he said. Cheng said that some of the benefits of Windows NT, such as built-in networking, true multiprocessing, and multithreading get lost when you remove your Windows NT machine from its network connection. Cheng added, "A lot of those things are not as important when you are traveling or when you're moving around."

—Dave Andrews

WHAT'S NEW

WINDOWS NT GAINING MOMENTUM

Windows NT wasn't ready at press time, but there was no shortage of NT product announcements, including this sampling of business, rendering, and networking software. A network-based business reporting application, Hyperion (headquarters site license, \$125,000) from IMRS (Stamford, CT) offers enterprise-wide reporting capabilities within the NT graphical environment.

The program collects data from multiple general ledger and planning systems and creates an enterprise-wide financial and business information database. You can then use this data for budgeting, forecasting, planning, and analysis. Hyperion's built-in business intelligence incorporates rules and structures necessary to handle corporate report-

ing requirements, complex data designs, and large data volumes.

The NT version of Renderize (about \$895) from Visual Software (Woodland Hills, CA), a photorealistic 3-D image-rendering utility, helps mechanical engineers, industrial designers, and architects communicate concepts or designs. You can easily import 3-D models, such as those you have produced in AutoCAD. Using Renderize's GUI, you can transform them quickly into full-color, photorealistic designs for hardcopy output.

Renderize for Windows provides selective area rendering and directed environment mapping, an effect that lets you create ray-trace effects on selected objects. Other features include a hybrid scan-line rendering engine; texture, bump, reflection, transparency, and alpha-channel mapping; unlimited light sources and camera views; and a built-in image editor.

Intergraph (Huntsville, AL) is also offering NT versions of its CAD products. The CAD engine for 80 percent of Intergraph's software applications, MicroStation is a CAD product that provides solutions for workgroup interaction. According to the company, NT complements MicroStation's strengths in ease of use, database support, and workgroup integration. The NT version of MicroStation (no price available at press time) enhances support of the Windows Clipboard (i.e., bit maps, metafiles, and sounds), DDE, and OLE capabilities.

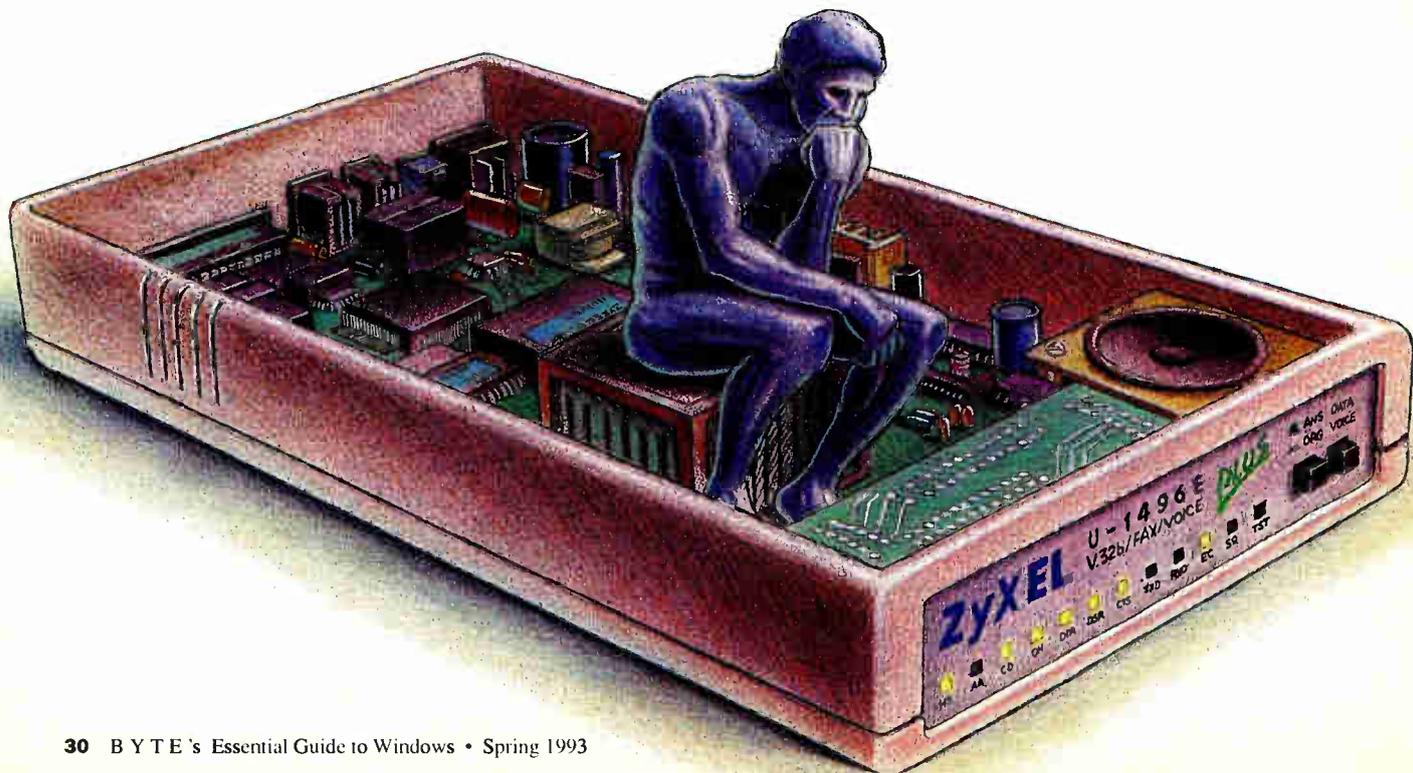
Visual Numerics (Boulder, CO) also offers a Windows NT version of its PV-Wave Advantage (no price available at press time). The software lets you quickly explore and understand your data visually. The visual data-analysis environment provides integrated graphics, data analysis, image processing, data animation, and

custom applications development.

The package helps you identify important features and trends in your data. You can access, visualize, and analyze data in most formats; display your data fast—250,000 floating-point data values from disk to display in less than 3 seconds; visualize multiple dimensions of data simultaneously, merging vector graphics and raster images; and rapidly develop applications using the PV-Wave Advantage interpretive programming language or create your own menu interfaces. The package's commands, menus, or macros let you navigate through your data.

Networking products for NT include Frontier Technologies' (Mequon, WI) 32-bit Windows Sockets TCP/IP applications for NT. The Super-TCP Apps for Windows NT (no price available at press time) offers a client/server file transfer

WHY OUR INTELLIGENT MODEMS ARE A WISE INVESTMENT.



program, E-mail, VT200 and tn3270 terminal emulation, Network News Reader, and Talk.

The client/server FTP (File Transfer Protocol) speeds file transfers and helps you perform remote-file and directory management tasks. E-mail features offer distribution lists, private and public mailboxes, address books, automatic forwarding, and concurrent use of different documents. Supporting the industry-standard SMTP and POP 2 and 3 protocols, E-mail lets a centralized server receive mail while workstations are off-line.

The VT220 and tn3270 emulations offer multiple sessions, session printing and logging, keyboard mapping, font and color selection, and scripting. Frontier Technologies' Network News Reader offers NT users access to news and information databases available on the Internet News System.

Talk brings the Unix Talk

protocol to the NT environment. You can converse interactively across the network through MDI (Multiple Document Interface) Windows, which simultaneously displays your monologue and the monologue of a remote user. You can also log all or part of a conversation to a file for future reference.

Ampersand (Glendale, CA) offers an NT version of its mainframe transaction-processing monitor, Matrix (no price available at press time). The product offers IBM CICS transaction-processing capabilities in the NT environment with full-scale execution and development for IBM CICS applications. With Matrix, you can execute, maintain, upgrade, and develop COBOL applications for the IBM mainframe and

move applications between the mainframe and NT.

The Matrix development environment is available at \$900 for an eight-user configuration. It includes a full-screen, configurable source editor; a Screen Definition Utility to paint CICS maps; a Record Editor to create, modify, and delete records in the internal

VSAM (Virtual Storage Access Method) database; menus for setting up CICS tables and resources; import and export capabilities for all tables, data sets, and BMS screen definitions; menu-based system administration capabilities; and complete user-configurable display characteristics. ■

—Martha Hicks

COMPANY INFO

Ampersand

(818) 548-9100

fax: (818) 548-7915

Circle 1046 on Inquiry Card.

Frontier Technologies Corp.

(414) 241-4555

fax: (414) 241-7084

Circle 1047 on Inquiry Card.

IMRS

(203) 321-3500

fax: (203) 322-3904

Circle 1048 on Inquiry Card.

Intergraph Corp.

(205) 730-2940

fax: (205) 730-8300

Circle 1049 on Inquiry Card.

Vision Numerics, Inc.

(303) 530-9000

fax: (303) 530-9329

Circle 1050 on Inquiry Card.

Visual Software, Inc.

(800) 669-7318

(818) 883-7900

fax: (818) 593-3750

Circle 1051 on Inquiry Card.



With the ZyXEL U-Series modems, you're sure to save.

Time. Effort. Money.

The savings begin with the U-Series' ultra-high speed—16.8Kbps data, 14.4Kbps fax (send and receive). And our new PLUS Series runs at 19.2Kbps.

But what keeps you saving are the U-Series' intelligent features—features that save you effort and ensure reliable communications.

Like *Fast Retrain* with *Auto Fall-Forward/Fall-Back*. And multi-level security features—*Call-Back Security* and *Password Protection*. With *Caller ID*, you can even answer calls selectively.

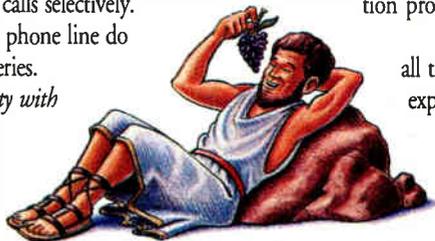
Want to save by having one phone line do the work of three? Get the U-Series. It adds *Digitized Voice Capability* with

Speech Compression to its fax and data capability. And, *Distinctive Ring* and *Auto* Data/Fax/Voice Detection* for intelligent access to all three.

And now there's a *Cellular Option* for the new PLUS Series.

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WORKGROUPS BY THE NUMBERS

Your guide to making the most of Windows for Workgroups

ANNE FISCHER LENT

In the never-ending quest to increase PC productivity, organizations large and small are moving beyond file and printer sharing and into the realm of workgroup computing. Microsoft's Windows for Workgroups is a unique product designed to fit right in with the way most people work today: as groups cooperating on shared tasks.

WFW has been the subject of Microsoft's vaunted marketing machine, making it difficult to separate the hype from the reality. WFW is easier to install than its major competitors LANtastic and NetWare Lite, and it features some neat technological tricks, like 32-bit virtual device drivers and automatic NIC (network interface card) detection. But installing it isn't the simple job Microsoft claims it is. And WFW has more than a few annoying limitations that require slick workarounds to get the most out of the system.

Keeping communications flowing throughout your organization can be done, but it requires some work and commitment. To make your job easier, I've pinpointed the 10 essential items you need to know to start using WFW effectively.

1

DON'T TRUST MICROSOFT'S RECOMMENDED MINIMUM SYSTEM REQUIREMENTS

While Microsoft claims that WFW runs on 386SX systems and even on 286s with DOS 3.3 and 3 MB of RAM, don't even think of running the software with the minimum configuration. Although a 286 can act as a client, it cannot share resources—and resource sharing is one of WFW's greatest claims to fame.

Depending on what role your system is going to play in the network, a fast (33-MHz) 386SX can perform adequately. The key to performance on a WFW network, however, is actually the RAM. A true multitasking operating system like WFW requires a lot of memory, so, again, take a look at how the system will be used and determine your

needs based on that use. For example, if your system is basically going to act as a client and will not be accessed much for its resources, you can get away with a 286 or 386SX—but with at least 4 MB of RAM. If your system is going to be accessed frequently by other users, get a 486 with at least 8 MB; 16 MB will serve your needs even better.

2

MAXIMIZE MEMORY BEFORE LOADING WFW

The performance that you'll get from your system and applications running under WFW is directly proportional to the amount of memory that you have available. While the total system memory is important (see Tip 1), it's imperative that you maximize your conventional memory (the area below 640 KB) to get the most out of WFW.

Here are a few ways you can make the most of memory:

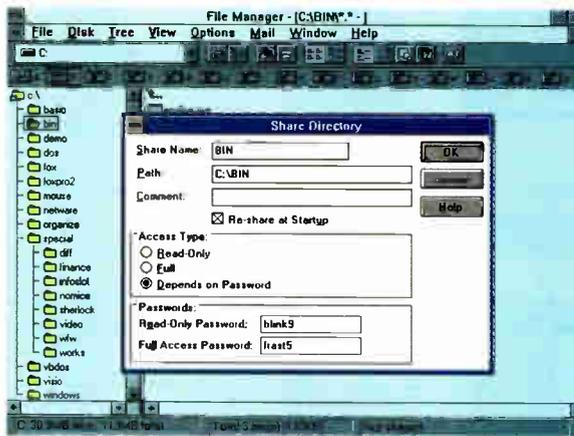
- Remove unnecessary device drivers and memory-resident programs from your CONFIG.SYS and AUTOEXEC.BAT files.
- Make sure the `buffer=` setting is between 10 and 30. If you set it for more than 30, you will use more memory without gaining much of a boost in performance.
- Don't load an extra mouse driver unless you are going to be using a mouse outside of WFW. WFW comes with its own mouse driver.
- Start your DOS TSR programs from within WFW instead of from your CONFIG.SYS or AUTOEXEC.BAT file. This procedure will allow these programs to

take advantage of WFW's built-in memory optimization and virtual memory abilities.

- If you run WFW in 386 enhanced mode, remove the SHARE.EXE command from CONFIG.SYS or AUTOEXEC.BAT. WFW supplies its own share utility.
- If you are using DOS 5.0, you should use the HIMEM.SYS device driver in CONFIG.SYS to load most of DOS into high memory.
- Use a memory manager such as QEMM-386 (Quarterdeck Office Systems, Santa Monica, CA) or 386Max (Qualitas, Bethesda, MD) to load PROTMAN.DOS, WORKGROUP.SYS, your NIC driver, and the NET redirector into UMBs (upper memory blocks). The memory manager that comes with DOS 5.0 (EMM386.EXE) will do the trick, but not as easily as QEMM-386 or 386Max.
- Use a memory manager to load into UMBs other drivers and memory-resident programs that would normally reside in conventional memory.

3 PLAN YOUR WORKGROUP SHARING AND SECURITY

One of the advantages of peer-to-peer networking is that it gives individuals a great amount of control over the operation of the network. WFW uses share-level security, which lets you grant access by resource. This differs from other network operating systems, such as Novell NetWare, that use user-level security, where access to resources is granted by user name. Other networking products, such as Microsoft LAN Manager, support both types of access. Because it is easy to grant access to resources in WFW, you should



Screen 1: The WFW File Manager lets you make directories on your local disk available to other WFW users.

seriously plan out what files, applications, and resources will be shared.

The File Manager within WFW lets you make directories available for others to access (see screen 1). You cannot make individual files available, nor can you open a directory to someone without letting him or her have access to all the subdirectories below it.

Unless you have a very small workgroup, it's wise to have a workgroup coordinator assigned to do the following:

- set up shared directories and specify which workgroup members will share which resources
- set up passwords
- act as mail administrator
- back up crucial files
- oversee site licensing for shared applications
- oversee overall performance of the network

4 DEDICATE PCs FOR PRINT AND MAIL SERVERS

Sharing printers—even with DOS users—is one of WFW's strong points. But don't bog down someone's regular workstation with printing chores; instead, dedicate a system as a print server. In fact, dedicate one of your lower-end systems (a 286 or 386SX with 4 MB of memory) and add memory to the shared printer.

To make a system a print server, install

a printer driver and click on Print Manager's Share Printer icon to make the printer accessible to others on the network. Next, you'll need to go to each workstation that will share the printer and install printer drivers for each printer you'll be accessing. Then you click on Print Manager's Connect to Network Printer icon to choose the shared printer.

To establish mail service, your workgroup must have a Postoffice located on a networked PC. The Postoffice is a central location where all message traffic is handled, and the computer on which it is

stored is the mail server. The actual mail application runs on the local workstation, but once a message is created and sent, it's stored in the Postoffice on the mail server until it's read.

Go for a high-end system for a mail server: It may be the most important workstation on the network. Plan on a 486-based PC with at least 8 MB of RAM and a large, fast hard drive.

Also, the mail server must be kept up and running at all times, so people can send and receive mail without worrying about whether the system is booted or not. Plan to equip the server with a backup storage device, as well.

5 FACILITATE MESSAGING WITH MAIL AND SCHEDULE +

Mail is one of the most powerful features of WFW. In addition to letting you send electronic messages to others in your workgroup, it is a full-fledged communications package that allows you to send messages to multiple recipients, attach documents from other applications to messages, and more.

To use Mail, each workgroup needs a Postoffice set up on one of the PCs on the network; that PC becomes the mail server. The actual mail application runs on the local workstations. Once a message is sent, it's stored in the Postoffice on the mail



Screen 2: With Schedule+, you can check other people's schedules to avoid conflicts and more effectively plan workgroup activities.

server until the person it's sent to reads it. Then the message is transferred to the receiver's local system.

Many Windows applications are now mail-enabled: They include Send Mail (or a similar choice) in the File menus, which lets you send the document directly from your application without exiting the application to enter WFW Mail.

Schedule+, which is robust enough to act as a miniature PIM (personal information manager), works in conjunction with Mail and lets you schedule appointments, set up times for group meetings, and manage group resources. You can also access Schedule+ off-line, but you must have SHARE.EXE loaded to do so.

When you run Schedule+ off-line, it reads the local calendar file on your hard disk. When you change appointments, those changes are written back to your hard disk. When you use it on-line, Schedule+ can show conflicts in the calendars of the people you invite to meetings, suggest free times for meetings, and send mail to notify others of meetings. It even lets you check other people's schedules (see screen 2). To keep workgroup scheduling working as effectively as possible, workgroup members should get into the habit of updating their personal schedules regularly.

WFW Mail will not connect out of the box to external mail systems such as X.400 or MHS (Message Handling Service). To access other mail systems, you must purchase the separate Mail and Schedule+ extensions from Microsoft. These extensions enable you to

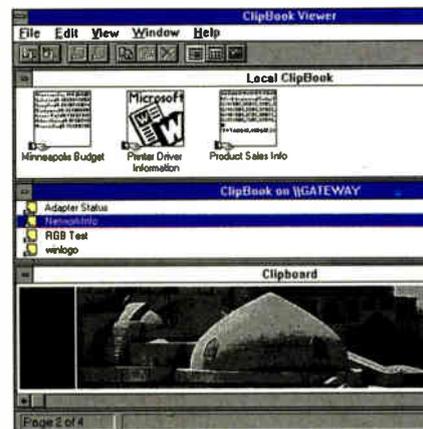
- exchange mail and schedules with other WFW Postoffices on the same network
- exchange mail and schedules with WFW Postoffices located on other networks or in remote locations

- exchange mail with other mail systems, including those running on other platforms such as Macintosh, Unix, or OS/2
- dial in from remote locations to send or receive mail
- add advanced administrative options and security
- create multiple Postoffices for networks with heavy mail use

If you're upgrading to Mail and Schedule+ extensions, you need a powerful processor and additional free disk space. Exact space requirements depend on what options and gateways you install.

6 SHARE WORKGROUP RESOURCES THROUGH CLIPBOOK AND OLE

One of WFW's neatest features is the ClipBook. This is an expanded variation of the Windows Clipboard that most Windows users are well acquainted with. The familiar Clipboard is a temporary entity that allows you to work with only one set of data at a time: Every time you write new data to the Clipboard or exit Windows, the old Clipboard contents are gone forever. WFW's ClipBook, on the other hand, is really a database of stored Clip-



Screen 3: You can copy text, spreadsheet, and graphics data to the ClipBook and share it with other users on the network.

board pages. Once you've copied some information (e.g., text, spreadsheet, or graphics data) into your Clipboard, you can then store it away in the ClipBook for later use.

Being able to store a virtually unlimited number of Clipboard pages in your ClipBook makes it a very handy feature. But when you extend the ClipBook to the network, it becomes truly powerful. ClipBook pages can be marked as shared, making them available to others in the workgroup; and you can even mark a Clipboard page so that when it is accessed, it automatically starts the application that created it (see screen 3).

WFW also extends OLE across the network. Objects embedded in applications launch the associated application, and DDE sets up hot links among workgroup members.

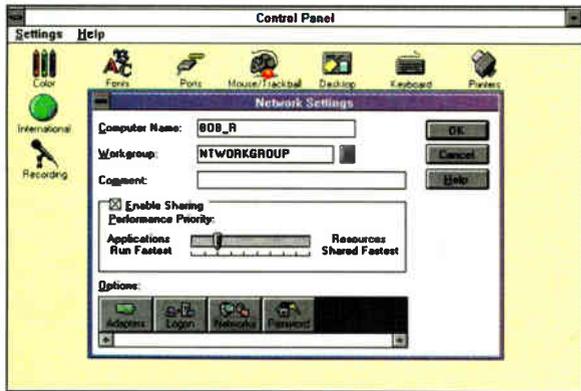
7 OPTIMIZE WORKSTATION PERFORMANCE

Like ordinary Windows, WFW gobbles up all the system resources that it can get access to. This is why WFW's performance is most capable on powerful PCs. (See Tip 1.)

Above and beyond your buying more powerful and more expensive hardware, WFW offers a way to fine-tune the resources in your existing system, through the use of the Performance Priority box (found in the Network area of the Control Panel). On a workstation whose resources (e.g., files, applications, and printers) are often accessed by others on the network, you can allocate more system resources for sharing by sliding the indicator in the Performance Priority box toward the Resources Shared Fastest setting (see screen 4). Sliding the indicator toward Applications Run Fastest optimizes local performance on the workstation, especially if few of its resources are shared with others in the workgroup.

Getting optimum performance from workstations that both share resources and run local applications (the most common configuration for a WFW workstation) requires a bit of a trade-off. You'll need to experiment to find the best setting. (Net-Meter, which comes with WFW, can help.)

One of the easiest ways to optimize WFW performance is to have users run their applications locally, using the net-



Screen 4: Sliding the pointer toward Resources Shared Fastest slows local performance but gives other users faster access to your shared resources.

work primarily for data sharing. Besides the legal (i.e., licensing) problems of multiple users running the same copy of an application from a common PC, there's the more practical matter of network overload: If many users are accessing an application at the same time, the network will slow to a crawl, so having the applications stored on local drives will keep the network humming along nicely.

8 CUSTOMIZE WORKGROUPS BY EDITING INI FILES

In WFW, the complex, yet familiar, initialization files (WIN.INI and SYSTEM.INI) have been expanded with a host of new workgroup-specific options. In addition, there are a bunch of new initialization files for the network, including PROTOCOL.INI, PROGRAM.INI, CONTROL.INI, WINFILE.INI, MSMAIL.INI, and SCHDPLUS.INI.

Although many of the INI file entries are changed automatically when you change options within WFW, there are many options within INI files that you can edit manually to optimize performance, change features, or enforce security measures. For example, you can dramatically increase control over workgroup security. You can prevent individual workstations from sharing any of their resources (i.e., files and printers) with others in the workgroup by setting NoSharingControl=1 in the [network] section of SYSTEM

.INI. You can prevent file sharing but still allow printer sharing by setting NoShareCommands=1 in the [restrictions] section of WINFILE.INI. Likewise, you can disable printer sharing but allow file sharing by setting NoShareCommands=1 in the [spooler] section of WIN.INI.

Other little-known security tricks are accessible by editing the [restrictions] section of PROGRAM.INI. For example, NoRun=1 disables the Run command in Program Manager; NoClose=1 prevents users from exiting WFW; and NoSaveSettings=1 prevents users from saving WFW changes on exit.

Various EditLevel settings in the [restrictions] section of PROGRAM.INI also limit editing. EditLevel=1 restricts the ability to create, delete, or rename groups; EditLevel=2 restricts the ability to create or delete items in groups; EditLevel=3 restricts the ability to edit command lines; and EditLevel=4 restricts the ability to change item properties.

To work with INI files, you need a resource that describes the entries in the various INI files. Unfortunately, such a resource doesn't come with the basic WFW package. You will have to purchase the WFW Resource Kit (\$29.95, direct from Microsoft), which tells you just about everything that you ever wanted to know (and probably a lot that you didn't) about the workings of WFW. You can also find INI file information in generally available books on WFW. If you plan a complex WFW installation, you will need the Resource Kit.

A word of warning, however: Carelessly changed INI file settings can play havoc with WFW. Start with a backup.

9 CONNECT TO OTHER NETWORKS

WFW comes with built-in connectivity to other popular networks—most notably, Microsoft LAN Manager and Novell NetWare. It can also connect to a wide range

of networks, including 3Com 3+Open, DEC Pathworks, Banyan Vines, and other SMB (Server Message Block)-compliant networks.

Because WFW and LAN Manager share the same NetBEUI transport protocol, there's no redirector involved; thus, it's simple to get WFW and LAN Manager Domains to talk with one another. Hooking up LAN Manager to WFW adds a group of features to the workgroup, in particular the enhanced security that LAN Manager offers.

For Novell aficionados (or for system administrators who are concerned with corporate-wide connectivity), MSIPX is WFW's NDIS-compatible version of Novell's IPX. Installation is a breeze: You select an option, and icons for NetWare drives appear in WFW's File Manager. Note that unlike in other WFW-compatible networks, NetWare communications is a one-way affair: WFW workstations can act as clients to Novell servers, but they cannot act as servers to Novell clients.

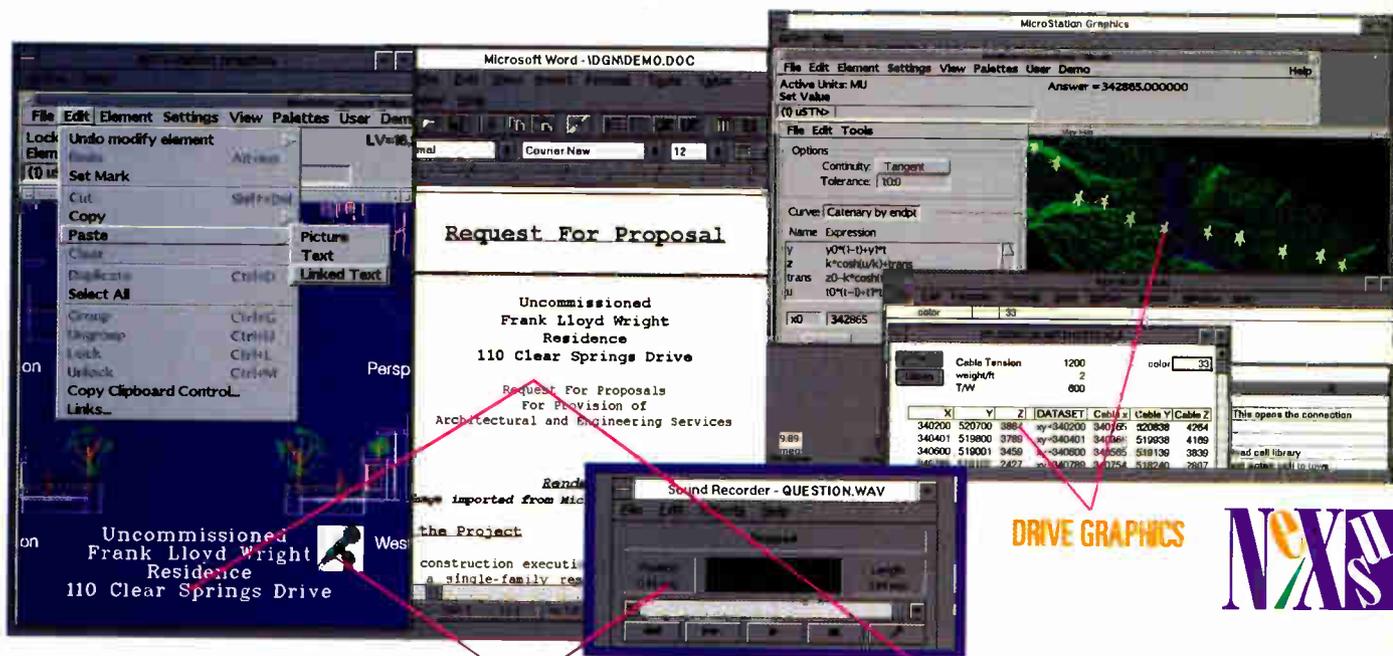
10 ACCESS THE NETWORK FROM DOS

Microsoft doesn't trumpet this ability, but it is possible to access the network from a workstation not running WFW (although you cannot share resources from such a workstation). Because the NIC driver, network redirector, and all transport hooks are started from your DOS CONFIG.SYS and AUTOEXEC.BAT files before you start WFW, you can access network resources from DOS using the NET command along with UNC's (Universal Naming Conventions).

The Workgroup Connection is a separate product from Microsoft that includes DOS access to WFW and a DOS-only version of WFW Mail client. But if you're willing to forgo the mail abilities, you do not need to buy Workgroup Connection to connect to your network from DOS. Everything that's needed (sans DOS Mail) comes in the WFW package. ■

Anne Fischer Lent (Peterborough, NH) is a consulting editor for BYTE and is co-author of The Windows for Workgroups Bible (Addison-Wesley, 1993). You can reach her on BIX as "alent" or through MCI Mail at 578-1168.

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WORKGROUPS PARTNERS

New products that enhance Windows for Workgroups

ANNE FISCHER LENT

Windows for Workgroups looks and functions just like Windows but with added networking and mail capability. Any hardware or software product that works with Windows 3.1 is compatible with WFW, but "compatible" doesn't mean that a product can take advantage of all the special features of WFW.

The added capabilities of this new peer-to-peer network operating system have launched a new wave of products aimed directly at WFW.

For NICs (network interface cards) to be compatible with WFW, they need a compatible driver, which, if not supplied with WFW, may be supplied by the manufacturer. The requirements for software are more demanding: For software to be fully compatible with WFW, it must use simple MAPI (Messaging API) functions and support OLE.

Simple MAPI is a set of C functions, developed by Microsoft, that let developers put "hooks" into applications so that they can communicate directly with Mail. Applications with these hooks are *mail enabled*. Mail-enabled applications have a menu item added, such as Send, or have a mail icon that you click on to activate Mail within WFW.

OLE is the technology that lets you dynamically link data between applications. Any OLE-compatible application will work with WFW and will let you link and embed objects across the network. This last point is a major difference between OLE in Windows 3.1 and OLE for WFW. The ability to share objects across a network is the first step toward truly distributed computing.

Hardware

NETWORK INTERFACE CARDS

With WFW, Microsoft includes drivers for almost 100 network interface cards, but other compatible cards continue to be introduced. The following are a few recently released network adapter cards for Ethernet or Token Ring networks that have drivers for use with WFW.

EtherCombo-16, EtherPair-16, EtherCoax-16

EtherCombo-16 uses Accton's proprietary Ethernet chip. The card is compatible with 10Base-2 (thin coaxial), 10Base-5 (thick coaxial), and 10Base-T (twisted pair) cabling. It includes BNC, AUI (attachment unit interface), and RJ-45 connectors on-board.

EtherPair-16 and EtherCoax-16 are 16-bit Ethernet adapters. EtherPair-16 has AUI and RJ-45 connectors, and it

supports 10Base-2 and 10Base-T cabling. EtherCoax-16 supports 10Base-2 and 10Base-5 cabling.

EtherCombo-16: \$219

EtherPair-16: \$189

EtherCoax-16: \$189

Accton Technology Corp.
Fremont, CA

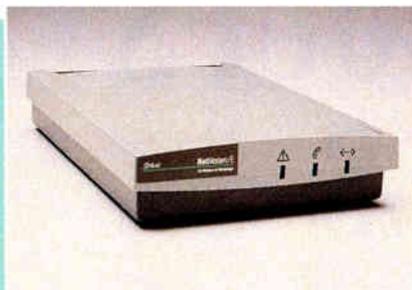
(510) 226-9800

fax: (510) 226-9833

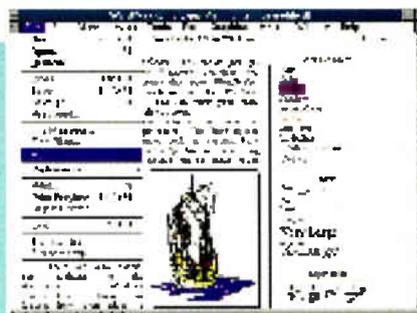
Circle 1075 on Inquiry Card.



EtherTPI-16T



NetModem/E



WordPerfect 5.2

EtherCombo-16 T/C and EtherTPI-16T

Both EtherCombo-16 T/C and EtherTPI-16T are 16-bit Ethernet adapters that support 10Base-2, 10Base-5, and 10Base-T cabling.

EtherCombo-16 T/C: \$149
EtherTPI-16T: \$139

Alta Research Corp.
Deerfield Beach, FL
(800) 423-8535
(305) 428-8535
fax: (305) 428-8678

Circle 1076 on Inquiry Card.

FiberCard

FiberCard is a switchable 16-/4-Mbps Token Ring adapter that is fully 802.5J compatible. It's available for ISA and Micro Channel machines.

FiberCard: \$895

Racore Computer Products, Inc.
Los Gatos, CA
(800) 635-1274
(408) 374-8290
fax: (408) 374-6653

Circle 1077 on Inquiry Card.

InterLan AT Series

The InterLan series of Ethernet adapters offers three different media options: 10Base-2/10Base-5, InterLan AT; 10Base-5/10Base-T, InterLan AT TP; and 10Base-2/-5/-T, InterLan AT 3M.

InterLan AT: \$209
InterLan AT TP: \$209
InterLan AT 3M: \$279

Racal-Datcom, Inc.
Boxborough, MA
(800) 526-8255
(508) 263-9929
fax: (508) 263-8655

Circle 1078 on Inquiry Card.

RangeLAN

The RangeLAN series of wireless LAN adapters includes RangeLAN/ISA, for use with desktop computers; RangeLAN/PCMCIA, for portable computers with a PCMCIA slot; RangeLAN/Parallel, which connects to the parallel port of any PC; and RangeLAN/LT, for Compaq notebooks. The wireless adapters have an interference immunity range of 300 to 500 feet indoors and operate at 242 Kbps.

RangeLAN/ISA: \$495
RangeLAN/PCMCIA: \$595
RangeLAN/Parallel: \$595
RangeLAN/LT: \$595

Proxim, Inc.
Mountain View, CA
(415) 960-1630
fax: (415) 964-5181

Circle 1079 on Inquiry Card.

Thomas-Conrad 4045

Thomas-Conrad's bus-master Token Ring adapter supports 10Base-T cabling.

Thomas-Conrad 4045: \$599

Thomas-Conrad Corp.
Austin, TX
(800) 332-8683
(512) 836-1935

Circle 1080 on Inquiry Card.

WinLAN

The low-cost WinLAN adapter is compatible with 10Base-T cabling. It comes in a two-adapter starter kit and in single-adapter add-ons.

WinLAN starter kit: \$199
Additional adapters: \$109 each

Apexx Technology, Inc.
Boise, ID
(208) 338-9632

Circle 1081 on Inquiry Card.

REMOTE-ACCESS MODEMS

Remote connectivity is a fast-growing segment of the network market. Special network modems allow you to access your WFW network from remote locations and let you interconnect workgroups at different locations. Many modems also have cellular-telephone connection and fax abilities.

NetModem/E for Windows for Workgroups

The NetModem/E is actually a server for WFW that you access by dialing in. The modem connects to the workgroup's Ethernet cable, so it sits on your WFW network as if it were yet another workstation.

The NetModem/E for Windows for Workgroups sends NetBEUI packets over the phone line. The modem has a 10-MHz 68000 processor with 512 KB of SRAM (static RAM) and 64 KB of ROM. It supports 10Base-2, 10Base-5, and 10Base-T cabling. It implements the V.32 and V.32bis standards with a base modulation of up to 14,400 bps, and it

includes V.42 error correction and V.42bis data compression for a throughput of 57,600 bps.

NetModem/E for Windows for Workgroups: \$1699

Shiva Corp.
Cambridge, MA
(800) 458-3550
(617) 270-8300
fax: (617) 252-4852

Circle 1082 on Inquiry Card.



WORD PROCESSORS

Mail-enabled word processing lets you compose messages and responses using the text-entry tool you're most comfortable with.

WordPerfect 5.2

This latest version of WordPerfect is a mail-enabled application: When you're working on a document, you can automatically send it to someone through E-mail. The software also supports OLE, letting you link other applications within your document and launch those applications with a double-click.

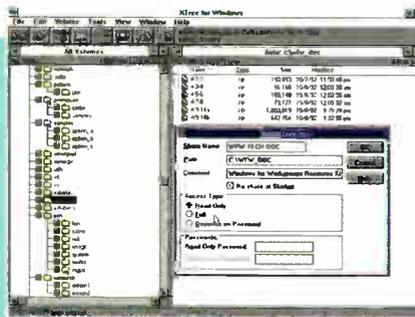
WordPerfect 5.2: \$495

WordPerfect Corp.
Orem, UT
(801) 225-5000
fax: (801) 222-5077

Circle 1083 on Inquiry Card.



Net Tools Print



XTree for Windows 1.5



LightShip

BACKUP

One of the most important rituals for computer users, especially those on a network, should be the backup process. You should at least make sure that all your shared directories are backed up regularly.

MaynStream

The MaynStream systems range in capacity from 250-MB quarter-inch cartridge drives to 4-GB DAT (digital audiotape) drives (both portable and internal). Prices include hardware and software and range from \$1495 for the 250-MB internal drive to \$3590 for the 4-GB portable DAT drive.

Maynard Electronics
Lake Mary, FL
(407) 263-3500
fax: (407) 263-3555

Circle 1084 on Inquiry Card.

Xpress Librarian 2.0

Emerald's Xpress Librarian 2.0 operates with all of Emerald's backup drives, including DAT drives. It includes the ability to run at regular intervals and has an automatic log-in and log-out ability.

Xpress Librarian 2.0: \$995
Peer-to-peer backup modules and AutoLoader module: \$495 each

Emerald Systems
San Diego, CA
(800) 767-2587
(619) 673-2161
fax: (619) 673-2288

Circle 1085 on Inquiry Card.

COMMUNICATIONS

While WFW is ideal for peer-to-peer communications over a LAN, it requires extra help with outside communications chores. This category includes software that lets you communicate with the outside world from your WFW network.

FaxGrabber

FaxGrabber converts documents and faxes into text and automatically sends them to a WFW mailbox. WFW support is available as an extension; it will be incorporated into future versions of FaxGrabber.

FaxGrabber: \$149
WFW extension: \$89

Calera Recognition Systems, Inc.
Sunnyvale, CA
(408) 720-8300
fax: (408) 720-1330

Circle 1086 on Inquiry Card.

FaxMaster Server

This upgrade to FaxMaster adds scanning, OCR (optical character recognition), and fax-compression capabilities, and lets up to 25 users access one phone line and fax board. The WFW workgroup coordinator can maintain the inbound and outbound fax logs, route faxes, control security, and assign priorities to users. You must have FaxMaster software installed on each workstation, with FaxMaster Server software and a fax board installed on a single server.

FaxMaster Server: \$695
FaxMaster (five-user): \$695

Caere Corp.
Los Gatos, CA
(408) 395-7000
fax: (408) 354-2743

Circle 1087 on Inquiry Card.

Message Port/WFW

Message Port/WFW lets each workgroup member send and receive fax and data messages by sharing a modem. The software works with most modems and lets you automatically send messages through Mail. Its WYSIWYG fax environment includes a routing ability that will send faxes to your mailbox, if designated to do so. The software offers multiple levels of security and log capability.

Message Port/WFW: \$195

Nuko Information Systems, Inc.
Milpitas, CA
(408) 262-1225
fax: (408) 262-2261

Circle 1088 on Inquiry Card.

Powerfusion for Workgroups

Interoperability between types of networks is often an elusive goal. Consequently, different parts of a company that employ different networks can't always communicate with one another. Powerfusion for Workgroups lets Unix machines reside as peer partners in a WFW network and share resources with WFW machines. Prices start at under \$100 for DOS and Windows clients.

Performance Technology
San Antonio, TX
(210) 349-2000

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WinBeep

Wireless communications includes alphanumeric pagers. WinBeep is software that lets you send a message from a WFW workstation to an alphanumeric display pager. By using WFW's NetDDE, WFW users can send messages to pagers through a shared modem and from DDE-capable applications.

WinBeep: \$149

Fourth Wave Technologies, Inc.
Troy, MI
(313) 362-2288
fax: (313) 362-2295

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WinRules

A WFW version of Beyond-Mail, WinRules includes Message Clerk, Folder Assistant, and Auto Tickle programs that work with WFW Mail. These programs automatically forward or file messages and notify users when the messages arrive.

WinRules: \$99.95

Beyond, Inc.
Cambridge, MA
(617) 621-0095
fax: (617) 621-0096

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NETWORKING UTILITIES

This category includes software that adds administration tools to WFW and software that lets you connect to other networks.

Net Tools Menu and Net Tools Print

Net Tools Menu enables workgroup coordinators to create, update, and control menuing; manage .INI files and software updates; and secure unattended workstations. Net Tools Print lets them configure and manage printers on the network. Both send mail to coordinators indicating network trouble. They're sold as a package.

Net Tools Menu/Net Tools Print: 10-pack, \$995; 100-pack, \$2495; 250-pack, \$4995

ADS

Atlanta, GA
(800) 366-2552
(404) 394-2552
fax: (404) 394-2191

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Norton Desktop 2.0 for Windows

The WFW version of Norton Desktop for Windows includes a Mail tool. Users can drag and

drop files from a drive window or group window to the Mail tool, to send documents from applications that are not yet mail-enabled.

Norton Desktop 2.0 for Windows: \$179

Symantec Corp.
Cupertino, CA
(800) 441-7230
(408) 252-3570
fax: (408) 253-4092

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XTree for Windows 1.5

The XTree file management utility supports WFW and provides support for MAPI. Its program-launching feature lets you start Windows programs from XTree instead of Program Manager or File Manager.

