ESSENTIAL GUIDE TO WINDOWS

Windows for Workgroups
- How to Use It
- 33 Add-ons that Make It Shine

Speed Up Your Windows Printing

Ultimate Windows Notebooks

Low-Cost DTP: Why Pay More?

Reviews:
The Best in Personal Finance, Contact Management, Presentation Graphics, and More!
Borland® Paradox® for Windows
Relational database power made easy

- Easiest to learn and use
- Relational database power
- Create graphical forms and reports with ease
- Instant answers to queries
- Effortlessly connect to your existing Paradox and dBASE data
Paradox: the magic of database power made easy

Experience the magic of easy database power

If you're looking for the easiest-to-use, most powerful, and most reliable Windows database, this is it! With new Paradox for Windows, there's no limit to what you can do. The graphical interface makes it easy to access, modify, and present your data. Create customer lists in seconds, automatically generate reports with the push of a button, or retrieve data from different sources with ease.

The best way to manage Paradox and dBASE data

Paradox for Windows makes it easy to work with your Paradox and dBASE® data. You can view, edit, query, and link to all your data, with no limitations. You make your request for data simply by checking off boxes with easy-to-use Query By Example. Then the Paradox for Windows query optimizer automatically determines the fastest way to deliver the answer.

Paradox for Windows lets you manage virtually unlimited data types. You can store any kind of information, including text, menus, graphics, OLE objects, sound, and even multimedia. You can even mix and match Paradox and dBASE data in queries, forms, and reports.

More people trust their PC data to Borland than all other database companies combined. That's why Borland is the Data Company. Put the power of Paradox to work for you today. You'll be amazed at what you can do.

Special introductory offer.

Offer expires April 30, 1993.

$139.95
(regular list price $195)

See your dealer or call now,
1-800-336-8464, ext. 5538

In Canada, call 1-800-461-3327.
90-day, money-back guarantee.
CorelDRAW has emerged as the ALL-IN-ONE graphics Super Star! Celebrated by top international industry publications, it has won over 90 awards for its exceptional ease of use, incredible value and outstanding features.

CorelDRAW 3.0 outshines the competition! There is no longer any need to buy separate illustration, charting, photo-editing and presentation software, because CorelDRAW 3.0 includes CorelCHART, Corel PHOTO-PAINT and CorelSHOW—all in one value-packed box.
BYTE's Essential Guide to Windows

EDITORIAL: Windows Reaches Beyond the Desktop

WINDOWS News & Views
ClarisWorks, VL-Bus accelerators, WordPerfect Presentations, Windows CAD, and more.

FEATURES

Workgroups by the Numbers
Ten essential tips and techniques for getting the most out of Windows for Workgroups.

Workgroups Partners
A guide to products that integrate seamlessly with Windows for Workgroups.

Extending Visual Basic
Visual Basic extensions let you produce quality programs faster than ever before.

The Fine Art of Windows Printing
How to speed up printing from Windows.

Inside Video for Windows
Microsoft's new extensions for desktop video open new horizons to Windows computing.

Keyboarding!
How to put your mouse out to pasture.

REVIEWS

Color You Can Carry Anywhere
BY TOM YAGER

Do You Know Where Your Money Is?
BY KENNETH M. SHELDON

The Case of the Missing File
BY ED PERRATORE

Beyond Word Processing
BY STAN MIASTKOWSKI

Desktop Publishing Made Easy
BY JOHN BRYAN

Compressing with Fractals
BY STEVE APIKI

Info Select Clears Clutter
BY STAN WSZOLA

Presentations to Go
BY MARK A. CLARKSON

Serving Up the Works
BY BARRY NANCE

Contact Managers: Keeping in Touch
BY HENRY FERSKO-WIESS

Mathcad: Better Than Paper
BY RAYMOND GA CÔTÉ

OPINIONS

Short Subjects
MicroPhone Pro for Windows, Dr. Floyd's Desktop Toys, and more.

Unsung Heroes
BY JERRY POURNELLE
Add more storage.
Protect your data.
Transport your data.
Share your data.

**Bernoulli MultiDisk™ 150.**
Handles like a floppy, performs like a hard disk.

- 150MB capacity.
- 18-msec effective access time.
- Rugged Bernoulli Technology.
- Disks available in 105, 65, and 35MB capacities.
- Reads/writes 90MB Bernoulli Disks, reads 44MB Bernoulli Disks.

---

**Iomega 21MB Floptical Drive.**
A standard floppy drive and a 21MB floppy drive in one.

- Reads/writes to standard floppy diskettes.
- Up to 3 times faster than floppies.
- Holographic Optical Tracking for added reliability and speed.
- New Iomega laser-etched media—every one is a master.

---

*Awards won for products using Bernoulli Technology. ©1993 Iomega Corp. Iomega, the Iomega logo, Bernoulli, and Bernoulli Technology are registered trademarks, and MultiDisk and LaserSafe call 1-800-456-5522. In Europe, call 49-761-45040. For worldwide custo...*
Hold everything! Iomega introduces storage solutions for everyone.

Never-ending storage solutions.
Windows, DTP, CAD, graphics, multimedia, databases, programming. Today's demanding software needs powerful storage—removable storage.

At Iomega, our solutions are the easiest way to share, transport and protect your data. And they never fill up. You just insert new media.

A company you can trust.
Iomega has won more awards than any other removable storage maker. And we've been doing it for nearly thirteen years.

Call 1-800-777-4066 for a free brochure.
Just pick up the phone. We'll send you all you need to know about our full line of products.

Iomega Tape250.
Five times the features for one times the price.
• Internal fits in standard 1" drive bay.
• Parallel port model available.
• The only drive that reads QIC and Irwin tapes.
• Includes Central Point software with Windows support.

Iomega LaserSafe® PRO.
Rewritable 1GB magneto-optical drive.
• 35-msec seek time.
• Disks have 30-year shelf life.
• Dual-mode switch lets drive be operated as fixed or removable.
• ISO compatible, so it reads & writes to 650MB MO disks.

are trademarks of Iomega Corp. Floptical is a registered trademark of INSITE Peripherals, Inc. All other products are trademarks of their holders. For customer service in U.S.A. or Canada, service, call 1-801-778-3000. For accessory items, call IOMART at 1-800-723-3770.

Circle 85 on Inquiry Card.
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 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 become 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
Technical Editor
THE CASE FOR THE ULTIMATE IN TECHNOLOGY:
MX15F

- Flat Square Technology Picture Tube with Invar Shadow Mask.
- 0.28mm Dot Pitch.
- 1280 x 1024 Non-interlaced Resolution.
- Intelligent Mode Switching.
- Digital Controls.
- LED Indicators for Mode and Status Information.
- Vertical Refresh Rate up to 76 Hz at 1024 x 768.

When it comes to advanced technology there's no debate. The MX15F has it all. From its super-sharp image to an onboard processor, ultrahigh resolution, optimal synchronization and sizing, LED status read outs and more...much more.

Ideally suited for high-level engineering, scientific, graphic and business applications, the MX15F is the computer monitor of choice for serious power users.

It's no wonder the MX15F has won so many awards. These include PC Magazine Editors' Choice-1993 and PC World's Best Buy in both 1991 and 1992.

Clearly, this is the monitor for those who refuse to compromise. It delivers the very highest performance, quality and technology.

MAG Innovision, Inc.
4392 Corporate Center Drive
Los Alamitos, CA 90720
714/827-3998 FAX 714/827-5522

© 1993, MAG Innovision, All rights reserved. MAG Innovision and its logo are trademarks of MAG Innovision.

For high performance at an affordable, competitive price, the new LX1564 is the popular choice.

Using the advanced 15-inch flat square picture tube in combination with an economical design, it offers a true melding of high-performance and economy.

And, with features like edge-to-edge overscan and 80 MHz video bandwidth, the LX1564 compares well against competitor's higher priced models.

THE CHOICE IS YOURS

Two great monitors. Two sets of features. Designed to fit the way you work. Designed to fit your budget. The choice is yours – Ultimate Technology or Ultimate Value.

Can't decide? Give us a call at 1-800-827-3998, extension 4304. We'll be glad to help.

Circle 110 on Inquiry Card (RESELLERS: 111).
We welcome your questions, comments, complaints, hints, and submissions.

MAIN OFFICE: One Phoenix Mill Lane, Peterborough, NH 03458, (603) 924-5261.

BYE LAB, 12000 O'Farrell St. #200, San Mateo, CA 94403, (415) 513-4912.


ELECTRONIC MAIL: On BIX, send to "feedback. Any BYE editors and columnists also have individual mailboxes on BIX for easy access.

Send submissions to: BYTE Magazine. Submissions may also have individual MCI addresses in their own names.

Other editors are also reachable through usenet, AppleLink, Compuserve, and numerous other services.

U.S. fax: Editorial: (603) 924-2550.

Advertising: (603) 924-2525.

U.S. only. or write to

BYTE Subscription Dept., P.O. Box 555, Hightstown, NJ 08520. Subscriptions are $29.95 for one year, $59.90 for two years, and $79.95 for three years in the U.S. and its possessions. In Canada and Mexico, $34.95 for one year, $64.95 for two years, $87.95 for three years. In Europe, £42 ($80) for first delivery, £35 ($60) for delivery. Non-European countries U.S. $60 for surface delivery, £50 ($85) at air delivery. Single copy price is $3.50 in the U.S. and its possessions. Subscriptions should be addressed to Faith Kluntz, the flat fee of $1.50 per copy of the article or the article itself. Correspondence and payment should be sent directly to the Copyright Clearance Center, 27 Congress St., Salem, MA 01970.

To photocopy any article herein for personal or internal reference use only, please contact Faith Kluntz, the flat fee of $1.50 per copy of the article or $1.50 per page, as appropriate. Copyrights Manager, (603) 924-2525.

BYE is available in microform from University Microfilms International, 300 North Zeeb Rd., Dept. PR, Ann Arbor, MI 48106 or 18 Bedford Row, Dept. PR, London, WC1R 4JU, U.K.

Copyright © 1983 by McGraw-Hill, Inc. All rights reserved. This publication is registered as a trademark of McGraw-Hill, Inc. Trademark registered in the United States Patent and Trademark Office.

Member Audit Bureau of Circulation.
Above And Beyond Basic.

INTRODUCING THE EASIEST BASIC DEVELOPMENT SYSTEM FOR WINDOWS.

Compared to Visual BASIC, CA-REALIZER® is half the cost and twice the product.

Develop applications using the familiar procedural language model and a large array of powerful tools. You don't need to learn all kinds of confusing new techniques. Just type in programs or design them visually 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.

Arrays are re-dimensioned and processed automatically. Algorithms can be written as formulae instead of complex looped expressions.

Once an application is complete, you can compile it into a stand-alone Windows application and distribute it 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."

And at $99, they can't match the price either.

So call 1-800 CALL CAI today for more information and the name of your nearest dealer.

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

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

CA-Realizer
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 103 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 from another program) directly into your document's text.
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 menu 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 elements 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

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 resolutions and up to 256 colors at 1280- by 1024-pixel resolution and 74-Hz refresh rate. Software shipping with the board includes Panacea’s TurboDL 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

WHAT’S NEW

WHILE SALES OF WINDOWS applications did not surpass those of MS-DOS in 1992, they are clearly on a pace to do so this year, says Dataquest (San Jose, CA). Sales figures are in billions of U.S. dollars.

<table>
<thead>
<tr>
<th>DOS</th>
<th>Windows</th>
<th>Mac</th>
<th>OS/2</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
</tbody>
</table>
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 RAMDAC, 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

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 categories, 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.

Carol Swartz

Microsoft Profit Eases Accounting Chores

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 5-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
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 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 outline 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 minimizing 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, copy, 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 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.

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

**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

**COMPANY INFO**

<table>
<thead>
<tr>
<th>Company Name</th>
<th>Phone Number</th>
<th>Fax Number</th>
<th>Inquiry Card</th>
</tr>
</thead>
<tbody>
<tr>
<td>ATI Technologies, Inc.</td>
<td>(416) 756-0718</td>
<td>fax: (416) 756-0720</td>
<td>Circle 999 on Inquiry Card.</td>
</tr>
<tr>
<td>DeltaPoint, Inc.</td>
<td>(408) 648-4000</td>
<td>fax: (408) 648-4020</td>
<td>Circle 1006 on Inquiry Card.</td>
</tr>
<tr>
<td>Erudite Software</td>
<td>(800) 786-6473</td>
<td>(502) 451-7712</td>
<td>Circle 1007 on Inquiry Card.</td>
</tr>
<tr>
<td>Q/Media Software Corp.</td>
<td>(604) 879-1190</td>
<td>fax: (604) 879-0214</td>
<td>Circle 1008 on Inquiry Card.</td>
</tr>
<tr>
<td>Vision Software International</td>
<td>(408) 748-8411</td>
<td>fax: (408) 748-9584</td>
<td>Circle 1009 on Inquiry Card.</td>
</tr>
<tr>
<td>Eru dite Software's Noise for Windows</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

---

**BYTE's Essential Guide to Windows • Spring 1993**
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 NetBEUI. 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

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 immediately 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.

Jon Udell

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.

14 BY T E ' s Essential Guide to Windows • Spring 1993
"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 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 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.

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 dialog, 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.

All The Tools You Need.
SA also has other features: automated documentation; extensible dictionary; normalization, rules and balancing; requirements traceability; export/import; custom reporting; and CRUD Matrices.

Call Us Toll-Free Today At 800-REAL-CASE, x109.
To find out how to qualify for your free 30-day evaluation copy, simply call us today or fax us at 212-571-5436.

SYSTEM ARCHITECT
Popkin Software & Systems, Inc.,
11 Park Place, New York, NY 10007
England 44-926-881186; Benelux 31-3406-65530; Germany 49-6151-82077; Italy 39-49-8700366; Switzerland 41-61-692266; Denmark 45-45-823200; Australia 61-02-346499; Sweden 46-8-626-8100.

Circle 98 on Inquiry Card.
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 predesigned 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 juggle slides; for example, if you’re almost finished with your presentation but are using the predesigned 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

*First Impression*

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

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.

---

Martha Hicks

**Un 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
All-new ABC FlowCharter 2.0 makes flowcharting faster, easier than ever!

Now the leader in Windows graphics puts its know-how behind the world's #1 Windows flowcharting solution!

Introducing ABC FlowCharter® 2.0 from Micrografx. With all the terrific features of the original. Plus an array of exciting new features that make it better, faster, easier than ever!

Our all-new user interface conveniently displays tools in a handy toolbox. No more searching through menus. Just point and click!

Customizable shapes and shape palettes let you tailor ABC FlowCharter 2.0 to your particular applications. And we've added new palettes of symbols for specialized charts like dataflow diagrams, audit diagrams, and many, many more.

"A Windows-based package that's both powerful and easy to use."
InfoWorld
April 20, 1990

"Turns making flowcharts into child's play."
DBMS Magazine
August 1991

You'll be able to choose from new line types and styles, including curved lines. And take advantage of an exciting new feature that automatically connects shapes.

Enhanced text capabilities let you edit text right on the chart, and mix different fonts, sizes and styles at will.

And best of all, you'll enjoy our friendly 24-hour telephone support (weekend hours too). (U.S. only)

CALL TODAY FOR UPGRADE INFORMATION
1-800-998-0153

If you're already an ABC FlowCharter user, call now for upgrade information. And if you're not, find out just how fast and easy flowcharting can be - with all-new ABC FlowCharter 2.0!
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 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 country, 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.
We've just made it easier to backup your hard drive with our 250 MB parallel port tape backup unit. One model works with all PC compatibles and portables.

Here's why:

- **Backpack** is easy to install. Plug Backpack into the parallel printer port. Then plug the printer into Backpack!
- **Backpack** requires no cards.
- **Backpack** is 30% smaller (1.5" h x 4" w x 7.75" l).
- **Backpack** is easy to transport and share between computers (2.5 lbs).
- **Backpack** can backup at a speed of up to 9 MB per minute.
- **Backpack** is a QIC 80 compatible and can read QIC 40 tapes.
- **Backpack** is available in 3.5" and 5.25" diskette, tape and hard disk models.

So don't get left in the dust. Call for more information today.

Micro Solutions, 132 W. Lincoln Hwy., DeKalb, IL 60115, 815-756-3411, FAX: 815-756-2928

Circle 90 on Inquiry Card (RESELLERS: 91).
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 repetitive 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, charcoal, 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 resizeable 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 Windows 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 database 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 antialiasing, 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
Keep Your Windowing Options Open

PORTABLE GRAPHICAL USER INTERFACES ACROSS ALL WINDOWING STANDARDS

Neuron Data Open Interface™ is an object-oriented, C based, extensible development tool with a layered API and graphic editor that lets you create your user interface once, and have it work across all standard windowing environments. Your applications will support native look and feel across Microsoft Windows, OSF/Motif, Open Look, Presentation Manager and the Macintosh. All without changing a line of code. Available on over 20 platforms including IBM, Apple, DEC, HP, Sun and PC UNIX.

Call us today at 1-800-876-4900 #637 to find out why companies like American Express, AMS, AT&T, Colgate, EDS, GE, IBM, SONY and more are using Open Interface. You'll receive seminar information, product literature and a free comprehensive technical paper. Special VAR, OEM and ISV pricing available.

