

# COMPUTE

MAY 1992

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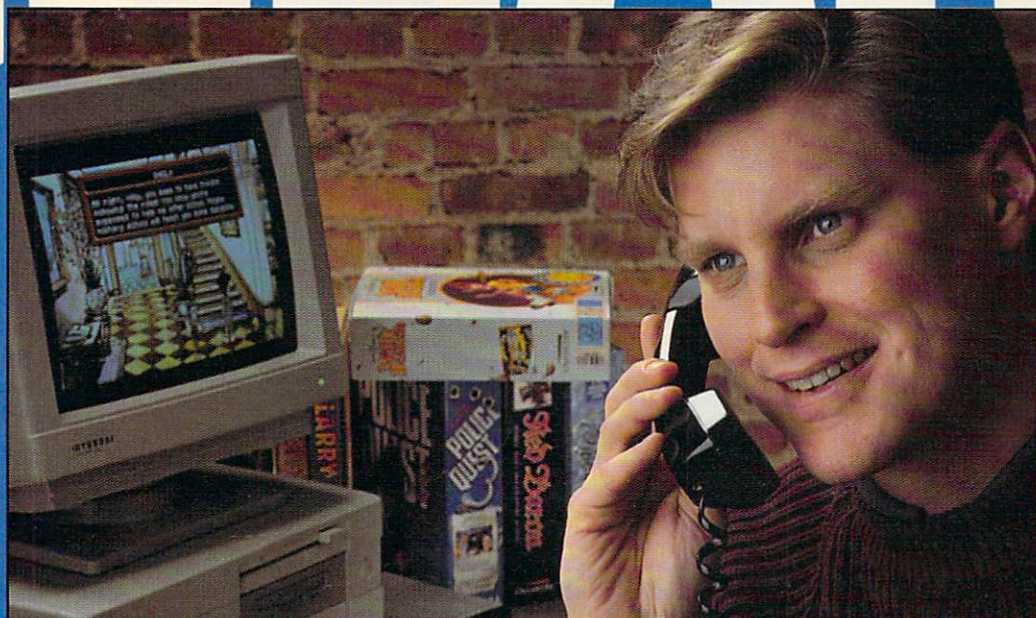
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# COMPUTE

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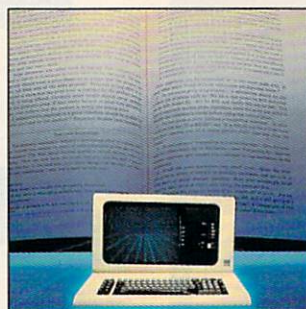
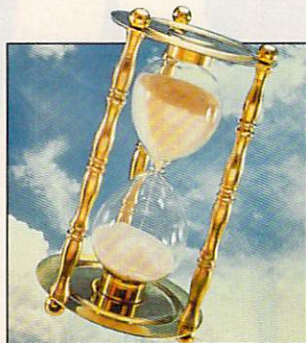
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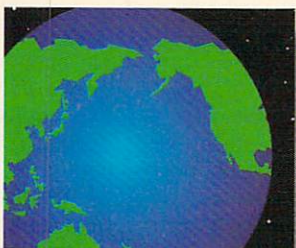
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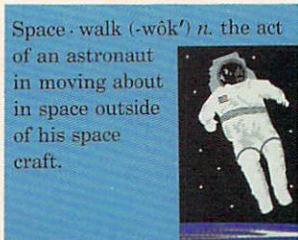
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# EDITORIAL LICENSE

Clifton Karnes

**W**hen Windows 3.0 hit the streets two years ago, it entered a hostile world. OS/2 loomed on the horizon like a dragon ready to devour us, and MS-DOS, stuck in version 4.0, had lost its momentum. It looked as if Digital Research with DR DOS was the only company really trying to make DOS better. Computing was boring, and the masses were grumbling. Some people even started talking about UNIX.

After two years of Windows 3.0, things are very different. OS/2 is on its way to becoming a footnote in computer history. Microsoft has just released a dramatic upgrade to Windows 3.0, version 3.1, which will further cement Windows as the operating environment of choice. And the company has produced an excellent new version of DOS, version 5.0, that fits Windows like a glove. Today, there are hundreds of exciting Windows applications, doing things most of us only dreamed about two

years ago. The masses are happy, and no one talks about UNIX much anymore.

Why has Windows been so successful? There are four main reasons.

First, there's the quality of the program itself. Windows is well designed, attractive, easy to use, flexible, and powerful. And it comes with an excellent group of support programs including Write, Paintbrush, Cardfile, Calendar, and Recorder.

The second thing that's really fueled Windows' takeoff is the fact that it runs DOS apps so well. In 386-enhanced mode, you can multitask DOS applications and customize the way they run. Microsoft recognized that downward compatibility with DOS was essential, and 3.0 garners four stars for getting along with DOS so well.

For those of us who use DOS apps regularly (and I imagine that includes most Windows users), 3.1 is a boon. Not only does it let you select your own DOS icons (which appear on your desktop when you minimize the DOS apps), but windowed DOS apps now support the mouse. Windows 3.1 earns *five* stars for getting along with DOS.

The third element is 386 hardware. Windows' magic act with DOS apps only plays on computers powered by an 80386 or better CPU. When Windows 3.0 was released, 386s had just become an option for most of us. A full-boat system was still about \$3,000, but that was within reach—a figure most serious PC users and most companies could handle.

Now, two years later, 386 prices have dropped *dramatically*, and loaded systems sell for about half of what they did at Windows' debut. The 386 is fast becoming the *de facto* standard.

The fourth major factor in

Windows' success (and perhaps the most important in the long run) is that a large number of Windows applications were immediately available after 3.0's release. In the past two years, developers have fallen over each other creating Windows applications and have made this by far the most active area in applications development today.

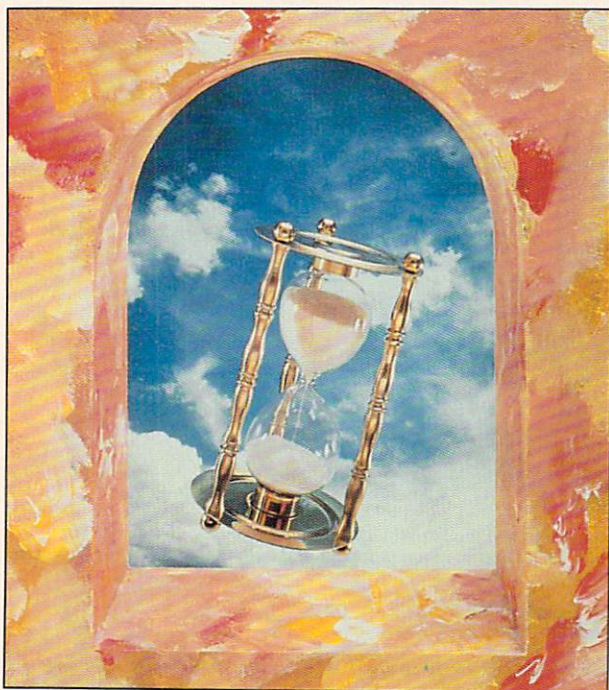
There's no doubt about Windows' success, but the question is, Should you switch to Windows?

In most cases the answer is yes. And the reason is simple. The most exciting apps being released today are Windows programs. And Windows programs are usually much more powerful than their DOS counterparts. But the icing on the cake is, as I mentioned earlier, that you can stay at the leading edge with Windows programs, but you don't have to give up your DOS favorites.

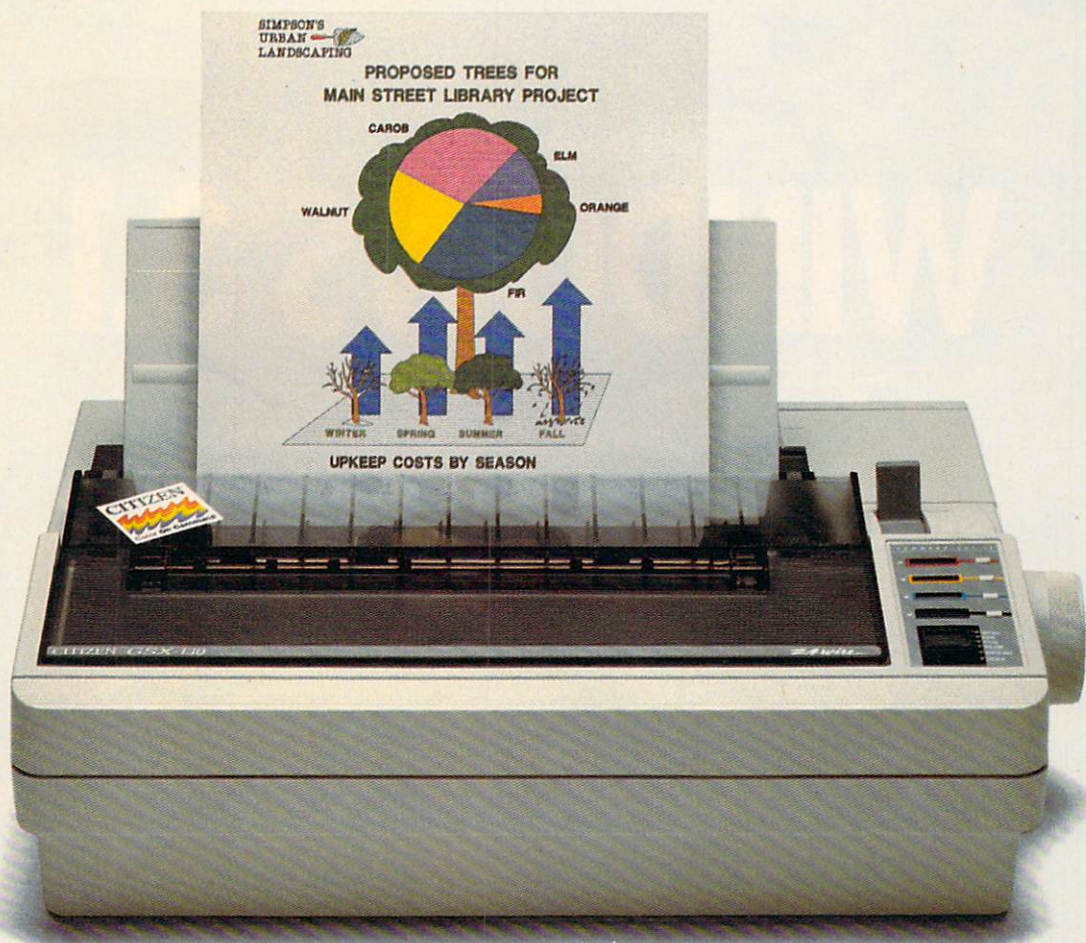
For example, DOS XyWrite is still one of my favorite word processors, and I'm writing this column with XyWrite now. If I have to print something that needs to look spiffy, however, I use Word for Windows. And if the document is complicated, I use PageMaker for Windows.

This issue celebrates Windows' birthday with a special feature on Windows' brand-new release, 3.1. You'll find out why 3.1 is the upgrade of the year, but don't stop there. You'll also find reviews of about 20 Windows products scattered throughout the magazine in Test Lab, columns, departments, and reviews. If you're thinking about catching the Windows wave, these articles will help you decide. If you're new to Windows, this issue will give you a jump start. And if you're a pro, you'll find a hands-on look at what's new with Windows 3.1. □

**When Microsoft released Windows 3.0 two years ago, the computing world was ready for a change—the timing was nearly perfect.**



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# WINDOWS 3.1

Windows 3.1 is here, and it's hot. It's fast, crashes less often, has a topnotch File Manager, runs DOS programs better than 3.0, comes with its own font technology (TrueType), makes compound documents possible with OLE, and much, much more. In short, it addresses almost every criticism of 3.0 and goes far beyond with new and exciting innovations. Here's a whirlwind tour.

## **Fast, Faster, Fastest**

First off, don't be misled by the 3.1 version number. This release was originally conceived as a minor upgrade to 3.0, but in the past year, it's grown into what should really be called Windows 4.0.

The changes begin with Setup. It's enhanced and has a special Express option that's faster and well worth using. If 3.1's Setup detects another version of Windows installed on your system, it will update it, leaving your groups and configuration as they are.

After you've got Windows up and running, the first thing you'll notice is

that it's faster—a lot faster. There are several reasons for 3.1's dramatic speed increase. First, the code has obviously been fine-tuned for speed optimization. More visible, though, are new video drivers—especially a Super VGA driver that's much faster than the third-party 16-color drivers I've seen.

And hidden in the entrails of the system is Fast Disk, an improved 32-bit hard disk driver that revs up disks driven by Western Digital and compatible controllers. (To see if Fast Disk is installed on your system, check Control Panel, or look in the [386Enh] section of SYSTEM.INI for the lines *device=\*int13* and *device=\*wdctrl*. These are the Fast Disk drivers.)

Windows 3.1 also comes with enhanced versions of HIMEM.SYS, EMM386.EXE, and SMARTDRV.EXE. (Yes, you read that right. SMARTDrive 4.0 is now an EXE file.) The new SMARTDrive is both faster and smarter and is covered in detail below.

In addition to its increase in speed, 3.1 is

much more robust than 3.0. You can all but kiss those UAEs (Unrecoverable Application Errors) goodbye. As an example, Windows used to crash on my system at work at least once or twice a day. Now crashes are extremely rare—especially with DOS programs, which used to be my biggest source of problems with 3.0.

## **Fancy File Manager**

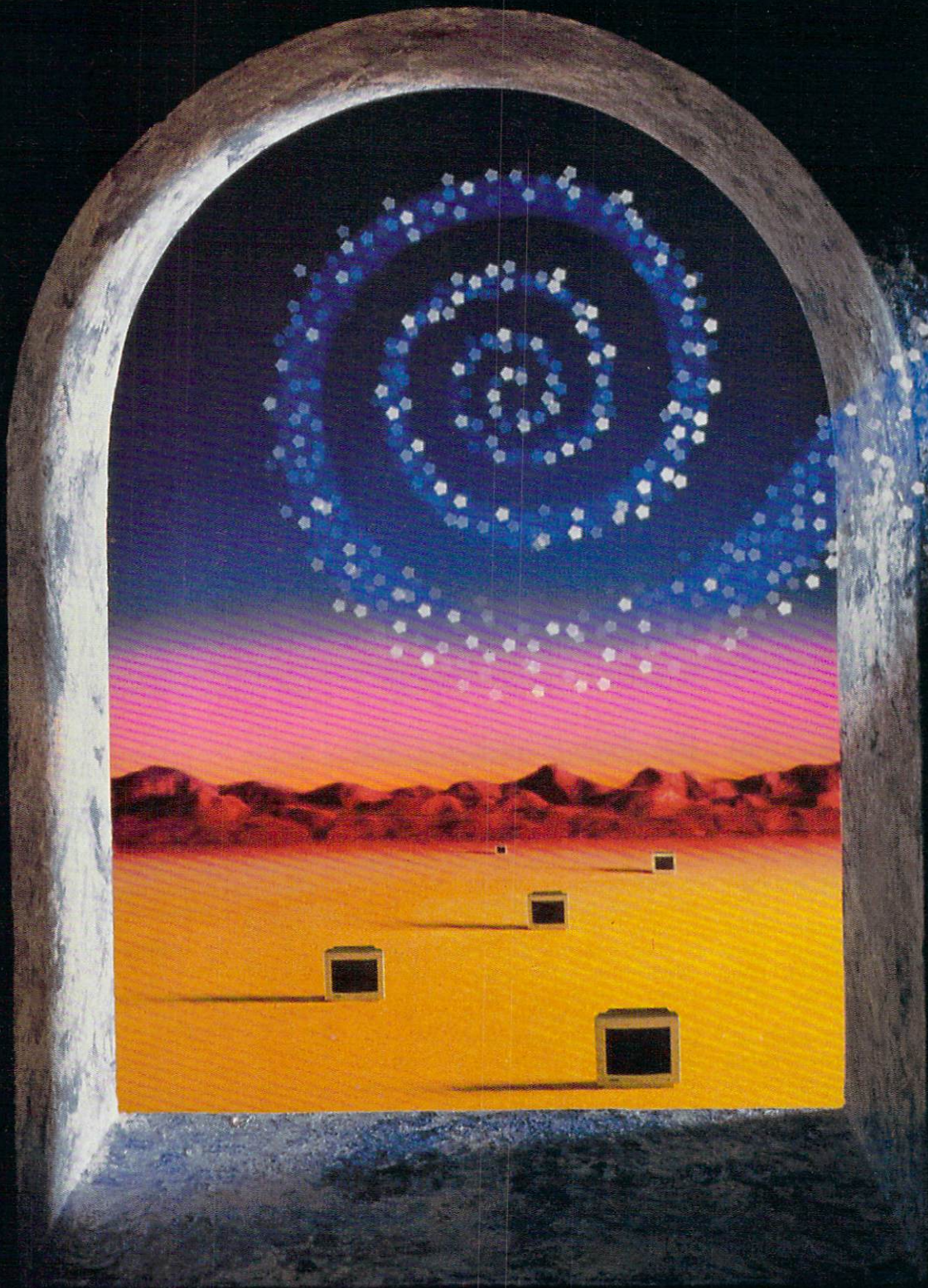
An improved Setup, increase in speed, and more robust design are exciting, but they're not things you can touch and play with. The new File Manager is, and it's 3.1's hottest new application. In fact, the new File Manager alone is worth the upgrade price.

When you first run File Manager, you'll notice its new look. Each drive window sports a directory tree on its left side and a window displaying the files in the selected directory on the right.

You can open and display multiple drive trees and directories, so copying and moving files be-

BY CLIFTON KARNES







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## OLE. A network idea whose time has come.

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## Even the experts agree.

Garry Ray, writing for PC Week, said, “Of these alternative operating environments (OS/2, DesqView and Software Carousel), Carousel may be the best choice of the day.”

Barry Simon of PC Magazine concurred with, “...I find it difficult to imagine using my computer without Carousel. This package has become an essential tool and one that I strongly recommend.”

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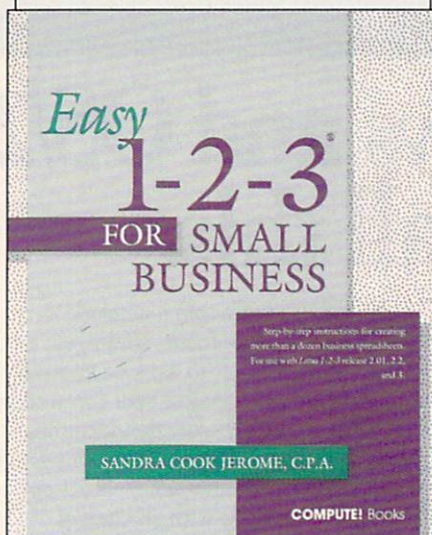
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### SMARTDrive 4.0

It's true that SMARTDrive used to be the brunt of a lot of jokes, the punch line always playing on the fact that it really wasn't smart at all.

The SMARTDrive shipping with 3.1 is a different animal, however.

First, it's now an EXE file, and you load it in your AUTOEXEC.BAT. SMARTDrive will automatically load itself into high memory, unless you tell it not to (pretty smart). And now it caches writes, which gives it a big performance boost. If you're nervous about caching writes, you can turn this feature off or just cache writes on selected drives.

And you can now control SMARTDrive interactively, which means you can turn it on or off and adjust its parameters while it's running.

Most people will simply specify the same two parameters for SMARTDRV.EXE that they did for SMARTDRV.SYS. For example, if the line in your CONFIG.SYS file says DEVICE=SMARTDRV.SYS 1024 512, you translate that line to SMARTDRV.EXE 1024 512 in your AUTOEXEC.BAT. SMARTDrive will automatically configure itself to cache writes for optimum speed.

If you want to find out how SMARTDrive is doing, type SMARTDRV /S at the DOS prompt (in or out of Windows), and you'll get a status screen that tells you the number of cache hits and the number of cache misses. The higher the ratio of hits to misses, the better SMARTDrive is performing.

If you're a Stacker user, it's worth noting that this new version of SMARTDrive is Stacker-aware and works fine with stacked drives.

### New Accessories

As if all this weren't enough, Windows 3.1 adds several new utilities and enhances others. Among the most useful new apps is Character Map, which displays a grid of all the characters available for each font in your system.

When you double-click on Character Map (found on the Accessories group), you'll see a character grid with your font names listed alphabetically in a drop-down list box.

Click on any character, and you'll get an enlarged view of it. There are also buttons to copy the selected character to the Clipboard and to append groups of characters. Once in the Clipboard, you can paste the character or characters directly into your document.

There are several enhancements to Control Panel's Desktop utility. First, there's an animated screen blanker that offers full password protection.

### PROGRAMMING 3.1

There's a lot for programmers to get excited about with 3.1. First, real mode is gone. While real mode provided a transition from Windows 2.0 to 3.0, it's always been a pain for programmers.

Although this version of Windows unassumingly carries a "point one" designation, in terms of new API (Application Program Interface) calls, it represents the biggest improvement in Windows history. Version 3.0 boasted 578 API functions, but 3.1 lists nearly 800 (the enhanced versions of Windows for multimedia and pens list nearly 1000 calls each).

Included in this large API group is a call for a standard File Open dialog box. The new dialog box includes a directory list of files and a tree display, as well as drop-down list boxes for drives and file extension types.

Perhaps 3.1's most challenging new feature for programmers is OLE (Object Linking and Embedding). With OLE, users can embed data in both the client's and the server's native formats. There are nearly 70 new API calls for OLE.

### HOW OLE WORKS

OLE is one of Windows 3.1's more powerful new features. Here's a step-by-step tutorial on embedding a Paintbrush object in a Write document.

1. Run Paintbrush and load WEAVE.BMP, the object we're going to embed.
2. Select the picture, and choose Edit, Copy.
3. Run Write, and select Edit, Paste.
4. The WEAVE picture will appear in your Write document. You've created an embedded object.
5. Close Paintbrush.
6. Now double-click on the WEAVE object, and Paintbrush will run with WEAVE.BMP loaded.
7. To link an object, follow all the steps above, except number 3, and choose Edit, Paste Link.

Note that when you embed an object, you create a static copy of the object. If the original changes, your copy won't change. When you link an object, you create a dynamic copy of the object. When the original changes, so does the copy.

With the Packager application that comes with Windows 3.1, you can embed objects but display them as icons.

There are a limited number of animations available, but they're all usable.

In addition, Desktop now sports several new, well-designed wallpaper bitmaps. Be sure to check out Marble and Slash.

Last but not least, there's a new OLE utility that links icons to objects you insert in documents.

That's the quick tour. Here's the bottom line: Get 3.1 as soon as you can. You won't be sorry. □



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# TEST LAB

Spreadsheets are the fuel powering the computer revolution. And in this capacity, they've often legitimized a platform, its operating system, or both. Strange as this may sound, it's supported by history.

When VisiCalc hit the scene in 1979, it turned the Apple II from a toy into a powerful business machine. Apple II sales skyrocketed, and it became *the* personal computer for the computer revolution's first generation. People often walked into a computer store asking for VisiCalc and a machine that could run it.

Next came Lotus 1-2-3. It was a tremendous improvement on VisiCalc and the epitome of user-friendly software in 1983. To run it, however, you needed an IBM PC. This created a huge demand for the early crop of PCs. Soon there were millions of PCs in homes and offices everywhere, and a large number of them were running 1-2-3.

When Excel appeared for the Mac in 1985, it was the most powerful spreadsheet available on any platform at any price. It forced business people to take the Mac seriously as a business tool.

And when Excel 3.0 for the PC hit the software shelves last year, everyone started thinking of Windows 3.0 as more than just a pretty face. Windows soon became *the* operating environment for PC power users, and Excel played a major role in establishing it as such.

The VisiCalc-Lotus-Excel story doesn't end there, however. VisiCalc is out of the picture, but Lotus has fired back at Microsoft's Excel with a trio of topnotch spreadsheets: Lotus 1-2-3 2.3 and Lotus 1-2-3 3.1+ for DOS and, more recently, Lotus 1-2-3 for Windows. These products, especially 1-2-3 3.1+ and 1-2-3 for Windows, are giving Excel a run for its money in the ever-hotter spreadsheet feature wars.

Excel and 1-2-3 for Windows are far from the only choices for

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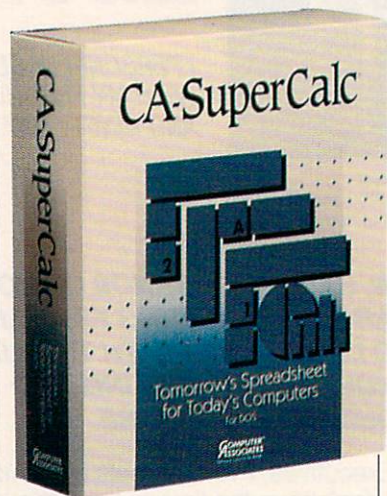
the Windows environment. There's also Wingz. It was a dramatic innovation when it first appeared, and it can still hold its own against most competition.

Not to be outdone, Borland champions the DOS arena. It has continually improved its flagship spreadsheet, Quattro Pro, which many say is the obvious choice for DOS. But SuperCalc aficionados stand staunchly by their spreadsheet of choice because it's faster and easier to use.

Why all this excitement about spreadsheets? Because of their versatility. You can do almost anything with a spreadsheet. It's an excellent tool for handling your checkbook and household finances. It can also be used as a general-purpose database for everything from recipes to addresses. In the business world, anything dealing with numbers, from accounts receivable to next quarter's sales projections, can be handled easily with a spreadsheet. In the educational and scientific communities, a spreadsheet is one of the primary tools for manipulating statistical data, from standard deviation to regression analysis.

Clearly, just about anyone can make use of a spreadsheet, but how do you choose the right one? First, you need to look at your platform. If you're a Windows user, you'll want a Windows spreadsheet. Windows users who are coming from a DOS version of 1-2-3 will want to give special attention to Lotus 1-2-3 for Windows. Others should take a close look at Excel.

For DOS, your choices are Quat-



tro Pro 3.0 or SE, 1-2-3 2.3 or 3.1+, and Computer Associates' SuperCalc 5.1. SuperCalc is fast, Quattro Pro is extremely feature-rich, and Lotus is the compatibility king, boasting more add-in support than any other software product in history.

It's a tough choice, but this issue's Test Lab can help. Our reviews of all the power spreadsheets will give you a feel for each product, and the features chart will offer critical info in an at-a-glance format. Whether you know it or not, you can give your productivity a real boost with spreadsheets. They're not just for accountants anymore.

CLIFTON KARNES

## CA-SUPERCALC 5.1

CA-SuperCalc 5.1 is a fast, efficient spreadsheet that shares many of the advantages and disadvantages of DOS-based spreadsheets. The interface takes some getting used to, particularly if you're already familiar with Windows spreadsheets.

Although it has many other positive attributes, the most obvious advantage of CA-SuperCalc 5.1 is its low price. For a little more than \$100, you'd have trouble finding a better 1-2-3-compatible spreadsheet. As a DOS product, CA-SuperCalc is fast because it leaves out the layers of interfaces necessary to run Windows. It



| 3 | A                | C     | E                           | F    | G     | H | I |
|---|------------------|-------|-----------------------------|------|-------|---|---|
| 4 | ACME Corporation |       | Second Quarter Sales Report |      |       |   |   |
| 5 |                  | April | May                         | June | Total |   |   |
| 6 | Mary             | 1500  | 1250                        | 1600 | 4350  |   |   |
| 7 | Bill             | 325   | 180                         | 550  | 1055  |   |   |

| 2 | A                | C       | E                          | F     | G     | H | J |
|---|------------------|---------|----------------------------|-------|-------|---|---|
| 3 | ACME Corporation |         | First Quarter Sales Report |       |       |   |   |
| 4 |                  | January | February                   | March | Total |   |   |
| 5 | Mary             | 1500    | 1250                       | 1600  | 4350  |   |   |
| 6 | Bill             | 325     | 180                        | 550   | 1055  |   |   |

| SCREENBOA | C                | E    | F                        | G     | I |
|-----------|------------------|------|--------------------------|-------|---|
| 2         | ACME Corporation |      | Six Months Sales Summary |       |   |
| 3         |                  | Mary | Bill                     | Total |   |
| 4         | First Quarter    | 4350 | 1055                     | 5405  |   |
| 5         | Second Quarter   | 870  | 575                      | 1445  |   |

Blank Copy Delete Edit Format Global Insert Justify Load Move  
 Name Output Protect Quit Save Title Unprotect Window Zap 1-2-3 /more  
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 MENU Sort spreadsheet (or specified range) by a column or row

CA-SuperCalc 5.1

will also run on machines that Microsoft has seen fit to leave off the Windows guest list—the millions of PC, XT, and AT clones. It can operate in as little as 512K (though 640K is recommended), but it can also be run on a network and supports up to 32MB of expanded memory. There are some drawbacks, however. You can't make use of the DDE and OLE links that will be a part of all new Windows-based spreadsheets (including the Windows version of CA-SuperCalc, which should appear early next year).

The product is not shipped with the reference manual, which contains explanations of all the functions. Only the most basic set-up and quick-start information comes in the package. The reference manual is shipped as soon as Computer Associates receives the registration card. This might be a minor or a major inconvenience, depending on how soon after purchasing a piece of software you want to begin using it effectively. There is a quick reference containing brief explanations of the keypresses, macro commands, and functions.

The user's guide that's shipped with the product includes (on

page 2) information on converting the interface to a more standard Lotus 1-2-3 interface, but, curiously, there are no instructions on how to return to the native interface. Here's how: Go to the CA-SuperCalc menu by selecting SC5 from the 1-2-3-style menu, select Global, select Optimum, select 1-2-3, select All, select SC, and select Quit. Simple, right? Save your configuration, and the program will load with the native interface in place.

I suspect that Computer Associates anticipates that most users will instantly switch to the more familiar 1-2-3 interface the first time they run the program and that they'll never again need the native format. Using the 1-2-3 interface allows you to run 1-2-3

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macros unconverted. It also allows you to make use of the dozens of 1-2-3 operations manuals that are available from third-party publishers. And if you're an experienced 1-2-3 user, there would be no reason to wait for the reference manual from Computer Associates before beginning to make use of the product.

Looking for a DOS-based spreadsheet that will fit your budget? Inexpensive CA-SuperCalc 5.1 will reduce your data-processing costs without reducing your capabilities.

ROBERT BIXBY

Circle Reader Service Number 304

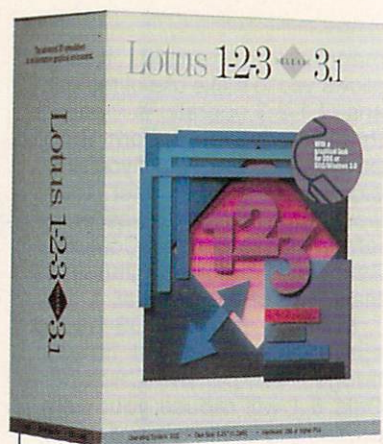
## LOTUS 1-2-3 RELEASE 2.3

You can buy spreadsheets with more power and richer features than Lotus 1-2-3 Release 2.3 for DOS, but it's still the ideal spreadsheet for many users who grew up with 1-2-3, don't have advanced hardware, or need to be compatible with the maximum number of other users. Lotus claims there are 15 million copies of 1-2-3 in use; most of them are in the Release 2.x series.

Release 2.3 is totally compatible with all prior versions of 1-2-3, runs all Lotus macros, and



# TEST LAB



gives you access to hundreds of third-party add-in products that provide specialized functions inside the spreadsheet. Its WK1 file format is almost an industry standard for file interchange. Although it isn't on the leading edge of technology, it's a mature product. Its code is thoroughly debugged and optimized.

Release 2.3 has all the essential features of a two-dimensional spreadsheet (Release 3.1+ delivers three-dimensional worksheets). New in 2.3 are the built-in Viewer and Auditor add-ins.

Viewer borrows technology from Lotus Magellan to show the contents of other worksheet files in a window. You can then copy or link the data from the viewed file into your active worksheet. Browsing with the viewer can help you quickly locate information when you've forgotten a filename.

The Auditor add-in identifies dependent and precedent cells, finds formulas and circular references, and lists out the order in which formulas are evaluated—quite handy as you attempt to find errors in worksheets or in trying to understand a sheet developed by someone else.

In Release 2.3, Lotus took its spreadsheet publishing a leap ahead by replacing Allways (the Release 2.2 add-in) with WYSIWYG, a similar but more powerful add-in. WYSIWYG supports embedded graphics and table annotations, and it uses up to eight

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fonts at a time from a larger set of supplied Bitstream fonts. It also centers headings over columns and uses clip art. You won't have lost any Release 2.2 files, though, because WYSIWYG reads and translates Allways formatting codes.

Graphing is adequate, but it's far from the spectacular work you can do with Quattro Pro or the Windows products.

For a longtime Release 2.2 user, Release 2.3 is a breath of fresh air. The WYSIWYG add-in lets you work with graphic formatting elements onscreen as you work on the data. (With Allways, you could only change data in text mode.) Unlike some of the

graphic spreadsheets, this one doesn't lose you in all the graphic elements and lose the feel of the basic spreadsheet. It's familiar enough that you can continue to get your work done without learning a whole new program.

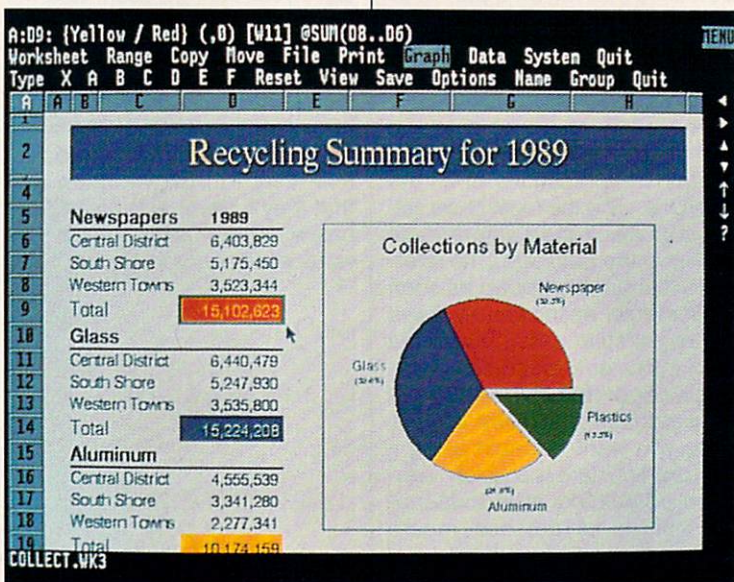
Lotus 1-2-3 2.3 is a proven performer, respectably fast, compatible with entry-level and older hardware, and, most of all, standard. While it doesn't have the highly advanced features of more powerful sheets, its suite of available add-ins gives it access to capabilities and specialties that no other spreadsheet can begin to match. For ordinary daily use by those who aren't power users, it's hard to beat.

RICHARD O. MANN

Circle Reader Service Number 305

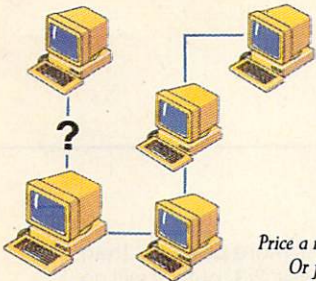
## LOTUS 1-2-3 RELEASE 3.1+

Since the introduction of 1-2-3 for Windows last August, Lotus's previous top-of-the-line spreadsheet, Release 3.1+, has been a product without a market niche. It's a high-powered, three-dimensional sheet that's a large step ahead of

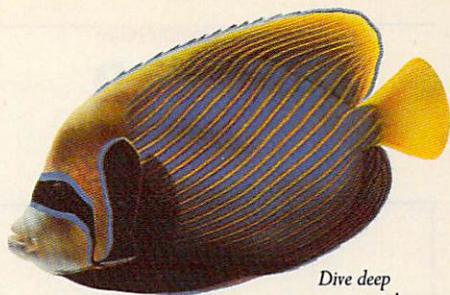


Lotus 1-2-3 Release 3.1+

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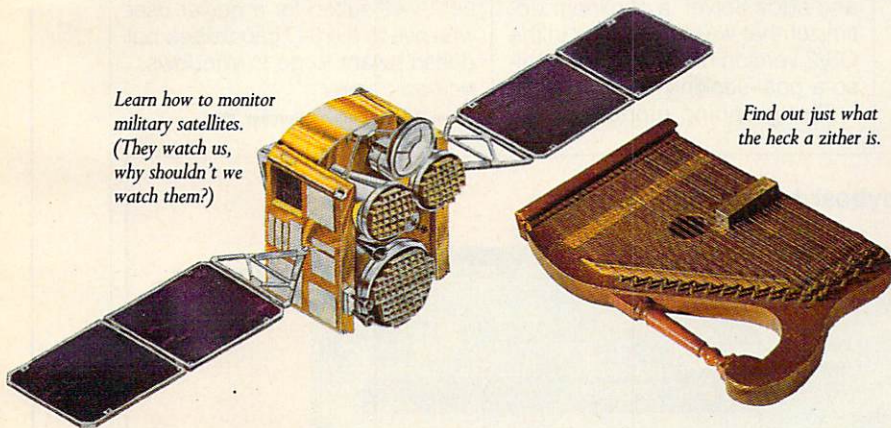
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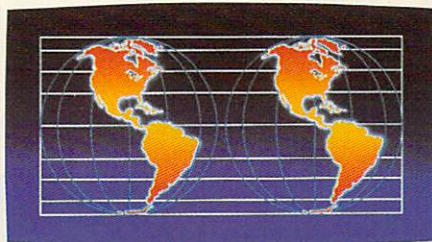


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Release 2.3, but so is the Windows version. It requires the same advanced hardware that the Windows version requires, so why not get the additional advantages that come only with Windows? One reason might be that until there are some substantial improvements to 1-2-3 for Windows and until Windows 3.1 ships, Release 3.1+ for DOS is a lot more stable.

Release 3.1+ is a true three-dimensional spreadsheet: Each sheet has up to 256 pages—a page being a full two-dimensional spreadsheet that fits below the page above. You can reference between pages, build ranges across pages, and do sums and other functions across pages. It's the answer to a prayer for someone who routinely has to consolidate similar reports and analyses. I would've killed for this product four years ago.

You can display the current page only or an array of three

pages. Multipage operations and group mode commands allow you to quickly set up many parallel-structured pages at once. The 3-D operations are well designed and easy to use.

Even with the multipage worksheet files, there is external file linking to other sheets, and the program holds more than one file in memory at a time. The DataLens function in Release 3.1+ gives you access to external database files in popular formats. It uses disk-based virtual memory, effectively giving you as much memory as you need—though when it goes to disk, it's necessarily slow. You're limited in what you can do with your data, primarily by your own imagination.

It has the same Viewer and Auditor add-ins as Release 2.3, and adds Solver, a nonlinear optimizer that was introduced in the OS/2 version of 1-2-3. There's also a goal-seeking function.

The graphing module of Re-

lease 3.1+ is more powerful than that of Release 2.3, but it's still no match for the graphing modules in Excel and Wingz.

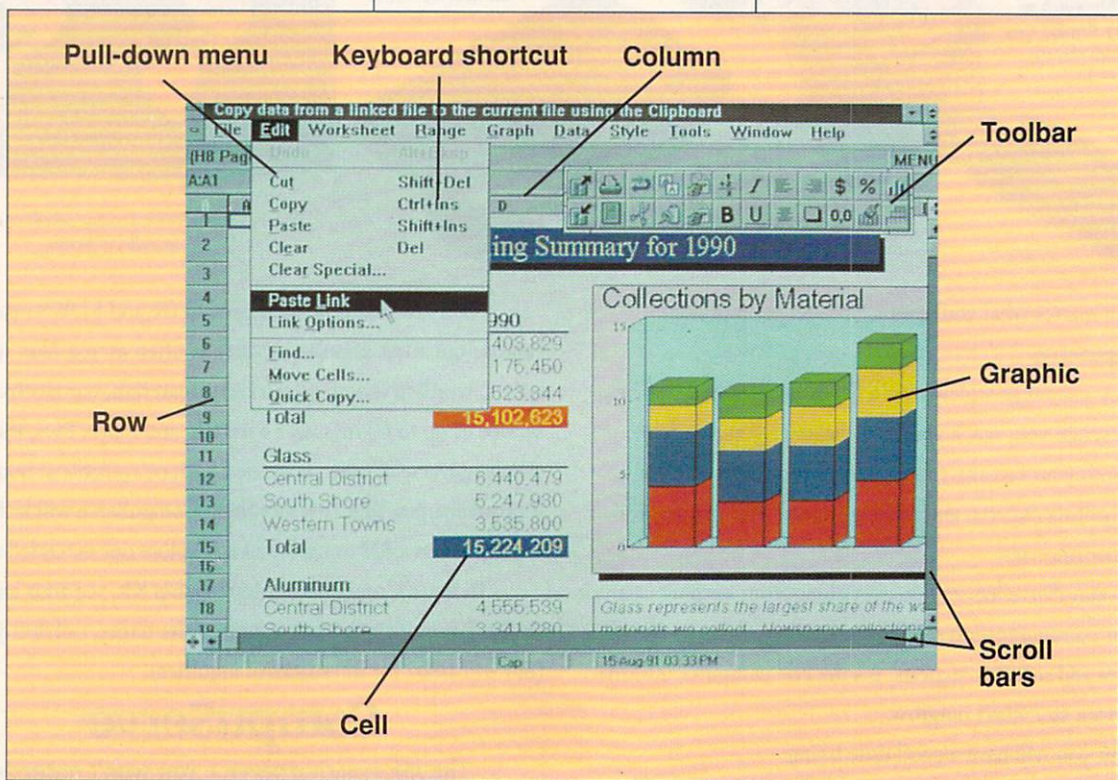
As is true of all versions of 1-2-3, this one is fully backward compatible with all other Lotus products. The key sequences you used with the original Release 1A still accomplish the same thing in 3.1+. Of course, there are many more menu items here, but the macros work and the key sequences work. If you limit your worksheets to two dimensions, you can save them as WK1 files that earlier versions of 1-2-3 and many other applications can read.