XTree for Windows: \$99

XTree Co.
San Luis Obispo, CA
(800) 333-6561
(805) 541-0604

fax: (805) 541-4762
Circle 1094 on Inquiry Card.

INFORMATION MANAGEMENT

While WFW's Schedule+ and Mail let you keep in constant communication with others on your network, the network operating system can't keep track of personal information. The categories of PIMs (personal information managers) and contact management blur, with both offering to extend the productivity of your workgroup.

Action+Plus

This product offers scheduling and time management in addition to basic contact management, so it falls into the PIM category. Action+Plus features mail merge and DDE links.

Action+Plus: \$399.95

Action Plus Software, Inc.
Salt Lake City, UT

(800) 766-7229
(810) 255-0600
fax: (801) 255-0642
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LightShip

LightShip, an executive information system, offers a graphical front end to text, numbers, images, or graphics. The WFW version lets you send graphics and messages as E-mail from a LightShip menu option.

LightShip: \$795

Pilot Software, Inc.
Boston, MA
(617) 350-7035
fax: (617) 350-7118
Circle 1096 on Inquiry Card.

Anne Fischer Lent (Peterborough, NH) is a consulting editor for BYTE and is coauthor of The Windows for Workgroups Bible (Addison-Wesley, 1993). You can reach her on BIX as "alent" or through MCI Mail at 578-1168.



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UVGA	VESA 1024 x 768/72Hz	N/A



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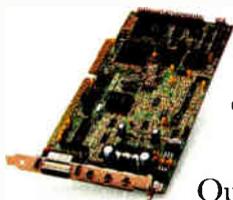
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SOUND.



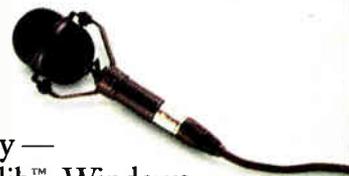
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Extending Visual Basic

Creating powerful programs for a graphical environment has never been easier

DICK POUNTAIN

Windows programming has become an almost painless activity, thanks to Microsoft's revolutionary Visual Basic environment. Where languages like C or Turbo Pascal require you to have at least some familiarity with the fear-

some Windows API, Visual Basic lets you build the user-interface part of your application by interactively combining preformed controls on the screen. It's like painting by numbers. Visual Basic controls are active entities that already know how to respond to mouse and keyboard events, thus eliminating the nastiest programming chores. You're then free to concentrate on the logic and data-processing parts of your application.

But what if there isn't a Visual Basic control that works exactly the way you want? No problem, because Microsoft made Visual Basic extensible. You can add new controls to Visual Basic, which are supported by the Visual Basic environment in exactly the same way as the built-in controls: They appear in the toolbox, their properties appear in the properties window, their events appear in the code window, and so on. Extending your system is as simple as clicking on the Add File menu option.

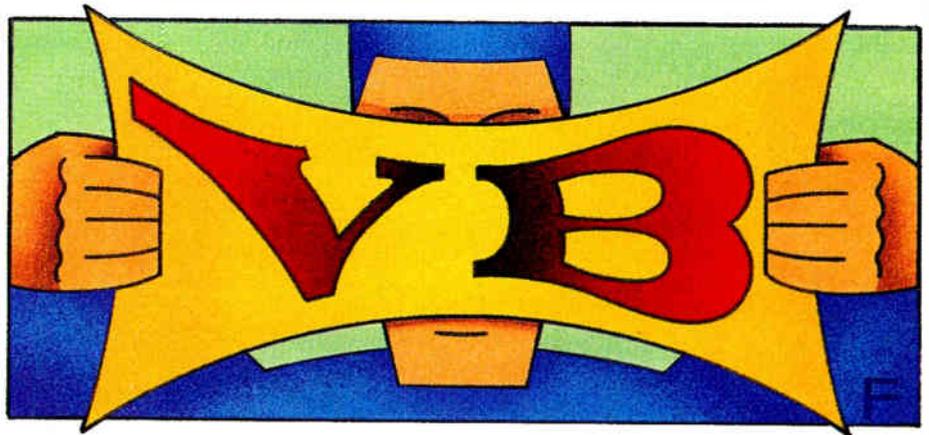
The Right Extension

Visual Basic extensions come packaged as a special kind of Windows DLL designed to interface only to Visual Basic. Because these files are named with the extension .VBX, they are usually called VBXes for short. A single VBX file may contain many controls. There's a trend, however, toward one control per file so that you, the Visual Basic programmer, don't have to load controls you're not planning to use.

Visual Basic 1.0 came with the 15 most fundamental control types built in, including text and picture boxes, scroll bars, listboxes, combo boxes, check boxes, and radio buttons. The professional edition added another 20 or so custom controls in the form of VBXes, and these are now bundled with both the standard and professional editions of Visual Basic 2.0.

Several of these bundled custom controls were developed by third-party VBX vendors; Microsoft liked them so much that it bought the rights to them. To that extent, Visual Basic 2.0 might seem to have made many third-party VBXes redundant, but as you'll see, the best VBX developers find ways to stay ahead of Microsoft in both appearance and functionality.

The Visual Basic language proper (i.e., program code rather than visual controls) is also extensible by adding ordinary DLLs that contain functions and sub-routines written in C, Turbo Pascal, or assembly language. You can use such routines just like built-in Visual Basic statements, after importing their names and parameter lists through a series of DECLARE statements in a global module.



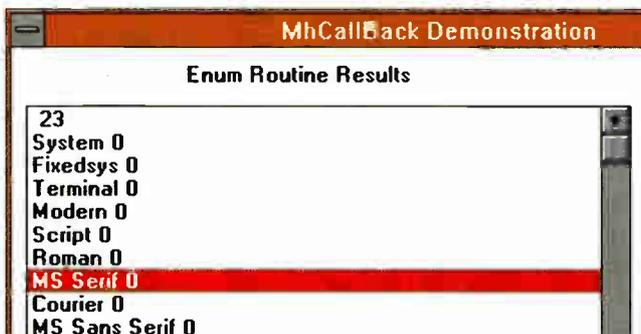
Writing VEXes or DLLs requires a thorough knowledge of the Windows API. You need a compiler such as Microsoft C 6.0 or Turbo Pascal for Windows that can generate DLLs, the Windows SDK (Software Development Kit), and, for VBXes, the CDK (Control Development Kit). Because of stringent interfacing requirements, VBXes are more difficult to write than DLLs. This may be why shareware and public domain Visual Basic extensions tend to come as DLLs while VBXes are more often commercial products.

Distribution Problems

One aspect in which custom controls differ significantly from the built-in Visual Basic controls is that a custom control's VBX file needs to be present and accessible (i.e., on a DOS path) at run time. The built-in controls are supported from the run-time library called VB200.DLL that must accompany all Visual Basic programs. Visual Basic doesn't link VBXes into your .EXE file because that would defeat the whole point of dynamic linking. Consequently, you *must* distribute any VBXes you've used along with your product, which in turn means that purchasers of your product get those VBXes effectively free of charge to design their own programs.

VBX vendors are not happy with this

Screen 1: VBTools features excellent Windows system access and a unique Stretch control, but it could stand to lose some dated tools and scale down the number of files supplied.



loss of potential revenue, and most of them stress that while you may distribute the VBX without paying royalties, only you are allowed to design with it. Some vendors (notably MicroHelp) go further by providing both design-time and run-time versions of their VBXes; you are permitted to distribute only the latter, which is completely functional but won't load into the Visual Basic environment.

Another distribution concern is file size; the VBX files you need to include can quickly use up the space on a single floppy disk. Also, you must ensure that the user correctly installs the VBX files to an accessible directory (WINDOWS\SYSTEM is usually suggested). Microsoft offers some assistance by providing a setup kit with the professional edition of Visual Basic 2.0 that helps you create Windows-style installation programs.

Extensions at Work

The exploding popularity of Windows in general—and Visual Basic in particular—has spawned a large and growing market for Visual Basic extensions. Today, dozens of companies offer Visual Basic extensions, and there are no signs that the growth of this market is slowing.

I looked at six packages that are representative of this growing market. They range from small, low-level tools that give you access to the Windows API and DOS, to large, ultrahigh-level tools like Visual Architect's Spreadsheet control. Some tools aim for a better appearance than Microsoft's offerings provide; others go for deeper functionality.

VBTools 2.50

VBTools 2.50 from MicroHelp is a vast collection of custom controls, assembly

language routines, Visual Basic subroutines, and sample programs spread among about 500 files that occupy 5 MB of disk space. Now upgraded for Visual Basic 2.0, VBTools is aimed very much at the professional developer, and many of its routines fix omissions in Visual Basic. The assembly language routines, accessible via DECLARE statements, give you control over BitBlts and StrBlts, cursors, color, text metrics, Windows system information, DOS file routines (e.g., File Exist), and much more.

My favorites among the 41 custom controls are the Stretch control, which lets you resize most standard Visual Basic controls at run time; the Tree control, which draws a collapsible tree diagram from user data as well as from disk directories; the Callback control, which accesses Windows' internal enumerated lists (e.g., fonts, sibling windows, and Clipboard formats) and messages (see screen 1); a Spread control; and the animated Card and Dice controls for game programmers. The thick ring-bound manual is untidy-looking but comprehensive and fully indexed.

VBTools is one of the older VBX packages, and a few of its tools have been overtaken by Visual Basic 2.0's bundled VBXes (e.g., VBTools' Key Status and Gauge controls are actually included with Visual Basic 2.0). Others are done better in MicroHelp's own 3-D Gizmos 1.10 (e.g., the multicolumn listboxes and toolboxes). Nevertheless, much of VBTools remains essential for serious developers.



Screen 2: MicroHelp's 3-D Gizmos offers a lot of functionality at a good price, although the large number of properties associated with some gizmos—especially the 3dMultiLabel tool—can be bewildering.

3-D Gizmos 1.10

Also from MicroHelp, 3-D Gizmos 1.10 is a collection of 17 custom controls that share the "brushed-aluminum" sculpted appearance with Visual Basic's THREED.VBX (see screen 2). The controls in 3-D Gizmos have extra properties, however, that give you more visual control than THREED.VBX does and often enhanced functionality, too.

All Gizmos let you change the fill, shadow, and highlight colors, so you can use something other than the standard gray. Any Gizmo can have a background that you can stretch or replicate to fill the control. All Gizmos allow left, right, and center alignment of single-line or multiline captions. They offer superior control of 3-D appearance, with extra bevel properties and the ability to raise or lower divider and grid lines.

The 3dList and 3dCombo boxes support multiple columns for their listed items, allowing you to use them to browse database records. The 3dDir and 3dDrive boxes feature string and substring searches on their list contents and support multiple

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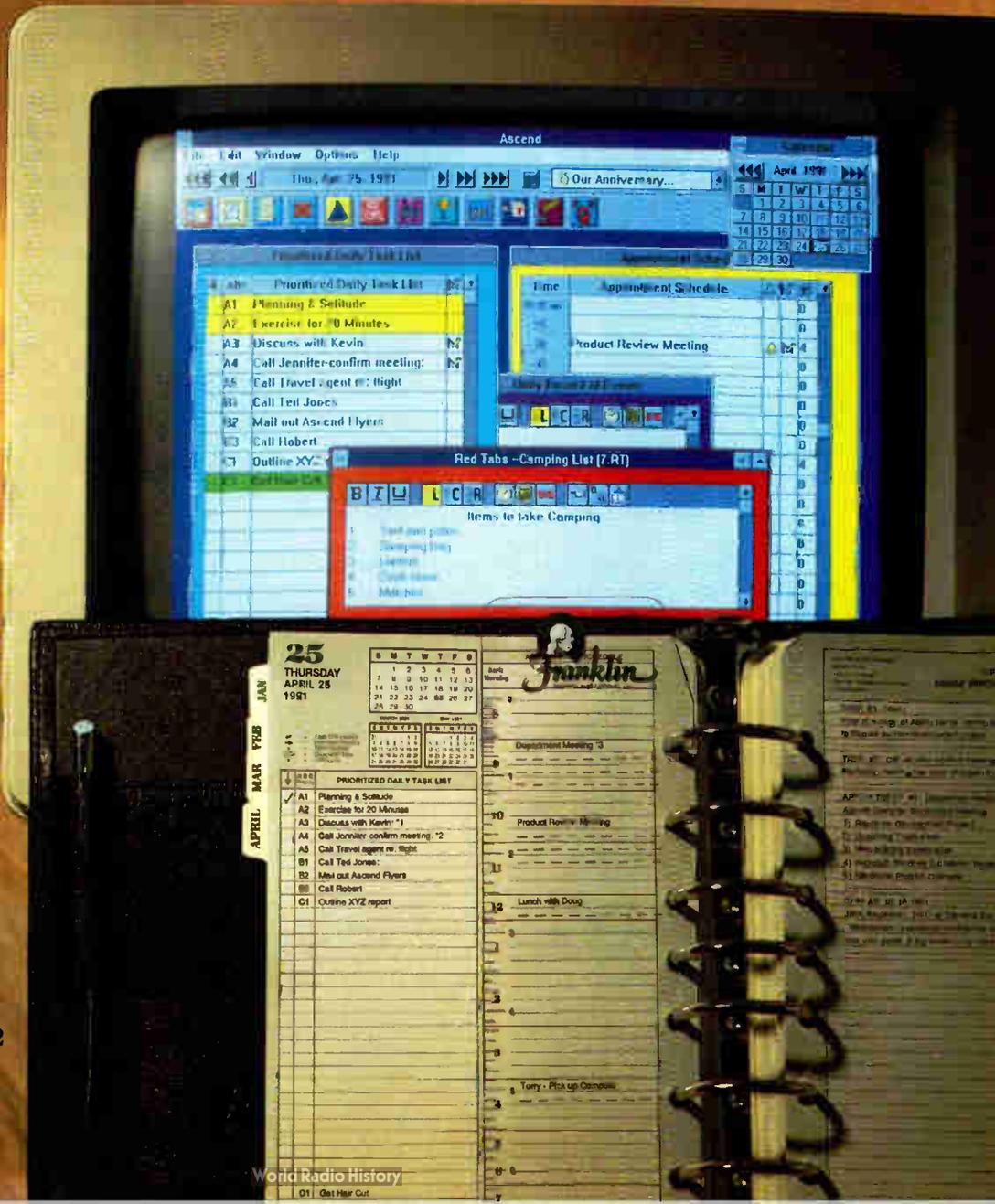
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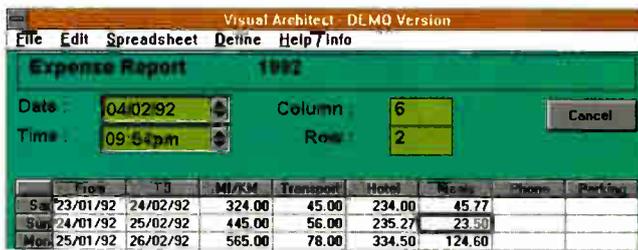


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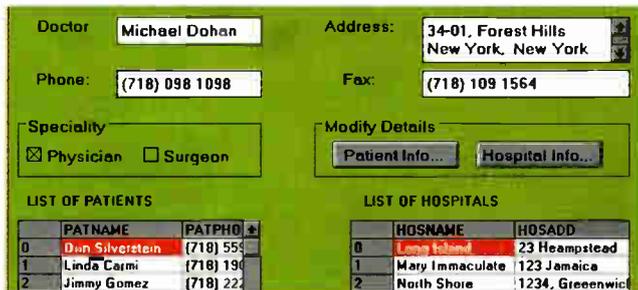
Screen 3: Visual Architect's Spreadsheet control is outstanding, but it could use on-line help.



Screen 4: Q+E Database/VB makes it easy for you to connect to a database, but it suffers from its reliance on proprietary field control types.



Screen 5: DbControls lets you use third-party controls for fields and supports multivalued fields, but it doesn't have built-in wild-card queries.



selections. The 3dCheck boxes allow you to use two different pictures to show the state of a button in place of a standard on/off button. The 3dLabels boxes allow vertically as well as horizontally oriented captions.

My two favorite Gizmos are the 3dCalendar, which lets you choose multiple dates from a beautifully drawn calendar tool, and the 3dMultiLabel, which can have up to 100 individually captioned segments within a single label bar. You use the latter to create status lines, like Microsoft Word for Windows.

The 318-page spiral-bound manual is first-class, and the \$79 price is a bargain. Apart from its calendar and multicolumn lists, 3-D Gizmos offers mostly cosmetic improvements over THREEED.VBX. But appearance is becoming a weapon in the Windows arms race; if your competitor is using 3-D Gizmos and you're not, your stuff may look like last year's model.

Visual Architect 1.0

Visual Architect 1.0 from FarPoint Technologies contains six rather modest validated data-input custom controls and one blockbuster—a fully featured Spreadsheet control that is probably the most advanced Visual Basic control that has been devised (see screen 3). While Visual Basic's own Grid control and VBTools' Spread control are just ways of viewing your data in a spreadsheet-like format, Visual Architect's Spreadsheet control is a real off-the-peg spreadsheet that includes printing, saving to disk, 3-D row and column title buttons, mouse-resizable row and column widths, and user-defined formulas.

At run time, you can press the equal key over any cell and enter a formula composed of 23 built-in functions and operators, and Visual Architect does all the work of expression parsing and calculation for you. (FarPoint tells me that later this year it will upgrade the Formula property to

full Excel emulation.) You can specify relative cell addresses using the # wild card when replicating a formula. A Redraw property gives you full program control over when recalculation takes place, which can enormously speed up spreadsheet operations. In addition to text, numbers, and Visual Architect's own validated data types, a spreadsheet cell can hold pictures, buttons, or drop-down combo boxes, letting you design some very fancy user interfaces indeed.

Visual Architect's validated data-input controls are Date, Time, Integer, and Float. They feature 3-D-effect entry boxes with optional spin buttons you use to change their values. FormattedPIC resembles Visual Basic's Masked Edit control, and TextView offers a scrolling, read-only text display. Visual Architect's manual offers no examples or index, but it's an adequate reference for all the controls.

Database Controls

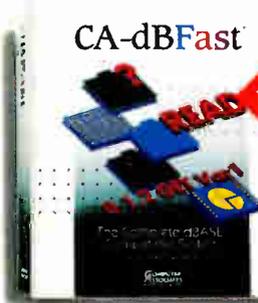
Building GUI front ends for database applications is probably the fastest growth area in Windows programming, and several VBXes let you harness Visual Basic to this task. I looked at two of them, Q+E Database/VB 1.0.4 (QEVb for short) from Pioneer Software (see screen 4) and DbControls 1.3.0 from Coromandel Industries (see screen 5).

Despite distinct differences in emphasis, these two packages have much in common. Both let you build simple database applications without writing any code by placing buttons and fields on a form. You attach one or more database files to the application by assigning their filenames to some control property and have the buttons trigger predefined database operations like Open, Close, Query, Insert, Delete, Next, and Previous, which are also designated as properties. Data retrieved from the file appears in the fields on the form. Both products work with dBase II/III/IV-format data files, but DbControls also supports Btrieve and Coromandel's own ObjecTrieve file formats. Both products let you build network-shared, multiple-file databases with either file- or record-level locking, and both support query by example.

I used QEVb and DbControls to build a simple address-book application to access 1300 addresses exported from Lotus Organizer as a .DBF file. Both produced a working solution in minutes. QEVb was marginally quicker, as I had only to place a single Query control and three text fields on the form. With DbControls, I had to manually register the field names from my .DBF file via a dialog box.

On the other hand, DbControls has a

Beauty And dBASE.



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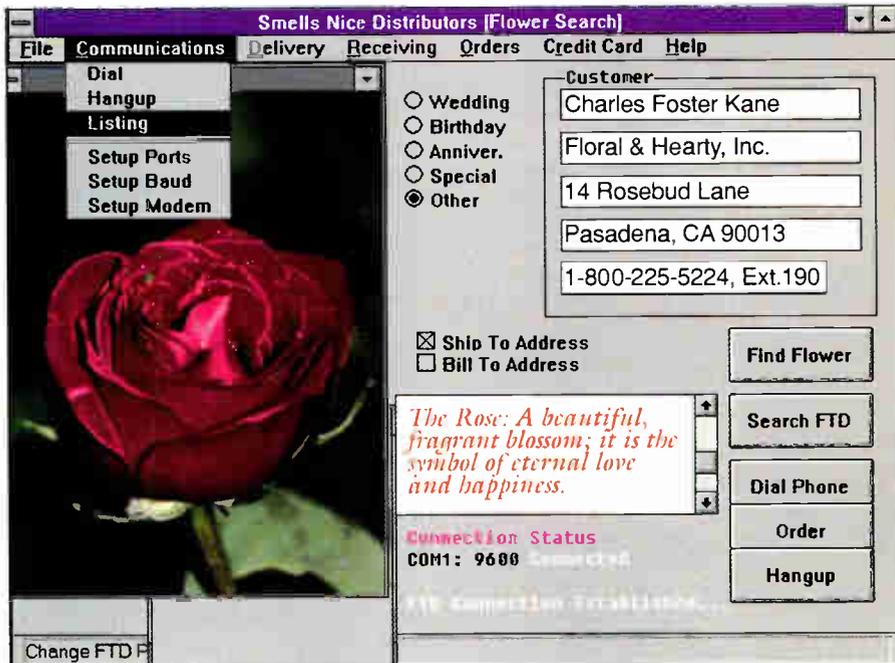
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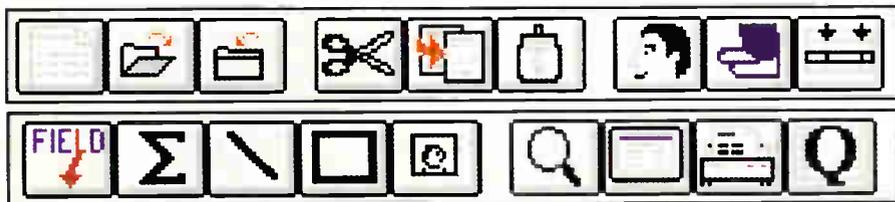
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The VAD generates the required source code, saving you hours of complex programming. You also get a

CA-dBFast 2.0 also includes CA-RET - an outstanding Windows-based report writer that lets you mix text, graphics and data on the same report in a full WYSIWYG environment.

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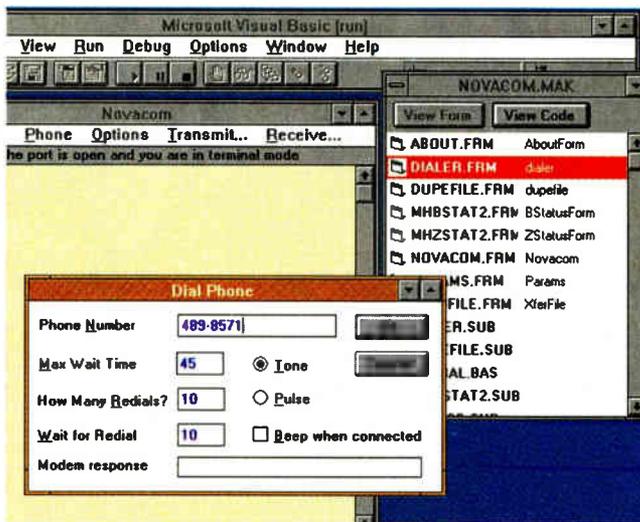
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World Radio History



Screen 6:
MicroHelp
Communications
Library features
off-the-shelf code
for protocol
transfers and a
wonderful sample
program, but it
could use on-line
help and a better
manual.



very telling advantage in that it can accept standard Visual Basic and third-party controls as fields (e.g., you could use 3-D Gizmos). QEVb supports only its own field types, which are database-aware versions of the standard Visual Basic text, check, command, radio, picture (256 colors), combo, and grid controls.

I liked QEVb's QueryGrid control, which automatically creates read-only scrolling browsers for your records; under DbControls, I had to write code using the DbcFillGrid function to fill a standard Visual Basic grid control. On the other hand, I loved DbControls' multivalued fields (you choose the delimiter character), which automatically display themselves in the successive rows of a single listbox.

QEVb offers transaction processing, with Commit and Rollback, but you'd have to code this yourself under DbControls. QEVb has a SQL query mode, but only for its own dBase files; there's no interface to external SQL devices. For that capability, you'll need one of Pioneer's more powerful products (e.g., Q+E DataLink/VB or Q+E Database Library). I found the manuals for both products barely adequate and poorly organized.

Both database VBxes worked well for me, but if I were planning a large multiuser database, I'd want stronger evidence than these simple tests provided. Choice in this area is also complicated by the recent launch of Microsoft Access, with its built-in Visual Basic language. Access may be preferable to a VBx-based solution for some applications.

MicroHelp Communications Library 2.10

Visual Basic 2.0 introduced a very simple Communications control that hides most of

the dirty business of data communications behind an event-driven facade. However, the control lacks many features you need to write professional-standard communications programs, and that's where MicroHelp Communications Library 2.10 (MCL for short) comes in (see screen 6). This library contains no custom controls, but it has more than 90 functions you import via DECLARE statements in GLOBAL.BAS. This is thus a product for experienced programmers rather than Visual Basic dabblers.

MCL's most tempting items are its eight binary-file transfer protocols (XMODEM and XMODEM/CRC; YMODEM and YMODEM-G, plain and batch; ZMODEM; and CompuServe's CIS B+) and both ANSI and TTY terminal emulations. Using MCL, you can run, simultaneously, up to eight sessions on eight serial ports, hardware permitting.

MicroHelp has also put together a number of useful forms (e.g., dialog boxes for COM-port parameter setting and phone dialing) as subroutines and functions you can call with a single statement. The MCL routines are very high-level—they completely hide UART (universal asynchronous receiver/transmitter) and interrupt-handling details. A sample project that is called NOVACOM is a usable communications program—complete with capture logs and transfer protocols—that you can use as a starting point for your own efforts.

VBxes Deliver

My overwhelming impression after trying these packages is that Microsoft, by inventing the VBx, has brought us closest yet to that Holy Grail of computing—a market in truly reusable software components. What Ada merely promised, humble

BASIC has delivered.

This is the way that object orientation was always supposed to work: Caffeine-crazed systems programmers design neat new gadgets that you and I buy in a shrink-wrapped package and use in blissful ignorance of their inner workings. I've always been a firm believer in precisely targeted laziness, and it thus gives me a real kick when I can click on an icon in the toolbox, drag an outline box to the workspace, and have a functional spreadsheet appear.

I was impressed by the overall quality of these products, but I do wonder how long this market can sustain add-on prices that are sometimes two or three times that of Visual Basic itself. However, the amount of programming time that you save using VBxes should recoup your outlay very quickly. For serious programmers, whether in-house, custom, or commercial, VBxes are like a dream come true. You owe it to yourself to try them. ■

Dick Pountain is a BYTE consulting editor who is based in London and a recent—and fervent—convert to Visual Basic programming. You can reach him on BIX as "dickp."

ITEMS DISCUSSED

DbControls 1.3.0\$199
Coromandel Industries, Inc.
Forest Hills, NY
(718) 793-7963
fax: (718) 793-9710
Circle 1148 on Inquiry Card.

MicroHelp Communications Library 2.10\$149
3-D Gizmos 1.10\$79
VBTools 2.50\$189
MicroHelp, Inc.
Marietta, GA
(404) 516-0898
Circle 1149 on Inquiry Card.

Q+E Database/VB 1.0.4\$299
Pioneer Software
Raleigh, NC
(919) 859-2220
fax: (919) 859-9334
Circle 1150 on Inquiry Card.

Visual Architect 1.0\$245
(\$895 with full source code)
FarPoint Technologies, Inc.
Richmond, OH
(614) 765-4333
Circle 1151 on Inquiry Card.



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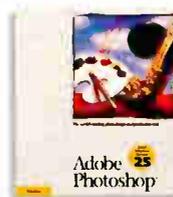
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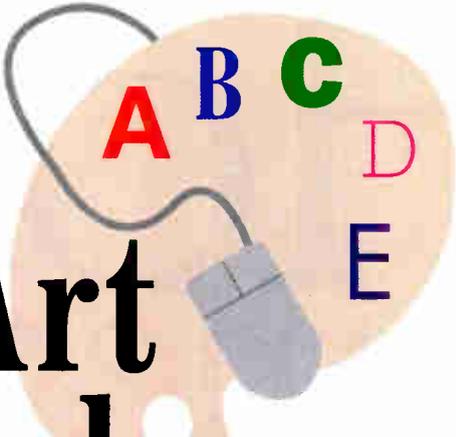
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The Fine Art of Windows Printing

Getting better printing performance from Windows means beating the bottlenecks

GREG LOVERIA

For most Windows applications, your final output is usually something printed, be it a spreadsheet, memo, letter, or color-presentation overhead. Windows makes getting data from monitor to paper relatively easy; the problem is that Windows printing is also relatively slow. This article will tell you how to speed up your Windows printing.

One Size Fits All

Windows printing has a lot going for it compared to DOS. With DOS-based applications, you frequently face the problem of hunting down the correct printer driver. If an application doesn't support your printer, you usually have to contact both the printer manufacturer and the DOS applications developer for a specific printer driver. In my experience, the hunt for the elusive printer driver often proves futile.

Windows eliminates the need for printer drivers for every application by having developers write to a virtual printer, the Windows GDI (Graphical Device Interface). The GDI is a graphics imaging model that, in conjunction with the printer driver you select, rasterizes an application's vector (i.e., line) graphics, bit-mapped graphics, and text into bit-mapped graphical data for output to your printer. Windows 3.1 ships with drivers for most printers currently manufactured, and you can get a driver for a nonsupported printer from the manufacturer.

The GDI approach benefits everyone. Developers need support only one set of printer commands, namely those supported by the GDI, and users need only one driver for each printer they own, instead of one driver for every application.

Printing from Windows

When you issue a print command from a Windows application, the application first questions the currently installed printer driver (as selected in Windows' Printers Control Panel) for answers as to how data will be sent to the printer. Some of the definitions the Windows printer driver specifies are type of printer, output resolution, and page orientation (i.e., landscape or portrait), to name just a few. After the application queries the printer driver, the GDI takes over and, depending on the printer selected, either rasterizes the data into a graphics bit map or sends the printer data as a stream of ASCII characters to the printer.

For dot-matrix printers, the GDI sends information to the printer in a series of data bands. If the print information is ASCII text, the GDI sends unrasterized data. If the data contains graphics information, which in Windows applications is most often the case, the GDI must rasterize this data into bit-mapped graphics bands, prepared and characterized in a data format for the specific printer in use. GDI rasterized data bands contain both text and graphics. Each time a rasterized data band is printed on a dot-matrix printer, the print buffer is dumped and the next data band is sent to the printer.

For laser printing under Windows, several factors have a direct effect on how fast you get printed output. The application, the printer driver, the GDI data-translation method, and the printer itself must all work together; any one factor can affect printing speeds.

Laser printers are controlled by PDLs (page-description languages) like Hewlett-Packard's PCL (Printer Control Language) and Adobe's PostScript. The main difference between PCL and PostScript is how each interprets and rasterizes Windows print data into bit-mapped graphical data. PCL printers receive bit-mapped data streams, prerasterized by the GDI, while PostScript devices receive streams of PostScript-language instructions as ASCII data.

In a PCL environment, the GDI first sends text bands to the printer, followed by bands of graphical information, which are overlaid and combined over the text bands. Often it is the application and printer driver that inform the GDI how to counterbalance and optimize the performance speeds for this text/graphics band-blending procedure. Otherwise, a PCL laser printer must receive two print requests per page, one for text and one for graphics, which slows PCL printing speeds.

PostScript combines both text and graphics into one large bit-mapped graphics page. When you print from Windows to a PostScript driver, it instructs the GDI to convert application data into a stream of PostScript commands that is sent to the printer as ASCII text. The instructions tell the PostScript interpreter inside the printer how to rasterize bit-mapped graphics pages. The rasterization of the PostScript ASCII code into a large bit-mapped graphics page occurs in the *PostScript printer*, not at the GDI level. You can get an idea of what PostScript code looks like by selecting any PostScript driver in Windows, printing a file to disk, and examining the ASCII file with a text editor.

Variables affecting how rapidly the GDI rasterizes application print information

into PCL bit-mapped data include CPU speed, available memory, printer-driver optimization, and Windows configuration. These same factors also apply to the Windows-to-PostScript ASCII data-translation process. However, after the PostScript ASCII data is sent from Windows, the final conversion speeds of PostScript ASCII code to bit-mapped rasterization are determined by the speeds of the PostScript printer's internal processor, the printer manufacturer's BIOS-to-PostScript translation, and the PostScript interpreter.

First Steps

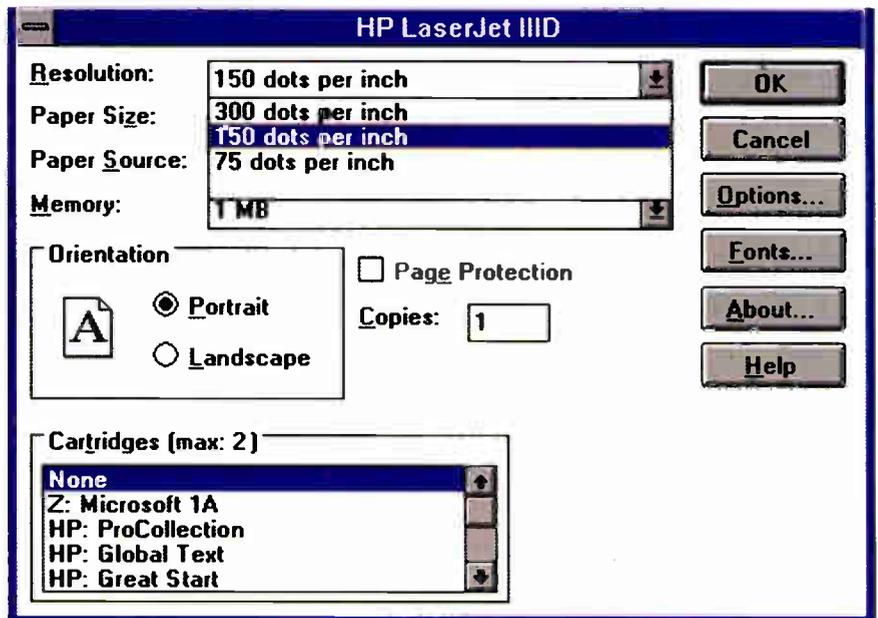
Both PCL and PostScript rely on storing bit-mapped graphics pages in printer memory. As a rule of thumb, a page of complex graphics and/or text can require from 1.5 to 4 MB of printer memory, depending on document content and the dot-per-inch resolution at which it is printed.

Many HP LaserJet compatibles ship with just 512 KB of internal memory, but users with these PCL printer memory restrictions can often circumvent adding extra memory by printing from Windows at 150 dpi. A resolution of 150 dpi can produce good-looking text documents—as well as passable graphics with some experimentation. But 150-dpi printing can also increase printing speeds by 20 percent to 50 percent. Often, half a megabyte of printer memory proves sufficient for users with spreadsheet and word processing needs. You change PCL resolution settings using the Resolution combo box that is found in the Setup dialog box of the Printers Control Panel (see screen 1).

Besides selecting a lower resolution, you can reduce both DOS and Windows print times by always using a parallel-cable and LPT printer-port connection instead of printing through a serial cable and COM port. Serial cables generally send data to the printer asynchronously at a 9600-bps rate, which can increase print times by 400 percent. The average parallel port and cable send data to printers in a multiplexed, bisynchronous communications format at a 57,000-bps rate.

Although the above low-dpi work-around solution can provide acceptable output and increase printing speeds for PCL printers with small amounts of memory, most Windows PostScript laser-printer drivers are fixed at 300-dpi resolution. Because PostScript devices rasterize whole pages of data inside the printer into one large bit-mapped page stored in printer memory, most PostScript printer owners will want to maximize their printer memory size to print full-page graphics.

Upgrading a PCL printer with additional nonaccelerated memory boards will also



Screen 1: An easy and effective way to decrease print time is to lower the resolution of your output using the Printers Control Panel program.

increase printing speeds, but you need to check that the PCL Windows printer driver in use is configured properly. For instance, if you use TrueType typefaces consistently with a PCL printer with more than 2 MB of RAM, you should set the printer memory options in the Setup dialog box of the Printers Control Panel to correctly reflect the amount of memory installed in the laser printer (see screen 2). If you have enough memory in your printer—above 2 MB—this informs the Windows printer driver to retain TrueType characters uploaded to the printer from previous print jobs.

If the printer driver's Setup dialog box is not set correctly, your printing speeds will suffer. Each time you print, Windows 3.1 will clear typefaces uploaded to the printer after each print session. The next time you print, the same typeface-upload process will be repeated each time you start another print session.

Accelerating Printing

One popular solution to accelerating printing on PCL printers is to create the final bit map for your page inside your computer rather than use the controller in your laser printer. The bit map is then sent to the printer through a high-speed link.

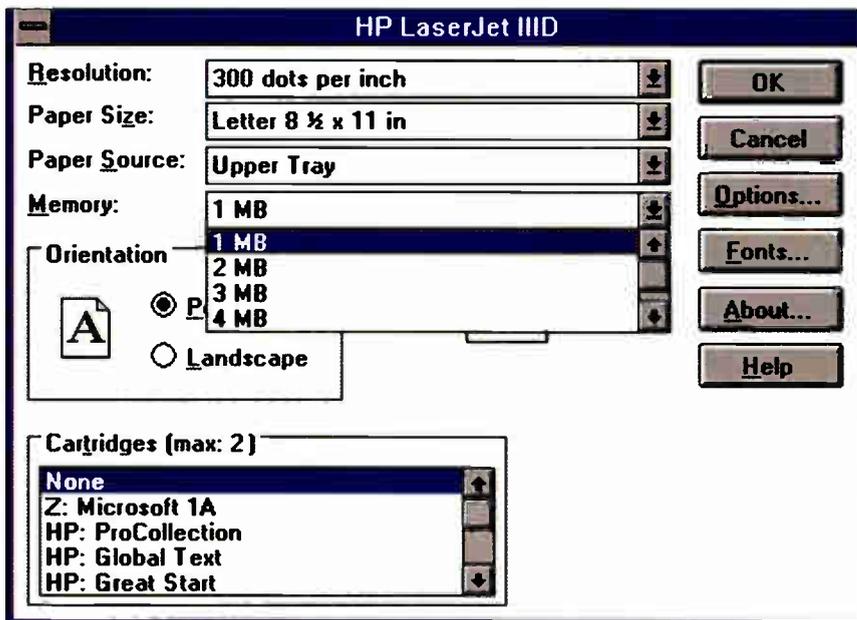
The WinJet series from LaserMaster and the PrintSprin products from Myriad Enterprises are examples of products that take this route. They use your computer's CPU to form the bit map for the printer and send the bit map via a dedicat-

ed I/O board inside your computer to the parallel port of a LaserJet II, IID, III, or IIID. These products come with special hardware that bypasses PCL completely, letting the CPU do a direct GDI-to-bit-map conversion. This can result in time savings of an order of magnitude or more.

Some of these boards also have a second mode of operation; they can provide you with PostScript emulation. The WinJet 300 (\$495), for example, provides 300-dpi PostScript; the WinJet 800 does PostScript at 800 dpi. Both let you use TrueType fonts with PostScript without first converting the fonts to Adobe format.

FlashPrint from Elite High Technology is similar to the WinJet and PrintSprin products except that it connects to the font slot of LaserJet II, IIP, III, and IIIP printers. FlashPrint comes in two models. The \$169 FlashPrint 100 works with letter-size pages; the \$189 FlashPrint 150 has extra memory to handle legal-size pages. Note that like the WinJet and PrintSprin products, FlashPrint is designed to work with HP printers. If your printer is an HP compatible, it may not work with these accelerator boards. Check with the board's manufacturer.

Another interesting add-on for LaserJets is Microsoft's newly released Windows Printing System (\$199), a plug-in cartridge and software printing-speed enhancement solution. The Windows Printing System supports LaserJet II, IIP, IIP Plus, IID, III, IIIP, and IIID printers under Windows 3.1. It requires 7.5 MB of



Screen 2: If you add memory to your printer, make sure you inform Windows of that fact. More memory means less time spent downloading fonts.

disk space and ships with 79 TrueType typefaces.

Like the accelerator boards discussed above, the Windows Printing System does not use PCL or PostScript as a PDL. It communicates directly through the GDI at the CPU level to another GDI processor/interpreter located in the Windows Printing System printer cartridge. This creates a bidirectional communications link between Windows and the PCL printer using the same GDI imaging model, circumventing PCL and PostScript translation lag times and increasing printing speeds dramatically.

Effectively, this gives Windows users near-perfect WYSIWYG printing, because there are no translations between what is displayed on the monitor by the GDI to a different PDL imaging model. Only the resolutions are different.

Bidirectional communication—Microsoft terms it High-Level Dynamic Communication—lets the Windows Printing System converse with the printer, reporting print status functions via real-time, animated pop-up windows, showing the paper moving through the printer's guide path. The Windows Printing System is network compatible, but bidirectional CPU-printer communication and status animations will work only on a locally attached printer.

On MPC systems or those that are equipped with a sound card, the system reports the status of a print job. It speaks audibly as your print job progresses, which is a plus when printing long documents if

you're away from the screen.

Microsoft's Windows Printing System also provides auto-collation for two-sided printing of long documents on nonduplex printers, full-duplex printing, and RET (Resolution Enhancement Technology) support for LaserJet III, IIID, and IIP printers. In my tests on a LaserJet IIP, the Windows Printing System worked flawlessly, with exceptional speed and quality of output in both text and graphics applications. In my experiences to date, it proved to be one of the fastest Windows-LaserJet printing-speed enhancement solutions that I've seen. Although it proved just slightly slower than the Zscript printing utility (described below), the Windows Printing System is easy to use and install.