Circle 95 on Inquiry Card.
156 University Avenue, Palo Alto, California 94301 Telephone: 415.321.4488
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
Why 8 out of 10 professionals choose OmniPage Professional.

Only OmniPage accurately scans words and images up to 256 shades of gray with the Graphic Editor.

Only OmniPage reaches scanning speeds of up to 2000 words per minute with Caere’s 32-bit OCR.

Only OmniPage reads 11 different languages, including French (oui!), German (ja!), and Italian (si!).

Only OmniPage gets the read on the most unusual characters with OmniTrain.

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.

Only OmniPage features direct input through DDE or Apple Events, enabling you to scan directly into popular business applications.

When it comes to OCR (optical character recognition), no other product can match the overall performance of OmniPage Professional. That’s why 8 out of 10 business professionals consistently choose OmniPage Professional over all other options. Only OmniPage Professional has the full capabilities to accurately scan virtually any document into almost any word processor, spreadsheet, or database file. So you can use OmniPage Professional to accurately scan newspaper articles, business reports, journals or legal documents. It’s not surprising then that 8 out of 10 scanners in the world have shipped with a trial version of OmniPage, including those from Hewlett-Packard, Epson, Microtek, and Apple. Why would they be any different than the rest of us?

For a few more reasons why you should consider OmniPage Professional, call us now at 1-800-535-SCAN.

Caere, the Caere logo and OmniPage are registered trademarks of Caere Corporation. The Graphic Editor, OmniTrain and AnyPage are trademarks of Caere Corporation. Epson is a registered trademark of Seiko Epson Corporation. All other ® registeredmarks and ™ trademarks are of their respective corporations. ©1992 Caere Corporation.
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 other data sources, 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 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 96 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
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.
- A Read/Write Memory inside the key should be available on demand.
- A Read/Write Memory inside the key should be available on demand.
- 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 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.)
- 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.
- A Virus Detection option that can be integrated in the key. This prevents reverse engineering and makes cracking virtually impossible.
- A Linkable Protection Module with which calls can be made to the key from any point in the protected program.
- Sophisticated antid debugging 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.

**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

**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.

**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.
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 different 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

<table>
<thead>
<tr>
<th>Company</th>
<th>Phone</th>
<th>Fax</th>
<th>Code</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prisma Office Ltd.</td>
<td>(44) 753 810899</td>
<td>(44) 753 810903</td>
<td>1036 on Inquiry Card.</td>
<td></td>
</tr>
<tr>
<td>The Complete PC</td>
<td>(408) 434-0145</td>
<td>(408) 434-1048</td>
<td>1037 on Inquiry Card.</td>
<td></td>
</tr>
<tr>
<td>Trio Information Systems, Inc.</td>
<td>(919) 846-4990</td>
<td>(919) 846-4997</td>
<td>1038 on Inquiry Card.</td>
<td></td>
</tr>
</tbody>
</table>

### 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 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.


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.

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.**

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 408-475-8380. ©1992 Digital Communications Associates, Inc. All rights reserved. DCA and Crosstalk are registered trademarks and QuickPad™ is a trademark of Digital Communications Associates, Inc. Windows is a trademark of Microsoft Corporation. All trademarks are the property of the respective owners.
**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 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 application 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

**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.

**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 highlighters 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.
The program presents Windows-based applications in a similar manner as on-screen icons known as Selection Sets. Selection Sets, which are predefined 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**

<table>
<thead>
<tr>
<th>Product</th>
<th>Contact Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACE Centre</td>
<td>+44 865 63508 fax: +44 865 750188</td>
</tr>
<tr>
<td>Canyon Software</td>
<td>(415) 453-9779 fax: (415) 459-4904</td>
</tr>
<tr>
<td>Circle 1043 on Inquiry Card</td>
<td>Circle 1044 on Inquiry Card</td>
</tr>
<tr>
<td>Springtime Software</td>
<td>(800) 458-2829 (617) 394-9455</td>
</tr>
</tbody>
</table>

**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

**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
WHY OUR INTELLIGENT MODEMS ARE A WISE INVESTMENT.

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 reporting 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...
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.

Amperand (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

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

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 Retain 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.

Everyone can save with the U-Series modems. Because they're smart enough to work in all environments—including DOS*, Windows*, OS/2*, Macintosh*, NeXT*, UNIX*, and Amiga*. The U-Series modems support V32bis/V32, as well as industry-standard data compression and error correction protocols.

In case you believe all this intelligence is expensive...relax.

The U-Series are the lowest-priced, high-performance modems around. And they come with free ZFAX software and a 5-year warranty.

Which means now is the perfect time for smart people to save—by getting the ZyXEL U-Series modems.

To start your wise investment, just call today for the name of your nearest ZyXEL dealer.

(800) 255-4101

ZyXEL
The Intelligent Modem

4920 E. La Palma Avenue, Anaheim, CA 92807. (714) 693-0808. BBS: (714) 693-0762. FAX: (714) 693-8811

*Available April 1993. All trademarks are the property of their respective owners.

Circle 112 on Inquiry Card (RESELLERS: 113).
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.

**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 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

**DEDICATE PCs FOR PRINT AND MAIL SERVERS**

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 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.

**FACILITATE MESSAGING WITH MAIL AND SCHEDULE +**

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.
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 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.

### 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 ClipBook 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 ClipBook 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.

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

CUSTOMIZE WORKGROUPS
BY EDITING INI FILES

In WFW, the complex, yet familiar, ini-
tialization 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 ini-
tialization files for the network, including
PROTOCOL.INI, PROGMAN.INI, CON-
TROL.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 mea-
sures. 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 work-
group 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 still
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 PROG-
MAN.INI. For example, NoRun=1 disables the Run
command in Program Manager; NoClose=1 pre-
vents users from exiting WFW; and No-
SaveSettings=1 prevents users from
saving WFW changes on exit.

Various EditLevel settings in the
[restrictions] section of PROG-
MAN.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 abil-
ity to edit command lines; and EditLevel=
4 restricts the ability to change item
properties.

To work with INI files, you need a re-
source that describes the entries in the var-
ious INI files. Unfortunately, such a re-
source 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 Re-
source Kit.

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

CONNECT TO OTHER NETWORKS

WFW comes with built-in connectivity
to other popular networks—most notably,
Microsoft LAN Manager and Novell Net-
Ware. It can also connect to a wide range
of networks, including 3Com 3+Open,
DEC Pathways, 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 compatibility),
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 commu-
nications is a one-way affair: WFW work-
stations can act as clients to Novell servers,
but they cannot act as servers to Novell
clients.

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 (al-
though you cannot share resources from
such a workstation). Because the NIC dri-
er, network redirector, and all transport
hooks are started from your DOS CON-
FIG.SYS and AUTOEXEC.BAT files be-
fore you start WFW, you can access net-
work resources from DOS using the NET
command along with UNC (Universal
Naming Conventions).

The Workgroup Connection is a sepa-
rate 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. Ev-
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 “alert” or through
MCI Mail at 578-1168.
CAD for Windows doesn’t have to hurt… your productivity or your budget.

We at Intergraph believe in Windows™. It’s a great tool for integration. So we bring you MicroStation Nexus — CAD for Windows. Without performance limitations. Without budgetary hassles. It’s free.

Nexus makes MicroStation a powerhouse of speed under Windows. And it offers a world of possibilities: cut and paste rendered 3D images into proposals… graphics into technical illustrations… a scanned logo into your drawing.

Take advantage of powerful object linking. Link text in a drawing and it stays always up-to-date. Link audio and place a message for your colleagues. Really tap MicroStation’s power, and drive graphics from a spreadsheet.

Have a look at the Windows solution that brings true integration. MicroStation Nexus for Windows. You can open a world of possibilities… without opening your checkbook.

MicroStation
Make the Move

Circle 83 on Inquiry Card (RESELLERS: 84).
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.

**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.
 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 swtichable 16/4-Mbps Token Ring adapter that is fully 802.51 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.

InterLa11 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-Datacom, Inc.
Boxborough, MA
(800) 326-8255
(508) 263-9929
Fax: (508) 263-8655
Circle 1078 on Inquiry Card.

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

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

Apex 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 37,600 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.
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.

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
Fax: (313) 362-2295
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
Nuku 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
Circle 1089 on Inquiry Card.

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
Circle 1090 on Inquiry Card.

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
Circle 1091 on Inquiry Card.

NETWORKING UTILITIES
This category includes software that adds administration tools to WFWand 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

**Circle 1092 on Inquiry Card.**

**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

**Circle 1093 on Inquiry Card.**

**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
(805) 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
(801) 255-0600
fax: (801) 255-0642

**Circle 1095 on Inquiry Card.**

**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 consultant for BYTE and is co-author of "The Windows for Workgroup Bible" (Addison-Wesley, 1993). You can reach her on BIX as "alen.t" or through MCI Mail at 578-1168.

---

**PLAYING 18 HOLES IN NEW YORK CITY IS NO PROBLEM.**
(But how would you know that?)

Sure, it's hard to see the first hole from your hotel on Madison and 33rd. Golf, however, is definitely an option when you visit the Big Apple. Just call New York City Golf and they'll take care of everything. All you have to do is make a tee time. Of course, if you had LOCAL EXPERT," you'd already know that.

"LOCAL EXPERT?" Yes, it's the new software package that gives you all the travel tips and inside information you'll ever need. It's the food critic, business resource, nightlife review and sports directory all rolled into one. And, best of all, it's rolled tight enough to fit easily onto your laptop computer.

**LOCAL EXPERT** comes with an extensive collection of world and regional maps, plus lots of useful information. Order now, and you'll get **LOCAL EXPERT** for the special introductory price of just $99. And that includes a detailed guide to the city of your choice from over 100 cities worldwide. To order, just call 1-800-442-8887. Then you'll really be swinging.

---

**LOCAL EXPERT**
1-800-442-8887

Available for Microsoft® Windows® computers & PCs. Compatible running Microsoft Windows®.
Unconditional 30 day money back guarantee. AH, MC & VISA accepted. All trademarks and registered trademarks are of their respective owners. Strategic Mapping, Inc. 3135 Kifer Rd., Santa Clara, CA 95051

---

**Circle 105 on Inquiry Card.**
Even in the most demanding environments, **CTX-1561** is a proven price/performance winner of 15-inch monitors in today's market. For your budget concerns, CTX also provides **CTX-1461** as an economical alternative to CTX-1561 without sacrificing resolution or other advanced features.
People are talking about PC sound cards. And Pro AudioSpectrum® 16 is the one they’re talking about. It’s the top-selling 16-bit PC sound card, for a lot of good reasons:

- **The Industry Choice** — You’ll be in great company. Pro AudioSpectrum 16 is selected by more original equipment manufacturers, such as Sony, NEC, Philips, Compaq and IBM, than anyone else. And the critics love it, too.

- **16-bit, 44.1kHz, Audio CD-Quality Sound** — The industry standard in high-fidelity digital audio. Pioneered by Media Vision for your PC.

- **SCSI** — Compatible with more industry standard CD-ROM drives than any other card.

- **Stereo Music Synthesizer** — Built with the industry standard Yamaha stereo synthesizer with 20 voices.

- **100% Compatibility** — Sound Blaster™, Adlib™, Windows 3.1™, MPC™. We could go on, but you get the picture.

- **It’s a Great Value** — You get all this and more for a price that makes all other sound cards a blast from the past.

---

**ADVICE.**

"It’s the best all-around sound board you can add to your system, and it creates a standard to which both software and rival boards will aspire."
Most Valuable Peripheral Award, PC/Computing, Dec. '92

"This is the best PC sound board..."
T. Yager, Byte, Dec. '92

"...one of the best all-around, affordable multimedia sound boards."
T. Carlton, PC Games, Mar. '93

"For my money, the PAS16 is the best deal going."
R. Lauriston, PC World, Nov. '92

"The PAS 16 is currently the best deal available in a 16-bit card."
D. English, Compute, Jan. '93

"...Media Vision has done well with its Pro AudioSpectrum line, which is compatible with Sound Blaster, but I think is even better."
W. S. Mossberg, Wall Street Journal, Oct. '92

"Those looking to add high-fidelity sound to their multimedia presentations should be pleased with this board’s capabilities."
J. Quain, PC Magazine, Sept. '92

---

© 1993 Media Vision, 3185 Laurelview Court, Fremont, CA 94538 1-800-845-5870.

Pro AudioSpectrum 16 is a trademark of Media Vision, Inc. Any other trademarks and registered trademarks are owned by their respective holders.

Circle 106 on Inquiry Card (RESELLERS: 107).
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 fearsome 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, checkboxes, 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 subroutines 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 VBXes 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...
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 BitBlt and StrBlt, 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 unattractive but comprehensive and fully indexed.

VBTools is one of the older VBX packages, and a few of its tools have been taken by Visual Basic 2.0’s bundled VBX packages (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.

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 sub-string searches on their list contents and support multiple
ASCEND is the award-winning, Windows-based PIM (Personal Information Manager) based on the popular time management techniques of Franklin Quest Co. Franklin is the world's leading time-management training firm. In addition to ASCEND being a PIM, it's also a contact manager and group scheduler!

ASCEND can print on either blank paper or Franklin Day Planner pages — allowing you to take with you everywhere your task lists, appointment schedules, contact information, address and phone listings, goals, and so on. ASCEND is available either with or without a Franklin Day Planner. ASCEND is also now available for Macintosh!

“I've become addicted to Ascend, which has changed my life for the better.”
Jerry Pournelle, Byte

“Ascend is... awesome.”
Jim Seymour, PC Week

“Though PackRat comes close, it is Ascend that will satisfy PC users…”
M. Keith Thompson, PC Magazine

New Version 4.0
with Contact Management
OLE, DDE, Pen Windows
Support, and much more.
ASCEND is available at
Eggheads, Computer
City Supercenters, and
other fine stores.

Franklin
Quest
2550 South Decker Lake Blvd.
Salt Lake City, UT 84119
1-800-877-1814 • (801) 975-9992
FAX (801) 975-9995
Circle 119 on Inquiry Card.
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.

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 TextAlign 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 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.

true: new CA-dBFast 2.0, the first and only dBASE-compatible database and language for Windows.

CA-dBFast meets two giant needs: moving existing dBASE applications to Windows and developing dazzling new applications in record time. It's the one solution that lets you take advantage of Windows while protecting the huge investment you've made in Xbase technology.

With CA-dBFast 2.0, you get a proven, stable environment that's more visual and more intuitive than anything you've ever used. And there's no need for Microsoft's confusing, intimidating SDK, so creating applications with CA-dBFast is — true to its name — fast.

dBFast's report writer, CA-RET, lets you mix text, graphics and data to produce great-looking reports in minutes.

The Visual Application Designer (VAD) makes creating pull-down menus, push buttons, radio buttons, check boxes, scrolling list boxes and other Windows objects as easy as "point and click" or "drag and drop." The VAD generates the required source code, saving you hours of complex programming. You also get a debugger that's so advanced it lets you watch your source code execute at run time — even Single Step through execution.

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.

Creating great-looking tabular reports, form letters and labels is as easy as using a word processor.

FOR A FREE DEMO DISK, CALL 1-800 CALL CAI, Ext. 190.

With CA-dBFast applications, there are no license fees, royalties or key diskettes to bother with. And recipients of runtime programs don't need CA-dBFast to run the application — just Windows. CA-dBFast is also compatible with CA-CLIPPER, dBASE III Plus, dBASE IV, and FoxBASE.

So whether you want to wake up old applications or build brilliant new ones, there's only one way to marry Windows beauty and Xbase power. Check out CA-dBFast today.

New CA-dBFast Release 2.0.
EXTENDING VISUAL BASIC

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). QEV 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 QEV’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.

QEV offers transaction processing, with Commit and Rollback, but you’d have to code this yourself under DbControls. QEV has a SQL query mode, but only for its own dBase file; 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 multi-user 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 dabbler.

MCL’s most tempting items are its eight binary-file transfer protocols (XMODEM and 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 interrupts-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 Fountain 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

<table>
<thead>
<tr>
<th>Product Name</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>DbControls 1.3.0</td>
<td>$199</td>
</tr>
<tr>
<td>Coromandel Industries, Inc.</td>
<td></td>
</tr>
<tr>
<td>Forest Hills, NY</td>
<td></td>
</tr>
<tr>
<td>(718) 793-7963</td>
<td></td>
</tr>
<tr>
<td>fax: (718) 793-9710</td>
<td></td>
</tr>
<tr>
<td>Circle 1148 on Inquiry Card.</td>
<td></td>
</tr>
<tr>
<td>MicroHelp Communications Library 2.10</td>
<td>$149</td>
</tr>
<tr>
<td>Q+E Database/ VB 1.0.A</td>
<td>$299</td>
</tr>
<tr>
<td>Pioneer Software</td>
<td></td>
</tr>
<tr>
<td>Raleigh, NC</td>
<td></td>
</tr>
<tr>
<td>(919) 859-2220</td>
<td></td>
</tr>
<tr>
<td>fax: (919) 859-9334</td>
<td></td>
</tr>
<tr>
<td>Circle 1150 on Inquiry Card.</td>
<td></td>
</tr>
<tr>
<td>Visual Architect 1.0</td>
<td>$245</td>
</tr>
<tr>
<td>(5895 with full source code)</td>
<td></td>
</tr>
<tr>
<td>FarPoint Technologies, Inc.</td>
<td></td>
</tr>
<tr>
<td>Richmond, OH</td>
<td></td>
</tr>
<tr>
<td>(614) 765-4333</td>
<td></td>
</tr>
<tr>
<td>Circle 1151 on Inquiry Card.</td>
<td></td>
</tr>
</tbody>
</table>
Call CompuServe
at 1 800 848-8199.