All this power has its price, of course. Release 3.1+ is slower than Release 2.3 (but not as slow as the Windows version).

Lotus 1-2-3 3.1+ is a fine product—well suited for a power user who needs the 3-D capabilities but doesn't want to go to Windows.

RICHARD O. MANN

Circle Reader Service Number 306





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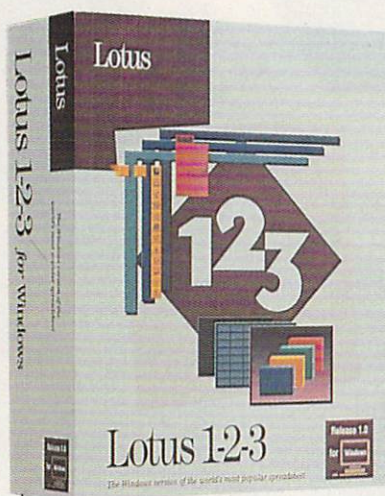
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# TEST LAB



## LOTUS 1-2-3 FOR WINDOWS 1.0A

After the long-awaited Lotus 1-2-3 for Windows hit the market last August, many of its early users found some bugs. It wasn't long before Lotus shipped Release 1.0a, fixing some of the major problems.

In spite of its problems, Lotus 1-2-3 for Windows is a major achievement. Matched feature for feature against Excel, it comes up short, but it has extremely significant advantages over Excel. First, it carries the magic name of Lotus 1-2-3. That alone will sell hundreds of thousands of copies. Second, it's totally compatible with all previous versions of 1-2-3: It runs unaltered, untranslated macros and still responds to slash-key commands that have run 1-2-3 from the beginning.

Changing from a text-based spreadsheet to a Windows-based sheet isn't easy; having the 1-2-3 classic command set available at any time is comforting.

The most obvious innovation in 1-2-3 for Windows is the SmartIcon palette. Lotus provides over 60 individual icons for commonly used processes that usually involve a series of menu choices, such as creating a sum of a column or row. From that set, you select about 20 to go into the SmartIcon palette, a toolbar you

**LOTUS 1-2-3 FOR WINDOWS 1.0A**  
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can shape and place anywhere on the screen. It might be a square in the corner or a long, thin bar down one side. You can assign your own macros to icons and include them as well.

Basically ported from 1-2-3 Release 3.1+, 1-2-3 for Windows is a true 3-D sheet, maintaining the layered three-page display option. You can, however, also have as many sheets as you wish in separate windows. Graphing capabilities are beefed up with more types of graphs and with each graph named and saved as part of the basic worksheet file. Live graphs can be embedded in the worksheet, changing onscreen as you change the data in the sheet.

Spreadsheet publishing is

more powerful, including automatic drop shadows and black-and-white page preview. The program reads both Allways and WYSIWYG formatting from prior versions. Adobe Type Manager and 13 scalable Postscript fonts are included, as is a set of HP-compatible soft fonts.

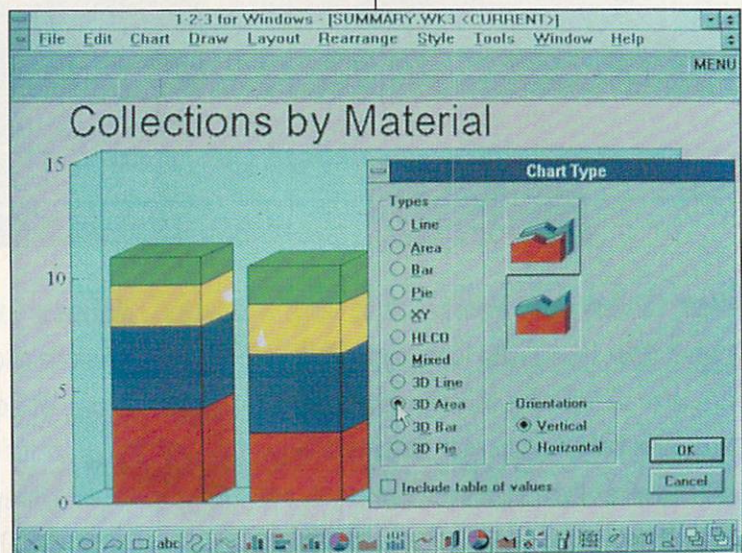
You get the advantages of Windows, including DDE (but not OLE), making file linking with any Windows application easy. Lotus, however, doesn't fully understand Windows conventions yet—it uses the interface in several non-standard ways.

Running on low-end hardware, the program is painfully slow. On a high-speed 386 with plenty of RAM, it's still not fast. Even with the slipstream update in place, bugs occasionally result in the dreaded UAE (Unrecoverable Application Error) message.

Lotus 1-2-3 for Windows shows a lot of promise; it will someday be an outstanding spreadsheet, though I wouldn't bet on its ever surpassing Excel. For now, it's a good Windows spreadsheet—and with the Lotus name attached, that's probably good enough.

RICHARD O. MANN

Circle Reader Service Number 307



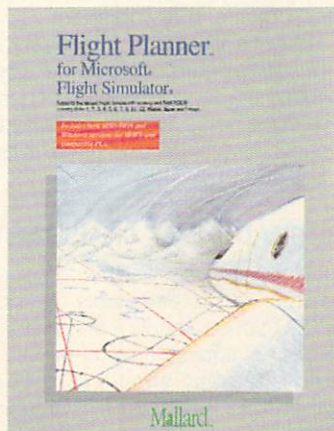
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# TEST LAB

## MICROSOFT EXCEL 3.0 FOR WINDOWS

If someone told me I could have only one application program, I'd choose Microsoft Excel. Its power, features, and ease of use make it my most-used app—and my favorite one.

What's so special about Excel? First, there's the program's power. In terms of sheer number-crunching savvy, Excel boasts some impressive features. At the top of the list is outlining, which lets you expand and collapse rows, columns, or both with a click of the mouse. Once you use this feature, it soon becomes indispensable.

Next on the power list is charting. Excel packs the power of many dedicated graphing programs, producing dazzling standard and custom 3-D charts. You can easily control each chart's rotation, perspective, and color.

Other impressive power fea-

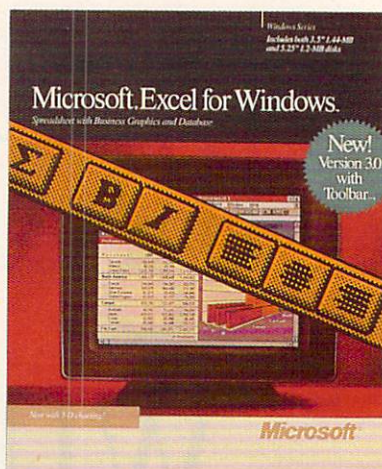
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tures include the ability to use styles (just like most word processors), a palette of as many as 256 unique fonts per worksheet, text boxes for comments, a full complement of drawing tools, links to other spreadsheets using names, print preview, and the ability to embed objects in a worksheet.

Excel's power is impressive, but you're more likely to be won over by the program's ease of use. I've done battle with lots of spreadsheets in my time, and Excel is by



far the easiest to master.

At the top of the ease-of-use ladder is the toolbar. This is a horizontal bar just below the menu bar that contains buttons for commonly used tasks, including buttons for selecting styles, promoting and demoting outline elements, toggling outline display on and off, selecting visible cells, autosumming, applying bold and ital-

## SPREADSHEET GLOSSARY

**address.** The location of an individual cell, usually given in A1 address style (A1, A2, A3, . . .) or R1C1 address style (R1C1, R1C2, R1C3, . . .). Also known as reference. See also **column heading** and **row heading**.

**cell.** The basic unit of a spreadsheet. Cells are formed by the intersection of rows and columns and can hold data, formulas, or both.

**column heading.** A heading that identifies a vertical group of cells. The heading is placed at the top of the cells. Column headings are usually labeled in A1 style (A, B, C, . . .) or R1C1 style (C1, C2, C3, . . . or 1, 2, 3, . . .). See also **row heading**.

**dimensional.** The term is combined with *two-* or *three-* to indicate whether a spreadsheet is

able to establish links among worksheets: 3-D spreadsheets can do it; 2-D spreadsheets cannot. The term *3-D* applies also, of course, to the graphic effects (3-D bar graphs, for example) available in spreadsheets. See also **link**.

**formula.** A statement that describes a mathematical calculation. Formulas in spreadsheets are linked to individual cells, though they often refer to data and formulas in other cells, allowing a user to perform what-if calculations.

**function.** A calculation tool that allows you to perform decision-making and value-returning operations automatically. One frequently used function is SUM. It sums a group of numbers. IF is a function that permits you to test a value and take action based on the result of that test.

**label (text).** A text string often used as a column or row heading.

**link.** A connection between spreadsheets, with data in one affecting data in another.

**macro.** A series of commands recorded and saved for future playback. Use of macros can simplify your spreadsheet work, as well as improve speed and accuracy.

**row heading.** A heading that identifies a horizontal group of cells. The heading is placed to the left of the cells. Row headings are usually labeled in A1 style (1, 2, 3, . . .) or R1C1 style (R1, R2, R3, . . . or 1, 2, 3, . . .). See also **column heading**.

**worksheet.** A spreadsheet document in which you can store, calculate, and analyze data.



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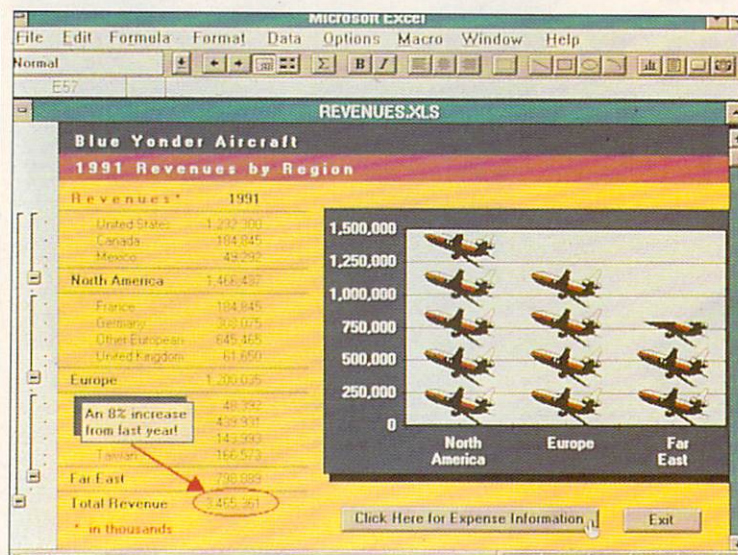


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# TEST LAB



Microsoft Excel

ic type styles, aligning text (left, center, and right), selecting graphics objects, drawing (including buttons for drawing lines, rectangles, ellipses, and curves), auto-charting, creating text boxes, creating your own user-defined buttons, and recording macros.

Probably the most used toolbar button is Autosum. Press this button, and Excel will sum the current column or row. How does it know whether you're adding a row or column? It takes a guess, and I've found it to be right 90 percent of the time.

Other features that make Excel easy to use include templates, best fit for column width, text wrap, and cell note markers. The toolbar and most of these features are so intuitive that using them soon becomes second nature.

Mix this power and ease of use together with full dBASE compatibility (Q+E, an excellent dBASE-compatible database, is included with the package) and tons of help for former Lotus 1-2-3 users, and you have an unbeatable product. In short, this is the spreadsheet for the others to emulate and the one for the others to beat.

CLIFTON KARNES

Circle Reader Service Number 308

## QUATTRO PRO 3.0 AND QUATTRO PRO SE 1.0

Are you looking for power in a DOS-based spreadsheet? Quattro Pro 3.0 offers both power and plenty of features. Quattro Pro Special Edition (SE) 1.0 includes all the basic features of its full-featured cousin without some of the advanced features. At \$69.95 (suggested list price), the SE version may be the best spreadsheet value available for both inexperienced and advanced users.

Quattro Pro 3.0 includes all the power and ease of use people

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have come to expect in state-of-the-art spreadsheets. Experienced users will have very little trouble using Quattro Pro 3.0 immediately. Its pull-down menus and optional WYSIWYG interface are easy to master. There's easy access to most of the features, including its complete set of 114 @ functions. Each spreadsheet has 8192 rows and 256 columns. You can link as many as 63 spreadsheets and have 32 open windows at any one time (if you have enough memory).

So what sets Quattro Pro 3.0 apart from other spreadsheets in its class? Unlike other spreadsheets, Quattro Pro includes a complete set of drawing tools and an array of clip art. These tools give you the means to annotate graphs and charts. Reading and writing a multitude of file formats such as Lotus 1-2-3, Symphony, Paradox, Reflex, and dBASE on the fly makes sharing data with others simple.

Quattro Pro uses Borland's Virtual Runtime Object Oriented Memory Manager (VROOMM) technology, which allows it to run on most MS-DOS machines—from the old XT with 512K RAM to the latest 486. This is an important feature if you have an older machine or a limited amount of memory. Although Quattro Pro



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# TEST LAB

## SPREADSHEET FEATURES

|  | CA-SuperCalc<br>5.1 | Lotus 1-2-3<br>2.3 | Lotus 1-2-3<br>3.1+ | Lotus 1-2-3<br>for Windows | Microsoft<br>Excel 3.0 | Quattro Pro<br>3.0 | Wingz<br>1.1A |
|--|---------------------|--------------------|---------------------|----------------------------|------------------------|--------------------|---------------|
| <b>GENERAL</b>                               |                     |                    |                     |                            |                        |                    |               |
| Global search and replace                    | ■                   | ■                  | ■                   | ■                          | ■                      | ■                  | ■             |
| Undo capability                              |                     |                    |                     |                            |                        |                    |               |
| Single                                       | ■                   | ■                  | ■                   | ■                          | ■                      | ■                  | ■             |
| Incremental                                  | □                   | □                  | □                   | □                          | □                      | □                  | □             |
| Maximum number of rows                       | 9,999               | 8,192              | 8,192               | 8,192                      | 16,384                 | 8,192              | 32,768        |
| Maximum number of columns                    | 255                 | 256                | 256                 | 256                        | 256                    | 256                | 32,768        |
| Number of built-in functions                 | 143                 | 93†                | 103†                | 107†                       | 144                    | 114                | 147††         |
| <b>USER INTERFACE</b>                        |                     |                    |                     |                            |                        |                    |               |
| Custom menus                                 | □                   | ■                  | ■                   | ■                          | ■                      | ■                  | ■             |
| Pull-down/drop-down menus                    | □                   | □                  | □                   | ■                          | ■                      | ■                  | ■             |
| Keyboard menu shortcuts                      | ■                   | □                  | □                   | ■                          | ■                      | ■                  | ■             |
| Context-sensitive help                       | ■                   | ■                  | ■                   | ■                          | ■                      | ■                  | ■             |
| Mouse support                                | □                   | ■                  | ■                   | ■                          | ■                      | ■                  | ■             |
| Tile windows capability                      | □                   | □                  | □                   | ■                          | ■                      | ■                  | ■             |
| Overlap windows capability                   | ■                   | □                  | ■                   | ■                          | ■                      | ■                  | □             |
| Toolbar/buttonbar                            | □                   | □                  | □                   | ■                          | ■                      | ■                  | ■             |
| <b>COMPATIBILITY</b>                         |                     |                    |                     |                            |                        |                    |               |
| Read/write capability                        |                     |                    |                     |                            |                        |                    |               |
| WKS  | ■                   | ■                  | ■                   | ■                          | ■                      | ■                  | ■             |
| WK1  | ■                   | ■                  | ■                   | ■                          | ■                      | ■                  | ■             |
| WK3  | □                   | □                  | ■                   | ■                          | ■                      | □                  | □             |
| WRK  | □                   | ■                  | ■                   | ■                          | □                      | ■                  | □             |
| WKQ  | □                   | □                  | □                   | □                          | □                      | ■                  | □             |
| WQ1  | □                   | □                  | □                   | □                          | □                      | ■                  | □             |
| ASCII import as TXT (tab delimited)          | ■                   | ■                  | ■                   | ■                          | ■                      | □                  | ■             |
| ASCII export as TXT (tab delimited)          | □                   | ■                  | ■                   | ■                          | ■                      | □                  | ■             |
| ASCII import/export as CSV (comma separated) | ■                   | ■                  | ■                   | ■                          | ■                      | ■                  | □             |
| DIF  | ■                   | R                  | ■                   | R                          | ■                      | ■                  | ■             |
| SLK  | □                   | R                  | R                   | R                          | ■                      | ■                  | ■             |
| dBASE  | ■                   | R                  | ■                   | ■                          | ■                      | ■                  | □             |
| <b>LINKS</b>                                 |                     |                    |                     |                            |                        |                    |               |
| References spreadsheets in formulas          |                     |                    |                     |                            |                        |                    |               |
| Loaded                                       | ■                   | □                  | ■                   | ■                          | ■                      | ■                  | ■             |
| Unloaded                                     | ■                   | ■                  | ■                   | ■                          | ■                      | ■                  | □             |

|  | CA-SuperCalc<br>5.1 | Lotus 1-2-3<br>2.3 | Lotus 1-2-3<br>3.1+ | Lotus 1-2-3<br>for Windows | Microsoft<br>Excel 3.0 | Quattro Pro<br>3.0 | Wingz<br>1.1A |
|--|---------------------|--------------------|---------------------|----------------------------|------------------------|--------------------|---------------|
| Updates dependent spreadsheets at load   | ■                   | ■                  | □                   | □                          | ■                      | ■                  | □             |
| Updates dependent spreadsheets on command  | ‡                   | ■                  | ■                   | ■                          | ■                      | ■                  | ■             |
| <b>MACRO CAPABILITIES</b>  |                     |                    |                     |                            |                        |                    |               |
| Runs Lotus 1-2-3 Release 2 macros  | ■                   | ■                  | ■                   | ■                          | ■                      | ■                  | ■             |
| Records macros (autolearn mode)  | ■                   | ■                  | ■                   | ■                          | ■                      | ■                  | ■             |
| Stores/uses macro libraries  | ■                   | ■                  | □                   | □                          | ■                      | ■                  | ■             |
| Automatically debugs macros  | ■                   | □                  | □                   | □                          | ■                      | ■                  | ■             |
| <b>GRAPHICAL</b>   |                     |                    |                     |                            |                        |                    |               |
| Maximum number of fonts  | 8                   | 8                  | 8                   | 8                          | 256                    | 8                  | Unlimited     |
| Uses clip art  | □                   | ■                  | ■                   | ■                          | ■                      | ■                  | ■             |
| Edits clip art   | □                   | □                  | □                   | □                          | ■                      | ■                  | ■             |
| Has drawing tools  | □                   | ■                  | ■                   | ■                          | ■                      | ■                  | ■             |
| Inserts shading  | ■                   | ■                  | ■                   | ■                          | ■                      | ■                  | ■             |
| WYSIWYG screen preview   | ■                   | ■                  | ■                   | ■                          | ■                      | ■                  | ■             |
| Automatic column-width adjustment  | □                   | □                  | □                   | □                          | ■                      | ■                  | □             |
| Integrates graph in spreadsheet  | □                   | ■                  | ■                   | ■                          | ■                      | ■                  | ■             |
| Wraps text   | ■                   | ■                  | ■                   | ■                          | ■                      | ■                  | ■             |
| <b>OUTPUT/PRINTING/REPORTING</b>   |                     |                    |                     |                            |                        |                    |               |
| Orientation  |                     |                    |                     |                            |                        |                    |               |
| Portrait   | ■                   | ■                  | ■                   | ■                          | ■                      | ■                  | ■             |
| Landscape  | ■                   | ■                  | ■                   | ■                          | ■                      | ■                  | ■             |
| Prints cell formulas   | ■                   | ■                  | ■                   | ■                          | ■                      | ■                  | ■             |
| Saves as EPS (Encapsulated PostScript) file  | □                   | ■                  | ■                   | ■                          | ■                      | ■                  | ■             |
| Saves as PCX file  | ■                   | □                  | □                   | □                          | □                      | ■                  | ■             |
| <b>CHARTING</b>  |                     |                    |                     |                            |                        |                    |               |
| 3-D charts   | ■                   | □                  | □                   | ■                          | ■                      | ■                  | ■             |
| Rotation   | □                   | ■                  | ■                   | ■                          | ■                      | □                  | ■             |
| Perspective  | □                   | □                  | □                   | □                          | ■                      | □                  | ■             |
| Color  | ■                   | ■                  | ■                   | ■                          | ■                      | ■                  | ■             |
| †There are also 17 basic mathematical operators not accessed as @ functions.<br>††This is the number of formula functions. There are also 173 programming functions.<br>‡Spreadsheets are updated whenever data changes.<br>R=Read capability but not write capability<br>■ —Yes □ —No |                     |                    |                     |                            |                        |                    |               |

# TEST LAB

## QUATTRO PRO 4.0 AND QUATTRO PRO FOR WINDOWS

By the time you read this, Borland may have released two new versions of its popular spreadsheet: Quattro Pro 4.0 and Quattro Pro for Windows. They weren't ready in time to be formally reviewed in this issue, but Borland has supplied us with a summary of the features. Here's a preview of what to expect from these new versions.

The new DOS version, Quattro Pro 4.0, will include all the features in 3.0 plus a number of enhancements. Some of the new features, according to Borland, will be two SpeedBars; intelligent graphics; compatibility with Lotus 1-2-3 version 3.1, Impress, and Always; and a print spooler.

Borland describes Quattro Pro for Windows as the first and only object-oriented software. New features you can look for will include Menu-on-Demand; SpeedBars; PowerButtons; Spreadsheet Notebooks with tab names; 3-D graphics; the ability to customize graphs and spreadsheets with millions of colors, wash effects, and bitmapped images; increased compatibility with other file formats; and the ability to link spreadsheets across a network.

—STEPHEN LEVY

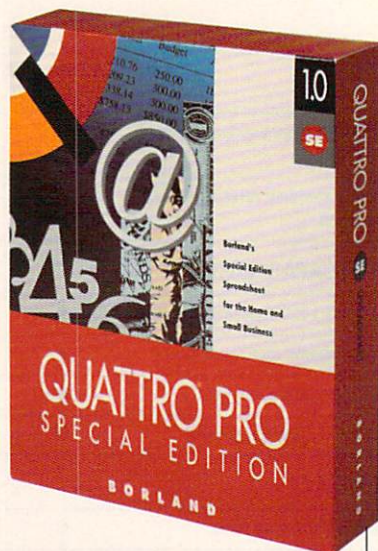
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will run on a machine with 512K RAM, 640K is recommended.

Because version 3.0 may offer more power than many users need, Borland offers Quattro Pro SE 1.0, a less expensive yet very respectable alternative. According to Borland, Quattro Pro SE 1.0 is the spreadsheet for the home and small business. Borland's characterization is probably intentionally modest, since many demanding spreadsheet users will find that the SE version will meet all their needs even though it doesn't contain all the most advanced features.

Some of the advanced features of Quattro Pro 3.0 that you won't find in Quattro Pro SE 1.0

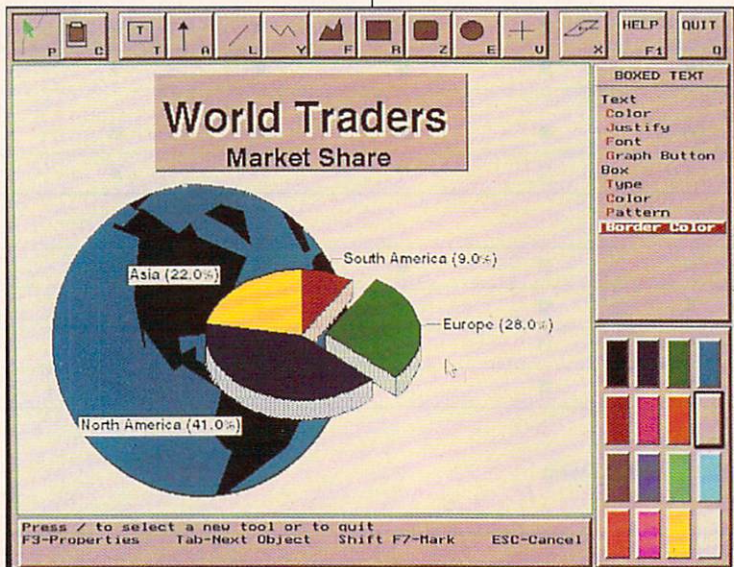


are a WYSIWYG interface option, Paradox access, full network support (SE has no network support), print-to-fit and banner-printing options, and custom and Lotus 1-2-3 menu options. In addition, the SE version comes with less clip art and documentation than its bigger cousin (although you should find that both sets of clip art and documentation are adequate to serve your needs). The graphic features in the SE version are similar to those in Quattro Pro 1.0; version 3.0's graphic features, on the other hand, show some real enhancements over the graphic features of the previous version.

Both these latest versions of Quattro Pro deserve high marks. Quattro Pro is a carefully thought-out, fast, feature-rich application that will satisfy all but the most demanding spreadsheet users.

STEPHEN LEVY

Circle Reader Service Number 309



Quattro Pro 3.0

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# TEST LAB

## WINGZ 1.1A

When Informix introduced Wingz, it made quite a splash. The public relations campaign for this spreadsheet was the most lavish in years. (Remember the popular Wingz bags?) More importantly, Wingz offered 3-D charts and graphs that nearly took your breath away—you could even place them right in your spreadsheet. Informix had demonstrated the possibilities of spreadsheet publishing, and the company seemed more than willing to do battle with Microsoft and Lotus.

Times have changed; Wingz hasn't. While other spreadsheet programs have improved, especially Excel, Wingz has added only one major new feature—and a telling one at that—the ability to read Excel spreadsheets directly. With Excel 3.0, Microsoft added most of the whiz-bang features of Wingz, including the integration of text and graphics, multiple typefaces in a spreadsheet, and a wide variety of charts and graphs, including some in 3-D. After Microsoft released Excel 3.0 for Windows, we stopped hearing about Wingz. The press no longer wrote about it, and Informix stopped running its advertisements.

Given the recent flood of new

## WINGZ 1.1A

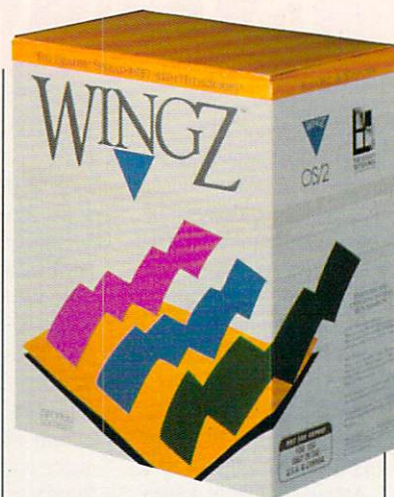
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Windows-based spreadsheet programs, should you even consider buying this program? The answer is a qualified yes. There are still three major reasons to buy Wingz.

First, you get a free OS/2 version of Wingz when you buy the Windows version. That may not sound as good as it did back in 1990 when the pairing was introduced, but it could be a real plus for an OS/2 fan.

Second, Wingz is available for an unprecedented number of platforms, including IBM-compatible PCs (Windows and OS/2) and Apple Macintosh (System 6.x and 7.x), as well as Unix-based systems from NeXT, Sun, Data General, Hewlett-Packard, Mips, and IBM RISC. All versions share the same features and menus and can even read the same program files written in the HyperScript programming language.

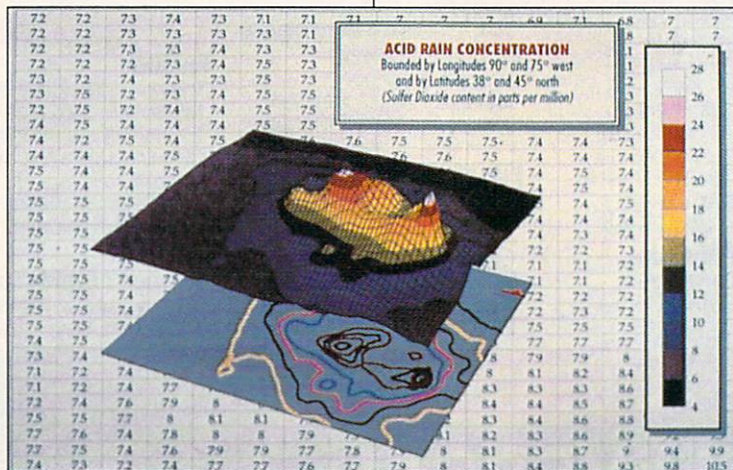


Third, you get the programming power of HyperScript. Much more than a macro language, HyperScript is powerful enough to create a full-blown application. Try out the Test Flight demo that comes with the package, and you'll see what I mean. The entire demo was written in HyperScript. It includes a very playable tic-tac-toe game, a fast-moving and interactive graphics-shape game, and a dialog box with sliding scale controls that lets you adjust the view of a 3-D chart in real-time. If you love to program, you'll love the high-level programming language and compiler.

For those who use OS/2, work on other platforms, or love to program, Wingz is worth a good look. But for the rest of us, Excel is the best overall choice. It's a shame that a program with so much early promise should now be so neglected. Perhaps someday Informix will release Wingz 2.0 and shake up the spreadsheet market just as it did with Wingz 1.0.

DAVID ENGLISH

Circle Reader Service Number 310

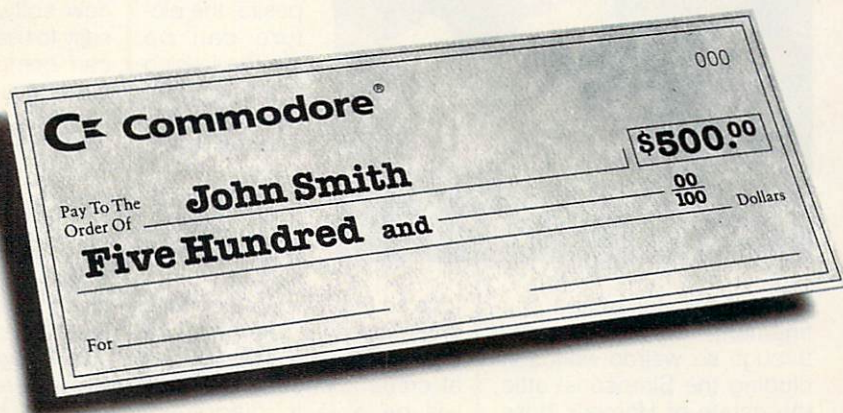


Wingz 1.1A

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# NEWS & NOTES

Jill Champion

## Don't Have a Cow, Man

Fans of the Simpsons can now get their fill of the dysfunctional family in a new PC game from Konami based on the animated TV series.

The Simpsons: Bart's House of Weirdness lets you take the starring role as the radical dude himself, Bart Simpson, in a quest for the ultimate coolest item of all. The game begins as Homer grounds Bart to his room until he's ready to "act like a hu-

man being." To escape confinement, Bart must travel through six weirdo worlds including the Simpsons' attic; the estate of Homer's boss, Mr. Burns; and Itchy and Scratchy's ice cream parlor.



You'll encounter numerous obstacles and traps along the way like burp balls, falling knives, and worms, but as the ever-resourceful Bart, you'll be armed with a burp gun, water balloon, slingshot, spray-paint can, and dart gun.

The price for Bart's House of Weirdness is \$49.95. For more information, contact Konami, 900 Deerfield Parkway, Buffalo Grove, Illinois 60089; (708) 215-5100.

**Crime-Fighting Windows**  
Artists who render criminal sketches for the Bellevue, Washington, police department are getting a little help from the PC these days. Detectives there have begun using

a Windows-based drawing program called Compusketch that makes producing composite drawings of criminals much faster than with the traditional pencil-and-paper method. Crime witnesses are interviewed by police officers for details about a suspect's physical appearance, such as eye, hair, and skin color; hair style; and head shape. The information is entered into the computer, and Compusketch generates a rough onscreen composite.

Once witnesses view the initial composite, the picture can be modified, using a mouse and the menu tools, to show more detail.

The department hopes to install Compusketch on laptops so that officers in mobile crime-investigation vans can take composite descriptions at crime scenes. Detectives will be able to diagram a crime scene on the spot with Compusketch and report from the field using Microsoft Word on laptops. They'll be able to put together a search warrant and send it to a judge by fax or modem.

## Living Color

Beginning readers can now turn to the PC for storytelling that's both educational and fun. Interactive Storytime from Multimedia Products is a series of classic children's tales on CD-ROM. Familiar characters like Goldilocks and the little red hen come to life through colorful graphics, voice-over narration, lively music, and vivid sound effects.

The software is so simple to use that children can maneuver their own way through

the stories with very little adult supervision. Clicking on an object shows how its corresponding word is spelled while a voice pronounces it. Clicking on different boxes takes the child to another page or story or prints out a coloring book.

Each disc contains three children's stories for a suggested retail price of \$49.95. For more information, contact Multimedia Products Group, 300 Airport Executive Park, Spring Valley, New York 10977; (914) 426-0400.

## Multimedia Made Simple

Eclipse Technologies says its new software for PCs is so easy to use that first-time users can complete a multimedia presentation with sound in about 15 minutes—and they won't have to break the bank to do it. Madison Ave. Multimedia software retails for \$169.95.

To create a presentation with Madison Ave., you capture and then display screens from any DOS or Windows program using the Camera feature. Images are then saved as high-resolution PCX files. Sound is recorded directly to the hard disk with the onscreen Recorder feature. A free music library of original compositions is included with the package, or, if you have a sound board, you can record sounds from any source—through a microphone or from a CD, cassette, or record. You can easily add special effects like transitional fades; even mouse-pointer movements can be recorded.

Using the Carousel feature, you view, sequence, copy, and move or delete captured screens. Voice, music, special effects, and images are all part of individual slides within Carousel, which makes editing a snap. Simply choose a slide or block of slides and move them with a keypress or

Get ready to hunt for the coolest item in the universe in Konami's recent release, *The Simpsons: Bart's House of Weirdness*.

mouse click, and sounds and special effects move automatically with the images.

For more information, contact Eclipse Technologies, 1221 West Campbell Road, Suite 125, Richardson, Texas 75080; (800) 456-6434.

### Virtual Hollywood

Virtual reality enthusiasts might have second thoughts about the technology after viewing *Lawnmower Man*, the new Stephen King flick that shows the darker side of a phenomenon taken too far.

This \$10 million futuristic thriller is one of the first films to incorporate virtual reality. New Line Pictures promises "computer graphic animation effects never before seen on the 35mm screen."

Pierce Brosnan, best known for his portrayal of TV's Remington Steele, plays an obsessed scientist who conducts intelligence-acceleration experiments on a slow-witted gardener nicknamed "the Lawnmower Man" (Jeff Fahey). The experiment goes awry, and the Lawnmower Man becomes a superintelligent being filled with hatred, capable of transforming matter with mere thought. The final battle between good and evil is waged in virtual reality.

### Becoming Word Smart

Punch up your communications skills with WordSmart. WordSmart is an English language enhancement program that teaches vocabulary, usage, derivation, and pronunciation to help improve spoken and written communication skills at almost any age and educational level.

The program combines computer software with audiotapes for ten levels of learning—fourth grade to Ph.D.—and is designed to dramatically improve reading, writing, and comprehension skills, as

well as clarity and direction in speaking. Each volume contains three floppy disks and five 1½-hour audiocassettes. If you would like to have further information, contact Software Resource, 8 Digital Drive, Suite 100, Novato, California 94949; (415) 485-0800.

### Let's Go to the Movies!

Think you've seen a lot of films? Odds are you'll discover something new if you consult the Banner Blue Movie Guide. You'll find information on more than 9000 movies—from the campiest B titles to Oscar winners—produced during the past 65 years. Browse through the entire catalog of movies or conduct a search by category, plot, actor, director, subject—even by typing in one word of a title. The guide includes information on critics' opinions and award nominations and wins. Its retail price is \$44.99.

For more information, contact Banner Blue Software, 39500 Stevenson Place, #204, Fremont, California 94539; (510) 794-6850.

### Talking Fingers

Learning sign language is now as easy as turning on your computer, thanks to E&IS SignWare.

Fingerspeller, the most popular signing program, teaches the American Sign Language (ASL) alphabet by displaying high-resolution pictures of correct hand positions for every letter. Instant letter conversion allows you to see the correct fingerspelling of any letter you press on the keyboard. In-

stant word conversion fingerspells any word up to 30 letters long. Learning comprehension tests your knowledge of fingerspelled words, including those in a personal file you create. Suggested retail price is \$39.95.

Elementary Signer uses more than 160 signed words to test word-recognition skills. Learning speed can be adjusted to the user's level of learning—from beginner to advanced signer. Suggested re-



The futuristic flick *The Lawnmower Man* explores the darker side of virtual reality taken to its ultimate limits.

tail price is \$79.95.

FingerZoids (only available for Mac and Apple II) is a game that helps reinforce sign language skills. As fingerspelled letters drop from the top of the screen, your goal is to press the correct letter on the keyboard before it reaches the bottom. Suggested retail price is \$49.95.

For more information, contact E&IS SignWare, P.O. Box 521, Cedar Falls, Iowa 50613; fax (319) 266-7800.

*Companies with items of interest suitable for "News & Notes" should send information along with a color slide or color transparency to News & Notes, Attn: Jill Champion, COMPUTE, 324 West Wendover Avenue, Suite 200, Greensboro, North Carolina 27408. Although space is limited, all items will be considered for publication.* □

**Reading single bytes from files with GW-BASIC, motivating a mouse, getting to the root of DeskMate, and taking the short course on scanners**

## GW-BASIC Binary

Here's a GW-BASIC program that reverses upper- and lowercase letters. It also demonstrates how GW-BASIC can be used to read and write files byte by byte.

```
10 INPUT "NAME OF FILE TO CHANGE",IFILE$
20 OPEN IFILE$ FOR INPUT AS #1
30 OFILE=LEFT$(IFILE$, INSTR(IFILE$, ".")+1)+"Z$$"
40 OPEN OFILE$ FOR OUTPUT AS #2
50 WHILE NOT EOF(1)
60 C$ = INPUT(1,#1)
70 IF C$ >= "A" and C$ <= "Z" THEN C$=CHR$(ASC(C$)+32) ELSE IF C$ >= "a" AND C <= "z" THEN C$ = CHR$(ASC(C$)-32)
80 PRINT #2,C$;
90 WEND
```

DONALD RICHMOND  
SAN ANGELO, TX

## A Mad Dash for the Exit

The DOS manual states that I should exit to DOS before turning off the computer to extend its life. I have a Tandy, and when I exit to DOS, my screen says C:\DESKMATE. I try entering C:, but to no avail. Is it all right to exit at that point, or should I select Tree in DeskMate, choose C:, and then leave to DOS?

TONI M. MARGUGLIO  
MILLVILLE, NJ

When your screen says C:\DESKMATE, you have exited to DOS. There's no reason to return to the root directory. Typing C: at the DOS prompt only takes you to the C: drive, which is where you are already. If you want to go to the root directory, type CD \ at the DOS prompt, and you'll be taken there, though there's no reason to return to the root directory before shutting down your computer.

The reason you should return to DOS involves the tem-

porary files used by many programs while they're running. If you simply turn off the computer while a program is running, the next time you turn it on you'll have many useless files on your disk. Worse, you might turn off the power while the file allocation table (a.k.a. the FAT) is being written to, resulting in an Osterized hard disk. But once you're at DOS with the C: prompt visible (regardless of the path that follows it), it's safe to turn off the machine.