Another hardware alternative to faster Windows printing is to invest in a TrueImage PDL "hybrid" printer, such as the units offered by LaserMaster. These printers use proprietary Windows printer drivers that send the GDI imaging model data directly to the printer in a GDI TrueImage PDL format, just as the accelerator boards mentioned above do. LaserMaster's \$1295 WinPrinter 800, a 4-page-per-minute printer, uses a WinPrint 800 PostScript driver to output at 300-, 400-, and 800-dpi resolutions. The WinPrint 400 Direct driver is a TrueImage PDL, supporting resolutions of from 300 to 400 dpi. You switch between resolutions and PDLs from inside Windows applications using the Control Panel and LaserMaster's WinPrint Manager, a pop-up print-queue utility.

During my tests of the WinPrinter 800, I was impressed with its rapid printing speeds. As expected, documents printed at 800 dpi take longer to print, and you can output them only using PostScript. However, 800-dpi text looks marvelous and is worth the extra wait. Halftone grayscale images look good and appear close to typesetter output quality. For pure speed, text documents without halftone images print the fastest in TrueImage PDL mode at 300 dpi; 400-dpi output is just a tad slower. In both resolutions, both TrueType and Type 1 faces look superb.

LaserMaster's WinPrint technology made my Windows print jobs hustle, and the 800-dpi output looked fabulous. I hope that LaserMaster's unique approach to desktop printing will set standards for other printer manufacturers.

Mixing PostScript and PCL

LaserJet owners who want access to both PCL and PostScript output can use PostScript emulation cartridges from either HP or Pacific Data Products. Pacific Data also supplies high-speed memory-upgrade XL accelerator boards for LaserJets. Prices range from \$399 for the PostScript Emulation cartridge alone to \$999 for a PE cartridge/XL memory board combination. In tests on my LaserJet IIP, depending on the document, Pacific Data's PostScript Emulation cartridge and XL memory combination provided faster PostScript output at ratios of up to 10 to 1 over a standard Apple LaserWriter IINTX or HP PostScript emulation cartridges.

Zenographics' SuperPrint 3.0 is a software-only Windows printing-speed enhancement program for PCL printers that works on both networks and stand-alone systems. It replaces Windows' Print Manager with a SuperQueue print spooler and Windows' standard LaserJet drivers with Zenographics' SuperDrivers, enhancing printing speeds substantially on PCL, dot-matrix, and non-PostScript color printers.

SuperPrint provides blisteringly fast PCL output from any Windows application, in any combination of graphics and/or text, by assisting GDI's PCL rasterization process. In my tests, SuperPrint outpaced straight PostScript and PCL output in both printing speeds and quality. And for printers that support HP's PCL 5, SuperPrint compresses rasterized print data before sending it to the printer; internally, HP's PCL 5 decompresses the data. This decreases parallel data transmission times and speeds printing.

Included with SuperPrint is SuperText, a font-scaling and typeface management program. Like Adobe Type Manager and Bitstream's FaceLift, SuperText scales

fonts on-the-fly, but it also serves as an intermediary between different typeface formats. SuperText auto-scales Nimbus, Speedo, Intellifont, and Adobe Type 1 and Type 3 bit-mapped typefaces.

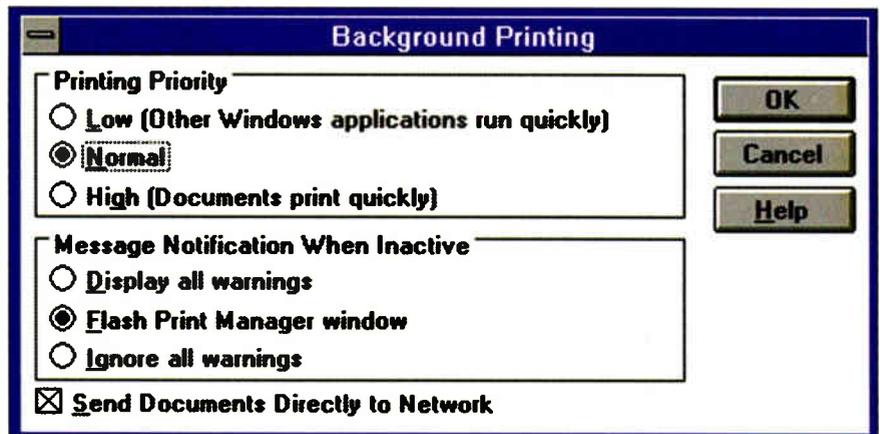
I have hundreds of multifont typefaces scattered across my five-station Xircom NetWare peer-to-peer network, with most typefaces residing on my Zeos 486/25's two 344-MB hard drives and additional typefaces on my MIS 486/66's 1.7-GB drive. Within Windows, you simply segregate typefaces by manufacturer in SuperText's Foundry integration window by browsing local and network drives for typeface subdirectories. Once the typeface is integrated into SuperText, in any Windows application, you can access, mix, view, and print any typeface format—including TrueType—from the subdirectory of any network drive to any local or network PostScript or PCL printer.

However, if you're more concerned with print quality than speed, the fastest as well as the best printed output I've seen on any LaserJet or PostScript printer is achieved using Zenographics' add-on Zscript enhancement utility. Zscript is a true 32-bit multitasking utility that is essentially a PostScript Plus substitute. Zscript uses Windows' standard PostScript drivers and lets you select the LaserWriter IINTX driver for monochrome output or the QMS ColorScript driver for color printing. You then connect your printer to an output port assignment using the Connect dialog box of the Printers Control Panel.

When you print from any Windows application, Zscript uses the standard PostScript driver and intercepts the GDI translation process to create its own PCL supermetafile, which can be either previewed on-screen before printing or printed directly to your PCL device. In my PageMaker, CorelDraw, Excel, Lotus 1-2-3, and Ami Pro tests of Zscript, I have never seen better halftones with deeper, richer, blacker blacks and faster printing speeds (or return-to-application times) from any PDL and laser printer/driver combination. SuperPrint 3.0 costs \$149; with the Zscript option, it's \$295.

Spooling Around

Using Windows' Print Manager, you have the option of returning to work in your application as rapidly as possible by spooling print jobs to disk. Print Manager spooling does increase print times, but it decreases the amount of time you are locked out of your Windows application until the print job is complete. For the fastest output possible, disable Print Manager in the Printers Control Panel and enable the Fast Printing Direct to Port option box in the Con-



Screen 3: For faster printing, set the Printing Priority to High. Just don't expect snappy response from your application while you print.

nect dialog box's pop-up menu.

Using Print Manager spooling, print times increase because the CPU must multitask between spooling data to the printer while simultaneously letting you continue working in an application. With some experimentation, however, you'll be able to find a nice compromise that lets you keep Print Manager enabled. You can experiment with the balance between multitasking and spooling priorities by choosing from the Low, Medium, or High Priority settings in the Print Manager's Options (see screen 3).

Faster spooling alternatives to the Print Manager are available from several companies. PC-Kwik's Power Pak (\$129.95), although aimed at boosting overall DOS applications and system performance speeds, also contains a fast Windows-compatible print spooler. It spools Windows print data from disk using DOS BIOS calls by disabling both Print Manager and the Fast Printing Direct to Port option in the Connect dialog box of the Printers Control Panel.

In a network environment, it's wise to disable Print Manager and set up a RAM disk as a print spooler or use intelligent spooling software. Most networks, like NetWare, frequently install their own print-queue spooler. In such situations, enabling Print Manager or simple disk spoolers causes your print jobs to pass through your local spool file to a network print spool/queue, thus increasing print times. A RAM disk or intelligent spooling system starts printing as soon as the first page of printer data is received; in a networked environment, the entire print job must be spooled to the network print queue before printing can begin.

Also in a traditional client/server network, Windows print jobs sent from a re-

mote user or client system with a locally attached printer must first spool Windows print data to the network file server. The print job must wait for the network print queue at the server to fill, and then the data is sent over the network back to the same user with the locally attached printer. With one-page Windows documents, this is not too slow, but with multipage documents or batch printing, this bogs down the network and slows printing speeds dramatically.

Intelligent network print spoolers, like Print Q Lan from Software Directions, disable NetWare's print queue at the server and enable each Windows user on the network with their own local print-spooling TSR program loaded into high memory. The TSR directs locally spooled print jobs immediately to the proper local or remote printer, bypassing the round-robin printing scenario mentioned above.

In Windows, Print Q Lan's status-display dialog box details the status of the users' print jobs, as well as which printer they have been directed to on the network. Users can easily control their print jobs locally instead of exiting an application to check NetWare's print-queue (i.e., PCONSOLE) status. In a Windows network environment, this approach reduces the load on the network server and can effectively boost Windows printing speeds with a tenfold performance increase.

Print Q Lan performs wonderfully on peer-to-peer networks, as well as on my small Xircom network. Xircom utilizes a client/server, peer-to-peer network technology. Xircom's EPP (Enhanced Parallel Port) technology increases network and print transmission speeds using external Ethernet adapters connected to standard LPT ports. Print Q Lan comes in various configurations, ranging from a low of \$495

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for a four-user network up to \$2995 for a 100-user network.

Bidirectional capabilities such as those found in the Microsoft Windows Printing System are also beginning to show up in spooling utilities. PrintCache 3.1 from LaserTools lets you use any type of memory to spool print jobs. It also reports back the status of your print job from the printer. PrintCache sells for \$99.95.

Experimentation Saves Time

Because most Windows and printing environments are unique, you need to experiment with different printer settings and driver combinations to achieve the best performance speeds and quality in your Windows printing environment. Try timing test documents within several Windows

applications with Print Manager on and off, and experiment with the multitasking priority settings mentioned earlier. You may also find that you'll want to add one or more of the printing-speed enhancement alternatives I've discussed above.

Understanding and "tuning" your particular Windows/printer setup will, in the long run, save you an abundance of time in future print sessions. So, set aside a few hours to explore and optimize your Windows print configuration. You'll find that the effort and hours you invest will bring a good return. ■

Greg Loveria is a computer graphics and desktop publishing consultant, animator, and writer in Binghamton, New York. He can be reached on BIX as "loveria."

ITEMS DISCUSSED

FlashPrint

- Model 100.....\$169
- Model 150.....\$189
- Elite High Technology
Torrance, CA
(800) 229-7888
(310) 370-2762
fax: (310) 542-4378
- Circle 1152 on Inquiry Card.**

- PE/XL.....\$999
- PostScript Emulation.....\$399
- Pacific Data Products
San Diego, CA
(619) 552-0880
fax: 619 552-0889
- Circle 1153 on Inquiry Card.**

- Power Pak.....\$129.95
- PC-Kwik Corp.
Beaverton, OR
(503) 644-5644
fax: (503) 646-8267
- Circle 1154 on Inquiry Card.**

- PrintCache 3.1.....\$99.95
- LaserTools Corp.
Emeryville, CA
(800) 767-8004
(510) 420-8777
fax: (510) 420-1150
- Circle 1155 on Inquiry Card.**

- Print Q Lan (four-user).....\$495
- Software Directions, Inc.
Randolph, NJ
(800) 346-7638
(201) 584-8466
fax: (201) 584-7771
- Circle 1156 on Inquiry Card.**

PrintSprint

- PS300.....\$249
- PS600.....\$399
- PS600/PS.....\$549
- Myriad Enterprises
Laguna Beach, CA
(800) 593-8165
(714) 494-8165
fax: (714) 497-9398
- Circle 1157 on Inquiry Card.**

- SuperPrint 3.0.....\$149
- with Zscript.....\$295
- Zenographics, Inc.
Irvine, CA
(714) 851-6352
fax: (714) 851-1314
- Circle 1158 on Inquiry Card.**

- Windows Printing System.....\$199
- Microsoft Corp.
Redmond, WA
(800) 426-9400
(206) 882-8080
fax: (206) 936-7329
- Circle 1159 on Inquiry Card.**

- WinJet 300.....\$495
- WinJet 800.....\$795
- WinPrinter 800.....\$1295
- LaserMaster Corp.
Eden Prairie, MN
(612) 944-9457
fax: (612) 943-3469
- Circle 1160 on Inquiry Card.**

INSIDE VIDEO FOR WINDOWS

Are you ready for desktop video?

TOM YAGER

Desktop digital video made a splash when Apple introduced its QuickTime for the Mac. QuickTime—along with applications such as Adobe Premiere that exploited it—demonstrated conclusively the power of digital video and showed how easy it can be to make video a part of everyday documents and presentations.

In hopes of trading on some of the momentum created by QuickTime for Macintosh, and of heading off the threat from QuickTime for Windows, Microsoft has introduced its own digital-video solution, called Video for Windows. Sold as a Windows extension, Video for Windows adds digital video to Windows' current mix of digital audio, MIDI, animation, graphics, and video-device control. It promises to make your machine a training and presentations powerhouse.

Before you can start integrating video clips into your Windows presentations and applications, however, you have to have a basic understanding of what Video for Windows does and how it integrates the many elements that make up a digital-video system. That's the job of this article.

The Inside Story

Video for Windows gives you everything you need to play audio-video clips on your desktop machine, and most of what you need to create your own videos. The most important item you don't get is video-capture hardware, but that isn't necessary if all you want to do is play back prerecorded clips.

If you have Windows 3.1 and an MPC-compatible audio board, Video for Windows lets you play clips encoded in its AVI (Audio Video Interleave) format. This capability is the heart of Video for Windows, but it's by no means all you get with the package. Video for Windows lets you convert QuickTime movies and Autodesk Animator animations to AVI format. You can also edit and combine prerecorded clips, like those on the included CD-ROM from Firstlight Productions (Redmond, WA), using the bundled editor, VidEdit. Microsoft has included the beefed-up audio editor, WaveEdit, from its Multimedia Development Kit, along with a bit-map editor (BitEdit) and a color-palette tool (PalEdit). A new version of the Media Player program, enhanced with a classier look and some helpful new OLE options, is included, as is a copy of Media Browser, which helps you keep track of your video clips.

Video for Windows plugs itself into Windows' Multimedia Extensions architecture

using Windows-level drivers. Once the installation program runs to completion, you can immediately start playing and editing video clips from within the Media Player and VidEdit.

Among the drivers loaded by the installation procedure are three codecs. Because digital-video data is so expansive, you need compression to bring it down to a manageable size. The standard codecs—Video 1, RLE, and Indeo—let you select the right balance between quality and size.

Because image compression is such a CPU-intensive job, it's not normally done on-the-fly while the video is being captured. Instead, you apply most codecs after the video has been captured, when the system has more time to analyze and compress frames. Decompression for playback, though, is a real-time affair. Specialized hardware (e.g., the Intel/IBM ActionMedia II board) that has hardware-assisted compression, decompression, and display can easily plug into the Video for Windows software.

Playback Parameters

Playing an AVI video clip is no cakewalk for your PC. As AVI's name implies, video and audio are interleaved into a single stream of data. For you to play it, the data must be split up. The player must extract the audio frames and send them to your system's audio board. The video frames take considerably more work. If the video is compressed, the player must run it through the appropriate codec. Then, if the video's color depth is higher than the display's, as when you play an AVI file with 16-bit video on an 8-bit display, the player has to dither the colors to fit within the display's color restrictions. If you've selected a playback window size that differs from the resolution at which the video was captured, the player has to scale each frame. Only then can the frame be painted onto the screen. During all this, the software must keep audio and video in sync and still leave some time for other critical tasks to run.

All this is a tall order that involves the processing of untold megabytes of data.

continued



Screen 1: *Media Player's new look. The dialog box lets you tailor the appearance of video played back through OLE links. On the right is a Windows Write document showing a Media Player OLE object icon. (Video clip courtesy of Firstlight Productions)*

easy access to AVI clips. You can embed a Media Player object in any application that has OLE client support. You simply load the AVI file, select Copy Object from Media Player's Edit menu, and then use the appropriate Paste option in the client application. This sequence creates an icon in your document that—when you double-click on it—will load Media Player and play the AVI file.

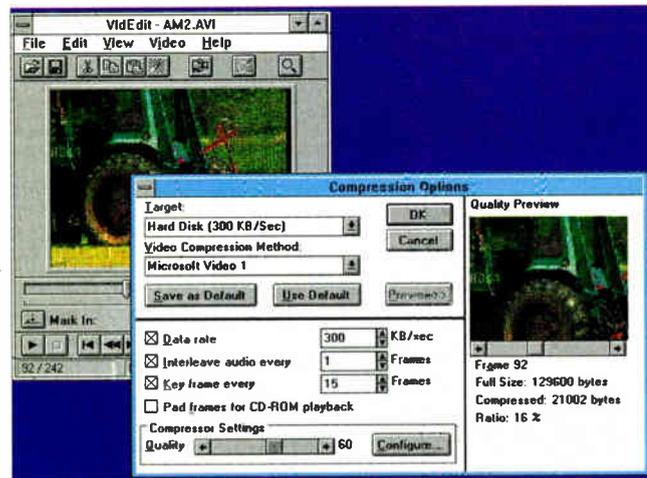
The version of Media Player included with Video for Windows includes a set of options that make video objects appear more at home in the target application. Selecting the "Play in client document" option makes the video window appear at the location of the object's icon. Thus, it looks like the video is playing from inside the client application. This option also extends the client's Edit menu to let you pop up Media Player to "edit" the video clip. This editing is limited to marking the start and end point for the embedded clip.

Of course, once you embed a clip in a document, you may want to make the document and clip available to someone else. Microsoft allows free distribution of the run-time components (but not the edit or capture applications) of Video for Windows so other people can play your clips.

Snip, Snip

If you want to do something more akin to actual video editing than what Media Player provides, you have to run VidEdit (see screen 2). Even if you are working with prerecorded clips that you have no interest in editing, you might want to run them through VidEdit. That's because VidEdit can save a video to another video file in an altered form using any combination of resolution, color depth, compression method, audio format, playback frame rate, and color palette. You can also use VidEdit to change the way the audio track is synchronized to your video. For example, a trip through VidEdit can let you trim the size of a clip moving from CD-ROM to hard disk using compression or color-depth reduction. VidEdit will resample your audio, too. Resampling from 22-kHz, 16-bit stereo to 11-kHz, 8-bit mono will quarter the size of the audio portion of your AVI file. You'll have to decide whether the corresponding reduction in sound quality is acceptable.

VidEdit is not a full-fledged digital-video editor—Microsoft certainly hasn't closed the market to likely future players such as Adobe Premiere. VidEdit lets you select portions of clips and do cut-and-paste editing. There are no transitional effects, no superimposed titles or graphics, nothing fancy. The most useful part of VidEdit is its interface to the codecs (see



Screen 2: *VidEdit, Video for Windows' editor and processor. The dialog box shows the video compression interface, which provides instant feedback through the quality preview window. (Video clip courtesy of Firstlight Productions)*

Digital video generally takes all the resources your system can throw at it. In particular, a slow CPU is the great enemy of Video for Windows; it adversely affects every stage in the processing of an AVI file for playback. A sluggish hard disk or CD-ROM controller will hold you up also, because data can only be processed as fast as it can be hauled into the CPU. And your display controller figures heavily as well: If it takes more than the merest fraction of a second to paint a frame's worth of video data onto your screen, you can't expect decent-quality video playback.

If your system isn't completely up to the challenge of AVI playback, Video for Windows does its best to adapt. By default, it maintains the continuity of the audio at all costs: a halting audio track is distracting, to say the least. When the burden of the video playback is so great that your system can't keep up, Video for Windows skips frames during playback. It also adjusts the frame rate continuously as your system's resource-usage patterns change.

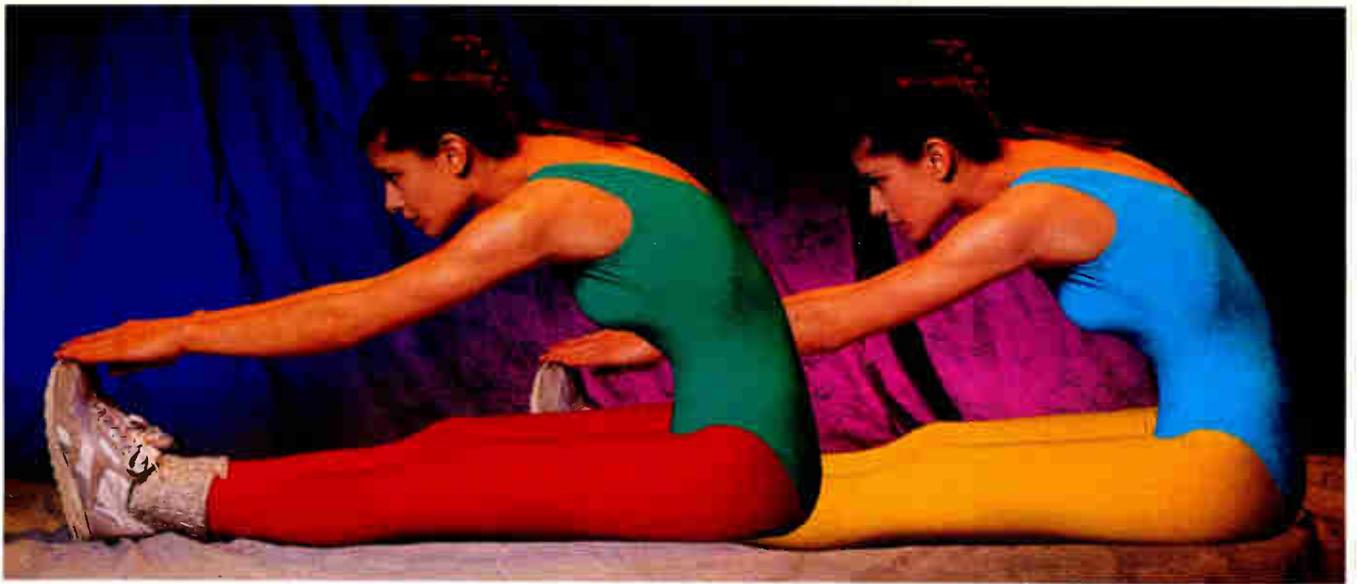
Video for Windows can adjust the frame rate to match your hardware because it

knows the capabilities of your video system. The first time you use Video for Windows—and every time thereafter that you change the default display—the software benchmarks your video hardware. Video for Windows uses the results of these tests—which only take a few seconds—to determine your system's baseline display performance at various resolutions and color depths.

Because you see the best performance with video captured or processed to a window just 160 by 120 pixels in size, the best mode for viewing video is Windows' standard 640- by 480-pixel resolution. At higher resolutions, the video window can look like a postage stamp floating in space. You can order Video for Windows to play in a larger window by rescaling the output window or by indicating a magnification factor. However, as you expand the window size, your video's frame rate declines.

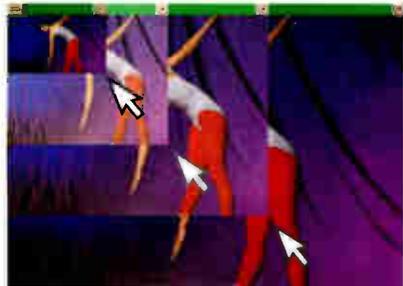
The Play's the Thing

Microsoft includes two applications that play AVI files: Media Player and VidEdit. Media Player (see screen 1) provides



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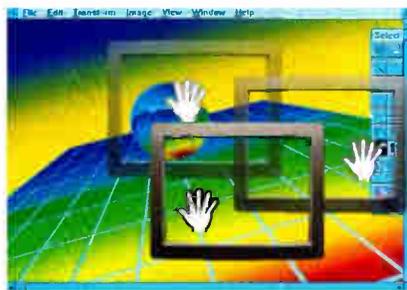


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screen 2). It gives you an instant preview of the effects a codec will have on an AVI file's size and appearance. Some codecs are tunable, letting you select a quality/size ratio that suits you.

Once you select the various properties of your clip that you'd like to change, you need only save the file. VidEdit will then resample each frame and apply the changes you've requested. Depending on the codec you've selected and your system's performance, this can take several seconds per frame. It's worth it, though, because some compressors like Indeo can chop a file to as little as 15 percent of its original size.

Up for Grabs

Until prerecorded AVI material becomes as ubiquitous as QuickTime material is for the Mac (the Firstlight CD-ROM included with Video for Windows is a great start), most of the digital video you work with will have to come from your own stock. With the included VidCap video-capture program and some special hardware, you can create your own AVI video clips. The challenge in video capture lies in how you set up your system.

At one time, two of the computer systems in my lab had 16 MB of memory. I had to trim them to 8 MB to accommodate the video-capture boards I was working with, because all but one (the VideoSpigot) were memory-mapped into the space between 8 MB and 16 MB. While the manuals wax cheery about "removing a few memory chips" to make room for the capture boards, I found the idea of emasculating my systems ludicrous. The whole experience gave me a strong preference for the VideoSpigot, which maps into the typical AT memory I/O space between 640 KB and 1 MB; you can have as much extended memory as you want.

Video-capture boards that have been released after Video for Windows come with a capture driver. Video for Windows includes capture drivers for some older boards. With a board and driver installed, you can proceed straight to VidCap.

VidCap gives you control over the parameters that affect the quality of your video clip. It captures audio through your system's MPC-compatible digital-audio board at any of the board's supported rates and resolutions. It even provides a level meter to let you see how "hot" your audio source is.

You generally write freshly captured video directly to disk in a raw format (8, 16, or 24 bits, depending on your capture board). This takes up a lot of space on disk, but it requires the least processing time during capture. That's a key consideration, because a good video capture requires

proper system configuration. If your Windows installation isn't running at peak performance, VidCap will drop frames. The more real memory and contiguous disk space you have, the faster your CPU and disk I/O and the smoother your video captures will be. If your system settings aren't right on, your maximum capture bandwidth can be halved or worse. VidEdit lets you tune your compression for a particular data rate, but when you do the capture, the only choices you have concern bit depth and frame rate. I wanted VidCap to advise me about the optimal settings for my system, but I found myself playing a lot of "high-low" games until I found the capture rate that resulted in the fewest dropped frames.

VidCap's "8-bit palettized" mode is notable in that you select the size and content of the palette. You can load a palette built with PalEdit, or you can ask VidCap to derive one from your video source. Colors in the video that aren't in your palette will be approximated, and you can redo the palette in VidEdit if you're not happy with it. Choosing your own palette can result in fine-looking 8-bit AVI videos, better than I've seen in any other 8-bit video format. Sixteen- and 24-bit color modes are useful for boards that feature accelerated high-color graphics; Microsoft includes a

specially tuned 16-bit driver for S3-based accelerators.

Fast Forward

I see Video for Windows as a pivotal technology that will spur imaginations and bring out uses for digital video that haven't yet been dreamed of. If that sounds far-fetched, consider how quickly E-mail has progressed from a curiosity to an indispensable technology.

Even if you don't care to produce your own video clips, you should at least equip your PC to play AVI files. As happened on the Macintosh, software developers will soon start using video for on-line training, reference materials, alerts, and (heaven forbid) entertainment. Beyond all that, you can't deny that video, used well, delivers many kinds of information far more effectively than words on a page or even stationary graphics. Video for Windows is the first step toward packaging that information in a compelling new way. ■

Tom Yager is an independent multimedia producer, analyst, and consultant, and author of The Multimedia Production Handbook for the PC, Macintosh and Amiga (Academic Press, forthcoming). He can be reached on BIX as "tyager" or on the Internet at tyager@byteph.byte.com.

COMPANY INFORMATION

Microsoft Corp.
 (Video for Windows)
 Redmond, WA
 (800) 426-9400
 (206) 882-8080
 fax: (206) 936-7329

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VIDEO-CAPTURE BOARDS
Creative Labs, Inc.
 Milpitas, CA
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 fax: (408) 428-6611

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IBM
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 (800) 426-3333
 (914) 765-1900

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Intel Corp.
 Santa Clara, CA
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 fax: (408) 765-1821

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New Media Graphics Corp.
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 (508) 663-0666
 fax: (508) 663-6678

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DIGITAL-AUDIO BOARDS
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 fax: (408) 428-6611

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Media Vision, Inc.
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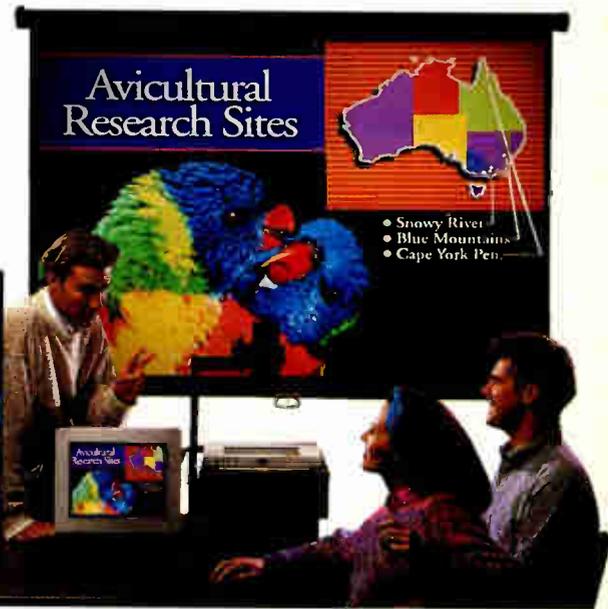
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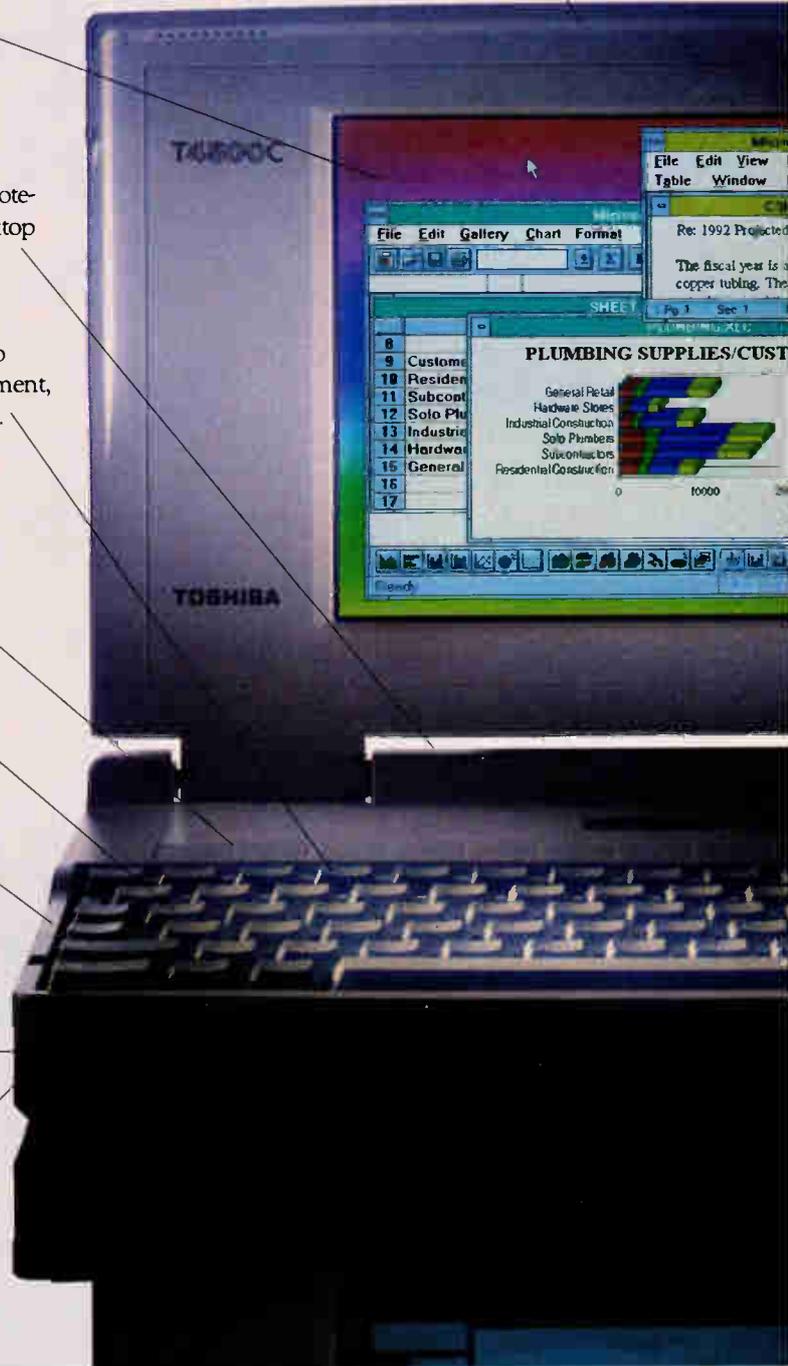
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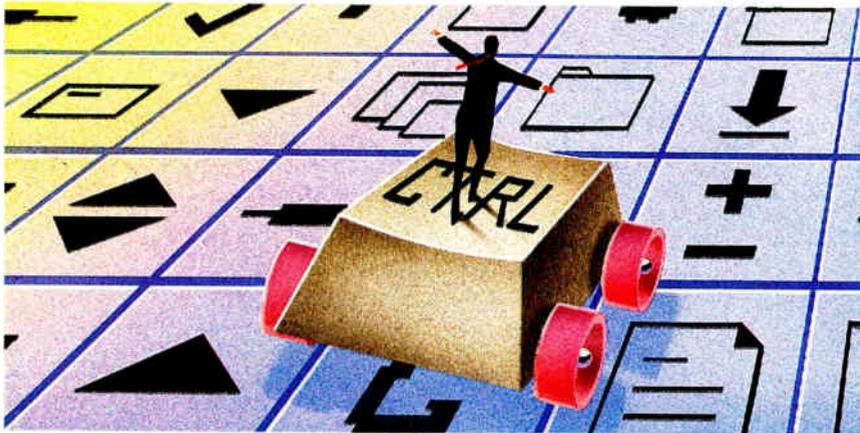
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Keyboarding!



Controlling Windows from your keyboard can make you far more productive in the right applications

NICHOLAS BARAN



In these days of GUIs—with buttons and icons designed for manipulation with a mouse—you might think it strange to run Windows strictly from the keyboard. But the fact is, many people either don't like using a mouse or need to minimize their use of the mouse for a variety of reasons. If you're interested in becoming more proficient at using Windows from the keyboard, this article will get you started.

Why would you want to avoid the mouse? For one thing, when traveling on an airplane, there's often nothing but the thigh of the passenger next to you to use as a mouse pad. Another reason to disconnect the mouse from your notebook is that it's so easy to lose track of the mouse pointer on an LCD screen; it happens to me all the time. Alternative pointing devices such as trackballs are no better than a mouse in this regard. If you do a lot of word processing, you probably don't like to take your hands off the keyboard to perform mouse operations; going mouseless will enhance your efficiency and productivity. Finally, you may be one of the literally millions of veteran DOS users who have made the switch to Windows but who still prefer working primarily, if not exclusively, from the keyboard.

To Have and Have Not

For many applications, the mouse is much better at performing certain tasks than is keyboard control. For example, drawing and page-layout applications are much easier

to use with a mouse. Any application that makes extensive use of toolboxes (in which you point and click on a tool to activate it) is generally more efficiently operated with a mouse.

Nevertheless, it's remarkable how much you can accomplish from the keyboard, particularly in basic productivity applications such as word processing and spread-

sheets, and from Program Manager and File Manager (see the text box "File Management" below). Many Windows applications—and Windows itself—provide keyboard or menu equivalents for most, if not all, mouse operations. [Editor's note: *The lists of keyboard equivalents that accompany this article are subsets of Windows operations that you can access from your keyboard.*] In fact, if you're planning to use Windows primarily from the keyboard, you should check out the keyboard capability of prospective applications before you purchase them. (Microsoft Word and Excel and WordPerfect for Windows are examples of products that provide extensive keyboard functionality.)

Getting Started

Unless you've modified the SYSTEM.INI file, Windows starts up by displaying

FILE MANAGEMENT

You can work effectively with File Manager strictly from the keyboard. In fact, many keyboard users prefer using File Manager as their main Windows interface. It's important to remember to use the Alt key along with the first letter of the menu bar options to open the various menus (e.g., Alt-F for the File menu, Alt-D for the Disk menu, and so forth).

To move between the two panes of the file directory and file lists, press the Tab key to move to the right, and Shift-Tab to move to the left. To change drives, press Ctrl and the drive letter. For example, pressing Ctrl-A opens the directories and files on the disk in drive A (you'll get an error if the drive is empty).

PROGRAM MANAGER KEYS

Arrow keys	Move between icons within a group or document window.
Ctrl-F6, Ctrl-Tab	Move between group windows or icons.
Enter	Start application or open file.
Shift-F4, Shift-F5	Arrange open windows in tile or cascade format, respectively.
Ctrl-F4	Close active group window.
Alt-F4	Exit Windows.



GENERAL SYSTEM KEYS

Alt, F10	Select (highlight) or cancel first menu selection on menu bar (press Alt + first character of menu selection to open that menu).
Esc	Close dialog boxes and menus.
Tab, Shift-Tab	Move forward and backward through fields in dialog boxes.
Alt-character	Move to field in dialog box designated by pressed character.
Alt-space bar	Open the Control menu of the active application.
Alt-hyphen	Open document window's Control menu.
Alt-F4	Quit application or close a window.
Alt-Enter	Switch a non-Windows DOS application between running in a full screen or in a window.
Ctrl-F4	Close active window.
F1	Open Help if available in active application.
Ctrl-Esc	Switch to Task List (also available from Control menu).
Alt-Esc	Switch to next application, running as an icon or a window.
Alt-Tab	Switch to application last used (open application window), or press Tab repeatedly to cycle through title bars of open applications.
Shift-Alt-Tab	Switch to previous applications (reverse of Alt-Tab).



Program Manager. In Windows, Program Manager is always running either in the background while you're working in an application or as the main interface for opening documents and applications.

For keyboard users, the most important tool in Windows is the Control menu, which lets you restore windows to their original size, move and resize them, minimize and maximize them (i.e., reduce them to icons or enlarge them to take up the entire screen), and close them, as well as switch to other windows. There are two types of control menus—document- and application-control menus. The menu displayed in the upper left corner of the Main window is its Document Control menu. Any window displayed within an application is a document window. The application itself runs in the application window. For example, Main is a document window within the Program Manager application window.

Menus and Icons

With a mouse, you open a control menu by clicking on the little box with the dash in it in the upper left corner of the window. With a keyboard, you open a document-control menu by pressing Alt-hyphen, and you open an application-control menu by pressing Alt-space bar. Once you have opened a control menu, you can execute the various commands in the menu simply by pressing arrow keys until the appropriate menu selection is highlighted and then pressing Enter, or by typing the

underlined letter of the desired menu option. For example, Alt-hyphen-N will minimize the document window.

Notice the two keyboard equivalents to the right of Close and Next in the Document Control menu. These keystrokes perform the corresponding action directly from the document window without opening the Control menu. Note that these and other keyboard combinations that work from the document window will work only if the menu bar is inactive. (To deactivate the menu bar, press the Esc key.) For example, typing Ctrl-F4 closes the currently active window. Typing Ctrl-F6 moves you to the next window or icon on the Program Manager desktop. This is particularly useful for moving from one icon to the next when you want to open a particular application.

It is also important to recognize that the Alt-hyphen command works with minimized icons. You can use the Control menu to move icons on the desktop or to

perform other Control menu commands. To move between icons within a document window, you use the arrow keys.

The Alt key activates the current application's menu bar, the Esc key cancels the current operation, and the Enter key executes the currently highlighted command or opens the document or application represented by the currently highlighted icon. For example, pressing Alt-F opens the File menu, pressing Alt-W opens the Windows menu, and so forth.

In Program Manager, pressing Alt-F-C executes the Copy command. One of the most useful keyboard combinations is Alt-Tab for switching between open applications. Hold down the Alt key and press Tab repeatedly, and you will cycle through the open applications. Windows will display the title bar of each open application rather than redrawing the screen as you cycle through the applications. When the title bar of the desired application is displayed, release the Alt and Tab keys, and that application's most recently used window will open.

Another method for switching between applications is to press Ctrl-Esc, which opens the Task List dialog box. The Task List lists open applications and provides some additional commands for manipulating them. Finally, you can use Alt-Esc to switch to the next application.

Working with Dialog Boxes

When you execute a menu command in Windows or in a Windows application, you are often presented with a dialog box. It's easy to work with dialog boxes directly from the keyboard. Pressing Esc cancels the operation and closes the dialog box. Pressing Enter is equivalent to clicking on the OK button with the mouse; it executes the current settings specified in the dialog box. To move from field to field in a dialog box, press Tab to move forward and Shift-Tab to move backward. If the field includes a check box, press the space bar to toggle the check box on or off.

To move directly to a particular field in the dialog box, press the Alt key along with the underlined character in the field

CLIPBOARD KEYS

Ctrl-C, Ctrl-Ins	Copy selected text to Clipboard.
Ctrl-X, Shift-Del	Cut (delete) selected text and copy it to Clipboard.
Ctrl-V, Shift-Ins	Paste text from Clipboard into active document or window.
Ctrl-Z, Alt-backspace	Undo most recent editing action (cut, copy, or paste).
Print Screen	Copy full screen image into Clipboard.
Alt-Print Screen	Copy image of active window into Clipboard.



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CURSOR MOVEMENT KEYS

Arrow keys	Move the cursor one line or one character.
Ctrl-right arrow	Move cursor to the right one word.
Ctrl-left arrow	Move cursor to the left one word.
Home	Move cursor to beginning of line.
End	Move cursor to end of line.
PgUp	Move cursor up one screen.
PgDn	Move cursor down one screen.
Ctrl-Home	Move cursor to beginning of document.
Ctrl-End	Move cursor to end of document.

(For text selection, use the Shift key in addition to the cursor movement keys. For example, Shift-Ctrl-right arrow selects the word to the right of the cursor.)



name. For example, if there is a field called Switch, with the S underlined, pressing Alt-S moves the cursor to that field. If a field contains a list (represented by an arrow in the right corner of the field), press Alt and the down-arrow key to open the list.

Working with Text

Fortunately, Microsoft has implemented a consistent set of keystrokes for manipu-

arrow key moves the cursor to the right or to the left one word at a time. Pressing Home or End moves the cursor to the beginning or to the end of the current line, respectively. Pressing Ctrl-Home moves the cursor to the beginning of the document, and pressing Ctrl-End moves the cursor to the end of the document. The PgUp and PgDn keys move the cursor up or down one whole screen at a time.

no problem working with the more sophisticated word processing applications that are available for Windows.