And find out more about the largest and most comprehensive computer information service in the world. With more experts, greater capabilities, and more members than you can find anywhere else.

Or return this card today.

Please send me your free CompuServe Information Services brochure.

Name ____________________________________________________________

Company (If Applicable) __________________________________________

Address __________________________________________________________

City, State, Zip _________________________________________________

Telephone (___) __________________________ CompuServe

Byte Windows/April
CompuServe®
ADVERTISING DEPARTMENT
PO BOX 20212
COLUMBUS OH 43220-9988
CompuServe does Windows.

Introducing a whole new way to look at CompuServe: CompuServe Information Manager for Windows (WinCIM™). It's a fully integrated Windows application, and lets you take advantage of Windows when you're on CompuServe. It'll make your session faster, more efficient, easier, and a lot more fun.

With the help of icons and pull-down menus, you'll find your CompuServe time is almost effortless. Cruise the forums, browse through your messages, download files — it's all about as simple as clicking a mouse button.

And with WinCIM you can do more offline, too. That means everything from writing letters to reading the answers to your hardware and software questions can be done much more economically.

So take a look for yourself. If you're already a CompuServe member, just type GO WINCIM. If you aren't, call us for more information at 1 800 848-8199.

Either way, you'll soon see why the best view is the one from CompuServe Information Manager for Windows.

CompuServe®
The information service you won't outgrow.
"Washington" will never be the same. It all starts with five scanned images and the magic of Adobe Photoshop. 

1. Sky is selected using cropping tool and resized using Image Size Option.
2. Field is carefully cut out and added using Quick Mask feature.
3. Individual flowers are colored using Paint Tool.
4. The stars are created using Adobe Illustrator™ and imported into Adobe Photoshop where Composite Controls are used to blend them into azure sky.
5. To erase a pesky flag in front of our "Capitol," another section of dome is cloned in its place.
6. Smaller section of a much larger house is selected and windows are cut out so flowers show through.
7. Type tool gives us "Hope." Anti-Alias text tool permits type to sit on image, and letters are "weathered" with Composite Controls.
8. Dodge and burn tool gracefully salts and peppers Sax Dude's hair.
9. Cloned flower in lapel is a nice touch.

For those of you who work in the world of Windows, Adobe introduces something far beyond Hope: it's the fulfillment of your visual aspirations. Adobe Photoshop, the world's leading photo design and production tool, brings all its power to the PC with the same features as its award-winning MAC® cousin. Create original artwork, correct and retouch color or black-and-white scanned images, generate high-quality output and prepare high-quality color separations in CMYK mode. Designers can start with a blank screen or scan images directly into the program. For prepress professionals, Adobe Photoshop software rivals high-end prepress systems at one-tenth the cost. Photographers will correct color, retouch, dodge, burn, mask and montage. In short, anyone can come closer to presenting their true visions. To turn hope into reality call 1-800-833-6687, Dept. D, Ext. 0125 for information and your nearest authorized Adobe Reseller.

If you can dream it, you can do it.
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 non-supported 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, synchronous communications format at a 57,000-bps rate.

Although the above low-dpi workaround solution can provide acceptable output, these solutions do not help much in increasing 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 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 bitmap for your page inside your computer rather than use the controller in your laser printer. The bitmap is then sent to the printer through a high-speed link.

The WinJet series from LaserMaster and the PrintSprint products from Myriad Enterprises are examples of products that take this route. They use your computer's CPU to form the bitmap for the printer and send the bitmap via a dedicated I/O board inside your computer to the parallel port of a LaserJet II, IID, III, or IIDD. These products come with special hardware that bypasses PCL completely, letting the CPU do a direct GDI-to-bitmap 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 PrintSprint products except that it connects to the font slot of LaserJet II, IID, III, and IIDP 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 PrintSprint 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, IID, IIDP, IID, III, IID, and IIDP 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 POL 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 nouduplex printers, full-duplex printing, and RET (Resolution Enhancement Technology) support for LaserJet III, IIDI, 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 IIIP, 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 IINXT 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 multiformat typefaces scattered across my five-station Xircom NetWare peer-to-peer network, with most typefaces residing on my Zeus 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 separate 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 Zonographics’ 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 INTX 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 interprets 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 quickly 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 Control Panel.

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

- Spooling AROUND

Using Windows’ Print Manager, you have the option of returning to work in your application as quickly 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 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 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 remote 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.

BYTE’s Essential Guide to Windows • Spring 1993 55
THE FINE ART OF WINDOWS PRINTING

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.

Power Pak ......................................... $129.95
PC-Kwik Corp.
Beaverton, OR
(503) 644-5644
fax: (503) 646-8267
Circle 1153 on Inquiry Card.

PrintCache 3.1 ..................................... $99.95
LaserTools Corp.
Emeryville, CA
(800) 420-1150
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) 384-7771
Circle 1156 on Inquiry Card.

PrintSprint
PS300 .............................................. $249
PS600 .............................................. $399
PS600/PS ......................................... $549
Myriad Enterprises
Laguna Beach, CA
(800) 851-6352
fax: (714) 851-1314
Circle 1157 on Inquiry Card.

SuperPrint 3.0 ......................... $149 with Zscript 
Zenographics, Inc.
Irvine, CA
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.

ITEMS DISCUSSED

It doubles your performance. It doubles your disk capacity. It’s fast and easy to install. It’s priced right.

It’s winSTORE, “created for the Windows” user. The first product of its kind, winSTORE combines two award-winning technologies: high-speed disk control from Perceptive Solutions and advanced “data compression from Stac,” in a plug-and-play solution.

It’s winSTORE—think of it as overdrive for Windows!

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.”

Perceptive Solutions, Inc.
800-486-FAST
Main: 214-954-1774 · FAX: 214-953-1774
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, VideEdit. 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 VideEdit.

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 I, 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
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 in this 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 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...
Exercise Your Video ... Stretch It!

Why settle for an out-of-shape graphics board? Let ATI's new GRAPHICS ULTRA+ and GRAPHICS ULTRA PRO cards pump up your computer with graphics and multimedia video acceleration.

Only the GRAPHICS ULTRA+/PRO cards come ready to accelerate multimedia applications under Windows. Stretch small video images to partial or full screen for better visibility ... and maintain smooth dynamic motion (when others fall behind).

ATI's mach32 Accelerator Chip adds the muscle to run Windows, NT, OS/2 and CAD fast ... even faster than other local bus solutions. With 2.0MB of video memory, ATI accelerates 1024x768 in 65,000 colors. Run resolutions up to 1280x1024, colors up to 24-bit, and sit-up to flicker-free graphics at 76Hz refresh rate. Plus, the best software support of ANY accelerator product with ATI, VGA, VESA or 8514/A drivers.

Exercise your options under Windows with the FlexDesk Control Panel or use DeskScan to pan and zoom across a virtual desktop. And our exclusive CRYSTAL FONTS smooths TrueType for laser-quality text right on-screen.

GRAPHICS ULTRA+
- Accelerated 1024x768 at 65,000 colors
- True color (16.7M) at 800x600
- Multimedia Video Acceleration
- Fast zero wait-state VGA
- Includes three button import mouse
- Available in 1.0MB or 2.0MB versions
- 5 year warranty
- Priced from $399.00

GRAPHICS ULTRA PRO adds
- Even faster performance with VRAMs
- Accelerated 1280x1024 at 256 colors up to 74Hz non-interlaced
- Available in ISA, EISA and Micro Channel versions
- Priced from $599.00

Avoid low impact graphics. Shape up with ATI Graphics and Multimedia Video Accelerators.
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 a properly 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 indispensible 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 forlorn) 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@bytepbybyte.com.

**COMPANY INFORMATION**

<table>
<thead>
<tr>
<th>Microsoft Corp.</th>
<th>New Media Graphics Corp.</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Video for Windows)</td>
<td>Billerica, MA</td>
</tr>
<tr>
<td>Redmond, WA</td>
<td>(508) 663-0666</td>
</tr>
<tr>
<td>(800) 426-9400</td>
<td>fax: (508) 663-6678</td>
</tr>
<tr>
<td>(206) 882-8080</td>
<td>Circle 1225 on Inquiry Card.</td>
</tr>
<tr>
<td>VidCap</td>
<td>Circle 1225 on Inquiry Card.</td>
</tr>
<tr>
<td>Creative Labs, Inc.</td>
<td>Digital-Audio Boards</td>
</tr>
<tr>
<td>Milpitas, CA</td>
<td>Creative Labs, Inc.</td>
</tr>
<tr>
<td>(408) 428-6600</td>
<td>Milpitas, CA</td>
</tr>
<tr>
<td>fax: (408) 428-6611</td>
<td>(408) 428-6600</td>
</tr>
<tr>
<td>Circle 1222 on Inquiry Card.</td>
<td>fax: (408) 428-6611</td>
</tr>
<tr>
<td>IBM</td>
<td>Circle 1226 on Inquiry Card.</td>
</tr>
<tr>
<td>Armonk, NY</td>
<td>MediaVision, Inc.</td>
</tr>
<tr>
<td>(800) 426-3333</td>
<td>Fremont, CA</td>
</tr>
<tr>
<td>(914) 765-1900</td>
<td>(510) 770-8600</td>
</tr>
<tr>
<td>Circle 1223 on Inquiry Card.</td>
<td>Circle 1227 on Inquiry Card.</td>
</tr>
<tr>
<td>Turtle Beach Systems</td>
<td>Turtle Beach Systems</td>
</tr>
<tr>
<td>York, PA</td>
<td>York, PA</td>
</tr>
<tr>
<td>(717) 843-6916</td>
<td>(717) 854-8319</td>
</tr>
<tr>
<td>fax: (717) 854-8319</td>
<td>Circle 1228 on Inquiry Card.</td>
</tr>
</tbody>
</table>
Introducing Proxima® Ovation™. The fully portable family of LCD projection panels that provides the most vivid color images available today.

Showcase your computer or video images crisply and clearly, utilizing the latest LCD technology and up to 226,981 true colors.

Ovation offers a dynamic range of multimedia capabilities to move and motivate your audience. Project computer presentations, video recordings, computer animation, TV, even live images from camcorders.

Ovation projects whatever you can see on your PC or Macintosh monitor. Just place the Ovation panel on an overhead projector, connect the panel to your computer, VCR, camcorder, or other output device, and you're ready to impress your next audience. Make your presentation even more interactive with the Proxima Cyclops™ pointer system. It's like a cordless mouse. Point, click, and pull down menus—right from the projection screen.

There's a Proxima product for nearly every presentation and price range—from monochrome data projection to full-color animation and video. For the name of the dealer nearest you, call 1-800-447-7694 today. Ask for our booklet which explains the advantages of using today’s LCD projection panels.
Our T4500C features an LCD TFT active matrix color screen that can display a kaleidoscope of 256 simultaneous colors from a palette of 185,193. Our T4500 offers a large, bright, easy-to-read 9.5" VGA display with 640x480 resolution and 17:1 contrast ratio.

A 150-pin expansion port lets you attach a SCSI adapter to the notebook. Or lets you attach the notebook to our Desk Station IV, providing true desktop capabilities in your office.

System control hotkeys save time by allowing you to quickly change your display setting, power management, security status, etc., without having to call up menus.

A generous 4MB RAM standard, expandable to 20MB.

Our award-winning keyboard features standard-sized keys and key spacing.

The T4500 series' advanced 20MHz i486SX processor makes any 386 seem like a tortoise. In fact, tests reveal it's up to two and a half times faster than many 386-based notebooks.

The T4500C comes with a 120MB hard drive and our T4500 comes with a choice of an 80MB or 120MB hard drive.

3.3-volt chip technology decreases power drain by as much as 25%, while adding up to 27% more battery life.

If you're getting the feeling the T4500 series represents a new standard in business notebook computing, you're right.
OPTIONAL.

The T4500Cs dimensions: 11.7"W x 8.3"D x 2.0"H. The T4500's dimensions: 11.7"W x 8.3"D x 1.8"H. Both fit into half of a briefcase.

Windows® 3.1 and DOS® 5.0 with UltraFont® come pre-installed.

AutoResume lets you start where you left off without rebooting and automatically saves your material when you turn the power off.

Our Quick Charge capabilities allow you to charge the battery while you're working.

Featuring AutoResume, AutoSave, Advanced Power Management, and CPU Sleep Mode, our MaxTime® power management system helps you get the maximum out of every battery charge.

Quickread LCD status icons allow you to check a host of functions (including remaining battery time, keyboard status, and power-saving mode) at a glance.

An industry-standard PCMCIA 2.0 slot accepts removable hard drives, data/fax modems, network adapters, and other expansion options.

The BallPoint™ mouse connects directly to the computer through a unique "one touch" QuickPort, so there's no cord to get in your way.

A front-loading floppy drive provides easy access.

Both the T4500 and the T4500C weigh in at about 6.5 lbs.

The T4500 features a large, easy-to-read 9.5" monochrome screen.

Tests reveal that the 3.3-volt 20MHz 486SX processor is up to two and a half times faster than many 386-based notebooks.

You can call real-live Toshiba technicians toll-free for complete product support.

In Touch with Tomorrow

TOSHIBA

1-800-457-7777

Circle 150 on Inquiry Card.
Have You Ever Wanted To Leap Out The Nearest Window?

Take The Plunge With Proxy. It's Network Remote Control For Windows, From Windows.

Some things you expect in remote control software. Like lightning-fast speed. And control over both DOS and Windows on the host PC. But new Proxy gives you something you probably don't expect. Because it not only works with Windows, it works from Windows. And that makes all the difference.

You see, other remote control products run from DOS, even if it runs on the host, it runs in a Proxy window. Even graphical DOS programs.

No need to abandon your own work when someone calls. Just click on a Proxy icon and instantly connect to the caller's machine. You now have full control of their hardware and software, complete with mouse and keyboard support, whether they're running Windows or DOS.

Reconfiguring Lots of Workstations? Leap Out The Nearest Window.

Now you can perform administrative chores like software installation, updates, and system configuration without going from room to room. Just capture a PC and perform any operation as if you were sitting in front of it.

You can even reboot it remotely!


Imagine off-loading your most CPU-intensive tasks to separate machines you control as if they were part of your own desktop. Imagine two, three, or more applications, each running at full speed because each has its own dedicated processor. That's the power of multi-processing with Proxy.

You can make Proxy available across the network and give power-hungry users access to spare or idle PCs. You can even dedicate PCs to specific tasks, like a high-powered 486 for CAD or a modern-equipped 286 for communications.

Take The Next Logical Leap in Remote Control.

Get the most advanced network remote control available, with applications ranging from user support to multi-processing. Get Proxy. It's from Funk Software. The same people who brought you Sideways, Allways, and other top-selling PC utilities.

Call today to order or for more information.
1-800-828-4146 Ext. 804 (U.S. and Canada)

Proxy gives you complete control of any computer on the network.

Proxy supports host computers running Windows.

Run time-consuming jobs on dedicated processors, and control them all from Proxy.

You can connect to multiple PCs over a network, with each appearing in its own window.

Users Calling For Help? Leap Out The Nearest Window.

If your job is to help users on the network, Proxy will make it easier.

System Requirements: Proxy "Master" runs in Windows and can control multiple "Hosts" running DOS or Windows over an IPX network (e.g. NetWare).
© 1992 Funk Software, Inc. Proxy is a trademark of Funk Software, Inc.
Funk Software, 222 Third Street, Cambridge, MA 02142 Tel (617) 497-6339 Fax (617) 547-1031

Circle 114 on Inquiry Card (RESELLERS: 115).
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-F1 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. 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, switch to other windows, and 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 to perform other Control menu commands. To move between icons within a document window, you use the arrow keys.

If you are opening a window within an application, the application window is its Document Control menu. The menu displayed is the application-control menus. The menu displayed in the upper left corner of the window is its Document Control menu. 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.
Introducing SoundXchange. Because Nothing Speaks Louder than Words.

"SoundXchange: This is the perfect complement to the office environment, providing an excellent business-level audio solution for a growing new market."
— Windows Magazine
January 1995

"The combination of features designed uniquely for the office and the extremely easy installation make the SoundXchange the ideal PC audio appliance."
— William Ladin, President
Desktop Solutions

"Whatever your use, you should examine SoundXchange. You won't be disappointed."
— IEEE Computer Magazine
January 1990

Priced from $149 to $289, SoundXchange lets you embed voice notes into Windows 3.1 documents and spreadsheets.

interACTIVE
MULTIMEDIA FOR BUSINESS COMMUNICATIONS™

1-800-292-2112
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-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.

To select text for cut, copy, paste, or any other editing operation, such as changing fonts, you use the same navigation keystrokes just described plus the Shift key. For example, to select just the word that's to the right of the cursor, you'd press Shift-Right arrow. To select all the text from the current cursor position to the end of the document, you'd press Shift-End.