The next question is whether you would want to turn it off at all. Many experts, including our own Mark Minasi, advise that you let your computer run all the time. It uses very little power when it's just sitting there.

## Scanned Heat

I plan to purchase a scanner and would like to make an informed decision. I would appreciate any information about costs, system requirements, and so forth.

JASON LOCK  
BRANTFORD, ON, CANADA

We get a lot of questions about scanners from our readers, and we believe that the technology is mature enough to be of interest to almost everyone with a computer. Check out the January 1992 issue for a comprehensive look at hand scanners. Briefly, there are a few different classes of scanners, and the kind of work you're doing will determine which scanner is right for you.

Hand scanners are mouse-like devices that can scan a section of a page about four inches wide. Hand scanners are portable and easily stored, so if you're scanning on the road, if space is a premium, or if your scanning needs are very restricted, a hand scanner is the scanner

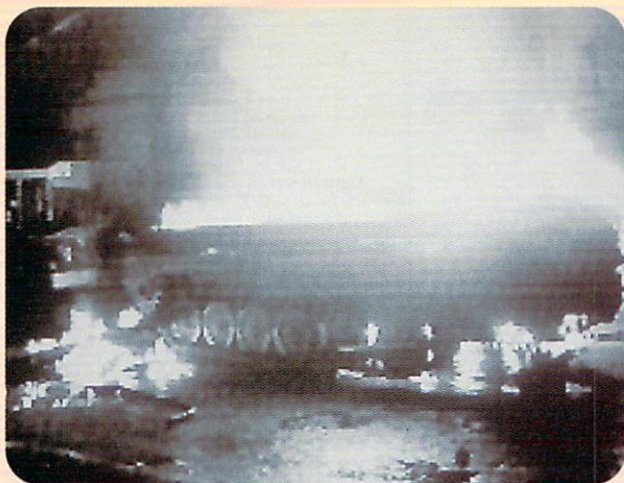
for you. Because you actually move the scanner over the page, however, this is the least steady and least reliable alternative.

Flatbed scanners are like small photocopiers. They read a page through a sheet of glass or (in the case of Chinon flatbeds) from a head located about a foot above the scanning surface. If you're scanning pages from books, this is your best alternative. Because the page is stationary and the scanner mechanism moves, a flatbed scanner often provides the steadiest scan.

Sheet-fed scanners transport the scanned page through the mechanism much like a standard fax machine. The way they feed paper prevents you from scanning books and makes scanning assemblages of paper (like a page with a Post-it note attached) risky. Because the scanned page moves and the scanner itself is stationary, this scanner can be unreliable, depending on the quality of its paper-handling mechanism.

Most scanners can produce monochrome, gray scale, or dithered grays. If you find a scanner that won't produce one of these forms of images, keep looking. Each is valuable for different purposes, and you'll undoubtedly feel as if you've bought crippled equipment if you get a scanner with less than a full range of capabilities.

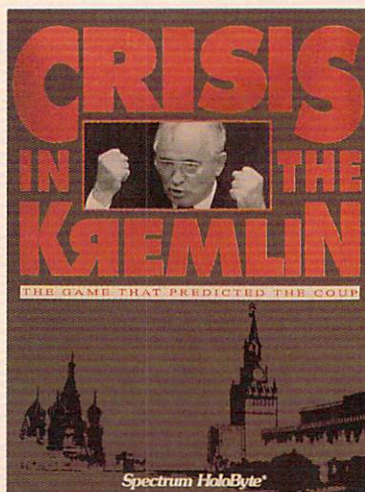
A number of color scanners have been introduced for desktop use over the past year or so. If you can afford it, color seems to be the wave of the future. Dots per inch (dpi) is an important consideration. Many scanners now offer 400-dpi resolution. You should also take a close look at the software provided with the scanner. The competition



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Circle Reader Service Number 229

is so intense and the scanner standards are so high that many scanner manufacturers now offer extremely sophisticated software packages with their products, providing optical character recognition (OCR) and photo editing as well as the tools normally found in paint software.

## Obstinate Arthur

Being a novice at the computer, I'm at a loss with the following situation. I have an IBM PS/2 55SX 386 computer that when purchased came with the following software loaded on the hard disk: DOS 4.01, Windows 3.0, Window Apps, hDC Apps, Word for Windows, and so on. The mouse functions well with all of this software but refuses to function with other software obtained since the purchase of the computer, including Labels Unlimited, Jack Nicklaus' Unlimited Golf & Course Design, and Instant Recall. Each of these programs states that a mouse can be used and recommends its use.

After referring to various manuals and talking with a few of the software companies and many individuals that have been in the computer game for a long time, I've had no success in getting my mouse, Arthur, to function with the software purchased since I bought the machine.

What am I overlooking? Is it something in the AUTOEXEC.BAT or CONFIG.SYS files? There must be some way to get Arthur to cooperate. Any help you can provide would be greatly appreciated. When a person starts calling a mouse by name, you know the frustration is getting the best of him.

WALT TAPPEN  
PARK FOREST, IL

*We called IBM and came up with a few ideas of our own. First, you should check your AUTOEXEC.BAT and CONFIG.SYS files to see if you have a mouse driver installed. (Windows has its own mouse driver, which it can load automatically.) If there's a line in your CONFIG.SYS that calls your mouse driver, it should look something like DEVICE=C:\DOS\MOUSE.SYS. If there's one in your AUTOEXEC.BAT file, it might look something like this: C:\DOS\MOUSE. If you have neither of these, try inserting the command into*

*one of the files and reboot. If the programs still don't recognize the mouse, you need to look for your mouse driver. Go to the root directory and type ATTRIB MOUSE.\* /S and press Enter. DOS will look throughout your hard drive for a mouse driver. When you find it, enter the path that ATTRIB prints on your screen in your CONFIG.SYS or AUTOEXEC.BAT files (depending on whether it's a SYS or a COM file). If there's no such file, look for it on your installation disks. It should be there. If it isn't, complain to the salesperson who sold you the unit.*

*If you found the call in your CONFIG.SYS or AUTOEXEC.BAT and you found the file MOUSE.SYS or MOUSE.COM but the mouse still doesn't work, you may have a TSR program loaded that's interfering with the signal. If so, create a boot disk by formatting a floppy with the command FORMAT A:/S. Write an AUTOEXEC.BAT or a CONFIG.SYS file that contains only the command to load the mouse driver and put it on the floppy boot disk. Make sure the disk is in place, ready to read, and boot your computer. It will boot from the floppy rather than the hard disk, and there will be nothing to interfere with the mouse driver. Run one of your mouse-driven programs. If the mouse driver still doesn't work, take the computer and mouse in for technical assistance from your dealer. If it does work, copy the program calls from the AUTOEXEC.BAT on your hard disk to the AUTOEXEC.BAT on your floppy disk one by one, rebooting each time, until your mouse fails to respond. The last program you copied is the culprit. Call its manufacturer to find out if there's a way to make it friendlier to your environment.*

Readers whose letters appear in "Feedback" will receive a free COMPUTE's PC clock radio while supplies last. Do you have a question about hardware or software? Or have you discovered something that could help other PC users? If so, we want to hear from you. Write to COMPUTE's Feedback, 324 West Wendover Avenue, Suite 200, Greensboro, North Carolina 27408. We regret that we cannot provide personal replies to technical questions. □

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# POINT & CLICK

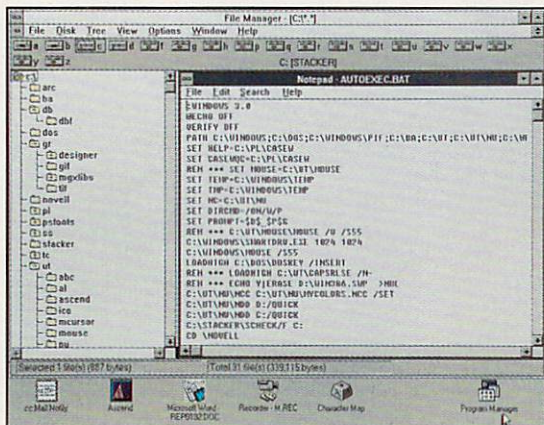
Clifton Karnes

## TURBOCHARGE FILE MANAGER

When you upgrade to Windows 3.1, many of you will want to start using the program's powerful new File Manager. It's a dramatic improvement over 3.0's File Manager, and here are two Recorder macro tips that will make it even more powerful. (These macros work with 3.0's File Manager, too, so don't stop reading if you don't have 3.1 yet.)

First, some background. With File Manager, there are two ways you can easily view files: You can associate the

**Create a Recorder macro to load files into Notepad with a single key combination.**



file's extension with Notepad (or another text-editing or -viewing program) and double-click on the filename. Or you can drag the file to Notepad's icon minimized on the desktop (in Windows 3.1 only).

The first method works only if the file is associated. The second method requires that Notepad be minimized on your desktop, ready to receive the file.

But what do you do when you want to load a batch file into Notepad but BAT is the extension of an executable program and can't be associated? Or when you have small text files with DOC extensions

that you want to read in Notepad but DOC is associated with WinWord? The answer is to create a Recorder macro to load the file at the cursor in File Manager into Notepad.

Before we dive into the File Manager macros, there's a possible problem with Recorder we need to remedy. If it records your mouse clicks, any mouse movements you make will only be played back correctly when the position and configuration of your windows are exactly the same as when the macro was recorded.

The solution is simple. Tell Recorder to record only your keystrokes.

Here's what to do.

1. Select Options, Preferences.
2. In the Record Mouse drop-down list box, select Ignore Mouse.
3. Click on OK.

Now that the mouse business is fixed, let's get back to the macro that will load the file at the cursor into Notepad. Here are the steps.

1. In File Manager, select a file to load into Notepad.

2. Open Recorder, choose a name for your macro (such as Load File at Cursor into Notepad), and start recording.

3. In File Manager, press Alt-F, P, and Ctrl-Insert to copy the selected filename to the Clipboard. Press Tab, Tab, Enter to exit the dialog box.

4. Press Alt-F, R. Then type NOTEPAD.EXE followed by a space in the text box.

5. Press Shift-Insert to paste the name of the file into the text box.

6. Press Enter. Stop recording, and assign the macro a keypress. I suggest Ctrl-Alt-N.

Now simply press Ctrl-Alt-N to load any file selected in File Manager into Notepad. (The Notepad in 3.1 can load binary as well as text files.)

Here's another common problem. If you want to view

files by their extension type in File Manager, it's a cumbersome process. You have to go through slow menus and dialog boxes.

The solution, again, is to create a Recorder macro to automatically display all files with the same extension as the file at the cursor.

Here's the macro, step by step:

1. Place the cursor on any filename in File Manager that has an extension.

2. Run Recorder (make sure you're ignoring mouse movements), and prepare to record a macro. I suggest a name such as View by Type and a key combination of Ctrl-Alt-T for this macro.

3. Press Alt-F, P. Then press the left-arrow key five times.

4. Press Shift-End to define the part of the filename before the extension.

5. Press Delete.

6. Type "\*" .

7. Press Home, followed by Shift-End to define the wildcard filename.

8. Press Ctrl-Insert followed by Esc.

9. Press Alt-V, T (press C instead of T for Windows 3.0), and Shift-Insert to paste the wildcard into the text box.

10. Press Enter to display files with the wildcard.

The macro to display all filenames is quite simple:

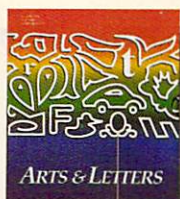
1. Press Alt-V, T.
2. Type "\*" .
3. Press Enter.

A good name for this macro is View All, and the key combination I suggest is Ctrl-Alt-A.

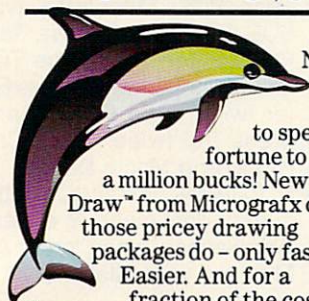
From now on, Ctrl-Alt-N will load the selected file into Notepad, Ctrl-Alt-T will display files with the selected file's extension, and Ctrl-Alt-A will display all files.

You can find these 2 tips, plus 99 more, in my forthcoming book *101 Essential Windows Tips*, published by COMPUTE Books. □





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# TIPS & TOOLS

Edited by Richard C. Leinecker

## Security Is No Accident

My computer at work is unattended while I'm away from my desk. During that time anyone can come in and browse files on the hard drive. Some of those files are sensitive, so I wrote two simple security programs. One hides them when I'm away, and the other shows them when I need to use them.

Make sure the DOS program called DEBUG is in your path or the current directory. In these examples, the italic text is what the computer prints; the roman text is what you should type.

### DEBUG HIDE.COM

*File not found*

```
-E 100 BE 80 00 AC 0A C0 74 3C
-E 108 AC 3C 0D 74 37 3C 20 74
-E 110 F7 8B D6 4A AC 3C 0D 74
-E 118 04 3C 20 75 F7 C6 44 FF
-E 120 00 2B C9 B4 2F CD 21 83
-E 128 C3 1E B4 4E CD 21 72 14
-E 130 8C C0 8E D8 8B D3 E8 0F
-E 138 00 B4 4F CD 21 72 05 E8
-E 140 06 00 EB F5 B4 4C CD 21
-E 148 B8 00 43 CD 21 80 C9 02
-E 150 B8 01 43 CD 21 C3
-RCX
CX 0000
:56
-W
Writing 0056 bytes
-Q
```

### DEBUG SHOW.COM

*File not found*

```
-E 100 BE 80 00 AC 0A C0 74 3D
-E 108 AC 3C 0D 74 38 3C 20 74
-E 110 F7 8B D6 4A AC 3C 0D 74
-E 118 04 3C 20 75 F7 C6 44 FF
-E 120 00 B9 02 00 B4 2F CD 21
-E 128 83 C3 1E B4 4E CD 21 72
-E 130 14 8C C0 8E D8 8B D3 E8
-E 138 0F 00 B4 4F CD 21 72 05
-E 140 E8 06 00 EB F5 B4 4C CD
-E 148 21 B8 00 43 CD 21 80 E1
-E 150 FD B8 01 43 CD 21 C3
-RCX
CX 0000
:57
-W
Writing 0057 bytes
-Q
```

To use the programs, type HIDE *filename* or SHOW *filename*. You can use wildcards in the filename.

RICHARD C. LEINECKER  
REIDSVILLE, NC

## Perfect Memo Forms

Feeding a special memorandum form into your laser printer each time you want to type an interoffice memo can be a nuisance, especially if the printer is away from your desk or in another room. The following WordPerfect macro will create the form for you. And all with just one keystroke! All you have to do is begin typing your memo.

Beginning at a blank WordPerfect screen, invoke Macro Define by pressing Ctrl-F10. Press Alt-M to name the macro. If you don't already have a macro defined on Alt-M, WordPerfect will ask you to describe the macro. Type MemoForm. If Alt-M exists, you'll be asked if you want to replace the macro. Press 1 for Replace and Y for Yes, and then type MemoForm. (Note: If you don't want to replace Alt-M, you can define this macro with any Alt-letter combination you want.)

Set the top margin to .25: Shift-F8, 2 (for Page), 5 (for Margins Top-Bottom), .25, Enter, Enter, Enter.

Set the left margin to .50: 1 (for Line), 7 (for Margins Left-Right), .50, Enter, Enter, Enter, Enter.

Set the base font to Helvetica by pressing Ctrl-F8, 4 for Base Font, and N for Name Search; then type Helv. (If you are using Bitstream or some other font product, Helvetica may have a different name.) LaserJet II and compatible printer users should select a 12-point font and then press Enter. PostScript users press Enter, type 12, and press Enter.

Now that the base font is

set, set the font for the heading at Very Large: Ctrl-F8, 1 for Size, 6 for Very Large.

Turn on Caps Lock, press F6 for Bold, and type MEMORANDUM. Press the right-arrow key to move beyond the Very Large code. Press Enter four times. Change the left margin back to one inch by pressing Shift-F8, 1 for Line, and 7 for Margins. Then type 1, and press Enter four times. Type DATE: and press Tab twice. Press Enter twice, type SUBJECT:, and press Tab. Press Enter twice, type TO:, and press Tab twice. Press Enter twice, type FROM:, and press Tab twice. Press Ctrl-F10 to end Macro Define.

To test your macro, exit the current document. At a blank WordPerfect screen, press Alt-M to see your "stationery."

WILLIAM HARREL  
VENTURA, CA

## Vaya con DOS

Sometimes it's nice to leave a batch file, go to DOS, and return to the batch file exactly where you left off. Here's how you can do that.

### ECHO OFF

REM Do batch file stuff here.

REM Now go to DOS.

```
SET OLDPROMPT=%PROMPT%
PROMPT=Type "exit" to return to
batch file $_.sp$g
%COMSPEC%
PROMPT=%OLDPROMPT%
SET OLDPROMPT=
```

REM Resume doing other batch file stuff.

CLARK WAGGONER  
SAPULPA, OK

## Easy Startups

Some programs ask you a question or two when they first run. A good example of this is Lemmings. When it first runs, it asks what kind of computer you have so it can

Protect your computer from malicious entry, set up standard forms with WordPerfect macros, and fool DOS into thinking it has received keyboard entry.

adjust its runtime speed for computers of varying clock speeds. My computer runs best on the second speed, so when I run Lemmings, I type ECHO 2IVGALEMMI -V. (The character after the 2 is a vertical bar.) It tricks the program into thinking that I typed the 2 key after the program ran. A batch file with this line makes it even easier to start this program.

I also use this technique when running the PC Tools MI program. It normally shows two screens of information, waiting for a keypress between them. Since I'm never interested in the first screen of information, I run the program by typing ECHOIMI. (The character after ECHO is a vertical bar.) It tricks the program into thinking I pressed a key after the program ran.

And here's one last handy trick that's similar. Instead of typing DEL B:\*. \* to delete all the files on drive B, just type ECHO YIDEL B:\*. \*. (The character after the Y is a vertical bar.) DOS will be tricked into thinking you pressed Y and do the deletes. Be careful; you could accidentally delete files that shouldn't have been deleted.

This technique doesn't work with every command. FORMAT is a good example. Microsoft probably made sure you couldn't use such a trick because one mistake could wipe out your hard disk.

BEN SEREBRIN  
LAKELAND, FL

## Use High Memory

If you have a 386 or better, you can add the UMB command (DOS = HIGH,UMB) so that programs such as device drivers and TSRs can run in upper memory as well. To make this work, you need to install the EMM386.EXE memory manager, and you need to direct your drivers and TSRs to high memory by using the HIGHDEVICE command in CONFIG.SYS and the LOADHIGH command in AUTOEXEC.BAT.

TONY ROBERTS  
GREENSBORO, NC

## Easier Paths

My path statement contained so many directories that it was slowing things down. Each time DOS searched for

something in the last directory on the path, it had to check all of the other directories first. I created a directory called BATS that contains a batch file to call each of my programs and put the BATS directory in my path. The batch files make sure I'm in the correct directory before running a program.

Here's a batch file called WPB.BAT to run WordPerfect. To use it, I just type WPB, and it gets me in the correct directory and runs WordPerfect.

```
ECHO OFF
CLS
CD \WP
WP
CD \
```

MATTHEW ALEXANDER  
PASADENA, NF, CANADA

## Hard Disk Real Estate

It's a constant struggle to keep ahead of the demand today's bloated soft-

ware makes on a hard disk. Furthermore, I have to keep a certain amount of hard disk space available for programs to use for temporary and swap files. LHARC has come to the rescue more than once.

If I have a directory that I expect to need in the near future but I'm not currently using, I can simply move all of its files into a single compressed file with LHARC M *dirfile*. Graphics files take up a lot of space, so I compress them, too. I can then examine the list of files within a compressed file with the LHARC *graphfil* command. If I need to expand a single file, I use LHARC E *graphfil filename* to expand the individual file.

Files that may be of interest but don't need to be immediately available can be simply backed up with any commercial backup program, like PCBACKUP (with PC Tools), or the DOS BACKUP command. I often



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Foreword by Brian Dougherty, CEO of GeoWorks

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make two backups of manuscript and graphics files because, if a disk goes bad, I can lose months of work. Once the backup is made, I can simply wipe out the directory and recycle the hard disk space.

My biggest devourers of hard disk space are PostScript files, graphics files, and applications. Word processors that do automatic backups may also overload your disk with old versions of files. Periodically, I issue this command from my root directory.

### **ATTRIB \*.PS /s > PSFILES**

This command creates a file containing a list of all the PostScript files on my hard disk. To find backup files, I substitute BAK where PS appears in the example. Once I know where these files are, I can back them up and delete them.

ROBERT BIXBY  
GREENSBORO, NC

### **Memory Jumpstart**

Sometimes, it's hard to remember from Friday afternoon to Monday morning what your current tasks are or what needs to be done before that Monday staff meeting. Sometimes, it's even hard to remember overnight. To leave reminders for yourself, include a command in your AUTOEXEC.BAT file that will display a screen of reminders of what your current tasks are when you first boot up. Near the end of your AUTOEXEC.BAT file, include these commands.

### **@ECHO OFF**

### **TYPE AGEND**

### **PAUSE HERE IS YOUR AGENDA**

Then, at the end of each day, create or modify a text file called AGEND. If your work varies greatly from day to day, you might as well simply create a new file every day, but if you have four or five things that you have to do routinely, place these at the top of the file and use EDLIN or a word processor that can write an ASCII file to change the tasks at the end of the file. If the file becomes long, use the MORE filter.

ROBERT BIXBY  
GREENSBORO, NC

*If you have an interesting tip that you think would help other PC users, send it along with your name, address, and Social Security number to COMPUTE's Tips & Tools, 324 West Wendover Avenue, Suite 200, Greensboro, North Carolina 27408. For each tip we publish, we'll pay you \$25-\$50 and send you a COMPUTE's PC clock radio while supplies last.* □

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| 2      | 2B       | JOE MURPHY  | NEW YORK |
| 3      | 3B       | JOE MURPHY  | NEW YORK |
| 4      | SS       | JOE MURPHY  | NEW YORK |
| 5      | LF       | JOE MURPHY  | NEW YORK |
| 6      | CF       | JOE MURPHY  | NEW YORK |
| 7      | RF       | JOE MURPHY  | NEW YORK |
| 8      | P        | JOE MURPHY  | NEW YORK |
| 9      | C        | JOE MURPHY  | NEW YORK |

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| 6      | NEW YORK | BB   | 10    |
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| 10     | NEW YORK | WHIP | 10    |

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| SPECIAL   | EP |

**MANAGER** 1

**STATS**

|         |   |
|---------|---|
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| STRIKES | 0 |
| INNING  | 0 |
| OUTS    | 0 |

**NEW YORK**  
LOS ANGELES  
DI MAGGIO  
KOUFAR

**STATS**

|         |   |
|---------|---|
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# PROGRAMMING POWER

Tom Campbell

## TURBO PASCAL FOR WINDOWS: FIRST STEPS

I think Turbo Pascal for Windows (TPW) is the best Windows development system available for anywhere near its price, especially if you're a Pascal programmer.

Just be sure to budget something extra for CompuServe and a third-party book because the Turbo manuals don't do a great job of turning the new user into a Windows programmer. One way to remedy that situation is to buy Tom Swan's *Turbo Pascal for Windows 3*, which costs \$29.95 from Bantam Books and is more than worth its price. Another way is to read this column.

### Turbo Price

The only thing I don't like about TPW is the documentation, which is pretty amazing considering it's a 1.0 product. There's a great deal to like about TPW.

First of all, its price makes it simply the best deal you can find for developing Windows applications and DLLs. Make no mistake about it; your hundred clams (and that's list!) for TPW, plus 30 for the Swan book, gets more bang for the buck than anything else out there by a margin of at least \$150.

Second, and more important, this set of robust, mature development tools is second to none. The debugger is a text-mode version of Turbo Debugger, not the more modestly endowed debugger that comes with Turbo Pascal 6 for DOS. The resource editor, which lets you create Windows dialogs, menus, and other user-interface gizmos, is Whitewater's well-respected Resource Toolkit, which itself

sells for several times more than the entire Turbo Pascal for Windows package. The sample programs, in what is becoming a tradition with Borland, are numerous and of very high quality, illustrating just about every concept a Windows programmer needs to find illustrated.

The ObjectWindows Library is a sheath over Windows to ease the considerable bookwork required to get started in Windows programming, and it does a good job of it. A Help compiler is also included free (\$49.95 if you buy it from Microsoft); it lets you create true Microsoft Help for your applications. Last but not least, the multiwindow development environment and editor work together in inimitable Turbo Pascal fashion, which means that TPW is intuitive and very, very fast.

### Dialing for Dialogs

This month we'll take those marvelous tools and create . . . well, we'll create a program that does very little. It merely displays a dialog with a couple of buttons on it. Normally I scorn do-nothing programs of this type, but I wish I'd had a template like it when I was creating my first real Windows app with Turbo Pascal (it's Windows File Finder, available on COMPUTE/NET).

The TPW example programs are all quite sophisticated—too much so for a laggard like me. What I needed to know was the bare minimum required to put up a modeless dialog with a few buttons on it and how to connect the visual entity that is a dialog with the code it's supposed to execute. You should read the TPW tutorial manual, which will make more sense after you peruse this column.

Following are the general steps. Create a dialog using

some sort of resource editor or the mysterious RC (a familiar sight to old Windows hacks). The controls on the dialog must have numeric identifiers, and your program must know what those identifiers are. When the controls are activated (for example, when you click on a button), Windows sends a message to the Turbo Pascal application, which routes it through OWL. You must create a method for that control, giving the method a virtual index containing the value of the control's identifier. This means that every button, scroll bar, edit box, menu item, and so forth can potentially have a method associated with it. It also means that the routines for each button on the dialog can be in widely disparate areas in the source and that there is no intrinsic connection between the code for these controls and the fact that they appear on the same dialog.

This, then, is why Windows programs tend to be modeless and are so much easier to write in a way that keeps modes to a minimum. The user manipulates a physical object on the screen, and that action triggers code somewhere. Your program consists of little more than subprograms (methods, technically) whose sole purpose is to react to those actions.

### Button Basics

The program below uses a simple dialog with two buttons. Clicking on one button causes a message to be displayed. Clicking on the other causes the program to end. While you could simulate this with the Windows Message-Box routine—it is in fact used by this program—you would be limited to the Message-Box's own resources. You can easily extend the concepts used to create this dia-

**The ObjectWindows Library is a sheath over Windows to ease the considerable bookwork required to get started in Windows programming.**

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# PROGRAMMING POWER

log to edit fields, other buttons, whatever. My file finder program illustrates several of these concepts. But let's get down to specific steps.

Fire up the Whitewater Resource Toolkit. Click on the New button and enter DLG as the filename. Click on the Dialog button. The default dialog type is perfect for our purposes. You may want to double-click on the dialog and change its caption for practice; I suggest the text *Click on Done to Quit* for reasons that will become apparent.

Click on the Button tool and add a button. Double-click on the button to bring up its Attributes dialog. Change the text to *Test* (don't ever accuse me of dazzling originality) and the item ID to 102. Repeat this for a second button, but name it *Done* and give it the button ID 103. Place the two buttons next to each other on the dialog. Name the dialog DIALOG1.

Save this dialog resource as DLG1.RES; then start Turbo Pascal for Windows and compile the following program. Be certain all identifiers and numbers are correct because they're needed inside the source. When you run it, a dialog with two buttons appears. Click on Test, and a message box acknowledging your action appears. Click on Done, and the OWL CloseWindow method is called, returning the program's resources to Windows and exiting.

## The Finished Product

The program contains extensive comments showing you how to hollow it out and replace its code with your own. It's quite simple; the code is about 30 lines long. Use it in conjunction with chapter 11 of the TPW Cookbook, and you'll be well on your way to building your own programs with custom dialogs. □

```
PROGRAM DLG1;                                { Compile using Turbo Pascal for Windows. }
{ DLG1 is a minimal program that simply puts up a dialog box with two
  buttons on it. It puts up a message box when the user clicks on Test,
  and quits when the user clicks on Done. }

{ Adapting it for use in your own program:
- Change the copyright message in the $D directive below.
- Change ResourceName to an appropriate identifier. This has to match
  the name of the identifier in the .RES file.
- If the name of a button, such as the Test button, is changed (very
  likely), change the id_Test identifier as well. Also, ensure that
  the button's ID number, 102, matches the ID number given to it in
  the resource editor.
To add buttons:
- Add them to the dialog resource using the resource editor.
- Make sure they have distinct IDs (the resource editor assigns unique
  IDs automatically, but you can change them--so be careful).
- Add CONST declarations with identifiers using the same names as the
  buttons but prefixed with id_. For example, if a button called
  Done is given the resource ID 103 in the resource editor, use this
  declaration in your program file:

CONST
  id_Done = 103;
}

{ Use the OWL units. }
USES WinTypes, WinProcs, WObjects;

{ Link in the resource file DLG1.RES. }
{$R DLG1 }

{ This gets inserted directly into the .EXE. }
{$D Copyright (c) 1991 by Your Name Here }

CONST
{ Symbolic name of the dialog resource. This must match the Dialog ID
  you assign the dialog object in the resource editor. }
  ResourceName : PChar = 'DIALOG1';

{ This matches the resource ID number of the Test button. }
  id_Test = 102;
{ This matches the resource ID number of the Done button. }
  id_Done = 103;

TYPE
  TMyApplication = object(TApplication)
    { Your application must override (have its own) InitMainWindow method.
    PROCEDURE InitMainWindow; virtual;
  END;

  { Points to objects of type TDialog1. Pointers of this type will
  be used to allocate TDialog1 objects dynamically. }

  PD1 = ^TDialog1;

  { This data structure matches the dialog resource 'EMPTY1' in DLG1.RES.
  TDialog1 = OBJECT(TDialog)
    { Executes when the button with ID #102 (id_Test) is clicked on. }
    PROCEDURE TestButtonProc(VAR Msg : TMessage);
      VIRTUAL id_First + id_Test;

    { Executes when the button with ID #103 (id_Done) is clicked on. }
    PROCEDURE DoneButtonProc(VAR Msg : TMessage);
      VIRTUAL id_First + id_Done;
  END;

  { Note that the VIRTUAL cm_First + id_Test isn't in the
  declaration. It appears only in the TYPE or OBJECT definition. }
  PROCEDURE TDialog1.TestButtonProc(VAR Msg : TMessage);
  BEGIN
    { Just put up this message when the Test button is clicked on. }
    MessageBox(HWindow, 'You clicked the Test button!',
      'Testing dialogs', mb_Ok);
  END;

  { Executes when the Done button is pressed. }
  PROCEDURE TDialog1.DoneButtonProc(VAR Msg : TMessage);
  BEGIN
    { Deallocates and removes the dialog box. }
    Done;
  END;

  { This procedure executes when the application's main window appears. }
  PROCEDURE TMyApplication.InitMainWindow;
  BEGIN
    { The only job of the main window is to put up a dialog of type PD1. }
    .MainWindow := New(PD1, Init(NIL, ResourceName));
  END;

  VAR MyApp: TMyApplication;
  BEGIN
    MyApp.Init('Application name');
    MyApp.Run;
    MyApp.Done;
  END.
```



Andrew Visscher's and Bruce Williams Zaccagnino's ...

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# COMPUTE/NET

Richard C. Leinecker

## COMPUTE/NET HAS SOMETHING FOR EVERYBODY

COMPUTE/NET is like *COMPUTE* magazine. It's chock-full of terrific information for a wide variety of folks. You can get software that'll help you diagnose your computer's troubles, release the artist in you, help your kids learn and have fun at the same time, teach you to program, and plenty more. Back issues of the magazine provide a comprehensive and valuable resource. Online conferences with people in the computer field give you real insight into the decisions being made today that will affect you tomorrow. Fun contests are held where winners are awarded prizes. And there are stimulating conversations that you'll find it hard to stay away from.

You won't believe this month's featured software. It's a commercial-quality, arcade-style, educational game. But you don't have to tell your kids it's educational. They'll have so much fun playing it that they won't notice. It's called *MathVoyager*, and it hones math skills to a sharp edge.

At the start of the game, you'll find yourself in flight school. Selecting the right book lets you set the math problems the way you want them. First, set the operation to addition, subtraction, multiplication, division, or a random mixture of the four. Then, pick the type of numbers from a choice of whole, decimal, or mixed. And finally, select the difficulty level. Because it's so customizable, you'll find the game useful for third graders on up through ninth graders.

After flight school's over, you'll find yourself on the bridge of an interstellar starship. Your mission is to

find home base before you run out of fuel, or you'll collide with a UFO with your shields down. You control the ship's functions by correctly answering the math problem that's on the console. You'll have to work fast, since there's a lot to do. Steering left, right, up, and down; firing; getting fuel; and watching the radar screen for hazards are among your duties. On the hard level the rear-view control will become available, so you can shoot the aliens that sneak up behind you.

The graphics are great. They appear in CGA, EGA, VGA, Hercules, and Tandy 16-color graphics modes. The program requires 256K RAM for CGA and Hercules, and 384K RAM for EGA, VGA, and Tandy 16-color modes.

To find this program, log on to GENie or America Online. Use the menus or type the keyword *COMPUTE* to get to the COMPUTE/NET area. Once in COMPUTE/NET, enter the software library (it's called Files from COMPUTE on America Online). Find the file called *MVOYAGER.ZIP* and download it. All you have to do then is use *PKUNZIP* to unpack it.

If you need to learn more about DOS, you're in luck. *COMPUTE's Releasing the Power of DOS* is online for you to download. Even an experienced user can be unaware of an important shortcut or feature. The fact is that DOS has many intricate facets, and the greater your understanding of them, the more you'll be able to increase your productivity and your ability to handle an emergency situation.

This book describes the internal operation of PCs and DOS, differentiates between the various versions of DOS, explains how information is stored on disks, reveals ways to unleash the power of DOS and your PC, shows how to use the various tools that are

part of DOS, discusses the hidden features and appropriate uses of each DOS command, introduces you to public domain software enhancements, explains the various error messages you could encounter, spells out how to diagnose problems, shows how to configure DOS for different languages, discusses how DOS works in a network environment, and more. You'll find out how to use the often misunderstood advanced features of MS-DOS and PC-DOS. All versions currently in use, up through version 4, are included. Most importantly, you'll be presented with useful applications and techniques for speeding up your computer or overcoming limitations built into the system. You'll see many shortcuts and tricks that are part of DOS but are ordinarily hard to find or decipher.

The syntax or a valid command format for all DOS versions is given along with the meaning of any parameters or switches. Below this is a list of any messages that might appear onscreen when you use the command, with explanations of their meanings.

The text accompanying the command reference provides the conceptual background for using the command, describes a variety of applications, and gives several examples of usage. Almost every DOS command has limitations, so alternative software solutions are also discussed. The author also tells about commercial and public domain programs that do a better job than related DOS commands.

If you have any questions or comments about COMPUTE/NET, you can write to me here at COMPUTE in Greensboro or send E-mail to me on GENie, address RLEINECKER; America Online, screen name Rick CL; or CompuServe, user ID 75300,2104. □

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# INTRODOS

Tony Roberts

## BACK FROM THE DEAD

The latest versions of DOS—MS-DOS 5.0 and DR DOS 6.0—include utilities that help you recover accidentally deleted files. It's a relief to have this insurance on hand, but to use this software most efficiently, you have to do a little pre-delete preparation.

To get the most out of the file-recovery utilities, it helps to know a little about how DOS stores and deletes files. DOS keeps track of each of its files through a directory entry and a table called the File Allocation Table (FAT). The directory entry includes the file's name, size, and starting cluster number. When a file is opened, the system checks the directory for the filename and the starting cluster number. It then uses the data in the FAT to locate the file's subsequent clusters.

Disk files are usually stored in sequential sectors. Other times, particularly on a crowded disk or one on which files are constantly being added and deleted, disk files are scattered around, filling in the nooks and crannies of unused space. The FAT's job is to keep track of the links to all of those scattered sections so that the entire chain can be recalled when the file is opened.

When a file is deleted, the FAT entry that points to it is changed, but the file's data is untouched. The space occupied by the file is made available to the system for reuse. Therefore, it's possible to recover a deleted file by reconstructing its FAT entry and reclaiming the file's disk space. This operation can only be successful, though, if the file is recovered before new information is written to the disk in the areas previously occupied by the deleted file.

So how do the new un-

delete utilities help? First, both MS-DOS and DR DOS now include the UNDELETE command. At its very basic level, UNDELETE can use a deleted file's directory entry to recover all or part of the file. UNDELETE stands a better chance of making the recovery if the file isn't fragmented or saved in more than one spot on the disk.

The best time to do something about a mistakenly deleted file is immediately after the deletion. Any operation that writes to the disk reduces the chances of your being able to recover a file completely.

UNDELETE is your first level of protection. Even if you take no additional steps to protect yourself, UNDELETE will bail you out of some mistakes.

Both MS-DOS 5.0 and DR DOS 6.0, however, offer additional tools that can make UNDELETE work better and more reliably. MS-DOS has the MIRROR command, and DR DOS has a similar utility called DISKMAP. These utilities take a snapshot of the disk's FAT and set it aside for safekeeping.

When you delete a file, changes are made to the disk's active FAT, but the backup copy of the FAT that was made with MIRROR or DISKMAP is unchanged. If you need the deleted file back, UNDELETE can use MIRROR's or DISKMAP's information to reconstruct the file's chain of clusters and increase the likelihood of a full recovery.

If you use the MIRROR or DISKMAP commands regularly, you give UNDELETE a better chance to succeed. Include the appropriate command in your AUTOEXEC.BAT file, and you'll always have a fairly current backup version of the FAT handy.

Although using MIRROR or DISKMAP along with UNDELETE provides more protection than has been available

with any previous version of DOS, DR DOS offers an even more foolproof safeguard against deleted files—DELWATCH.

If DELWATCH is running, the DEL command doesn't actually erase files; it only *marks* them for deletion. The filename is removed from the visible directory listing, but the file continues to exist and continues to occupy allocated disk space.

DELWATCH, which is a memory-resident utility that runs in the background, keeps track of a specified number of deleted files (200 is the default). Once that limit is reached or the disk becomes full, DELWATCH performs an actual deletion of the oldest file in its pending delete list.

With DELWATCH operating, your chances of recovering a deleted file are almost 100 percent—even if you've saved other data to the disk. The security of DELWATCH comes at a cost, though. First, it occupies memory, and second, the files in the pending delete list still occupy disk space.

As you may have discovered, it's easy to make a mistake and delete the wrong file. If you're using one of the new DOS versions or if you have other undelete utilities, take a few minutes to learn how to recover from a mistake.

Keep in mind, though, that the ability to retrieve accidentally deleted files is no substitute for keeping current backups of your data. Also, because undelete utilities cannot always recover an entire file, they aren't too helpful at recovering deleted program files. You should be able to restore program files from your original disks or their backups.

But even a partial recovery of a data file can be useful. Wouldn't you rather have 18 pages of your 20-page report than nothing at all? □

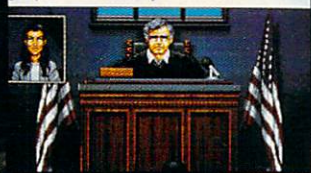
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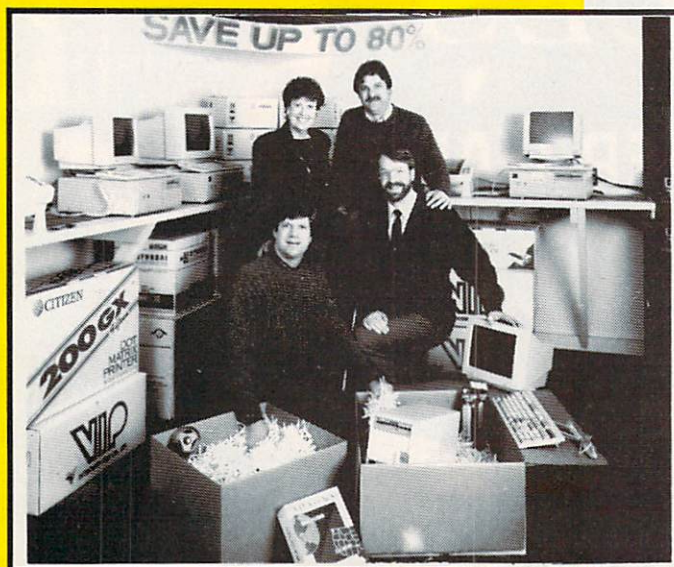
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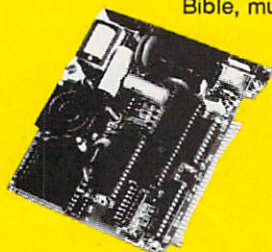
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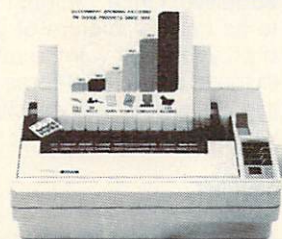
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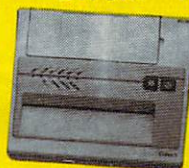
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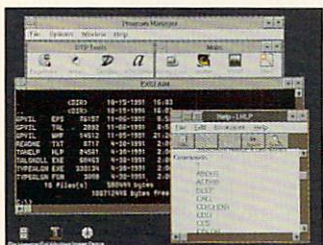




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Have you ever tried the command TYPE COMMAND.COM? All you'll get is gobble-dyook' and a beep or two. Snooper solves the problem by reading through the file and displaying only the text strings it contains. If you run it on COMMAND.COM, you'll see the text of all the error messages, the help text, and the copyright notice.