Practice the following keystrokes in a Write or Notepad document or in your favorite word processor: The right- and left-arrow keys move the cursor to the right and the left one character at a time. The up- and down-arrow keys move the cursor up and down one line at a time. Pressing Ctrl and the right- or left-

and Alt-backspace, for cut, copy, paste, and undo, respectively.

In any case, to use these commands, simply select the desired text and press the appropriate key combination. The text will be placed in the Windows Clipboard. You can then paste the contents of the Clipboard into another location in the current document or into a different document. The cut and paste commands also work on graphics data (see the text box "Capturing Screens" below).

Life After Mice

I have worked for several months with Windows without a mouse, and I must confess that I've been converted to mouse-

CAPTURING SCREENS

Another handy feature of Windows that you can access from the keyboard is the ability to capture the current screen or the current window, which is then copied to the Clipboard. Press the Print Screen key to capture the entire screen or Alt-Print Screen to capture the current window.

If you want to print the screen or save it as a graphical image, you can paste it into Paintbrush. The trick is to make sure that the image attributes in Paintbrush are correct (Alt-O-I) and that View is set to Zoom Out (Alt-V-O or Ctrl-O). Now, select Paste (Alt-E-P or Ctrl-V) and then any editing tool—it doesn't matter which one—using the Tab, arrow, and Enter keys. Finally, select Zoom In from View (Alt-V-I or Ctrl-N). You can now save or print the screen normally.

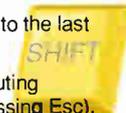
lessness. I find that the mouse gets in my way. With a little practice, you might find the same is true for you.

As mentioned earlier, however, there are many functions and applications that cry out for a mouse or some other pointing device. Don't throw your mouse away, but don't let it rule your life, either. ■

Nicholas Baran is a consulting editor for BYTE based in Sandpoint, Idaho, and the author of Windows from the Keyboard (John Wiley & Sons, 1993). You can reach him on BIX as "nickbaran."

DIALOG BOX KEYS

Home	Move to first item or character in a list or text box.
End	Move to last item or character in a list or text box.
PgUp, PgDn	Scroll up or down a list one screen at a time.
Alt-down arrow	Open a list.
Space bar	Select an item in a list or cancel selection, or select or clear check box.
Ctrl-/	Select all items in a list.
Ctrl-\	Cancel all selections except current selection.
Enter	Execute dialog box command.
Shift-Home	Extend or cancel the selection to the first character in a text box.
Shift-End	Extend or cancel the selection to the last character in a text box.
Alt-F4	Close dialog box without executing command (same result as pressing Esc).



lating and selecting text in either Write or Notepad, the two text editors that come with Windows. These same keystrokes are supported in most word processing applications for Windows, so if you master the keystrokes described here, you should have

Windows 3.1. They are Ctrl-X for cut, Ctrl-C for copy, Ctrl-V for paste, and Ctrl-Z for undo. Most Windows applications support these keystrokes now, although there are still some that use the old DOS conventions: Shift-Del, Ctrl-Ins, Shift-Ins,

COLOR YOU CAN CARRY ANYWHERE

Combine a 486 CPU with a color active-matrix LCD, and you get a dynamite Windows notebook

TOM YAGER

The marriage between active-matrix color LCD and the high-performance Intel 486 processor is the best thing to ever happen to notebook PCs for Windows users. But speed and great video alone don't make a good Windows notebook. A notebook should also have a reasonable pointing device, room for expansion, and superior power management. And, of course, this should all come with

a reasonable price tag.

The four color 486 notebooks reviewed here—the AST PowerExec 4/25 SL ColorPlus, the Compaq LTE Lite 4/25C, the IBM ThinkPad 700C, and the Toshiba T4400C—all offer exceptional performance and crisp, colorful displays (see photo 1). Each is small enough to fit easily into your briefcase. Beyond that, each has its own strengths and weaknesses.



Photo 1: The four reviewed notebooks all sport active-matrix color displays and 486-class processors.

All four systems that I looked at were loaded with DOS 5.0 and Windows 3.1. Each machine had 4 MB of memory and at least 120 MB of hard disk space (the PowerExec came with a 203-MB hard drive). All use some variety of the 486 processor: the IBM 486SLC, the Intel 486SX, or the Intel 486SL. The SLC and SX lack internal math coprocessors but can accept add-in 387SX math chips. The SLC and SL employ special power-conservation circuitry.

These systems were tested in two stages. First came the scientific part: BYTE's low-level benchmarks and Thumper battery-life tests (see "A Real-World Notebook Battery Test," December 1992 BYTE) were plied on the notebooks. Then came the nonscientific part: I set aside my own notebook (a Toshiba T2000SX, loaded each system with the Windows software that I use every day—Microsoft Works and Visual Basic—and toted each around in turn for several days, doing my work on the fly.

Toshiba T4400C

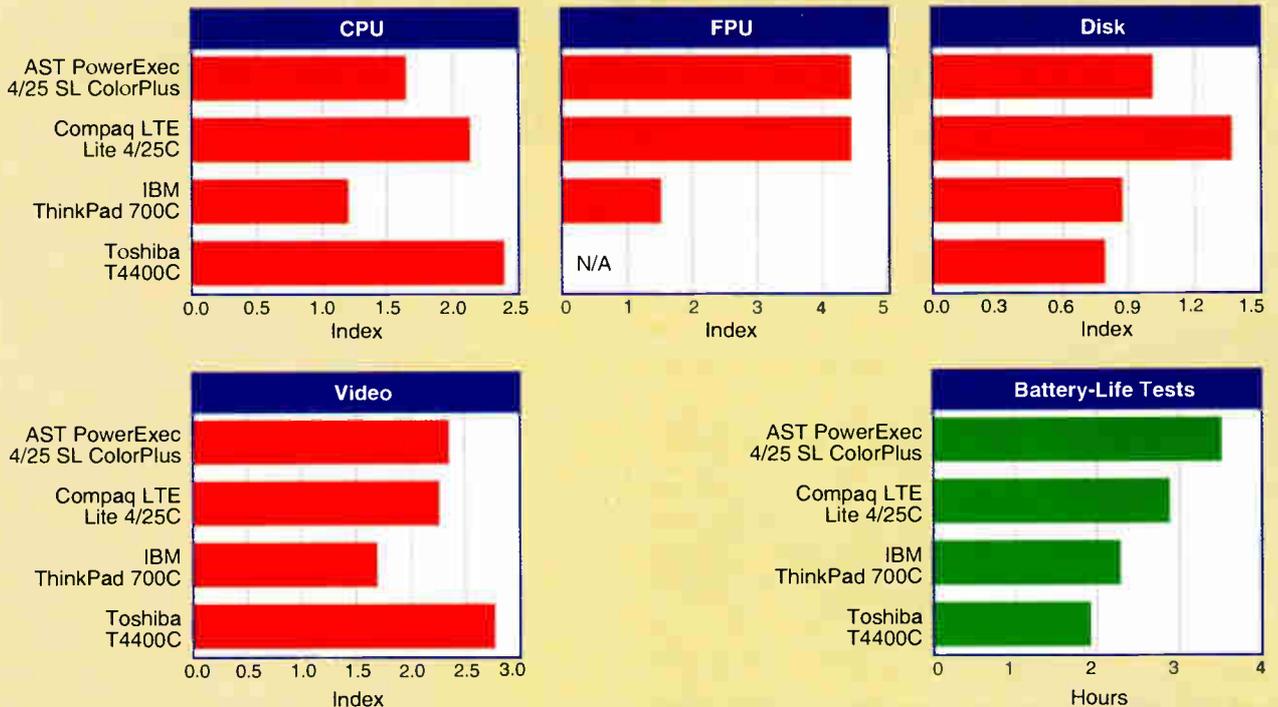
The Toshiba T4400C (see photo 2) uses a 25-MHz Intel 486SX CPU and employs traditional Toshiba power-conservation techniques. After a specified length of inactivity, the screen backlight goes out and the hard disk spins down to conserve battery power. Depending on your stated preference, powering down is done either traditionally (which wipes out the computer's memory) or Toshiba-style, with AutoResume. This feature draws enough juice from the battery to keep memory intact so that when you power back up, your program picks up precisely where you left off, letting you avoid the lengthy Windows boot-up sequence.

Between the main rechargeable nickel-cadmium battery and the internal backup battery, the T4400C can maintain memory in AutoResume mode for several days without using external power. AutoResume also kicks in automatically if your battery runs out while you're using your system.

The only controls you have over the rate of battery drain are the screen and disk inactivity timers. The T4400C displays the battery's estimated remaining juice on a pop-up bar graph that's visible only from DOS. That's unfortunate for Windows users, because the T4400C scored lowest on the BYTE battery tests, delivering just under 2 hours of operation (see the figure).

Like most Toshiba notebooks, the T4400C feels sturdy and is a pleasure to use. You pay for its ruggedness in weight.

BYTE NOTEBOOK BENCHMARKS



BENCHMARK SUMMARY

	AST PowerExec 4/25 SL ColorPlus	Compaq LTE Lite 4/25C	IBM ThinkPad 700C	Toshiba T4400C
Low-level benchmarks				
CPU	1.64	2.13	1.20	2.39
FPU	4.43	4.43	1.52	N/A
Disk	1.01	1.37	0.87	0.79
Video	2.35	2.26	1.69	2.77
Battery-life tests				
(Hours:minutes)	3:31	2:53	2:17	1:55

Except for the battery-life tests, all results are indexed. Higher numbers indicate better performance.

The BYTE low-level benchmark suite identifies relative performance at the hardware level, breaking down performance by system component. The results of these tests can help you identify the relative performance of a given subsystem and determine where performance bottlenecks may lie.

For a complete description of these tests, see "BYTE's New Benchmarks: New Looks, New Numbers," August 1990 BYTE. The BYTE low-level benchmarks, version 2.2, are available in the byte.bmarks conference on BIX, or you can contact BYTE directly.

The power requirements of 486-class processors and active-matrix displays mean that these machines, as a class, need to be recharged more often than lower-end notebooks. As you'd expect, all the machines tested outperformed the baseline 386-class system (a Toshiba T2200SX), although in the case of the IBM ThinkPad 700C, the difference is small. (N/A = not applicable.)

however—8 pounds, 2 ounces' worth. Its keys seem to have just the right resistance and travel, and they make just enough noise to let a touch-typist know the keys have gone down. The T4400C has no standard pointing device, but Toshiba includes a special clip that makes a Microsoft Ballpoint easier to slip on and off the machine.

The only shoddy part of the otherwise sturdy T4400C is its port covers. These flimsy pieces of plastic are always falling off and getting lost. They are friction-fitted, so the more you use them, the less firmly they close. The system I tested had already lost most of its port covers elsewhere.

AST PowerExec 4/25 SL ColorPlus
Going from using the T4400C to using the AST PowerExec 4/25 SL ColorPlus (see photo 3) required a big adjustment due to the drop in quality. The PowerExec has some distinctly likable features, but as a whole I was unimpressed with the machine. The brightness and contrast controls are huge buttons that click when you push them but don't repeat if you hold them down. The contrast control on my unit had no effect on the display at all; it just beeped. The keyboard layout is atrocious, with a letter-size Shift key on the right side and uselessly tiny function and

Escape keys. The keys responded to nothing but perfectly perpendicular pressure (and lots of it).

The PowerExec has one big plus: long battery life. It ran just over 3½ hours in the BYTE battery test—the best of the lot by far. That, combined with its light weight (barely over 7 pounds), makes the PowerExec well suited for in-transit work. It uses a 25-MHz Intel 486SL CPU and offers a smorgasbord of power-conservation options. After a lengthy period in stand-by mode, or when its battery power is about to give out, the PowerExec writes the contents of memory to a reserved area



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SHERLOCK also provides the basic file management functions such as: *Add, Move, Delete, Export, Rename, Copy, etc.*



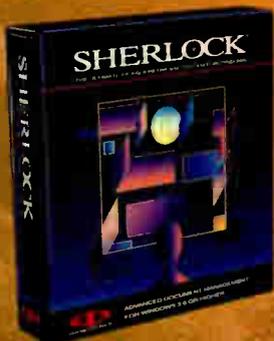
SHERLOCK's List Card:
Files are instantly retrieved using a 'Best-Fit' lookup whenever you use the application's 'Open' command. SHERLOCK's 'List Card' displays all the files that match the 'Best-Fit' characteristics in a matter of seconds. Double-click on the desired file and SHERLOCK automatically launches the file.

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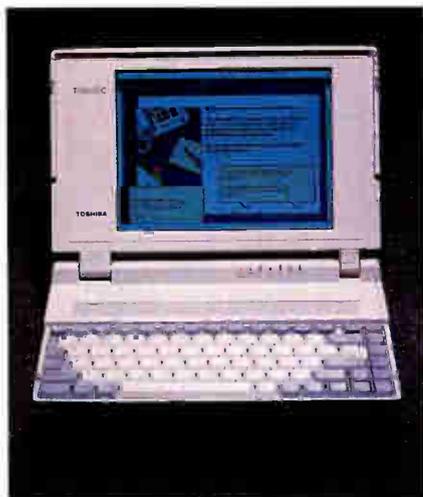


Photo 2: The Toshiba T4400C is rugged and has a superior keyboard.

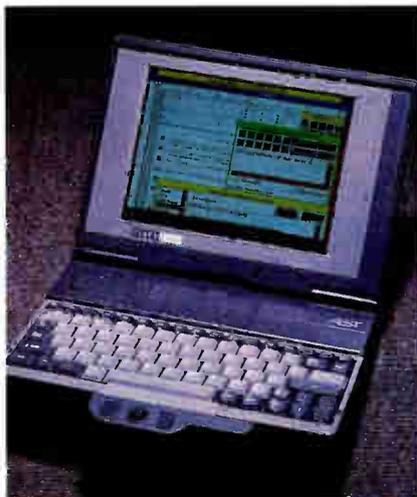


Photo 3: The AST PowerExec is easily expandable with PCMCIA cards.

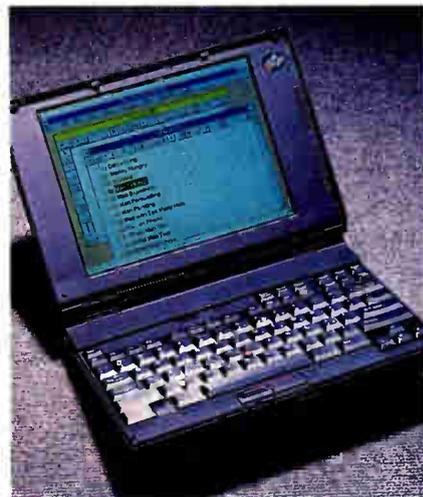


Photo 4: The IBM ThinkPad 700C has a gorgeous 10-inch-diagonal display.

on the hard disk and powers down completely. You can resume your application even if your battery has been dead for

BYTE ACTION SUMMARY

- **WHAT THESE COLOR 486 NOTEBOOKS OFFER**
Active-matrix LCDs and 486-class CPUs, with or without an integrated FPU.
- **LIKES**
Beautiful color video; good performance.
- **DISLIKES**
These notebooks are larger, heavier, and more expensive than monochrome notebooks; low battery life.
- **RECOMMENDATIONS**
The Compaq LTE Lite 4/25C offers the best mix of performance and features, but the IBM ThinkPad 700C is more durable and better designed for usability.
- **PRICE**
AST PowerExec 4/25 SL ColorPlus:
with 203-MB hard drive, \$4699;
with 83-MB hard drive, \$4199
Compaq LTE Lite 4/25C, \$4099
IBM ThinkPad 700C, \$4350
Toshiba T4400C, \$3999

days—that's more than any of the other systems here can do. A press of the Suspend button puts the system in standby mode, and another press awakens it. The PowerExec can also awaken itself at a specified time or in response to a ringing modem for those late-night modem transfers and fax transmissions. (The IBM ThinkPad 700C provides similar capabilities, but it uses a DOS utility, as opposed to the PowerExec's ROM setup.)

Other advantages of the PowerExec include two PCMCIA card slots, a removable hard disk, and a front-mounted port for a snap-on trackball. Some of the trackball assembly is well designed. Unfortunately, the ball is loose and rattly, and the buttons flanking it require too much pressure. You can hook a conventional pointing device to the mouse port, or if you're in a bind, you can use the PowerExec's keyboard mouse: When you hold the Fn key down, the arrow keys move the mouse pointer, and the Z and X keys act as left and right mouse buttons. This is a very handy setup for those situations when you are mouseless but you want to run Windows.

IBM ThinkPad 700C

The IBM ThinkPad 700C (see photo 4) wins the award for most innovative design. From its soft black exterior to its bright 10-inch-diagonal display (the largest in the group) and integrated pointing device, this system stands out in a crowd. At the front, the NiMH (nickel-metal-hydride) battery and hard disk are easily removed, although you can lock the hard disk in its bay. You can also use the retractable metal hasp to secure the system to a desk with a cable. At 7 pounds, 3 ounces, the rugged-

ly built ThinkPad is the second heaviest machine that I reviewed.

A pair of feet let you stand the ThinkPad at a comfortable typing angle, and the keyboard layout shames even that of the T4400C. The large Alt and Control keys are set on both sides of the space bar. Keys that are supposed to be bigger, like Tab and Backspace, are bigger, and the inverted-T cursor-key arrangement is set

The IBM ThinkPad
700C notebook
wins the award for
most innovative
design.

apart from the rest of the keyboard. The keys are a little springier than those of the T4400C and don't travel quite as far, but the ThinkPad's keyboard is very nice just the same.

The standard pointing device on the ThinkPad is an ingenious creation that IBM calls a "pointing stick." It's a stubby joystick that looks like a pencil eraser jammed into the center of the keyboard. The pointing stick is omnidirectional and pressure-sensitive; the harder you press, the faster the pointer moves. A pair of per-



Photo 5: *The Compaq LTE Lite 4/25C has the best all-around performance.*

fectly placed pseudo-mouse buttons are located at the bottom edge of the keyboard, and either hand can comfortably shift from the keyboard to the pointing stick and back again, with the thumb operating the mouse buttons.

The ThinkPad is long on indicators and short on controls. LEDs (which are visible when the case is opened or closed) show the system's operating status. There are only three controls: brightness and contrast sliders (which actually work) and a speaker volume control. Power management is done indirectly. Closing the lid places the system in standby mode, and a DOS command-line program gives you more direct control over display and disk shutdown as well as other power options. There is no software battery-life gauge; a battery LED glows a different color when the battery runs low, and it blinks just before death occurs.

Due to the poor integer performance of the IBM 486SLC, the ThinkPad ranked last in the overall performance tests (see the figure). It also lacks built-in floating-point acceleration. The fact that the ThinkPad has little head for numbers won't cause you trouble while working with a word processor, but complicated spreadsheet recales and high-end graphics will suffer unless you buy the optional floating-point accelerator.

Compaq LTE Lite 4/25C

You'd expect a machine from Compaq to put in an impressive showing, but the LTE Lite 4/25C (see photo 5) proved to be a mixed bag. The system's case is similar in design to that of the T4400C, but the 4/25C feels much less substantial. Its case feels cheap, with connector covers even

flimsier than the T4400C's and a too-thin plastic shell on top that gives under the slightest pressure. On the other hand, the 4/25C is the lightest system I reviewed (6 pounds, 9 ounces).

A small trackball sits to the right of the display (bad news for the left-handed) and suffers from the same loose feel as the PowerExec's snap-on trackball. There are too few indicator lights (there are no top-facing hard or floppy drive activity lights), and the lid obscures all indicators.

The keyboard felt too stiff and didn't offer enough key travel for touch-typing, and the layout is flawed: The Alt and Control keys are letter size (but the lesser-used Fn key is larger), F11 and F12 are double-bunked with F1 and F2, the backslash and tilde are squeezed-in half-size keys, and the legends on the directional keys (e.g., Home, End, and PageUp) are too small. Still, the keyboard is at least usable (unlike that of the PowerExec).

Like the PowerExec, the 4/25C drops in and out of standby mode at the press of a button. A so-called hibernation mode provides a deeper sleep, similar to Toshiba's AutoResume; as long as your primary or standby battery has power, your data is safe and you can pick up precisely where you left off.

For Windows users, the 4/25C wins handily in the power management software contest. It's a mix of a point-and-click graphical DOS option manager and a set of hot-key-based pop-ups that work even under Windows. You can use these pop-ups to check your battery status (with both a gauge and a timer), change the degree of power conservation, and set the speaker volume.

Another plus for Windows users is the 4/25C's speedy hard drive. It was over 25 percent faster than the PowerExec's drive, which was the next fastest.

Top Choices

I like the Toshiba T4400C's keyboard better than the others—although I like the layout of the ThinkPad's keyboard best—but the machine's weight and short battery life moved the T4400C down on my list. If you're stuck on Toshiba, you may want to wait until the T4500C, with its 3.3-volt processor, becomes generally available. Dead last belongs to the AST PowerExec. Its flaws outweigh its impressive list of features. Still, if you like the concept of PCMCIA slots, the PowerExec is the only system of the group that provides them.

For combined performance and battery life, the Compaq 4/25C is the leader (although the T4400C is faster and the PowerExec lasts longer). However, the 4/25C

might not hold up as well as the others on the road. But despite its disappointing keyboard and other lacking elements, the 4/25C, with its 486SL NiMH battery, and killer power management software, is a compelling choice if you know you can give it a well-cushioned ride.

You should have no travel fears about the sturdier IBM ThinkPad 700C, but to carry it would be a compromise. It lags in both performance and battery life. Then again, the 10-inch-diagonal display is big and bright, and the NiMH battery is remarkably easy to replace. Its superior keyboard and built-in pointing stick will make Windows easier to use. The ThinkPad's usability and durability place it at the top of my list. ■

Tom Yager is an independent multimedia producer, analyst, and consultant, and author of The Multimedia Production Handbook for the PC, Macintosh and Amiga (Academic Press, forthcoming). He can be reached on BIX as "tyager" or on the Internet at tyager@bytepb.byte.com.

COMPANY INFORMATION

AST Research, Inc.
(PowerExec 4/25 SL ColorPlus)
Irvine, CA
(800) 876-4278
(714) 727-4141
Circle 1064 on Inquiry Card.

Compaq Computer Corp.
(LTE Lite 4/25C)
Houston, TX
(800) 231-0900
(713) 370-0670
fax: (713) 374-1402
Circle 1065 on Inquiry Card.

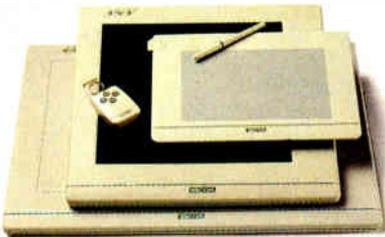
IBM Corp.
(ThinkPad 700C)
Somers, NY
(800) 772-2227
(800) 426-2968 (orders)
(914) 766-1900
Circle 1066 on Inquiry Card.

Toshiba America Information Systems, Inc.
Computer Systems Division
(T4400C)
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DO YOU KNOW WHERE YOUR MONEY IS?

Microsoft Money and Quicken for Windows let you get a grip on your personal—and not so personal—finances

KENNETH M. SHELDON

Balancing your checkbook has certainly come a long way from the days of canceled checks, calculators, and curses. Today, a wealth of computer programs promise to help you straighten out your checking account, not to mention track your credit cards, help you stick to your budget, and perform a lot of other financial functions. Two of the best such programs are available for Windows: Quicken and Microsoft Money.

Getting Started

In many ways, Quicken for Windows and Microsoft Money are twin sons of different mothers. The latest versions (2.0 in both cases) include enhancements that make them more powerful than previous versions, not to mention more similar to each other.

Installing these programs is relatively easy, and each has an on-line introduction that walks you through the major features of the program. Each comes with a thick manual: Money's contains 295 pages, and Quicken's has 320 pages (and is, in fact, a bit more comprehensive).

Quicken and Money organize your finances into one or more accounts, each of which represents a checkbook, credit card, savings account, and so forth. You enter transactions in each account—checks that you have written, deposits, purchases made with a charge card—and the programs keep track of the balance, the total amounts you've spent in each category, and so on.

Both programs have a row of icons that let you perform common functions by pointing and clicking. Quicken's "icon-bar" has a major advantage: You can choose buttons with icons, text, or both, or you can turn the bar off altogether (see screen 1). You can also rearrange or

move icons and add icons for built-in functions or macros that you've written to automate tasks you perform repeatedly. In contrast, Money's toolbar is fixed and unchangeable (see screen 2).

Quicken lets you open as many accounts as you want, and you can arrange them on

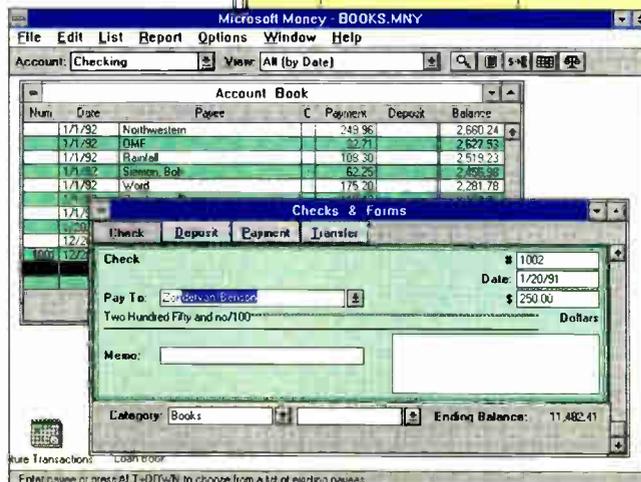
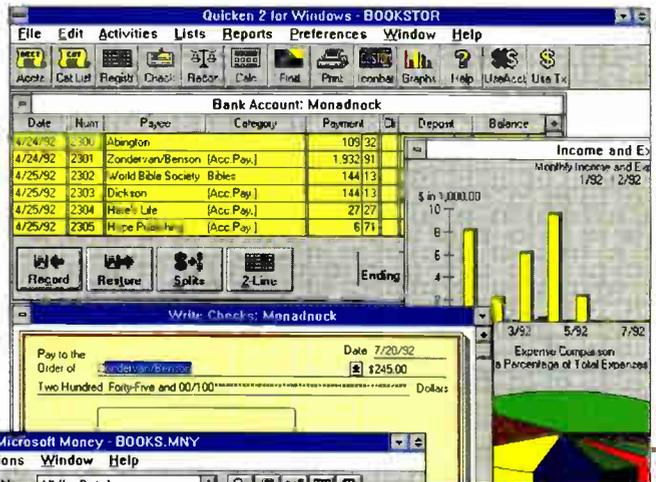
the screen to please your own taste. Money provides an account book that lets you view only one account at a time, although you can view multiple accounts in the single account window—although I'm not sure why you'd want to. You can also restrict that view by payee, category, and so on, to get a kind of temporary on-screen report.

In either program, an account looks like a checkbook register, with places for the date, a check (or reference) number, the payee, the amount, a memo, and a category. You can enter transactions directly into the account register or by filling out a check. Quicken limits the check-writing metaphor to accounts for which you would actually write checks. Money carries the metaphor over into charge accounts, in which case the form resembles a charge slip.

Thanks for the Memory

Now comes the real glitz: Both of these programs can memorize transactions. For example, suppose you make a check out to Woodman's Florist. Quicken and Money will memorize the payee, amount, and

Screen 1: Quicken 2.0 for Windows lets you open as many accounts as you like and arrange them as you please. As you enter transactions in the Write Checks window (shown here), Quicken makes educated guesses about the payee.



Screen 2: Microsoft Money provides one account window in which you can see a single account or multiple accounts combined.

category. The next time you begin to type "Woodman's," the programs automatically fill in the rest of the name. (Money needs at least three letters; Quicken starts making suggestions with the very first letter and begins to narrow the choices as you continue typing.) You press the Tab key to accept the suggestion, and the programs complete the check with the name, memo, category, and amount of the last check written to that payee.

This auto-fill feature is especially handy for transactions like payroll or rent checks, which don't tend to change from month to month. (Note that you can also turn off the feature in either program if you don't find it useful.) Quicken adds a few fea-

tures: It lets you edit the memorized transaction so that it comes up with the category and amount you want (rather than those of the most recently written check). Quicken also provides the auto-fill feature in the category field, whereas Money limits it to the payee field.

If you'd rather, you can choose the payee and category from a drop-down list, which appears when you click on an arrow next to the field. (Or you can have it appear automatically every time you select the field.) When you first start Quicken or Money, the program sets you up with categories for home (e.g., "groceries" and "rent"), business (e.g., "advertising" and "freight"), or both. You can also add to the category list as you enter transactions. This list includes the names of other accounts so that you can make transfers from one account to another. For example, you can write a check to pay off your credit card debt and select Credit Card from the category list, and the programs will automatically transfer the information from one account to the other.

Doing a Split

What if you want to write a single check to cover several invoices owed to the same company? Both programs let you "split" transactions by clicking a button. (Money also provides keyboard and pull-down-menu equivalents.) If you haven't already entered an amount in the payment or deposit field, Money asks if this transaction is for money spent or received. Quicken assumes it's for money received, which, of course, isn't always the case.

The two programs handle split transactions that include transfers to other accounts differently. If more than one part of the split goes to a single account, Money enters each part as a separate transaction in the other account; Quicken lumps them together into a single transaction, and you have to go back to the original account to see information such as separate invoice numbers.

Editing split transactions can be a bit tricky, because the amounts in the Splits dialog box have to equal the total amount of the final check or deposit. Here again, Money is a bit friendlier, alerting you when you're about to do something that could throw things off, and providing you with some options. For example, if you change your mind completely about splitting the transaction, Money lets you get rid of the breakdown just by typing over the word *split* in the category box—although it prompts you to make sure you know what you're doing. The "unsplitting a transaction" procedure in Quicken is quite a bit more complicated.

Be Ye Reconciled

If you're like me, you've spent hours trying to reconcile your monthly bank statement with your checkbook to see why there's a 47-cent difference between the two. Both of the programs make reconciling accounts a breeze.

First you click on an icon with a set of scales ("balancing" your checkbook—get it?), and you'll be prompted to enter the opening and closing balances from your statement. You then click on the checks that have been returned, and the programs mark them as processed. If the amounts don't jibe, the programs will tell you how much you're off and let you go back to look for the problem or automatically enter an amount to correct it.

Reporting for Duty

Both Quicken and Money let you print out a variety of reports based on the information in your transactions. Money provides Register, Summary, Income and Expense, Tax, Budget, and Net Worth reports, and you can customize them to restrict the accounts included, type of transaction, date range, and so on. Quicken has four major categories of reports—Home, Business, Custom, and Investment—and several sub-categories, which you can also customize. Either program will give you, for example, an itemized list of the expenses in any given category in the event that your tax return is audited. A row of buttons along the top of reports makes it easy to customize reports, and both programs let you "memorize" customized reports so that you can select them later using the pull-down Reports menu—a great time-saver.

Microsoft Money also lets you create a chart for any report and display it in bar, line, or pie format. You can customize the chart, and if you save the report, the chart is saved along with it.

Quicken's charts, on the other hand, are not linked to any specific report. And although you can customize the four standard graphs (Income and Expense, Budget Variance, Net Worth, and Investment), you can't change the display format, nor can you memorize the chart. However, Quicken provides a powerful feature called QuickZoom that lets you zoom in on any item in a report or graph so you can see the data it's based on (e.g., the numeric value of a column or the actual checkbook entry for a report). QuickZoom is handy for figuring out discrepancies like why your net worth dropped in November.

When Quicken has too much data to fit on one chart, it breaks the information down into multiple charts. Money tries to squeeze everything onto one page, which can make for some illegible charts. In fact,

BYTE ACTION SUMMARY

■ WHAT WINDOWS FINANCE PROGRAMS DO

They help you manage your checkbook, credit cards, investments, and other accounts.

■ LIKES

These programs make money management easy. Both have auto-fill features to speed data entry, and both let you create custom reports.

■ DISLIKES

Money limits you to a single account window. Quicken's handling of split transactions could be better. Computer checks are too expensive.

■ RECOMMENDATIONS

While these programs are very similar, Quicken 2.0 for Windows has the edge in features and flexibility.

■ PRICE

Microsoft Money 2.0, \$69.95
Quicken 2.0 for Windows, \$69.95

■ FOR MORE INFORMATION

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A HOST OF QUICKEN ADD-ONS

Quicken, once a simple checkbook manager, has become the foundation for several add-on products for individuals and small businesses. Here's a brief look at some of these products.

The Quicken Business Pack (\$129.95 from Intuit) bundles Quicken for Windows with features designed for businesses, such as specialized category lists that let you set up income and expense categories for 21 different specific businesses, from Accounting to Wholesale. A Tax Schedule Automator allows you to assign each category to a specific tax form or schedule so that the categories automatically go to the right place when you transfer information to a tax-preparation program. In addition, a feature called QuickInvoice generates invoices on preprinted forms, letterhead, or plain paper—and it integrates the information with Quicken so that you can keep track of how much you are owed, who

has paid, and so forth.

Another package, Quicken Companion (\$19.99), adds two features to Quicken. The first, Quicken Quotes, automatically retrieves current stock prices and lets you transfer them to investment accounts to keep track of your portfolio's value. The program dials a special 900 number (which costs \$1 per minute) or lets you use CompuServe. With it, I was able to check the current value of my stocks, along with a few others that I'm interested in, in less than a minute.

The second feature Quicken Companion adds to Quicken is the Quicken Tax Estimator, which lets you calculate your estimated tax and compare different scenarios for withholding, deductions, and so on. Unfortunately, the Tax Estimator does not import information directly from Quicken; you have to type it in, which seems odd for a program of this nature. Nevertheless, Quicken's reports make this information easy to get

to, and the Tax Estimator helps you answer questions like, Is your company withholding enough from your salary? Should you be paying estimated taxes on a quarterly basis? How much would it save you in taxes to put \$2000 in an IRA this year?

Although Quicken prints payroll checks and reports, it doesn't calculate wages, taxes, deductions, and so on. Fortunately, another Quicken add-on called QuickPay (\$59.95) does all that. With it, you enter each employee's name and personnel information into the program. When it comes time to write checks, you only have to click on the person's name and then click on the Process Check button. QuickPay's built-in tables calculate the employee's withholding, Social Security, and other deductions, and it posts the check to the appropriate Quicken account. When all the employee checks for a pay period have been posted, you can print all of them in a batch.

Quicken's graphs generally look better than Money's when printed, and they also look much better on-screen. Unfortunately, they have to *stay* on-screen, because Quicken doesn't let you export them to the Clipboard. Money lets you copy a chart to the Windows Clipboard and paste it into another application, a handy feature.

The Frills

Setting up a budget is probably one of the most important financial steps you can take—not to mention the least enjoyable. Quicken and Money attempt to make budgeting a little easier by providing auto-budgeting. This feature uses your previous transactions to suggest how much you want to budget for any given category. Quicken's system is a bit more flexible.

Quicken also has a financial-planning toolkit with four tools: Loan Planner, Investment Savings Planner, College Planner, and Retirement Planner. These features are helpful and easy to use, but the data isn't integrated with the rest of Quicken. Money, in contrast, provides only a Loan Calculator, which nevertheless could be used for the same things and is more flexible (e.g., it allows for balloon payments at the end of a loan). Money will also walk you through the creation of a loan account that is integrated with your other accounts.

Down to Business

Quicken and Money both claim that you can use them to keep the accounts for a small business. You do this by setting up asset and liability accounts (which resemble the standard checking account) for accounts receivable and payable, respectively. You then enter the names of the parties that owe you money (or to whom you owe money), the amount, and when it's due. To keep track of your payroll, you set up a payroll category—with subcategories for various deductions—in the standard checking account.

The manual that accompanied Quicken for Windows 1.0 provided extensive help for setting up bookkeeping, project tracking, payroll, accounts payable and receivable, and other business uses. Unfortunately, that information seems to have disappeared from Quicken 2.0's manual, negating a strong advantage Quicken used to have over Money. When you start dealing with payroll, accounts payable, and accounts receivable, you're getting perilously close to real accounting, a situation in which most of us need all the hand-holding we can get (see the text box "A Host of Quicken Add-Ons" above).

Both programs let you create "classes" or "classifications" (which are essentially subcategories) to track expenses that relate to specific jobs or clients. Quicken

tacks the class onto the category field of a transaction, while Money actually lets you add up to two additional classification lines to the standard transaction form. For example, if you manage real estate for a number of clients, Money lets you create classifications labeled Property and Client. You enter the names of all your clients and properties in those lists and then select from the appropriate list—which will pop up automatically—each time you enter a new transaction. This is much more comprehensive than Quicken's rudimentary class list.

Both programs keep track of upcoming bills by letting you postdate checks, and they will remind you when it's time to print or hand-write the check. And, speaking of checks...

The Check's in the Printer

The whole point of a checkbook is to write checks, so the point of a computer checkbook should be to print your checks, right? Not necessarily. There are several problems with the whole concept of printing your checks by computer, which Quicken and Money attempt to resolve in different ways.

First, checks must have preprinted numbers. This means that, at printing time, you end up throwing away whatever numbers you have already assigned to previous

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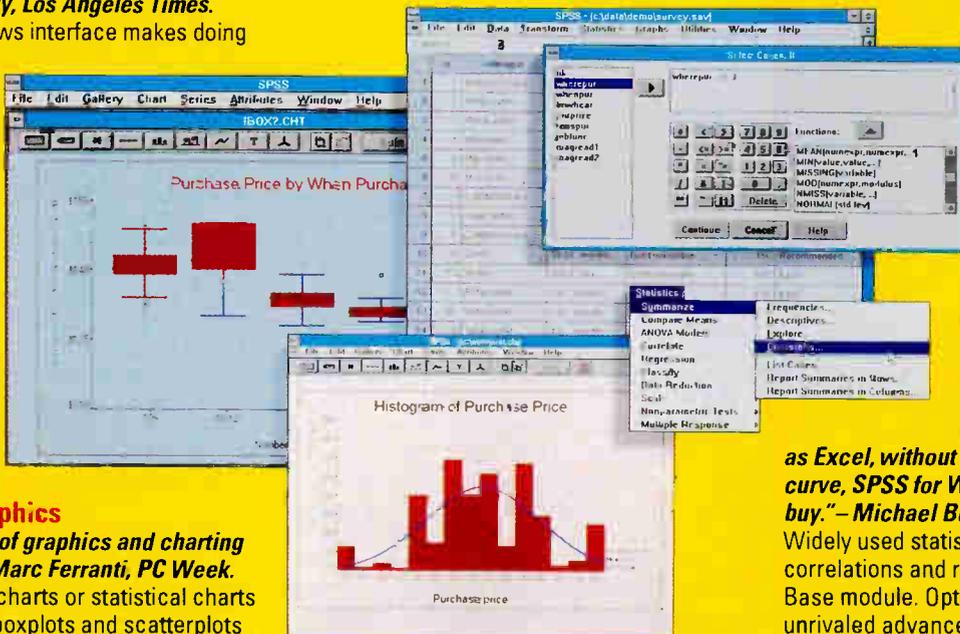
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DO YOU KNOW WHERE YOUR MONEY IS?

checks. If a check doesn't print correctly the first time, you have to reprint it and void the first check, and it can take a bit of practice to make sure the preprinted checks line up correctly in your printer. (It took me half an hour to get my first check correctly printed.) If you use your printer for other tasks, you have to set up the printer each time you want to print checks. On top of that, preprinted checks are expensive, starting at around \$44 for 250 of them (depending on style) if you buy them directly from Intuit or Microsoft. And what about checks that can't be written at home, like those for a purchase in a store?

Granted, there are solutions to all these problems, and if you write a lot of checks, printing them by computer could save you time—at the very least, the time you'd spend rekeying information into the program from a handwritten checkbook. But I've spoken to several users of these programs, and most of them do not use these programs to print their checks. Those who do often have a printer (an old dot-matrix model will do) that's dedicated to the task.

Of course, if you don't want to handle paper checks at all, you can sign up for CheckFree, an electronic clearinghouse that lets you use Quicken to pay your bills by modem. (This is a separate subscription service that costs \$9.95 per month for the first 50 payments and \$3.50 for each block of 10 payments thereafter.) Money lets you use a similar service called Billpay, which is part of the Prodigy on-line system. Though not inexpensive, these services are handy if your time is precious.

And if you like electronic checking, why not electronic charging? Last summer, Intuit introduced Intellicheck, a no-fee credit card that enables you to receive monthly statements by either modem (\$3 per month) or floppy disk (\$4.50 per month) that will automatically update your Quicken accounts.

Attacking a Taxing Problem

Using a financial management program like Quicken or Money makes tax preparation a lot easier. As if merely organizing your information weren't helpful enough, both Quicken and Money let you export information to tax programs so that you don't have to rekey it. Essentially, you create a tax report and then "print" the data to a TXF (Tax Exchange Format) file for later incorporation into your tax program. If you use TurboTax for Windows, you can import Quicken for Windows data directly without any intermediate steps.

Both programs have import and export functions, which I used to transfer information back and forth between the two with relative ease. These aren't functions

that you will use often, but when you do, you'll want them to work seamlessly. Both support QIF (Quicken Interchange Format), a text-based file format that's fairly easy to duplicate when you need to import data from a program that doesn't support Quicken automatically (e.g., an old spreadsheet application).

Quicken also supports DDE links, though in a fairly rudimentary fashion. The program comes with an Excel macro and a worksheet with three tables: one that totals specific transactions from Quicken accounts, one that finds the price of a security as of a specified date, and a third that lists all the shares of a security as of a specified date. The information is not updated automatically, although the supplied worksheet has an Update button that you can press if you've changed your Quicken data. There's also a Lotus 1-2-3 worksheet that provides the same information.

Aside from the question of how useful these worksheets are—you can get the same information from a Quicken report in about the same amount of time—that's it for DDE support. The DDE links are hardwired into the worksheet-macro combination, and if there's a way to create links to any other worksheets (let alone any other applications), Quicken's manual, on-line help, and menus don't give a clue as to how to do so. This barely qualifies as DDE support in my book.