The keystrokes for cut, copy, paste, and undo have been used in the Macintosh and Unix environments for some time and have been adopted in 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, 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 mouselessness. 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, 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.

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.

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."
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 4/25LC, 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.

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 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.

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

### CPU

<table>
<thead>
<tr>
<th>Model</th>
<th>Index</th>
</tr>
</thead>
<tbody>
<tr>
<td>AST PowerExec 4/25 SL ColorPlus</td>
<td>1.64</td>
</tr>
<tr>
<td>Compaq LTE Lite 4/25C</td>
<td>2.13</td>
</tr>
<tr>
<td>IBM ThinkPad 700C</td>
<td>1.20</td>
</tr>
<tr>
<td>Toshiba T4400C</td>
<td>2.39</td>
</tr>
</tbody>
</table>

### FPU

<table>
<thead>
<tr>
<th>Model</th>
<th>Index</th>
</tr>
</thead>
<tbody>
<tr>
<td>AST PowerExec 4/25 SL ColorPlus</td>
<td>4.43</td>
</tr>
<tr>
<td>Compaq LTE Lite 4/25C</td>
<td>4.43</td>
</tr>
<tr>
<td>IBM ThinkPad 700C</td>
<td>1.52</td>
</tr>
<tr>
<td>Toshiba T4400C</td>
<td>N/A</td>
</tr>
</tbody>
</table>

### Disk

<table>
<thead>
<tr>
<th>Model</th>
<th>Index</th>
</tr>
</thead>
<tbody>
<tr>
<td>AST PowerExec 4/25 SL ColorPlus</td>
<td>1.01</td>
</tr>
<tr>
<td>Compaq LTE Lite 4/25C</td>
<td>1.37</td>
</tr>
<tr>
<td>IBM ThinkPad 700C</td>
<td>0.87</td>
</tr>
<tr>
<td>Toshiba T4400C</td>
<td>1.69</td>
</tr>
</tbody>
</table>

### Video

<table>
<thead>
<tr>
<th>Model</th>
<th>Index</th>
</tr>
</thead>
<tbody>
<tr>
<td>AST PowerExec 4/25 SL ColorPlus</td>
<td>2.35</td>
</tr>
<tr>
<td>Compaq LTE Lite 4/25C</td>
<td>2.26</td>
</tr>
<tr>
<td>IBM ThinkPad 700C</td>
<td>1.68</td>
</tr>
<tr>
<td>Toshiba T4400C</td>
<td>2.77</td>
</tr>
</tbody>
</table>

### Battery-Life Tests

<table>
<thead>
<tr>
<th>Model</th>
<th>Hours:minutes</th>
</tr>
</thead>
<tbody>
<tr>
<td>AST PowerExec 4/25 SL ColorPlus</td>
<td>3:31</td>
</tr>
<tr>
<td>Compaq LTE Lite 4/25C</td>
<td>2:53</td>
</tr>
<tr>
<td>IBM ThinkPad 700C</td>
<td>2:17</td>
</tr>
<tr>
<td>Toshiba T4400C</td>
<td>1:55</td>
</tr>
</tbody>
</table>

### BENCHMARK SUMMARY

<table>
<thead>
<tr>
<th>Model</th>
<th>CPU</th>
<th>FPU</th>
<th>Disk</th>
<th>Video</th>
<th>Hours:minutes</th>
</tr>
</thead>
<tbody>
<tr>
<td>AST PowerExec 4/25 SL ColorPlus</td>
<td>1.64</td>
<td>4.43</td>
<td>1.01</td>
<td>2.35</td>
<td>3:31</td>
</tr>
<tr>
<td>Compaq LTE Lite 4/25C</td>
<td>2.13</td>
<td>4.43</td>
<td>1.37</td>
<td>2.26</td>
<td>2:53</td>
</tr>
<tr>
<td>IBM ThinkPad 700C</td>
<td>1.20</td>
<td>1.52</td>
<td>0.87</td>
<td>1.68</td>
<td>2:17</td>
</tr>
<tr>
<td>Toshiba T4400C</td>
<td>2.39</td>
<td>N/A</td>
<td>0.79</td>
<td>2.77</td>
<td>1:55</td>
</tr>
</tbody>
</table>

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 shoddily 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 standby mode, or when its battery power is about to give out, the PowerExec writes the contents of memory to a reserved area.
Why Are You Still Working With DOS File Names?

Creating documents using Windows' applications has been getting easier, but figuring out how to describe that file with only 8 characters is still as difficult as ever...until now! Physiotronics' SHERLOCK allows users to fully describe their files with up to 254 characters, and also offers a powerful file management system with its user-friendly Visual Filing Environment.

SHERLOCK is an extension to the Windows file management environment—it replaces the 'Save' and 'Open' dialog boxes—and is automatically available when using the Windows' standard pull-down menus, providing seamless integration with every compatible application. You can take advantage of SHERLOCK's file management powers as soon as it is installed.

SHERLOCK's Save Card: With SHERLOCK, every compatible application has the same 'Save Card' whenever you use the application's 'Save' command. SHERLOCK pops-up instead of the original 'Save' dialog box. SHERLOCK allows you to name a file with up to 254 characters—no more file names like: Bobbune.doc or Phony93.xls. Files saved with SHERLOCK make DOS file names a thing of the past.

SHERLOCK's Visual Filing Environment: DOS directories are accessed through a visual filing environment of Doors, Cabinets, Drawers and Folders, all of which can be named with up to 40 characters. This interface makes filing and retrieving your files familiar and easy.

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.

SHERLOCK is available in Single User Version and LAN-PACK (10 User) Version. To find out more about SHERLOCK and the dealer nearest you, call:

1-800-952-2314
The Toshiba T4400C is rugged and has a superior keyboard.

The AST PowerExec is easily expandable with PCMCIA cards.

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 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 ratty, 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.

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 ruggedly 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 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.

COLOR YOU CAN CARRY ANYWHERE

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), F1 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 486SLi 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@byrepb.byte.com.
WE MAKE THE SECOND
MOST POWERFUL
TABLETS KNOWN TO MAN.

The very early tablets had lots going for them—durability for starters—but it
sometimes took an act of God to get people to use them. Not so, once Wacom
introduced digitizing tablets. They allow artists to work on a computer the
same way they’ve worked for centuries. They can create thick or thin lines.
Fancy, delicate swirls. Expressive dabs, sprays or explosions of color. Even elegant hand-lettering. The perfectly balanced,
batteryless, cordless stylus can be a pencil, crayon,
paintbrush, pastel, marker or photo editing and retouching tool. It responds
to every nuance of hand motion with the same natural and intuitive
stroke and pressure control as the original.

Thanks to Wacom, and the dozens of software applications that have been
developed to use our pen and tablet, your computer can become an
entire studio. So if you’ve always believed that the pen was mightier than the
sword, consider this a message from on high: Your pen is here, with a tablet as power-
ful as your imagination. Call 1-800-922-6613 to pick up one at a dealer near you.

WACOM
Putting technology in its place.™

Call FAX BACK (1-800-724-4077) for info on the most award-winning tablet, and the only batteryless, cordless pen available.
©1993 Wacom Technology Corporation. Wacom is a registered trademark of Wacom Co., Ltd. Illustration by Paul Nelson.

Circle 120 on Inquiry Card.
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: Quick and Microsoft Money.

Getting Started

In many ways, Quick 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).

Quick 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. Quick’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 re-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).

Quick 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...
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 features: 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 “unsplittin g 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 subcategories, 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.
There's never been a better time to move from your old software to a new Office. For a limited time, you can get the latest version of The Microsoft® Office for Windows™ at the low Software Spectrum price of $375* when you upgrade from any qualifying spreadsheet, word processor, presentation graphics program, "suite" of products, or "works" program for MS-DOS® or Windows operating system.**  The Microsoft Office gives you Microsoft Word, the leading word processor for Windows; Microsoft Excel, the highest-rated spreadsheet for Windows; Microsoft PowerPoint®, the powerful, yet easy presentation graphics program; and a Microsoft Mail Workstation License for the most advanced electronic mail system for Windows.  And Software Spectrum gives you all the convenience of toll-free shopping. Friendly, knowledgeable salespeople who know more than just prices. Reliable technical support. Plus same-day shipping of orders received before 4:00 pm (Central).

1.800.824.3323 SOFTWARE SPECTRUM

Offer Good through May 15, 1993. * Prices subject to change. ** Customers must surrender their title page or set-up disk.
© 1993 Software Spectrum. Microsoft, MS-DOS, and PowerPoint are registered trademarks and Windows is a trademark of Microsoft Corporation.

Circle 102 on Inquiry Card.
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 handling 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

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 handling 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
Real Stats. Real Easy.

SPSS for Windows gives you answers your spreadsheet or database can't. It's a great value at $695!

Learn Fast, Work Fast
"Stumbling blocks to statistical analysis are eliminated with SPSS for Windows. You don't have to be a programmer to use it and you don't have to be a statistician to understand it."—Richard O'Reilly, Los Angeles Times.

The 100% Windows interface makes doing analysis simple. Context-sensitive help and an on-line glossary of statistical terms are just a click away.

Complete Data Management and Editing
"A breakthrough in data capacity and ease of use...impressive."—Alan Fridlund, InfoWorld.

There's no limit on the number of variables you can analyze. You don't have to be a programmer to use it and you don't have to be a statistician to understand it."

Real Stats. Real Easy.

When you really want answers you have to go beyond what spreadsheets or databases can offer. You need a package that is designed for real statistical analysis, reporting and charting — and is easy to use. You need SPSS® for Windows, the real stats, real easy combination that delivers real value.

You'll break out of the spreadsheet cell with SPSS for Windows. Do more than simple percentages and sums — subset, sample, aggregate, explore, summarize, poke and prod, slice and dice your data to get the answers you need. Analyze surveys, dig into databases, improve quality, conduct research studies, forecast sales and prepare reports with ease. All without writing complex macros or queries. Find relationships, see patterns and trends, determine significance and use the past to predict the future.

In-depth Statistics
"For more statistical analysis tools than you'll get from a spreadsheet such as Excel, without the steep learning curve, SPSS for Windows is a great buy."—Michael Burgard, PC/Computing.

Wide ly used statistics such as crosstabs, correlations and regression are in the Base module. Optional modules with unrivaled advanced statistics are available. You won't grow out of this package.

Learn fast, work fast. Prepare for your analysis quickly with SPSS’ full-featured Data Editor. Choose from a broad range of statistical routines, including those in specialized add-on modules, that produce full-color charts automatically. Hot button between charts and related numerical output. Share information using DDE and OLE. Put together a great presentation with powerful and flexible business graphics and a report writer. If you need help, the documentation is full of statistical "how to," and experienced technical support is just a phone call away.

SPSS for Windows — when you need more stats than a spreadsheet or database can offer.

Order now and get a great value — only $695. American Express, Discover, MasterCard or Visa accepted. Unconditional 60-day money-back guarantee.

Fax (312)329-3668 or Call (800) 543-5835
DO YOU KNOW WHERE YOUR MONEY IS?

**Coming in May**

An All New BYTE Lab Product Report on Printers!

The BYTE Lab and National Software Testing Lab (NSTL— the world’s largest independent testing facility) team up to bring readers the most complete product buying reports in the industry.

Each and every month, BYTE Lab Product Reports give readers a full evaluation of products.

Here’s a line-up of future reports:

- Printers
- Systems
- Modems/Fax Boards
- Network Interface Cards
- Storage Devices
- Mobile Computers

These comprehensive BYTE Lab Product Reports give readers all the buying information they need!

Don’t miss the exciting BYTE Lab Printer Report this May — Over 125 will be Reviewed!
REVIEW

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. Phystrotions' 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 networked computers by taking you beyond the confines of the limited DOS filename 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.

Phystrotions 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 Phystrotions' 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\L0000004\LOOOOOO I.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

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
  Phystrotions 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."
"my dog ate it"

"i lost the phone number"

"i can't remember everything"

"no one told me"

"i was stuck in traffic"

"what meeting?"

Stop making excuses. Now anyone can get organized with new PackRat 5.0. It's the only complete information manager that makes Windows easier to use - so you and your computer can become more productive. For a free brochure call 1-800-PACKRAT, xG041.
PUT AN END TO SOFTWARE PIRACY!

Meet the growing family of security keys from Software Security.
Each one a specialist at enforcing your license agreement in virtually any user environment you can think of. Whether it's DOS, UNIX, Macintosh or OS/2. Whether it's a single user installation or a LAN.

Simply connect the appropriate key to a single user computer, or a non-dedicated file server in a network, and you control all access to your protected application.

Users, however, won't even know it's there. The keys are transparent and won't impact software functionality or the ability to make back-up copies. Normal node and LAN operations are unaffected.

Simple. Unassuming. Ever vigilant. Easy to incorporate into your application package. And quite possibly the most profitable hardware investment a software developer can make.

The Ultimate Protection For Software Publishers

To find out more, call: 1-800-841-1316
In CONNECTICUT CALL: 203-329-8870
FAX 203-329-7428
EUROPE AND UK: +44 784 43 00 60

SOFTWARE SECURITY
1011 High Ridge Road
Stamford CT 06905
Proudly Made in the USA

North American Readers circle 106
Other Readers Worldwide circle 101.
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 graphic-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 processors 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 pre-defined 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
BEYOND WORD PROCESSING

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 ($995) was announced at press time but was not available for review; however, it will be by the time you read this.


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.

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
The not-so-hard drive upgrade.

The Hardcard EZ™ hard drive is absolutely the easiest way to add high-performance drive capacity to your system.

And choosing the Hardcard EZ drive is even easier, because Quantum guarantees it's compatible with everything else in your computer — or your money back.

It's guaranteed to run with any 286 or later PC/AT system and all your popular operating systems like MS-DOS, OS/2 and Microsoft Windows. It's guaranteed to coexist with your current drive, too. So you don't sacrifice existing storage to increase your capacity.

And anyone can install the Hardcard EZ hard drive — even if you've never seen the inside of a computer. Just drop it into an expansion slot, run the automatic installation software, and you're ready to grow with 42, 85, 127 or 240 MB of added capacity.

Manufactured by the makers of the original Hardcard® hard-disk-on-a-card, Hardcard EZ upgrades contain full-featured Quantum drives renowned for the highest performance and reliability and backed by a two-year worry-free warranty — twice as long as most other drives.

See your dealer today or call 1(800) 624-5545 to find out more about the Hardcard EZ drive.

It's the hard drive upgrade that's easy to add.

Quantum™

The Quantum logo and Quantum Hardcard EZ are trademarks and Hardcard is a registered trademark of Quantum Corporation. Brand or product names are trademarks or registered trademarks of their respective holders. ©1992 Quantum Corporation.

Circle 148 on Inquiry Card (RESELLERS: 149).
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.

**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

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).
The Nanao FlexScan® family of award-winning big-screen monitors introduces our newest family member. The FlexScan F340iW—an affordable monitor for Windows applications.

Our new 351lb., 15" addition has the same traits as its big brothers. Features like our exclusive Advanced Image Control System that lets you adjust color balance, store picture adjustments and recall the settings...automatically. And a flat-square, .28mm dot pitch Invar Shadow Mask CRT combined with Dynamic Beam Spot Control to optimize both resolution and convergence over the entire screen. You get a brilliant, sharp image and 20% more work area than a 14" monitor, plus 1024 x 768 resolution at a 76Hz flicker-free refresh rate, up-front controls and compliance to MPR-II guidelines—all of which make the F340iW a healthy addition to any work environment.

So, if you're looking for a quality monitor for Windows applications, but a 17" is beyond your budget, you've found it.

Congratulations.

23535 Telo Avenue, Torrance, CA 90505
(310) 325-5202

1-800-800-5202
BYTE READERS are considered experts in today's complex computer environment. When you need to make decisions, BYTE editorial is there to give information on current products and emerging technologies.

And when you order products, BYTE advertisers are ready to answer your every need. Use the convenient toll-free numbers in this issue, and remember to say:

You Saw it in BYTE

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) 888-8080
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 flyer, 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 Microsol, 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, multiformat 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, 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.

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, or the three programs considered in this review, it was the lowest in nearly every aspect of its operation. Power Up's program was usable but slow when loading text from a word processing document, reformattin 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
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 Word-Perfect 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 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 program. 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...
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, you start using Publisher 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, Publisher for Windows assumes that you know what you want and how to create it.

To be fair, Publisher 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.

Publisher 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 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 Publisher 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 Publisher 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 2: Page Wizards walk you through the creation of a Publisher document.