Snooper can help you figure out the purpose of all those mystery files that clutter up your hard disk. And it's great for just snooping—it's always fun to see things you were never intended to see.

Snooper is a free program.

### Tealeaf

Here's a DOS screen saver that allows you to select one of several patterns for never-

ending display when you're away from your computer screen.

Another use for Tealeaf is as an attention getter in the window or behind the counter of any business. The program, developed by Gene Woods, is shareware with a registration fee of \$11.95.

### Exclaim

Exclaim is a Windows program that acts like DOS. From your Exclaim window, you can read directories or use the TYPE, COPY, and MOVE file commands just as you do with DOS, but you can do so without leaving the Windows environment.

Exclaim is almost essential for anyone running Windows on a 286 because it allows you access to DOS-like commands from a true Windows program. If you prefer to handle file-management chores from the DOS command line, you'll be right at home with Exclaim.

Exclaim is shareware with a \$20 registration fee. If you use the program past a trial period, please register it with its author, Gary B. Gordon.

### WinRunner

Here's a utility that puts you back in the driver's seat when you're running Windows programs. WinRunner permits you to specify the size of the window that your application will use. The options include maximized, minimized, hidden, or optimized.

The program can be executed from a Program Manager icon, from a Run command, or through a program association.

With WinRunner you won't have to take potluck when you open an application; you'll be in control. WinRunner is a free program created by Clifton Karnes, COMPUTE's editor. □

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# HARDWARE CLINIC

Mark Minasi

## HARD DISK SIZE CRISIS

By now, most everyone knows the worst part of PC- and MS-DOS 3.3—they're limited in that they can only address a drive up to 32MB. You may know that DOS 4.x and 5.x can theoretically address a drive of up to two terabytes (two trillion bytes), but you probably don't know that you're essentially restricted to 516MB because of your BIOS. This month, I lead you through the maze of disk size limitations—limitations we'll all have to learn to live with.

First, understand that limitations of various kinds are imposed by the layers that data must pass through from the disk to the applications program. It looks something like this: disk  $\Rightarrow$  disk interface  $\Rightarrow$  BIOS  $\Rightarrow$  DOS.

The first hurdle is the interface. The most common interface is the ST506 interface, so let's start from there. Disk geometry is dependent on how the data is laid out on the disk. There are multiple read/write heads on a disk, as hard disks consist of multiple metal platters on which the data resides. Each disk surface is divided up into circular concentric areas called tracks, which are like the lanes of a racing track, and each track is divided into a number of sectors. Each sector contains 512 bytes of data, or, expressed differently,  $\frac{1}{2}$ K bytes of data. An ancient 10MB XT hard disk had four heads, 305 tracks per head, 17 sectors per track, and  $\frac{1}{2}$ K bytes of data per sector for a total of  $4 \times 305 \times 17 \times \frac{1}{2}$ K, or 10,370K bytes of data capacity.

### The Beast with 16 Heads

The common ST506 interface can only support up to 16 heads (8, actually, but most AT-type ST506 controllers break the rules and go to 16),

and it really doesn't care how many sectors or cylinders the disk has. So ST506 imposes the first constraint—the disk can have no more than 16 heads. The newer ESDI interface, by comparison, can support up to 256 heads, up to 4096 cylinders, and up to 256 sectors per track (256 heads  $\times$  4096 cylinders  $\times$  256 sectors per track  $\times$   $\frac{1}{2}$ K bytes per sector would be about 135 gigabytes (GB). The other newer SCSI and IDE interfaces don't care about heads and cylinders, as they're designed differently, and are only concerned with the total number of sectors on the disk.

Next is the BIOS. The BIOS disk interface is called INT 13 after the programming command used to access it. It was originally defined for floppy disks, and therein lies the source of many of its problems. An 8-bit register, called CL, stored the sector number. Another named CH stored the track number. And a third 8-bit register called DH stored the head number. Eight bits can represent up to 256 values, so that meant that the BIOS supported up to 256 heads, 256 cylinders, and 256 sectors per track.

For the sake of convenience and compatibility, INT 13 was augmented to support hard disks in the XT and later machines. 256 cylinders  $\times$  256 heads per cylinder  $\times$  256 sectors per track  $\times$   $\frac{1}{2}$ K bytes per sector isn't a bad limit—8.4GB. But it's arranged wrong. Nobody makes a drive with more than 16 heads, and virtually all hard disks have more than 256 cylinders.

So INT 13 for the hard disk cheated a bit.

The definition of CH and CL was blurred a bit. CL still stores the sector number, but only in the low six bits of CL. The high two bits of CL were tacked onto the front of CH

for the cylinder number. That means that CL—the sector number—can only assume a value up to 63. CH—the cylinder number—can only assume a value up to 1023, the largest value that can be represented with ten bits.

So the BIOS imposes a restriction of cylinders no greater than 1023, sectors per track no greater than 63, and heads no greater than 256. As you'd imagine, 256 heads isn't a problem. The 1024 cylinder barrier is a major pain, as many of today's drives exceed it, and the 63 sector barrier is being approached by many drives. What should you do if you have a drive with more than 1024 cylinders? You can sidestep the BIOS, as with SpeedStor or OnTrack, but you sacrifice total compatibility with Windows and will be unable to use OS/2.

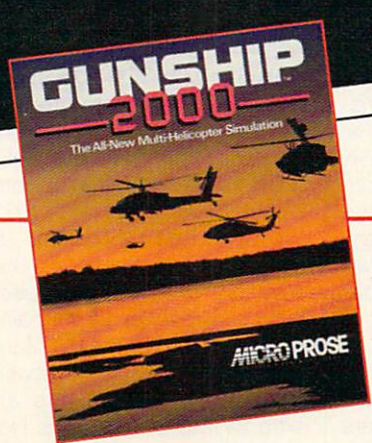
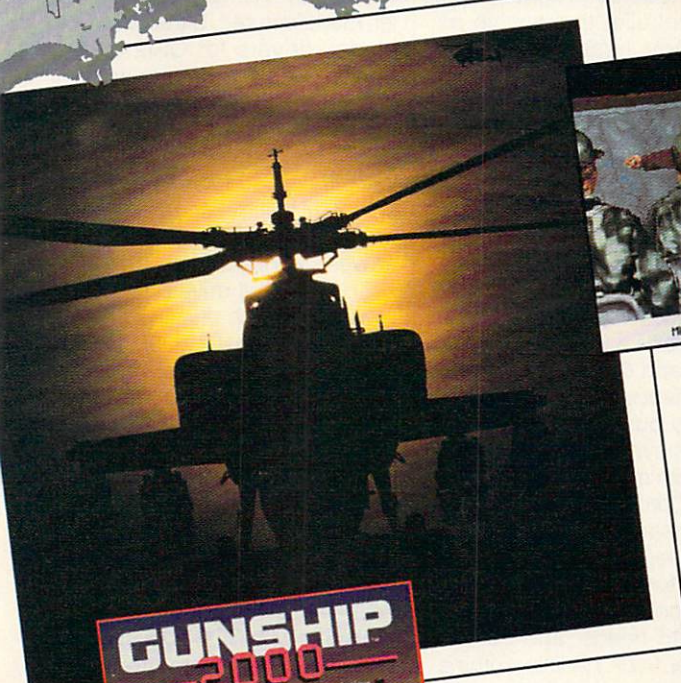
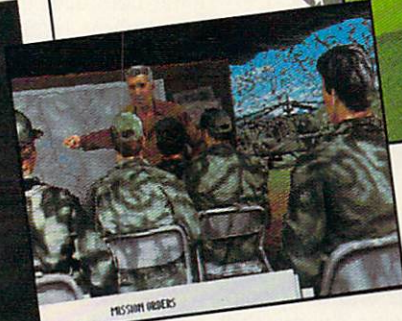
How do some drive makers get around this? They tell their drives to lie to the PC. Rather than saying that they have four heads and 2000 cylinders, they say they have eight heads and 1000 cylinders. The result comes out the same, capacitywise. Doing this is called translation—sector, head, or cylinder translation. Basically, translation is undesirable because it removes much of your flexibility in doing data recovery when problems arise with your drive. I avoid it.

### One Size Fits All

Last in the limitations list, DOS has size limitations. The major DOS limitation is imposed by the boot record. There were, prior to DOS 3.31, two bytes—16 bits—set aside for the total number of sectors per logical drive. The size of 16 bits implies a maximum number of sectors equal to  $2^{16}$ , or 65,536, or 64K. As each sector is  $\frac{1}{2}$ K in size, the total size of the logical disk was restrained to  $64K \times \frac{1}{2}K$

You probably never thought of 516MB as a limitation for the size of a hard drive.

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bytes per sector, or 32MB per logical disk.

DOS 3.31 and later versions have removed this restriction, however, setting aside four bytes for the total number of sectors. Four bytes is 32 bits, describing two terabytes of disk size—enough to hold us for a while.

So how large a disk could you buy today without resorting to translation? Assuming that the large drive was an ESDI, your limitations would be as follows:

cylinders = 1023 (BIOS limitation)  
heads = 16 (market limitation—  
no drives today have 17+  
heads)  
sectors per track = 63 (BIOS  
limitation)  
bytes per sector = ½K (only  
because most software  
expects it)  
total (1023 × 16 × 63 × ½K) =  
516MB

Of course, this isn't the limit. As I've said, if you don't mind giving up OS/2 and UNIX compatibility, device drivers that ship with OnTrack and SpeedStor can double the size of the cylinders to 2048, allowing drives up to 1032MB, or just over a gigabyte, under DOS.

Should you care, given how complicated this all appears? Yes, and the reason is that DOS is reaching a crisis. While 516MB may *seem* like a lot, it's not. You can now buy a 200MB drive for just \$500. Drives exist that store over one gigabyte and cost in the \$3,000 range, not much more than you would've paid for a 60MB drive just a few years ago. In the mid nineties, you'll be able to buy a 500MB drive for just \$700. Something's got to be done: either a general acceptance of device drivers to access hard disks or a new augmented BIOS standard. You can be sure that there will be more than one solution

offered and several proposed new standards hawked by the big vendors.

## Short-Term Solutions

Is there another answer? Sure. Two, in fact. But you won't necessarily like them. I recently installed a 631MB drive in a new system, an ESDI drive. As the drive's being put in a system with an EISA bus, I thought I'd try out a bus-mastering controller to see if bus-mastering controllers are all they're cracked up to be.

With ESDI, the drive tells the controller all its vital statistics. Rather than your having to run a setup program to tell the controller that you've got so many heads, cylinders, and the like, you just plug the drive into the controller, and away you go. When it's format time, the controller just asks the drive how it's laid out and formats accordingly.

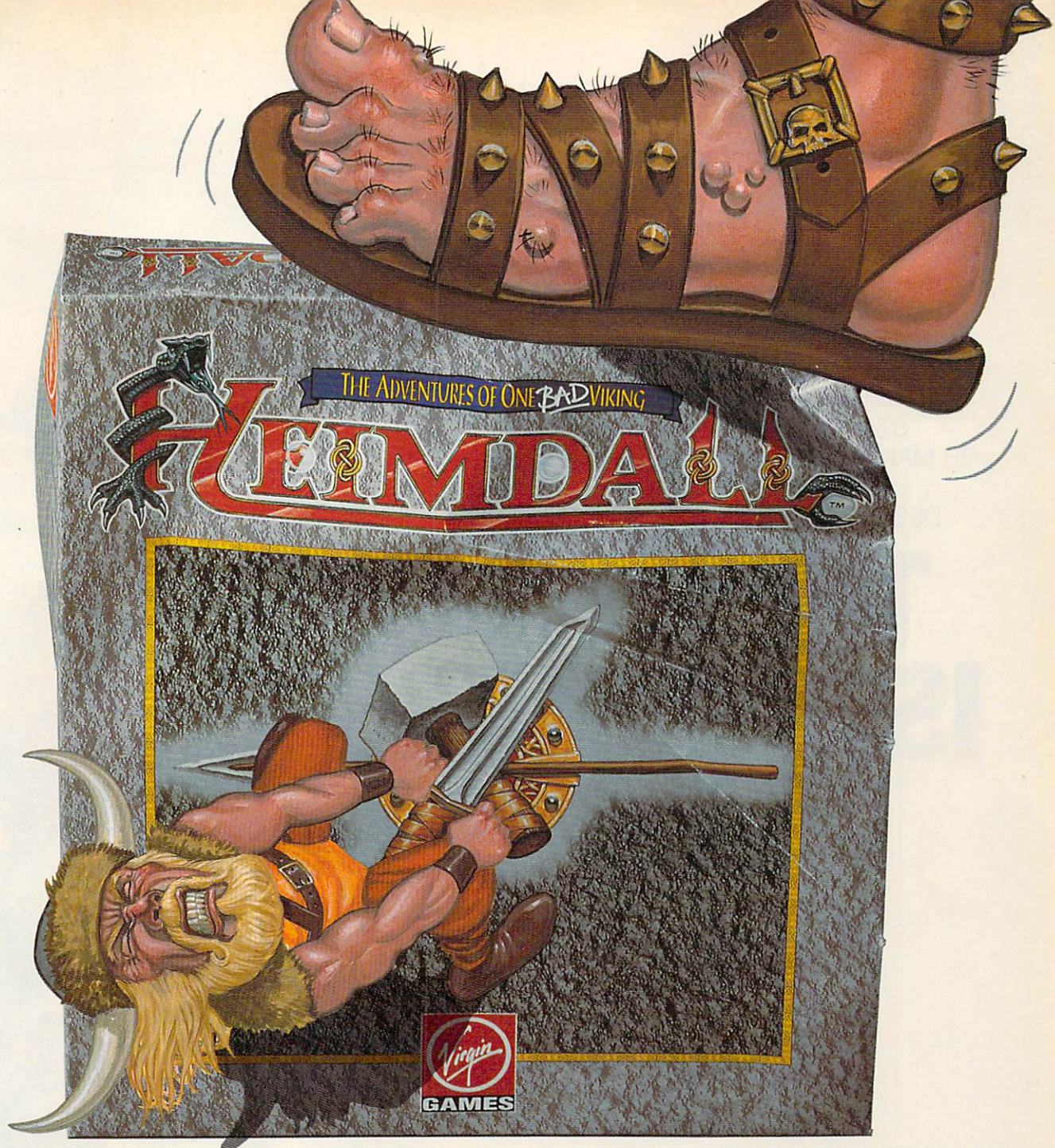
You can imagine my surprise when I ran a disk-tester program on my new 631MB drive and it reported that it had 64 heads, 32 sectors per track, and 631 cylinders. After a moment's thought, I realized that my bus-mastering controller was evading the "How do I deal with more than 1023 cylinders?" problem by doing sector translation. Notice how the controller does it—64 heads, 32 sectors per track. (The actual geometry is 1630 cylinders, 15 heads, and 52 sectors per track.) A little arithmetic shows us that 64 heads × 32 sectors per track × ½K bytes per track yields a cylinder that's exactly 1024K—one megabyte—in size. This is actually a fairly popular translation scheme, perhaps because IBM uses it in many of its desktop PS/2s, most of which do some kind of translation. If it has any virtue, it's that the existence of cylinders that are exactly one megabyte in size makes partitioning easy

under DOS 3.3's FDISK. When FDISK under 3.3 allows you to chop up a drive, it forces you to do it in units of cylinders, units that most of us don't have close to hand. By making each cylinder one megabyte in size, the translating controller lets you specify a number of cylinders equal to your desired partition size in megabytes.

So I've got the drive installed. It's incredibly fast, and DOS likes it just fine—but, as I said above, I'm stuck in DOS with this controller and hard disk. As it's a sector translator, it confuses OS/2 and UNIX. That's not the end of the world, however, as the controller manufacturer, Ultrastor, includes drivers for OS/2 and UNIX. The OS/2 drivers work just fine with OS/2 version 1.3, but I'm still just a teensy bit uncomfortable about the future. Will Ultrastor support OS/2 version 2.0? Will the company be around when OS/2 version 47 arrives? We'll see.

I bought that drive because I've worked with one like it before. It's the Maxtor 676E, and it's an excellent device. I've installed it on another machine, gotten the full capacity available to DOS, and still not sacrificed OS/2 compatibility.

First, I got a fairly vanilla ESDI controller, the Western Digital WD1007W. It sees the drive as a 1630-cylinder drive—which is good. I avoid problems with DOS by just not telling DOS that there are any cylinders after 1023. So from the point of view of DOS, UNIX, OS/2, and the bunch, it's a drive with 15 heads, 1023 cylinders, and 52 sectors—a 390MB drive. That's all the drive that OS/2 and UNIX see. But I can recover the remaining 241MB by using Disk Manager. Now I have 390MB available to any system and an extra 241MB just for DOS. Not a perfect answer, but one that doesn't involve translation. □



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BY ROSALIND RESNICK  
AND  
GARY TAYLOR





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**ING**

**N**o matter where you turn, you can't go very far without brushing up against the legal system. If you're like most people, this means hiring an attorney and spending a small fortune, buying a fill-in-the-blank legal form from the local stationery store, or not putting anything in writing and taking your chances.

There is a better way. By investing less than \$100 in the legal software of your choice, you can prepare your own will, contracts, leases, and other legal documents with the speed, ease, and accuracy once available only to legal professionals. And now that lawyers often charge \$100 an hour or more (frequently for documents generated by professional legal software similar to personal legal software), home legal software makes more sense than ever.

Prices are coming down, and programs are getting friendlier. You owe it to yourself to give legal software a try. The Software Publishers Association says that sales of forms software, which includes self-help legal programs, soared by 84 percent through the third quarter of 1991, more than four times the growth rate of the software industry as a whole.

To see why legal software is catching on, consider the case of Harry Hunter. Hunter, who runs a consulting and tax accounting practice in Union, New Jersey, purchased Parsons Technology's *It's Legal* in November 1991 to help him draft customer contracts.

"But I noticed it had a collection letter, too," Hunter recalls. "So the first thing I did was use it to draft a letter to a client who owed me money. I didn't expect to get paid, but I hoped that the letter and the deadline would at least generate a phone call. Then I expected to take the letter to my lawyer and have him finish the collection. Instead, I got full payment from the client. I never had to show it to my attorney."

The bottom line on this single transaction: Hunter saved the 30 to 40 percent he would have had to pay his lawyer to collect the money, a savings that more than paid for the program.

Unlike do-it-yourself tax software, self-help legal software has taken awhile to catch on. Steve Elias, copublisher at Nolo Press (the Berkeley, California, firm that produces *WillMaker*, a popular will-drafting program), says many people still fear that they'll mess up if they attempt to draft a legal document on their own.

Those fears aren't entirely unfounded. Even so, legal software represents a giant step beyond fill-in-the-blank legal documents. And unlike the paper forms, computer-generated documents

## ONLINE LEGAL

Unsure about springing for legal software? If you have a modem, there's plenty of law-related information available online.

CompuServe offers legal insights on its Legal (LAWSIG) and Work at Home (WORK) forums. Forum members who log on to LAWSIG can browse through such libraries as Computer Law and Software and Lawyer-to-Lawyer, an information exchange for attorneys. What's more, you can even leave your legal questions in messages on a bulletin board called Attorney Wanted. Lawyers thumb through the messages and post answers, giving tips and recommending referrals.

And, unlike scheduling an appointment to see a lawyer in his office, the online advice is free—apart from CompuServe's 22-cents-a-minute connect charge.

"We usually give general advice," says Noel Adler, a New York lawyer who doubles as LAWSIG's sysop. "When somebody poses a question, anyone with an answer can answer it."

America Online, another popular service, offers law-related articles in its Microsoft Small Business Center such as "Avoiding Legal Problems," "Copyright Basics," "Obtaining Good Legal Advice," and "Negotiating Lease Contracts."

For more in-depth information, consider logging on to Dialog's Knowledge Index, a new online service that gives home computer users access to nearly 100 Dialog databases during evenings and weekends at a reduced rate. Subscribers get access to the Legal Resource Index (LEGA1), which features articles from more than 750 law journals and reviews since 1980, and BNA Daily News (LEGA2), which offers daily news coverage of national and international government and private sector activities.

Over at Prodigy, members can sign up for LawPhone, a prepaid legal plan. Though LawPhone doesn't give answers online, it does offer discounts on lawyers' hourly rates plus unlimited consultations by phone or letter.

LawPhone Advisory Communication Systems, a 50-state network of private attorneys, charges \$60 for a three-month membership plus a \$15-a-month continuation fee or \$180 for an entire year. Prodigy members can sign up for LawPhone online. People who aren't on Prodigy can reach LawPhone at (800) 255-3352.

can be updated easily and printed out neatly and professionally. Simply plug your answer into a program's question-and-answer format, and out pops a document written in impeccable legalese.

## Not for Everybody

Despite the many pluses, however, legal software isn't for everybody. If your legal problem is complex or if you've been sued or charged with a crime, hiring a lawyer is your best bet. Because of estate tax implications, Elias sug-

gests that small-business owners and people with estates worth more than \$600,000 consult a lawyer when drawing up a will. It's also important to note that few legal software programs will work for Louisiana, which, unlike the rest of the nation, has a legal system based on the French civil code rather than English common law.

"People want life to be simple, but it's not," says Paul Stokes, a trusts and estates lawyer at Kelley Drye & Warren in Miami. "Even when people have small estates, the planning has to be careful. Little mistakes are magnified, and there are all kinds of little traps in a will. But there certainly is a need to develop legal services for the middle class, and legal software is a step in that direction."

Even the software publishers acknowledge their programs' limitations. "We don't publish them to take the place of a lawyer, just to make the law accessible," says Monica Jackson, product manager of MECA's *Home Lawyer*.

With those caveats in mind, it's reassuring to know that, when it comes to shopping for legal software, there are choices available to fit most people's needs and budgets. Softhink/Expert's one-purpose *Expert Will* retails for only \$14.95, while other programs, like BLOC's *Personal Law Firm*, that do everything from drafting contracts to writing collection letters and prenuptial agreements cost less than \$100.00. Specialized programs that create employee handbooks and other corporate documents typically cost more.

## The Case for Legal Software

Here's a look at how some of the leading programs in the legal software field stack up:

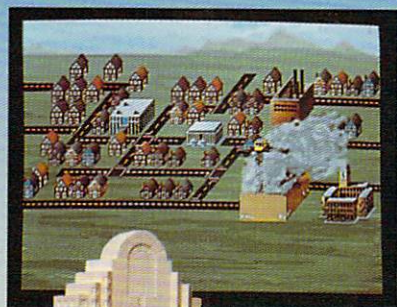
*WillMaker* (\$69.95) is the granddaddy of legal software programs. It was first released by Nolo Press in 1985 and has sold nearly 300,000 copies since then. Besides its easy-to-use software, the strength of the *WillMaker* program is its 200+-page manual containing detailed and accurate information on a variety of topics related to making a will. With *WillMaker*, you can specify up to 16 different bequests; name alternate beneficiaries; create trusts for your minor children; choose a way to pay your debts, funeral expenses, and estate taxes; and protect against overlooked heirs.

BLOC Publishing's *Personal Law Firm* (\$99.95) is the largest and most comprehensive legal software program available. It creates documents for both personal and business use. Its 30 documents include such exotics as Trade Secret Protection, License of In-



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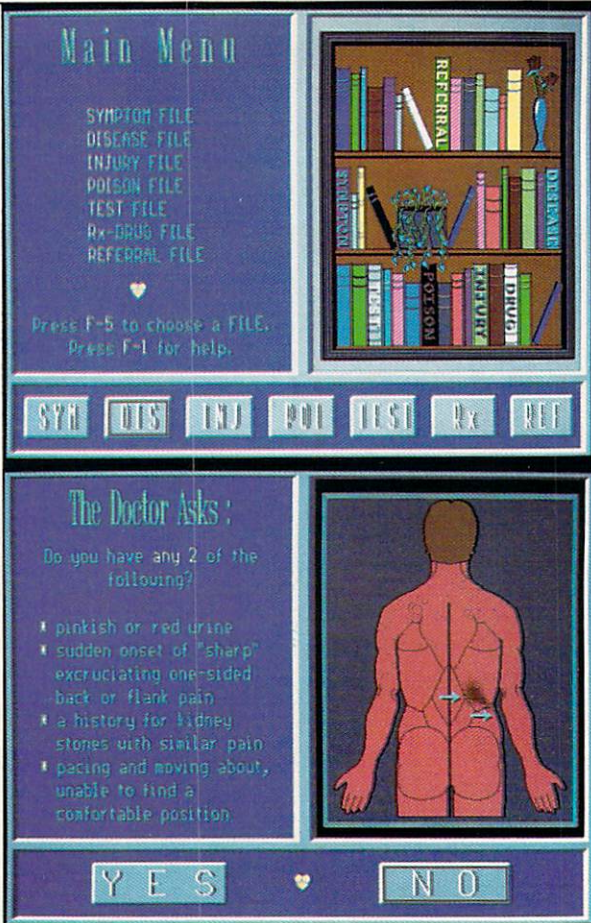
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## LEGAL ADVICE

Legal software is fine for routine legal needs, but it's no substitute for the skill and judgment of an attorney. If you're injured in an accident, if you've been charged with a crime, or if you and your business partner have decided to call it quits, it's probably time to call a lawyer.

Here are five tips that will help you make an intelligent choice:

**Ask for referrals.** The best way to find an attorney is to make a list of lawyers who've achieved good results for family, friends, and other people you trust. Even if these lawyers tell you they don't handle your kind of case, they'll often be able to refer you to a lawyer who can. Another good source of recommendations is your state or local bar association. Many bar groups offer this service free and can arrange initial consultations at a minimal charge.

**Shop around.** Depending on the lawyer's expertise and reputation and the size and location of the law firm, lawyers' rates can range from \$50 an hour to more than \$200 an hour. If you don't have much money, your local legal aid society may be able to provide a lawyer free. Savvy legal consumers typically shop around, visiting—or at least calling—three or four lawyers before making a choice.

**Get answers.** Before going to see a lawyer at his office, briefly state your problem and then ask the following questions:

- Have you ever handled this type of case before?
- How much will you charge for our first meeting?
- What's your estimate of the total fee?

If you're satisfied with the answers, make an appointment. Prepare an outline of the facts of your case plus all relevant documents and a detailed list of questions.

**Exercise your right to say no.** Don't let yourself be pressured into hiring the first lawyer you interview. If you're uncomfortable or have any doubts, press on with your search. Run—don't walk—from any lawyer who promises to win your case or tries to bowl you over with legal mumbo-jumbo. A lawyer with your best interests at heart may even advise you to try to settle your dispute out of court.

**Put it in writing.** Once you've decided which lawyer to hire, get a written contract that spells out how much he or she intends to charge. Most lawyers charge by the hour, though some lawyers—especially those who handle accident cases—work on a contingent fee. This means the lawyers get a percentage of the jury award or settlement if they win the case but no fee if they lose. It's important to note, however, that even these lawyers will charge you for court costs and expenses, even if you're not awarded any money.

Intellectual Property, Warranty Agreement, and Pre- and Post-Nuptial Agreements. The program's two 250-page user's guides explain features, answer questions, include sample documents, and feature a glossary and an index of legal terms.

Hyatt Home Lawyer (\$79.95), produced by MECA Ventures with help from the Hyatt law-clinic chain, isn't as comprehensive as Personal Law Firm, but it's less expensive and helps you draw up most of the personal and business documents you're likely to need. Among the program's 19 documents are the following: a will, an employment agreement, a power of attorney, a bill of sale for a motor vehicle, and an independent contractor agreement. There's also an online glossary of legal terms to help you wade through the legalese and a help key.

It's Legal (\$69), from Parsons Technology, offers a full range of legal documents—a will, a living will, a lease, a promissory note, a general power of attorney, and others—at an attractive price. The living will, a document not found in several other programs, lets you decide if you want to be kept alive should you become terminally ill or require life support and lose your ability to think rationally. Unfortunately, there

is a downside: Few of It's Legal's documents will help you run your business.

Expert Will and Home Will Kit (\$14.95 and \$29.95 respectively) are produced by Softhink/Expert, a subsidiary of BLOC Publishing. These products offer a low-cost solution for making your will. Expert Will prepares simple wills only, while Home Will Kit generates a living will as well.

The Desktop Lawyer (\$99.95) is unlike the other legal software programs in that it doesn't use a question-and-answer format but functions as a document library on disk. The user simply chooses from 300 documents; then the program copies it, loads it into the word processor, and customizes it to suit your needs. The Desktop Lawyer is the brainchild of Orlando lawyer Laurence Pino, who also offers a consultation service for \$100.00 a year that lets you consult with lawyers by phone as questions arise.

JIAN Tools for Sales offers a line of legal products including LivingTrustBuilder and AgreeMentor, each aimed at a specialized area of the legal assistance market. Like the Desktop Lawyer, these products require that you have a separate word processing program for customizing documents.

No matter which legal software program you buy, make sure it includes the following useful features:

- ✓ A helpful reference manual: Managing your legal affairs consists of far more than simply drafting documents and filling in blanks. WillMaker's manual, for instance, gives advice on how to plan your estate, how to sign and update your will properly, how to name a personal guardian for your children, and other topics related to the will-making process.
- ✓ Clear language: Though it's important for your document to be legally accurate, it's also essential that you understand what you're signing. If you can't make your way through legalese, make sure the program you buy offers onscreen definitions and user help to make everything understandable in layman's language.
- ✓ Interactive capability: The question-and-answer format used by most legal software programs makes drafting legal documents quick and simple. "Comparing the program to forms in books, I'd say it's easier to use because you don't have to type anything," says Hunter, who recently bought It's Legal. "You just plug in the information by answering the questions. It minimizes error because you can customize the letters to the situations."
- ✓ Flexibility: No matter how routine

| THE SCALES OF JUSTICE   |  |   |
|---|--|---|
| Product   | System Requirements  | Notes   |
| <b>Personal Law Firm</b><br>BLOC Publishing<br>800 Douglas Entrance<br>Executive Tower<br>Coral Gables, FL 33134<br>(800) 444-3363<br>\$99.95   | IBM PC or compatible,<br>512K RAM, hard drive                                      | Prepares 30 legal documents: wills, leases, cohabit and marital agreements, trade secrets, leases, and others. Has sold 1 million copies since 1990.  |
| <b>LivingTrustBuilder</b><br>AgreeMentor<br>JIAN Tools For Sales<br>127 Second St.<br>Los Altos, CA 94022<br>(800) 346-5426<br>(415) 941-9191<br>\$139.00 (LivingTrustBuilder)<br>\$99.00 (AgreeMentor) | IBM PC or compatible,<br>512K, hard drive, and a<br>word processor                 | LivingTrustBuilder helps design a living trust but it also includes a living will, health care power of attorney, and asset power of attorney, along with supporting documents; AgreeMentor helps you produce agreements such as employee contracts, leases, partnerships, nondisclosure agreements, referral letter, power of attorney, promissory note, and product warranty.                           |
| <b>Hyatt Home Lawyer</b><br>MECA Software<br>P.O. Box 912<br>Fairfield, CT 06430<br>(800) 288-6322<br>\$79.95   | IBM PC or compatible,<br>640K RAM, hard drive                                      | Prepares 19 legal documents "that Americans most often need" using advice from Hyatt Legal Services. Sales figures not available.   |
| <b>WillMaker</b><br>Nolo Press<br>950 Parker St.<br>Berkeley, CA 94710<br>(800) 992-6656<br>\$69.95   | IBM PC or compatible,<br>640K RAM; Macintosh<br>Plus                               | Only prepares wills but comes with a detailed, 200-page manual; emphasizes flexible options and estate planning. Has sold 290,000 copies since 1985.  |
| <b>The Desktop Lawyer</b><br>The Open University<br>Legal Institute of America<br>24 S. Orange Ave.<br>Orlando, FL 32801<br>(800) 874-0388<br>\$99.95   | IBM PC or compatible,<br>640K RAM; any Macintosh<br>with Microsoft<br>Word 3.0.    | Prepares more than 300 documents for all 50 states including Louisiana. Documents load from disk into the user's word processor, and the manual leads the user through the document development. Users can also subscribe to a newsletter and legal consultation service. These are free for the first three months, then \$100.00 a year. Lifetime technical support. Has sold 10,000 copies since 1983. |
| <b>It's Legal</b><br>Parsons Technology<br>One Parsons Dr.<br>Hiawatha, IA 52233<br>(800) 223-6925<br>\$69.00   | IBM PC or compatible,<br>512K RAM, two floppy<br>drives or a hard drive            | Prepares 24 legal documents: bill of sale, consumer and credit letters, leases, power of attorney, employer, promissory note, guardianship, and wills. Sales figures not available.   |
| <b>Expert Will</b><br><b>Home Will Kit</b><br>Softhink/Expert<br>(BLOC subsidiary)<br>800 SW 37th Ave.<br>Coral Gables, FL 33134<br>(800) 759-2562<br>\$14.95/\$29.95                                   | IBM PC or compatible,<br>512K RAM for Expert<br>Will, Windows for Home<br>Will Kit | Expert Will prepares simple wills only. Home Will Kit prepares wills and living wills. Both are positioned as the bargain will-writing programs. Expert Will has sold 20,000 copies, and Home Will Kit has sold 1,000 copies.   |

your legal problem may seem, you need a program that lets you tailor each document to fit your needs. If you don't think your kids will be responsible enough to handle an inheritance until they're 30, you need a program that will create a will to hold the property until then. And, since state laws vary, it's important to find a program that creates binding docu-

ments for your particular state. (In Louisiana, that can be a problem.)

- ✓ Good text editing: Unless you're the type who does crossword puzzles in pen, it's a good idea to buy a program that lets you save your document to disk so you can revise or finish it later. The program should also allow you to review your document onscreen and revise it before printing.

## IMPORTANT NOTICE FOR COMPUTE DISK SUBSCRIBERS

COMPUTE offers two different disk products for PC readers; the *SharePak* disk and *PC Disk*. *SharePak* is monthly and has a subscription price of \$59.95 for 5<sup>1</sup>/<sub>4</sub>-inch disks and \$64.95 for 3<sup>1</sup>/<sub>2</sub>-inch disks. A subscription to *SharePak* does not include a subscription to the magazine. *PC Disk* appears in even-numbered months and has a subscription price of \$49.95, which includes a subscription to the PC edition of *COMPUTE*. You can subscribe to either disk or to both, but a subscription to one does not include a subscription to the other.

### Product List

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(703) 448-8700  
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**CompuServe**  
5000 Arlington Centre Blvd.  
P.O. Box 20212  
Columbus, OH 43220  
(800) 848-8990  
\$2.00 per month plus \$12.80 per hour for 1200 and 2400 baud access.

**Dialog Information Services**  
3460 Hillview Ave.  
Palo Alto, CA 94304  
(800) 334-2564

The Knowledge Index's \$35.00 start-up fee includes two hours of practice time. Each minute costs \$0.40 and includes telecommunications charges and all typed or displayed records.

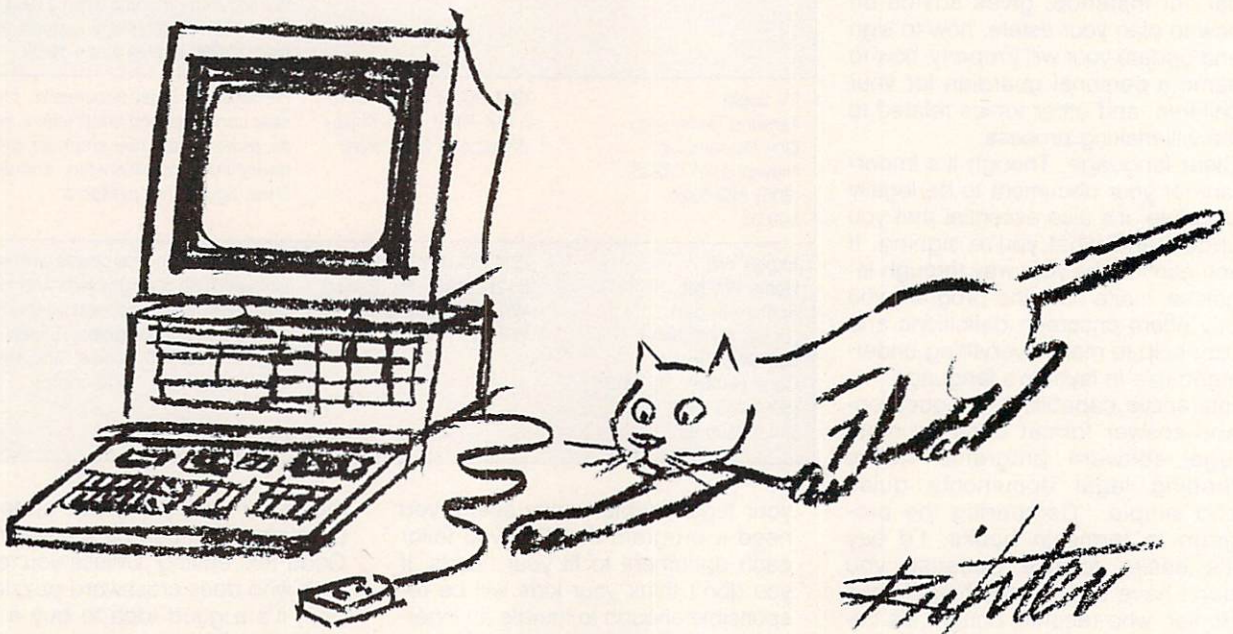
**LawPhone Advisory  
Communication Systems**  
4501 Forbes Blvd.  
Lanham, MD 20706  
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A three-month membership is \$60.00; the continuation fee is \$15.00 a month or \$180.00 per year. Prodigy members can sign up for LawPhone online.

**Prodigy**  
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White Plains, NY 10601  
(800) 284-5933

### The Law and You

Now you know the range of software available to you for routine business forms and personal legal matters. But what's next for legal software? The experts say that in the future legal software programs will become speedier, simpler to use, and more complete. Expert systems might help you anticipate problems instead of reacting to them

as they crop up. Still, it's unlikely that a computer program will ever be able to take the place of a lawyer—after all, the documents you draft on your PC can still be challenged in court. Even the best legal software won't make a brilliant closing argument in your defense or help you weasel out of a contract. Besides, without lawyers, who would write the legal software? □



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# SHAREPAK

Bruce M. Bowden

## WORK BETTER, PLAY HARDER

Spring is here: time to recover from the long winter by being extra aggressive in both work and play. This month's SharePak disk gets into that spirit! LZEXE will pack more executable software onto a disk. Then, to see just how much space remains, use RDIR—a

hundreds of programs from the online services, narrowing the selection down until only the best remain. Consequently, the savings to you as a SharePak subscriber are enormous.

### CD Dot Challenge 1.4

This game will look familiar to generations of kids who've teamed up to wile away boring hours at school by taking

directory within the pie includes, as part of its size, the sizes of directories below it—with as many as 16 levels of nesting.

RDIR gives you a free trial period of about 20 uses, after which the program ceases to function. If you register, you get a validation key number to enter, which allows unlimited use of the program.

For this program you'll need an IBM PC or compatible with DOS 2.0 or higher.

### Alive Sharks 1.0

Alive Sharks is an arcade-style game of underwater skill and daring. Your mission is to collect rare marine creatures from the bottom of the sea, while avoiding vicious denizens of the deep.

You'll need an IBM PC or compatible with 256K RAM; a joystick or mouse is optional. This game supports CGA, EGA, EGA-Mono, and Hercules graphics displays.