The Bottom Line

Financial management programs have come a long way from the days when they were essentially glorified checkbooks. Either of the two programs reviewed here will give you more of a handle on your finances than you could possibly manage on your own, and the Windows interface makes them relatively easy to set up, learn, and use. The addition of features like auto-budgeting and graphs makes these programs even more useful.

In their first versions, Quicken for Windows was the clear leader over Microsoft Money. But with version 2.0, Money has narrowed the lead, although Quicken continues to be more flexible and powerful. Money has several strong points, including the way it handles split transactions, job tracking, and customizable graphs.

If you do not use a program like Quicken or Money, you are probably wasting time and money. With the relatively low cost of these programs, no home or small-business system should be without one. ■

Kenneth M. Sheldon is a consulting editor for BYTE, owns a small business, and appears on PCTV. You can contact him as "ksheldon" on BIX or MCI Mail.

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64	90	116	142	168	194	220
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67	93	119	145	171	197	223
68	94	120	146	172	198	224
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413	439	465	491	517	543	569
414	440	466	492	518	544	570
415	441	467	493	519	545	571
416	442	468	494	520	546	572
417	443	469	495	521	547	573
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427	453	479	505	531	557	583
428	454	480	506	532	558	584
429	455	481	507	533	559	585
430	456	482	508	534	560	586
431	457	483	509	535	561	587
432	458	484	510	536	562	588
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770	796	822	848	874	900	926
771	797	823	849	875	901	927
772	798	824	850	876	902	928
773	799	825	851	877	903	929
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775	801	827	853	879	905	931
776	802	828	854	880	906	932
777	803	829	855	881	907	933
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779	805	831	857	883	909	935
780	806	832	858	884	910	936
781	807	833	859	885	911	937
782	808	834	860	886	912	938
783	809	835	861	887	913	939
784	810	836	862	888	914	940
785	811	837	863	889	915	941
786	812	838	864	890	916	942
787	813	839	865	891	917	943
788	814	840	866	892	918	944
789	815	841	867	893	919	945
790	816	842	868	894	920	946
791	817	843	869	895	921	947

Inquiry Numbers 1123-1304

1123	1149	1175	1201	1227	1253	1279
1124	1150	1176	1202	1228	1254	1280
1125	1151	1177	1203	1229	1255	1281
1126	1152	1178	1204	1230	1256	1282
1127	1153	1179	1205	1231	1257	1283
1128	1154	1180	1206	1232	1258	1284
1129	1155	1181	1207	1233	1259	1285
1130	1156	1182	1208	1234	1260	1286
1131	1157	1183	1209	1235	1261	1287
1132	1158	1184	1210	1236	1262	1288
1133	1159	1185	1211	1237	1263	1289
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1138	1164	1190	1216	1242	1268	1294
1139	1165	1191	1217	1243	1269	1295
1140	1166	1192	1218	1244	1270	1296
1141	1167	1193	1219	1245	1271	1297
1142	1168	1194	1220	1246	1272	1298
1143	1169	1195	1221	1247	1273	1299
1144	1170	1196	1222	1248	1274	1300
1145	1171	1197	1223	1249	1275	1301
1146	1172	1198	1224	1250	1276	1302
1147	1173	1199	1225	1251	1277	1303
1148	1174	1200	1226	1252	1278	1304

Inquiry Numbers 234-408

234	259	284	309	334	359	384
235	260	285	310	335	360	385
236	261	286	311	336	361	386
237	262	287	312	337	362	387
238	263	288	313	338	363	388
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Inquiry Numbers 591-765

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594	619	644	669	694	719	744
595	620	645	670	695	720	745
596	621	646	671	696	721	746
597	622	647	672	697	722	747
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607	632	657	682	707	732	757
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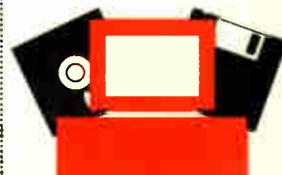
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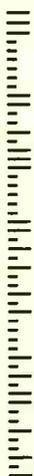
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THE CASE OF THE MISSING FILE

Organize your Windows documents with Sherlock

ED PERRATORE

One complaint many users have about file management under Windows is that it is limited to the eight-character filenames and three-character extensions of DOS. Physiotronics' Sherlock overcomes this critical limitation.

Sherlock doesn't pigeonhole easily. You could call it a file finder on Macintosh pills, or an application launcher, or even a low-end document management program. It is, in fact, all these things. Yet, by assigning it to any one of these categories, you risk overlooking the product's overall purpose: It helps you organize and retrieve your work on stand-alone and NetWare-connected computers by taking you beyond the confines of the limited DOS file-and directory-naming convention.

Sherlock takes over the task of saving and retrieving your files from within your Windows applications, which normally

use DOS for this purpose. One limitation of the product is that it doesn't yet support all Windows 3.1 applications. Thus far, the list of supported applications consists of 17 major products, plus the Windows Write, Paint, and Notepad applets; I tested it using Word, Excel, and Ami Pro. Missing from the list at press time were such products as Adobe Photoshop, Informix's Wingz, and Microsoft's PowerPoint.

Physiotronics is constantly adding support for more applications and updating the list of supported programs. You can download an updated list and the DLLs for additional applications from Physiotronics' BBS or CompuServe.

Elementary Duties

Sherlock mimics high-end document management products such as PC Docs and

SoftSolutions by keeping a database (that is stored in .DBF format) of files you save in the supported Windows applications. When you click on Save or Save As in, say, CorelDraw, Sherlock's battleship-gray window pops up with fields for Document Description, Document Type, Contact, User Name, Document Format, Keywords, and Document Location. All these fields include pull-down lists of options (see the screen).

Document Description is a 254-character free-form field that, in effect, serves as your filename. The actual DOS filename that Sherlock uses is obscure (e.g., \SHERLOCK\10000004\10000001.DOC). The Document Location field is also important. Instead of directories, you contend with terms (e.g., office, cabinet, drawer, and folder) that even your temp would recognize.

If all this sounds like Sherlock is a cutesy "paperless-office" product designed to make computers seem fun, you should definitely think again. The whole point of



Selecting Save in a supported Sherlock application brings up the Sherlock Save window, which gives you many ways to specify the document you are storing.

BYTE ACTION SUMMARY

- **WHAT SHERLOCK IS**
A program for naming, organizing, and retrieving files.
- **LIKES**
Its long filenames; document profiling; search capabilities.
- **DISLIKES**
Doesn't support all major applications.
- **RECOMMENDATIONS**
Sherlock is a winner. Check the company's list of supported applications, however, before committing your dollars.
- **PRICE**
Stand-alone, \$249.95; Novell NetWare version, \$695 for five-user license
- **FOR MORE INFORMATION**
Physiotronics Corp. USA
New York, NY
(800) 952-2314 ext. 120
(212) 887-9555
fax: (212) 887-9546
Circle 1147 on Inquiry Card.

Sherlock's terminology is to cut down on time wasted in searching for files that you otherwise cannot name expressively. The program requires only that you fill in the Document Description field. (Some network-administrator control would come in handy here.) And while you cannot rename any of the fields (e.g., renaming Document Type as Case for a law firm or Project for a construction firm), Physiotronics plans this capability for the next release of Sherlock.

The Game's Afoot

To retrieve a file, you click on Sherlock's toolbar, which remains present in the Windows Program Manager and lets you search on any field or combination of fields. For the Document Description field, you can search on any part of a string—even a single character—although no Boolean operators or fuzzy searches are supported here.

If you include keywords in the Keywords field, Sherlock can make use of a

synonym dictionary of alternate keywords if it doesn't recognize the one you enter. Sherlock does support standard Boolean searches on keywords.

Once complete, the search presents a list of matches in a window. Sherlock launches the appropriate application when you select a file. (You can launch the application yourself.) The same list comes in handy if you need to copy, move, or delete a file; generate a report on matches; or assign rights.

What about the files already on your hard disk when you install Sherlock? There's no means of bulk import yet (this is another planned feature). Instead, Sherlock's Import screen pops up when you try to open an existing file in the usual Windows way. Then, when you try to save your changes, Sherlock invokes the Save screen to add the profile information to its database. You'll need 2 MB of disk space (2 MB for a server if you're networked) to store this data.

Because you shouldn't dare run a shell like Norton Desktop for Windows with Sherlock—at least, you'd better leave the data files and directories that are served by the shell alone—Sherlock lets you move, copy, or delete files, folders, and drawers as needed. And if a Windows program requires a filename that is described using its standard DOS path name, an included utility called Watson (are you surprised?) can find a file and copy its full path name to the Clipboard.

I tested Sherlock on a stand-alone Gateway 2000 66-MHz 486DX2 machine and found no problems saving or retrieving files in the applications I tested. However, in my evaluation of the database rebuild facility, I rebooted the system during a database update. As a result, the procedure repeatedly began and then aborted. Physiotronics soon uncovered the database error and has included the fix in all software being shipped.

Sherlock is off to a respectable start so far, and it includes many more features that I simply don't have room to discuss here. The product will not be fully effective, however, until it supports all available Windows applications and provides a better mechanism for importing preexisting files. And for its price of \$249.95 (\$695 for a five-user LAN), you certainly deserve more in the way of customization options. But if time is truly money, this product will pay for itself by ensuring that you never waste another minute looking for files. ■

Ed Perratore is a news editor for BYTE in New York. You can reach him on BIX and MCI Mail as "eperratore."

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“what **meeting?**”



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BEYOND WORD PROCESSING

Word processors aren't just for juggling text anymore

STAN MIASTKOWSKI

Windows has raised the ante in the word processing arena. Its graphics orientation and built-in typefaces have resulted in a natural progression to applications that go beyond the mundane chores of putting words on a screen and transferring them to paper. As a matter of fact, today's applications bear little resemblance to the image conjured up by the outdated term *word processor*, because they have virtually all the features of the desktop publishing packages of a few years ago.

There are many word processors for Windows users to choose from, but the market is dominated by the Big Three: Ami Pro for Windows 3.0, Microsoft Word for Windows 2.0, and WordPerfect 5.2 for Windows. All three word proces-

sors are huge programs, requiring between 12 and 15 MB of hard disk space for a full installation. They are also amazingly capable—and complex.

Similarities and Differences

As you would expect, the Big Three Windows word processors have many traits in common. All let you use multiple type styles and sizes and import graphics. And all provide spelling and grammar checkers, a thesaurus, and envelope-printing capabilities. That's as you'd expect, but at the same time, each of these packages has its own unique features and personality. In this review, I'll concentrate on the components that set these programs apart from one another.

All three programs retail for \$495—no

small chunk of change in a software budget, either corporate or personal. But all three are often highly discounted.

Ami Pro for Windows 3.0

The most apparent trait of Ami Pro is its aggressive use of icons. When you first install and run this program, a line of 24 icons for commonly used operations appears across the top of the screen. But that's only the beginning. Over 150 predefined icons are available, and you can design your own and assign them to custom operations (see screen 1). You can position the icons in a horizontal or vertical line or create a floating SmartIcon palette that you can drag anywhere on the screen.

SmartIcons give Ami Pro the unique ability to be highly customized for almost any situation. Because many of the icons give you access to other applications and Windows features, Lotus's word processor can serve as an alternative to Windows' Program Manager. It's pretty sneaky, but it works. You can "live" in Ami Pro.

A Little Style

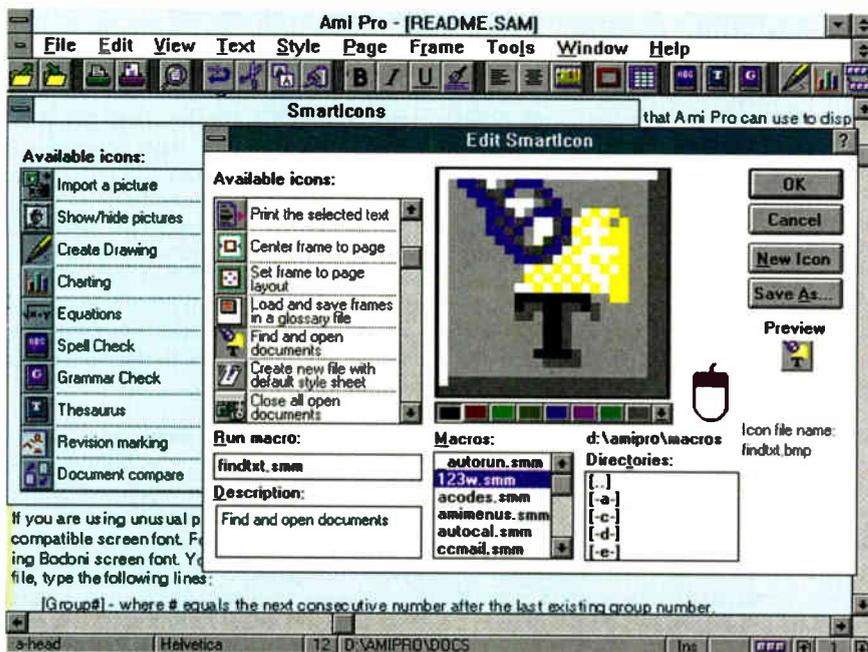
All Windows word processors include *style sheets*, predefined templates designed as a starting point for creating specific types of documents (e.g., a memo, a business letter, or a multicolumn newsletter). A style sheet defines the look of a document by setting such things as the fonts and the layout. These tools let you get to work without having to first learn the details of page layout, but you can also customize them or design your own.

Ami Pro outshines the competition with its use of style sheets: It provides more of them (57), and they are easier to use than those of the other packages. Besides offering a description of the elements of each style sheet, Ami Pro also has a Style Sheet Viewer, which allows you to see how a finished page will look as defined by the selected style sheet. It sounds minor, but this feature can save you a lot of time. Other packages require a great deal of experimenting with style sheets.

On-the-Fly Formatting

One of the frustrations with all Windows word processors is the wide range of formatting options they offer. You can customize fonts, sizes, styles—you name it. The danger is that documents with too many fonts, sizes, and styles can be confusing and look tacky.

If you decide to change or customize parts of your document, the process can be time-consuming. You have to mark the



Screen 1: Ami Pro for Windows 3.0's SmartIcons can be customized, allowing you to set up permanent or floating icon bars that let you access the program's features as well as Windows utilities and other applications.

ADDING SOUND AND VIDEO TO WORD

Microsoft offers Word for Windows 2.0 in a unique configuration for those who have a CD-ROM drive. The Microsoft Word and Bookshelf Multimedia Edition package (\$595) was announced at press time but was not available for review; however, it will be by the time you read this.

The Bookshelf Multimedia Edition consists of a variety of references that any writer would find helpful: The American Heritage Dictionary, Roget's II Electronic Thesaurus, Bartlett's Familiar Quotations, and The Concise Columbia Dictionary of Quotations. In addition, you get three general reference works that will help you enhance the contents of your documents: The Concise Columbia Encyclopedia, The World Almanac and Book of Facts 1992, and the Hammond Atlas.

The unique aspect of the Bookshelf Multimedia Edition is that it also includes Microsoft Video for Windows

and a variety of video clips, audio clips, and 200 pieces of clip art, which bring the material in the references to life. For example, the dictionary includes more than 65,000 digitized pronunciations that you can access, and many entries in the encyclopedia are augmented by audio and video clips.

Although you need a multimedia PC (with a sound board) to take full advantage of the Bookshelf Multimedia Edition, you can get by without one—you'll still be able to access the other features of the package. The best feature is the ability to search through tens of megabytes of reference material in seconds. CD-ROM is a great way to deliver such material.

Finally, the package shows an interesting new trend in software packaging: It doesn't come with printed manuals; all the manuals are on CD-ROM. If you feel you need printed references, though, you can always buy one from Microsoft for an additional \$70.

text, choose a font or style, and move through your document and repeat the steps wherever necessary. Ami Pro has an interesting way of eliminating the drudgery, called Fast Format. This feature lets you mark a block of text that you've customized and repeat the style anywhere in your document. Say you want to indent and italicize the first paragraph of each section in a report. With Fast Format, you just mark the first indented and italicized paragraph, choose Fast Format from a pull-down menu, and mark the paragraphs you want in the new format. It's fast and easy.

Other Features

Lotus's product has other singular features: It's the only Windows word processor that uses the often-neglected right mouse button. This option, called *SmartClick*, lets you modify an object (e.g., a graphics frame or text) by pointing to it and clicking on the right mouse button. Other packages require multiple steps, usually using pull-down menus.

Ami Pro has the largest selection of predefined graphics images (over 100). They range from serious business images to not-

so-serious cartoons. You can also import almost any graphical image in numerous formats. As with all these packages, working with graphics is easy. You can dynamically create and resize graphics on the fly and have text automatically flow around the image.

Finally, there's *Clean Screen*. For those who would rather not be distracted by icons, toolbars, menus, and everything else, Clean Screen lets you remove these elements, either individually or all at once. Removing them gives you about 30 percent more space for text on your video display.

Word for Windows 2.0

Word has the fewest new bells and significant whistles of the packages that I looked at. But that doesn't mean it's a slouch in the features department (see the text box "Adding Sound and Video to Word" above). Word has all the common features mentioned earlier and a number of extras of its own.

Overall, Word offers surprising ease of use for such a complex application. This is a result of Microsoft's extensive usability testing. Although the program's opening

screen looks complex at first glance, it quickly becomes obvious that it's carefully designed. Features are easy to find and use, and extensive help is available (see screen 2). The program's pull-down menus are terse and eminently usable instead of being simply a laundry list of options.

Word was the first Windows word processor with a graphical-file viewer, which lets you preview a file before you open it, a feature that both Lotus and WordPerfect's offerings now provide. It also was the first application in this category with *drag and drop*, the ability to move text around a document by dragging it using the mouse. Word's competitors now offer this feature.

Integrating Applications

It's not surprising that Word offers the tightest integration with the Windows environment and other Windows applications (all of which have full DDE and OLE capabilities) than any of the other word processors for Windows. If you're already using Microsoft Excel or Access, it makes sense to use Word as your word processor, even if it lacks some interesting features.

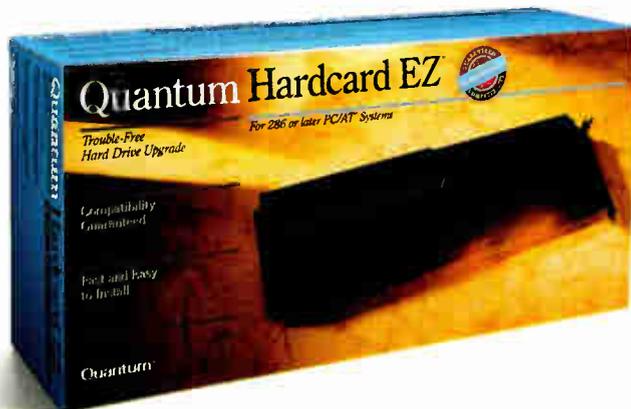
The integration extends to the network environment. Word is a MAPI (Messaging API) program that integrates with Microsoft Mail and Microsoft Windows for Workgroups. If Word detects that Microsoft Mail is installed, a Mail option appears on Word's File menu, so you can send documents to other users on the network without leaving your word processor.

Since Word was first shipped in the fall of 1991, it's been upgraded twice. At press time, version 2.0c had just been released. No major new features have been added, but bugs have been fixed and minor new features have been added (e.g., version 2.0c reads Microsoft FoxPro for Windows files). Word may not have some of the more advanced features found in its competitors' products (e.g., Ami Pro's SmartClick and WordPerfect's QuickFinder), but that doesn't mean that Microsoft is letting things slide.

Wordperfect 5.2 for Windows

When you install Ami Pro or Word on your computer, you're asked if you would like special instructions for WordPerfect users. When you install WordPerfect, Ami Pro and Word are not mentioned. That should tell you something. According to the Gallup organization (April 1992), WordPerfect has 71 percent of the U.S. word processing market. That's not limited to Windows, though. WordPerfect makes versions of its word processor for many platforms. However, the market perception

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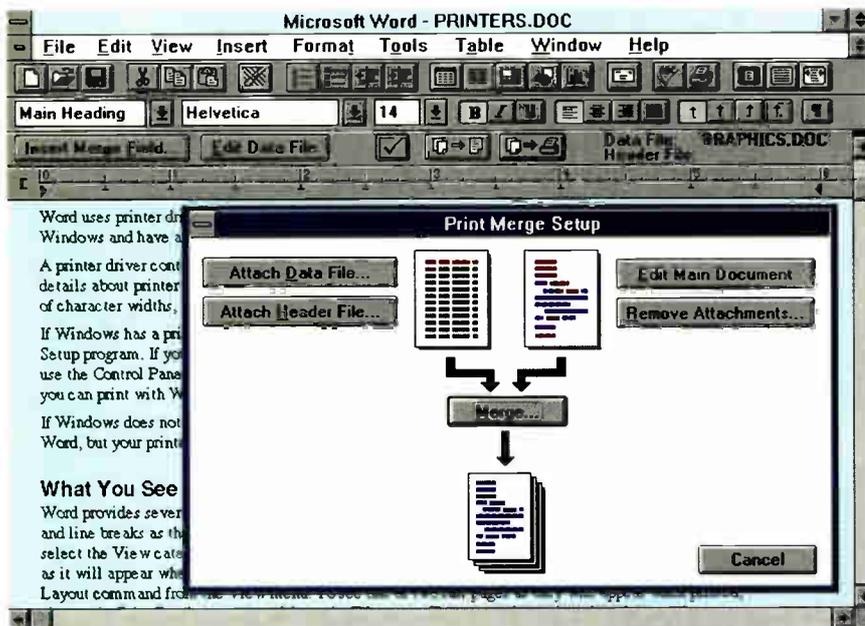


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Screen 2: Microsoft Word for Windows 2.0 offers easy access to advanced features (e.g., print merge) and extensive on-line help.

is that it has been playing catch-up in the Windows market. But with this new version of WordPerfect, the company has a major contender.

According to its version number, WordPerfect 5.2 would at first blush appear to be a minor upgrade from 5.1. In fact, it's a major upgrade, with a host of distinctive features designed to set it apart from its competitors (perhaps it's not a coincidence that WordPerfect now has its own usability lab).

The most noticeable difference between WordPerfect and the other Windows word processors is that there are no icons on WordPerfect's screen. However, you can add what the company calls Button Bars (there are eight of them). This limited screen goes a long way to emphasize the company's philosophy that a word processor is, after all, for writing. The less on the screen, the better. But if you want Button Bars and a ruler, they're available.

Adding Features

WordPerfect has all the features that its competitors offer and more. Adobe Type Manager (which provides type support beyond what Windows already has built in) is included, along with 13 WordPerfect-created custom fonts. The program also includes Grammatik V, Reference Software's grammar checker. Unlike the other packages reviewed here, which automatically install a grammar checker, you can choose whether or not you want to install Grammatik. If you do, a new item appears on the Tools menu.

Also new and useful in WordPerfect is a high degree of integration with Microsoft and other's applications. For example,

WordPerfect is an OLE client, allowing it to interact with major Microsoft applications. Also unique is full mail support for programs that follow either the VIM (Vendor-Independent Messaging) or MAPI standards. This makes it compatible with virtually all Windows-based mail applications.

Accelerating the Printer

WordPerfect stands alone among Windows programs because it includes its own optimized printer drivers (you can also use standard Windows drivers). That's not new, but now changing them doesn't take forever. In prior WordPerfect Windows packages, it took a long time to change printer drivers. The wait is gone in 5.2.

WordPerfect's custom printer drivers work well. Printing a highly graphical test page to my PostScript printer took 2 minutes and 30 seconds with the default Windows printer driver and only 1 minute and 10 seconds with the custom driver.

File Navigation

Initially, WordPerfect 5.2's File Manager looks like the same thing offered in version 5.1, but it's been extended in a significant way. WordPerfect File Manager is a replacement for Windows' File Manager, and it offers an unusual yet logical way of accessing and working with files on your system.

Perhaps the most notable feature in WordPerfect is *QuickFinder*, which you can access from within or outside of WordPerfect File Manager. QuickFinder is an indexing and text-retrieval package that offers features found in stand-alone programs that cost nearly as much as the entire WordPerfect package (see screen 3).

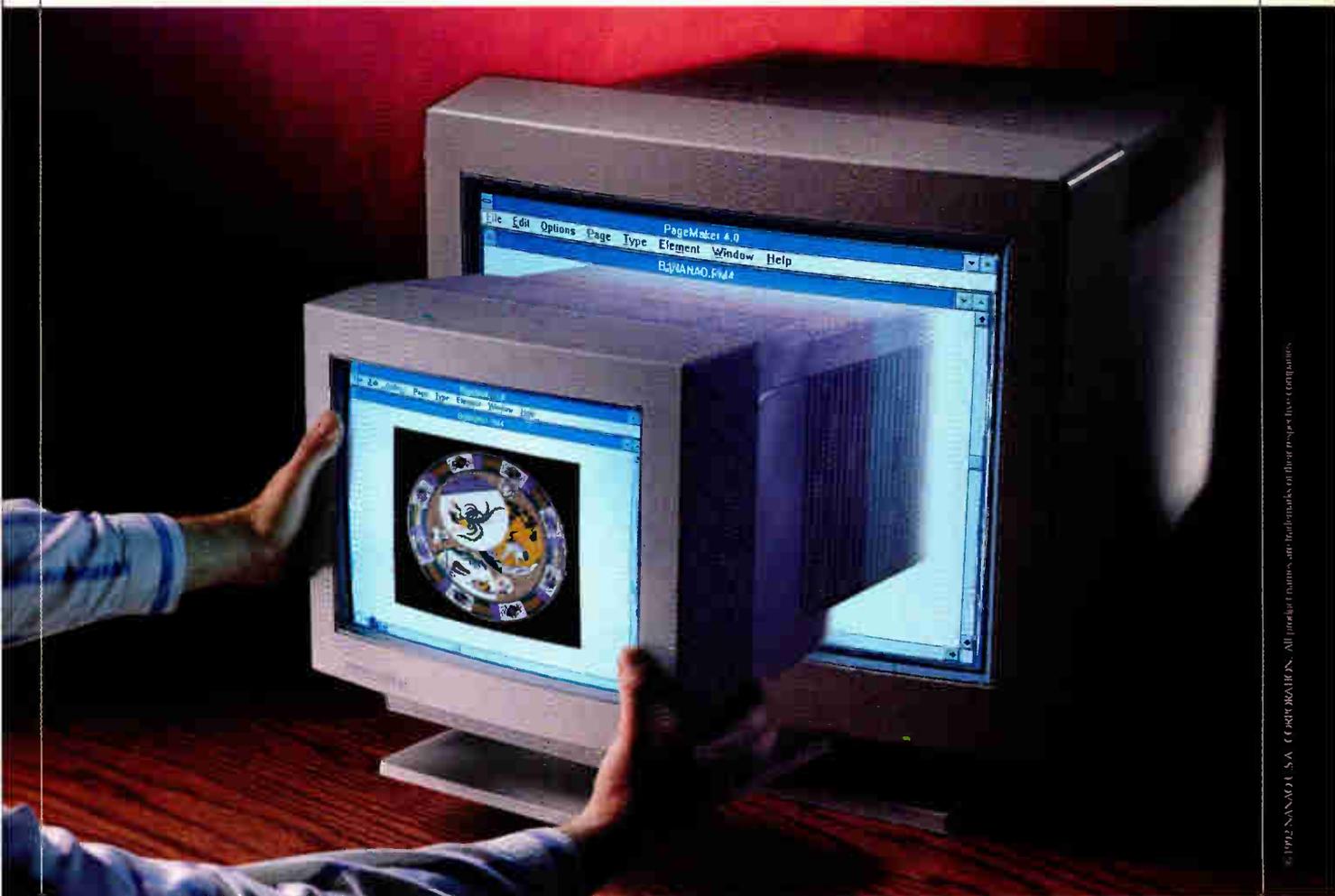
QuickFinder isn't limited to WordPerfect files. You can create an index of all the text files on your disk, or you can produce multiple indexes for different types of files. But creating the initial index takes time—it took QuickFinder nearly 2 hours to process the 74 MB of data on my hard disk, producing a 3-MB index.

The index references every word in every file you've specified. Once you've created an index, you can perform word or phrase searches and use Boolean operators (e.g., AND, OR, and NOT). Searching is fast, usually taking just a few seconds. When you add new files, you can easily update the index in a couple of minutes. Best of all, you can use WordPerfect File Manager and QuickFinder outside of WordPerfect (they have their own icons).

Finally, WordPerfect is the only company mentioned here that offers unlimited toll-free support for its products (for the truly desperate, toll-call support is available

BYTE ACTION SUMMARY

- **WHAT THE LEADING WINDOWS WORD PROCESSORS ARE**
Word, WordPerfect, and Ami Pro.
- **LIKES**
These packages give you just about every text-manipulation capability you would ever need.
- **DISLIKES**
Each requires a real time commitment to master and a lot of disk space.
- **RECOMMENDATIONS**
Make your choice based on features—Word for ease of use; Ami Pro for page layout and graphics; WordPerfect for handling lots of large documents.
- **PRICE**
Ami Pro for Windows 3.0, \$495
Word for Windows 2.0, \$495
WordPerfect 5.2 for Windows, \$495



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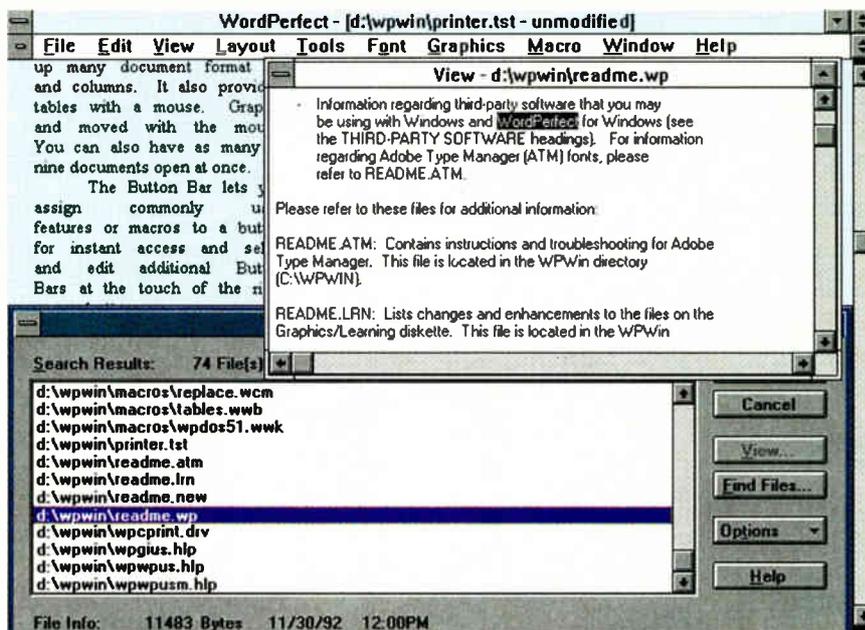
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BEYOND WORD PROCESSING



Screen 3: One of the unique features of WordPerfect 5.2 for Windows is QuickFinder, a text indexing and retrieval program that can be used as a stand-alone Windows application.

from 2 a.m. to 7 a.m.). If you rely on support, especially if you work at a company that has many copies of the program, this support policy is a good reason to tilt toward WordPerfect.

Making Choices

The great American sports axiom says that there can be but one winner. Everyone else has to lose. But these three packages prove to be the exception to that rule. All three word processing programs offer nearly every conceivable feature for creating sophisticated documents. Because Ami Pro, Word, and WordPerfect are all based on the basic Windows interface and can be highly customized, it's difficult to make a choice based on each package's look and feel.

The best way to differentiate among the programs is to look at the special features each offers. Because of its integrated File Manager and QuickFinder, WordPerfect (the newest of the lot) is particularly useful for handling several large documents simultaneously. Ami Pro shines brightest for its easy page-layout capabilities and graphics integration. Not surprisingly, it also integrates best with other Lotus applications. And Microsoft's extensive human-engineering research shows in the ease of use of Word's advanced features. So, it boils down to finding what matches your needs best and using it. Beyond that, choosing among these packages is a matter of personal taste. ■

Stan Miastkowski is a **BYTE** consulting editor and a freelance writer specializing in computer technology. He can be seen regularly on the "PCTV" syndicated TV show and is the coauthor of *The Windows for Workgroups Bible* (Addison-Wesley, 1993). You can reach him on BIX as "stann" or via MCI Mail at 530-9979.

COMPANY INFORMATION

Lotus Development Corp.

(Ami Pro for Windows 3.0)
Cambridge, MA
(617) 577-8500

Circle 1003 on Inquiry Card.

Microsoft Corp.

(Word for Windows 2.0)
Redmond, WA
(800) 426-9400
(206) 882-8080
fax: (206) 936-7329

Circle 1004 on Inquiry Card.

WordPerfect Corp.

(WordPerfect 5.2 for Windows)
Orem, UT
(800) 451-5151
(801) 225-5000
fax: (801) 222-5077

Circle 1005 on Inquiry Card.

DESKTOP PUBLISHING MADE EASY

Windows desktop publishing is more accessible than ever

JOHN BRYAN

You've heard it before: "With desktop publishing, anyone can produce professional-quality publications." Whoever said that was either a publishing professional or someone who had never wrestled with the intricacies of Ventura Publisher, FrameMaker, or PageMaker (see the text box "The Big Boys" on page 92). These programs produce high-quality documents of practically any length or style; however, they are also expensive and complex.

So what if you simply need to produce a departmental newsletter, an advertising flier, or some other printed material that cannot be done easily with a word processor? Should you invest the time and the money necessary to acquire and master a professional desktop publishing package? The answer—emphatically—is no.

Publisher from Microsoft, Express Publisher for Windows from Power Up Software, and Publish It for Windows from Timeworks are all low-priced packages designed for people with a wide range of skill, from novices to accomplished print artists. Each of these applications has a complete set of tools for creating all kinds of documents (e.g., newsletters, brochures, marketing sheets, and reports). They also include clip art, which allows you to liven up a document with pictures, and text and print managers, which enable you to directly manipulate printed output.

Why Not Word Processing?

As Windows word processors have become more feature-laden (some people would say bloated), they have become capable of producing multicolumn, multi-font documents enhanced with artwork and special effects. Important conceptual

differences exist, however, between a word processor and a desktop publishing package.

Word processors remain text-oriented, which limits the ways they can manipulate a document. On the other hand, a desktop publishing package treats all parts of a document as objects. Each object is mounted in a *frame*, like a picture, and frames, regardless of content, can be manipulated at will. The contents of the frames are fluid,

Diving In

Because economy is one of the attractions of the three packages under consideration in this review, I installed the packages on a minimum system—a 25-MHz 386DX with 2 MB of RAM. After all, you should not have to buy a 486DX2 to run a \$150 piece of software.

Each package installed smoothly and ran adequately, if a bit slowly, on the system. My goal was to create an eight-page newsletter that included various fonts, type styles, color photos, and artwork that could be sent to a print shop for printing.

Express Publisher for Windows

Express Publisher for Windows (see screen 1) from Power Up is not very aptly named. Of the three programs considered in this review, it was the slowest in nearly every aspect of its operation. Power Up's program was usable but slow when loading text from a word processing document, reformatting it, saving the file, and formatting it for printing.

Another sticking point was that Express Publisher for Windows didn't seem particularly intuitive. Perhaps I've been prejudiced by my experience with other systems, but when I used this package without the benefit of a manual, I kept making the wrong choices.

Like other desktop publishing software, Express Publisher for Windows differentiates between graphics frames and text frames; it also supports what Power Up calls *free text*, which is text that flows between frames (this is a concept unique to this program). The icons in the toolbox were less than obvious. However, the manual is well written and complete, and it offers step-by-step instructions for every operation that you can think of. It provides a



Screen 1: Express Publisher for Windows' unique "free text" makes it easy to flow text between frames.

expanding and contracting to fill the frame in a balanced fashion.

The degree of intelligence and flexibility with which a package lets you manipulate frames is probably the most significant determinant of the quality of a desktop publishing package. The other important determinants are more familiar: the sophistication of text and font manipulation, the range of file-format-translation capabilities, the extent to which a program is WYSIWYG, and the speed and gross capabilities of the software. These apply to both the lower-priced and monster packages that I looked at.

nice tutorial on creating a newsletter, and it was to this exercise that I retreated.

From a functional standpoint, Express Publisher for Windows is as complete a program as you could ask for. It will import any file saved in ASCII format and text files from all the major word processing packages (including AmiPro, omitted by the other two) and Lotus 1-2-3 .WK1 files. I tested several types of files and came up with only two problems. First, Express Publisher for Windows decided to underline all the text in one of my WordPerfect documents. And second, in the enlarged view of a document (where more is off the screen than on it at any given time), the application will not scroll the window in view.

The package also has a good collection of clip art—not as extensive as that found in Timeworks' Publish It for Windows but significantly more than Microsoft's Publisher had. For people without much artistic ability or interest in producing their own artwork, these little graphics can be invaluable, but for the serious user, a scanner is a must-have peripheral.

Publisher

Microsoft has taken the position that desktop publishing novices need a lot of assistance, and Publisher supplies it in a slick fashion with Page Wizards, a formatting tool that creates the type of document that you want (see screen 2). There are Page

THE BIG BOYS

None of the packages reviewed here can be called low end. They are low-priced, but for 99 percent of the users out there, a savings of \$500 or more is about the only difference they'll find in choosing Publisher, Express Publisher for Windows, or Publish It for Windows over more expensive packages. In fact, until Aldus's latest release, announced at MacWorld Expo in January, Publish It for Windows was more flexible in text rotation than the more expensive and widely respected PageMaker.

What does more expensive software offer that these low-cost programs do not? In a nutshell, PageMaker, Ventura Publisher, FrameMaker, and QuarkXPress provide the extra bells and whistles needed to bridge the gap to professional publishing. For example, these programs can create two-color separations, where the black elements of a page are printed on one sheet and the single-color elements are printed on another (QuarkXPress and FrameMaker

are capable of more than this, but they are expensive).

These programs are also more flexible in the text fonts they support, with microadjustable fonts to one-tenth of a point, or 0.0013 inch. This is not a function that the average citizen is going to find essential. In addition, PageMaker and the rest support a finer degree of leading and kerning (i.e., the space between lines and the horizontal space between letters, respectively).

The more expensive programs will also handle larger documents (literally thousands of pages) and have the support functions that these documents need, such as automatic indexing and table-of-contents tools. Finally, support for color printing and the transfer of color information to high-quality printing systems is more advanced, especially in QuarkXPress. None of the \$150 to \$250 packages claim to compete with the more complicated and advanced software systems, but in most cases, they don't have to.

Wizards for a newsletter, business forms, brochures, cards and invitations, a calendar, and even paper airplanes.

Everything about Publisher indicates that the developers had a lot of fun putting together the code for this package, and you can have just as much fun using the program. When you choose the Page Wizards option, the system asks you several intelligent questions about the document you want to produce and then goes ahead and creates it.

The theory is that it's easier to replace text and pictures in a precreated format than it is to create everything from scratch, especially if you're inexperienced at using this type of application. This system can be an automatic tutorial, because the software lets you watch it create your document—you can even adjust the speed of the process. Publisher includes templates for a wide range of document types, and the templates include text in the appropriate places. Page Wizards can be used on these templates, too, automatically creating special effects while you are producing the document.

Publisher has one feature that the other packages lack: OLE. This capability lets you link the objects of a Publisher document to a document or file in another pro-

gram. If the linked file is changed, the Publisher file is updated automatically. This can be a handy feature, especially in a business environment where reports are often generated on a weekly or monthly basis with only minor changes made to their content.

One area where Publisher falls short, at least when compared to the other packages reviewed here, is in the ability to rotate text or images. This type of tool can make something pop off a page, focusing attention on a specific item or section. Publisher has Word Art, a frame type that allows special manipulation of text, but it's not as capable in this area as the tools you find in Publish It for Windows or Express Publisher for Windows.

Overall, though, Publisher is a great package. The tool-selection buttons are easier to decipher than those of either of the other two packages, and the tool systems are well grouped according to their functions. Publisher is easy to learn, but it still retains enough power and flexibility to do a fine job at just about any task you might choose.

Publish It for Windows

Timeworks' Publish It for Windows is the powerhouse of these packages. It includes

BYTE ACTION SUMMARY

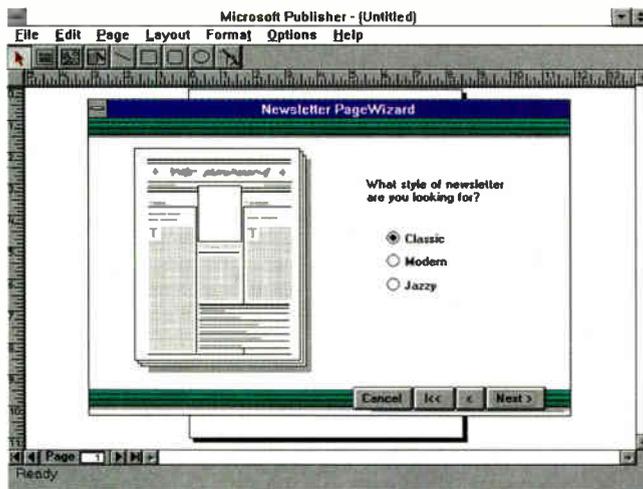
- **WHAT LOW-COST DESKTOP PUBLISHING IS**
DTP packages for under \$200.
- **LIKES**
These programs are surprisingly capable.
- **DISLIKES**
Each program has holes, so you have to match the features they offer with your needs.
- **RECOMMENDATIONS**
For features and power, go with Publish It for Windows; for ease of use, the choice is Publisher.
- **PRICES**
Express Publisher for Windows, \$149.95
Publisher, \$199
Publish It for Windows, \$149.95

more clip art (although with a surprising dearth of business-oriented stock), options, and frame-manipulation tools than either Microsoft's or Power Up's offering. It also has an intriguing manual that's divided into two parts, each with its own cover and table of contents. The first section focuses on getting started, and the second is a complete reference guide to the program.

As with most powerful programs, when you start using Publish It for Windows, you have to work through a steep learning curve before you are able to achieve proficiency. I found this program to be the least intuitive of the three software packages reviewed here, but the practice time is well worth the investment. Where Publisher takes practically everything out of your hands, Publish It for Windows assumes that you know what you want and how to create it.