Screen 3: Frames with irregular shapes are just one of the advanced features of Publisher for Windows.
Ultimately the Winner in
BIG SCREEN
SCEPTRE 17" Flat Screen High Resolution Digital Color Monitor CL-617,
Introduced by Brutus*, the King of Monitors:

1280 x 1024
Non-interlaced

VESA 72 Hz
Refresh Rate, Flicker Free

Multiscan
Horiz. 30-66 KHz
& Vert. 50-90 Hz

Advanced
Compact & Slim
Design

Automatic
Dynamic
Focusing

Wide Viewing Angle

0.26mm
Dot Pitch

INVAR
Shadow Mask
(30% Brighter Screen)

Mac Compatible

Auto & Manual
Degaussing

90-260 VAC
50/60Hz
Auto-input Power

Front Access
Push Button
Microprocessor
Controls with 31
Memory Modes

Plus: Two Year Limited Warranty, Low Radiation (MPR II) and Anti-Static Options, and many more. For more information, call

SCEPTRE

1-800-788-2878

SCEPTRE TECHNOLOGIES, INC. 714-993-9193 FAX 714-993-2997

©1993 Copyright SCEPTRE Technologies, Inc. All Rights Reserved. All products and brand names are trademarks or registered trademarks of their respective companies. Circle 117 on Inquiry Card (RESELLERS: 118).
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 foregoing 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 reconstructed 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
COMPRESSION WITH FRACTALS

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.”
YES! Enter my one-year (12 issues) subscription to BYTE for only $24.95.*
I’ll save 40% off the single copy price. Plus, I’ll also receive BYTE’s Annual Special Issue FREE with my paid subscription.
If at any time I’m not satisfied with BYTE, I may cancel for a full refund on all unmailed copies.

☐ Payment enclosed  ☐ Bill me later

NAME ...........................................................................................................
COMPANY ........................................................................................................
ADDRESS ...........................................................................................................
CITY ............................................. STATE ............................................. ZIP

Please allow 4-6 weeks for delivery. Basic subscription rate is $29.95. (Mexico, $29.95 payable in U.S. funds). Above rates are for U.S. delivery only. Please see table of contents for international subscription rates.

*Plus applicable state and local tax, if any.
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 selected 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 CLEARS CLUTTER

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."

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 "features," 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.
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 hourglass 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-sor ter 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-sor ter 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—back-grounds, color schemes, and a variety of templates that provide a consistent look throughout your presentation.
A Moving Target

A roundup 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 presentation 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 program 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 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 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.

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.
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 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, 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 outline 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 outline into your presentation. I found the outline 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 PowerPoint), 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 2: 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.

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.

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 presentation 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 PowerPoint. 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 graphics 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.
PRESENTATIONS TO GO

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 outline 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.

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

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.

BYTE's Essential Guide to Windows • Spring 1993
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.”

The Superstar of Mathematical Software
Macsyma Now Costs $349.00*
An Unbeatable Value on PCs and Workstations
Macsyma not only offers the most complete and reliable portfolio of mathematical capabilities, it now has an unbeatable price. Macsyma’s new PC version runs as a regular Windows 3.1 application with many improvements.

- World’s best trig simplification and best differential equation packages are now even stronger. Factoring of large integers is 1,000 times faster.
- Color Scientific Graphics includes graphic windows with user controls for rotate, zoom, hardcopy printing, postscript output, colors, plot labels. Also, plotting of parameter surfaces, improved hidden line removal.
- New screen display of special math symbols, exponents, and Greek letters makes output more readable.
- Easy-to-use hypertext† on-line help system with 1,500 text entries, 500 executable examples and demonstrations. Function templates‡ indicate function names and argument slots.

If you want the best mathematical software at a price the competition can’t touch, call 1-800-MACSYMA (1-800-622-7962) or FAX 617-646-3161. Quantity discounts and academic prices are available.

*Macsyma Inc.
20 Academy Street, Arlington, MA 02174  Circle 116 on Inquiry Card.
SERVING UP THE WORKS

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 Compdyne 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 WorksWizard 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

BYTE's Essential Guide to Windows • Spring 1993 105
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 cellrange 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,
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."
The First Revolution in Instrumentation Software...

Graphical Programming

The Second Revolution...

Platform Independence

Over six years ago, LabVIEW® for Macintosh revolutionized the development of data acquisition, instrument control, and data analysis systems. No longer did you have to write text-based programs. With LabVIEW, you could graphically build virtual instruments (VIs) with front panel interfaces and block diagram programs. But, you had to have a Macintosh...

Introducing LabVIEW for Windows and LabVIEW for Sun. Now you can choose from three industry-leading computing platforms – control your GPIB, VXI, and RS-232 instruments – acquire data from your plug-in data acquisition boards – and perform data analysis, from simple statistics to real-time digital signal processing. Best of all, you're not locked into one computer platform. All of your programs are portable between platforms.

If you're searching for an alternative to text-based programming, or considering another icon-based system – try the original, try LabVIEW – and draw your own solution!

For a FREE LabVIEW Demo Disk, call:
(512) 794-0100 or (800) 433-3488 (U.S. and Canada)
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 on a great deal of 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 programs 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 make 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 information. 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
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-oriented rather than form-oriented. It displays 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 can quickly move between these lists in windows that scroll together.

Maximizer’s architecture makes it more action-oriented than other contact managers. Because you typically have more than one open contact 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 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
STATISTICA/W™ (for Windows) Complete Statistical System with thousands of on-screen customizable, presentation-quality graphs fully integrated with all procedures • Complete Windows 3.1 support, DDE, OLE, TT-fonts, multiple toolbars, right mouse button support • Unlimited numbers of data-, results-, and graph-windows • Inter-window integration: data, results, and graphs can be treated as objects and connected into one another in a number of ways • The largest selection of statistics and graphs in a single system; comprehensive implementations of: Exploratory techniques; multi-way tables with banners (presentation-quality reports); nonparametrics; distribution fitting; multiple regression; general nonlinear estimation; stepwise logistic regression; general ANOVA/MANOVA; stepwise discriminant analysis; log-linear analysis; factor analysis; cluster analysis; multidimensional scaling; canonical correlation; item analysis; reliability; survival analysis; time series modeling; forecasting; log analysis; quality control; process analysis; experimental design (with Taguchi); and much more • Manuals with comprehensive introductions to each procedure and examples • Hypertext-based Stats Advisor expert system • Extensive data management facilities (spreadsheet with long formulas, block operations, advanced clipboard support, DDE hot links, relational merge, data verification, powerful programming language) • Batch command language and macros also supported, "turn-key system" options • All output displayed in ScrollSheets™ (dynamic, customizable, presentation-quality tables with toolbars, pop-up windows, and instant 2D, 3D and multiple graphs) • Extremely large analysis designs (e.g., correlation matrices up to 32,000x32,000, unlimited ANOVA designs) • Megafile Manager with up to 32,000 variables (8 Mb) per record • Unlimited size of files; extended ("quaduple") precision; unmatched speed • Exchanges data and graphs with other applications via DDE or an extensive selection of file import/export facilities • Hundreds of types of graphs, including categorized 2D and 3D graphs, matrix plots, icons, and unique multivariate (e.g., 4D) graphs • Facilities to custom design new graphs and add them permanently to menu • On-screen graph customization with advanced drawing tools, interactive stretching and resizing of complex objects, interactive embedding of graphs and artwork, special effects, icons, maps, multi-grapics management, page layout control for slides and printouts; unmatched speed of graph redraw • Interactive rotation, perspective and cross-sections of all 3D and 4D graphs • Extensive selection of tools for graphical exploration of data: fitting, smoothing, overlaying, spectral planes, projections, layered compressed, marked subsets • Price $995.

Quick STATISTICA/W™ (for Windows) A comprehensive selection of basic statistics and the full graphics capabilities of STATISTICA/W™ • Price $495.

STATISTICA/DOS™ (for DOS) A STATISTICA/w-compatible data analysis system • Price $795.

Quick STATISTICA/DOS™ (for DOS) A subset of STATISTICA/DOS statistics and graphics • Price $295.

Domestic s/h $10 per product; 14-day money back guarantee.

Circle 104 on Inquiry Card.

StatSoft™
2325 E. 13th St. • Tulsa, OK 74104 • (918) 583-4149
Fax: (918) 583-4376


Quick STATISTICA/Mac™ (for Macintosh) A STATISTICA/w-compatible data analysis system and graphics system designed for the Macintosh • Large selection of statistical methods fully integrated with presentation-quality graphics (incl. EDIA, multilots, a wide selection of interactively rotatable 3D graphs; MacDraw-style tools) • Unlimited size of files • Full support for System 7, incl. "Publish and Subscribe" • Price $595.

Quick STATISTICA/Mac™ (for Macintosh) A subset of STATISTICA/Mac: a comprehensive selection of basic statistics and the full graphics capabilities of STATISTICA/Mac™ • Price $295.

The calendar offers day, week, one-month, and two-month views that let you see some 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 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 market 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
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 clo “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
Circle 1103 on Inquiry Card.

Richmond Technology & Software, Inc.
(Maximizer for Windows)
Burnaby, British Columbia, Canada
(800) 663-2030
(604) 299-2121
fax: (604) 299-6743
Circle 1104 on Inquiry Card.
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 anywhere 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 formulas 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 instantaneously. In seconds, you'll see a pretty graph and some prose explaining how things work. After you've toyed with the magic paper for several minutes, you'll sit back and say, "Wow, it actually works!"

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— instantaneous 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 titles 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.

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
 (617) 577-1017
 fax: (617) 577-8829
 Circle 1229 on Inquiry Card.
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 Maple 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 supplement 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-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 can't 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 "rgcote" or on the Internet at rgcote@bytepb.byte.com.
Seven Good Reasons To Use ImagePals

This is our list. But once YOU use ImagePals Version 1.2, your list will be a lot longer. We've added so many new features you're going to love it more than the original. ImagePals' power and versatility make it perfect for managing and coordinating all your imaging, graphics, word processing and publishing tasks. Now here's another great reason to buy ImagePals Version 1.2 today:

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 and 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.

Suggested Retail Price $249.00
To order call:
(800) 858-5323 Ext. 250
(310) 523-9393 Ext. 250
For International inquiries contact U-Lead Systems, Ltd.
Telephone: 886 2 764-8599 Facsimile: 886 2 764-9599

ImagePals—the award winning solution for graphics and publishing users.

ImagePals is a registered trademark of U-Lead Systems, Inc. All other trademarks whether registered or not are the property of their respective holders. Suggested introductory price available through participating resellers only and is subject to change or cancellation without further notice.

Circle 128 on Inquiry Card (RESELLERS: 129).
The Switch is On... to Cybex Solutions!

**PC-COMPAION PLUS™**
Add a second keyboard, monitor and mouse to your PC up to 250 feet away!
- Supports PC/AT, PS/2 and 100% compatibles
- Combine monochrome and color VGA monitors
- Mouse support available at both local and remote workstation
- Switch selectable privacy mode

**PC-EXTENDER PLUS™**
Extend the distance between your PC and a keyboard, VGA monitor and mouse up to 250 feet!
- Supports PC, PC/XT, PC/AT, PS/2, and 100% compatibles
- Supports monochrome or color VGA monitors
- Offers conversion from RGB color to gray-scale
- PS/2 style or Microsoft/Logitech serial mouse support available

**PC-EXPANDER PLUS™**
Add up to 7 keyboards, monitors and mice to your PC up to 250 feet away!
- Supports PC/AT, PS/2 and 100% compatibles
- Selectable privacy modes
- Automatic keyboard and mouse switching
- Microsoft and Logitech serial mouse support available at all workstations

**COMMANDER™**
Control up to 96 file servers with one keyboard, monitor and mouse!
- Supports PC, PC/XT, PC/AT, PS/2 and 100% compatibles
- Remotely switch PCs via keyboard 250 feet away
- "AutoBoot™" Feature boots attached computers without operator intervention
- Supports either PS/2 or Microsoft/Logitech serial mouse
- Each unit accommodates from 2 to 8 PCs; cascade up to 12 units

PC, PC/XT, PC/AT and PS/2 are registered trademarks of International Business Machines Corporation. Microsoft and Logitech are registered trademarks of their respective companies.

Circle 122 on Inquiry Card (RESELLERS: 123).
Windows at the Speed of Thought.

Plain Talk About Your Need For Speed

And the Difference Between ISA, EISA and VL-Bus

First:
ISA transfers data up to 3MB/second on an 8-bit wide databus

Faster:
EISA offers 32MB second transfer rates on a 16-bit wide databus

Fastest:
NAGA's VL-Bus™ system is capable of transferring raw data on a 32-bit wide databus at the rate of 132MB/second

System Bottlenecks Cause Lengthy Redraws
Redraws take a long time because data displayed on your monitor is bottlenecked. The database, peripherals and CPU aren't operating on the same bandwidth—the number of bits able to pass through the system's narrowest bottleneck—causing delays.

You've looked at a zillion ads. It seems like everyone's selling the same thing. You want the fastest 486 or 386 available at the lowest price. And now, everyone's talking EISA and VL-Bus™. And how much more speed you need.

CAD, Imaging or Graphic Designers: Work 50 Times Faster and Smarter.
For CAD, imaging or graphic design users, VL-Bus™ speed advantages are incredible! Without all the wasted time spent waiting for screen redraws, you'll work up to 50 times faster—and smarter.

NAGA's Quality Commitment to You
- 2-Year Warranty on ALL Components
- Lifetime 800 Number for Service & Support
- FREE 12-Month On-Site Service Contract™
- Next-Day Replacement Part Warranty
- 45-Day Money-Back Satisfaction Guarantee—No Questions Asked
- 24-Hour BIS Technical Support

Windows Solution 486-VL
- Intel 80486 Processor
- 4MB RAM (exp. to 32MB)
- 128KB Cache (exp. to 256K)
- 320MB-75M IDE Hard Disk
- 1.44MB/1.2MB Floppy Drive
- 32 Bit VL/IDE I/O Controller

Executive Solution 486-VL
- Intel 80486 Processor
- 4MB RAM (exp. to 32MB)
- 128KB Cache (exp. to 256K)
- 320MB-75M IDE Hard Disk
- 1.44MB/1.2MB Floppy Drive
- 32 Bit VL/IDE I/O Controller

Order Today Toll Free 1-800-568-6242
Fax orders: 602/820-3153
Direct & international line: 602/820-3294

Fortune 1,000 Companies & Universities. Commercial leasing available.

NAGA Systems Corporation
Smart Computer. Smart Solution. Smart Choice.

1520 West Mineral Road
Tempe, AZ 85283

Circle 131 on Inquiry Card (RESELLERS: 132)
CONTROL UP TO 96 PC FILE SERVERS WITH 1 KEYBOARD AND MONITOR USING...

COMMANDER™

- Select via Keyboard
- Dual access up to 250 feet away (optional)
- No external power
- Mix PC, PC/XT, PC/AT and PS/2
- "AutoBoot™" Feature boots attached computers without operator intervention
- Able to Broadcast to all attached computers

- PS/2 and Serial Mouse support available
- Each unit accommodates from 2 to 8 PCs
- Up to 12 units can be cascaded
- Mounting kit available for 19" and 24" rack installation

CYBEX
2800-H Bob Wallace Ave.
Huntsville, Alabama 35805
(205) 534-0011
Fax (205) 534-0010

Dealer Program Available

PC, PC/XT, PC/AT and PS/2 are trademarks of International Business Machines Corp.
WINSLEUTH™ GOLD

SUSPECT, DETECT AND CORRECT!!!™

WINSLEUTH™ GOLD

WinSleuth Gold is the first tutorial/analysis/diagnostic program specifically written to operate under Windows 3.0/3.1. A newly enhanced graphical user interface makes WinSleuth Gold the easiest WinSleuth to use, EVER.

Novice and advanced users will appreciate WinSleuth Gold's access to low-level information and functions. WinSleuth Gold can actually test and evaluate memory chips, serial and parallel ports, the video adapter and other vital system components. New users will find the on-line help facility valuable as a learning aid. WinSleuth Gold helps make complex aspects of computing such as IRQs, hard disk drives and video easier to understand.

TuneUp is now more comprehensive in its analysis and not only can make performance-enhancing suggestions, but with a set of NEW 'smart editors', can make changes to system settings automatically that improve Windows operation! Installation Assistant is a partner in the frustrating task of installing new hardware. With Report Generator send hardcopy to the printer, or an ASCII file for import into your database manager.

PC Computing, July, 1992 - BEST VALUE - “WinSleuth...is a godsend to Windows users intent on fine-tuning their systems.” “WinSleuth...is exceptionally easy to use.” - Preston Crats

BYTE Magazine, March, 1992 - First Impressions. “WinSleuth...is one of the few programs that I consider absolutely and positively necessary on my PC. One...should be on yours, too.” - Stan Minkowski

“it beats Quarterdeck's Manifest.”
Jerry Pournelle, Byte Magazine
November, 1992

800-892-9950/714-236-1380/FAX 800-892-9951

WinSleuth Gold ($169.00 value) NOW INCLUDES System Sleuth Professional 4.0 ($169.00 value) FREE PLUS WinRx and PCScan virus detection and elimination ($99.00 value) FREE

ONLY $99!

Coming Soon:

BYTE Buyer's Guide on Printers

Available only on the Newsstands

• BYTE Reviews
  Dot-Matrix, Laser, Ink-jet, Portable Printers

On Sale Date: June 8, 1993
FREE On-Site Service Nationwide For One Year!

One Hollywood Drive
North Grafton, MA 01536
508-839-3289 fax 508-839-6236
800-685-3981

Monday-Friday: 10am-10pm
Saturday: 10am-6pm
Sunday: Noon-6pm
Circle 130 on Inquiry Card.