### LZEXE 0.91

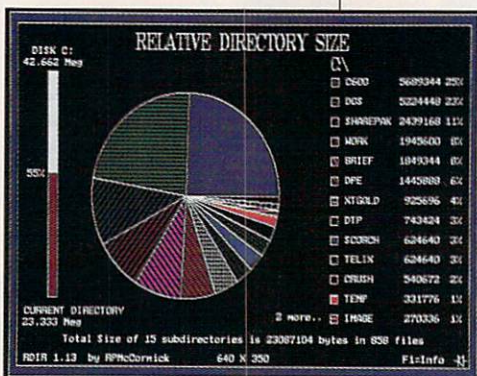
LZEXE differs from the other offerings this month in that it's not shareware but is public domain software—absolutely free. And it's not often that you get this kind of quality at that kind of price!

Use LZEXE to compress executable files—those with the extension EXE. The advantage of this program over many others is that your compressed EXE files are still executable. Files compressed with this utility are almost as small as the corresponding ZIP files and are much smaller than the older ARC files.

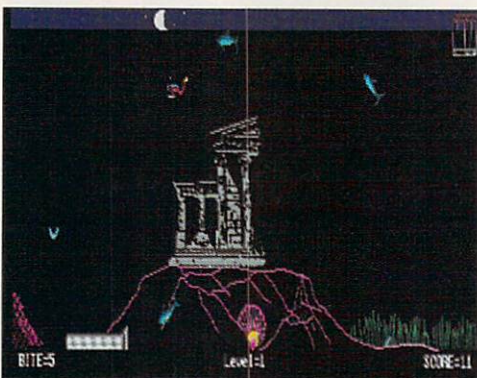
For safety and peace of mind, LZEXE doesn't delete your old EXE file; instead, it's renamed with the extension OLD.

LZEXE requires an IBM PC or compatible with 128K RAM and DOS 2.0 or higher. □

May's SharePak  
brings you  
a powerful selection  
of software.



Check relative directory sizes with RDIR.



Fend off the predators in Alive Sharks.

graphical way of viewing directory sizes. When the work is done, playtime begins as you dive for sunken treasure with Alive Sharks. But if tamer pursuits are more to your liking, match wits with a friend or the computer in a game of CD Dot Challenge.

Each month, COMPUTE's SharePak disk brings you the best of IBM shareware. We spend long hours collecting

To play CD Dot Challenge, you need an IBM PC or compatible with DOS 2.0 or higher. CGA, EGA, MCGA, VGA, and Hercules graphics are all supported.

### RDIR 1.11

RDIR stands for Relative DIRectory. This handy utility displays a pie chart which shows the relative size of each subdirectory. Every sub-

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### Back Issues Available

**DEC 89:** *Hearts*, play your computer in hearts; *Bass Tour*, super fishing simulation; *MahJongg*, match and stack colorful tiles; *Ed's Chess*, full-featured chess game. (#CDSK1289)

**JAN 90:** *Directory Master*, customize with this DOS shell; *Quick Type*, improve your typing skills; *Skulduggery*, tricky game of mystery; *MathMagic*, four educational games. (#CDSK0190)

**MAY 90:** *QHELP* and *QHCOMPIL*, create TSRs to give online help; *Levy Adventure Development System*, create your own adventure games; *GEEWHIZ*, TSR BASIC manual; *Sounds Good*, make sounds for programs. (#CDSK0590)

**OCT 90:** *Amado*, match scrambled blocks to the computer pattern; *Captain Comic*, great EGA graphic adventure game; *Funny Face*, Mr. Potato Head-type animation faces; *Fusion*, great game similar to *Tetris*; *Power Poker*, create poker hands in two dimensions. (#CDSK1090)

**MAR 91:** *Cash Control*, simplify financial recordkeeping; *Personal Inventory 2.11*, maintain a record of household items. (#CDSK0391)

**APR 91:** *Schedule\*Master*, manage your daily schedule; *Meal-Master*, menu-driven database system for managing recipes; *The Monuments of Mars!*, great graphic arcade/adventure game. (#CDSK0491)

**AUG 91:** *TurboPaint 1.5*, full-featured paint program; *Math Voyager*, guide starship by answering math problems; *EARTH-WATCH*, graphically displays 24-hour day-and-night cycles. (#CDSK0891)

**COMPUTE's SharePak** disk contains the best of shareware—handpicked and tested by our staff—to complement this month's focus. You'll sample entertainment, learning, and home office software at a great savings. Each *SharePak* disk includes two to five programs plus complete documentation for one low price:

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# PRODUCTIVITY CHOICE

*This powerful word processor stands tall in the company of high-end desktop publishing packages.*

Robert Bixby

## MICROSOFT WORD FOR WINDOWS 2.0

Word for Windows—or Win-Word, as it's affectionately known among its followers—avoids many of Windows' worst pitfalls. It manages to be quick (it has no trouble keeping up with my fastest typing) while providing a suite of formatting options that put it in the running for the most complete desktop publishing option available in a single package. It provides all of the functionality of a first-rank word processor, and it includes frames and linking more commonly seen in desktop publishing packages.

Word for Windows is a very powerful and friendly word processor, but the path to its current release has been far from perfect. Early releases of the 2.0 version suffered from problems such as faulty implementation of templates and inconsistent spelling checks and margin performance. However, Microsoft should have cleared them up by the time this appears in print.

What remains is well worth your full attention. The interface is good—somewhat better than that of WordPerfect's Windows offering because it's more closely tied to the Windows standard.

Winning over WordPerfect users is of concern to the folks at Microsoft, of course, since that program has such a huge market share while Word has had to wear the bridesmaid's dress. The Word for Windows promotional literature stresses how easy it is for WordPerfect users to make the switch. For instance,

Word for Windows includes a special WordPerfect Help system keyed to the specific kinds of problems WordPerfect users may encounter in making the transition. And former WordPerfect users can simply enter keystrokes they're familiar with, and they'll be shown how to execute the same procedure in Word for Windows.

It doesn't matter which word processor you use, if all you're doing is straight typing. The differences between word processors become key when you're engaged in specialized activities like desktop publishing. Word for Windows meets many of these demands.

It supports frames, which are isolated islands of text or graphics on the page. The frames are similar to Ventura Publisher frames: By dragging them with the mouse pointer, you can adjust their position and size. You can link them to the text, causing a frame to move from page to page as the text does. In Word for Windows, you simply drag a tool to create the frame and then click on it and start typing—it's much easier than the process found in WordPerfect for

Windows. You can also eliminate the frame and leave its contents in the page. I experienced some problems with the frames in my test document. At one point, text from the page suddenly became inserted into a frame, and I had to cut and paste to get it back on the page.

Word for Windows supports columns and provides a fairly intuitive way to insert them. Once again, I ran into problems in my test document with columns suddenly disappearing. A quirk that may bother some people is that moving the cursor down to the bottom of a column will take you to the same column in the next page rather than to the top of the next column. To move to the next column, you must move to the bottom of a column and then move right. When you reach the end of the last line, the cursor leaps to the top of the next column.

Part of desktop publishing involves entering graphics and special characters like curly quotes and long dashes. It would be unfair to single out Word for Windows as having poor implementation of special characters because most





Windows products require a very awkward procedure for inserting them. In Word for Windows, you have to switch to Num Lock, hold down the Alt key, and type in four-digit codes to generate curly quotes and long dashes.

I grew so tired of halting my typing every couple of lines to insert a quotation mark or a long dash that I eventually assigned these functions to macros. Word for Windows shines in this area, making the key assignment part of the process of initiating macro recording.

Once you've created a macro, it's very simple to edit it. Though Word for Windows won't allow you to edit the macro in the regular text area the way Ami Pro and WordPerfect will, its macro editor allows you to have access to all of the menus. And you can even create macros to use in the macro-editing window.

Word has adopted OLE (Object Linking and Embedding), which Ami Pro has had for some time. You may be familiar with Windows' dynamic linking. It allows you to paste cells from a spreadsheet to a word processor document and have those cells made current each time the spreadsheet changes. OLE goes a step beyond this by having the embedded cells in the word processor document "belong" to the spreadsheet. To access the spreadsheet program from the word processor document, you just click on the cells. It's as if there were a rectangular hole in the document through which you can see the actual spreadsheet.

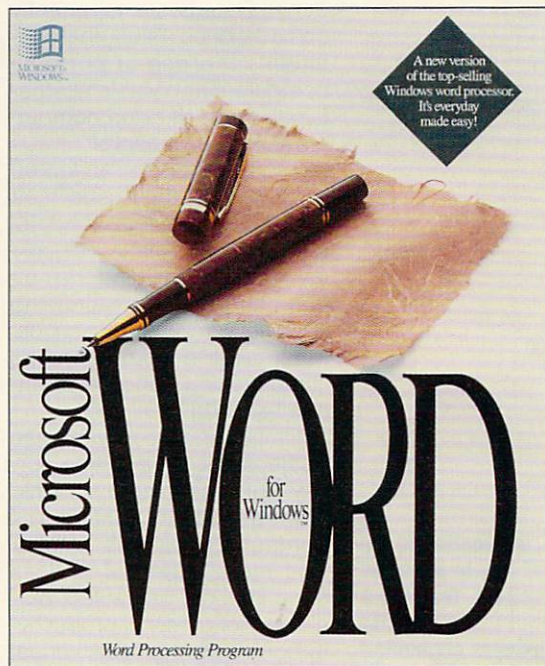
If you're looking for a real traffic stopper in Word for Windows' features list, it's the integration of an online grammar checker. Although limited, as

are all such programs, it represents a real advantage over the competition. When you've finished writing, you can invoke the grammar checker from a menu option as if it were a spelling checker. Word for Windows will also provide readability statistics (such as grade level) on a document.

Software publishers seem to think that no one will respect them unless their products are truly massive. And make no mistake—Microsoft is highly respectable in this regard. Word for Windows is huge. I had to buy a larger hard disk and upgrade from MFM to IDE so I could have Ami Pro, WordPerfect for Windows, and Word for Windows on my hard disk. If you want a Windows word processor, clear about 15MB from your hard disk. At least Word for Windows seems more amenable to running on the basic Windows box—an 80286 or 80386 with 2MB of RAM. (Word for Windows claims to need only 1MB of RAM, but I had no way to test this.)

Almost like children going through a troubled adolescence, Windows word processors loom large in potential but are sometimes maddening to deal with on a daily basis. Most people who've used a really demanding Windows program have stumbled across a few unexplained application errors (UAEs). You'll be working along, thinking everything is fine, when suddenly a box appears informing you that Windows has experienced an unexplained application error and is shutting down your application. Your work is gone.

Word for Windows seems to have far fewer UAEs than the competition. While I've found it advisable to close WordPerfect

The graphic features a diamond-shaped logo in the top right corner with the text "A new version of the top-selling Windows word processor. It's everyday made easy!". Below the logo is a photograph of a fountain pen and a ballpoint pen resting on a piece of aged, yellowed paper. The Microsoft logo is in the top left. The word "Microsoft" is written vertically on the left, and "WORD" is written in large, bold, serif letters in the center. "for Windows" is written in a smaller font inside the "O" of "WORD". At the bottom, it says "Word Processing Program".

Microsoft  
WORD  
for Windows  
Word Processing Program

for Windows every hour or so to prevent the UAE monster from appearing, I have yet to encounter a single UAE with Word for Windows 2.0.

Word for Windows has an equation editor, a simple drawing program, and a graphing program, so it's clear that Microsoft knows who the competition is—and that it plans to match both Ami Pro and WordPerfect feature for feature.

If you want a solid word processor that stands toe-to-toe with high-end desktop publishing programs, you're looking for Word for Windows. Microsoft has a proven track record for support and upgrade options, which should keep you economically up-to-date as long as you stay with Word. It will meet your needs for word processing, and it offers a complete suite of specialized options for formatting, publishing, and data handling. □

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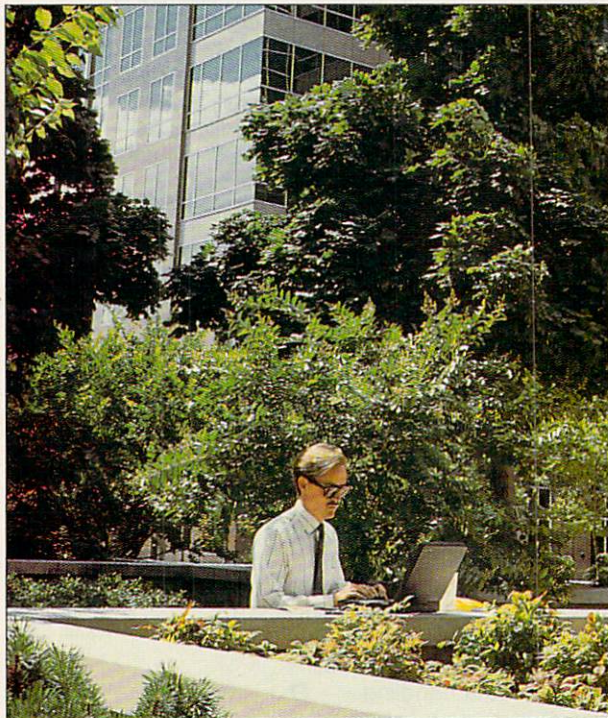
Peter Scisco

## HOW MUCH IS ENOUGH?

Zenith Data Systems recently commissioned a study that documents the rise of portable computers as a viable alternative to large desktop computers. Fully 100 percent of the survey's respondents, all laptop owners, said they used their portable computers at home. Executives and managers looking for ways to extend their office hours without sacrificing all of their family time are choosing portable computers as "time-shifting" and "environment-shifting" devices.

It's not good policy to base conjectures on a single survey, but something quite striking seems to be happening as computers become smaller and more powerful and as the number of computers purchased for personal productivity continues to grow. America, the birthplace of the modern mobile society, in thrall to the au-

**If location is the key to business success, teaming a laptop with business computing makes the world your private office.**



tomobile and to the opportunity over the horizon, is taking its work into the world outside.

The power in today's laptop and notebook computers makes it possible for you to carry financial reports, business presentations—really your entire business—in a seven-pound package. All of this functionality comes at a price, of course. The best notebooks—those that sport state-of-the-art video screens, big and fast hard disks for storing large amounts of data, and powerful processor chips for speeding your work—cost from \$2,500 to \$4,000. But you can get a decent laptop or notebook computer for less—sometimes for much less.

Since the business world has adopted the 386SX processor for its notebook and laptop computers, the price for 286-based laptops has plummeted. A 286-based notebook is a very capable machine; with a decent-size hard disk and a portable mouse, you could even run Windows applications on one (except for those requiring enhanced mode performance, such as Excel). You can pick up an AT-class notebook these days, with a hard disk, for around \$1,000. If that still sounds like too much money, you can get an XT-class machine like the Toshiba 1000XE, with a 20MB hard disk, for around \$800. Match a system like that with a package like Works, and you'll have almost everything you need for running a home-based business away from your home base.

Good things come to those who wait. The same companies that are producing high-powered SX notebooks are also moving quickly to adopt Intel's 386SL chip, which offers the same processing power with decreased energy consumption—which translates into longer battery life.

As the focus shifts to the 386SL, home computer users can look forward to a further drop in the price of 386SX notebooks. For 286, 8088, and V20 processors, price should cease to be much of a factor at all. Portable computers for word processing, simple databases, and telecommunications will be as prevalent in college dormitories as typewriters, VCRs, stereos, televisions, and videogames.

Increased functionality and usefulness aren't just the result of lower prices and higher processing speeds, however. A major stumbling block to efficient portable computer use has been the transfer of data from one system to another—from the desktop machine at work or home to the notebook in the hotel, out in the yard, or on the plane.

A few software companies, such as Traveling Software and DataStorm, have carved their niche by constructing file-transfer programs that make it easier to shift data from one machine to another. And Ergo has made headlines with portable systems that you can attach to a monitor and keyboard—all you carry is the CPU and the hard disk.

Recent developments in hard disk storage—autoparking, better shock mounting, increased capacity, and smaller footprint—are giving us families of systems that can share storage media. Companies like Samsung and Epson are leading the way. In fact, Samsung aims to create a series of computer systems, from desktop to notebook to pen-based, that will share the same plug-and-play hard disk. The hard disk will weigh only ounces and will come in a variety of sizes. That's portability.

The road to portable computing for home office workers is clear: An office without walls is a business without limits. □

# ThunderHAWK™

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Hey Hotshot! It's 1995 and the Pentagon has just unveiled it's brand new gunship - AH-73M Thunderhawk - and guess who's been selected to put her through her paces? That's right - you.

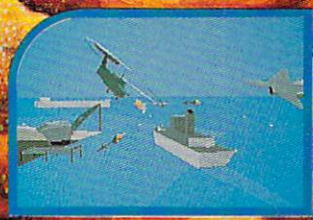
Here's what the Thunderhawk combat helicopter simulator has that the others don't:

**Campaign scenarios with a multitude of missions**

**A true world to interact with - not just a cockpit - but other locations and characters that respond to your actions**

**A helicopter armed with the latest in weaponry, electronic countermeasures, functioning displays and computer-aided targeting systems**

**Realistic missions reflecting actual military conflicts and contingency plans**



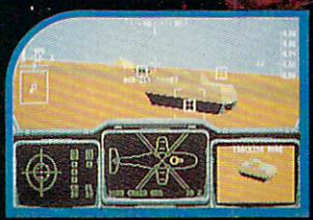
AMIGA SCREENSHOTS SHOWN

**Zip up your flightsuit, adjust your sunglasses and control your nerves, 'cause this one makes Nam look like a day at the beach!**

Circle Reader Service Number 149

DEVELOPED BY **CORE DESIGN LIMITED**

Available soon for IBM and Amiga. Thunderhawk is a trademark of Virgin Games, Inc. Virgin is a registered trademark of Virgin Enterprises, Ltd. ©1991 Virgin Games and Core Design. All rights reserved. Virgin Games, Inc. 18061 Fitch Ave., Irvine, CA 92714



For pricing orders, please call 800-VRG-IN07. Visa, Mastercard, American Express and checks accepted.

**M**any people wouldn't dream of putting a For Sale sign on the front lawn without slapping a fresh coat of paint on the house. The first thing a job-hunter does is get a haircut and maybe a new suit. Cosmetics makers search out perfect models for photos to accompany their products. Why? Because, for better or worse, looks sell.

Still, many home-business owners continue to use uninteresting, blah-looking business cards, letterheads, and brochures, wasting an opportunity to grab the attention of potential customers. That's too bad because now there's no reason why a small business has to look its size. With a computer, a little imagination, and some simple desktop publishing software, it's easy to make your business look like a million bucks without spending a fortune at the printer.

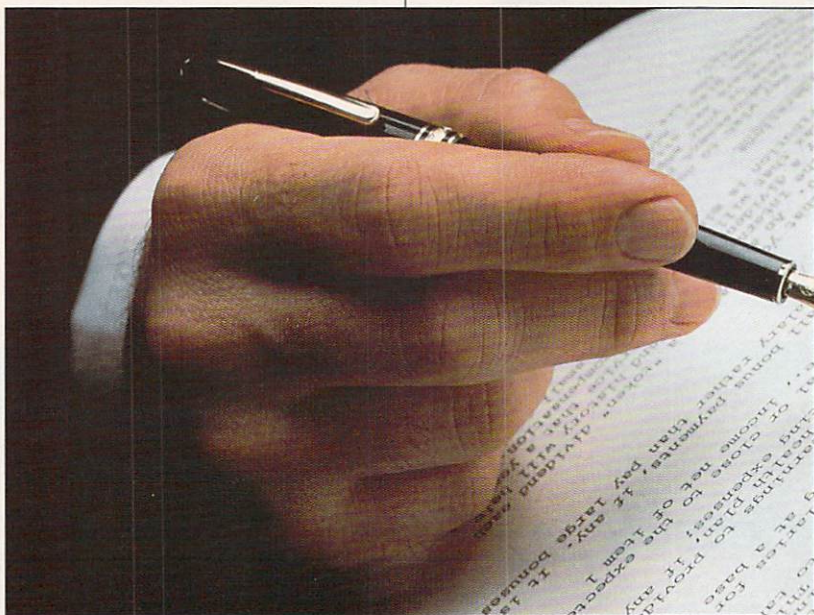
Even if you're not a professional artist, you can jazz up your company's image by choosing bolder typefaces, adding color, or incorporating graphics. It all depends on the message that you want to send—traditional, competent, funny, even outrageous. The key is getting your customers to sit up and take notice. Even a member of the most staid profession can benefit from a business card that shows panache. Professionalism doesn't have to equal boredom.

"The idea is to quickly describe, both visually and verbally, what your company does best," says Rob French, who helps redesign company logos as senior art director at Tatum Toomey & Whicker, a High Point, North Carolina, advertising agency. "If you can create an image that helps make you look more professional, you've got a leg up on the competition."

Here are ten ways to give your business a fresh look without busting your budget:

1. Copy from the pros: "The best thing to do if you're a beginner is to look at other stuff," says Daniel Will-Harris, an author and designer who writes about desktop publishing. "Find business cards and stationery that you like, and start by copying." If you can't tell serif from sans serif, however, it also may be a good idea to look for ideas by leafing through some catalogs at your local print shop or graphic arts store.

2. Find your own style: The style of type you use, be it on envelopes, business cards, or even the body text of your letters, tells your customers who you are. That's why it's important to choose a typeface that sends the message you want. A lawyer, for instance, might choose a conservative type-



## FIRST AND LASTING IMPRESSIONS

BY ROSALIND RESNICK

## PRODUCTIVITY

face to suggest competence and evoke trust. A computer consultant might opt for a more modern look to stress creativity. You can also convey your personal style by combining upper- and lowercase, italic and bold. As a rule, mixing upper- and lowercase type conveys a friendlier feel than using solid uppercase. It's a good choice if your customers are small businesses. Type that is all uppercase tends to impress big corporations, while italic type can make potential customers think of speed and efficiency when they see your card.

3. Keep it simple. When creating your design, don't get carried away and use a whole lot of rules and a big mess of typefaces. While you want your business materials to convey information, cramming too many words, fonts, or graphics into too small a space will mark you as an amateur.

4. Be consistent: Whichever typeface you choose, be sure to use the same one on all your written materials—letterhead, envelopes, business cards, advertisements, and brochures. If you have a logo, include that on all your materials, too. "The classic example of this is IBM," Will-Harris says. "[It's] used the same type of Bodoni in every ad. Even before you've read the ad, you know it's IBM."

5. Dare to be different: You don't have to type your letters on hot pink stationery to get clients to notice (and if you did, you might not get the kind of attention you want). On the other hand, you may want to switch from horizontal business cards to vertical. Or you may want to type your letters using a typeface other than the two that are tried-and-true, Times Roman and Helvetica. To make your letters stand out, Will-Harris sug-

gests trying other typefaces such as Trump Medieval, Baskerville, Cheltenham, Galliard, Souvenir, and Palatino. "You can use any of those typefaces and still get a fairly traditional look," he says.

6. Add a splash of color: Nobody ever said that business communications had to be conducted in white. Though you'll want your clients to be able to read what you send them, "choosing a color other than white will get people to notice it," Will-Harris says. "If you have something very artistic and you want to use purple paper, that's fine." On the other hand, it's important to beware of certain colors, such as goldenrod, a favorite of grade-school teachers, which can come across as ordinary and cheap. Go for thicker paper. A sheet of 24-pound paper stands out from a sheaf of letters written on 20-pound. And, if you can af-

ford it, use a linen- or cotton-content paper. Even a blank sheet of fine paper carries a message about the person who uses it.

7. Design a logo: A good logo sums up your company's image in one easy-to-remember graphic. If you're not artistic, consider hiring a freelance designer or a local art student. If you don't want to start from scratch, many software programs offer clip art you can use free of charge. You can also use an image from a book, though you'll need to check to see if the photograph or illustration is copyrighted.

8. Brighten up your business cards: "For someone in business for himself a business card can serve as a minibillboard," French says. It's also the one piece of business literature that customers see every day while leafing through their Rolodexes. French recently redesigned a card for a client who installs cabinetry. Before the redesign, the card looked pretty ordinary—a horizontal card with the client's name in the center and his address at the bottom. French made the card vertical, changed the typeface to one that looks hand-tooled, and drew a border that looks like the exterior frame of a cabinet door. The result is a card that sells a service.

9. Get your computer to help:

Though word processing programs such as WordPerfect and Microsoft Word are fine for publishing the occasional newsletter or flier, you may need to invest in some desktop publishing software as your needs grow. Will-Harris suggests Ventura Publisher for its speed and precision, though he says that Lotus's Ami Pro is easier to use. French, who uses a Macintosh, recommends PageMaker for desktop publishing novices.

10. Say it right: No matter how classy your business materials look, your efforts will be wasted if you can't get the message across to your customers. Misspelled words and grammatical mistakes can cast doubt on your abilities in other areas. "Don't fall into the trap of spending more time formatting your work than you do writing it," Will-Harris says. "If the content isn't good, nothing else will matter."

### Your Design Is Your Fortune

It's important to realize how valuable a first impression is. The first time you saw the car you drive, the house you live in, perhaps even the person you're involved with romantically, chances are that something clicked. Something made you look a second time. That's the impact you want your business card and documents to have.

No matter what your first impression was, though, you probably wouldn't stick with a car, a house, a partner, or a friend if the quality weren't consistent throughout. That's why you should approach every design decision from letterhead to invoice with the same industrious attitude. If you make a good first impression and live up to its promise, success can't fail to find your door. □

### WHO WROTE THE BOOK ON DESIGN?

*Editing by Design*

\$34.95

ISBN 0-8352-1508-3

Jan White

R. R. Bowker

245 W. 17th St.

New York, NY 10011

(212) 337-7008

*Typestyle*

\$24.95

ISBN 0-938151-23-1

*WordPerfect: Desktop Publishing in Style*

\$23.95

ISBN 0-938151-15-0

Daniel Will-Harris

Peachpit Press

1085 Keith Ave.

Berkeley, CA 94708

(415) 527-8555



"The keyboard input monitoring was bad enough. This is ridiculous."

**TOP SECRET**

# KGB

To ALL NEW KGB AGENTS  
From CENTRAL CONTROL  
Special Instructions:  
DESTROY INFORMATION ONCE  
RECEIVED AND REPORT TO YOUR  
COMPUTER TERMINAL FOR FURTHER  
INFORMATION ON YOUR MISSION

It's your first day at Department P, Moscow KGB and you can't help but think that whoever arranged for your transfer here either has a strange sense of humor or hates your guts.

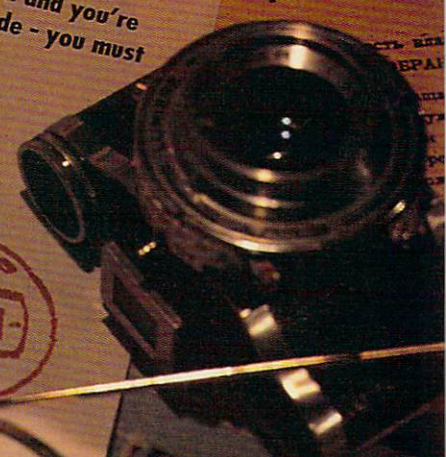
Despite all the upheaval in the Soviet government in recent years, the KGB, or Committee for State Security, is still the most feared and pervasive intelligence-gathering network in the world. Only now the KGB itself is under secret surveillance - by you!

Questions lead to more questions but one thing is clear - the KGB reeks of corruption and you're about as safe as a long-tailed cat in a room full of rocking chairs. Be advised, comrade - you must act quickly and shrewdly to uncover the conspirators before they uncover you.

### FEATURES:

- \* Movie-like storyline filled with surprising twists and intrigue
- \* Intuitive Icon-based Interface - that means no more wading through menu after menu
- \* VCR-style "REWIND" option for keeping track of important clues and information

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rain - eight

Депутатов

Robert Bixby

## ONE MAN'S STORY

One of the purposes of art is to bring joy into people's lives. And even in these days of unauthorized biographies and kiss-and-tell autobiographies whose whole reason for being seems to be to embarrass and/or injure as many people as possible, the publishing art can occasionally rise to its higher purpose and generate a book whose interest lasts beyond a single season. This is the story of such a book.

For several years a gathering in my wife's family meant the opportunity to read the typed memoirs of my wife's grandfather, John Russell Beal. He prepared them on bond paper and kept them in the kind of binders you probably used in high school to turn in important history papers.

If asked, he probably couldn't have said what he wanted to do with his story other than share it with the very people who were helping—with their memories, photographs, and encouragement—to put it together.

The book grew year by year until it filled several binders. As memories became clearer or were proven inaccurate, erasures, strike-outs, margin notes, and handwritten addenda accumulated in the opus. This was the state it was in when my wife and I agreed to put it together in book form. Night after night she would return from her second job and type a few more pages into our trusty Commodore 64.

Then we transferred the text to PC disks, and my work began. I used a desktop publishing package to typeset it. Family photographs were scanned in and placed in the book as TIF files. I generated the pages using a borrowed laser printer and sent them to Thomson-Shore with an order for 50 copies in a brown cloth

binding with the author's name in gold on the cover.

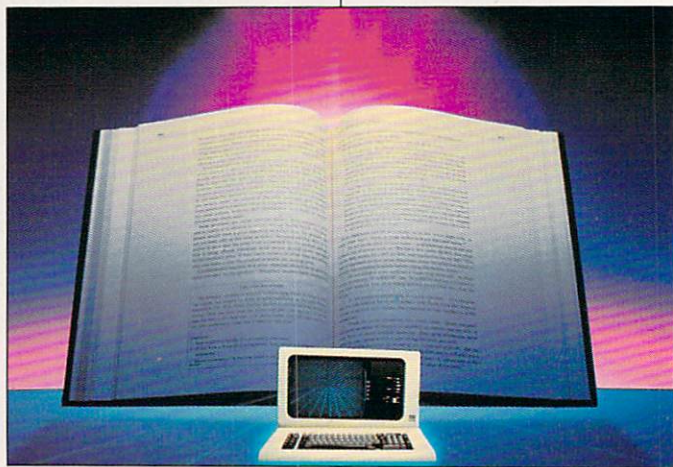
Thomson-Shore of Dexter, Michigan, is preeminent in the tiny field of "short-run" book printers. It offers low-cost, high-quality printing and binding for book runs from 50 to 5000.

The cost for a short run of books is so high, on a per-book basis, that few people are willing to pay it. Our order of 50 came to approximately \$14 per book (the complete cost was around \$700), but the economies of scale would have made another 50 copies cost only \$200 more—or about \$9 per book.

family gathered from all over the eastern half of North America. Weddings serve a vital function in her family. They give the grownups an excuse to hide things like rotting fish in the glove compartment of the groom's car. The modern history of the family is a list of wedding atrocities involving shaving cream, cheese, balloons, and leather unmentionables.

At the reception, the champagne and dance music were put on hold while my father-in-law presented a framed document to my wife's grandfather: the copyright registration of his autobiography. It's a gov-

**Publishing returns to its original purpose when the story of a family is set in type.**



Thomson-Shore prints only on acid-free paper, which is stable enough to last 300 years, or 15 generations.

Reading the adventures of a man who helped survey Colorado for the first settlers and started his career as an automotive metallurgist when the trolleys were horse-drawn caused us to start thinking in broad historical terms. That's probably the most important function of autobiography. It's devoted to putting historical events on a human scale, to making them as real—or as unreal—as daily life.

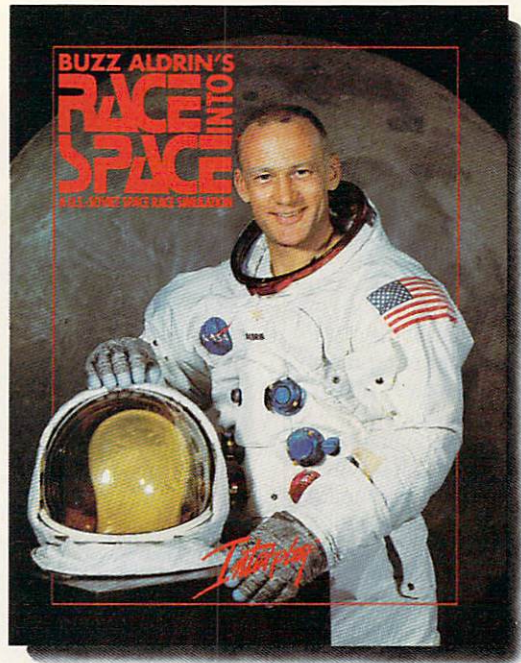
The end of the story came at the wedding of my wife's cousin in Ontario, when the

ernment form about as attractive and functional as an application for SSI. But in this case it stood for much more than the fact that two copies of the book had been checked into the Library of Congress. It meant that one man's experiences—and his memories of his parents and others of a generation long past—would be preserved. They would be available not only to the children, grandchildren, and great-grandchildren gathered at the reception for this emotional moment, but for hundreds, perhaps thousands of his progeny who would never have the opportunity to hear the stories firsthand. □



“We choose to go to the moon...”  
 —John F. Kennedy

“Likely to set  
 a standard  
 for multimedia  
 entertainment  
 products.”  
 —Computer Gaming World



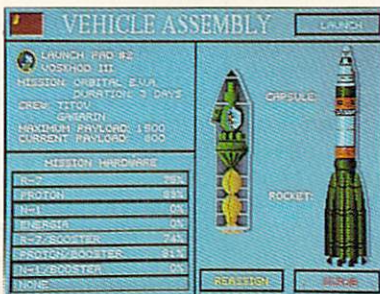
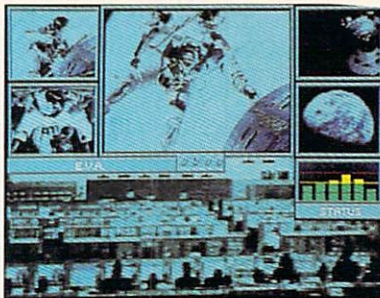
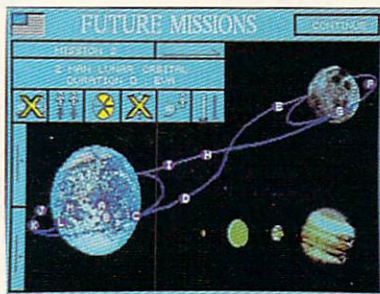
**BUZZ ALDRIN'S  
 RACE INTO  
 SPACE**  
 A U.S.-SOVIET SPACE RACE SIMULATION

Three... two... one... LIFT-OFF! The roar of the giant Saturn V engines becomes deafening as the gleaming rocket clears the launch tower. Within minutes it has enough velocity to reach orbit. America's space program is heading to the moon! But for two years the Russians have been working on a larger, more powerful rocket. Could they be secretly planning a mission this year to land men on the moon? Will they get there first?

Buzz Aldrin's Race Into Space™, is a computer simulation of man's greatest adventure, the race to the moon. It recreates all the excitement of every space mission using digitized footage from lift-offs, space walks, lunar landings and splashdowns.

As Space Director, you have at your disposal the entire space inventories of both the U.S.A. and U.S.S.R., and can plan and direct every conceivable space mission: sub-orbitals; orbital manned and unmanned; duration records; lunar flybys; lem tests; lunar passes; lunar orbits; lunar landings; and even emergency space rescues!

You get to recruit and train over 140 astronauts and cosmonauts and determine which ones have the “right stuff”. You determine which space hardware to research and develop and then you actually schedule and launch individual space missions.



Buzz Aldrin's Race Into Space™ offers twenty different approaches to the moon. Do you follow history or do you cut your own path to glory? Will the United States land on the moon first? Or will the Russians continue to dominate space and plant the red flag on lunar soil first?

**Do You Have The Right Stuff?**

- Buzz Aldrin's Race Into Space™ includes:
- Ability to select from over thirty types of space hardware
  - Hundreds of historical photos and digitized animations
  - Twenty varied approaches to land on the moon
  - Play the U.S. or Soviets
  - Recruit, train, and assign over 140 astronauts
  - Rescue stranded astronauts
  - Three levels of difficulty
  - Complete astronaut history
  - Full musical score and sound effects

To Order Buzz Aldrin's Race Into Space™, call 1-800-969-GAME, or see your local retailer. Coming soon on MS-DOS.

**Interplay™**  
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MS-DOS Screens Pictured.

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# DISCOVERY CHOICE

Enjoy multimedia effects—even on an average PC system—with this innovative educational program.

Peter Scisco

## KNOWLEDGE ADVENTURE

For a few years now, the computer industry has tried to define the term *multimedia* in terms of computer equipment. This definition revolves around something called the MPC—a 386SX-based personal computer with a CD-ROM drive, a high-quality graphics monitor, and a sound card compatible with Microsoft's multimedia extensions to Windows.

The problem with this definition is that not all computer users have MPC-compatible machines nor are they prepared to upgrade their present computers to meet these rigorous demands. For these users, however, the world of multimedia computing is not completely out of reach. A company called Knowledge Adventure, with its same-named Knowledge Adventure software, brings a multimedia-flavored environment to regular-edition personal computers.

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Knowledge Adventure isn't a game: You don't score points, and you don't race against a clock. Neither is it just an encyclopedia. Instead, you take a leisurely journey through a storehouse of facts, images, and sounds. For adults and children already imbued with healthy curiosity, the journey becomes as invigorating as any adventure game. For students who need prompting and encouragement to pursue their studies, the fact that this is a computer-based product with high-quality images and sound effects may be enticing enough to get them hooked on learning—at least for a while.

Knowledge Adventure is designed as a modular applica-



tion. To the basic program, the company is planning to add special voyages into the worlds of music, literature, science, sports, law, math, religion, and philosophy. If these additional modules perform as well as the basic program, you can look forward to many hours of adventure and discovery. The graphics are well designed and produced, and the sound effects, including voices, are quite clear when played through a Sound Blaster card.

It's hard to speak of a program like this as being well organized. While there are several threads and options that allow you to direct your explorations or retrace your steps, the point is to promote free travel and discovery.

Such freedom can at times be disconcerting, even jarring, in its juxtapositions. For example, while reading a short biographical note about Leonardo da Vinci, you might click on the small graphic of the *Mona Lisa* and find yourself looking at a larger representation of

this famous portrait. Clicking on the *Mona Lisa* might take you to a screen displaying the *Venus de Milo*. The connection between these two artworks is unclear, and the matter is further complicated when you click on the statue of Venus and are transported into space for a spectacular view of the planet Venus.

The program's manual suggests making a game of discovering the connections between such apparently disparate pieces of information. As any student of liberal arts will tell you, it's in these links, and not in the facts themselves, that real knowledge resides.

To assist you, Knowledge Adventure employs a simple interface of icons and directional indicators. The buttons lined up at the top of the screen represent the categories of Art, Science, Literature, Architecture, Music, and Nature. Selecting any of these buttons with the mouse (the program also accepts keyboard input) moves you to a screen that falls within the selected

category. Selecting the Literature button, for example, guides your search to a biographical note about a famous author or perhaps a description of a work with particular literary significance.

The category buttons can be used as more than linear passageways through time, however. By highlighting a button, you can limit your voyage to a specific category. For instance, if you were to highlight the Nature button, all of the information that you'd receive during your search would be confined to that category.

The Help option is a good example of the program's interactive screens. The Help area appears as a library reference room. There's a large "card catalog" with lettered drawers from which you can get an alphabetical listing of subjects contained in the program.

For example, selecting the L drawer brings up a list beginning with LAB and ending with LYNDON. These main subjects—in uppercase—can't be selected, but the underlying subjects are linked to information screens. Under LAB, you'll find G. Washington Carver and Penicillin. Clicking on Carver brings up a biographical entry about the inspirational scientist who invented hundreds of ways for using the peanut and the sweet potato—and in so doing, helped to lift many Southern black farmers out of poverty.

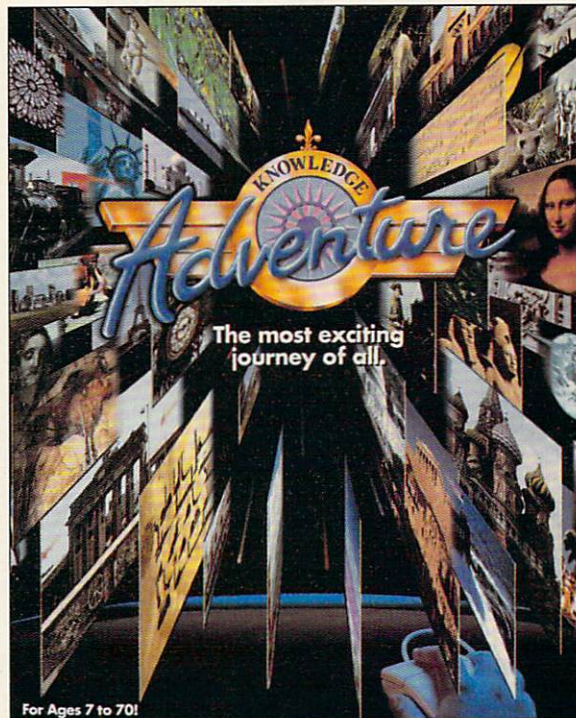
The Help screen also has a graphic of a checkerboard. Select it, and you move to the program's only game element—a quiz game. In it, you must answer a question by navigating through the database. Your score is determined by how many mouse clicks it takes you to answer the question.