To be fair, Publish It for Windows is less a low-end package than it is a low-priced one. Especially in the manipulation of text special effects, this program rivals some of the top software systems on the market. Timeworks has created a special frame, called PowerText, that you use to perform such functions as creating custom lettering and arching text up, down, or around a circle.

Publish It is also the only program examined here that allows nonrectangular frames. You can modify a standard frame to almost any shape, allowing text to flow in and around a picture, logo, or other piece



Screen 2: Page Wizards walk you through the creation of a Publisher document.

of art (see screen 3). The first section of the software's manual covers all these functions in an extended tutorial, and it's very complete.

What the manual does not cover, and what the other programs attempt to address explicitly or implicitly, is style—not style in the sense of text styles (e.g., serif or sans-serif fonts) but the overall look and feel of a document. This stems from Publish It for Windows' orientation as a low-priced but professional package. If you know what you're doing and only need a tool to help you do it, this package is for you.

Common Ground

Until the advent of programs like these, you had to settle for whatever functions you had in a word processor, or you had to purchase a full-blown professional desktop publishing package. Conceivably, by using one of the programs reviewed here, you may not need to do either.

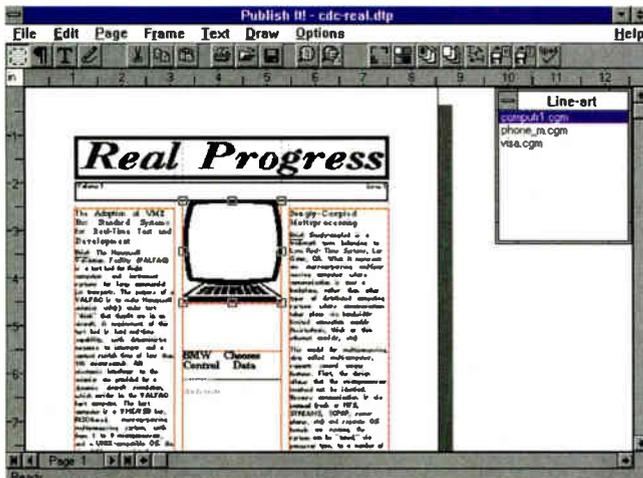
It's still easier to create text documents with your word processor, but each of these programs will do almost everything a word processor will do, although perhaps not as quickly. Each includes a dictionary, but there is not a thesaurus in

the bunch. And each package excels at creating and positioning the types of special text groupings (e.g., tables) that are awkward to handle in a word processor. If you want to create a calendar, form, brochure, or document with a complicated format—anything other than letters and standard business documents—you should take a close look at these software offerings.

Where these programs really shine is in document formatting: making text flow through noncontiguous pages, creating special text features, and integrating art and text. Each of the programs examined in this review takes a different approach to desktop publishing, and in choosing one, you should consider

how much you know about desktop publishing and what features are important to you. If you are already something of an expert and know the look you want to create, I recommend Publish It for Windows. On the other hand, if you're just beginning and want to learn to use this kind of software, Publisher is probably the program for you. ■

John Bryan is a freelance writer based in San Jose, California. You can reach him on BIX c/o "editors."



Screen 3: Frames with irregular shapes are just one of the advanced features of Publish It for Windows.

COMPANY INFORMATION

Microsoft Corp.
(Publisher)
Redmond, WA
(800) 426-9400
(206) 882-8080
fax: (206) 936-7329
Circle 1001 on Inquiry Card.

Power Up Software Corp.
(Express Publisher for Windows)
San Mateo, CA
(800) 851-2917
(415) 345-5900
fax: (415) 349-1356
Circle 1000 on Inquiry Card.

Timeworks, Inc.
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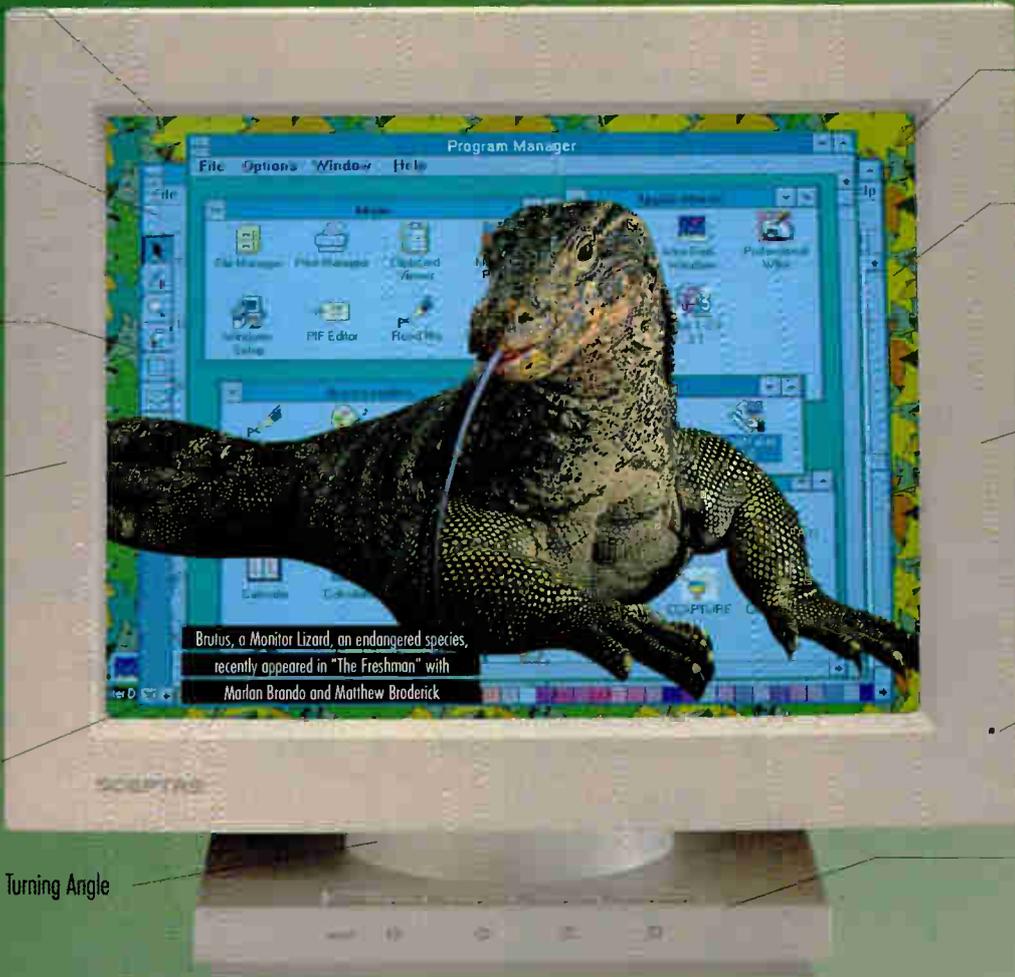
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World Radio History

COMPRESSING WITH FRACTALS

ColorBox lets you plug fractal compression into your C or Visual Basic programs

STEVE APIKI

With POEM ColorBox 1.0, fractal compression makes its biggest leap yet from academia into the grimy world of Windows applications development. The timing could hardly have been better. As more Windows applications sprout image-handling capabilities and as true-color (i.e., 24-bit) Windows hardware becomes more common, developers and users alike clamor for high-powered, high-quality image compression.

POEM ColorBox Compression SDK (Software Developer's Kit) is a set of Windows DLLs from Iterated Systems that lets developers add fractal compression to applications with relative ease (see the screen). ColorBox isn't the first compression product from Iterated Systems, but it's the first one aimed at mainstream commercial Windows developers. At \$499, ColorBox is hardly exotic fare; it's well within the reach of any Windows developer working with images.

ColorBox delivers impressive compression ratios and excellent image quality. But using ColorBox as opposed to image-compression alternatives (e.g., JPEG libraries) means forgoing compression speed, image-interchange capability, and widespread licensing in favor of the benefits of fractal compression.

Fractal Compression

The fractal-compression technology in ColorBox is a lossy image-compression method based on the work of Michael Barnsley, an Iterated Systems cofounder. For a more complete explanation of the mathematics behind this technology, see his book *Fractals Everywhere* (Academic Press, 1988).

Fractal compression stores an image as a collection of *affine* maps that describe coordinate and color-space transformations from one region of the original image to another. The original image can be re-

constructed from this set of maps alone; the compressor does not store any of the original bit-map data it uses to construct the maps. Iterated Systems calls its compressed file format FIF, for Fractal Image Format.

As with any compression technology, fractal technology reduces the size of image files as a consequence of reducing redundancy in the source data. *How* you reduce or eliminate redundancy characterizes your compression technique. With JPEG, primary compression comes from recognizing redundancy in the storage of frequency components. But unlike JPEG, fractal compression is not a block-by-block collection of transformed data. With fractal compression, redundancy is reduced at a much higher level: Storage savings come

about as the compressor recognizes that arbitrary parts of the image "look like" other parts.

There are three important consequences to the fractal-compression process. First, the compression ratios you get from the process can be fantastic, on the order of 20 to 1 with no noticeable degradation. Second, the compressed image is resolution-independent, so you can scale the compressed file into an image buffer without introducing scaling artifacts such as jagged edges. The third consequence is the only real drawback: The fractal-compression process is complex, and getting quality images takes a long time.

The ColorBox API

Physically, ColorBox is a skinny, shrink-wrapped box that contains a single disk and a brief but fairly complete manual. The only thing the manual lacks is a numeric list of error codes, which would have been helpful in debugging.

The meat to ColorBox is a set of three DLLs: one for decompression and two for compression. The main compression DLL is a 32-bit library for maximum performance; you get access to its functions through the 16-bit interface provided by the second compression DLL.

ColorBox also contains a set of C header files that define the ColorBox API, and an import library. The latter lets you get to the ColorBox DLLs without explicit



A sample application developed with POEM ColorBox libraries. On the right is a 24-bit bit-mapped image; on the left is the same image after approximately 29-to-1 high-quality compression through the ColorBox library. While the quality is good, you can see some compression artifacts at this setting.

LoadLibrary() and GetProcAddress() calls. Besides C, you can use ColorBox with Microsoft's Visual Basic.

The ColorBox API provides three basic kinds of functions: those that compress or decompress images, those that support image compression, and those that set compression parameters. The decompression API maps nicely to a Windows image-processing application—you call functions that set parameters in response to a dialog box and then carry out decompression in another part of the program without having to keep track of lots of parameter globals.

Through its compression API, ColorBox lets you offer the end user three variations: fast compression, compression to ratio, and compression to size. Fast compression shrinks images to a fixed ratio. With the other two variations, you specify a target ratio or size, and the compressor does its best to comply. You can specify

ratios ranging from 10-to-1 to 600-to-1. There is one additional compression parameter that tells the compressor whether you are more concerned with compression speed or image quality.

The compressor always works on a file-to-file basis: You first supply it with a handle to a 24-bit bit-map or Targa file and then pass it a handle to a target compressed file. The decompressor, on the other hand, always works on a file-to-buffer basis: It expands data from a compressed file into a Windows DIB buffer. As a result, the decompressor is significantly more complex than the compressor. Again, the functions align well with typical application requirements, although the capability to compress a DIB buffer down to a file would make a nice additional feature.

One strong element in both APIs is the ability to specify a callback function to the compressor or decompressor. This provides an easy method for breaking out of a time-consuming function in response to a user cancel request.

Hands-On ColorBox

I wrote a little ColorBox-based Windows application that lets you view, save, and perform some rudimentary image manipulation (e.g., adjusting brightness and contrast) on FIF and bit-map files. I based this application on a program I had previously written in Borland C++ using Borland's ObjectWindows library that manipulates bit maps. Using this program let me see how well ColorBox fits with C++.

Adding FIF decompression to the program was a matter of adding a new object type for FIF files and associating the object-manipulation functions with ColorBox calls. ColorBox works well in this environment, and the libraries are fairly simple. The decompressor ultimately resolves to a single call to the ColorBox function FIFFileToBuffer(), although there is some palette manipulation involved up front. The one minor problem I had was that FIFFileToBuffer() insists on placing the output DIB header and image data in one large sequential buffer, and my program was originally built expecting independent buffers.

Adding FIF compression functions was easier than working with the decompression API: I simply had to add a menu entry and quality-selection dialog box and then pass ColorBox a couple of file handles. The compressor works on up to 800 by 600 24-bit files.

Iterated Systems provides a healthy supply of sample applications to get you started. These range from a very simple compression-decompression program to complex examples that include parameter

selection. Overall, they provide excellent learning tools for working with ColorBox.

To get some data for quantitative comparison, I ran my compression program using a sample 24-bit image on a 25-MHz 386DX system with 4 MB of RAM and a 4-MB swap file. The original image was approximately 750 KB in size.

Using "fast" ColorBox compression, I got about a 9-to-1 compression ratio and very good quality. Compression took about 3½ minutes. With a "ratio" ColorBox compression set for 30 to 1 and high quality, I got 29-to-1 compression in 41 minutes, 32 seconds. The 29-to-1 image, with some slight artifacts, appears on the left side of the photo on the previous page. A high-quality JPEG compression of the same image took a little over a minute and compressed at an 8-to-1 ratio. Decompressing each FIF file took only seconds, while decompressing the JPEG file took almost a minute.

Best for Delivery

POEM ColorBox obviously offers great compression. However, it's just as obvious that these high compression ratios are only attainable if your application doesn't need to compress interactively—you can't expect an end user to wait over 40 minutes while the software compresses an image. To answer this, Iterated plans a new release of ColorBox that should be out by the time you read this. The new version is supposed to deliver 20 percent to 30 percent better compression and support compression hardware for much faster compression times. However, the new release will likely be more expensive than ColorBox 1.0.

There are two minor drawbacks to ColorBox that aren't related to technology. First, Iterated Systems includes only 20 DLL distribution licenses with the ColorBox package; to distribute additional applications, you'll need to purchase licenses from Iterated (the fees vary, but they're acceptably low). Second, while the FIF format may gain wide acceptance, currently it is not widespread enough to make FIF a good distribution format.

But if you're writing an application for *delivering* compressed images, both compression-speed and format concerns evaporate. For multimedia or other delivery applications, ColorBox is clearly a fantastic choice. You get a combination of high compression ratios, fast decompression, and scalable images that no other technology offers. ■

Steve Apiki is a BYTE technical editor with a B.S.E.E. from Rensselaer Polytechnic Institute. You can contact him on BIX as "apiki."

BYTE ACTION SUMMARY

■ WHAT POEM COLORBOX IS

A software developer's kit that consists of fractal compression and decompression DLLs.

■ LIKES

Outstanding compression quality and ratios, resolution-independent images, and fast decompression.

■ DISLIKES

Developers must purchase additional run-time licenses when distributing more than 20 applications. Compression can be very slow, depending on quality parameters.

■ RECOMMENDATIONS

For image-delivery applications, ColorBox is the perfect choice. Other applications developers must consider compression speed and the availability of other applications that support FIF.

■ PRICE

\$499

■ FOR MORE INFORMATION

Iterated Systems, Inc.
Norcross, GA
(800) 437-2285
(404) 840-0633
fax: (404) 840-0806

Circle 1131 on Inquiry Card.

INFO SELECT CLEARS CLUTTER

This PIM for Windows works the way you do

STAN WSZOLA

Time for a short quiz. Do you forget to return important phone calls? Miss meetings, appointments, and deadlines? Lose your desk or computer under a blizzard of yellow sticky notes? If you answered "yes" to any of these questions, you are a prime candidate for a PIM (personal information manager).

A PIM is a computerized version of a paper-and-pen organizer, and it usually consists of a calendar, a to-do list, and an address book. The trouble with most PIM programs is that they are too much trouble to learn and use. Invariably, you grab a pencil and paper when you need to record some information rather than struggle to remember commands with a program that is less than easy to use. Info Select for Windows from Micro Logic stands out from the crowd because it is a simple, easy-to-use package.

Order Out of Chaos

Info Select reminds me of Post-it notes or simple sheets of paper in an electronic scratchpad. You enter random data (e.g., addresses, columns of numbers, sales orders, phone numbers, reminders, and to-do lists), with each discrete piece of information having a window on-screen (see the screen). A window can contain anything from one line of information to a screenful or even more. The upper limit for a single window is 32,000 characters. Adding information to Info Select is as easy as editing an existing window or calling up a blank window and entering new information.

Info Select organizes windows into databases called *stacks*, which can be up to 32 million characters. You can maintain all your windows in a single stack or create multiple stacks, each with a distinctive name. You can call up a stack, display the data contained in its windows, search for data, and organize or manipulate the stack in almost any way. You can copy or transfer windows between stacks and combine stacks at will.

The Old and the New

Info Select for Windows is based on the older DOS version of the program. The translation to Windows has added numerous features. You can now copy and paste between Info Select and other applications, enter text in various colors for visual cues, and use different fonts, boldfacing, and underlining.

The program now includes a scroll bar for faster data access, and two undo commands (one discards your last change; the other discards all changes since your last save) in case you've made a mistake entering data or deleted too much text. Info Select for Windows has an automatic file conversion utility, so you can translate your old DOS-based files.

Installation was simple; I barely had to look at the documentation. The program

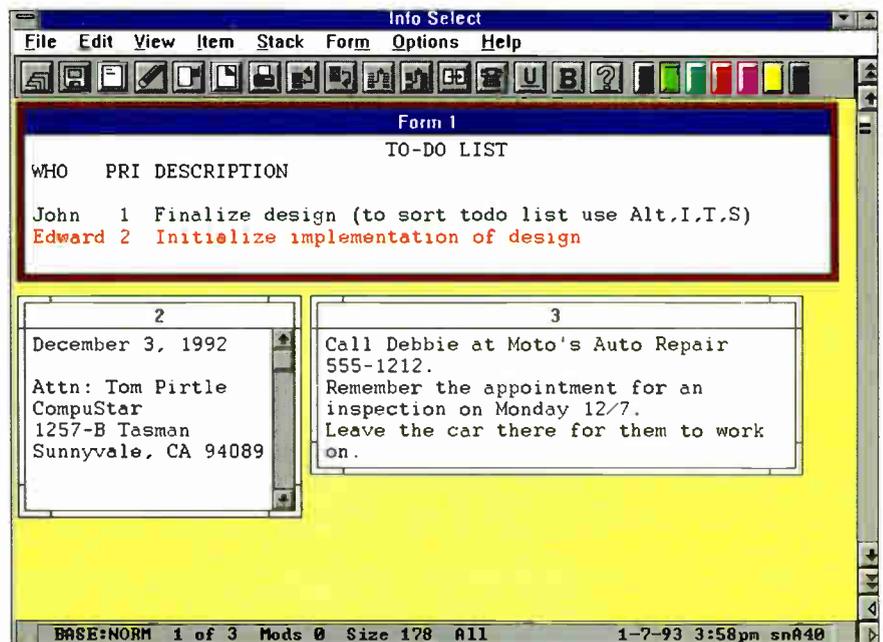
requires only 700 KB of hard disk storage space, which is rather small for a Windows application.

Running the program is also easy. The most used functions are available via a function key or a mouse-click on the icon bar. As with most Windows programs, you need to read the manual and practice to understand what the icons stand for. I found the menu bar easier to use than the icon bar.

One of the best features of Info Select is its fast search engine. You click on the Find button, the Stack Search menu item, or the F2 function key to pop up the search dialog box. Enter a text string or strings in the key box. You can choose from a variety of searches: an exact search; a "neural" search, which looks for windows containing matches to one or more keywords; a Boolean search involving AND and OR parameters; a search on a preselected group of windows; or a search for particular dates, sizes of windows, or even duplicate windows.

When the program finds a match or matches for your search criterion in a stack, it displays the matches by number and graphically as a set of colored boxes. Click on OK, and the program displays the selected windows.

One of the handiest features of the program is the built-in phone dialer. It works with almost any PC-compatible modem



Info Select features free-form data entry; you aren't constrained by the field-based format used in many other PIMs.

that's attached to a COM port and with any Touch-Tone phone. You can set up the dialing feature to send the correct initialization string to the modem, to recognize your local area code, and to recognize special phone numbers. To dial a number, you just click on the phone icon in the icon bar or on the pull-down Item menu. The dialing feature is smart enough to search any selected window, and, when it finds what it thinks is a phone number, it displays a pop-up dialog box and asks if

you want to call this number or select another. You can also highlight a phone number in any window and choose Dial from the Item menu.

You can set up tickler items and be reminded of appointments. To get a reminder, you just put two asterisks behind a date in any window. On that date, that window will pop up first.

Info Select also integrates the built-in Windows Calendar and Calculator programs into its menu selections.

Yin and Yang

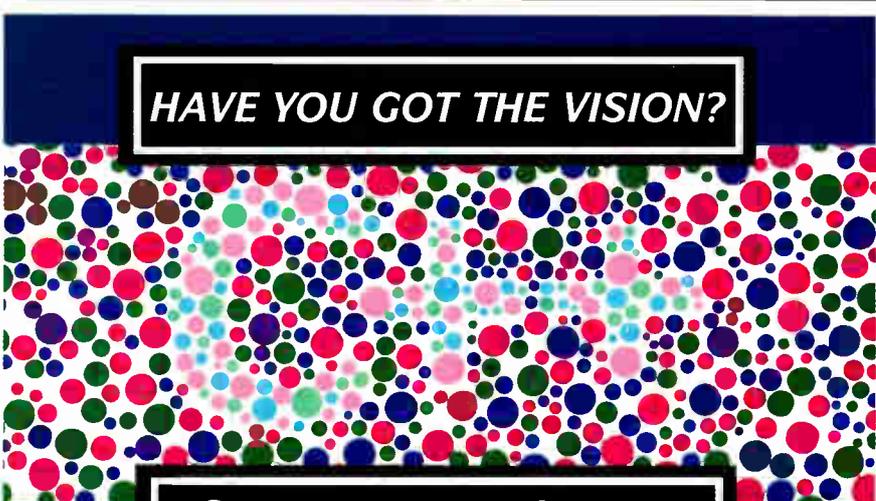
For a Windows application, Info Select lacks a few functions. For example, you can't import a graphics file into a window. Also, the selection of typefaces is limited to five in various point sizes. There doesn't seem to be any way to add fonts.

In terms of useful features, I missed not having the ability to export or print out a list of names and addresses in a fixed format. It would also be nice to easily print mailing labels using standard Avery label stock for dot-matrix and laser printers. Info Select's strong point is that it is a true Windows PIM. It lets you quickly switch between applications, so you can run an application such as a word processor and also access your schedule, go to your project list, or jot down a phone number or an address.

Info Select's simplicity and flexibility make it easier to handle all the loose bits of information in your life. It can take the randomness of data and put it into order. ■

Stan Wszola is a well-organized testing editor/engineer for the BYTE Lab. You can reach him on BIX as "stan."

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BYTE ACTION SUMMARY

- **WHAT INFO SELECT IS**
A free-form PIM that integrates seamlessly into your Windows environment.
- **LIKES**
This is truly an easy-to-use PIM, and thus one that you really will use.
- **DISLIKES**
It doesn't export formatted lists, and it has limited font support.
- **RECOMMENDATIONS**
A strong thumbs-up; in this age of bloated software and "featuritis," InfoSelect for Windows is actually usable.
- **PRICE**
\$149.95
- **FOR MORE INFORMATION**
Micro Logic Corp.
Hackensack, NJ
(800) 342-5930
(201) 342-6518
fax: (201) 342-0370
Circle 1146 on Inquiry Card.

PRESENTATIONS TO GO

The best presentation graphics package is the one you don't have to think about

MARK A. CLARKSON

Do you need to create great-looking business presentations quickly? Without digging out the bothersome manual? So do I.

I took a look at six high-end presentation graphics programs for Windows—Software Publishing's Harvard Graphics for Windows, Claris's Hollywood, Micrografx's Charisma, Microsoft's PowerPoint, Aldus's Persuasion, and Lotus's Freelance Graphics for Windows. I evaluated them from a very simple point of view: How easy is the program to get into, figure out, and create simple presentations with?

In each of the six programs, I created two bulleted word charts, built two graphs from data in a Lotus (.WK1) worksheet, and imported two bit-map pictures (.PCX). I then adjusted things a bit, checked the spelling, and put on a slide show. And in the true spirit of computer users everywhere, I tried to avoid using the documentation.

Why such an unorthodox evaluation methodology? A presentation graphics program differs from spreadsheets and word processors in that you probably don't use it every day. You may dust it off once every quarter to prepare a budget report or even less frequently for project presentations. Consequently, you're bound to forget much of how your presentation program works between uses. No matter how many whiz-bang features it has, a presentation graphics program must be something you can get up to speed with quickly and easily.

Common Ground

The reviewed programs are big. For instance, a full installation of Harvard Graphics for Windows unfurls 14 MB of programs and data across four directories. You can reduce that somewhat by picking and choosing which fonts and filters to install; however, you should be prepared to give over a good portion of your hard disk

space to any one of these programs. Also, as with most Windows programs, the more RAM you have to offer them, the better.

Not only are these programs big, but they can also be slow. It may be a different story on those super machines in the BYTE Lab, but on my bargain-basement 486 with 4 MB of RAM and a nearly full hard disk,

I spent a lot of time staring at the hour-glass cursor and listening to my hard drive chatter.

All six programs subscribe to some variation of the same interface metaphor, providing three views of the data, which I call the *slide*, the *outline*, and the *slide-sorter* views. The slide view provides you with a close-up of a single slide—or page—from your presentation. The outline view lets you plan your presentation and enter data (e.g., for word charts) in outline form. The slide-sorter view provides an overview of the whole presentation, with each slide shown in miniature, as a thumbnail.

In addition, each program has some form of data manager that lets you input, import, and edit the data behind your charts and graphs, and they all provide an array of drawing and painting tools, as well as a selection of presentation styles—backgrounds, color schemes, and a variety of templates that provide a consistent look throughout your presentation.

continued

User Survey

- + Phone Surveys
- + Newsletter responses
- + Mail-In cards
- + Customer - consultant input

Happy Satisfi

Very Unsati

World Radio History

A MOVING TARGET

Aroundup of software packages in any category runs the risk of being overtaken by events (i.e., the advent of upcoming releases), and the programs reviewed here are no different. At the time of this writing, I received beta copies of the next releases of Lotus's Freelance Graphics and Aldus's Persuasion. In addition, WordPerfect released a beta version of its new Windows presen-

tation package—aptly named WordPerfect Presentations. As none of these products was shipping at the time of my evaluation, they were not included in the main story. However, they may be available by the time you read this.

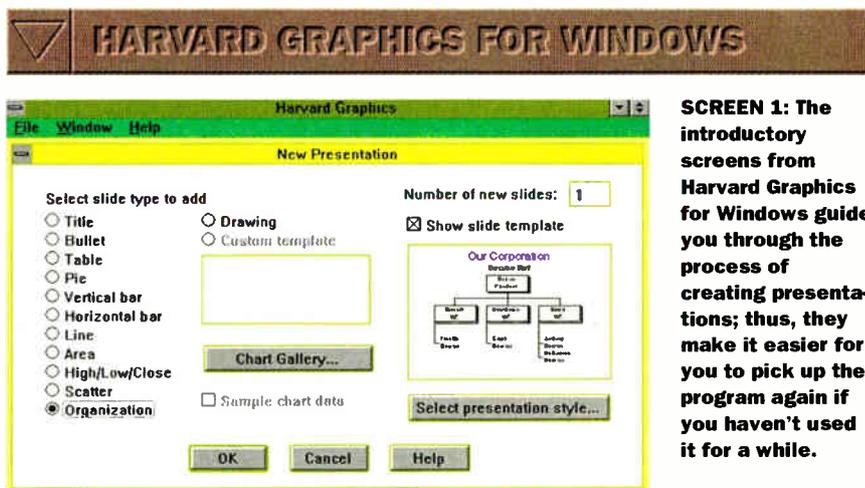
The new version of Persuasion is in one respect the most interesting of the lot. With it, Aldus has taken the big step of removing graphing functions from the pro-

gram and including them in a stand-alone "graphing engine." Persuasion will use OLE to take advantage of the graphing engine, which will also be available to other Windows products. With this release of Persuasion, Aldus says that the era of kitchen-sink software is over, and integration and cooperation between applications is the wave of the future.

I booted up a beta version

of Freelance Graphics for Windows 2.0 with some trepidation. Would Lotus somehow screw up the product I had picked as the best of the lot? With a good deal of relief, I found that the second release of Freelance Graphics is every bit as easy to use as the first and more powerful as well. Events may have overtaken this evaluation, but they have not changed the order of things.

Of the programs I worked with, Software Publishing's Harvard Graphics for Windows (\$595) is the granddaddy, having inaugurated the field of presentation graphics in 1986. Harvard Graphics does an excellent job of holding your hand throughout the process of creating a presentation. The opening screen's dialog box asks you whether you are creating a new presentation and, if so, lets you select the look (i.e., the layout, presentation style, background, and color) at that point (see screen 1). As you add each new page, the program asks you what type of elements will be on the page (i.e., graph, word chart, or picture) and applies the appropriate template before it lets you work on the page. For the neophyte, this is a lot more comforting than being dumped into the middle



SCREEN 1: The introductory screens from Harvard Graphics for Windows guide you through the process of creating presentations; thus, they make it easier for you to pick up the program again if you haven't used it for a while.

BYTE ACTION SUMMARY

■ WHAT PRESENTATION GRAPHICS PROGRAMS DO

Create slides that present text, graphics, and numeric information in a visual format.

■ LIKES

How PowerPoint and Freelance Graphics let you create presentations without having to resort to the manual.

■ DISLIKES

Graphs lack auto-scaling, except those of Freelance Graphics.

■ RECOMMENDATIONS

Freelance Graphics leads the pack with its advanced features and ease of use.

of a blank page and left to fend for yourself.

Clip art is imported via a moving-van icon. For unknown reasons, the clip art would periodically refuse to copy to my slides, forcing me to cut and paste via the Windows Clipboard.

Harvard Graphics offers a veritable cornucopia of charts and chart styles: from line graphs to organization charts to high/low/close charts. Unfortunately, I seldom cared for the default graphs that Harvard Graphics gave me. In the line chart, the default lines were big, fat, and fuzzy, obscuring the data rather than highlighting it.

Harvard Graphics' graphs default to a baseline of zero (i.e., the graphs begin at zero and extend high enough to encompass all the data). If your data varies between one and five, that's fine. But if you have five data points that range between 101.1 and 103.7, a graph running from 0 to 105 will show the data as five indistinguishable straight lines—especially if they're fat, 3-D lines. (I tested each program with this "scaling" test—graphing many data points that ranged from 100 to 105. Only Lotus's Freelance Graphics gave me graphs I could

read the first time.) Harvard Graphics lets you manually rescale the graph and adjust the thickness of the lines.

My quest to rescale the graphs forced me to resort to the manual, which was a joy to use. It is complete and well organized, and I easily found the commands needed to adjust things more to my liking.

If you'll be giving presentations on your computer, you'll love Harvard Graphics' Hyperlinks. Clicking on an object on the screen, say a picture of a cow, can bypass the normal order of the presentation, taking you directly to another screen—perhaps to a graph labeled Dairy Products.

Harvard Graphics also has support for playing back sound, MIDI music, and animation files as part of your on-screen presentations. Software Publishing offers Video Player, an add-on module that lets you incorporate digital video clips. Video Player is shown in a user-definable window and can run automatically, or you can run it manually. You control the volume. By contacting the company, Harvard Graphics users can obtain Video Player (which retails for \$125) for \$15 through April.

THE IMPORTANCE OF BEING OUTPUT

Before you start putting things into your presentation, it is important for you to decide what you want to get out of it. What is your intended output device—your computer screen, 35mm slide film, an overhead transparency, or your monochrome dot-matrix printer?

While it's fairly obvious that presentations incorporating 256-color graphics won't translate well onto your black-and-white dot-matrix printer, it's also true—although less obvious—that not all presentation styles and colors that look good on a 35mm color slide will also look good on your Super VGA screen and vice versa. The size, aspect

ratios, effects of color saturation, and units of measure are different for each.

If you have to change formats in midstream, you may have to painfully reformat every page of your presentation or just throw it away and start from scratch. The more a presentation graphics program guides you to make the right choices—and the harder it is to make the wrong choices—the better. Aldus's Persuasion, for example, includes a reference card that enumerates the available presentation styles, each labeled with handy symbols indicating whether that presentation style is best suited for overhead transparencies, the computer screen, and so on.

Software Publishing's Harvard Graphics for Windows includes a similar reference, divided by output type. In addition, the various presentation styles, backgrounds, and color palettes are usually divided up by filename or directory, or both.

If you need high-quality output, say, to 35mm slides, but lack the equipment, don't despair. In their electronic form, you can deliver your presentations on disk or upload them via a modem to a service bureau (i.e., a company that produces slides, transparencies, and other high-quality output from your electronic-image file).

Except for Lotus's Freelance Graphics, each of the

reviewed programs includes some kind of bridge to a particular service bureau. Should you so desire, you can upload a presentation from your modem-equipped PC and have slides returned to you in 24 to 48 hours.

I tried Microsoft's PowerPoint link to Genigraphics Presentations. I just had to print some slides to the Genigraphics driver and then fire up the special communications program provided. PowerPoint walked me through filling out the order form and then it dialed the telephone, handled the file transfer, and provided me with a receipt. The slides arrived a few days later—and they looked good, too.

CLARIS HOLLYWOOD

	D	E	F
1	Hourly	GO	WEA
2	3.225	3.443	3.625
3	2.714	2.695	2.688
4	3.130	3.299	3.375
5	3.605	3.823	3.250
6	3.363	3.493	3.750
7	3.517	3.833	3.750
8	3.748	3.771	3.688
9	3.538	4.010	4.375
10	3.709	4.000	4.000
11	3.749	4.025	4.188
12	3.715	3.721	3.688

SCREEN 2: Hollywood's data manager creates, imports, and edits chart and graph data. Hollywood lets you easily see your source data (in this case, a Lotus .WK1 worksheet) and mark specific cells for import.

Claris, of course, is best known for its work on the Macintosh—a platform known for its integration. It's ironic that the various components of Claris's Hollywood (\$499) are not well integrated.

Where Harvard Graphics lets you switch between different views of your presentation, Hollywood forces you to switch between different programs. For example, Hollywood's outliner is not integrated with the slide viewer but is a separate program.

You use the Windows Clipboard and cut-and-paste commands to move text from the outliner into your presentation. I found the outliner generally clumsy to use. It always defied my first and second guesses as to how to add a new page or delete a spurious bullet. It also produced text in unexpected colors.

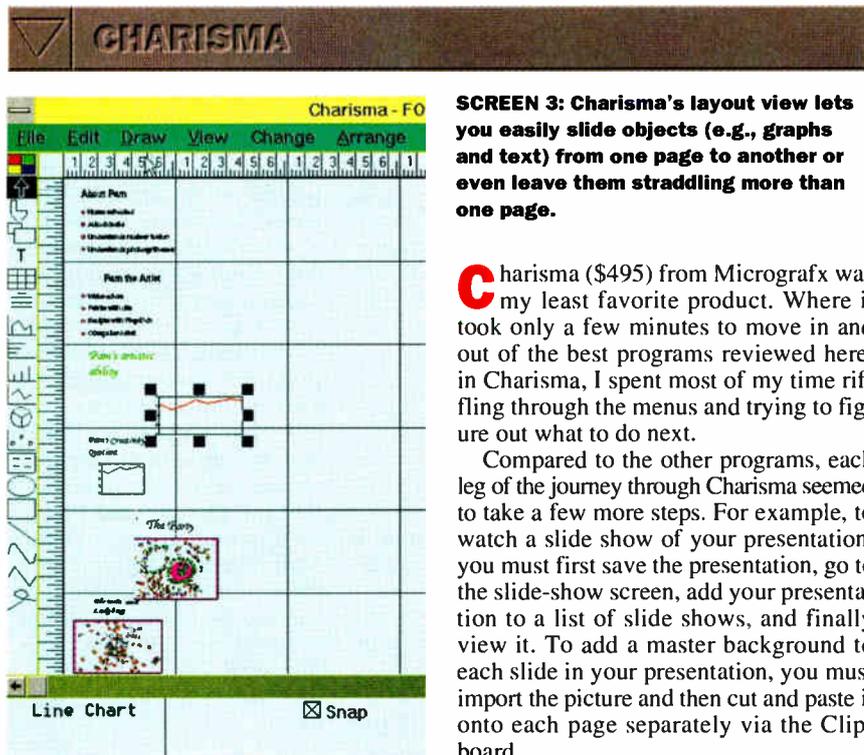
Compared to the vast libraries of clip art and graph types provided by the other programs (e.g., Harvard Graphics and Pow-

erPoint), Hollywood's collection is downright disappointing. Its collection of backgrounds is also similarly limited. Hollywood allows you to add your own custom charts, clip art, and backgrounds to the existing libraries, but I expected a bigger initial selection.

As with Harvard Graphics, Hollywood provides default graphs (with data-obscuring 3-D effects) that I don't much care for. On the plus side, Hollywood also offers extensive text-manipulation tools. You can mirror your text, add shadows to it, perform manual kerning, and even bend text around a circle or an arc—something that is extremely hard to accomplish manually, if you've a need to do it. In addition, Hollywood provides tools for more standard text operations such as changing the text font, size, and color, as well as checking the spelling and performing a search and replace. The package also has a complete set of drawing tools, including a paintbrush and an adjustable spray can.

Hollywood also provides a nice data manager, which allows you to open and view your intended source file, say a Lotus worksheet (see screen 2). You can easily mark the block you want to import from the worksheet. You don't have to import the entire worksheet, nor do you have to remember the exact range of data you wish to import.

continued



SCREEN 3: Charisma's layout view lets you easily slide objects (e.g., graphs and text) from one page to another or even leave them straddling more than one page.

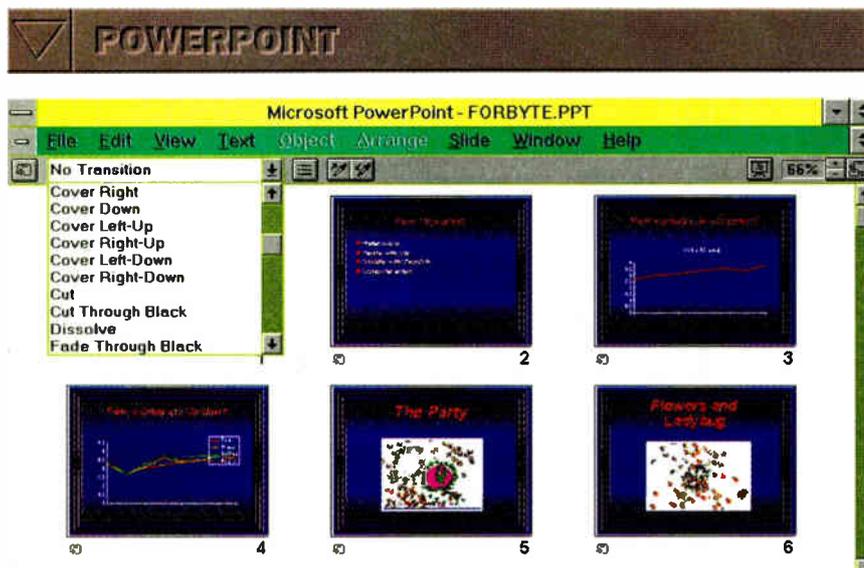
Charisma (\$495) from Micrografx was my least favorite product. Where it took only a few minutes to move in and out of the best programs reviewed here, in Charisma, I spent most of my time riffling through the menus and trying to figure out what to do next.

Compared to the other programs, each leg of the journey through Charisma seemed to take a few more steps. For example, to watch a slide show of your presentation, you must first save the presentation, go to the slide-show screen, add your presentation to a list of slide shows, and finally view it. To add a master background to each slide in your presentation, you must import the picture and then cut and paste it onto each page separately via the Clipboard.

Charisma presents you with your presentation laid out in a large, 2-D sheet. Objects such as graphs can easily slide from one page to another, or you can place them so that they straddle two pages at once (see screen 3). While this might be useful at times, it makes committing mistakes easier.

I spent more time in Charisma's manual than in those of the other programs, and I was less than impressed. It kept me jumping from page to page in a quest for simple information; for example, neither the index nor the table of contents in the reference manual provide any pointer to information about speaker notes or audience handouts. While trying to look for something else, I accidentally stumbled on both those topics in chapter six of the Learning Guide. (The topics do not appear in the Learning Guide's index, either.)

In addition, out of all the reviewed programs, Charisma is the only one that does not offer you a built-in spelling checker. Charisma's charts are easy to manipulate and change from one type to another, although the selection is not as extensive or as obvious as that of the other programs.



SCREEN 4: PowerPoint's slide-sorter view lets you move, copy, and reorder slides. You can easily assign transition effects (e.g., dissolve and cut) to any or all the slides.

Using Microsoft's PowerPoint (\$495) was like driving a sports car: It combined a feeling of power with easy control. Although PowerPoint didn't guide me through the process of creating a presentation as thoroughly as Freelance Graphics and Harvard Graphics did, I never got lost for long.

PowerPoint provides a large set of pre-

sentation style templates that are easy to find and apply. Likewise, entering text is a piece of cake. You simply click in the box marked Title and then type your title in the box marked Body. The program automatically and intuitively creates a bulleted word chart as you type.

I often change the size and shape of text, and no program makes that as easy as Pow-

erPoint. You can change the size of the text by clicking on the plus and minus buttons at the top of the screen. Your text grows and shrinks dynamically as you watch. This is a tremendous aid to page composition; no guesswork is involved. Other common text selections (e.g., italics and bold) are available via similar buttons.