386DX 40 64K Cache 4 Meg $1175
486DX 33 256K Cache 4 Meg $1575
486DX2 50 256K Cache 4 Meg $1625
486DX 50 256K Cache 4 Meg $1775
486DX2 66 256K Cache 4 Meg $1775
486 VESA Local Bus w/24 bit 16 Million true color video Add $100

All Systems Include:
- 130 Meg hard disk (14.5 ms)
- 1.44 Meg floppy drive
- 1.2 Meg floppy drive
- SVGA 1024 X 768 28 14" color monitor
- SVGA card (trident) 1 Meg
- 220 Watt desktop or mini tower
- 2 serial, 1 parallel, 1 game, IDE 2HD/2FD
- 101-Key enhanced keyboard
- 1 year parts and 5 years labor
- 1 YEAR ON-SITE SERVICE
- FCC B AND UL APPROVED

Circle 130 on Inquiry Card.
Add-In Boards • Communications/Networking

COMMUNICATIONS & I/O SPECIALISTS

124 A & B • PORTS - 232/422/485
* CURRENT LOOP
* RS-530 & V.25 INTERFACE
* HIGH SPEED SYNC/ASYNC
* DIGITAL & RELAY I/O
* MICROCHANNEL™
* LAPTOP ADD-ONS
* EXCELLENT TECHNICAL SUPPORT
* CALL FOR FREE CATALOG

SEALEVEL SYSTEMS, INC.
FO BOX 230
LIBERTY, OH 44437
800-843-4593

Circle 137 on Inqury Card.

Announcing the

THE One Slot™

COMBINATION MULTIPORT BOARD
with Single Slot Expansion: 3 parallel & 4 Serial Ports

ideal for people who love their PC's but don't like running out of slots. Simple to install and use. Save slots & money. Perhaps the last I/O board you'll ever need.

Features

- Supports Windows, Multimeda, OS/2, Novell, DOS and SCO Unix
- ISA, EISA compatibility
- Ports easily configured
- Easy connect remote panel
- Diagnostics software available. Call 1-800-782-7428.

STAR GATE®

People and products you can depend on.

Star Gate Technologies, Inc.
29300 Aurora Road
Solon, OH 44139
Tel: (309)862-1704 Fax: (309)862-1804

Circle 142 on Inqury Card.

New for Windows 3.1!

It's Voice Mail.
It's Fax-on-demand.
It's an Applications Generator.
It's $495 for board and software.
It's PhoneOffice.

Call our demo line 309-862-1804
to get more information by fax-on-demand.
Tel: (309)862-1704 Fax: (309)862-1804
309 W. Beaufort, Suite 8, Normal, IL 61761

Circle 143 on Inqury Card (RESELLERS: 144).

Memory/Chips/Upgrades • Programmable Hardware • Tape Drives

Memory Superstore... your direct source...
For the absolute best prices on tape, desktop and workstation memory, call now! 800-800-7056.

Structure SIMMS

4MB x 2-307200 $110.00
4MB x 4-307200 $114.00
256K x 8-307200 $111.00
1MB x 8-307200 (8 chips) $34.50
1MB x 8-307200 (3 chips) $3.50
1MB x 8-307200 (1 chip) $1.38
2MB x 36-70" $262.00
4MB x 36-70" $499.00

Call for best price on a 16 or 32-bit product.

Working Memory

Sun ECP/EPX/ES 16MB $470
Del 486 16MB $499
IBM R5000 16MB $620
HP Apollo 16MB $575
Silicon Graphics 16MB $620
Next 16MB $470

Specialists in workstation products: Contact us for current prices and new catalog.

Memory/Controller Card/Flash Memory

2MB $114.00
4MB $199.00
6MB $299.00
8MB $399.00
16MB $499.00
32MB $599.00
64MB $699.00
256MB $799.00

Call for best price on a 16 or 32-bit product.

Desktop 9-Track Tape Subsystem

#1-selling 9-track system on desktop.

Quasars low cost 1/2-inch 9-track streaming tape systems bring full ANSI data interchange to your AT, PS2 and Macintosh, giving you the freedom to exchange data files with nearly any computer in the world. Systems include DOS or Xenix compatible software, two cartridge and cables, high reliability 1600 or 2560 BPI capability may be used for disk backup as well as data interchange.

Call us today! For details and to order: Fax (918) 862-4081
Phone (918) 862-5822

QUALSTAR®

Circle 135 on Inqury Card.

Tribal Microsystems Inc.
4439B, GRIMMER BLVD., FRESNO, CA 93710
Tel (515) 823-8859
Fax (515) 823-9995

Circle 138 on Inqury Card (RESSELLERS: 139).

Universal Programmer, Emulator & Tester

TUP-400 $745.00
TUP-300 $575.00

- New improved hardware and software.
- The most complete PC-based Universal Programmer. Programs PLD (PAL, GAL, CPL, CPLD, PEEL, MAX, MACH.), EPIROM, (up to 1MB), Flash EPROM, EEPROM, Special PROM, MPU (5637, 6502, 6800, Z80/90, PIC), Xilinx, reverse engineering, Flashram, (up to 1MB). Popup Programmer. Does not require a disk drive.
- Fast Programming software available also.
- EPROM Emulator capability.
- 100% digital I2C and SPI (64MHz, I2C/SPI adapter available),
- Flash software updates and new features added upon request.
- IC manufacturer's approval.
- 5-year warranty, 30-day money-back guarantee.
- CALL TODAY FOR MORE INFORMATION. All prices are subject to change. Distribution welcomed.


16MB $80 4MB $109
2MB $200 8MB $430
8MB $300 32MB $109
64MB $480 128MB $670
256MB $980 512MB $1950


Circle 140 on Inqury Card.
INTELLIGENT DATA ACQUISITION

Now you can run high speed data acquisition under Windows™. A Data Acquisition Processor™ with on-board intelligence handles the critical part of an application: the tasks that run in real time. The DAP can be controlled from any Windows language or application that can make DLL calls. The one shown here is written in Visual Basic® and uses only seven DLL functions.

MICROSTAR LABORATORIES

HSC Chemistry for Windows

Chemical reaction and equilibrium software, which utilize automatically an extensive thermochemical database equivalent to more than five thick data books. A new faster and cheaper version is now available with an illustrative manual.

Ask for a color brochure:

Outokumpu Research Oy P.O. Box 60, SF-28101 Pori, Finland

Windows

Connect 8 High Speed Modems To A Windows PC With Maxspeed’s SS-4Plus® Multiport Controllers

Call 800-877-7998 or 415-345-5447 Fax 415-345-6398

Europe: Call 353-21-821-454 Fax 353-21-821-654

Maxspeed

New Origin™ Version 2.8

Scientific Graphics and Data Analysis in Windows

"I have used SigmaPlot, EasyPlot, and several others. I would rate Origin at the very top...This is the best scientific software I have found...I love this product!"

Dr. Gipps S. Smith Physicist Los Alamos National Laboratory

FEATURES INCLUDE:
- Many chart types, including line, scatter, column, bar, area, error bars, hi-lo-close, spline, step, box, QC charts, polar and waterfall plots.
- Create charts in multiple WYSIWYG windows with zooming, scrolling, and easy double-click editing of all graphic elements.
- Sophisticated "layer" system makes it easy to put multiple graphs on a page.
- Function plotting, statistics, t-Test, histogram, regression, curve fitting to user-defined models, and much more.
- Superior publication-quality output. Makes beautiful color slides.
- A powerful scripting language lets you create custom applications. Also supports DDE and DLL.
- Ideal for OEM Applications.

only $495.00

60 day money back Guarantee

Call 1-800-969-7720

FREE demonstration disk available.

MicroCal Software Inc., 22 Industrial Dr., Northampton, MA 01060
TEL (413) 586-2013 FAX (413) 586-0149

Circle 144 on Inquiry Card (RESELLERS: 147)
Inquiry 651.

126 B

Boosts signals up to 600 feet. Control up to 10 96 PCs
> - 9V Battery Operation with Lithium Backup
> - Use as a PORTABLE, WEGE, or SERIAL
Emulates Keyboard: Works With Any Software
> - Data Appears as Keyboard Input
> - Uses Enhanced Decoding Algorithms
> - Reads all Popular Bar Codes (16 types)
> - 2x16 SuperWist LCD Display
> - Supports NOVELL Networks
> - Easily Programmable with a Bar Code Menu
> - Over 140 User Configurable Options

Bulll -ln Calculator
> - Reads all Popular Bar Codes (16 types)
> - 2x16 Superwist LCD Display
> - Supports NOVELL Networks
> - Easily Programmable with a Bar Code Menu
> - Over 140 User Configurable Options

CD-ROM

OPTI-CDacce
c
Improve CD-ROM workstation performance!
Only $99!
OPTI-CDacce
 takes advantage of Extended Memory (XMS) to cache CD-ROM data. Recover data from a high-speed cache instead of directly from the CD-ROM drive and significantly improve your CD-ROM workstation performance.
For our free catalog of exciting CD-ROM products including the market leading PCL-CDMX networking software, contact ONLINE COMPUTER SYSTEMS, INC.
A member of the Red Earl group.

1-800-922-9201 or 301-223-4700. Fax at 301-229-5700.

Inquiry 657.

COMPUTER BOOKS

COMPUTER BOOKS at a discount
We specialize in ADVANCED books for developers, programmers, computer professionals, and academics. 15% discount. Latest books from over 50 publishers. Free catalog. UPS & international shipping. Professional service.
MC/Visa/AMEX. CompuServe 70007.1323. G0 CBk. Windows, C++, C# 2.0. UNIX, Mac, QPC
CompuBooks
Rt. 1, Box 271-1
Cedar Creek, TX 76162
FAX 512-321-8625
800-880-6818

Inquiry 658.

INSURES YOUR COMPUTER
SAFEWAE Computerowner's coverage provides replacement of hardware, media and purchased software. As little as $49 a year covers accidents, theft, fire, power surges and more.
TOLL FREE 1-800-848-3469
SAFEWARE, The Insurance Agency Inc.
PO Box 2631, 2906 N. High St., Columbus, OH 43202

Inquiry 659.

COMPUTER SYSTEMS

LOW-LOW-LOW
Computer Systems/Notebooks/Network Solutions
IBM-Apple-Compatible AST-ALR-Everex-Kelbys SURAH 386/486/586/A-Max/Microcomputers
CD-ROMs/ Tape Backup/ Postscript FAX Modern LAN Cards/ Hardware/Software/ Repairs/ Upgrades/ Service/ Compatibility
DRAKE, SIMM Modules / Laser Printers/ Scanners/ Printers & Duplicators*
SOFTWARE

48151 Ousted Road, Fremont CA 94539 USA
Phone (510) 651-5101 Fax (510) 651-5241

SURAH Inc.
1-800-543-1001 Nationwide Orders

Inquiry 660.

DATA RECOVERY

Ontrack DATA RECOVERY
> Professional service recommended by major hard drive manufacturers
> Expertise in virtually every operating system & media storage device
> 24-hour support with weekend, priority, & on-site service available
> For fast, successful results, call:
> CA: 1-800-943-7657
> MN: 1-800-979-2307
> 2400 Main Street, Suite 200, Irvine CA 92714
> Fax: 301-229-6269

Inquiry 661.

DATA/DISK CONVERSION

CONVERSION SERVICES
Convert any 3-track magnetic tape to or from 5000 formats including 3\"h, 5\", 8\" disk formats & word processors. Disk-to-disk conversions also available, introducing CD-ROM conversions. Call for more info.
Pivov Computing Services, Inc.
165 Arlington Hghts, Dept. #B
Buffalo Grove, IL 60089 (800) Convert

Inquiry 662.
Inquiry 675.

FREE SOFTWARE FOR IBM/"CLONES"
Try us! Get 5/5.25" or 3/3.5" disks full of the latest software – FREE! Choose from General Interest, Games, Windows®, Kid’s, Clip Art or Fonts. Pay only a small service charge of $2.95 per package. Call or write for Free Catalog.
ROCKET SHAREWARE
PO Box 36236, Edina, MN 55439
612-934-4775

Inquiry 676.

SOFTWARE/ENGINEERING

Inquiry 677.

SOFTWARE/GRAPHICS

Inquiry 678.

SOFTWARE/SCIENTIFIC

Volume Visualization

Inquiry 680.

FREE SOFTWARE FOR IBM/"CLONES"
Try us! Get 5/5.25" or 3/3.5" disks full of the latest software – FREE! Choose from General Interest, Games, Windows®, Kid’s, Clip Art or Fonts. Pay only a small service charge of $2.95 per package. Call or write for Free Catalog.
ROCKET SHAREWARE
PO Box 36236, Edina, MN 55439
612-934-4775

Inquiry 679.

Sirlin’s CAD ++ ENGINE

Inquiry 689.

Inquiry 682.

Inquiry 683.

Attention U.S. BYTE Subscribers

Watch for the next BYTE DECK mailing that will be arriving in your mailbox soon!

Use this as a fast, convenient tool to purchase computer products and services. It’s loaded with essential hardware and software products that you should be aware of when making your buying decisions...and it’s absolutely FREE!

If you have a computer product or service, and would like to reach 275,000 influential BYTE magazine subscribers, please give Brad Dixon a call today at (603) 924-2596.

Here’s what a BYTE Deck advertiser has to say:

“The BYTE Deck does very well for us...we’ve been in for over two years—and will continue advertising in ’93.”

Karen Tacy
Rainbow Technologies, Inc.
Your Direct Link Card

For free product information, mail your completed card today. For quicker response, fax to 1-413-637-4343!

Yes, I want FREE information on the following products!

A. What is your primary job function/industry of responsibility? (Check one)
   1) MIS/VP
   2) Computer/IT Systems Analyst
   3) Administration/Management
   4) Senior Marketing
   5) Software Engineer
   6) Other

B. What is your level of management responsibility?
   1) Senior Vice President 9 Professional
   2) Middle Management

C. Are you a retailer (VAR, VAD, Dealer, Consultant)?
   10 Yes 11 No

Product Category
Information
Circle the circles below for information on the entire category products you are interested in

Hardware
1) Desktops
2) Laptops
3) Notebooks
4) Printers
5) Scanners
6) Tape Drives
7) Keyboards
8) UPS
9) LAN Hardware
10) Modems/Multiplexors
11) CAD/CAM

Software
12) Databases
13) Business Applications
14) Database Management
15) User Interface
16) Operating Systems
17) Programming languages
18) Tools
19) Security

Accessories/Supplies
20) Posters
21) Binders
22) Notebooks
23) Pens/Pencils
24) Tape
25) Mail Order
26) Check/Deposit
27) On-Line Services
28) Miscellaneous

Bar Coding
29) Bar Coding Labels
30) Bar Code Software

Communications/Networking
31) Fax Machines
32) Modems
33) Network Interface Cards
34) Network Adapters

Computer Systems
35) Desktop
36) Laptop
37) Notebook
38) Workstation
39) Mainframe
40) Server

Data Acquisition
41) Infrared
42) Radio Frequency
43) Laser
44) Magnets

Files
45) Databases
46) Macintosh
47) UNIX
48) Linux

Influence the purchase of hardware or software?
1) Yes 2) No

In what products do you currently use?
For free product information, mail your completed card today. For quicker response, fax to 1-413-637-4343!

See reverse side for card.

1. Circle the Numbers on Your Direct Link Card
Circle the numbers which are found on ads and articles in this issue or circle the product category number and receive information on all advertisers listed in that category.

2. Print Your Name and Address
Answer questions “A” through “E” and mail or fax card to 1-413-637-4343.

3. Product information will be rushed to you from the selected companies!
To order products or request FREE information, call advertisers directly or send in the Direct Link Card by mail or fax! Let them know you saw it in BYTE!