Knowledge Adventure is further bolstered by a globe and a time line that are always present. Rotate the globe using directional arrows beneath the box to have access to almost any point on the earth. When you reach the spot you want, click on it to receive information linked to that geographical point. Besides the directional arrows, you can use a sliding scale to zoom in on and out from the globe.

The time line at the bottom of the screen encompasses the eons from 15 billion B.C. (the start of the universe, according to proponents of the big bang theory) to Beyond 2000, which offers a glimpse of the world tomorrow. The last two entries are for 1989 (the collapse of the Berlin Wall, presaging the disintegration of Communist influence in Eastern Europe) and 1990 (the launch of and the problems with the Hubble Space Telescope).

The strength of Knowledge Adventure—its promotion of discovery at the expense of overly rigid organization—is, paradoxically, also its greatest weakness. The program can be used effectively as a launching pad for further exploration, but it's neither complete nor comprehensive enough to be used as a research tool in its own right. Descriptions are brief and reasonably accurate; however, they aren't annotated in any way and shouldn't be taken at face value. Adults who buy this program for their children should assist them in finding suitable reference materials once the spark of discovery has been lit.

Knowledge Adventure, unlike MPC-based reference tools such as Microsoft Bookshelf for Windows, doesn't of-



fer research and writing tools other than its printing utility. Also, there are no animated sequences such as those you might find on a CD-ROM-based multimedia product.

However, bringing this kind of free-form database, complete with sound and images, to the PC in a disk-based product is an achievement that should be recognized as a challenge to the notion that only MPC-equipped computers can make use of multimedia elements. Long after the standard for multimedia computing has been defined, innovative companies like Knowledge Adventure will use the theory of multimedia—linking images, sound, and text in an interactive context—to take us back to where we've been and forward to where we've not yet gone. □

**IBM PC and compatibles, 384K RAM, EGA or VGA, hard disk with 6MB free space; printer and mouse optional; Sound Blaster, Disney Sound Source, or Covox Speech Thing required for playback of digitized sound effects—\$79.95**

**KNOWLEDGE ADVENTURE  
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La Crescenta, CA 91214  
(800) 542-4240**

Circle Reader Service Number 301

Steven Anzovin

## SCANNING THE WORD OF THE LORD

Computers are helping to crack the world's longest-running proofreading problem. One of the oldest texts in continuous use is the book Jews call the Torah (or Pentateuch), which consists of the first five books of the Bible. The Torah is written out in Hebrew on a large scroll that's read in the synagogue on every Sabbath. This scroll, which according to traditional Jewish belief contains the word of God as it was given to Moses on Mount Sinai, is the most precious and often the single most expensive possession of a Jewish congregation.

There are exactly 304,805 Hebrew characters in a Torah scroll, and ideally, all of them have to be perfect for the scroll to be considered fit for use in worship. To use a defective scroll would be an insult to the Almighty. But making a perfect Torah is no trivial task—you can't just type one

out on a word processor and use a spelling checker. According to Jewish law, the scroll must be inscribed by hand with a quill pen and special vegetable-based ink on parchment made from the skin of a kosher animal, such as a sheep or a goat. Highly trained Torah scribes and proofreaders, who take up to a year to complete one scroll, follow strict rules laid down in the twelfth century by the sage Maimonides. Great pains are taken to avoid mistakes and to correct any that are found before the scroll is delivered. Inevitably, however, some errors creep through. In fact, it has been estimated that up to 85 percent of the scrolls written since World War II (when thousands of accurate scrolls were destroyed by the Nazis) contain mistakes.

The problem of imperfect Torah scrolls is an interesting example of how difficult it is to transmit exact information using analog means—in this case, looking at words and copying them by hand. (The word *analog* itself comes from the Greek roots *ana-* and *-logos*, meaning "according to the word.") Just one repetition is all it takes to corrupt analog information, as anyone who has ever been the victim of gossip can attest. Only with great effort has it been possible to transmit the text of the Torah essentially unchanged over the 2½ millennia since its codification. Now a company in Israel is applying digital technology to increase the accuracy of Torah scrolls. Mishmeret Stam of Bnai Brak (offices in Jerusalem, France, and New York, among other places) uses an optical character reader (OCR) to scan photocopies of Torah scrolls for errors. The software to proofread the Torah text is lengthy and complex, since it's far more difficult for an OCR program to recog-

nize handwritten characters than printed ones, which are much more uniform. Once a particular scroll has been scanned, it's compared with a computer copy of the text of the Torah which has been checked and rechecked for accuracy. A list of errors is then returned to the scroll's owner, who can arrange for a scribe to make repairs to the original. The computer doesn't guarantee a perfect Torah—the OCR scanner may not be able to recognize certain subtle mistakes—but Torah scrolls checked by computer are so much more accurate overall that most contracts for new scrolls require that they be checked by optical scanner before the scribe is paid.

A proper Torah can never be generated by a PC, but study of the Torah and the Bible can certainly be enhanced by computer. PC-based Bible-study tools are offered by several different software publishers, each with its own slant on this vast subject. Parsons Technology (One Parsons Drive, Hiawatha, Iowa 52233; 800-223-6925) offers the most comprehensive selection, including HebrewTools, which contains a Hebrew lexicon database, a set of flashcards, and a Hebrew word processor for those studying Hebrew scriptures in the original language. There's also GreekTools, for those who want to master enough Biblical Greek to check out the New Testament in its original language. Parsons also publishes several on-disk English Bible translations—the King James and the New International, for example—for use with its QuickVerse 2.0 searching, indexing, and annotation program.

These programs, with their instant access and a wealth of approaches, make Bible study and scholarship easier than ever before. □

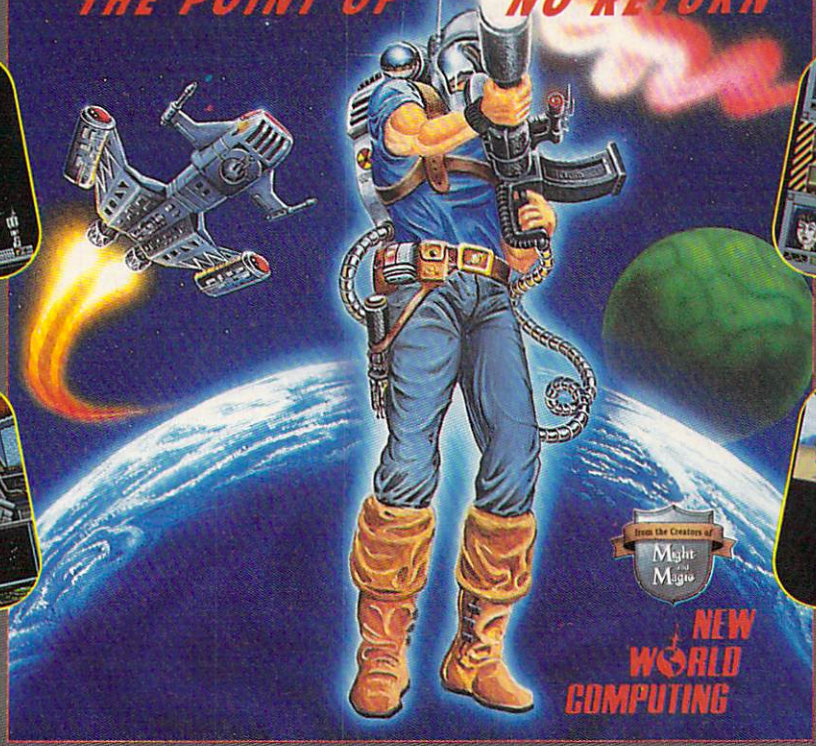
Great pains are taken to eliminate mistakes before the Torah scroll is delivered.



# ADVENTURE INTO A LIVING UNIVERSE!

## PLANET'S EDGE™

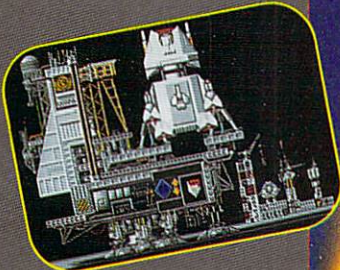
THE POINT OF NO RETURN



DISCOVER



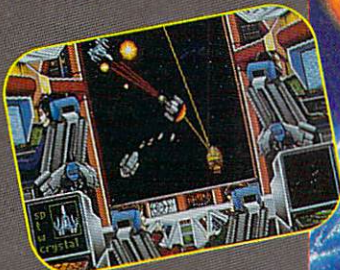
INTERACT



DESIGN



SOLVE



CHALLENGE



ENJOY

**Help solve the mystery of the vanished planet Earth...**

You and your comrades will follow a path of clues across the adventure-filled cosmos on a quest to return the Earth to its own space-time continuum. Buckle up, lay in your course and hang on...you've just crossed over the *PLANET'S EDGE!*

★ **SPACE COMBAT SIMULATION!**

★ **ROLEPLAYING ADVENTURE!**

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# MULTIMEDIA PC

David English

## TRIPLE THREAT

Seven years ago, Microsoft began preaching the gospel of CD-ROM when no one wanted to listen. Two years ago, Microsoft began pushing multimedia when most people thought the technology was at least five years away. Now that multimedia is here and beginning to catch on, what has Microsoft done lately to promote the Multimedia PC (MPC) standard?

Of course, we wouldn't have MPC without Microsoft's Windows with Multimedia. It's the foundation on which all the

soft Multimedia Beethoven: The Ninth Symphony; and Microsoft Bookshelf for Windows.

Microsoft Works for Windows, Multimedia Edition (Microsoft, One Microsoft Way, Redmond, Washington 98052; 206-882-8080; \$199) is essentially the same program as Microsoft Works for Windows except that the multimedia version comes on a CD-ROM and includes a multimedia-based tutorial. Using sound, video, and animation, the tutorial actually makes learning fun. Clearly, some talented people were involved in creating these highly entertaining lessons.

Microsoft Multimedia Beethoven: The Ninth Symphony (\$79.95) is actually a port of a Macintosh CD-ROM created by The Voyager Company. It's a multifaceted and detailed look at the greatest symphony ever

written. Robert Winter, a music professor at UCLA, wrote the text for each of the four sections.

The four sections are Beethoven's World (a vivid look at Beethoven's life and times), The Art of Listening (a short course in musical concepts, using the Ninth Symphony for examples), A Close Reading (a listening tour of the entire symphony with information displayed at various points in the symphony), and The Ninth Game (a game that tests your knowledge of the material in the other three sections).

The recording itself is a 1966 recording with the Viennese Philharmonic. You can hear it through your CD-ROM drive's audio outputs or through any sound card that

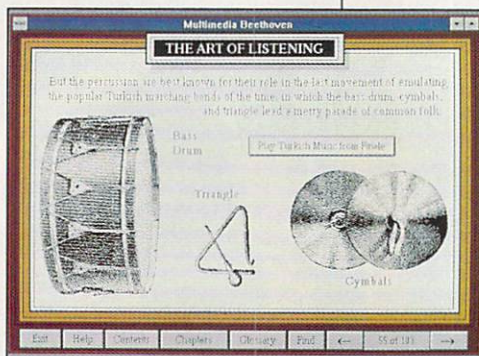
meets the MPC specs. You can even play the symphonic tracks in a regular audio-CD player.

Multimedia Beethoven is a terrific example of how to bring high-quality music to an MPC title. The software lets you easily compare musical themes and hear individual instruments. The only flaws in this otherwise stellar product have to do with its translation from Macintosh to MPC. Originally based on a low-resolution, black-and-white HyperCard stack, the graphics are still mostly low-resolution and black-and-white. In addition, rather than rebuild the program from the ground up, Microsoft chose to translate the Macintosh-based HyperCard stack into a PC-based ToolBook 1.5 book and touch it up a bit. That's fine, except that ToolBook can be slow, so Multimedia Beethoven is sometimes slower than it should be.

Microsoft Bookshelf for Windows (\$195) is a reworking of the popular DOS-based Microsoft Bookshelf. It's practically a full reference library on a single disc, including as it does *The Concise Columbia Encyclopedia*, *The American Heritage Dictionary*, Roget's II Electronic Thesaurus, *The World Almanac and Book of Facts*, *Bartlett's Familiar Quotations*, *The Concise Columbia Dictionary of Quotations*, and *Hammond Atlas*. Added to these text-based works are over 1000 images and maps, 20 animations, and over 65,000 audio pronunciations. You can also hear many speeches, national anthems, and snippets of music. The interface is easy to use and allows keyword searches through one or more of the seven reference works.

For those of us who thrive on information, Microsoft Bookshelf for Windows is like a gift from heaven. □

**Microsoft Multimedia Beethoven: The Ninth Symphony provides a detailed look at the greatest symphony ever written.**



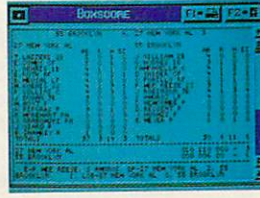
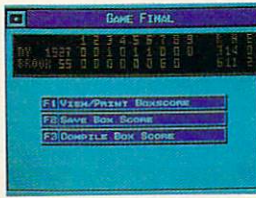
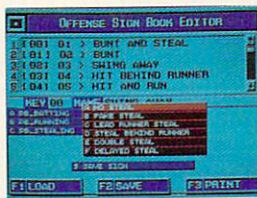
MPC titles are built. While the MPC standard is officially set by the Multimedia PC Marketing Council, it was Microsoft that developed the original standard. Fortunately, Microsoft designed Windows with Multimedia to be an open platform, so it can be easily extended with new hardware and software drivers. Microsoft also continues to sponsor the annual International Conference & Exposition on Multimedia and CD-ROM, an important meeting place for swapping ideas and displaying new CD-ROM products.

In addition to its contributions on the systems side, Microsoft is committed to developing and selling its own MPC applications. The company has recently released three MPC titles: Microsoft Works for Windows, Multimedia Edition; Micro-

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# ENTERTAINMENT CHOICE

*Don a feathered cap and become a living legend in this ingenious adventure game.*

Clayton Walnum

## CONQUESTS OF THE LONGBOW: THE LEGEND OF ROBIN HOOD

Surely everyone who isn't filthy rich has at some time wished to be Robin Hood. How noble it would be to help those in poverty and take the ultrarich down a notch or two. Justice would be served, and the underdogs would get their just rewards.

Now's your chance to live the legend. In Sierra On-Line's spectacularly illustrated adventure, *Conquests of the Longbow: The Legend of Robin Hood*, you're Robin Hood as he strives to collect King Richard's ransom. Along with your merry men, you must correct the injustices being perpetrated in the name of Prince John and the Sheriff of Nottingham. If you're successful, you'll save the throne for the king. You'll even gain the hand of the luscious Maid Marion. If you fail, you'll die a rogue's death at the hands of the sheriff's men.

For those unfamiliar with the details of the tale, here's a brief review. King Richard the Lionheart sets off for the crusades with high hopes. But the crusades take a bloody turn, and the king is captured by Austrian soldiers.

Back in England, Prince John has his eyes on the throne and privately swears that Richard will never be freed. Conspiring with the likes of the Sheriff of Nottingham, he weaves a web of intrigue and treachery that drives King Richard's faithful subjects into poverty and despair.

Accused of banditry and other crimes against the prince

and his people, Robin Hood, a disillusioned member of the rich class, becomes an outlaw and sets up a hidden camp with a small group of followers. Stealing from the rich in order to feed and clothe the poor, Robin becomes the people's champion.

Sierra has brought the legend to life. *Conquests of the Longbow* is a carefully crafted and researched tale, bursting with druid magic and medieval English lore. Over two dozen books were used in the game's research, as evidenced by the bibliography included in the manual. As a result, the graphics, the text, and even the story line ring with an authenticity that inexorably draws the player into the game.

Adopting a pleasing cinematic approach to computer storytelling, *Conquests of the Longbow* begins with a lengthy graphic introduction that is sung by an animated bard. After the introduction has ended, you, as Robin, find yourself in your cave, and the adventuring begins.

To keep this long quest manageable, *Conquests of the Longbow* is divided into days. Each morning, you awaken and talk to your men to learn what you need to do that day. Then you sally forth to solve that day's puzzles.

You might, for example, need to acquire a disguise so you can enter Nottingham incognito, or you might need to rescue someone from the sheriff's clutches. Often, you'll find yourself on Watling Street, relieving rich travelers of their gold, battling the sheriff's cronies, or bargaining with innocent passersby.

At first, the game is fairly easy, with quickly solvable puzzles and many animated sequences to guide you into the story. However, don't let the first few game days fool you. *Conquests of the Longbow* is a challenging adventure that requires much ingenuity to solve—inexperienced adventurers may have a rough time solving some of the puzzles. This is a toughie!

Usually, after solving a major puzzle, you're treated to an





animated sequence in which the characters take over the game in order to advance the story line. Each ensures that the game's story is captivating and cohesive. At the end of each day, you and your men gather around a campfire to discuss the day's events. When a character speaks, his animated portrait appears on the screen, allowing you to see your men close up and further adding to the game's realism.

If you discount the many "rooms" that make up Sherwood Forest, there are few locations in the game—so you won't need to do a lot of mapping (hurray!). In fact, *Conquests of the Longbow* includes its own map. To move to one of the game's main locations, you bring up the map and click on your destination, saving you from much wandering through the forest.

Of course, there are locations you must discover on your own. Once you've found them, they're added to the map. Other adventure game designers would be wise to incorporate this feature.

As you travel through this medieval fantasy, you'll visit the Watling Street overlook, the town of Nottingham, a mysterious fens monastery, and more. When you enter castles, the display changes to show the building's floor plan. You can visit any room by simply clicking on it in the display. Once again, Sierra avoids meticulous and boring—and senseless—mapping.

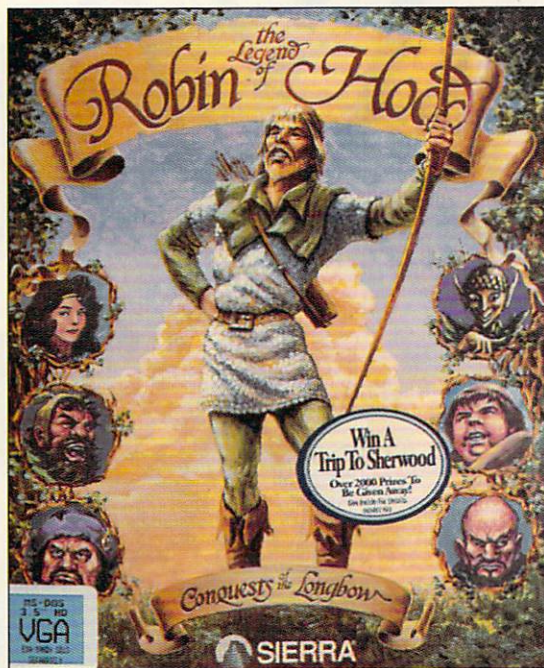
The adventure is packed with Sierra's trademark humor, so talk to everybody and look at everything. That way you won't miss important clues, and you'll discover some zany comedy bits. At a fair, for example, you'll run into a lazy gos-

sip named George Bush. Then there's the log-laden peasant who confesses, "I used to be a programmer for Sierra On-Line, but hauling wood is much easier work."

*Conquests of the Longbow* features not only Sierra's famous mind-bending puzzles but also several arcade sequences, and there's even an authentic ancient English game called *Nine Men's Morris*. The arcade sequences and *Nine Men's Morris* are fully playable games within the adventure. However, if you prefer straight adventuring, you can set the game's arcade level to 0, which assures that you'll win all arcade sequences on your first attempt.

As with all recent Sierra games, no typing is required to enter commands. You can choose commands from a menu or you can use the right mouse button to cycle through the commands, with the mouse cursor changing to a different icon with each click. There are only about half a dozen commands to choose from, but they can be used in many ways. Even with the limited command set, you won't reach the end of this adventure quickly.

No game is perfect. There are a couple of minor but annoying problems with *Conquests of the Longbow*. For example, if you click the mouse button at the wrong time, you may inadvertently dismiss an important text box that has just appeared on the screen. Moreover, although your outlaw band comprises over 30 men, the only ones you ever see are the five main characters. You never get the feeling that you're leading a large band of men. Finally, I came across one important pass-



word that was misspelled. Ouch! Remember *i* before *e* except after *c*.

These are just quibbles, though—all easily overshadowed by the many strong points of *Conquests of the Longbow*. The 256-color graphics are marvelous; the text is, for the most part, impeccably written; and there's a large helping of mystery, mayhem, and magic. Even romantics will get their due as Robin woos the beautiful Maid Marion.

The *Legend of Robin Hood: Conquests of the Longbow* is a delight, accurately portraying a long-gone medieval age. If you've played Sierra games before, this game's high quality will be no surprise. If you've never played a Sierra game before, *Conquests of the Longbow* is an impressive introduction to this company's fine fare. This feathered cap fits perfectly. □

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# Golf Game Handicap.

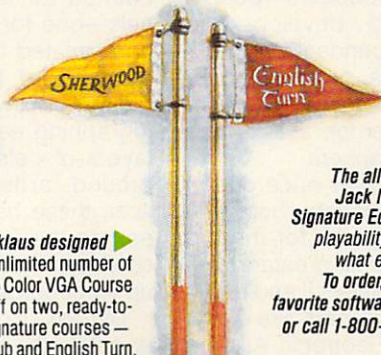


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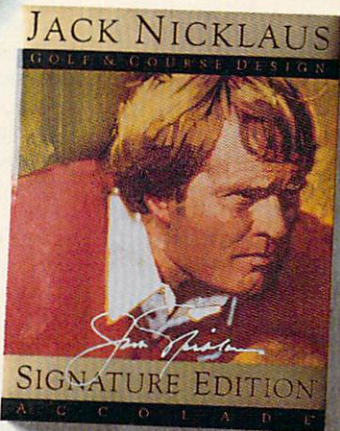
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# GAMEPLAY

Gregg Keizer

## LIGHTS! CAMERA! COMPUTER GAME!

They shoot on location; they put actors on the set. They work from scripts and storyboard nearly every scene. They employ teams of creative people, from musicians and background artists to writers and animators.

Moviemakers? No way.

Not even the best computer games look like movies—not yet, anyway—but their creators have cribbed notes from film school, because as time goes by, more and more games are made like movies.

Have you noticed a similarity between movies from the Golden Age of Hollywood and the latest computer games? It's no accident.



Computer game makers have played the movie analogy card for years. Trip Hawkins, founder of Electronic Arts, hammered home "The New Hollywood" theme in the mid 1980s when he assembled a game company around a group of producers—people who would develop and guide independent programmers, artists, musicians, and writers just as a film producer leads a director, actors, and cinematographers.

Dynamix was once one of those independent shops that contracted work for the big boys. Dynamix created titles like *Ghostbusters II* and *Arctic Fox* for publishers like Activision and Electronic Arts. In 1989, Dynamix went solo, and a year later Sierra bought the

company. Today, Dynamix has several serious hits on its hands, from *Red Baron* to the hard-to-pigeonhole *Adventures of Willy Beamish*.

The infrastructure needed to produce state-of-the-art software titles is both impressive and sophisticated. Teams of specialists—artists, animators, programmers, and musicians—work on projects in a ballet of scheduling, deadlines, and cost controls.

Dynamix's payroll includes not only the programmers and computer artists you might expect, but also writers, musicians, animators experienced in cel-animation techniques, a full-time photographer, and even a costume designer.

Disney-style animators? A costume designer? Sure. Their expertise comes in handy because of the way Dynamix produces much of its work. When the way games *look* is

so important, you have to start with the realistic and the professional. In a game like *Willy Beamish*, for example, the cartoon-world adventure is created in much the same way as an animated picture. Backgrounds are drawn and painted by hand. Individual cels—one for each frame in an animated film—are drawn and painted, too. So far, like a movie. But rather than photographing each frame, with layers of cels atop a background, artists at Dynamix scan these handmade images into the PC with a Targa scanner and then touch them up electronically.

Dynamix's costume designer outfits the live actors—actors, not models—who portray characters in some of the com-

pany's adventure games. *Ac-ces of the Pacific*, a flight/combat simulator based on the successful *Red Baron* model, incorporates digitized photos of actual WWII aircraft, shot on location at an air show. Even the background clouds come from a photograph, not an artist's imagination. Videotape taken at a semipro football game will end up in an upcoming sports title.

Not only its dependence on such real-life images and Disney-style animation mark Dynamix as a studio kind of shop. The nuts and bolts make you think of films, too.

To kick off an adventure game at Dynamix, a designer submits a treatment—a description or proposal composed by the game's designer. Next, writers flesh out the game's story line. If it's an animation-based title, character studies are drawn for months; if live actors are needed, screen tests take place. A shooting schedule, complete with multiple and overlapping deadlines, is compiled, while in the art department, storyboards of sketches that outline each shot and scene stretch across entire walls. Finally, when as much as possible has been done away from the computer, teams of programmers, artists, and writers work simultaneously on the program, each team completing its own piece, which is then bolted together near the end. And all the while, a production budget (a major game at a major publisher typically carries a price tag of over half a million dollars) looms overhead.

Are games made just like movies? Hardly. They're games, after all, not cinematic art. Game designers aren't pressing the flesh at Cannes, putting hand prints in cement, or punching out the paparazzi. But give them time. □

# Pacific Islands

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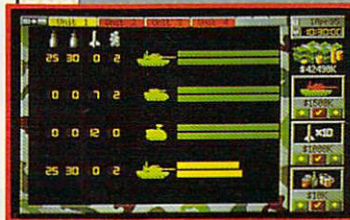
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- Is there enough time and money to repair your damaged tracks and give the crews some rest?



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**TAKE CO**



Tired of your keyboard letting you down when you fly the unfriendly skies? These joysticks put the joy back into flight simulators.

BY DENNY ATKIN

# CONTROL

Everything's looking good for a successful attack run. It seems the enemy air force is too chicken to take to the air today. Not a SAM launcher in sight, and ack-ack fire is minimal. A couple more minutes, and I'll be in range to launch-drop a couple of laser-guided bombs on the Scud emplacement, and then I can head for home. Suddenly I see my threat warning light burning—a radar-guided SAM is headed for my plane! OK, I think, drop some chaff and pull some evasive maneuvers to get out of the missile's way. Let's see—which key controls chaff? Yikes! That one turned off my electronic countermeasures jammer! I'm really a sitting duck now. Which key drops the chaff? Here comes the missile—break right! Oh, no! I hit Page Up instead of Cursor Right—I'm flying right into the missile. Good-bye, cruel world.

If only I had a joystick.

Let's face it: If American combat aircraft were equipped with PC keyboards, we'd never win a war. Flying one of the hot new PC flight simulators such as Falcon 3.0 or Secret Weapons of the Luftwaffe with the keyboard is like steering a Porsche with a touch-tone telephone. Luckily, a PC pilot has a wealth of controller options that can turn a computer desk into the hottest simulated cockpit this side of the Air Force Academy.

While a real fighter pilot has to flip a number of switches during the course of a flight, actual combat is usually performed with a HOTAS (Hands On Throttle And Stick) setup. This system puts all essential switches and toggles for air combat right on the pilot's joystick and throttle. A HOTAS system prevents the pilot from having to reach for the instrument panel during combat, preventing deadly delays. With the right accessories, you can approximate a HOTAS setup on your PC's screen.

### Stick with It

Modern computer flight simulator controls barely resemble the flimsy plastic joysticks used by folks to fly blocky little biplanes across an Atari VCS video game screen. Those early videogames used switch-based joysticks, which can only sense whether you're holding the stick up, down, left, right, or diagonally. The Apple II introduced a better kind of stick, the analog joystick, which can sense not only the direction but how far and how fast you move the stick.

While this type of stick is actually harder to use for the Pac-Man-style games popular in the late 1970s, it's the perfect choice for an innovative program released for the Apple in 1979: SubLogic's Flight Simulator. The con-

trol afforded by an analog joystick helps bring an extra degree of realism to Bruce Artwick's innovative simulation.

Just as flight simulations have come a long way from the low-resolution, black-and-white Flight Simulator, the newest PC joysticks barely resemble the primitive controllers of the early Apple II days. Those early sticks are little more than a couple of buttons and potentiometers crammed in a boxy off-the-shelf plastic case; they're hardly stylish, and they aren't very ergonomic, either. Those days are gone; many modern PC analog joysticks would look at home in the cockpit of a real F-16.

With all the features available nowadays, picking out the right joystick controller can be as confusing as buying the right PC. Among the features that differentiate various joysticks are on-board throttle controls, extra buttons, auto-centering, and trim controls.

The controller most popular with dedicated flight-sim aficionados, CH Products' FlightStick, has all these features. This large gray-and-black controller features a heavy pistol-shaped grip, trim controls on both axes, and handle-mounted fire buttons. Instead of the ball-joint joystick base found on many joysticks, the CH stick handle uses a gimbaled mount. This allows more precise control—if you want to pull back without turning to either side, the gimbaled mount makes it easy.

One FlightStick feature that comes in particularly handy is its throttle control wheel. Mounted just to the left of the stick, this wheel simulates the y-axis of a second joystick. So if your program supports the use of a second joystick as a throttle (Flight Simulator 4.0, Falcon 3.0, Chuck Yeager's Advanced Flight Trainer 2.0, and A-10 Tank Killer 1.5 are among the simulators that do), you can use the FlightStick's throttle wheel to control your engine power. It's much handier to have this control right at your fingertips rather than on a second stick you have to reach for. The throttle makes an annoying clicking sound as you move it; it would be more comfortable if the wheel would advance smoothly. (Instructions on disabling the throttle click are available on bulletin boards and online networks.)

Kraft's sleek all-black Thunderstick shares a number of features with the FlightStick, including a gimbaled mount, a throttle control, x and y trim adjustments on the top of the stick, and stick-mounted fire buttons. However, the Thunderstick just doesn't have the professional feel of the FlightStick. The joystick movement isn't as smooth, and the handle is lighter and not as comfortable. To Kraft's credit, its throttle implementation is easier to use than CH's. The

Kraft throttle is a slider on the side of the joystick, and it's easier to set to a specific setting than the CH wheel. Also, Kraft includes a switch to disable the throttle in cases of software incompatibility or if you want to use a second joystick instead. And Kraft's five-year warranty is hard to beat; CH offers only one year.

Both the FlightStick and the Thunderstick work nicely as general-purpose joysticks as well. Their trim adjustments let you use them even with older games that don't include joystick calibration routines. However, both sticks are auto-centering and can't be used in free-floating mode, where you can leave the stick in any position. If you need that feature for CAD or other work, you might consider a second general-purpose joystick, such as CH's excellent MACH III. This smaller, more traditional-looking stick features three fire buttons, trim adjustments, sturdy construction, and switchable self-centering on either or both axes.

Advanced Gravis Analog Joystick is also a contender if you need a general-purpose stick. It has a unique adjustable-tension centering feature—you can select how hard you have to push the joystick to move it off-center, or you can defeat the centering entirely. The Gravis stick has three fire buttons, one on the stick and two on the base. Each of these buttons can be assigned as joystick button 1 or 2, or disabled. The stick handle is fairly large and foam-padded, and it's more suitable for use in combat flight simulators than the CH MACH III. The Gravis joystick has one major problem—adjusting the trim requires a screwdriver, so it's not feasible to tweak it in mid flight.

Suncom's Analog Xtra is billed as a "Flight Simulation Joystick"; it's probably only a good choice if you want to simulate getting blown out of the sky. The stick is one of the most impressive-looking in the bunch, and it sports a full feature list: throttle slider, three fire buttons, adjustable-rate rapid fire, trim sliders, and optional suction cups. However, the stiff rubber boot at the bottom of the stick handle makes it very difficult to move the stick, robbing you of necessary flight control.

### Total Control

Even if a joystick has a throttle control, you're still forced to reach for the keyboard for functions like deploying the speed brake or changing radar modes. With the ThrustMaster system, though, you can approximate a true HOTAS setup.

The ThrustMaster system consists of two components, each sold separately: the Flight Control System (FCS) joy-





# KICK BACK

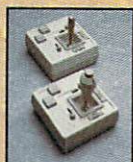
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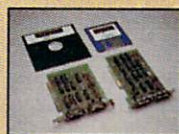
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stick and the Weapons Control System (WCS) throttle. The FCS is probably the most authentic control stick available for any computer. Its heavy-gauge molded plastic stick looks just like the side-stick in an F-16. It has four buttons (the extra buttons are currently supported by Falcon 3.0, where they toggle speed brakes and change weapons modes, and by Chuck Yeager's Air Combat 1.1) and uses a unique nonlinear spring system to provide more tension as you push the stick farther—just like in a real plane. It has no trim adjustments, however, so it's only suitable for flight simulators that let you calibrate the stick within the program.

The WCS is a throttle control with six buttons and a three-position toggle switch. The throttle works just like a side throttle in a fighter jet: Push the throttle forward to the detente stop to go to full speed; push it farther to activate afterburners. The buttons and toggle switch activate different functions, depending upon which simulator you're using. In Falcon 3.0, the buttons control flares, chaff, target selection, lock on, lock clear, the air brake, and combat mode. In Secret Weapons of the Luftwaffe, on the other hand, they control the gun camera, map mode, weapons mode, arming and launching rockets, flaps, and landing gear. Be prepared for a bit of confusion if you fly a number of simulations, but it's no worse than memorizing different keyboard controls.

The WCS acts as a keyboard device and plugs in between your PC and its keyboard. (Note that you'll need adapter cables if you have a PS/2-style keyboard.) It works by sending the key codes to the computer as if you'd pressed them on the keyboard. This works great for weapons toggles and such, but the WCS sends throttle movements by sending keypresses, also. This isn't as responsive as the analog throttle control used by the FlightStick and Thunderstick. Also, some programs, such as Secret Weapons of the Luftwaffe, can't accept a fast series of keypresses, so quick throttle movements can result in little more than a series of "too-many-keypresses" beeps.

Because the WCS has to send different keypresses depending on which simulator you're running, you have to change a set of DIP switches on the back of the case each time you boot a different simulator. You also must replace a ROM chip inside the stick to add support for new programs. The stick currently supports 14 of the hottest flight simulators—including Falcon 3.0, Yeager's Air Combat, Wing Commander, and A-10 Tank Killer—and the ThrustMaster company regularly

releases update ROMs for a small fee. Even with these minor problems, though, I'd recommend the WCS to all flight sim fans, no matter which joystick you choose. With a good joystick in your right hand, the WCS in your left, and a set of rudder pedals at your feet, you've got a true HOTAS system that can make combat easier, more realistic, and much more exciting.

### It's in the Cards

To attach any of these joysticks, you'll need a game card as well. Many PC sound cards include joystick ports, including the Sound Blaster Pro and Thunder Board. Besides, a sound card is another must-have flight simulator accessory; combat is more exciting when your guns thunder than when they click.

I tested all of the sticks here with a Thunder Board and had no problems. However, if you're going to be using more than one joystick-port device (such as two joysticks and rudder pedals), you'll need to attach Y cables to the single joystick port on the back of the sound card. I've heard reports of incompatibilities with such setups and the Sound Blaster Pro card, so you might be better off just buying a game card with two joystick ports.

Both Kraft and CH manufacture dual-port cards that will automatically adjust to your PC's speed, and both include calibration software on disk. The Kraft Programmable MultiSpeed Game Card will autoadjust to speeds up to 35 MHz, while the CH GameCard III Automatic will work at up to 50 MHz. Suncom's GamePort 2 Plus card works only up to 16 MHz and requires you to manually change switches on the back of the board to alter the card's speed.

Advanced Gravis Eliminator Game Card takes a unique approach to the calibration problem, offering an external adjustment dial that plugs into the back of the joystick card. Although this setup ensures that you'll be able to adjust the card specifically to your computer's speed, I didn't have any problems with the automatic cards.

### Take Off, Eh?

There are a number of good options for the dedicated PC pilot. My setup of choice is either the FlightStick or the ThrustMaster FCS, along with the ThrustMaster WCS. Jerking back on the stick while shoving the throttle forward is an experience totally different from holding down the + key while hitting 2 on the numeric keypad. Another accessory the dedicated pilot will want is a set of rudder pedals. The Maxx Pedals from Maximum are popular with PC pilots, but they didn't arrive in time to be included in this feature.

If you're considering buying some of these accessories, you should check your flight simulator's manual to see if it supports some of the more esoteric options, such as rudder pedals or second-joystick throttles, before buying. A good source of compatibility information and product recommendations is CompuServe's FSFORUM, an online forum dedicated exclusively to talk about flight simulators. A couple of FSFORUM pilots are even putting together a custom HOTAS system, which will sell for around \$300 and be completely user-programmable.

Put away that keyboard and grab a real flight controller. The wild blue yonder will never be the same. □

### PRODUCTS REVIEWED

Advanced Gravis Analog Joystick—\$59.95

Eliminator Game Card—\$44.95

Advanced Gravis  
1602 Carolina St., #D12  
Bellingham, WA 98226  
(604) 434-7274

FlightStick—\$79.95

GameCard III Automatic—\$49.95

MACH III—\$49.95

CH Products  
970 Park Center Dr.  
Vista, CA 92083  
(619) 598-2518

Sound Blaster Pro—\$299.95

Creative Labs  
2050 Duane Ave.  
Santa Clara, CA 95054  
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Thunderstick—\$49.95

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Programmable MultiSpeed

Game Card Two Ports—\$44.95

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(for Micro Channel)—\$149.95

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(619) 724-7146

Thunder Board—\$169.00

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Fremont, CA 94538  
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Weapons Control System—\$99.95

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Analog Xtra—\$46.99

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# 64/128 VIEW

*More Commodore user groups emerge as a new generation of 64 and 128 owners discover the machines' appeal.*

Tom Netsel

Last month, we printed an updated listing of about 90 Commodore user groups. Then, just as that list was rolling off the presses, I learned of yet another new group.

An envelope arrived containing a letter, a disk, and Issue 1, Volume 1 of a newsletter from the Carbonaro Commodore Users Group in Valley Stream, New York. The newsletter was a one-pager that contained a lot of information. In fact, I don't remember when I've seen so many words squeezed onto one sheet of paper.

The newsletter contained a welcome from the editor, information about the companion disk, and tips on turning your disk drive into a racehorse with JiffyDOS. Among other items were concise reviews of Rocket Ranger and Who Framed Roger Rabbit?. The reviewer liked Rocket Ranger's graphics, soundtracks, and digitized voices, so he gave it an A+. Roger Rabbit was criticized for not having different playing levels, so it got an A-.

Since this was the first issue, the Questions Forum was empty, but the editor requested that readers send him their Commodore-related questions. The address for those questions was a little odd, however. To submit a question, readers are instructed to jot it on a note and deliver it to the editor, John Edward Everson, in Miss Celona's sixth-grade class, room 10 at R. W. Carbonaro School in Valley Stream. Oh, yes—John requests that you include your name, class, grade, and room number with your questions. He'll answer your

questions to the best of his ability and expertise and, if necessary, seek further information on QuantumLink.

The Carbonaro Commodore Users Group is open to 64 and 128 users at the school and to Commodore users in the community, as well. Just because the editor is in the sixth grade, don't think he's a lightweight when it comes to knowing his way around a computer. The accompanying disk—which came free with the first issue of the newsletter but will cost \$1 from now on—contains two of John's programs. One of these, Bowman, made the top ten download list on Q-Link for several months last fall.

John, who has access to several computers, chose a 128 with Paperclip Publisher to produce his newsletter. The 128 has a 50MB hard drive and a 13MB RAMLink, and it's connected to a Star NX-1000 color printer. It's not exactly a lightweight system, but John's father is also an avid Commodore fan.

Through word of mouth, the Carbonaro user group has grown considerably in just a short time, and John is sending out several hundred copies of his newsletter each month. As I write this, another issue is about ready to hit the school corridors and mailboxes across the country.

In a day when many user groups are closing their doors, it's refreshing to hear about a new one being started by a new generation of 64 and 128 users. We at Gazette want to wish John good luck with his newsletter and hope the Carbonaro User Group prospers. □

## GAZETTE

### 64/128 VIEW

G-1

A new generation of computer users is discovering the 64 and 128. One young enthusiast has started a user group at school and has his own newsletter. By Tom Netsel.

### FEEDBACK

G-2

Questions and comments from our readers.

### D'IVERIONS

G-6

The grand-prize winner of the Design-a-Robot Contest is Gordon H. Smith of Kenosha, Wisconsin. His winning robot is named GOLMER. By Fred D'Ignazio.

### BITS, BYTES, AND BLOOPERS

G-8

Have you ever done something stupid while working at your computer? Cheer up. When it comes to computer boo-boos, you aren't alone. By Julia L. Wilkinson.