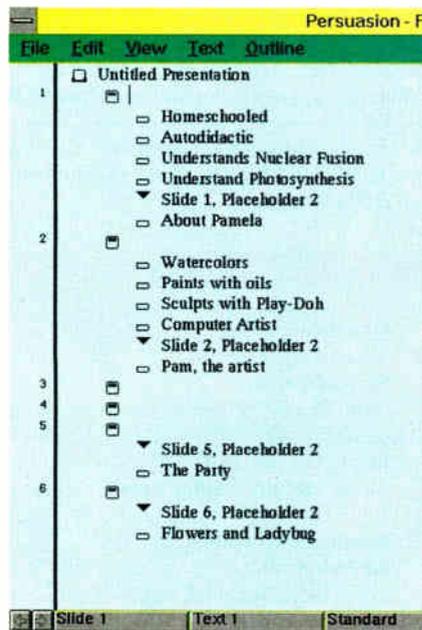
PowerPoint came with a large (and my personal favorite) collection of color clip art, with everything from traffic signs to a map of Azerbaijan and an angry duck. In addition, its manual is well laid out and easy to use, with a handy reference card printed right on the back cover where you can find it.

PowerPoint is not without its warts: By default, the data manager came up filled with sample data, which I had to mark and delete before I could do any actual work. Fortunately, I could disable this feature, but I certainly could have lived without it.

The graphs were good looking and easy to set up, although PowerPoint failed my scaling test. As with most of these programs, I had to do a little fishing to find the scaling command, but once I did, it worked well enough.

PowerPoint's slide-sorter view is second to none (see screen 4). It lets you effortlessly preview, add, and change transition effects. Slides can be easily moved, shuffled, copied, and deleted. A slide show is just a button-click away.

ALDUS PERSUASION



SCREEN 5: An outline view of a six-slide presentation in Aldus's Persuasion presents easy access to all the text in the presentation.

A big step up from Charisma, Aldus's Persuasion (\$495) did not perform well or badly enough to call much attention to itself. Persuasion is a thorough implementation of a presentation graphics program, with adequate documentation. It is not as intuitive as some of the other packages I worked with, as I had to resort to the Persuasion manual several times. The manual was much less helpful than that of Harvard Graphics; it kept me flipping from page to page.

To a first-time user, Persuasion was peppered with little annoyances. When I started the program, it complained that two printers I don't even own were not installed. I selected output devices I do have, only to face the same prompt the next time

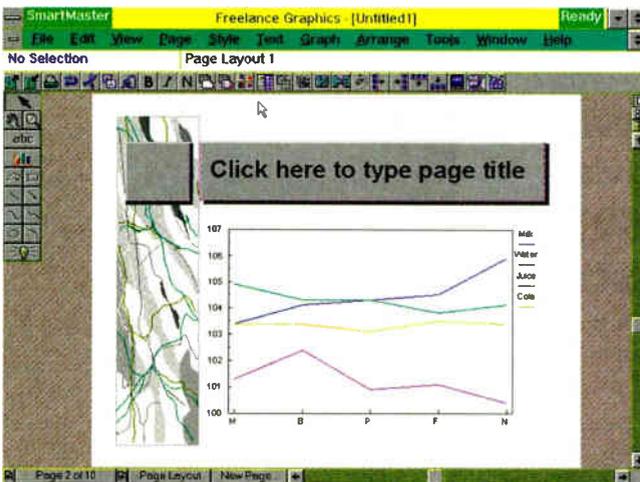
I started work on a presentation. I found that I had to install the drivers for these default printers to get Persuasion to work properly.

Persuasion's data manager presents your data in tiny eyestraining cells. The data manager insists that you remember and then provide it with the name or coordinates of the range of data you wish to import. The outliner module, however, was a joy to use (see screen 5). It let me manipulate directly all the text in my presentation.

Persuasion provides a fair collection of black-and-white clip art. The slide show is easy to run, although it offers only a few transition effects. Persuasion provides excellent control over the slide-show process, allowing you to move forward and backward and control the way graphs are built up on the screen, layer by layer.

Persuasion provides a spelling checker and a search-and-replace feature. Backgrounds and templates are also easy to apply and change. The different views of your data are tightly integrated, and you can switch between them with the click of a button.

FREELANCE GRAPHICS FOR WINDOWS



SCREEN 6: In Freelance Graphics for Windows, the default graph is scaled to accentuate the data. With the other programs, you have to provide the scaling factor manually.

No program gave me less grief or took up less of my time than Lotus's Freelance Graphics for Windows (\$495). I was in and out of the program in a matter of minutes. When Freelance Graphics drew my graphs, I could read them the first time. The graphs were scaled to emphasize the data. Indeed, Freelance Graphics was the only program to pass my data-scaling test (see screen 6). Freelance Graphics makes you feel safe and in control at all times.

As with Software Publishing's Harvard Graphics, Freelance Graphics stops you on the way into the program allowing you (OK—forcing you) to select a presentation style. With each new page, Freelance Graphics asks you what kind of slide you will be building (i.e., title, graph, drawing, or word chart) and applies the proper template for you.

When importing data, Freelance Graphics' data manager presents you with a view of your spreadsheet data, letting you mark

cells for import, rather than having to remember which rows and columns you want to import for this particular graph. In addition, Freelance Graphics provides an extensive selection of color clip art—added with the click of a button (which is for obscure reasons adorned with a light bulb)—and a gallery of 96 graphs. The documentation, which I didn't need, is great.

To spare you from slogging through menus, Freelance Graphics provides a huge set of shortcut buttons, which Lotus calls SmartIcons. The SmartIcons (75 in all) provide one-button access to a wide range of Freelance Graphics features such as opening a file, drawing a 3-D pie chart, and checking the spelling. Freelance Graphics allows you to choose your favorite SmartIcons to place on a toolbar (i.e., the palette) on the screen.

The Best and the Rest

Each of these programs is powerful and filled with features. They are capable of producing eye-catching presentation graphics. Given time to learn their quirks and features, you might come to love any one of them.

And, of course, these programs usually integrate more tightly with—and more closely resemble—other members of their own family. For example, if you already own Aldus PageMaker, you may be more

comfortable using Aldus's Persuasion.

But if you, or the people you work with, are going to encounter one of these programs only a few times a year, then I recommend Lotus's Freelance Graphics. No other program reviewed here more thoroughly guides you through the process of creating a presentation than does Freelance Graphics, and its presentations are second to none. Microsoft's PowerPoint and Software Publishing's Harvard Graphics vie in my heart for second place. PowerPoint

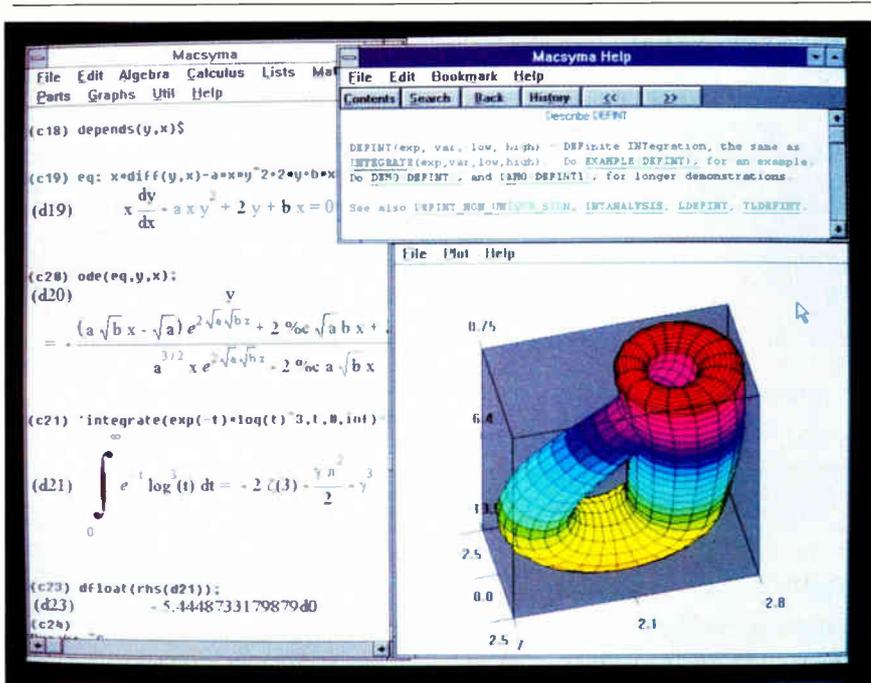
is feature-filled and wonderfully simple to use, while Harvard Graphics takes you by the hand and leads you almost as well as does Freelance Graphics.

Hollywood just felt like a lightweight in the presence of the more complete programs. Although, at about 7.5 MB, it was only about half the size of Harvard Graphics. Persuasion is a fine program, but it gave me neither the feeling of easy control that I got from PowerPoint nor the security of Harvard Graphics and Freelance

Graphics. And, when I sat down cold at Charisma, hoping to create a good-looking presentation quickly, it seemed to fight me at every turn.

Time is precious, and I've got better things to do than wrestle with software. That's why I chose Freelance Graphics for Windows for my presentation software. ■

Mark A. Clarkson is a freelance writer living in Wichita, Kansas. You can reach him on BIX c/o "editors."



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World Radio History

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These integrated applications handle the "big three" jobs—and more

BARRY NANCE

If you were to buy individual Windows word processing, database management, and spreadsheet packages, you'd spend several hundred dollars, need roughly 30 MB of free disk space, and devote a considerable amount of time and effort to learning them. Microsoft Works for Windows and Spinnaker Software's PFS:WindowWorks integrate these "big three" functions into low-cost, simple-to-use products that take up less than 6 MB of disk space each. For Windows users on a budget or for notebook users with limited disk and memory real estate, these products can be lifesavers.

I evaluated Works 2.0 for Windows and PFS:WindowWorks 2.0 on stand-alone PCs and a Windows for Workgroups LAN; the workstations consisted of an IBM PS/ValuePoint 486/25 and two CompuDyne 486/25 PCs. Neither software product supports concurrent multiuser access, so LAN users running these packages have to coordinate by phone or E-mail to use public files.

At press time, a third integrated package for Windows was close to shipping. ClarisWorks will compete directly with the two products that are reviewed here. For a look at ClarisWorks prior to its release, see "ClarisWorks for Windows" on page 10.

The Contenders

The PFS:WindowWorks package consists of a WYSIWYG word processor, a 41-function spreadsheet, a disk-based (not RAM-based) database manager, a communications program, a chart maker, and a label maker. The package also includes WinFax UltraLite, a scaled-down version of Delrina Technology's WinFax Pro fax

software (more on this later).

Microsoft Works for Windows consists of a WYSIWYG word processor, a 57-function spreadsheet, and a RAM-based database manager. The package features the WorksWizards technology (which I will talk more about later), which is designed to help you create form letters, address books, and mailing labels. The

Works charting function is a menu option within the spreadsheet module.

Both PFS:WindowWorks and Works supply searchable on-line help files, but be aware that the Works help file is about four times the size of the PFS:WindowWorks file. This can be a blessing if your manuals are often out of reach, but a curse if you're lacking space on your notebook computer's hard disk.

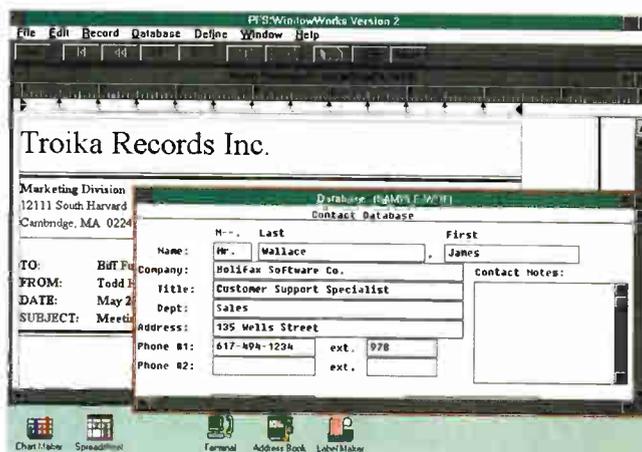
In PFS:WindowWorks, each module offers a windowed view of a document, spreadsheet, or database file, and you can use more than one module at the same time (see screen 1). But you can't open two word processing documents, two spreadsheets, or two databases at once. In contrast, Works uses MDI (Multiple Document Interface) to let you open two or more files of the same type simultaneously. This makes cutting and pasting between documents easier. With both products, ribbons of toolbar icons and menu options change dynamically to be appropriate for the module you are currently using.

Beginning with Words

The PFS:WindowWorks word processor reads many types of files, including text, its own (.WPD), RTF (Rich Text Format), BetterWorking, PFS:First Choice, PFS:Write, Professional Write, Ami Pro, Word

for Windows (1.0 and 2.0), and WordPerfect (5.0, 5.1, and WordPerfect for Windows) files. For all files other than those in PFS:WindowWorks' own .WPD file format, however, you have to tell the program the format of the file you want to read—it won't automatically recognize other formats.

The PFS:WindowWorks word processor



Screen 1: PFS:WindowWorks lets you open different modules, but you can't have two word processing documents, spreadsheets, or databases open at the same time.



Screen 2: Microsoft Works for Windows' WorksWizards technology makes doing labels and form letters painless.

screen looks somewhat like that of Word for Windows or Ami Pro: Inside a standard Windows window, there's a menu bar, a ribbon of toolbar icons, a ruler, and a typing area. Under the menu bar, the PFS:WindowWorks word processing module displays a ribbon of clickable options for choosing a font, font size, bold/italic/underline, paragraph justification, and paragraph style. PFS:WindowWorks uses International CorrectSpell, the Houghton

Mifflin thesaurus and spelling checker.

The PFS:WindowWorks word processing module lags behind a fast typist in both page and draft modes. Because it makes substantial use of .DLL program files, PFS:WindowWorks is also slow at loading, saving, and checking the spelling of your files; it has to read the .DLL code from disk each time you ask it to do one of these tasks. In addition, the word processing module cannot save in text-with-line-breaks format, an important limitation if you also use a text editor that can't handle text files with soft carriage returns.

The Microsoft Works word processing module gives you functions that are similar to those of PFS:WindowWorks, and it's also quicker. So, although a fast typist can easily stay ahead of Works, the lag is not as great as with PFS:WindowWorks. One reason for Works' quicker response is that its programs exist in a single executable file, so you get faster response when loading, saving, or checking the spelling of your documents.

The Works word processor module, like PFS:WindowWorks', displays a menu bar, a toolbar, a ruler, and a typing area. It can read its own file format as well as ASCII text, dBase, RTF, Windows Publisher, Word for DOS, WordPerfect (5.0 and 5.1), Word for Windows, and Windows Write formats. Unlike PFS:WindowWorks, Works automatically recognizes each file format; like PFS:WindowWorks, Works uses the International CorrectSpell thesaurus and spelling checker.

On to Spreadsheets

The spreadsheet modules of PFS:WindowWorks and Microsoft Works are similar. PFS:WindowWorks offers 41 math, statistical, financial, date, and data management functions; Works offers 57. If you want to print your spreadsheet data in different fonts, PFS:WindowWorks lets you specify fonts on a cell-by-cell or cell-range basis. Works makes you use the same font for the entire spreadsheet.

Both programs' spreadsheet modules can import and export Lotus 1-2-3 worksheets as well as comma-delimited files. With both PFS:WindowWorks and Works, the spreadsheets you create are limited by the amount of RAM in your computer, plus whatever memory Windows holds in its swap file.

Neither of these spreadsheets poses any threat to their full-featured cousins. However, they are handy for quick-and-dirty analysis.

The Database Difference

It's in the database manager modules that PFS:WindowWorks and Microsoft

Works differ the most. Works loads the entire file into RAM, so you must save the results when you finish. PFS:WindowWorks updates the disk file directly and does not have a Save menu option in the database manager module. Ending a database-definition session in PFS:WindowWorks is not intuitive; you must choose the Edit Records menu option to get the "Do you want to save this definition?" message box.

In Works, you can have up to 32,000 records—fewer if you run out of memory. For example, 32,000 records of 200 bytes each, which is not unreasonable for name, address, phone, and fax information, would require over 6 MB of free memory. You can define as many as 256 fields per record and set a field's size to be from one to 256 characters. A Works field name can be up to 15 characters long and must end with a colon.

In PFS:WindowWorks, each field name can be up to 10 characters long. General-format (i.e., character string) fields have a maximum length of 254 bytes. You might think that PFS:WindowWorks, with its direct file-update orientation, could manage more records than Works. But Spinnaker suggests that 10,000 records of 110 fields each is a practical maximum. Both the Works and PFS:WindowWorks database managers let you define derived fields whose contents depend on spreadsheet-like formulas.

You can also tell either database manager to show records in form view (one record at a time) or in list view (all records in a scrollable, tabular display). Works allows you to sort records, in ascending or descending order, using up to three fields as sort criteria. In PFS:WindowWorks, you can specify up to three fields on which the database manager will index your database.

A database field in Works can be one of nine data types: general, fixed, currency, comma-delimited, percentage, exponential, leading zeros, true/false, or time/date. PFS:WindowWorks lets you specify that a field must contain character, numeric, date, logical (i.e., true/false), or memo data. You can create simple reports and perform simple queries in both programs.

Works permits you to specify a screen font and font size, but not on a field-by-field basis. The PFS:WindowWorks database manager doesn't let you specify a font at all. If you have existing data you want to import, both Works and PFS:WindowWorks accept quote- and comma-delimited input files. Works can save database files in its own file format or in text-and-commas, text-and-tabs, dBase III,

BYTE ACTION SUMMARY

■ WHAT INTEGRATED PACKAGES DO

They combine simple word processing, a spreadsheet, and database management in one package.

■ LIKES

Both products are surprisingly capable; they handled most of the tasks I asked of them.

■ DISLIKES

PFS:WindowWorks is a little slower, and its help screens are sparse. You can't do field-by-field font selection in the database manager modules of either product.

■ RECOMMENDATIONS

If you need to work with multiple documents at once, get Microsoft Works for Windows. If integrated telecommunications is your thing, get PFS:WindowWorks.

■ PRICE

Microsoft Works 2.0 for Windows, \$199
PFS:WindowWorks 2.0, \$149

■ FOR MORE INFORMATION

Microsoft Corp.
Redmond, WA
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fax: (206) 936-7329
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Spinnaker Software Corp.
Cambridge, MA
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(617) 494-1200
fax: (617) 494-1219

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or dBase IV format. PFS:WindowWorks writes its own format database files and can export all or part of a database in comma-delimited format.

Neither database manager offers a programming language; you cannot create complex, custom-written applications with these products or access them via some high-level query language. These flat-file databases are best suited for common name-and-address types of data management.

Module Integration

Both PFS:WindowWorks and Works allow you to share data among their modules. For instance, if you want to perform a mail-merge operation in PFS:WindowWorks, you select menu options that tell the word processor which fields from a database file to use in your form letters. In Works, you perform essentially the same steps.

You can cut, copy, and paste data via the Clipboard, and both products support DDE and OLE. PFS:WindowWorks, for example, allows you to link data from the spreadsheet to the chart-editor module, from the chart editor to the word processor, and from the spreadsheet to the word processor. You can set up the link so that changing the original document automatically updates any document containing a hot link to it. If you prefer, you can shift into manual mode, which has a cold link that requires you to pick a menu option before the update takes place. In Works, you can similarly link spreadsheet charts, spreadsheet ranges, and drawings into a document.

Icing on the Cake

As I mentioned earlier, Works contains WorksWizards, a series of scripts you can use to create form letters, address books, and mailing labels. The scripts operate automatically to tailor the word processor and database manager modules to specific tasks (see screen 2). WorksWizards is a slick feature for people who are task-oriented and who don't want to constantly refer to the user's guide to learn how to do a particular job.

In addition to coming bundled with WinFax UltraLite, PFS:WindowWorks gives you some extra modules. Except for the Terminal communications program, these modules are simpler in function than their Works counterparts. You also get a chart editor (in Works, this function isn't a separate module; it's built into the spreadsheet module), a label maker, and an address book.

The Terminal communications module is similar to the Terminal program that

comes with Windows, but it has some additional features, including the YMODEM batch-file transfer protocol, a control strip of icons for many common menu items, and a simple script language. You can have up to 30 dialing-directory entries. Terminal-emulation modes include ANSI, TTY, and VT102.

PFS:WindowWorks terminal scripts can contain simple control-flow statements (e.g., IF, MATCHSTR, JUMP, and RETURN), command statements (e.g., GET INPUT STRING, DISPLAY MESSAGE, and HANG UP), and comment lines. There is no Dial Number option in the window of dialing-directory entries; you have to use the separate Log On menu option or icon—another characteristic of PFS:WindowWorks that I found nonintuitive. The user's manual explains the procedure clearly, however.

The WinFax UltraLite program lets you send and receive fax documents if you have a fax modem attached to your computer. WinFax UltraLite includes a receive module that stores incoming faxes as graphics image files, a send module that you configure as a print destination under Windows and that you can use to administer fax documents, an image-viewer module for reading and printing incoming faxes, and a printer driver module. Fax reception occurs in the background under Windows. To send a fax, you merely choose WinFax as your printer in the Print Setup dialog box.

Difficult Choice

Both PFS:WindowWorks 2.0 and Microsoft Works 2.0 for Windows do simple word processing, spreadsheet analysis, and database management. Both offer sufficient features to make choosing between them difficult.

Works has better on-line help, uses MDI, and offers WorksWizards. PFS:WindowWorks 2.0, which is much improved over the previous version, is less expensive (indeed, many computer makers load it along with Windows on new PCs) and has telecommunications support. And its WinFax UltraLite module is compelling if you want to be able to computerize your fax documents. The final choice comes down to the specific features you need most. ■

Barry Nance, a programmer for the past 20 years and a contributing editor for BYTE, is the author of Using OS/2 2.0 (Que, 1992), Network Programming in C (Que, 1990), and Introduction to Networking (Que, 1992). He is the editor for the IBM Exchange on BIX, where you can reach him as "barryn."

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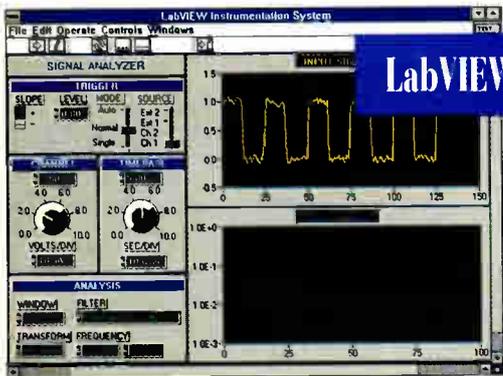
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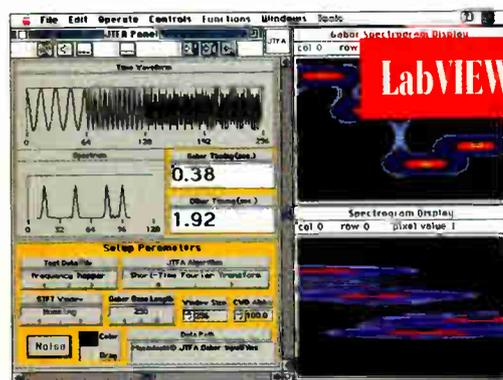
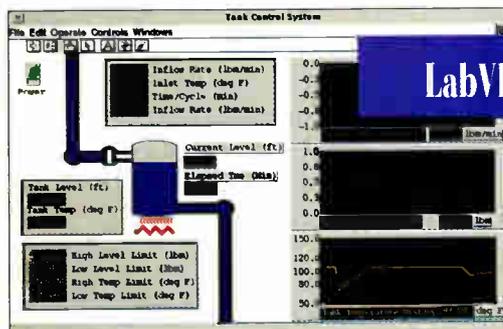


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World Radio History

CONTACT MANAGERS: KEEPING IN TOUCH

Three programs that help you get a grip on who you have to call today

HENRY FERSKO-WEISS

Successfully maintaining a relationship with a customer depends a great deal on the information you have on that customer and how quickly you can get to it. Contact management programs are designed to organize this "people information" and make it instantly available. Not only can these programs keep simple, Rolodex-type information, but they can also maintain a much more detailed profile of people; record the past history of all your dealings with them; help you select clients to work with by complex criteria; list all future calls, meetings, and tasks associated with them; facilitate correspondence; and, when you have to make a call, dial the phone for you.

Contact managers were once thought of mostly as a sales application, but today these programs have come to have a much broader appeal. Marketers, public relations representatives, managers at all levels, and writers—as well as doctors, lawyers, exterminators, plumbers, contractors, and virtually anyone who has customers or clients—are finding contact management valuable. This client-centered orientation is what differentiates contact managers from their close kin, PIMs (personal information managers; see the text box "What About PIMs?" on page 110).

You start your day by going to your contact manager to see whom you have to call, what correspondence has to go out, and your schedule of meetings. Then, as you deal with clients throughout the day, you can recall what you talked about previously, how they make payments, who referred them to you, when you last met, their kids' birthdays, and their golf handicaps—even if you haven't spoken to them for six months. Well-organized contact information that you can get to quickly is a truly powerful asset that can make you more productive and your business more profitable.

Contact managers have increased in

popularity over the last couple of years, and your choices in the Windows environment are growing. Three products stand out: Contact Software International's Act for Windows, Richmond Technology & Software's Maximizer for Windows, and Pyramid Data's PowerLeads. All of these are good products, but their wide range in price and capabilities makes each suitable for a different type of user.

Act for Windows

Act for Windows is for people who live by contact management. With more than 70 fields, each contact record can hold a considerable number of details, and you can customize the fields to suit your particular needs. Act comes with a robust report generator, a full-blown word processor with a spelling checker, great calendar facilities, macro capability, and numerous ways to search and select contact infor-

mation. The program takes full advantage of the Windows environment, offering a customizable icon bar across the top of its window that allows you to activate almost any function with just one click of the mouse. Of course, at \$495, this program isn't for the casual user.

The contact record in Act contains two pages, and there are so many fields that each page takes up most of the screen. A button on the icon bar lets you toggle between the pages. There are 15 undefined user fields, but you can also rename all but four of the predefined fields, so you have a lot of leeway in how you customize the program.

You can hide or protect fields, and you can create edit masks for formats that include phone number, date, time, and currency. In addition, you can create a pop-up listbox with preset values for any field, and Act allows you to attach one library document—perhaps a telemarketing script or a price list, for example, or even a graphics image pasted from the Windows Clipboard—to every record. All of this flexibility means that you can make Act work the way you want it to.

The contact record screen has an extremely useful status bar, with buttons that make it easy to navigate through the database. The status bar displays icons to indicate scheduled activities, an associated note, and a history record, and it gives you an idea of how your current contact list was selected and the position of the contact in the current group, as well as the time and date.

continued

BYTE ACTION SUMMARY

■ WHAT CONTACT MANAGERS DO

They maintain addresses, phone numbers, and profile information about contacts.

■ LIKES

The easy-to-use icon-button orientation of the Windows interface is especially appropriate for these programs.

■ DISLIKES

These programs have no convenient way to keep information that's not directly tied to a particular contact, such as project to-do items or notes on a group of contacts.

■ RECOMMENDATIONS

Act for Windows and Maximizer for Windows are ideal if you spend most of your time in a contact manager; Maximizer is the better value. PowerLeads searches records very fast and has a nice record layout, but it has more limited profile information.

■ PRICES

Act for Windows, \$495
Maximizer for Windows, \$249
PowerLeads, \$295

WHAT ABOUT PIMS?

The main difference between contact managers and PIMs (personal information managers) is that contact managers focus on the *contacts*—meetings, scheduled phone calls, and letters—all connected to a contact record, while PIMs focus on *you and your schedule*—meetings, to-do items, and so on—all part of a universal calendar for your activities. While there may be ways to link items to a contact, PIMs still focus on *your* time.

In addition, contact managers tend to have more robust databases with sophisticated search capabilities. If you want to find all your contacts in the Boston area who, on the average, do more than \$30,000 worth of business annually and haven't been called in the last 30 days, this is easy in a contact

manager but impossible in a PIM. Contact managers also maintain history on phone calls, meetings, and letters, and they generally have set fields to show some of this history on every contact record. PIMs do not concern themselves so much with history, except in the form of a phone log or event log that is tied to a date rather than to a contact.

All this said, there are still some areas in which it's hard to tell the difference between a contact manager and a PIM, and if you don't need to keep highly structured information or do sophisticated searches, then a PIM will help you organize some basic people information and may serve you better. In the Windows environment, the most popular PIMs are Ascend, Desktop Set, Organizer, and PackRat.

If you want to see more than the profile information, additional details are only a click away. The icon bar has buttons for jumping to a history record, an unlimited note record, or an activity list for the contact. It also lets you schedule calls, meetings, or to-do items; jump to the word processor; display a daily, weekly, or monthly calendar; print a report; and more. There are 20 of these buttons, as well as 30 additional buttons that you can use for other functions or assign to run macros you've created. Thus, you can get at any function in Act and program routine activities with one mouse-click, saving yourself considerable time.

Act makes it easy to search records in a variety of ways. You can look up a contact by last name, company, state, city, or other selected fields. If you want to create a more complex lookup, you can fill in a number of values in a blank record form. And you can build a more sophisticated query by selecting fields from a pop-up list and using logical and Boolean operators with as many as 25 clauses. Complex queries can be saved for later use. Act also lets you create report and letter templates by selecting fields from pop-up listboxes; the program comes with 11 report templates, as well as templates for a standard letter, a memorandum, and a fax cover sheet.

The word processor that comes as an integral part of the Act package gives you

control over fonts, point sizes, colors, text attributes, page layout, headers, footers, page numbering, and so on. It lets you perform all the common word processing functions, including checking spelling. It's so complete, in fact, that you're not likely to need any other Windows word processor, although Act comes with macros to link to Word for Windows, WordPerfect for Windows, and Ami Pro.

Act's calendar features are outstanding (see screen 1). You can view your calendar by day, week, or month. If you want to change an appointment, you just drag it to the new location and drop it. Dates never have to be typed in: The F4 key brings up a calendar, and the Insert key deposits the highlighted date. A phone menu lets you record incoming and outgoing calls and their date, time, duration, purpose, and priority. When you complete a call, you can, with just a few mouse-clicks, move this information to the history record, where it is available for future reference.

Act is an impressive package, with all the facilities that you would expect to find in a contact manager. It gives you wonderful control over record information, menus, icon buttons, and other items, and you can create your own library of reports, letter templates, and queries with very little effort. Of the programs reviewed here, Act has the most features and the most flexible design without leaving you totally on your own.

Maximizer for Windows

Maximizer for Windows, like Act, is a powerful, full-function contact manager, but it takes a very different approach to organizing your contacts. Maximizer is list- rather than form-oriented and uses Windows' multiple windowing capability to present more information on the screen at once than any of the other products reviewed here. You get lists of clients, categories, notes, letters, tasks, and so on, and you view these lists in windows that scroll together.

Among Maximizer's advantages are its wonderful flexibility in the amount of information you can maintain on clients and its ability to save multiple client views. It also offers a full-function word processor with a spelling checker and thesaurus and has excellent calendar features. Maximizer makes broadcast faxing a breeze, it lets you create macros that can call other programs, and it supports DDE. Yet its list price, at \$249, is about half that of Act for Windows.

Maximizer's architecture makes it more action-oriented than other contact managers. Because you typically have more than one window open at a time and most of them are synchronized, you can move from one area of information to another instantly. For example, if you open the Hotlist window of today's tasks and the Notes window, you can click on a task and then jump right into a note for the client involved (see screen 2). Thus, you can quickly trace contact history without losing sight of your daily tasks.

Maximizer also makes it easy to comfortably fit all the windows on the screen by using the Tile Vertically, Tile Horizontally, Cascade, and Arrange Icons choices on the Windows menu. Naturally, you can also size and move windows with the mouse.

When you use the phone-log feature along with the Hotlist and Notes windows, the program automatically logs the time, date, and duration of your calls in the corresponding note. Appointments can also be logged automatically to a note. The phone-dialer dialog box has buttons labeled Previous and Next that let you move back and forth through your hotlist without having to go in and out of the Hotlist window. Buttons on the toolbar let you access other functions in the program, such as the word processor, calendar, or expense record, with one click of the mouse. Because all these features are so easy to mobilize, the program has a dynamic feel—you're not staring at semistatic client information.

Most users will start off their day by opening the Hotlist window. You can view

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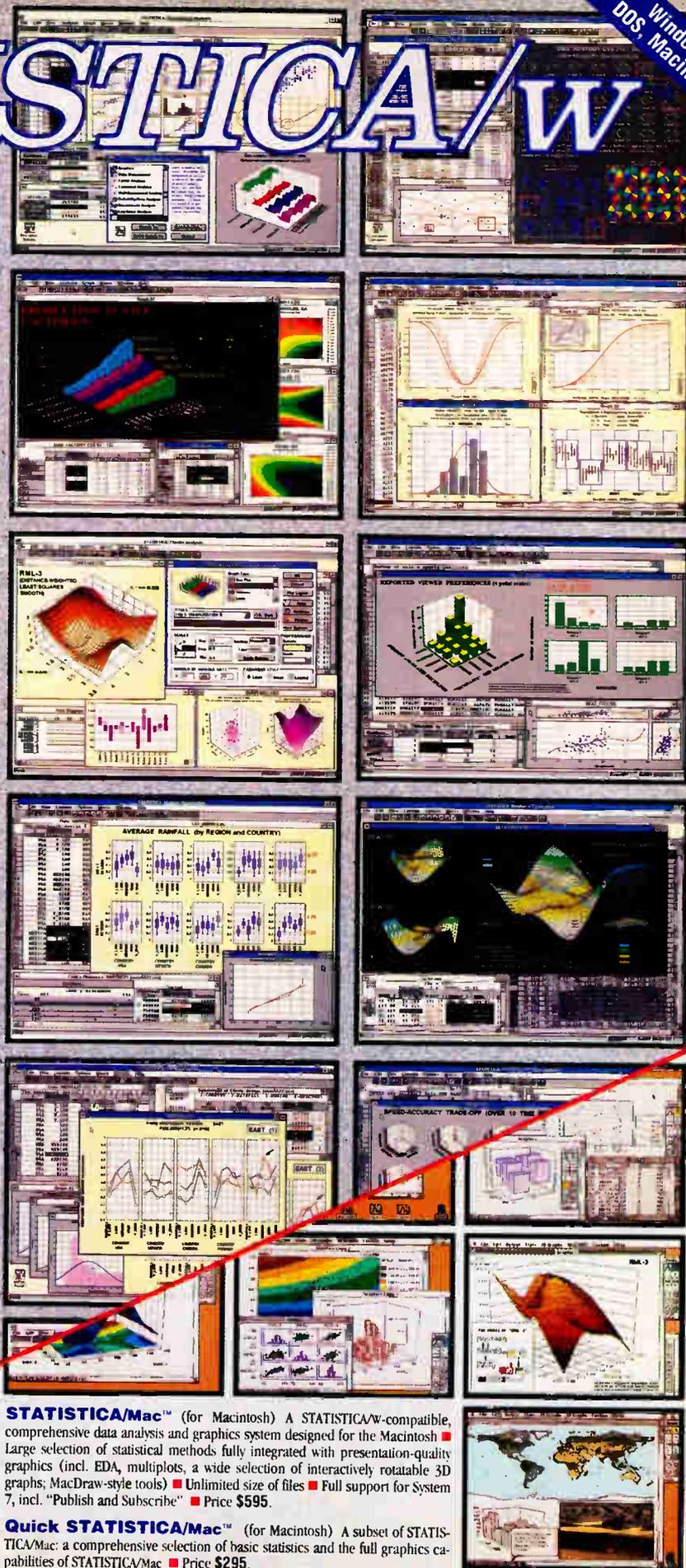
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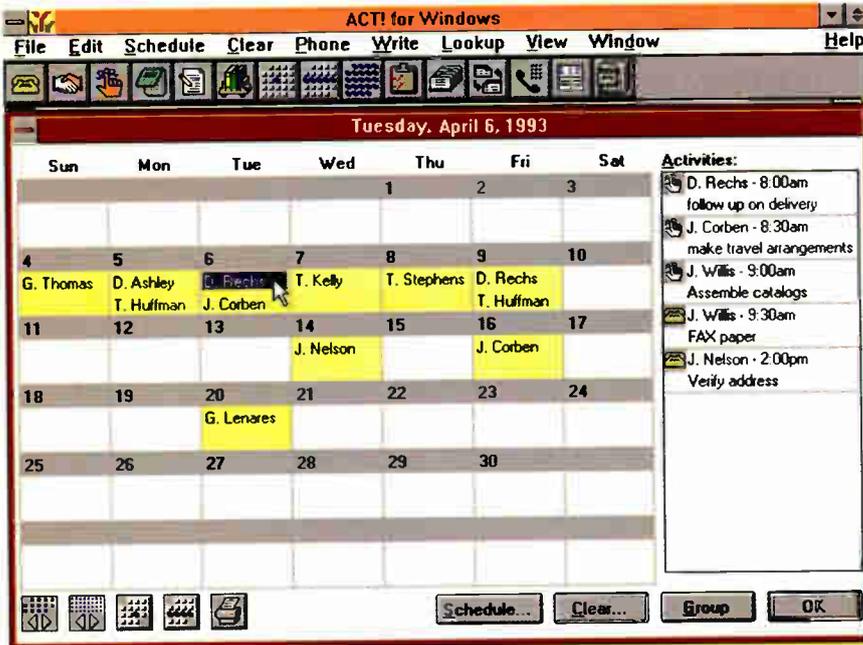
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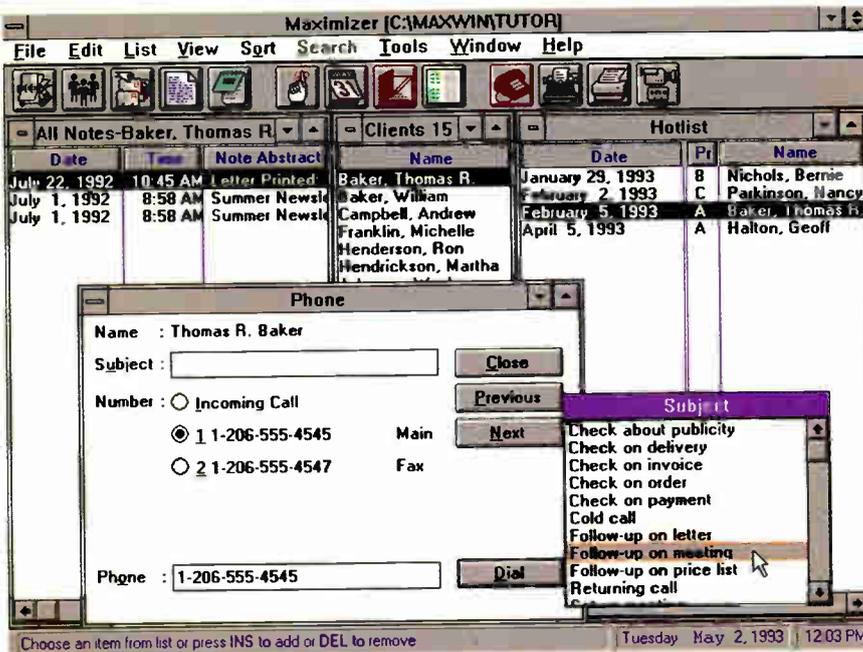


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Screen 1: Act for Windows offers a daily, weekly, or monthly view of the Activities calendar. In the monthly view, the activities for a highlighted day, along with their time and a brief description, appear in a vertical listbox. You can shift to the other calendar views, change the month or year shown, or print the present view by using icon buttons at the bottom of the calendar. Its superb calendar features help differentiate Act for Windows from the competition.



Screen 2: The windows in Maximizer for Windows are synchronized with the hotlist. Thus, notes and contact information about the current client are always available when you are working with the hotlist. In this example, a task involving Thomas R. Baker is highlighted in the Hotlist window. Maximizer automatically calls up corresponding information in other open windows. Maximizer excels at getting you the information you need without getting in your way.

your hotlist for today, tomorrow, yesterday, this week, or next week, or by date range. At the end of the day, unfinished tasks can be carried forward automatically. Another window that you will probably access often is Categories. This is where you keep all client information other than address and phone number. As you would expect, the Categories window is also synchronized with the hotlist. Categories are the equivalent of fields in other contact managers.

The great thing about the handling of categories in Maximizer is that you can have a standard set of categories that apply to all clients (giving you consistency of information from one record to the next) and, for any one record, extra categories with specialized information. There's no limit to the number of categories you can create or the number you keep for a particular client. The categories can be alphanumeric, numeric, date, or table (table categories let you have more than one value). While the number of field types is limited, the ability to add any number of fields to a client record gives you great flexibility.

The standard Clients window lists a client's name, city, state or province, and ZIP or postal code in columnar format. You can delete columns and add others—including categories—to get a maximum of 12 columns. You can create an unlimited number of client views this way and save them for future use. The column titles in a view are buttons that, if pressed, sort the client list by that column. Many of the fields have pop-up pick lists to make data entry speedier.

You can also list clients as individuals or companies. If you create a company client, you can attach an unlimited number of contacts within the company. This is great for people who deal with large companies and who may need to maintain information on 50 or more contacts. In contact managers that restrict the number of contacts per client, you can't see a complete list at once.

Maximizer has several other excellent features. Because of its support for automatic faxing via WinFax Pro or Eclipse Fax, you can fax a single letter or broadcast a fax to an entire client list as simply as you would print a letter. The program's calendar offers day, week, one-month, and two-month views that let you see some portion of the task title in the calendar. The calendar also lets you drag and drop clients to a date, has task priorities and an alarm, and lets you record recurring tasks. With this much going for it, Maximizer can really stand up to Act in head-to-head competition.

PowerLeads

PowerLeads has a fully relational Superbase database (from Software Publishing, Santa Clara, CA) at its core. The \$295 program builds many-to-one relationships between notes and schedule items and automatically indexes primary fields. This makes searching extremely fast, even with large databases and complex queries. You can also link PowerLeads to other applications written in Superbase. The program comes with 26 predefined reports and is easy to use.