<table>
<thead>
<tr>
<th>Inquiry No.</th>
<th>Page No.</th>
<th>Phone No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>61</td>
<td>ADOBE SYSTEMS INC (N.A.)</td>
<td>50-51 800-833-6687</td>
</tr>
<tr>
<td>62</td>
<td>ALADDIN KNOWLEDGE SYS</td>
<td>25 800-223-4277</td>
</tr>
<tr>
<td>63</td>
<td>ATI TECHNOLOGIES INC</td>
<td>59 416-756-0718</td>
</tr>
<tr>
<td>B</td>
<td>BORLAND INTERNATIONAL</td>
<td>CII 800-336-6646 ext. 5538</td>
</tr>
<tr>
<td>66-67</td>
<td>BORLAND INTERNATIONAL</td>
<td>1 800-336-6646 ext. 5538</td>
</tr>
<tr>
<td></td>
<td>BUSINESS WEEK</td>
<td>132 212-512-3113</td>
</tr>
<tr>
<td>C</td>
<td>CAERE CORP</td>
<td>23 800-535-SCAN</td>
</tr>
<tr>
<td>70</td>
<td>COMPUSERVE</td>
<td>48A-B 800-848-8199</td>
</tr>
<tr>
<td>71</td>
<td>COMPUTER ASSOCIATES</td>
<td>9 800-CALL-CAI</td>
</tr>
<tr>
<td>72</td>
<td>COMPUTER ASSOCIATES</td>
<td>47 800-CALL-CAI</td>
</tr>
<tr>
<td>73</td>
<td>COREL SOFTWARE</td>
<td>2 800-836-DRAW</td>
</tr>
<tr>
<td>74-75</td>
<td>CTX INTERNATIONAL INC</td>
<td>41 714-595-6146</td>
</tr>
<tr>
<td>122-123</td>
<td>CYBEX CORP</td>
<td>119 205-534-0010*</td>
</tr>
<tr>
<td>124-125</td>
<td>CYBEX CORP</td>
<td>121 205-534-0010*</td>
</tr>
<tr>
<td>D</td>
<td>DARIANA INC</td>
<td>122 714-236-1382</td>
</tr>
<tr>
<td>76-77</td>
<td>DCA (N.A.)</td>
<td>27 800-348-3221 ext. 25DD</td>
</tr>
<tr>
<td>506</td>
<td>DEG (INT'L)</td>
<td>40</td>
</tr>
<tr>
<td>133</td>
<td>DIVERSIFIED COMPUTER</td>
<td>125 303-447-9251</td>
</tr>
<tr>
<td>78</td>
<td>EASTERN SYSTEMS</td>
<td>82 508-435-2151</td>
</tr>
<tr>
<td>143-144</td>
<td>EDEN'S TECHNOLOGY CORP</td>
<td>124 309-882-1704</td>
</tr>
<tr>
<td>119</td>
<td>FRANKLIN QUEST CO</td>
<td>45 600-677-1814</td>
</tr>
<tr>
<td>114-115</td>
<td>FUNK SOFTWARE</td>
<td>64 617-497-6339</td>
</tr>
<tr>
<td>H</td>
<td>HONEYWELL KEYBOARD DIV</td>
<td>CIV 800-445-6839</td>
</tr>
<tr>
<td>503</td>
<td>INNOVATIVE SOFTWARE (INT'L)</td>
<td>89 +49-69-236929</td>
</tr>
<tr>
<td>80-82</td>
<td>INTERACTIVE INC</td>
<td>67 800-292-2112</td>
</tr>
<tr>
<td>83-84</td>
<td>INTERGRAPH (N.A.)</td>
<td>36 800-345-4856</td>
</tr>
<tr>
<td>85</td>
<td>IOMEGA</td>
<td>4-5 803-777-4045</td>
</tr>
<tr>
<td>K</td>
<td>KEA SYSTEMS LTD</td>
<td>CII 800-663-8702</td>
</tr>
<tr>
<td>M</td>
<td>MACSYMA</td>
<td>104 800-MACSYMA</td>
</tr>
<tr>
<td>110-111</td>
<td>MAG INNOVISION</td>
<td>7 714-827-3998</td>
</tr>
<tr>
<td>146-147</td>
<td>MAXPEED CORP</td>
<td>125 800-877-7998</td>
</tr>
<tr>
<td>106-107</td>
<td>MEDIA VISION</td>
<td>42 800-845-8870</td>
</tr>
<tr>
<td>140</td>
<td>MEMORY SUPERSTORE</td>
<td>124 800-800-7056</td>
</tr>
<tr>
<td>87-88</td>
<td>MERIDIAN SOFTWARE</td>
<td>96 800-635-2522</td>
</tr>
<tr>
<td>90-91</td>
<td>MICRO SOLUTIONS COMP PROD</td>
<td>19 815-756-3411</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Inquiry No.</th>
<th>Page No.</th>
<th>Phone No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>141</td>
<td>MICROCAL INC</td>
<td>125 413-586-7720</td>
</tr>
<tr>
<td>89</td>
<td>MICROGRAFX</td>
<td>17 800-998-0153</td>
</tr>
<tr>
<td>134</td>
<td>MICROSTAR LABORATORIES</td>
<td>125 206-453-2345</td>
</tr>
<tr>
<td>501</td>
<td>MINOLTA GMBH (PAN EUROPE)</td>
<td>77 +49-511-77000</td>
</tr>
<tr>
<td>N</td>
<td>NAGA SYSTEMS CORP</td>
<td>120 800-558-6242</td>
</tr>
<tr>
<td>92-93</td>
<td>NANA USA CORP (N.A.)</td>
<td>89 310-325-5202</td>
</tr>
<tr>
<td>94</td>
<td>NATIONAL INSTRUMENTS</td>
<td>108 800-433-3488</td>
</tr>
<tr>
<td>95</td>
<td>NEURON DATA</td>
<td>21 800-876-4900 ext. 837</td>
</tr>
<tr>
<td>O</td>
<td>OUTOKUMPU RESEARCH OY</td>
<td>125 +35838265310**</td>
</tr>
<tr>
<td>P</td>
<td>PERCEPTIVE SOLUTIONS</td>
<td>56 800-486-3278</td>
</tr>
<tr>
<td>130</td>
<td>PERSONAL SOLUTION COMP</td>
<td>123 800-585-3961</td>
</tr>
<tr>
<td>121</td>
<td>PHYSIOTRONICS CORP, USA</td>
<td>71 800-952-2314</td>
</tr>
<tr>
<td></td>
<td>POLARIS SOFTWARE</td>
<td>83 800-PACKRAT G041</td>
</tr>
<tr>
<td>98</td>
<td>POPKIN SW &amp; SYSTEMS INC</td>
<td>15 212-571-3434</td>
</tr>
<tr>
<td>108-109</td>
<td>PROXIMA CORP</td>
<td>61 619-457-5500</td>
</tr>
<tr>
<td>Q</td>
<td>QUALSTAR CORP</td>
<td>124 818-882-5822</td>
</tr>
<tr>
<td>148-149</td>
<td>QUANTUM CORP</td>
<td>67 408-894-4000</td>
</tr>
<tr>
<td>S</td>
<td>SCEPTRE TECHNOLOGIES</td>
<td>94 800-788-2978</td>
</tr>
<tr>
<td>136</td>
<td>SCIENTIFIC ENDEAVORS</td>
<td>125 800-998-1571</td>
</tr>
<tr>
<td>137</td>
<td>SEALEVEL SYSTEMS INC</td>
<td>124 803-843-4343</td>
</tr>
<tr>
<td>100-101</td>
<td>SOFTWARE SECURITY INC</td>
<td>84 203-329-8870</td>
</tr>
<tr>
<td>102</td>
<td>SOFTWARE SPECTRUM (N.A.)</td>
<td>77 800-824-3323</td>
</tr>
<tr>
<td>504-505</td>
<td>SPEA SOFTWARE AG (INT'L)</td>
<td>36 +49-9151-21256**</td>
</tr>
<tr>
<td>103</td>
<td>SPSS INC</td>
<td>79 800-543-5835</td>
</tr>
<tr>
<td>142</td>
<td>STARGATE TECHNOLOGIES</td>
<td>124 800-782-7248</td>
</tr>
<tr>
<td>104</td>
<td>STATSOFT</td>
<td>111 918-583-4149</td>
</tr>
<tr>
<td>105</td>
<td>STRATEGIC MAPPING (N.A.)</td>
<td>40 800-442-8887</td>
</tr>
<tr>
<td>99</td>
<td>SZKI RECOGNITA CORP</td>
<td>18 +66-1-2019825</td>
</tr>
<tr>
<td>T</td>
<td>TOSHIBA AMERICA INC</td>
<td>62-63 800-457-7777</td>
</tr>
<tr>
<td>138-139</td>
<td>TRIBAL MICROSYSTEMS</td>
<td>124 510-623-8859</td>
</tr>
<tr>
<td>U</td>
<td>U-LEAD SYSTEMS</td>
<td>116 800-858-5323 ext. 250</td>
</tr>
<tr>
<td>W</td>
<td>WACOM TECHNOLOGY CORP</td>
<td>74 800-922-6613</td>
</tr>
<tr>
<td>502</td>
<td>WALKER, RICHER &amp; QUINN (INT'L)</td>
<td>27 206-324-0407</td>
</tr>
<tr>
<td>Z</td>
<td>ZYXEL USA</td>
<td>30-31 714-693-0808</td>
</tr>
</tbody>
</table>

* Correspond directly with company.
** Indicates FAX Number
For FREE product information from individual advertisers, circle the corresponding inquiry numbers on Your Direct Link Card!

To receive information for an entire product category, circle the category number on Your Direct Link Card!

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>HARDWARE</td>
<td></td>
<td></td>
<td>SOFTWARE</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 ADD-IN BOARDS</td>
<td>63</td>
<td>ATI TECHNOLOGIES INC</td>
<td>59</td>
<td>16 MISCELLANEOUS HARDWARE</td>
<td>108-109</td>
<td>PROXIMA CORPORATION</td>
<td>61</td>
<td>114-115</td>
</tr>
<tr>
<td></td>
<td>506</td>
<td>DEC (INT'L)</td>
<td>40</td>
<td>17 MODEMS/MULTIPLEXORS</td>
<td>112-113</td>
<td>ZYXEL USA</td>
<td>30-31</td>
<td>502</td>
</tr>
<tr>
<td></td>
<td>143-144</td>
<td>EDEN'S TECHNOLOGY CORP</td>
<td>124</td>
<td>18 MONITORS &amp; TERMINALS</td>
<td>74-75</td>
<td>CTX INTERNATIONAL INC</td>
<td>41</td>
<td>78</td>
</tr>
<tr>
<td></td>
<td>96-97</td>
<td>PERCEPTIVE SOLUTIONS</td>
<td>56</td>
<td>19 MULTIMEDIA</td>
<td>80-82</td>
<td>INTERACTIVE INC</td>
<td>67</td>
<td>134</td>
</tr>
<tr>
<td></td>
<td>137</td>
<td>SEALEVEL SYSTEMS INC</td>
<td>124</td>
<td>20 PRINTERS/PLOTTERS</td>
<td>501</td>
<td>MINOLTA GMBH (PAN EUROPE)</td>
<td>77</td>
<td>94</td>
</tr>
<tr>
<td></td>
<td>504-505</td>
<td>SPEA SOFTWARE AG (INT'L)</td>
<td>36</td>
<td>21 PROGRAMMABLE HARDWARE</td>
<td>138-139</td>
<td>TRIBAL MICSYSTEMS</td>
<td>124</td>
<td>29</td>
</tr>
<tr>
<td></td>
<td>142</td>
<td>STARGATE TECHNOLOGIES</td>
<td>124</td>
<td>22 SCANNERS/OCR/DIGITIZERS</td>
<td>68-69</td>
<td>CAERECORP</td>
<td>23</td>
<td>126</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4 COMMUNICATIONS/NETWORKING</td>
<td>505</td>
<td>DEC (INT'L)</td>
<td>40</td>
<td>23 TAPE DRIVES</td>
<td>135</td>
<td>QUALSTAR CORP</td>
<td>124</td>
<td>31</td>
</tr>
<tr>
<td></td>
<td>143-144</td>
<td>EDEN'S TECHNOLOGY CORP</td>
<td>124</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>142</td>
<td>STARGATE TECHNOLOGIES</td>
<td>124</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5 COMPUTER SYSTEMS</td>
<td>83-84</td>
<td>INTERGRAPH (N.A.)</td>
<td>36</td>
<td>36 MATHEMATICAL/STATISTICAL</td>
<td>116</td>
<td>MACSYNA</td>
<td>104</td>
<td>103</td>
</tr>
<tr>
<td></td>
<td>131-132</td>
<td>NAGA SYSTEMS CORP</td>
<td>120</td>
<td>104 STATSOFT</td>
<td>111</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>130</td>
<td>PERSONAL SOLUTION COMP</td>
<td>123</td>
<td>38 ON-LINE SERVICES</td>
<td>*</td>
<td>COMPUSERVE</td>
<td>48A-B</td>
<td>70</td>
</tr>
<tr>
<td>7 DISK &amp; OPTICAL DRIVES</td>
<td>85</td>
<td>IOMEGA</td>
<td>4-5</td>
<td>40 PROGRAMMING LANGUAGES/TOOLS</td>
<td>503</td>
<td>INNOVATIVE SOFTWARE (INT'L)</td>
<td>89</td>
<td>87-88</td>
</tr>
<tr>
<td></td>
<td>90-91</td>
<td>MICRO SOLUTIONS COMP PROC</td>
<td>19</td>
<td>98 POPKIN S&amp;W &amp; SYSTEMS INC</td>
<td>15</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>149-149</td>
<td>QUANTUM CORP</td>
<td>87</td>
<td>41 SECURITY</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8 DISKETTES/DUPLICATORS</td>
<td>83-84</td>
<td>INTERGRAPH (N.A.)</td>
<td>36</td>
<td>42 SPREADSHEETS</td>
<td>102</td>
<td>SOFTWARE SPECTRUM (N.A.)</td>
<td>77</td>
<td>62</td>
</tr>
<tr>
<td>9 GRAPHICS TABLETS/MICE/PEN INPUT</td>
<td>79</td>
<td>HONEYWELL KEYBOARD DIV</td>
<td>GIV</td>
<td>101 SOFTWARE SECURITY INC</td>
<td>84</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>120</td>
<td>WACOM TECHNOLOGY CORP</td>
<td>74</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12 LAN HARDWARE</td>
<td>122-123</td>
<td>CYBEX CORPORATION</td>
<td>119</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>124-125</td>
<td>CYBEX CORPORATION</td>
<td>121</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>506</td>
<td>DEC (INT'L)</td>
<td>40</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13 LAPTOPS &amp; NOTEBOOKS</td>
<td>150</td>
<td>TOSHIBA AMERICA INC</td>
<td>62-63</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14 MAIL ORDER</td>
<td>130</td>
<td>PERSONAL SOLUTION COMP</td>
<td>123</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15 MEMORY/CHIPS/UPGRADES</td>
<td>140</td>
<td>MEMORY SUPERSTORE</td>
<td>124</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

130 BYTE's Essential Guide to Windows • Spring 1993
For FREE product information from individual advertisers, circle the corresponding inquiry numbers on your Direct Link Card!

To receive information for an entire product category, circle the category number on your Direct Link Card!

<table>
<thead>
<tr>
<th>Category No.</th>
<th>Inquiry No.</th>
<th>Page No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>46 UTILITIES</td>
<td>62 ALADDIN KNOWLEDGE SYSTEMS</td>
<td>25</td>
</tr>
<tr>
<td>126-127 DARIANA INC</td>
<td></td>
<td>122</td>
</tr>
<tr>
<td>47 WINDOWS</td>
<td>61 ADOBE SYSTEMS INC (N.A.)</td>
<td>50-51</td>
</tr>
<tr>
<td>126-127 DARIANA INC</td>
<td></td>
<td>122</td>
</tr>
<tr>
<td>119 FRANKLIN QUEST CO</td>
<td></td>
<td>45</td>
</tr>
<tr>
<td>503 INNOVATIVE SOFTWARE (INT'L)</td>
<td></td>
<td>89</td>
</tr>
<tr>
<td>50-62 INTERACTIVE INC</td>
<td></td>
<td>67</td>
</tr>
</tbody>
</table>

**BYTE ADVERTISING SALES STAFF**

Liz Coyman, Inside Advertising Sales Director, One Phoenix Mill Lane, Peterborough, NH 03458, Tel. (603) 924-2516

**NEW ENGLAND**

ME, NH, VT, MA, RI, CT, ONTARIO

Canada & Eastern Canada

David Richardson (877) 959-5344
Parricia Payne (603) 924-2565

Mary Ann Goulding (404) 841-4782

McGraw-Hill Publications

24 Herff Hall Avenue

Londonderry, NH 03053

FAX: (617) 959-5499

**SOUTHEAST**

NC, SC, GA, FL, AL, TN, MS, AR, LA, KY, MO, OK, WV

Gary Lucas (404) 545-5038

McGraw-Hill Publications

617 Ashford-Dunwoody Rd., Suite 520

Atlanta, GA 30306

FAX: (404) 545-4556

**MIDWEST**

IL, MI, KS, IA, ND, SD, WI, NE, MN, OH

Kurt Kalley (312) 916-3239

Scott Ware (612) 248-2564

McGraw-Hill Publications

810 North Station Ave.

Chicago, IL 60601

FAX: (312) 816-3370

**SOUTHWEST, RIO GRANDE RIVER**

CO, OK, TX

Jennifer Walker (214) 916-3209

McGraw-Hill Publications

14900 Quorum Dr., Suite 380

Dallas, TX 75240

FAX: (214) 916-2520

**SOUTH PACIFIC, LOS ANGELES, CA**

Los Angeles County, AZ, NM, El Paso (213) 460-5424

Larry Levine (603) 924-2637

McGraw-Hill Publications

3333 WIlshire Boulevard 4107

Los Angeles, CA 90010

FAX: (213) 459-2549

**NORTH PACIFIC**

NORTHERN CA, OR, ID, MT, WY, UT

Rey J. Kops (415) 916-3281

Joseph Molie (303) 594-2682

SILICON VALLEY, OR, WA, AK, W. CANADA

Bill McHaffy (415) 594-2682

McGraw-Hill Publications

1900 O'Farrell Street, #200

San Mateo, CA 94403

FAX: (415) 916-2467

**EAST COAST**

NY, NYC, NJ, DE, PA

Ken Norris (212) 512-2645

Kun Kolloy (312) 616-3328

Larry Lovino (603) 924-2637

NY, NYC, NJ, DE, PA

IL, MO, KS, IA, ND, SD, MN

LO, Anilil:ol:u, CA

Basi>era Holmos (415) 513-0945

Larry Lovino (603) 924-2637

McGraw-Hill Publications

1900 O'Farrell Street, #200

San Mateo, CA 94403

FAX: (415) 916-2467

**WEST COAST**

CA, NM, AZ

Maggie Silver (603) 924-2662

Bohn Dudas (714) 991-0208

SILICON VALLEY, NV

Bahiya Echevarria (603) 924-2574

McGraw-Hill Publications

1900 O'Farrell Street, #200

San Mateo, CA 94403

FAX: (415) 916-2467

**INTERNATIONAL ADVERTISING SALES STAFF**

GERMANY

Jorgen Haase


Loblawasse 19

D-6050 Frankfurt

Germany

Tel: +49 69 71470-140

FAX: +49 69 71470-147

SCANDINAVIAN COUNTRIES

Zena Coupé

A-Z International Sales Ltd.