### REVIEWS

G-14

Back to the Future Part III, Goofy's Railway Express, and Donald's Alphabet Chase.

### PROGRAMMER'S PAGE

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Here are some dazzlers to show off your machine. By Randy Thompson.

### BEGINNER BASIC

G-22

Learn to write an amortization program so you can check your bank's or mortgage company's figures. By Larry Cotton.

### GEOS

G-24

Fonts are an exciting aspect of using GEOS, and literally hundreds of them are available. By Steve Vander Ark.

### PROGRAMS

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## Machine Language Demos

Could you tell me what I need to make superb demonstration programs in machine language? To help me learn about the 64 and machine language programming, I have purchased COMPUTE's *Commodore 64/128 Power BASIC*, *All About the Commodore 64*, *Mapping the Commodore 64*, and *Machine Language for Beginners*.

STEVEN MCCLAUGHERTY  
HURRICANE, WV

The books you've purchased are a great beginning for learning and applying machine language for the 64. Machine language programming can be broken into two broad groups: machine specific and machine general. Machine specific programming takes the properties of the computer itself into account, often making use of built-in machine routines, such as those from BASIC or the disk operating system. Using these routines to handle many essential computer functions frees the programmer from a lot of tedious programming.

In order to use existing routines, however, you need to know what routines the computer uses to do its job and what the routines do. Do they need values passed to them to work? Do they return values? How do they affect the operation of the computer? You'll also need to know the logical internal arrangement of the computer, how the memory is laid out, and how to access these locations and manipulate the associated data.

Each microprocessor has its own set of codes for machine language. You need to know these commands, or at least be familiar with the group of mnemonics. This is where an assembler comes in handy as a programming aid.

As to the other broad divi-

sion of machine language programming, general ML, there are some fundamental rules and standard operations. All of this sounds like an awful lot to learn, but you can start small and build up your knowledge. Because everything in the computer is interrelated in some way, it all falls into place with time. Applications can then be found for your knowledge as you learn. Thinking in machine language terms is a departure from thinking in high level languages such as BASIC, but the learning curve is no steeper. So plunge in and have fun!

## Orderly Directories

Is there any program for altering the sequence of files in a directory or for listing directory files alphabetically?

GLEN M. SHUE  
SILVER SPRING, MD

There are several. Commodore provides such a utility with its disk drive test/demo disk for the 1541 and other drives, and COMPUTE's Gazette published one called *Directory Magic* (October 1987). *Directory Magic* lets you alphabetize, change file names, and move entries where you want them. You can also scan the contents of both programs and text files.

A copy of this disk and any Gazette Disk earlier than June 1990 can be had for only \$3.50. Order by writing to Single Gazette Disk Sales, 324 West Wendover Avenue, Suite 200, Greensboro, North Carolina 27408. Be sure to specify the month and year of the desired disk. A copy of *Directory Magic* can be also be found for downloading in our COMPUTE/NET area of Quantum Link. Also, you may find several utilities of this kind in user group archives and on local bulletin board systems and networks.

## Mind-Reading 64

Can you help me with a program that would appear to read people's minds? If someone held up a pencil, I would type in "Please tell me what this person is holding," and the computer would display PENCIL. If the person held up a computer disk, I would type "Describe this item," and the computer would display DISK. The secret would be that the first letter of the item name would correspond with the first letter I type in when I ask what the item is.

EARL WALKER  
LANSDALE, PA

Here's a BASIC program that should do what you need.

```

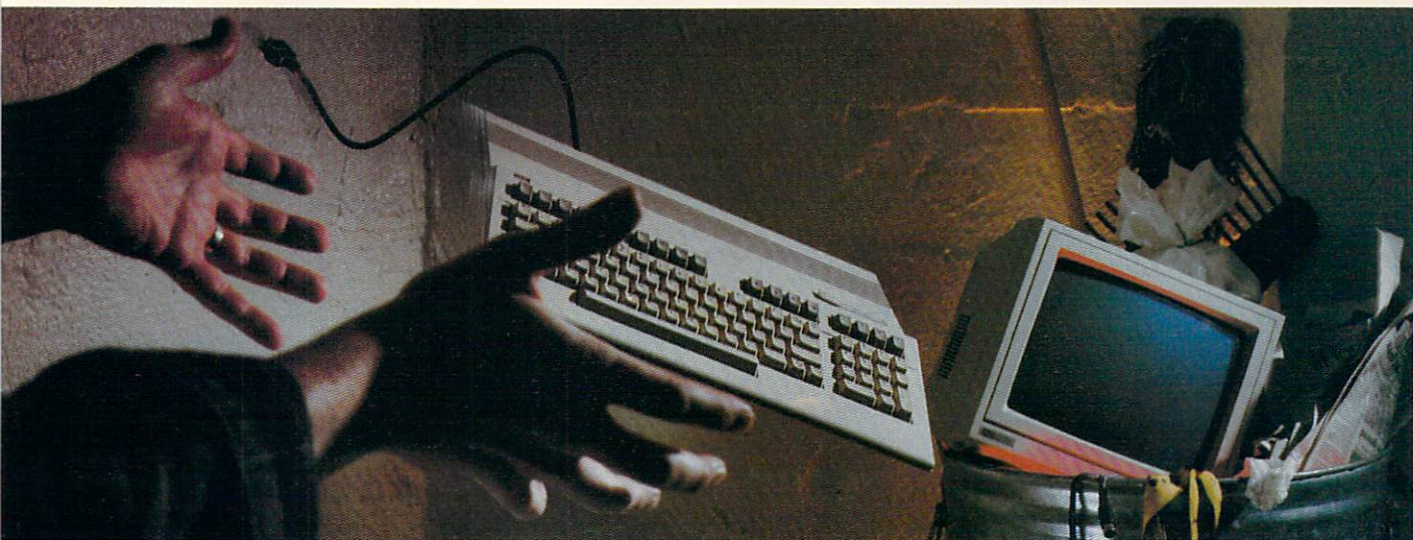
HF 10 INPUT "{CLR}{DOWN}
{N}WHAT NUMBER OF
{SPACE}ITEMS";N:DI
M I$(N)
CJ 20 FOR X=1 TO N:PRINT
"WHAT'S ITEM";X:I
NPUT I$(X):NEXT
JE 30 PRINT "{CLR}
{2 DOWN}THE AMAZIN
G COMPUTINI!"
RK 40 PRINT:PRINT:INPUT"
WHAT IS YOUR QUEST
ION";Q$:PRINT
XA 50 FL=0:FOR X=1 TO N:
IF LEFT$(Q$,1)=LEF
T$(I$(X),1) THEN F
L=X
GJ 60 NEXT
QK 70 IF FL>0 THEN PRINT
"THAT IS ... ";:FO
R X=1 TO 1000:NEXT
:PRINT I$(FL):GOTO4
0
MG 80 IF FL=0 THEN PRINT
"I'M STUMPED ON TH
AT ONE!":GOTO40
    
```

Line 10 sets up an array according to the number of items involved. Notice that by pressing Ctrl-N we are using upper- and lowercase letters in the program.

Line 20 asks the magician for the item names. If the first letter of your question in line 40 starts with a capital letter, then the item you enter must also start with a capital letter if it's to match. (Don't let your audience see you enter data

Questions  
and answers about  
ML demos,  
alphabetical directory  
listings, mind-  
reading programs,  
and more

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CZ052

## Where to find read/write heads and how to program with EPROMs

for these first two lines.)

Line 30 prepares the screen for the first question from the magician. In line 40 the program accepts the question then moves to line 50 to see if the first letter of the item corresponds to the first letter of the question. Remember, the case must also agree if there's to be a match.

If a corresponding item is found, line 70 prints the word—after taking a dramatic pause. If there's no match, the program moves to line 80 to report that it's stumped. Either way, the program then returns to the prompt for a new question.

This is just the basic program. You can add your own bells and whistles later. You may want to save lists of items to disk, add spooky graphic effects and sounds, and so on to make the program more entertaining.

### Read/Write Heads

My local Commodore service technician has advised me to replace the read/write heads in my 1571 disk drive. Distributors, meanwhile, haven't been able to suggest anything better than purchasing a new drive unit. Can you tell me how to get a read/write head set without buying an entirely new disk drive?

LODOVICO BONINSEgni  
CURRIDABAT, COSTA RICA

*Our information, which we got from a local service technician, is that read/write head sets have been discontinued. Instead, the closest option is to have your technician order a 1571 drive assembly (part number 252092-01). As of late 1991, it has a suggested retail price of \$148.50.*

### EPROMs and HEX

I would like to know how to put a program on an EPROM and then make the 64 recog-

nize the EPROM's presence. I would also like to know where I can find a cross reference to hex characters, such as those in MLX listings.

JOSEPH YARMEL  
NANTICOKE, PA

Erased programmable read only memory (EPROM) is a chip upon which a program or group of programs can be stored. To program the chip requires a piece of hardware called, naturally enough, an EPROM programmer. The chips may also be erased and reused. For the professional programmer and hobbyist alike, EPROMs allow a quality alternative to software packaging with a high level of protection from both physical and software abuse. When an EPROM cartridge board is plugged into the 64 expansion port, its contents are found from memory address 32768 (\$8000) onward.

EPROMs come in several capacities, such as 4K bytes (16 CBM disk blocks), 8K (32 blocks), 16K (64 blocks), 32K (128 blocks), and 64K (256 blocks). Code painted on the EPROM identifies its capacity. A popular series of EPROMs is the 2700 series, whose code is a 27 followed by the capacity in kilobits. For example, with the NEC D27128D EPROM you would divide the 128, indicating 128 kilobits, by 8 to discover that its capacity is 16 kilobytes or divide by 2 to find that the equivalent in disk storage is 64 blocks.

Once you've installed your program on this chip, you're ready to make your software autobooting. One of the first things the Kernal RESET routine does is check locations 32772-32776 (\$8004-08) for the string of characters CBM80 (HEX C3 C2 CD 38 30). If these exact characters aren't found, the Kernal RESET process continues.

If the CBM80 is found, the RESET routine is interrupted, and the processor immediately jumps to whatever location is specified by the cartridge cold-start vector. This vector is expected to be found at locations 32768-32769 (\$8000-01). A pointer must be placed here, in standard low byte/high byte order, directing the processor to the beginning of the cartridge code. From that point on, your cartridge software must handle all the initialization itself for any functions it will use, such as the I/O devices or Kernal or BASIC routines. The Kernal initialization routines are, of course, still available to be called upon for this. Unless you know exactly what you're doing, your cartridge should use these routines to initialize the functions it needs. For EPROM supplies, call Jason-Ranheim at (800) 421-7731.

The second part of your question is easy. Hex, short for hexadecimal, or base-16 numbering, is an easy, two-character way of representing all 256 possible values that might be contained in the 64's memory. You can't tell anything from these numbers themselves. A particular value might be a number, letter, or other kind of data. It could also be part of a machine code command or an address in a jump table. If you want to examine a program, you'll have to view it with a disassembler. You can't really tell anything from a MLX listing. However, if you want to know the text equivalents of hex codes for, say, screen printing, take a look at the table in the Commodore 64 Programmer's Reference Guide.

Send your questions and comments to Gazette Feedback, 324 West Wendover Avenue, Suite 200, Greensboro, North Carolina 27408. □

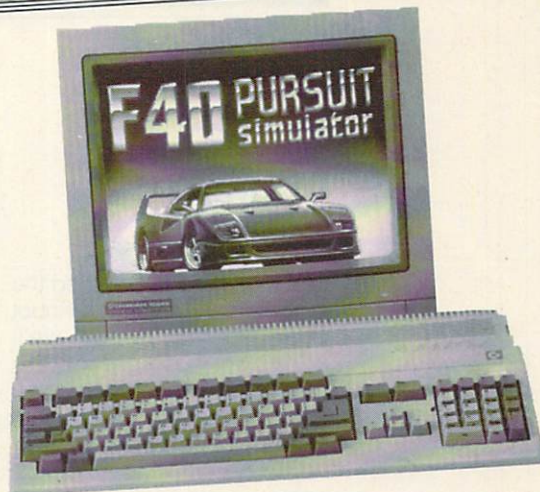
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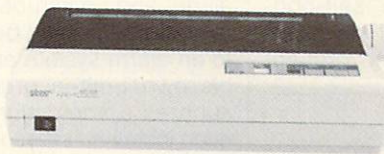
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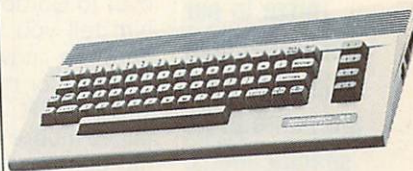
|                    |        |          |
|--------------------|--------|----------|
| NX-1001 Multi-Font | 90895  | \$139.95 |
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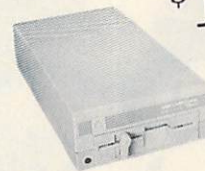
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# D'IVERSIONS

Fred D'Ignazio

## GOLMER THE ROBOT

Last month we announced the winners of the Design-a-Robot Contest. This month we'll point the spotlight at the grand prize winner, Gordon H. Smith of Kenosha, Wisconsin, and his robot GOLMER.

GOLMER is an unusual name, even for a robot. It stands for Gordon's Own Little Mechanical Electrical Robot. GOLMER was the most impressive contest entry that I received. The package included photographs, hardware diagrams, program listings, even an Interface Report.

Now, I'll turn the column over to Gordon Smith and let him tell you what GOLMER can do now and what's planned for the future.

GOLMER is a self-contained mobile robot with external controls. At the present

time GOLMER is slow, and his abilities are limited. He was designed to go to the refrigerator and get me something to drink. When he can do that, I will consider him useful, but he'll never be finished. There will always be upgrades.

He'll have on-board logic to avoid obstacles and will be able to communicate with an external computer through FM radio signals. This will allow him to receive complicated commands and to send status reports to the main computer.

Status reports will include distance and direction traveled, path taken, and position of each moving part on the robot. Also, there will be an adjustable light source and indicators for running time and estimated power remaining. In the future I may add to his circuits a thermometer, a smoke alarm, and an intruder detector. GOLMER could be tied into an alarm system and have his own built-in protection, such as a squirt gun. I may even install an ultrasonic pest repellent for ants, mice, mosquitoes, bees, and so on.

GOLMER's design is patterned after Johnny Five in the movie *Short Circuit*. I like this design because it can fold itself into a small package. The head is patterned after the security robots in the movie *Chopping Mall*. Much of GOLMER's design is based on a *Radio Electronics* article from 1981, "How to Build Your Own Robot for Under \$400." The main principle involves sending touch-tone frequencies over a walkie-talkie. GOLMER decodes the frequencies into functions.

GOLMER uses two basic programs, one written in 8088 assembly language and one written in C. Both do the same thing. A menu lets you sample incoming data from eight data switches or eight feedback ports, or you can send out numbers that will turn on any or all

of eight outputs. With eight binary inputs or outputs, each digit can represent a number from 0 to 255. With a microprocessor on board, this number can give you 256 separate commands. Each command could initiate a series of tasks.

I would like to use infrared light to avoid obstacles and to locate objects to pick up. Infrared could be transmitted through fiber optics to the hands to detect objects. Hall effect sensors could detect metal objects, and ultrasonics could be used to measure distances in order to map a room for future reference.

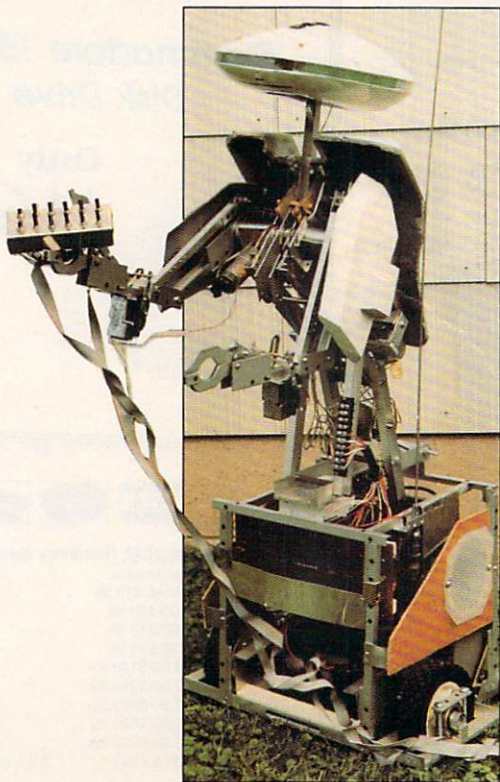
A JAEMCO speech synthesizer will be added to give GOLMER a voice. I want to give him ears, but that's much more complicated. An existing voice-detection circuit has only five commands built in: forward, reverse, left, right, and stop. It would be nice to pick up sounds with a microphone and try to compute a response to spoken language.

My interest in robots began when I was ten years old, watching *Lost in Space*. Twenty years later I tried to build the robot that appeared in the series. It looked good, but I found out I didn't know enough about the robotics. So I took a course in the subject at Gateway Technical College in Kenosha, Wisconsin. I built GOLMER as a final project.

I am trying to complete work on GOLMER so I can use it to start a robot rental business. If that works out, I would like to manufacture robots for entertainment and for useful tasks like housecleaning and aiding the handicapped.

GOLMER is a success at entertaining and making instant crowds. Children of all ages want to see GOLMER again and again. They want a robot of their own; they want to know how to get one or how to make one. Everyone needs one. □

**Gordon Smith's  
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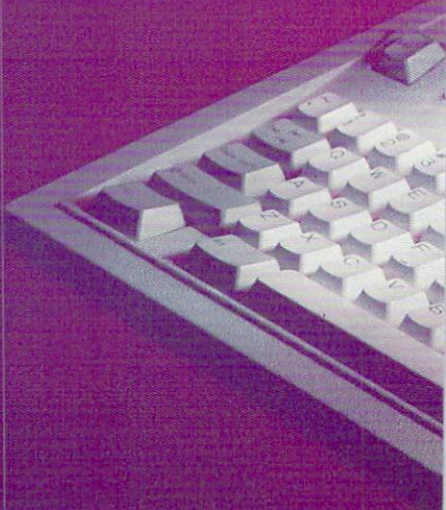



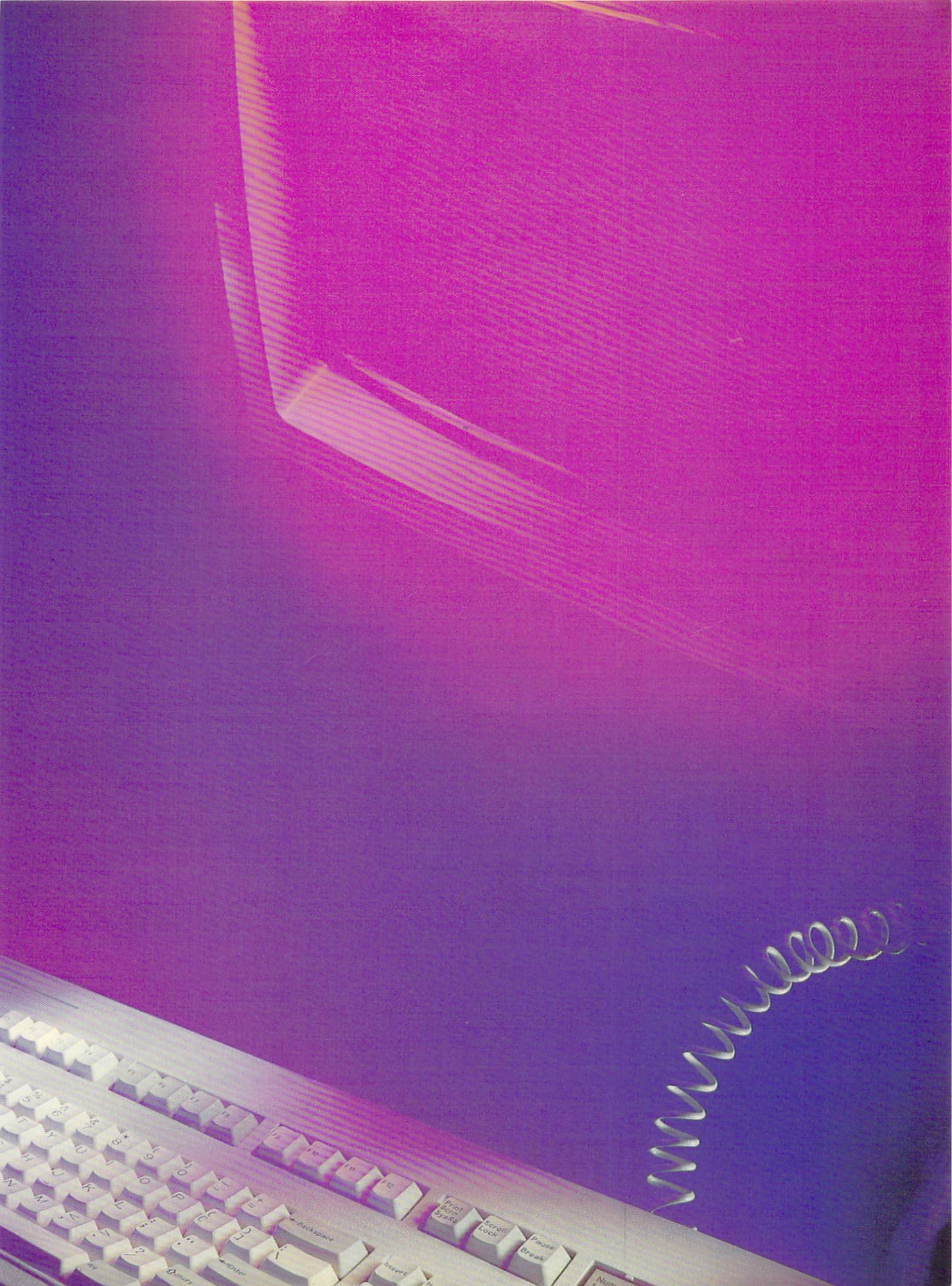
HAVE YOU EVER DELETED A CRUCIAL  
FILE OR COMMITTED SOME OTHER COMPUTER  
BOO-BOO? YOU AREN'T ALONE.

# **BITS, BYTES, AND BLOOPERS**

BY JULIA L. WILKINSON

So you made a stupid mistake. Mistakes are to be expected, especially when you're learning something. Since working with computers is a continuous learning process, you should expect to make your share of blunders. Perhaps you can take some solace in the fact that other people are doing the same silly things—and some even sillier.





If you're one of those people who are berating their momentary idiocy, take heart. Worse things have been done while worshipping at that silicon altar. Take a minute to peruse these disconcerting anecdotes from the Computer Boo-Boo Hall of Fame. If you've been guilty of one of these mistakes, take comfort in the fact that you're not alone. No names have been used for obvious reasons.

### On Campus

A Penn State student who'd just completed a paper using MacWrite asked the computer lab consultant how to print it. He responded that she should pull down the File menu and select Print. The ensuing blank stare told the consultant that the student didn't know how to use a pull-down menu. "See that little arrow?" he asked, pointing to the screen. "Use the mouse to move it to the word *File* at the top of the screen. Then hold the button down and drag it downward until you reach *Print*." The student then picked up the mouse, put it against the monitor, and began to move it up and down the screen.

A University of Delaware student approached a lab consultant and said, "I can't find the Any key."

"What do you mean?" asked the confused consultant.

"Oh, you know," the student said, "right here where the program instructions say, 'Hit any key to continue.'"

Mainframe computer systems at schools and universities normally permit access by students and faculty. To protect each person's files, programs, and electronic mail, however, most systems require a password from the user. A student logging on to the computer at one large university had to abort this process when it came time to select a password. He couldn't think of a six-letter word.

A Carnegie Mellon University student tried to log on to the CMU computer by entering his user identification number (USERID) from the College of William and Mary.

Another student tried to log on to the mainframe using the serial number of his PC as a USERID.

A student was told to put the system disk and one data disk into a Macintosh. She put the two 3½-inch disks on top of each other and crammed them both into the same drive. Along the same lines, another computer novice tried to jam a disk into the slight opening between the A and B drives.

### Do As I Say

These mistakes may seem silly, but we should bear in mind that the instruction-

al terminology is often not accurate or specific enough. It's the old story of a person who religiously follows the directions for making a peanut butter sandwich. When instructed to place the peanut butter on the bread, the person sets the entire jar on the slice.

That might explain why when a consultant told a customer over the telephone to put the disk in the drive and close the door, he heard the sound of footsteps followed by the sound of a door slamming.

Another gentleman complained that his manual instructed him to "remove the diskette and hold for transmission." That wasn't too helpful. He held the disk for an hour and a half, and nothing happened. Many tales are told of folks who, when asked to send copies of their disks, comply by sending photocopies of them.

High-level executives aren't immune from following instructions too literally. A senior vice president of marketing called in a problem on a Saturday afternoon: "This darn thing says, 'Press f10 to continue.' I've pressed the F, the 1, and the 0 keys at least a dozen times, and nothing happens!"

A customer called a computer store and said, "I've read the book about DOS. Now what about the don'ts?"

Another person thought "take disk out of envelope" meant prying the magnetic medium from the black plastic, not taking the plastic from the sleeve.

This is not to say that users are totally at fault for these kinds of misunderstandings. As one contributor to this article wrote, "Why should we consider the use of a mouse to be intuitive or assume that someone using a word processor for the first time will know that his work will disappear if he pulls the power plug from the wall?"

### That's Not What I Meant

People often take computer jargon literally. Who can blame them, when the terminology often has additional, more common meanings? One computer expert bumped into this problem when writing a memo in response to a request from 3M, asking him to explain why a certain company was having problems with disk failures.

His memo stated that the disks were failing because of head crashes, and counseled, "If the customers would just clean their heads periodically, they wouldn't have this problem."

To which the customer replied in all seriousness, "What kind of shampoo do you recommend we use?"

### Disk Dilemma

Many problems stem from misunderstandings about the handling of disks.

One man who had problems with a backup called a technician, who discovered the man's disks were bent like half-moons. When the technician asked what had happened to them, the man said they always looked like that after he typed the labels on them.

One writer was told she should never write on the disk label with a ballpoint pen, so she used pencil and erased it each time she made a change. When the disk finally failed, she lost several chapters of her book. She had to rewrite them from notes and intermediate printouts.

Then there was the guy who couldn't figure out why his disks wouldn't work in his 3½-inch drive. He'd taken the larger 5¼-inch ones and trimmed them exactly to size.

Disk labels pose another problem. Not everyone realizes the label is supposed to fold over the back of the 3½-inch disk shell. One computerist had placed the label over the front side of the disk without folding it. It extended over the metal sleeve that has to slide open to access the disk itself. Another disk glitch has to do with loss of information. A woman wanted to make sure hers were safe, so she secured the disks to the side of her monitor—with magnets. Other office personnel have been known to keep their disks handy by hanging them on magnets stuck to the side of a filing cabinet.

### Out of the Mouths of Babes

Sometimes it takes a child to make us realize how truly far we still have to go. One man who had just bought a 64 for his kids showed them a game which drew simple shapes on the screen. It used D for draw, M for move, C to change the color, and so on.

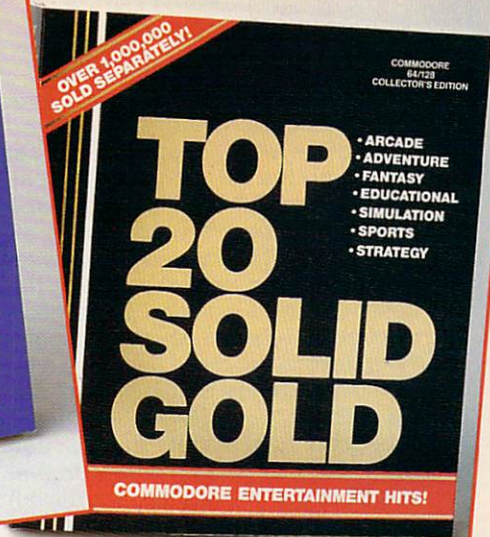
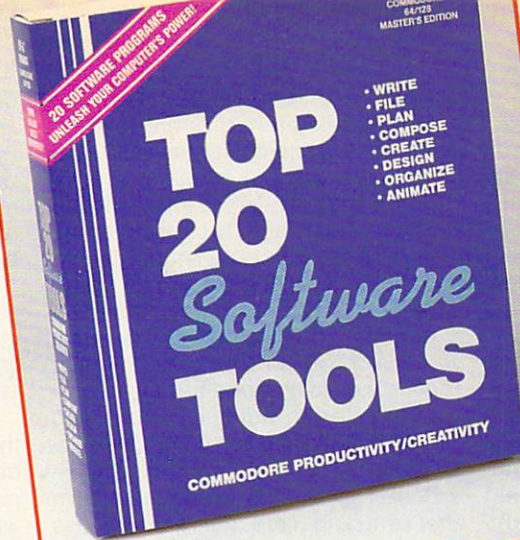
It may not be all that exciting for us, but the kids got a kick out of doing it. Imagine the man's surprise when he returned to where he had left his four-year-old son playing with the computer and saw a screen full of circles, squares, triangles, and colors, including some interesting geometric shapes that required options and functions that should've taken days to master. "Wow, that's great!" he said to the boy. "Show me how you did that!"

The young boy took hold of the keyboard with both hands and bashed his forehead into it several times.

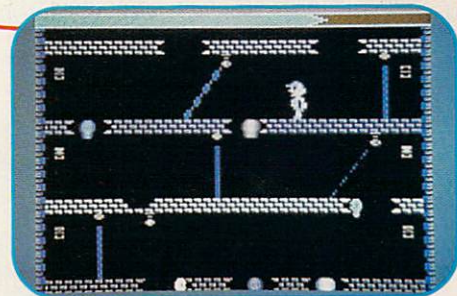
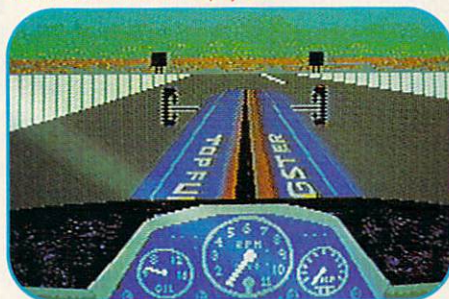
### Journalistic Bloopers

Ah, the power of the media! The ability to disseminate information to millions of people can be heady stuff. Unfortunately, that power carries with it a danger as well. The wrong information sometimes slips through the system undetected—especially when comput-

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ers are used to file stories.

One journalist tells the story of a wire-service reporter in an Associated Press office who wrote a letter to her mother on the AP computer system. The letter was full of enthusiastic references to the neat new computers AP had just bought, followed by extremely disparaging remarks about the boss. She also included some comment about how you could type something there in the office and have it go from that computer to hundreds of media outlets.

Legend has it that, as you can guess, the letter was transmitted to every radio station in the state, and the author was fired. Now, AP apparently has a rule that no personal correspondence is allowed on its computers.

And speaking of radio stations, computers have been responsible for some interesting bloopers there, too. A couple of years ago, a newsman at a Seattle station read an erroneous headline over the air. It dealt with a senator who had been found naked and drunk outside a Washington, D.C., nightclub.

The headline was promptly retracted two minutes later. Apparently, a staffer who was about to resign from the station had put a set of fake headlines into the station's BASYS computer sys-

tem as a joke. Everyone thought the bogus headlines had been deleted, but a copy evidently appeared in the backup of the sports headline set.

Best—or worst—of all, among those listening to the radio broadcast at the time, in a car with his wife and family, was the senator himself.

Probably the most frequent computer glitch that afflicts reporters is losing portions of their work to the computer. There's the story of one newsman during the Carter administration who threw himself a little too much into covering the unveiling of the ephemeral Billy Beer. He returned to the newsroom after sampling more than a few bottles of the product, ready to input his magnum opus into the paper's computer.

After much fevered typing, he realized, two minutes to deadline, that he'd typed the entire story on a directory screen rather than saving it to a file. In his panic, he hit the Store button, which made the whole thing disappear forever. It's said that was the last time that particular reporter was ever sent to cover any event where alcohol was on the menu of items being served.

There are many ways to lose a story when working with computers. Another reporter spent an hour or so toiling over a long story without saving it to

disk. He leaned back in his chair and stretched, with his arms behind his head, and the chair went over backward. As the reporter tumbled, the toe of his shoe caught on the power cord and yanked it out of the wall. Good-bye, story.

Rumor has it that a certain Gazette editor has done a similar thing on more than one occasion by accidentally hitting the On/Off switch on the power strip beneath his desk.

Sometimes it's an external force that causes a user to lose work. One computerist recalls with woe an evening in his apartment when he'd been writing for four hours without saving. Just as he was about to hit the Return key to save his work, a drunken driver crashed into a pole outside the apartment, killing power to the building.

### Experts Fall Victim

Even seasoned computer consultants goof up now and then. One admits to calling the repairman when his printer wouldn't print. He had it plugged into the wrong port. Another consultant once confused her modem and mouse cables.

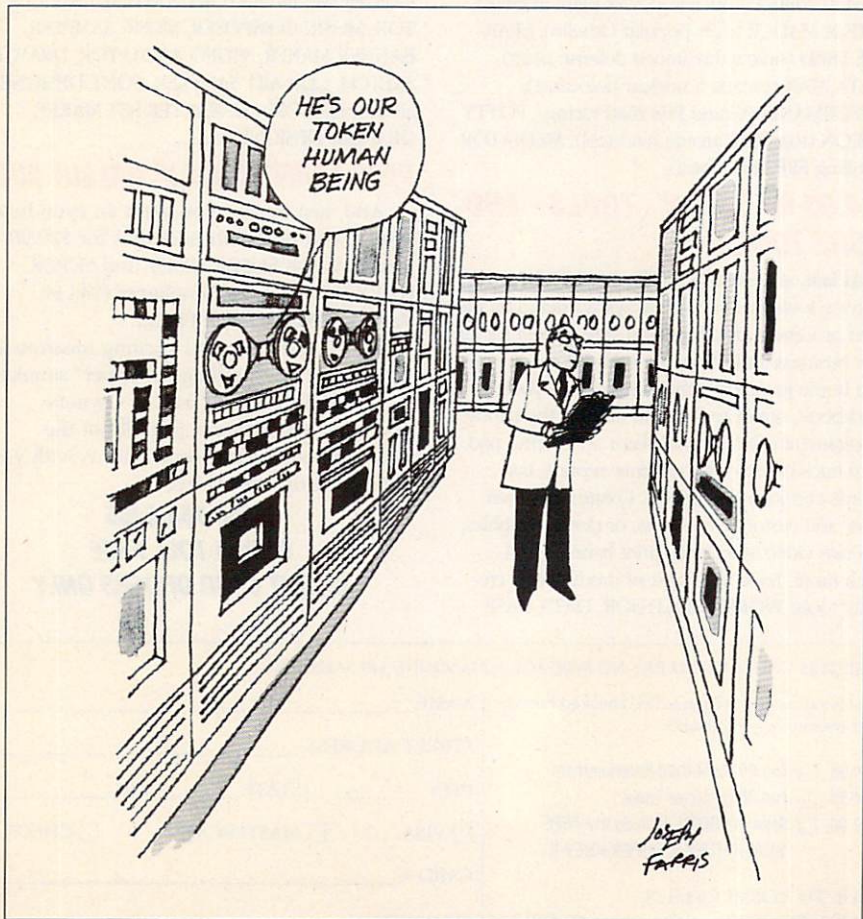
A systems programmer beat on his machine for half an hour, screaming because it wouldn't work. Everything apparently checked out, but nothing appeared on his monitor. He had the contrast turned all the way down.

In the data-processing department of a hospital, someone thought it would be nice to have some sturdy canvas dust covers for the CRTs. Late one night, an employee was going to the snack bar and smelled something like burning electronics coming from that office. Luckily, there was no fire, but now the office staff knows it's a good idea to turn off a monitor before putting a dust cover over it for the night.

### Try the Obvious

Sometimes the most obvious is the last thing tried. A computer consultant tells the story of a personnel clerk who called, explaining that her computer just showed a blank screen and wouldn't do anything. When he asked if the computer was turned on, she scolded him vehemently for impugning her integrity, informing him that she had graduated from a prestigious college and certainly had enough common sense to turn the computer on. Unfortunately, she didn't have enough common sense to plug it in.

Julia Wilkinson is a freelance writer and telecommunications junkie based in Virginia. She admits to making stupid mistakes frequently. □



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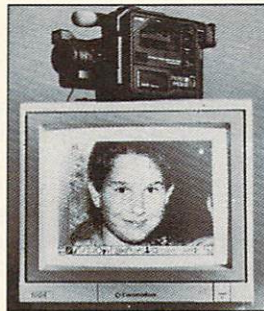
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# REVIEWS

## BACK TO THE FUTURE PART III

OK. So I don't play arcade games that often. To appeal to me, a game has to be really good. It has to entice me into it and make me want to continue playing. It has to be challenging enough so that I can't master it immediately, but it has to be masterable.

It has to have good sound, good graphics, and a clever plot line. If it's grounded in some other fiction or reality, such as a television show or current event, so much the better. The rules have to make a certain sense, and the program must create a reality of its own. This requires smooth programming. I want to be able to lose myself in the game, not get lost in its complexities. This is a tall order to be sure, but this is what a program needs if it's to attract me. Back to the Future Part III has what it takes.

One small confession: None of our test team, Dave and Robin (the adults) and Meaghan (the kid), was able to get past the first level of this game. We kept trying, but we couldn't get close enough to break the barrier into the second level. Of course, this means that there's a lot to the program we can't comment on. You can tell a lot about a game from its first level, however; it lets me know whether I want to play it or not.

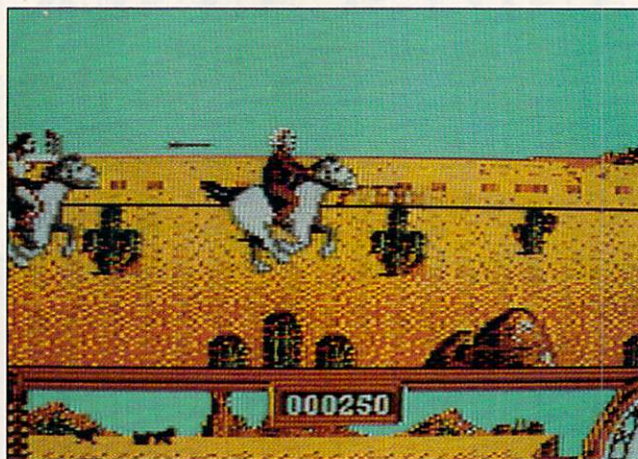
Back to the Future Part III is based on key scenes from the movie of the same name. You don't have to have seen the movie to play, but the scenes and goals are much more meaningful if you have. In the movie, Marty McFly has to go back to 1885 where Doc has opted to live out the rest of his

days. Unfortunately, Marty has just discovered those days number only 3! So he's going to bring Doc back to the future.

Upon reaching 1885, Marty encounters Indians, a lovely schoolteacher, and bad guy Buford "Mad Dog" Tannen. Each of these encount-

cially Doc's. You (Marty) start spinning pie tins Frisbee-style at the bad guys.

Level 4 is the final run for the money. You must make your way over the roof of a moving train to supply it with enough of Doc's magic logs to get it up to the 88 mph necessary to send the De-



*Doc must dodge Indians and other obstacles if he is to rescue Clara from a runaway buckboard that's heading for a ravine.*

ters plays a part in our good guys' efforts to reach 1885.

The program takes four of the key turning points of the film as the basis of the four playing levels. Level 1 depicts the episode where Doc rescues schoolteacher Clara Clayton from the runaway buckboard before it falls into the ravine. As Doc, you try to catch the racing buckboard while galloping across rugged terrain and avoiding tumbling debris, crossfire between Indians and cavalymen, and bank robbers.

Level 2 takes place at the celebration of the building of the clock tower where you—this time as Marty—take your turn at a newfangled shooting gallery.

Level 3 takes place later at the celebration when the bad guys are acting up and spoiling everyone's fun, espe-

cially Doc's. You (Marty) start spinning pie tins Frisbee-style at the bad guys.

Level 4 is the final run for the money. You must make your way over the roof of a moving train to supply it with enough of Doc's magic logs to get it up to the 88 mph necessary to send the De-Loorean Time Machine back to the future!

I really appreciate the program's faithfulness to the film and the ingenuity used to adapt the situations to playable circumstances. I also have to compliment the graphics and the feel of the program. The horse on Level 1 is well drawn and graceful as it gallops across the screen. As you approach ditches and fallen suitcases, the anticipation is not unlike that of jumping a live horse. I even felt myself rise from my seat and lean forward with each jump.