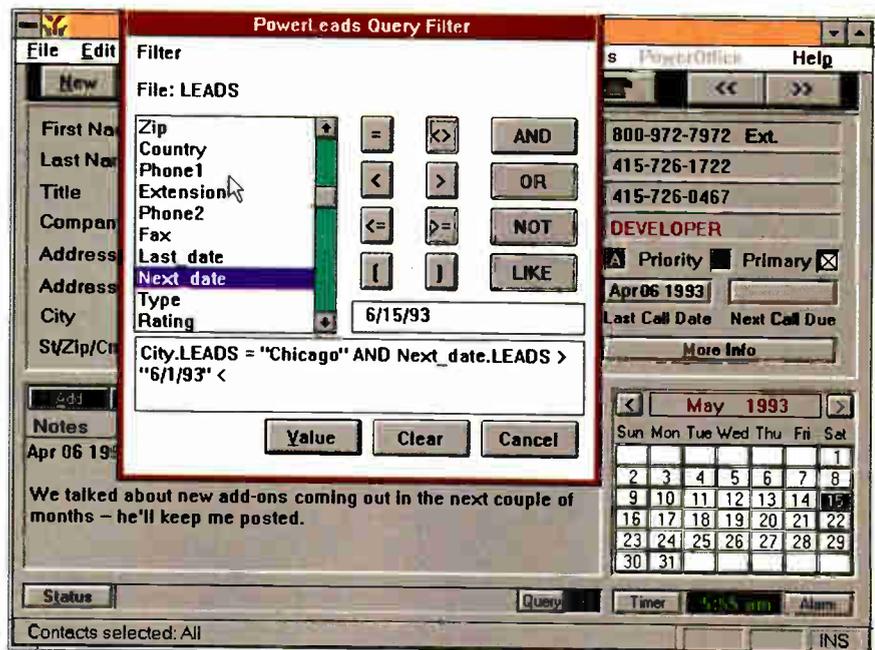
You can look at your contact data in PowerLeads by *detail* view or *list* view. The detail view gives you the fullest access to all the program's features. It holds the basic name and address information, a notes window, and a one-month calendar—all appealingly designed and arranged. The contact fields include a Type field for categorizing your contacts; you might use it to classify a contact as a customer, prospect, or lead, for example. You can also rank your contacts with a one-character Ratings field or assign them priorities through a one-digit Priority field. The Last Call Date and Next Call Due fields are great reminders of your activities with contacts.

The rest of the contact fields, a mere 10 of them—only four of which are more than check boxes—pop up in a dialog box when you press the More Info button. These fields do not come preset, so you can use them to customize the program to fit your needs. The relatively small number of contact fields is one of PowerLeads' weaknesses. You can purchase an add-on module, called PowerFields, that gives you 32 more fields, but they are spread out over four dialog boxes, so access to them is a bit cumbersome.

The Notes window has its own buttons to control operations. A note can be 4000 characters long, and you can have an unlimited number of notes attached to a contact. When editing notes, you can work in full-screen mode to see more of your note at one time. The notes editor is nothing more than a simple text editor, however, with only underline and italics available for highlighting text.

The calendar at the side of the Notes window can be used to call up a Daily Agenda of events. From Agenda you can jump to another dialog box listing your phone calls or to still another box that lists your to-do items. Thus, all your fundamental contact data is easily accessible. I found the program so easy to learn that the manual was hardly necessary.

Compared to the list-oriented interface offered by Maximizer, the list view in PowerLeads is of limited value. It shows



Screen 3: You build a query expression in PowerLeads by selecting fields from a pick list, typing in values, and clicking on logical operators and Boolean commands. In the expression being built here, the query will return all contacts in Chicago whose next-contact field holds a date between 6/1/93 and 6/15/93. A query can be up to 256 characters long.

only the first and last names of a contact and the company name. Its primary use is to give you a quick glance at a number of contact names resulting from a search. You can't add new contacts in this view, but most of the general operation buttons and menus are available.

Among PowerLeads' relatively few icon buttons are three that lead to dialog boxes that you use for searching your records. One of these lets you do a quick lookup, but only by first and last name and/or company name. If you want to do a search by other fields, you use the query button, which lets you pick any fields and apply Boolean and logical operators (see screen 3). A query can be up to 256 characters long, so it can get quite complex, but the relational database that forms the underpinnings of the program ensures fast results. You can save up to 25 queries. The third button lets you do a keyword search on notes.

One of the advantages of this program is the ability to add on customized pieces using Superbase. Pyramid Data is developing some add-ons, one of which, called PowerCall, can recognize a caller's telephone number and automatically displays the contact record. Another company, Scarborough of Manchester, New Hampshire, is producing PowerBroker, a full office-automation product for the real estate mar-

ket that includes PowerLeads as a module. If PowerLeads catches on, you will undoubtedly see other third-party developers producing specialized add-ons for the program. If you use Superbase, you can add industry-specific modules and place them on the PowerOffice menu in PowerLeads.

With its relational abilities, easy interface, and nice layout, PowerLeads is a good program for people who don't need to maintain a great deal of detailed information on each contact. But it doesn't have as much flexibility in setting up the contact records as the other packages reviewed here.

Choosing What's Best for You

Contact managers are intended for people whose work is largely focused on relationships with customers, clients, patients—other people with whom their company or practice does business. When it's crucial for you to know a client's history, special needs, and preferences with just the click of a few keys or mouse buttons, or when it's desirable to group clients together by a common profile that changes and may be complex, then you need a contact manager.

Act for Windows and Maximizer for Windows are the most fully rounded contact managers reviewed here. With its 74

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CONTACT MANAGERS

fields on the contact record, Act lets you maintain a great deal of common detail on people. The notes field is unlimited, history is recorded automatically, and its calendar features are excellent. In addition, it uses the Windows interface to its fullest, giving you control over icon buttons and even letting you place macros beneath customized buttons.

With its list-oriented interface. Maximizer for Windows lets you see more information at one time than the other programs do and lets you access category and history information without losing your place in the program. For flexible, action-oriented contact management, Maximizer is unsurpassed.

PowerLeads is less robust in features than Act, but it has the advantage of the fully relational Superbase database at its core, which makes searching very fast. Hooks to Superbase also enable you to add specially designed modules to PowerLeads. While you can maintain far fewer details on a profile, the main contact screen has a nice arrangement of database fields, a Notes window, and a one-month calendar. ■

Henry Fersko-Weiss is a freelance writer and editor working out of Warwick, New York. You can contact him on BIX c/o "editors."

COMPANY INFORMATION

Contact Software International, Inc.

(Act for Windows)
 Carrollton, TX
 (800) 365-0606
 (214) 919-9500
 fax: (214) 919-9750

Circle 1101 on Inquiry Card.

Pyramid Data, Inc.

(PowerLeads)
 San Mateo, CA
 (800) 972-7972
 (415) 312-7070
 fax: (415) 312-9374

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Richmond Technology & Software, Inc.

(Maximizer for Windows)
 Burnaby, British Columbia,
 Canada
 (800) 663-2030
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MATHCAD: BETTER THAN PAPER

This calculating program lets you concentrate on solving problems, not equations

RAYMOND GA CÔTÉ

Back in the dark ages of my student years, I would huddle over my desk using slide rule and electronic calculator to work out electrostatic discharges, moments of inertia, circuit oscillations, and electron trajectories. The calculations weren't particularly difficult; it was just that there were so many of them. Instead of concentrating on understanding how all these wonderful physical phenomena interacted, I was often caught up in solving a single problem.

Now, imagine that instead of struggling with pencil and paper, you were presented with a sheaf of magic paper. Any equation you wrote on this paper was instantly solved and the result presented in beautiful graphs. Simply changing any of the equations caused all the calculations on the paper to be redone. No longer need you toil for hours to grind out answers. Your time is free to concentrate on the problem, not on the mundane details of the calculation process.

The preceding scenario best describes my love affair with MathSoft's Mathcad 3.1 for Windows. The folks at MathSoft did not set out merely to build a powerful calculating engine. The task they attacked is one that computerdom rarely accomplishes—building a better piece of paper.

Mathcad's true beauty is that it works the way you think it should. When you open a new document, you are presented with a clean, fresh sheet of electronic paper. You can freely place formulas, definitions, functions, graphs, text, and pictures anywhere on the page. The only constraining factor is that when Mathcad evaluates formulas, it starts evaluating at the upper-left corner of the page and works down to the lower right. This is a very natural flow of control, but you do need to ensure that variables and functions are defined higher up on the page than their first use.

Free-form text can also be placed any-

where on the page. Version 3.1 of Mathcad for Windows allows you to mix fonts, styles, and font sizes. Formulas are limited to a single font, although subscripts and superscripts appear in a reduced size.

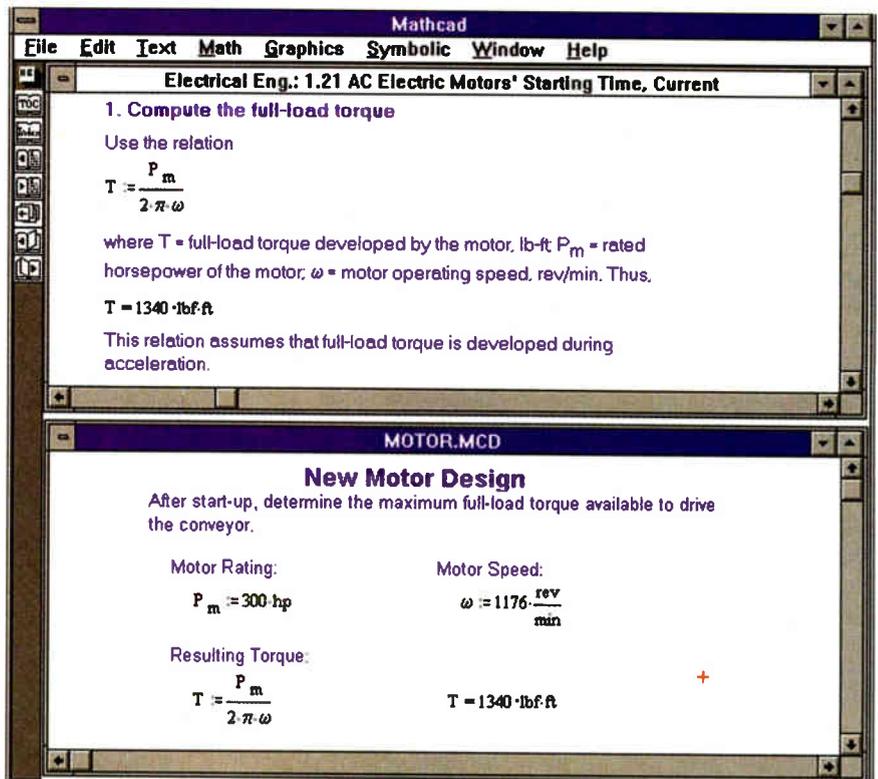
You wouldn't expect to find any esoteric programming language lurking in your idealized magic paper, and you won't find one in Mathcad, either. The equation is the central actor on the page. All for-

mulas and equations are entered using a series of custom keystrokes. The resulting equations look exactly as you'd expect to find in any physics or mathematics book. The program has quite a bit of built-in smarts about how equations should be laid out.

Standard keyboards simply are not optimized for entering massive amounts of Greek letters, superscripts, subscripts, fractions, and so forth. With Mathcad, you can easily enter Greek characters, which appear so frequently in formulas, by typing a Roman equivalent followed by Control-G. For example, the character sequence "a Control-G" enters a lowercase Greek alpha.

Learning to navigate through an equation takes a bit of patience and perseverance. Although it's easy to learn the proper keystrokes, I found it took several hours before I felt comfortable and could enter new equations with wild abandon. There's a quick-reference card to help new or infrequent users.

Mathcad gives you results practically



The Electronic Handbook in the top window is opened to the calculations for determining the fully loaded torque of an AC motor. The bottom window shows a working document where the user is calculating some of the properties for a new conveyor design. To copy the formula from the Handbook to the working document just requires double-clicking on the Handbook formulas.

ELECTRONIC HANDBOOKS

One of Mathcad's fascinating aspects is Electronic Handbooks— instant on-line interactive technical documents. Electronic Handbooks are not simply collections of generic equations. Rather, they are electronic copies of leading reference books. Specific reference works are scanned into Mathcad documents. The text is translated into ASCII through an OCR (optical character recognition) process, and the equations are translated by hand into live Mathcad equations. You now have the live, on-line equivalent of the reference work.

Currently available works include McGraw-Hill's *Standard Handbook of Engineering Calculations* and two ti-

ties from CRC, *CRC Handbook of Chemistry and Physics* and *The CRC Materials Science and Engineering Handbook*. Each of these electronic books provides cross references to the standard paper manual. The only problem I found is that some of the scanned illustrations appear blurred on-screen. I found deciphering some of the optical lens diagrams (which had very small legends) to be particularly difficult, although when I printed them out they looked much nicer than they appear on-screen. This is my only reservation. The use of Electronic Handbooks as a new publishing medium indicates MathSoft's commitment to making even better magic paper.

instantaneously. Pressing the = key after typing in an equation almost always displays an immediate answer. There are times, however, when the calculation will take a long time; you might want to turn off the automatic-calculation option. One of the documents I built needed to calculate 10,000 values in each of three matrices. Results were then graphed on a surface plot. Changing any of the input parameters caused a delay of 2 or 3 seconds while the entire document was updated. This was

more annoying than tedious, particularly as I needed to change five input parameters. Setting the manual-recalculation option quickly solved this problem.

Built-in Functions and Examples

Mathcad is a tool for both the serious and casual engineer. The treasury of built-in functions and equations can be used in the fields of mechanics, electronics, physics, statistics, finance, and kinematics, just to name a few. There's such helpful infor-

mation as universal constants (e.g., Avogadro's number, Planck's constant, and the velocity of light), surface tension of common liquids, thermal conductivity of metals and solids, and atomic weights and numbers. You'll also find basic formulas for area and volume. Although I rarely delve into areas requiring knowledge of the properties of solids, liquids, and gases, I do spend a lot of time in the mechanical library while designing beams, levers, and lifts.

In Mathcad, knowledge is delivered in two forms: built-in functions and pre-worked examples (see the text box "Mathcad's Built-in Functions" on page 117). Basic Mathcad also provides numeric integration and derivatives, as well as the ability to do iterative sums and products. This functionality forms the base layer of Mathcad's usefulness.

The real flexibility comes from the use of Electronic Handbooks (see the text box "Electronic Handbooks"). These let you quickly look up basic formulas and then copy them to your working document. The screen on the previous page shows a typical Mathcad working session. The Electronic Handbook in the top window is opened to the calculations for determining the fully loaded torque of an AC motor. The bottom window shows my working document, where I am calculating some of the properties for a new conveyor design. To copy the formula from the Handbook to the working document, I only had to double-click on the Handbook formulas.

In addition, since all the equations in the Handbook are functionally active, you can work with the equations directly without copying them to your document. This is helpful when you want to explore the use of several equations to find the correct one. Any changes you make to the Handbook are forgotten when it is closed. This ensures you cannot accidentally alter your basic formula. Unfortunately, it also means you cannot make personal notes in the margins, because they won't be there when you open the Handbook the next time.

Symbolic Manipulation

Mathcad 3.1 for Windows goes beyond numeric calculations to the world of symbolic manipulation. A scaled-down version of the Maple V program from Waterloo Maple Software (Waterloo, Ontario, Canada) is available as part of the standard Mathcad package. Maple lets you perform various symbolic manipulations, such as solving for a particular variable and substituting an expression for a variable. Other operations include evaluating an equation symbolically and simplifying,

BYTE ACTION SUMMARY

■ WHAT MATHCAD 3.1 FOR WINDOWS IS

An engineering tool that lets you concentrate more on the problem and less on the calculations.

■ LIKES

WYSIWYG formula entry; convenient Electronic Handbooks; rich selection of built-in functions spanning many engineering disciplines.

■ DISLIKES

Some odd hot-key combinations.

■ RECOMMENDATIONS

Mathcad is the choice for anyone who needs to manipulate numbers. Engineers and statisticians particularly will like the new Handbooks.

■ PRICE

Version 3.1 for Windows, \$495
Electronic Handbooks, \$99 to \$149

■ FOR MORE INFORMATION

MathSoft, Inc.
Cambridge, MA
(800) 628-4223
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expanding, and factoring expressions. If you tend to wander into the realm of calculus equations, you'll appreciate the ability to perform symbolic differentiation and integration.

Maple also provides a set of matrix manipulations allowing inversion, transposition, and evaluation of the determinant. All the symbolic manipulations recognize basic Mathcad functions, including complex numbers and the full range of trigonometric functions.

Although the functionality provided by this version of Maple is identical to the capabilities found in the full Maple V implementation, it does not provide the extensive Maple libraries for algebra, group theory, linear algebra, statistics, and number theory. The full version of Maple V is also available through MathSoft.

Life in a Window

You can purchase Mathcad in a variety of languages for a number of computing platforms, including Windows, Macintosh, and Unix. The version I evaluated for this review is 3.1 for Windows; a comparable release for other platforms is not yet available.

Mathcad takes excellent advantage of the Windows environment. The MDI (Multiple Document Interface) allows you to keep several active documents open at the same time while selecting predefined equations from multiple Handbooks. The program's on-line help system cannot supplant the excellent printed documentation, but it provides a ready reference to all of Mathcad's functionality.

Windows is a mouse-centric environment, but entering equations is a keyboard-intensive task. Mathcad provides an excellent balance between the mouse and the keyboard. All basic activities can be quickly performed from either the mouse or the keyboard. As a matter of fact, I think you could run Mathcad without having a mouse at all, although having a mouse allows you to quickly move about the document much more easily than you could by keyboard alone.

Some of the Windows accelerator keys in Mathcad are a little odd, such as the use of Control-O for printing and function keys for New and Save document. MathSoft has also kept the older Insert and Delete key functions for cut, copy, and paste rather than the new official versions of Control-X, Control-C, and Control-V.

With release 3.1 for Windows, Mathcad can act as a Windows OLE client. This means that Mathcad 3.1 users can import data from OLE server programs, such as Microsoft Word, Excel, and so on, into their documents. They can also import bit-

MATHCAD'S BUILT-IN FUNCTIONS

BESSEL

Bessel functions I, J, K, and Y

COMPLEX NUMBERS

Imaginary and real parts of complex numbers

DISTRIBUTION

Histograms, cumulative normal distribution, error function, Euler's gamma function

FOURIER TRANSFORMS

Fast Fourier transform and inverse for real and complex data

HYPERBOLIC

Hyperbolic sine, cosine, secant

INTERPOLATION

Linear, spline, cubic interpolation

LINEAR REGRESSION

Best-fit slope, intercept of line

LOG AND EXPONENTIAL

e raised to a power, natural and base 10 log

SORTING

Sort vectors and matrices

STATISTICS

Standard deviation, variance

TRIGONOMETRY

Sine, cosine, secant, angle from x-axis to x,y point

VECTOR AND MATRIX

Addition, subtraction, identity, eigenvalues, vectors

mapped graphics to use for illustrative purposes (e.g., a line drawing of a turbine).

What Mathcad Isn't

For all its power and ability, there are some things that Mathcad isn't. For one, it isn't a simulation program. You can describe and plot interactions algorithmically, but the results are static. You cannot watch a simulation in progress.

Mathcad, by itself, is also not a visualization tool. MathSoft has chosen not to emphasize the program's plotting capabilities; they're satisfactory, but they don't provide a wide assortment of plot types. Creating even simple polar plots requires a manual conversion to x,y coordinates—a simple operation, but one that I think should be unnecessary for the user. Graftool, a third-party graphing product supported by Mathcad, does provide this capability with a dazzling number of different graph formats. Graftool also provides the ability to read data points directly off the graph, which is useful when attempting to interpret results.

Mathcad is not a programming language. Being a professional programmer, I've spent years needing to think about problems in two domains—the equations to solve the problem and the algorithm to solve the equations. Mathcad, by not providing any programmer tools at all, forces you to remain in the domain of equations. Overall, this is good, because it simplifies

the task at hand and allows you to concentrate on the problem rather than on the computer. However, it takes a little getting used to if you've spent much of your life speaking C or Lisp. Once you can adjust to the change, though, you'll find that Mathcad helps you to solve problems quickly and without much effort.

Software at Its Best

Mathcad demonstrates computers at their best—as tools for increasing your personal abilities. With Mathcad, you can concentrate more on the problems to be solved and less on the mechanics. The program also allows you to quickly experiment with options that you may not have the time to explore with a more manual method. And the innovative Electronic Handbooks make it easy to bring in data from outside references.

Mathcad isn't just a great program for everyone who needs to work with numbers. It's a program that shows what the future of books can be: interactive, and not static, tools for solving problems. ■

Raymond GA Côté is a software development engineer for Appropriate Solutions, specializing in cross-platform applications development. He is a BYTE consulting editor and edits the Robot Explorer newsletter. You can contact him on BIX as "rgacote" or on the Internet at rgacote@bytepb.byte.com.

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1 IMAGE & GRAPHICS MANAGEMENT

Create thumbnail albums to organize images, graphics and documents. Then browse through thumbnails or search by description, file type or other attributes to locate or modify files.

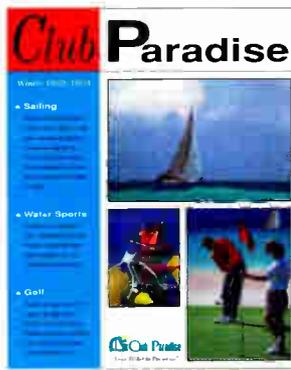


2 IMAGE EDITING

Import images from scanners, video & Photo CDs. Paint, mask or apply special effects using intuitive tools. Color correction commands and image processing filters deliver studio quality results.



3 APPLICATION ORGANIZER



Access word processing, publishing and editing applications... without leaving ImagePals! Add application icons to the toolbar and drag and drop thumbnails from an album to an icon for processing. Supply images and graphics to OLE compatible programs like Microsoft® Word™, Excel™ and PowerPoint™. ImagePals is the central link between your images, graphics and applications.



4 SCREEN CAPTURE

Capture screen shots from an application to illustrate your documents and presentations. Add shadows/borders, convert data types and save images to albums automatically.

5 SLIDE SHOW

Provides manual or automatic presentation of your artwork, complete with dazzling transition effects.

6 FILE CONVERSION

Convert among popular data types and file formats including BMP, CLP, EPS, GIF, ICO, IMG, JPG, MSP, MAC, PCX, RAS, RLE, TIF, TGA, WMF. Read only: CGM, CUR, DXF, PCD, PCT, PIC, WPG.

7 IMAGE COMPRESSION

JPEG compression condenses image files by as much as 100 to 1. LZW and RLE options provide lossless compression.

U-Lead

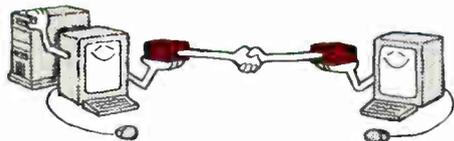
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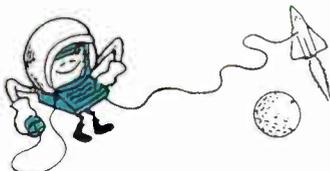


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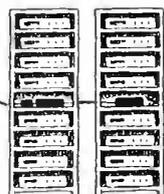
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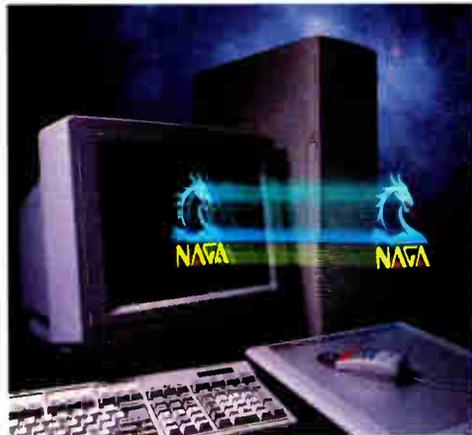
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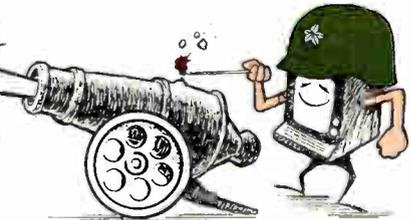


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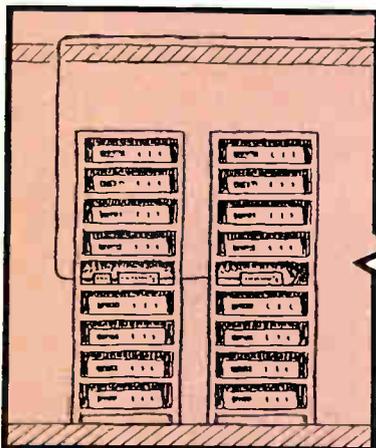
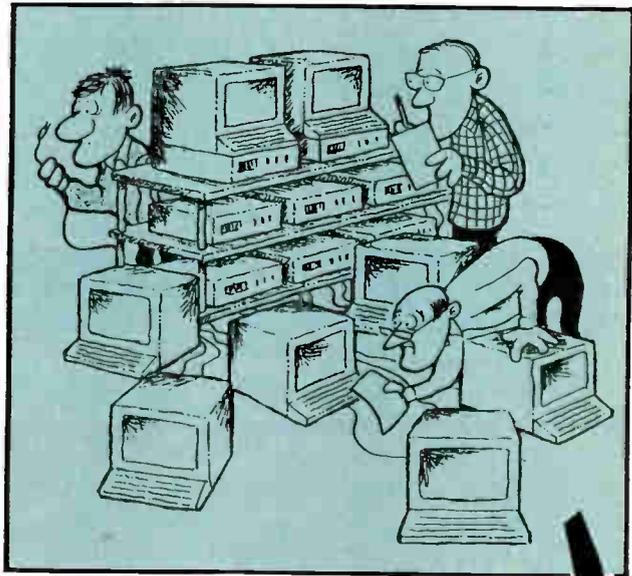
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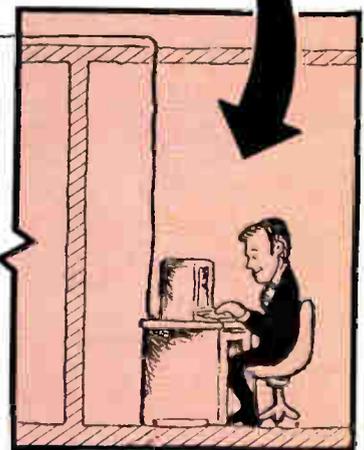
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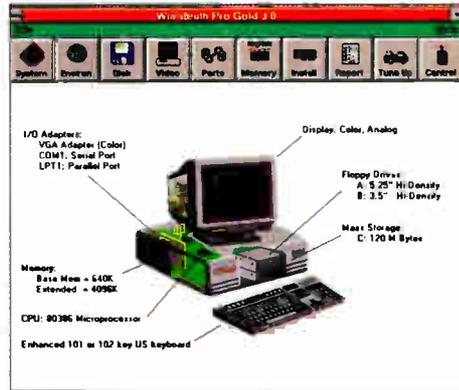
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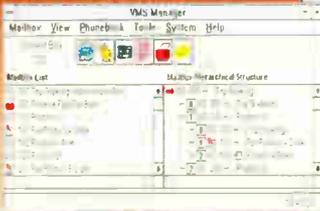
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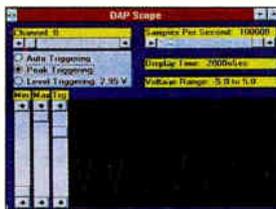
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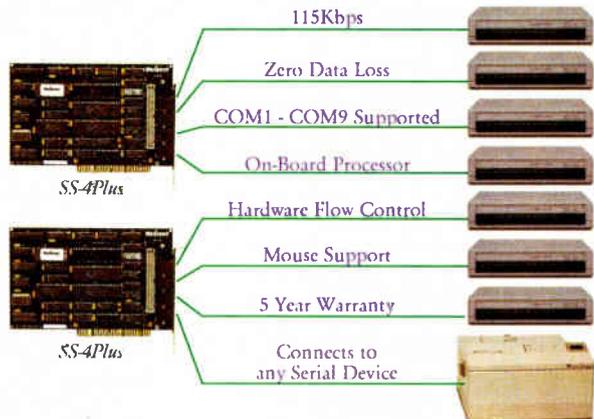
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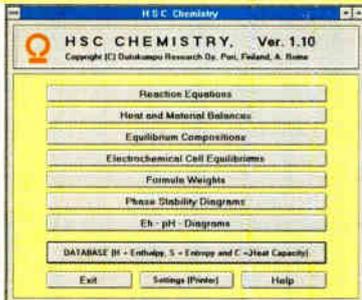
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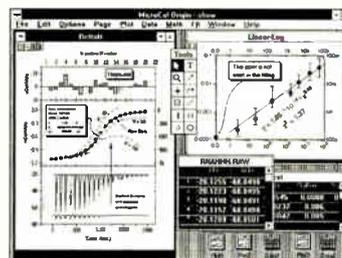
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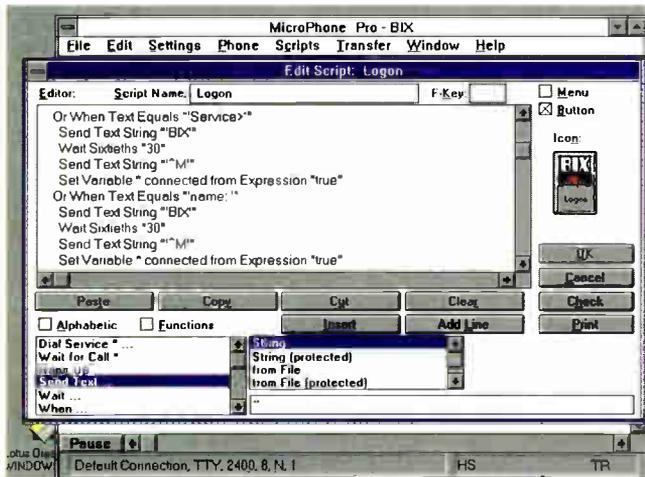
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Short Subjects

Windows products for work and leisure



MicroPhone Pro. The script editor puts all the MicroPhone script language commands at your fingertips.

MicroPhone Pro for Windows

I'm hard on telecommunications software. I have to be—I use telecommunications, particularly E-mail, in all aspects of my job, and I need a fast, reliable, and flexible telecommunications package. It doesn't hurt if the package is easy to use, either.

MicroPhone Pro for Windows has what you'd expect to find in a full-featured Windows telecommunications package: dialing directories, lots of modem drivers, terminal emulation, protocol transfers, and support for leading E-mail and information services. It also has some advanced fax and multimedia capabilities, and the best scripting I've ever used in a telecommunications package. This latter point is especially important to me because it saves me a lot of time.

For example, I used to log on to BIX every morning and read my mail and conference messages on-line, a process that could take a half hour or more. Using MicroPhone Pro's Watch Me script builder, however, I've created a script that completely automates my BIX sessions. With two clicks of my mouse button, I launch a script that brings up MicroPhone Pro in the background, dials the modem, logs me on to BIX, downloads my unread mail and conference messages to separate files on my hard disk, and logs me off. I can then examine these files at my leisure. Other telecommunications packages let you do the same thing, but I have not found one that can make script building as painless as MicroPhone Pro does.

MicroPhone Pro for Windows \$195
Software Ventures Corp.
Berkeley, CA
(510) 644-3232
fax: (510) 848-0885
Circle 1097 on Inquiry Card.

The MicroPhone Pro package includes Delrina's WinFax Lite and integrates well with the fax software. The script language has been extended to include support for fax operation, and MicroPhone Pro now supports a toolbar and drag and drop. To send a fax, you just drop an icon onto the MicroPhone Fax button.

MicroPhone Pro also integrates well with Windows 3.1's multimedia capabilities. From MicroPhone Pro, you can control a CD-ROM player, display a graphical image, or listen to a sound file. Unlike with the fax extensions, however, the point of all these multimedia capabilities is lost on me. We are a long way from the day when individuals will be able to afford enough telecommunications bandwidth to make modem transfer of multimedia information practical. I think the time and resources spent in giving the software a multimedia sheen would have been better spent in including the Kermit protocol or TCP/IP support in the basic package, as Software Ventures does in the Macintosh version of MicroPhone Pro.

Despite some misgivings that MicroPhone Pro has too many bells and whistles, I recommend this program. It does a wonderful job on the essentials of telecommunications, and it provides advanced features for those who want or need them. Whether accessing MCI Mail from work or downloading fantasy baseball stats from CompuServe at home, if you have MicroPhone Pro, you don't need any other Windows telecommunications package.

—Bob Ryan

Microsoft Golf for Windows

For most PC users, there comes a time when you realize that Windows is hot stuff. Maybe it's the first time you embed a sound file in a word processing document using OLE or use a TrueType font to spice up an otherwise drab report. For me, that time came when I first booted Microsoft Golf for Windows and began *minimizing* my productivity applications—after hours of intense work, of course—and *maximizing* Microsoft Golf.

This program is basically Access Software's Links repackaged under a Microsoft label. Microsoft Golf is compatible with all of Access's add-on course disks—a good thing, because it ships with just one course, Torrey Pines. You can play Microsoft Golf



Microsoft Golf. The grid overlaid on the green gives you a feel for the speed and break of your putts.

on one of three levels—Beginner, Amateur, or Pro. Pride should prevent you from playing at the Beginner level for more than a hole or two. The Amateur level takes wind and your swing timing into account, but it is not as demanding as the Pro level, which lets you mess with your stance, swing angle, and other variables. The game offers a reward when you move up in levels: The distance of your shots increases as you move from Beginner to Amateur to Pro.

Unless you indicate otherwise, the program selects your clubs for you. You can also decide whether to play with Gimmies and

Mulligans. It takes only a few holes to get a feel for driving, chipping, and putting with Microsoft Golf.

Microsoft Golf offers the thrill of smacking a 2 wood down the middle of the fairway and the rush of draining a 30-foot putt—feelings I've only dreamed about as I've explored the more obscure parts of the local country club. In fact,

I think it's about time to minimize Word for Windows and switch to ... Microsoft Golf.

—Dan Muse

Microsoft Golf for Windows

\$64.95

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The Far Side Daily Planner 2.0

I never returned phone calls; never remembered birthdays, meetings, or simple errands; and didn't realize I had anything in common with cockroaches. Then I installed Amaze!nc's The Far Side Daily Planner 2.0 for Windows, which set me straight on all counts.

Veteran Far Side users can expect more than a new set of Gary Larson cartoons. Improvements in the new version include color and more animation. Amaze has also upgraded the graphics across the entire operation, including a button bar and view tabs. You can categorize and filter events, as well as drag and drop them into customizable calendars. With a sound card, you can also add .WAV files to Amaze's alarm repertoire.

The main elements of the Planner are events and lists. Events are linked to the calendar, and lists transcend time. The Planner ships with To Do, Contact, and Shopping lists, but you can define many more. The rose-colored-glasses icon lets you filter out events you don't want your office cohorts to see. You can also choose whether to filter out notes, private calendars, and specific lists by category.

Amaze hasn't forgotten that many people prefer keyboards; the



The Far Side Daily Planner. Who says getting organized can't be fun?

The Far Side Daily Planner

2.0 for Windows \$69.95

Amaze!nc
Kirkland, WA
(206) 820-7007
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Planner has keyboard alternatives for most mouse-clicks. To my mind, the interface is intuitively correct, and the documentation is straightforward. Amaze also offers Trivial Pursuit Sports and Genus Edition versions of the Planner, as well as a version based on the popular Cathy comic strip.

If you haven't purchased your copy of The Far Side Daily Planner yet, you're four months late. Don't waste another day before getting organized—and enjoying yourself, to boot.

—Selinda Chiquino

Dr. Floyd's Desktop Toys

(MicroProse Entertainment Pack Vol. 1)

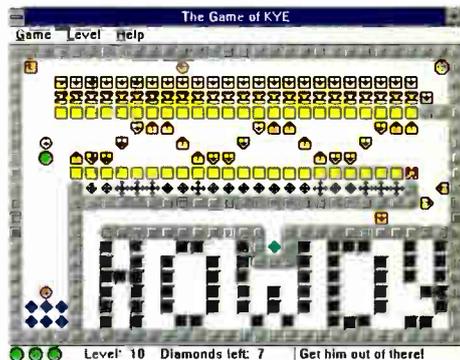
The games that come standard with Windows 3.1 have three qualities that I find particularly appealing: They are fun yet challenging, they don't take a long time to play, and they're free. Dr. Floyd's Desktop Toys from MicroProse Software doesn't share that last quality, but it shines in the first two.

The package takes its name from Dr. Floyd, who pops up periodically on your computer to make inane comments—a "Little Computer People" for the nineties. He didn't last 5 minutes on my hard drive.

The six toys are another matter: Wallop is a mindless "hit the furry woodland creatures on the head" game, and Web Spinners lets you create some neat string art. The best, however, are Cryptograms, which takes the pain—and erasings—out of solving cryptograms; Snark Hunt, a simple yet elegant game of deductive reasoning; and Kye. In Kye, you maneuver a green ball around the screen, trying to pick up diamonds; you complete a level when you've got them all. Each level is its own logical puzzle that you have to solve to get all the diamonds. Only by avoiding the many obstacles can you complete a level and move on.

The games make extensive use of graphics and sound and work best with an MPC sound board. A sixth toy and some screen-saver modules were not yet functional in the beta version I looked at. But even without them, Dr. Floyd's Desktop Toys is a lot of fun and an excellent value.

—Bob Ryan



Kye. If you've figured out how to solve this level, call me and put me out of my misery.

Dr. Floyd's Desktop Toys

\$39.95

MicroProse Software, Inc.
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(800) 879-7529
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Unsung Heroes

Everybody's favorite end user—
and BYTE columnist—fills you
in on some Windows products
that can have a big impact
on how you get your work done

JERRY POURNELLE

Everywhere you look, you can find advice on which Windows word processor to buy or who makes the best Windows database. On occasion, however, it pays to spend a moment on the less obvious. Presented here are a handful of great programs you may never have heard of. I'll leave it to the other authors in this issue to tell you about the high-powered stuff.

Under New Management

Windows is great, but both File Manager and Program Manager have their limits. A comprehensive fix for both is Norton Desktop for Windows from Symantec (Cupertino, CA). This works very well, but NDW takes up a lot of disk space and isn't cheap.

A simpler fix is to get Plug-In for Program Manager, a shareware program from Plannet Crafters (Alpharetta, GA) that takes care of many of Program Manager's defects. Plug-In displays available resources and warns you when resource reserves are getting low. It makes changing icons a snap, for both programs and program groups. It gives you different cursors and helps with installations, and while it won't allow you to nest program groups, it has a group management feature that's just about as good. I've used it with both Windows 3.1 and Windows for Workgroups, it has never given me a problem, and it's my favorite small Windows utility and winner of the Shareware User's Choice for the year. You can contact Plannet Crafters at (404) 740-9821 (voice) or (404) 740-1914 (fax).

My fix for File Manager is to run Norton Commander, a DOS program, under Windows. I have two Commander icons, each with its own PIF: one runs in the background, the other doesn't. The backgrounder is useful for large file transfers and for getting my MCI Mail messages—which it does automatically. Commander lets you view files, and while it won't translate them as more grown-up file viewers do, I don't find I miss that. I also use the little editor in Commander for a lot of housekeeping work. Between Commander and Plug-In I find that, while I have Norton Desktop, I don't always bother to turn it on. Of course I also have friends who think I'm weird. You can contact Symantec at (408) 253-9600 (voice) or (408) 253-4092 (fax).

For B-School Dropouts

B-Tools for Windows from Star Software Systems (Torrance, CA) is a useful though odd assortment of business tools, from a simple financial calculator to a comprehensive system for generating a business plan. It includes such tools as Feasibility Plan, Business Plan, Financial Plan, Management and Control, and Growth. If you have to put together a business plan and haven't much notion of how to do it, get this program. It won't make

you an expert, but it will help you to fake it. There's also a phone book, a number of legal forms and business letters, templates for spreadsheets and databases, and more. There's even a backgammon game.

Understand, B-Tools isn't a spreadsheet or word processor; it just helps you make better use of the software you have. I've given it a User's Choice award.

One B-Tool I don't use is the phone book; instead, I use the one in Ascend from Franklin Quest (Salt Lake City, UT). Ascend is a task and appointment manager, and I've become addicted to it. Ascend does mechanical things like keeping track of my schedule, but its real value is that it gets you to thinking about how you use your time, and it strongly pushes you toward setting your priorities. I find that a

few minutes a day using Ascend to set priorities lets me get a lot more work done. It also has provisions for keeping a journal. I really wonder how I lived without it. You can call (801) 975-9992 or send a fax to (801) 975-9995 for more information.

Graphically Inclined

Everyone should know about CorelDraw from Corel (Ottawa, Ontario, Canada), which has become the high-end standard program for drawing and painting in Windows. If you plan to do a lot of fancy drawing, CorelDraw is the program to get and learn. *Learn* is the operative word here: CorelDraw is very powerful, but that means a fairly steep learning curve. You can contact Corel at (613) 728-8200 (voice) or (613) 728-9790 (fax).

Windows Draw from Micrografx (Richardson, TX; (214) 234-1769) is less powerful, but because of that it's also considerably simpler to learn. Micrografx also offers Graphics Works for Windows, which includes Windows Draw, PhotoMagic, Windows OrgChart, WinChart, SlideShow, a bunch of clip art, 1000 photos, over 130 TrueType fonts, and a partridge in a pear tree, all for a list price of \$295. That's quite a bargain.

A Final Bit of Heresy

Many DOS programs have been brought over to Windows, and for most of them that was an improvement, but not for all. I still prefer the DOS version of Datastorm Technologies' Procomm 2 running under its own PIF to the Windows version of the program. That's only a preference, and at least two friends think I'm nuts.

I also prefer the DOS version of Intuit's Quicken to the Windows version. This is again pure preference; the Windows version works quite well. I just get weary of all the mousing around. ■

Jerry Pournelle writes the User's Column in BYTE in addition to his day job as a science fiction author. You can reach him c/o BYTE or on BIX as "jerryip."

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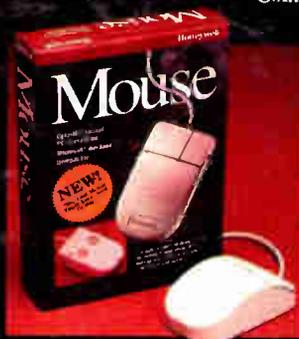
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