70 Chalk Farm Road

London NW1 8AN

England

Tel: +44 71 2843171

FAX: +44 71 2843176

FRANCE, UNITED KINGDOM, BENELUX

Gary Lucas (404) 545-5038


Weinfren Bridge House

One Herford Road

Wimbledon, London SW6 5FU

England

FAX: +44 71 5056294

TELEX: 025011

ITALY

Zena Coupé, Amanda Bleskot

A-Z International Sales Ltd.

70 Chalk Farm Road

London NW1 8AN

England

Tel: +44 71 2843171

FAX: +44 71 2843174

ISRAEL

Dan Enrich

Echadik Communication Intern.

P.O. Box 29

Herzliya 46101

Israel

Tel: +972 3 586344

FAX: +972 3 5869590

AUSTRALIA

Rod Tremlett

Rod Tremlett Media

Suite 4, 1st Floor

13-14 My Lydia Street

Grosvenor, NSW

Australia 2065

Tel: +61 2 955 2549

FAX: +61 2 955 2548

JAPAN

Masato Maru

Transworld Media Inc

4th Floor, 1-25-5 Kamiguro

Meguro-ku, Tokyo 153

Japan

Tel: +81 3 57210781

FAX: +81 3 57210782

KOREA

Young-Ilk Chung

JEE MEDIA INT'L.

54-7, Chamwon-Dong, SeochO-Gu

41st Floor

2nd Fl. No. 19-1, Lane 231

Sukchon-Kuy, Seoul 137-030

Korea

Tel: +82 2 5498865

FAX: +82 2 5498861

SINGAPORE

Derek Low

Stephen Tay

Transworld Publishing Corp.

1123 Seaview Road, #03-01

Singapore 1220

Tel: +65 256 9156

FAX: +65 256 9151

CHINA

Catherine Lee

Third Wave Publishing Corp.

Unit 2, 6F, Happy W thighs Center

2nd Fl. No. 19-1, Lane 231

Fu Hsing North Road

Taipei 10445, Taiwan

Tel: +886 2 2616 3383

FAX: +886 2 2616 3385

THAILAND

Jack Hu

Sahanvnya OA Group

321 Pranpattl Bldg., Sukhumvit

Road 21

Siam, Sathorn 10050

Tel: +66 2 2659595

FAX: +66 2 2659596

TAIWAN

Lawrence Lee

Third Wave Publishing Corp.

3rd Fl., No. 19-1, Lane 231

Fu Hsing North Road

Taipei 10445, Taiwan

Tel: +886 2 2659595

FAX: +886 2 2659596

INDIA, INDONESIA,

PAS XA, PHILIPPINES,

OTHER ASIAN AND

PACIFIC COUNTRIES

K. T. Wu

Third Wave Publishing Corp.

3rd Fl., No. 19-1, Lane 231

Fu Hsing North Road

Taipei 10445, Taiwan

Tel: +886 2 2659595

FAX: +886 2 2659596

Subscription Customer Service

U.S. 1-800-292-2983

Outside U.S. +1-609-426-7676

For a New Subscription

U.S. 1-800-257-9402

Outside U.S. +1-609-426-5526

BYTE's Essential Guide to Windows • Spring 1993 131
What's The Future of Telecommunications? 
It's Your Call...

Dial 212.512.3113 to Find Out.

Call Ilene Barnofsky at 212.512.3113 or 800.821.1329 for more details and to register for the event.

For information about corporate sponsorship at this or other Business Week Executive Programs, contact William H. DeGraff, Director of Sales, Strategic Programs 212.512.6012


To be held May 5 through 6, 1993 at McGraw-Hill World Headquarters, Rockefeller Center, New York

Calling all upper management: Directors, executive vice-presidents, general managers, vice-presidents/MIS of North America’s largest corporations, and military and government officials directly involved in making international telecommunications policy.

Business Week's Symposium on The Future of World Communications will feature personal interchanges with leading figures of international business and government.

Agenda highlights include:

The Honorable Robert J.L. Hawke, Prime Minister of Australia, 1983-1991:

"Telecommunications and Asia-Pacific Economic Cooperation: Laying the Groundwork for a Truly Pacific Community"

Hank R. Greenberg, Chairman & CEO American International Group:

"View From The Top: The CEO's Perspective on World Communications"

"The Ministers' Roundtable" which features:

Ambassador Bradley P. Holmes, Assistant Secretary of State, U.S. Department of State
Edward Leigh MP, Parliamentary Under-Secretary of State for Trade and Technology, UK
Dr. Eugene Chien, Minister of Transportation and Communications, Republic of China

Presented in association with:

BT Cable and Wireless, PLC
France Telecom PTT Telecom Netherlands U.S., Inc.
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td></td>
<td>F</td>
<td></td>
<td></td>
<td></td>
<td>G</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1075</td>
<td>Accton Technology</td>
<td>37</td>
<td>1151</td>
<td>FarPoint Technologies</td>
<td>48</td>
<td>1022</td>
<td>Graphical Dynamics</td>
<td>22</td>
<td></td>
</tr>
<tr>
<td>1043</td>
<td>ACE Centre</td>
<td>28</td>
<td>1090</td>
<td>Fourth Wave Technologies</td>
<td>37</td>
<td>1024</td>
<td>hDC Computer</td>
<td>22</td>
<td></td>
</tr>
<tr>
<td>1095</td>
<td>Action Plus Software</td>
<td>37</td>
<td>1090</td>
<td>FirstLight Productions</td>
<td>57</td>
<td>1019</td>
<td>IMRS</td>
<td>20, 31</td>
<td></td>
</tr>
<tr>
<td>1092</td>
<td>ADS</td>
<td>37</td>
<td>1048</td>
<td>Informative Graphics</td>
<td>24</td>
<td>1049</td>
<td>Intergraph</td>
<td>31</td>
<td></td>
</tr>
<tr>
<td>988</td>
<td>Aldus</td>
<td>99</td>
<td>1066</td>
<td>IBM</td>
<td>57, 69</td>
<td>1020</td>
<td>Letrasert Software Products</td>
<td>52</td>
<td></td>
</tr>
<tr>
<td>1076</td>
<td>Alta Research</td>
<td>37</td>
<td>1115</td>
<td>LaserTools</td>
<td>52</td>
<td>1021</td>
<td>Looking Glass Software</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>1046</td>
<td>Ampersand</td>
<td>31</td>
<td>1066</td>
<td>IBM</td>
<td>57, 69</td>
<td>995</td>
<td>Hercules</td>
<td>11</td>
<td></td>
</tr>
<tr>
<td>1081</td>
<td>Apex Technology</td>
<td>37</td>
<td>1028</td>
<td>Informix</td>
<td>57</td>
<td>1060</td>
<td>Intuit</td>
<td>75, 136</td>
<td></td>
</tr>
<tr>
<td>1064</td>
<td>AST Research</td>
<td>69</td>
<td>1024</td>
<td>hDC Computer</td>
<td>22</td>
<td>1110</td>
<td>Iterated Systems</td>
<td>95</td>
<td></td>
</tr>
<tr>
<td>1025</td>
<td>Asymetrix</td>
<td>22</td>
<td>1028</td>
<td>Informative Graphics</td>
<td>24</td>
<td>1124</td>
<td>Intel</td>
<td>57</td>
<td></td>
</tr>
<tr>
<td>991, 1</td>
<td>ATI Technologies</td>
<td>10, 13</td>
<td>1048</td>
<td>136</td>
<td>1049</td>
<td>Intergraph</td>
<td>31</td>
<td></td>
<td></td>
</tr>
<tr>
<td>999</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1030</td>
<td>Avalan Technology</td>
<td>24</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1091</td>
<td>Beyond</td>
<td>37</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1018</td>
<td>CADworks</td>
<td>20</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1087</td>
<td>Caere</td>
<td>37</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1086</td>
<td>Calera</td>
<td>37</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1044</td>
<td>Canyon Software</td>
<td>28</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>987, 1</td>
<td>Claris</td>
<td>10, 99</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>990</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1031</td>
<td>Cognitronix</td>
<td>26</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1055</td>
<td>Compaq Computer</td>
<td>69</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1037</td>
<td>The Complete PC</td>
<td>26</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1101</td>
<td>Contact Software</td>
<td>109</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1148, 1</td>
<td>Coromandel</td>
<td>48</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1222</td>
<td>Industries</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1226</td>
<td>Creative Labs</td>
<td>57</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1006</td>
<td>DeltaPoint</td>
<td>13</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>994</td>
<td>Diamond Computer Technology</td>
<td>11</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1023</td>
<td>Distinct</td>
<td>22</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1152</td>
<td>Elite High Technology</td>
<td>52</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1085</td>
<td>Emerald Systems</td>
<td>37</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1007</td>
<td>Eudrite Software</td>
<td>13</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1014</td>
<td>MicroLogic Software</td>
<td>16</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1100</td>
<td>MicroProsa Software</td>
<td>134</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>989, 1</td>
<td>Microsoft</td>
<td>6, 12, 32, 52, 993, 57, 75, 81, 85, 1001, 91, 99, 105, 134</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1004</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1061</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1096</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1159</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1221</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>992</td>
<td>Mouse Systems</td>
<td>10</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1157</td>
<td>Myriad Enterprises</td>
<td>52</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1153</td>
<td>Pacific Data Products</td>
<td>52</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1035, 1</td>
<td>PC-Kwik</td>
<td>26, 52</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1154</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1089</td>
<td>Performance Technology</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1049</td>
<td>Phar Lap Software</td>
<td>28</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1147</td>
<td>Physiotronics</td>
<td>81</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1096</td>
<td>Pilot Software</td>
<td>37</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1150</td>
<td>Pioneer Software</td>
<td>48</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1034</td>
<td>Powercore</td>
<td>26</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1000</td>
<td>Power Up Software</td>
<td>91</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1036</td>
<td>Prisma Office</td>
<td>26</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1079</td>
<td>Proxima</td>
<td>37</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1103</td>
<td>Pyramid Data</td>
<td>109</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1008</td>
<td>Q/Media Software Qualitas</td>
<td>13</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1008</td>
<td>Quarterdeck Office Systems</td>
<td>32</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1078</td>
<td>Racal-Datacom</td>
<td>37</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1077</td>
<td>Racore Computer Products</td>
<td>37</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1026, 1</td>
<td>Richmond</td>
<td>22, 109</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1104</td>
<td>Technologies</td>
<td>&amp; Software</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1011, 1</td>
<td>Shiva</td>
<td>14, 37</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1002</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1156</td>
<td>Software Directions</td>
<td>52</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>986, 1</td>
<td>Software Publishing</td>
<td>26</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1032</td>
<td>99, 109</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1097</td>
<td>Software Ventures</td>
<td>134</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1063</td>
<td>Spinnaker Software</td>
<td>105</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1045</td>
<td>Springtime Software</td>
<td>28</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Star Software Systems</td>
<td>136</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>998</td>
<td>STB Systems</td>
<td>11</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1010</td>
<td>Sterling Software</td>
<td>13</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1017</td>
<td>Strategic Mapping</td>
<td>18</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1093</td>
<td>Symantec</td>
<td>37, 136</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1080</td>
<td>Thomas-Conrad</td>
<td>37</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1002</td>
<td>Timeworks</td>
<td>91</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1067</td>
<td>Toshiba America Information Systems</td>
<td>69</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1038</td>
<td>Trio Information Systems</td>
<td>26</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1228</td>
<td>Turtle Beach Systems</td>
<td>57</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Unix Systems Laboratories</td>
<td>6</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1027</td>
<td>Virtual Skrket Technology</td>
<td>24</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1050</td>
<td>Vision Numerics</td>
<td>31</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1009</td>
<td>Vision Software International</td>
<td>13</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1051</td>
<td>Visual Software</td>
<td>31</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1005, 1</td>
<td>WordPerfect</td>
<td>16, 37, 85</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1015, 1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1083</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>XTree</td>
<td>37</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1042</td>
<td>XVT Software</td>
<td>28</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1158</td>
<td>Zenographics</td>
<td>52</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1013</td>
<td>Zylab</td>
<td>14</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

For more information on any of the companies covered in articles, columns, or news stories in this issue, circle the appropriate inquiry number on Your Direct Link Card. Each page number refers to the first page of the article or section in which the company name appears.
Short Subjects

Windows products for work and leisure

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.

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, so 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 puts.
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.

**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!nc 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!nc hasn’t forgotten that many people prefer keyboards; the Planner has keyboard alternatives for most mouse-clicks. To my mind, the interface is intuitively correct, and the documentation is straightforward. Amaze!nc also offers Trivial Pursuit Sports and Genius 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 Chiquoine

**The Far Side Daily Planner 2.0 for Windows $69.95**
Amaze!nc
Kirkland, WA
(206) 820-7007
fax: (206) 823-0568
Circle 1099 on Inquiry Card.

**Dr. Floyd’s Desktop Toys**
(MicroProse Entertainment Pack Vol. I)

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 screensaver 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

**Dr. Floyd’s Desktop Toys $39.95**
MicroProse Software, Inc.
Hunt Valley, MD
(800) 879-7529
(410) 771-0440
Circle 1100 on Inquiry Card.
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 run 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.

Under New Management from Franklin Quest (Salt Lake City, UT) 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.

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.
We’ve just added a new dimension to VT340 functions—Windows.

Imagine working with host graphic images as comfortably as you work at your PC. KEAterm 340 gives the power of Windows to your host applications.

KEAterm products combine the features of Windows—copy & paste, DDE, script language and multiple sessions—with the features of the VT340 terminal—multinational text and ReGIS, Tektronix and sixel graphics. So, you can use traditional PC tools, like word processors and spreadsheets, to handle your host data.

With copy and paste and Dynamic Data Exchange (DDE), KEAterm delivers true PC-to-host integration. Control your host data just as you control PC applications—with access to the same powerful software and printers. Pull down financial figures from your remote host to automatically pop into your spreadsheet for further processing and charting. Host data becomes truly usable.

With KEAterm 340, you can use PC graphics tools to expand the use of host graphics. Copy ReGIS, Tektronix and sixel images into desktop publishing or draw packages for further manipulation.

Picture new power for host applications with KEAterm 340 for Windows.

KEA Systems Ltd.
Call 1-800-663-8702
Phone: (604) 431-0727
Fax: (604) 431-0818

Circle 86 on Inquiry Card.
COMPARISON
THE NEW
HONEYWELL
MOUSE
TO ALL
THE
OTHERS.

It’s Different. It’s Better.
It’s The Last Mouse You’ll Ever Need To Buy.

“The unique dual-wheel design means no more mouse ball cleaning or replacing. The feel is identical to the best ball mouse. Very cool product. I was impressed.” — John C. Dvorak, PC Magazine

“Microsoft may have ruled the roost, but the best bar none is this Honeywell mouse. Without a doubt this is the best mouse I’ve used, and its design proves that the ball-based design was wrong.” — Barry Plows, Windows Magazine U.K.

“Once you use the Honeywell mouse, you probably won’t want to go back to an ordinary mouse.” — Joe Fishkind, UPI

It’s Almost Unfair To Compare. Our new technology is so advanced it virtually makes other mice obsolete.

Compare the accuracy. A ball mouse picks up dust and dirt that can roll up and contaminate the internal mechanism, which makes your cursor jump around the screen. Our unique design keeps the mouse free of debris, so your cursor goes precisely where you want it, when you want it — forever.

Compare the ease of use. The Honeywell mouse doesn’t need a special pad; it works perfectly on any surface — at any angle — even upside down!

Compare the quality, reliability and price. Proven Honeywell quality and fewer parts make our mouse extremely reliable. So reliable, we back it with a limited lifetime warranty. And, our simple design allows it to be competitively priced with mice using out-of-date ball technology.

So, compare all of the other mice. But do yourself a favor and try a new Honeywell mouse — you’ll see why it’s the last mouse you’ll ever need to buy. We guarantee it.

The Honeywell mouse is Microsoft®, Windows®, and DOS compatible, and works with IBM, compatibles and PS/2 systems.

For information on where to get the new Honeywell mouse call us at 1-800-445-6939.

In Canada, call (416) 293-8111.

Circle 79 on Inquiry Card.

Honeywell

Available At

Honeywell Inc./Keyboard Division 4171 N. Mesa, Bldg. D, El Paso, Texas 79902 1-800-445-6939

*See warranty for complete details. ©1983 Honeywell Inc. Keyboard Division. All product names are trademarks of their respective companies.