Considering that my experience with arcade games isn't extensive, I suppose that what's challenging to me isn't nearly so much an obstacle to an avid player. Perhaps, but then this program gets progressively harder. What I like best is that it's not

defeating. I always feel it's within my power to do better next time. Nothing is more frustrating than an arcade game that continually creams you, and a frustrating game is one no one wants to play for long.

One warning: Don't start this game in dim light. As copy protection, this program resorts to the trendy password printed in black on dark red paper. The print is hard to read if you have good vision and nearly invisible if you have any sort of eye trouble, particularly color blindness. There has to be a better way.

The manual is really good—probably the best combination of entertaining writing, background information, directions, and helpful hints I've seen with a program in a long time. The only thing I would add would be a listing of the maximum number of points you could accumulate at each level. This is because you can either concentrate on making a clean run (not losing a life), or you can try to make a clean run and rack up points. If you knew the maximum possible number of points, you'd know when to quit looking for point opportunities.

This brings up an interesting hitch we found. The manual tells you twice not to shoot the cavalry, but the game gives you points for doing so. I sense a subtlety here. The cavalry seems to act as a screen; the cavalymen help to fight off the Indians and the bank robbers, giving you a little more room to maneuver. When you shoot them, you lose their help. On the other hand, I've been killed by as many cavalymen as Indians, so. . . .

Of all the arcade games I've played, Back to the Future Part III is probably the



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# REVIEWS

most fun. The pace is varied, not constantly and increasingly tense as some games are. Graphics and sound are excellent. It has humor, plot, and familiar characters. There's also something more. The game has an intangible personality of its own, something programs take on only when they're well crafted, tight, and uniformly good, which *Back to the Future Part III* is.

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## GOOFY'S RAILWAY EXPRESS AND DONALD'S ALPHABET CHASE

As a mom and computer fan, I've long been satisfied with the 64's contribution to my children's education. From *Carmen Sandiego*, *World Geography*, *Scrabble*, and products from Davidson Educational Software, Commodore, and Fisher-Price on down to the Children's Television Workshop's *Sesame Street* series, there's been something at every level to keep my kids' eyes, hands, and minds glued to the computer, painlessly absorbing new concepts while being challenged in play.

Always looking for quality programs, I check out particular points when browsing. Is it attractive to my children? Does it make good use of the computer's capabilities? The 64 can manage both good graphics and good sound; a program that ignores this is too limited and

risks losing its audience. A program the kids won't use is useless. Does the program teach something specific, or can it expand my children's world? If it bears the label educational, the program had better do one of these; otherwise, it's entertainment masquerading as something else.

good friends? I'm happy to say that these programs fulfill my other requirements, too.

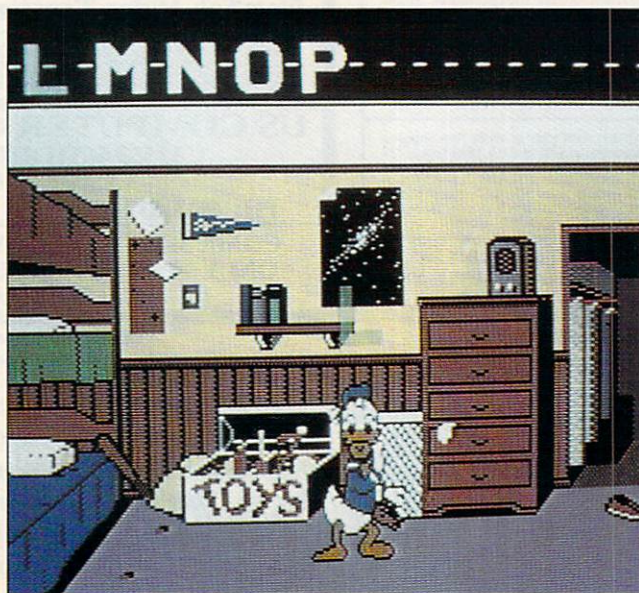
Geared for ages 2-5, these two games are an exploration of new worlds for preschoolers. In *Goofy's Railway Express*, Goofy and Mickey chug along the countryside in their train. Puffs of

time to change all the shapes on a screen. It takes several passes to catch all the shapes, thus holding the child's interest longer.

Goofy's graphics are excellently detailed, crisp, and entertaining. Sound effects are sprinkled throughout to good advantage. The interaction with the computer is kept simple—pressing the space bar—so that even the youngest child can handle this program in minutes. As children accompany Goofy and Mickey on their train ride, they learn how shapes make up the objects of our world.

Donald's *Alphabet Chase* allows children to play with the computer keyboard and experiment with recognizing letters. Donald's alphabet pets have escaped from his nephews' room and are running rampant throughout the house. He needs help catching them. When a child presses a letter, Donald goes to whatever room that letter is hiding in, waits until the letter leaves its hiding place, then picks it up and tosses it up to the top of the screen. When all the letters in a room are caught, the alphabet song plays.

The antics of these silly alphabet pets are delightful. Donald responds accordingly as they click the television on and off, stick their tongues out at him, and toss things out of the closet. There aren't a lot of sound effects, but the animation is terrific. In this game, the child is in control. Rather than asking the children to match the letters, Donald follows their directions and seeks out whatever letter they press. This allows them the freedom to explore the game and lets the parent guide children according to their abilities. Older children may be ready to



When a child presses a letter on the keyboard, Donald goes to his nephews' bedroom and other rooms to find the hiding letter.

As moms and dads the world over know, there are characters with universal appeal who have earned places in our children's Hearts of Fame. These friends include Bert and Ernie, Big Bird, Bugs Bunny, Mickey and Minnie Mouse, Goofy, and Donald Duck. Products associated with any of these characters have guaranteed attraction and appeal, but are they worthwhile on other counts?

Goofy's *Railway Express* and Donald's *Alphabet Chase* are two products from Disney Software that automatically fulfill the first requirement of child appeal. Who could resist Mickey's

smoke issue from the smokestack in all sorts of shapes. Children press the space bar to toot the whistle whenever they want to see a shape used to make a real object. In one sequence a triangle becomes a teepee; in another, it becomes a sailboat. These objects briefly become an animated part of the scenery.

Meanwhile, Goofy's train chugs on, passing through four different screens to his destination. There he reverses direction and heads back, the engine huffing and puffing more smoke shapes. Because the sequences take a little time and the train keeps moving, there isn't

locate a particular letter, while younger ones may select a letter and have Mom or Dad tell them what it is while Donald catches it.

Although these games are for the same age group, I found that, in our household, Goofy appealed more to 5-year-old Katie, who was ready to seek out the geometric shapes and the objects created from it, while Donald won over 3-year-old Michael, who laughed at the letters and sang along with the alphabet song. A lot depends on the child, naturally, but these programs work for the age group that Disney claims they will.

Disney recommends that you back up disks—an especially smart move for children's programs. There's no problem doing this since Disney's copy protection doesn't depend on the disk. Instead, at the beginning of each program you're asked to match and identify a graphic with one that appears on a sheet that accompanies the program.

Herein lies my sole complaint about these programs. Disney has printed this sheet with black ink on very dark reddish brown paper. Text is hard to read, and the graphics are difficult to see. The only reason I can see for making this so dark is so that it cannot be photocopied. My guess is borne out by the fact that Disney charges \$15 to replace a lost sheet. It will replace a damaged one free of charge, provided you send the pieces. While I hold no truck with pirating, making the sheet almost unreadable isn't the answer.

The process of creating and developing characters of the magnitude of Mickey Mouse and his companions carries a certain amount of responsibility. Any products that use these images should be closely scrutinized before they're placed on the market. Such products should be of high quality so as not to betray the trust of these characters' loyal following. As a rule, Disney is careful to meet this responsibility. It didn't let us down this time either.

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### Visible Sound Waves

This 64 program dynamically graphs the triangular waveform produced by the SID chip's Voice 3. To see Voice 3 in action, plug a joystick into port 2, and then type in and run the following listing.

```
AC 100 FOR I=679 TO 739:READ D
      :POKE I,D:C=C+D:NEXT
MP 110 IF C<>7677 THEN PRINT "
      ERROR IN DATA STATEMENT
      S":STOP
PD 120 DATA 162,0,160,0,169,50
      ,133,2,173,27,212,141,0
      ,208,173,18,208,141
FX 130 DATA 1,208,198,2,208,24
      0,173,0,220,201,126,208
      ,13,232,208,1,200,142
SH 140 DATA 14,212,140,15,212,
      76,171,2,201,125,208,21
      2,202,208,1,136,142,14
AC 150 DATA 212,140,15,212,76,
      171,2
SJ 160 PRINT CHR$(147):POKE 53
      280,0:POKE 53281,0
SJ 170 FOR I=54272 TO 54296:PO
      KE I,0:NEXT
RA 180 POKE 54296,15:POKE 5429
      1,190:POKE 54292,248:PO
      KE 54290,17
ES 190 FOR I=832 TO 894:POKE I
      ,255:NEXT
RA 200 POKE 2040,13:V=53248:PO
      KE V+21,1:POKE V+39,2:P
      OKE V,24:POKE V+1,100
XK 210 POKE 56333,127:SYS 679
```

Move the joystick up or down to change the pitch of the sound. For best visual results, tune the sound to a low pitch. When the frequency is low enough, you will see one large triangular waveform on your monitor screen. As you increase the frequency, the number of waveforms per screen increases. High-frequency tones oscillate faster than your monitor can handle, but they'll often lock into place like Lisajous patterns on an oscilloscope.

This program uses a single sprite to plot Voice 3's waveform. You might be interested to know that the machine language for the sprite-plotting code is only 15 bytes long.

```
LOOP LDA 54299
      STA 53248
      LDA 53266
      STA 53249
      JMP LOOP
```

RICHARD PENN  
MONTREAL, PQ  
CANADA

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# BEGINNER BASIC

Larry Cotton

## CHECK YOUR BANK'S MATH

Recently, I decided to run an amortization schedule on my 13-year-old home mortgage loan to see if it agreed with the bank's schedule. I wanted to see how each month's payment was apportioned to principal and interest. I also wanted to check the bank's math. Most importantly, I was interested in the balance due.

There's a certain satisfaction that comes from writing your own program while honing your BASIC skills. Let's write a simple program that does what we need. We'll start with white characters on a blue screen.

```
10 POKE53280,6:POKE646,1:
GOTO30
```

GOTO30 sends control around a subroutine in the next line, which appears early in the program to speed printing the screen. Here's the subroutine, which we'll discuss in a moment.

```
20 PRINTTAB(T1)N TAB(T2)J
TAB(T3)B:RETURN
```

Set C to 12 (more about that later) and define the tab stops to locate information in four columns on the screen. Remember that the leftmost screen position is TAB(0) and that positive numbers include a leading space.

```
30 C=12:T1=5:T2=16:T3=27
```

Rounding to dollars and cents requires two constants, 100 and .5.

```
40 H=100:D=.5
```

The next three lines gather user input and check for values less than zero. If any are found, the program just runs

from the beginning.

```
50 INPUT“(CLR){DOWN}AMOUNT
OF LOAN”;B:IFB=<0THENRUN
60 INPUT“(DOWN)ANNUAL
INTEREST RATE”;AI:I=AI/1200:
IFI=<0THENRUN
70 INPUT“(DOWN)NO. OF YEARS
ON LOAN”;Y:M=Y*12:
IFM=<0THENRUN
```

B is the amount of the loan (later, balance). Line 60 also converts annual interest rate AI to its monthly decimal equivalent I; line 70 also converts years Y to months M.

Line 80 uses the above information plus rounding constants H and D to calculate the monthly payment. The formula uses a monthly payment schedule and won't work with any other payment interval.

```
80 P=(INT(H*B*(I+1)/((I+1)^M-
1))+D)/H
```

Line 90 prints the result of the calculation.

```
90 PRINT“(DOWN)MONTHLY
PAYMENT SHOULD BE $”;P
```

If you're evaluating an existing loan and this isn't your actual payment, you have an opportunity to change it.

```
100 PRINT“(DOWN)(PRESS
RETURN TO USE ABOVE PAY
MENT)”
110 INPUT“(DOWN)ACTUAL
PAYMENT”;AP$:IFAP$=""
THEN130
120 P=VAL(AP$)
```

Offer the option of seeing a monthly or yearly picture.

```
130 PRINT“(DOWN)SEE MONTHLY
OR YEARLY (M/Y)?”
140 GETA$:IFA$<>“Y” THEN
IFA$<>“M”THEN140
```

Here's the heading of the screen-printing routine, which uses the tab stops defined in line 30.

```
150 PRINT“(CLR)”
160 PRINT“(HOLD SPACE BAR TO
SEE ENTRIES)”
170 PRINT“(DOWN)MO.”
TAB(T1)“ PRINCIPAL”
TAB(T2)“
INTEREST”TAB(T3)“ BAL
ANCE”
180 PRINT“(1 SPACE){38 -)”
```

Now we must calculate and print the monthly dollar amounts applied to interest and principal and the principal balance. For this we use a month counter, Q.

```
190 Q=Q+1
```

Just after starting the counter, we check to see if the space bar has been pressed, which causes the calculated values to be printed. (To examine a line, release the space bar.)

```
200 GETB$:IFB$<>“(
1 SPACE)”THEN200
```

The three calculations are as follows.

```
210 J=INT((I*B)*H+D)/H
220 N=INT((P-J)*H+D)/H
230 B=INT((B-N)*H+D)/H
```

Pay close attention now. J (the portion of payment applied to interest) is monthly interest times principal balance, N (the portion of payment applied to principal) is the payment less interest, and B (the new principal balance) is the old balance less the portion of payment applied to principal.

Quickly, check to see if the balance has become less than zero.

```
240 IFB<0THENEND
```

Now we check the response from line 140 to see if we want to print a monthly or yearly picture. If monthly, our subroutine at line 20 kicks in after every calculation to print

Write an amortization program to see if your figures agree with the bank's schedule.



month Q and the other variables N, J, and B. If yearly, the line 20 subroutine is used only once every 12 calculations.

```
250 IFA$="M"THEN
    GOSUB20:GOTO270
260 IFINT(Q/C)=Q/CTHEN
    GOSUB20
```

Line 260 shows an interesting way to count by any value C. (C is equal to 12 in this program, as defined in line 30.) Q/C will always result in a decimal value except when Q is evenly divisible by C. If the balance on the loan is still greater than 0, then we return control of the program to line 190.

```
270 GOTO190
```

When the amortization schedule has finished printing, we print the headings again, but in reverse order.

```
280 PRINT"{"1 SPACE}{38 -}"
290 PRINT"{"DOWN} MO."
    TAB(T1)" PRINCIPAL"TAB
    (T2) " INTEREST"TAB(T3)"
    BALANCE"
```

To use the program, enter the amount of the loan after any down payment (don't use commas); the annual interest rate, such as 8.5 or 10; and the number of years the loan runs. The program usually will not work with illogical values supplied.

If the calculated payment is OK, just press Return at the next question. If not, enter another payment. A payment greater than that calculated will reduce the term of the loan and vice versa; the program will end when the loan balance is less than zero.

Pressing the space bar causes the values to be displayed on either a monthly or yearly basis. Release the space bar to halt the listing.



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## GOING WILD ABOUT FONTS

The first GEOS article I ever had published was about fonts. That was a few years ago, and since so many things have changed in the GEOS world since those days, I thought I'd attack the subject again. After all, fonts are one of the more exciting aspects of using GEOS.

Fonts are one of the more exciting aspects of using GEOS.

To see fonts in action, just boot up your copy of geoWrite. This word processor allows for just about any kind of expressive font you can imagine. When it comes to desktop publishing, there is even more excitement on hand. GeoPublish takes fonts a step further by introducing MegaFonts and allowing you to smooth and scale your fonts.

There are literally hundreds of fonts available from various sources. In addition to FontPack Plus and International FontPack from GeoWorks, font collections from Susan Lamb (3575 East County 18th Street, Yuma, Arizona 85365), and Jim Collette's collections (6782 Junction Road, Pavilion, New York 14525-9755), there are more public domain fonts around than you can count. Parsec (P.O. Box 111, Salem, Massachusetts 01970) has released a huge collection of public domain fonts along with an 80-page booklet giving examples of each one (\$24.95 plus \$2.90 shipping and handling U.S., \$7.50 Canada). The booklet and disks put more than 550 fonts at your fingertips.

One of the prerequisites for being able to use fonts effectively is knowing when to use them. Fonts can be separated into three categories, depending on how they're used. Those that look good in large bodies of text are called body fonts. These fonts are very

readable. They're a best bet for correspondence or as the text of a newsletter. Examples of body fonts are Roma, University, Wheeler, and Haste.

Headline fonts are more decorative and have much more character. They grab a reader's attention, but they seldom work well in large sections of text. Their frills can confuse the reader's eye. Fonts such as America, Kensington, and Telegraph are usually larger in size, which is in keeping with their function: creating headlines and other short sections of text. Headline fonts, carefully selected, can give your document extra impact.

The third type of font is the specialty font, including picture fonts like Ashby or Wurster. These fonts have limited value in geoWrite but make excellent miniphoto collections for geoPaint or geoPublish.

It's fun to collect fonts, but keeping them straight can be confusing. It can be especially frustrating if you're scanning lists of fonts by name, trying to recall what each one looks like. The easiest way to keep track of different fonts is to maintain printouts of each one. Such printouts or samples are included with commercial packages like FontPack Plus, but for the most part, you'll have to make your own. A utility by Joe Buckley called Font Dump will handle the job for you; you can download it from Q-Link. Its filename is FONT DUMP 3. SFX, uploaded by Red Storm.

If you need to check out a font on the fly, however, use FontView. This utility is from RUN magazine's GEOS Power Pack II disk (80 Elm Street, Peterborough, New Hampshire 03458). FontView displays any font you select from either drive and allows you to add style effects, such as italics and boldface.

Another clever way to organ-

ize fonts is to change the icon of each to the letter F from the actual font. A file of such icon images is available on Q-Link (FNTPK+ICONS, uploaded by LadyCarmen), which includes icons for most of the fonts on FontPack Plus. You'll need an icon editor, however, to make the switch.

Each font has an individual ID number, which applications use to identify the fonts in your documents. You can also identify fonts within a file or on a disk by these numbers using Identifont, a program written by Dennis Seitz of Berkeley, California.

If the font numbers it encounters correspond to known GEOS fonts (in other words, the ones on the system disks), it'll give you the font names; otherwise, it simply lists the font ID numbers. If you've kept a list of the numbers with your different printouts, you can cross-reference the various fonts yourself.

OK, you don't keep such good records. Neither do I. That's why I always appreciate a utility that takes care of those kinds of niggling little jobs for me. That's where Jim Collette's program called Font Editor 2.5 comes in.

Yes, it's a font editor, but it's easily the best of the bunch. It's loaded with every feature you could want. It'll create megafonts, allow you to scale fonts to different point sizes or widths, and even allow you to save a point size from one font into that size in another font.

To organize the whole mess, Font Editor will also print out the font along with the name, point size, and ID number. This handy program pretty much takes care of all the font needs any GEOS user could ask for. It's available from CommPlex Software for \$21.50. (See Collette's address above.) □

# PROGRAMS

## MILK RUN

By Gus Vakalis

Milk Run is a fast-paced two-player arcade game with animated characters and a scrolling playing field. The object of the game is to deliver milk to the customers on your route. Getting the milk bottles right on the doorstep is tough enough, but you must also contend with angry dogs who chase you and an opponent who tosses milk bottles at you.

### Typing It In

Although Milk Run is written entirely in machine language, it loads and runs like a BASIC program. To type it in, use MLX, our machine language entry program. See "Typing Aids" elsewhere in this section. When MLX prompts, respond with the following values.

Starting address: 0801

Ending address: 1F98

Be sure to save the program to disk before you exit MLX.

### Deliver the Milk

After you load and run the program, you'll be taken immediately to the title screen. From there, press the space bar to start the game.

Player 1, using joystick 1, delivers milk to the houses on the left-hand side of the road, and player 2 uses joystick 2 to deliver to the houses on the right-hand side. You must deliver milk to each house with a white porch as it comes scrolling past.

Press the fire button to launch a milk bottle in the direction that the joystick points. Try to toss the bottles to land right at the white door. Failing to do so will cost you that customer, and that porch will turn red. A counter at the top of the screen indicates how many customers each player has remaining. You'll earn 100 points for each successful delivery, and those customers will continue their patronage for another round.

### Occupational Hazards

Just doing your job is not enough to win this game. You also have to worry about the competition. You and your opponent can toss milk bottles in any direction, even at each other. If you're

struck by your opponent's milk bottle, you'll lose 500 points. Dogs are another nuisance. If you're bitten by a dog, you'll lose 1000 points.

You can stop your opponent's milk bottle or a charging dog by throwing your milk bottles at them. Since you can have only one bottle in the air at a time, however, saving yourself from these threats can cost you one or more customers.

There are five levels to the game, with each level having as many dog attacks as the level number. That is, there will be one dog attack at level 1, two at level 2, and so on.

### Top Employee

At the end of the fifth level or at the end of any level in which a player has lost all of his customers, an Employee of the Month board will appear, praising the winner. The winner will be the player with the highest score and not the player with the most remaining customers. So it's possible to lose all of your customers and still win the game.

### Key Keys

At the bottom of the screen, you'll find a red key bar indicating the keys that are active and their functions. Pressing the Q key at any time during the game will exit the game and return you to BASIC. Pressing Run/Stop will pause the game, and pressing it again will continue the action. The Restore key will terminate the game and reset it to the beginning so you can play again.

### MILK RUN

```

0801:0B 08 0A 00 0E 32 30 36 2E
0809:31 00 00 00 78 A5 01 29 37
0811:FB 85 01 A2 00 BD 00 D8 9A
0819:9D 00 38 BD 00 D9 9D 00 7D
0821:39 BD 00 DA 9D 00 3A BD 0A
0829:00 DB 9D 00 3B BD 00 DC 91
0831:9D 00 3C BD 00 DD 9D 00 26
0839:3D BD 00 DE 9D 00 3E BD 6C
0841:00 DF 9D 00 3F E8 D0 CD 0A
0849:A5 01 09 04 85 01 AD 14 6D
0851:03 8D 8F 10 AD 15 03 8D 8E
0859:90 10 AD 18 03 8D 91 10 6E
0861:AD 19 03 8D 92 10 AD 28 20
0869:03 8D 93 10 AD 29 03 8D 77
0871:94 10 A9 FF 8D 8A 10 A9 65
0879:06 8D 8B 10 8D 06 14 A9 B8
0881:3C 8D 05 14 A9 01 8D 96 F7
0889:0F 8D D1 0F A9 D2 8D 14 77
0891:03 A9 0F 8D 15 03 A9 FA 4B
0899:8D 28 03 A9 F6 8D 29 03 B8
08A1:A9 EC 8D 18 03 A9 14 8D 69

```

```

08A9:19 03 A9 00 8D 8C 10 8D 88
08B1:8D 10 8D F4 14 8D 8E 10 91
08B9:8D 95 0F 8D D0 0F 58 A2 C6
08C1:00 BD 18 1D 9D 80 35 BD 2D
08C9:B8 1D 9D 20 36 BD 58 1E AA
08D1:9D C0 36 BD F8 1E 9D 60 5F
08D9:37 E8 E0 A0 D0 E3 A2 00 41
08E1:BD 18 1B 9D D8 3A E8 E0 76
08E9:C8 D0 F5 A2 00 BD E8 19 5D
08F1:9D D8 38 E8 E0 10 D0 F5 7B
08F9:A2 00 BD F8 19 9D 80 39 1C
0901:E8 E0 50 D0 F5 A2 00 BD CE
0909:48 1A 9D 08 3A E8 E0 D0 02
0911:D0 F5 A2 00 BD E0 1B 9D A2
0919:C0 3B E8 E0 C8 D0 F5 A2 9D
0921:00 BD C0 1C 9D 08 3E E8 EE
0929:E0 08 D0 F5 A2 00 BD C8 80
0931:1C 9D 28 3E E8 E0 08 D0 4D
0939:F5 A2 00 BD D0 1C 9D 48 45
0941:3E E8 E0 08 D0 F5 A2 00 EC
0949:BD D8 1C 9D 70 3E E8 E0 FC
0951:40 D0 F5 A9 FF 8D 6B 3D 5B
0959:8D 79 3D A9 81 8D 6C 3D 2B
0961:AD 18 D0 29 F0 09 0E 8D 52
0969:18 D0 A9 FF 8D 8A 10 20 C7
0971:49 0F 20 5A 0F 20 39 0F 10
0979:A9 00 8D 09 14 8D F4 14 77
0981:8D 46 14 8D 47 14 8D 54 41
0989:11 8D C1 12 8D 03 14 8D 0F
0991:04 14 8D 8C 10 8D 8D 10 07
0999:A9 40 8D A9 0E 8D AA 0E E6
09A1:A9 31 8D 9C 0A 8D 68 18 BF
09A9:A9 01 8D 07 14 8D 08 14 ED
09B1:A9 00 AA 9D 28 13 E8 E0 08
09B9:06 D0 F8 A9 80 8D 91 02 1C
09C1:A9 93 20 D2 FF A9 06 8D FE
09C9:20 D0 A9 00 8D 21 D0 A9 91
09D1:C8 8D E2 0D A9 04 8D E3 35
09D9:0D A9 00 8D E4 0D 8D E6 13
09E1:0D A9 00 8D B7 0D A9 0E 11
09E9:8D E5 0D 20 59 0C 20 7C 97
09F1:0E 20 AC 0E 20 18 0C A9 AC
09F9:00 8D 8A 10 A2 8C A0 FF 4A
0A01:88 D0 FD CA D0 F8 20 39 DD
0A09:0D 20 B8 0D AD B7 0D C9 C3
0A11:F0 D0 03 4C 30 0A CE E3 22
0A19:0D AD E3 0D 03 20 E7 27
0A21:0D CE E5 0D AD E5 0D D0 EC
0A29:D3 20 15 0E 4C FD 09 A9 C8
0A31:10 8D 6A 0A CE E5 0D AD 74
0A39:E5 0D D0 03 20 15 0E A2 E1
0A41:F8 A0 FF 88 D0 FD CA D0 BE
0A49:F8 20 39 0D CE 6A 0A F0 FE
0A51:15 CE E5 0D AD E5 0D D0 21
0A59:E6 AD 6A 0A C9 03 90 DF 95
0A61:20 15 0E 4C 40 0A 4C 6B 7F
0A69:0A 0E A2 FF A0 FF 88 D0 BD
0A71:FD CA D0 F8 AD A9 0E F0 02
0A79:23 AD AA 0E F0 1E EE 9C 3B
0A81:0A AD 9C 0A C9 36 F0 14 57
0A89:8D 68 18 29 0F 8D 07 14 E4
0A91:8D 08 14 A9 00 8D 09 14 E7
0A99:4C D0 09 00 A9 FF 8D 8A 1C
0AA1:10 20 49 0F 18 A2 04 A0 D3
0AA9:08 20 F0 FF A2 00 BD B1 2A
0AB1:15 20 D2 FF E8 E0 E3 D0 16
0AB9:F5 A0 00 B9 28 13 D9 2B F8
0AC1:13 F0 04 B0 0A 90 0B C8 98
0AC9:C0 03 D0 EF 4C D6 0A 4C 36
0AD1:49 0B 4C 82 0B A0 00 B9 93

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# PROGRAMS

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0AD9:28 13 D0 1D C8 C0 03 D0 D2 0D09:1A C9 6F F0 19 C9 72 90 05
0AE1:F6 18 A2 07 A0 08 20 F0 92 0D11:18 C9 74 90 1D C9 78 90 D2
0AE9:FF A2 E0 BD 94 16 20 D2 92 0D19:1C C9 A0 F0 0F A9 00 60 56
0AF1:FF E8 E0 42 D0 F5 4C B8 30 0D21:A9 08 60 A9 04 60 A9 0C B9
0AF9:0B 18 A2 07 A0 08 20 F0 B4 0D29:60 A9 0B 60 A9 05 60 A9 11
0B01:FF A2 00 BD 5E 17 20 D2 FD 0D31:02 60 A9 01 60 A9 07 60 C1
0B09:FF E8 E0 47 D0 F5 A0 00 89 0D39:A9 F8 85 F7 85 FB A9 06 0C
0B11:A2 00 B9 28 13 4A 4A 4A D2 0D41:85 F8 A9 20 85 F9 85 FD B0
0B19:4A 09 30 9D 4A 05 B9 28 78 0D49:A9 07 85 FA A9 DA 85 FC 1B
0B21:13 29 0F 09 30 9D 4B 05 11 0D51:A9 DB 85 FE A0 00 AD 8E C6
0B29:B9 2B 13 4A 4A 4A 09 07 0D61:AD F4 14 F0 05 68 68 4C 08
0B31:30 9D 56 05 B9 2B 13 29 AB 0D69:6B 09 AD 8C 10 D0 E7 B1 3F
0B39:0F 09 30 9D 57 05 E8 E8 82 0D71:FB 91 FD B1 F7 91 F9 C8 8B
0B41:C8 C0 03 D0 CD 4C B8 0B 75 0D79:C0 28 D0 DA A5 FB 85 FD EB
0B49:18 A2 07 A0 08 20 F0 FF A1 0D81:A5 FC 85 FE A5 F7 85 F9 60
0B51:A2 00 BD D6 16 20 D2 FF B4 0D89:A5 F8 85 FA 38 A5 F7 E9 47
0B59:E8 E0 44 D0 F5 A0 00 A2 86 0D91:28 85 F7 A5 F8 E9 00 85 6F
0B61:00 B9 28 13 4A 4A 4A 76 0D99:F8 38 A5 FB E9 28 85 FB A9
0B69:09 30 9D 50 05 B9 28 13 3B 0DA1:A5 FC E9 00 85 FC A5 F7 6E
0B71:29 0F 09 30 9D 51 05 E8 29 0DA9:C9 78 D0 A8 A5 F8 C9 04 14
0B79:E8 C8 C0 03 D0 E3 4C B8 E5 0DB1:D0 A2 EE B7 D0 60 00 AC CC
0B81:0B 18 A2 07 A0 08 20 F0 3E 0DB9:E2 0D A2 00 B9 A6 18 9D 13
0B89:FF A2 00 BD 1A 17 20 D2 64 0DC1:A0 04 20 FA C0 9D A0 D8 D1
0B91:FF E8 E0 44 D0 F5 A0 00 E1 0DC9:C8 E8 E0 28 D0 EE 38 AD 81
0B99:A2 00 B9 2B 13 4A 4A 8B 0DD1:E2 0D E9 28 8D E2 0D C9 3C
0BA1:4A 09 30 9D 50 05 B9 2B 34 0DD9:D8 D0 05 A9 C8 8D E2 0D 1F
0BA9:13 29 0F 09 30 9D 51 05 A5 0DE1:00 00 00 00 00 00 A9 06 85
0BB1:E8 E8 C8 C0 03 D0 E3 AD 6C 0DE9:8D E3 0D AC E4 0D B9 96 95
0BB9:8E 10 F0 03 4C C8 0B AD B2 0DF1:19 29 F0 F0 0A A9 01 8D 96
0BC1:F4 14 F0 F3 4C 6B 09 20 F6 0DF9:A3 D8 A9 72 8D A3 04 B9 35
0BC9:49 0F A9 00 8D 1B D4 8D 8D 0E01:BE 19 29 F0 F0 0A A9 01 FA
0BD1:15 D0 85 C6 3D 91 02 AD 28 0E09:8D C4 D8 A9 73 8D C4 04 32
0BD9:18 D0 29 F0 09 04 8D 18 EF 0E11:EE E4 0D 60 A9 06 8D E5 EB
0BE1:D0 A9 06 8D 21 D0 A9 0E 12 0E19:0E AC E6 0D B9 96 19 2C 1B
0BE9:8D 20 D0 8D 86 02 78 AD 9C 0E21:AB 0E F0 26 29 0F D0 1D 5B
0BF1:8F 10 8D 14 03 AD 90 10 C6 0E29:A9 00 99 96 19 A9 02 8D B7
0BF9:8D 15 03 AD 91 10 8D 18 57 0E31:33 DA A9 63 18 D 33 06 F8 47
0C01:03 AD 92 10 8D 19 03 AD DD 0E39:38 AD A9 0E E9 01 8D A9 0B
0C09:93 10 8D 28 03 AD 94 10 2B 0E41:0E D8 4C 4B 0E A9 F0 99 6B
0C11:8D 29 03 58 4C 94 E3 AD 4A 0E49:96 19 B9 BE 19 2C AB 0E F8
0C19:9C 0A C9 31 F0 01 60 18 B2 0E51:F0 26 29 0F D0 1D A9 0E D3
0C21:A2 04 A0 08 20 F0 FF A2 87 0E59:99 BE 19 A9 02 8D 54 DA 79
0C29:00 BD F5 14 20 D2 FF E8 E5 0E61:A9 64 8D 54 06 F8 38 AD 94
0C31:E0 BC D0 F5 A5 C5 C9 3E 78 0E69:AA 0E E9 01 8D AA 0E D8 B7
0C39:F0 19 C9 3C D0 F6 20 B6 66 0E71:4C 79 0E A9 F0 99 BE 19 F2
0C41:0C A5 C5 C9 40 D0 FA A9 03 0E79:EE E6 0D AD A9 0E 4A 4A A7
0C49:00 8D 8C 10 8D 8D 10 8D A7 0E81:4A 4A 09 30 8D 51 04 AD E0
0C51:F4 14 60 68 68 4C C8 0B 8C 0E89:A9 0E 29 0F 09 30 8D 52 8A
0C59:18 A2 00 A0 00 20 F0 FF 92 0E91:04 AD AA 0E 4A 4A 4A 4A AB
0C61:A2 00 BD A5 17 20 D2 FF BB 0E99:09 30 8D 75 04 AD AA 0E 89
0C69:E8 E0 84 D0 F5 18 A2 16 37 0EAL:29 0F 09 30 8D 76 04 60 E8
0C71:A0 01 20 F0 FF A2 00 BD 75 0EA9:00 00 F0 A9 00 8D 15 D0 AF
0C79:29 18 20 D2 FF E8 E0 7D 40 0EB1:8D 10 D0 A9 D0 8D F8 07 6B
0C81:D0 F5 A9 02 8D E7 DB A9 42 0EB9:A9 DF 8D F9 07 A9 09 8D 72
0C89:A0 8D E7 07 A9 03 8D 51 88 0ECL:27 D0 8D 28 D0 A9 33 8D FA
0C91:D8 8D 52 D8 A9 04 8D 75 3F 0EC9:1C D0 A9 01 8D 25 D0 A9 B9
0C99:D8 8D 76 D8 A2 00 A9 1B 61 0ED1:06 8D 26 D0 A9 08 8D 00 90
0CA1:9D 78 04 A9 1C 9D 48 07 B0 0ED9:D0 A9 9A 8D 01 D0 A9 D8 6C
0CA9:A9 06 9D 78 D8 9D 48 DB FC 0EE1:8D 02 D0 A9 9A 8D 03 D0 DB
0CB1:E8 E0 28 D0 E9 A9 00 85 45 0EE9:A9 D9 8D FA 07 A9 D6 8D CC
0CB9:F7 85 F9 A9 04 85 F8 A9 DA 0EF1:FB 07 A9 01 8D 29 D0 8D 53
0CC1:D8 85 FA A0 00 B9 A6 18 5D 0EF9:2A D0 A9 78 8D 04 D0 A9 E3
0CC9:91 F7 20 FA 0C 91 F9 C8 BF 0F01:94 8D 05 D0 A9 E3 8D 06 78
0CD1:C0 28 D0 F1 18 A5 F7 69 3E 0F09:D0 AC 94 8D 07 D0 A9 DB 10
0CD9:28 85 F7 A5 F8 69 00 85 B3 0F11:8D FC 07 A9 DA 8D FD 07 C0
0CE1:F8 18 A5 F9 69 28 85 F9 C1 0F19:A9 09 8D 2B D0 8D 2C D0 98
0CE9:A5 FA 69 00 85 FA C9 DB 48 0F21:A9 81 8D 0B D0 A9 C8 8D F2
0CF1:D0 D1 A5 F9 C9 48 D0 CB 18 0F29:09 D0 8D 0B D0 A9 D9 8D D0
0CF9:00 C9 63 F0 32 C9 64 F0 A2 0F31:0A D0 A9 33 8D 15 D0 60 B3
0D01:2E C9 6D 90 1B C9 6F 90 CA 0F39:A2 00 A9 F0 9D 96 19 9D 04
0F41:BE 19 E8 E0 28 D0 F5 60 01 0F49:A2 00 8A 9D 00 D4 E8 E0 E9
0F51:18 D0 F8 A9 0F 8D 18 D4 1D 0F59:60 20 49 0F A9 FF 8D 0E 40
0F61:D4 8D 0F D4 A9 80 8D 12 F8 0F69:D4 60 AD 95 0F 49 FF 8D 44
0F71:95 0F F0 15 A9 95 8D 01 4D 0F79:D4 A9 30 8D 06 D4 A9 81 A3
0F81:8D 04 D4 A9 01 8D 96 0F 17 0F89:60 09 00 8D 04 D4 A9 04 E5
0F91:8D 96 0F 60 00 00 AD 03 62 0F99:14 D0 08 AD 04 14 D0 03 E6
0F99:14 D0 08 AD 04 14 D0 03 E6 0FA1:4C C3 0F AD D0 0F 49 FF E8
0FA1:4C C3 0F AD D0 0F 15 A9 B5 8D FB 0FA9:8D D0 0F F0 15 A9 B5 8D FB
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0FB9:81 8D 0B D4 A9 01 8D D1 E8 0FC1:0F 60 A9 00 8D 0B D4 A9 A0
0FC9:03 8D D1 0F 60 00 00 00 FA 0FD1:00 A5 C5 C9 3E D0 08 A9 9D
0FD9:FF 8D 8E 10 4C 31 EA AD D8 0FE1:8A 10 F0 03 4C 31 EA AD 42
0FE1:8A 10 F0 03 4C 31 EA AD 42 0FE9:8D 10 F0 0B A5 91 C9 7F 28
0FE9:8D 10 F0 0B A5 91 C9 7F 28 0FF1:F0 26 A9 00 8D 8D 10 A5 AF
0FF1:F0 26 A9 00 8D 8D 10 A5 AF 0FF9:91 C9 7F D0 1B AD 8C 10 09
0FF9:91 C9 7F D0 1B AD 8C 10 09 1001:49 FF 8D 8C 10 A9 00 8D F4
1001:49 FF 8D 8C 10 A9 00 8D F4 1009:04 D4 8D 95 0F 8D 0B D4 05
1009:04 D4 8D 95 0F 8D 0B D4 05 1011:8D D0 0F A9 0F 8D 0D 10 0A
1011:8D D0 0F A9 0F 8D 0D 10 0A 1019:AD 8C 10 F0 03 4C 31 EA DA
1019:AD 8C 10 F0 03 4C 31 EA DA 1021:20 9E 13 20 95 10 20 FD 88
1021:20 9E 13 20 95 10 20 FD 88 1029:11 20 C3 12 20 48 14 CE 8C
1029:11 20 C3 12 20 48 14 CE 8C 1031:96 0F D0 03 20 6B 0F CE 46
1031:96 0F D0 03 20 6B 0F CE 46 1039:D1 0F D0 03 20 97 0F CE 9C
1039:D1 0F D0 03 20 97 0F CE 9C 1041:8B 10 F0 03 4C 31 EA A9 20
1041:8B 10 F0 03 4C 31 EA A9 20 1049:06 8D 8B 10 AD F8 07 49 EA
1049:06 8D 8B 10 AD F8 07 49 EA 1051:01 8D F8 07 AD F9 07 49 91
1051:01 8D F8 07 AD F9 07 49 91 1059:01 8D F9 07 AD FC 07 49 C5
1059:01 8D F9 07 AD FC 07 49 C5 1061:01 8D FC 07 AD FC 07 49 32
1061:01 8D FC 07 AD FC 07 49 32 1069:01 8D FD 07 AD FA 07 C9 CE
1069:01 8D FD 07 AD FA 07 C9 CE 1071:D6 F0 09 CE FA 07 EE FB 15
1071:D6 F0 09 CE FA 07 EE FB 15 1079:07 4C 31 EA A9 D9 8D FA CF
1079:07 4C 31 EA A9 D9 8D FA CF 1081:07 A9 D6 8D FB 07 4C 31 09
1081:07 A9 D6 8D FB 07 4C 31 09 1089:EA 00 00 00 00 00 00 00 1F
1089:EA 00 00 00 00 00 00 00 1F 1091:00 00 00 00 AD 54 11 F0 83
1091:00 00 00 00 AD 54 11 F0 83 1099:5A AD 55 11 4A B0 06 4A 79
1099:5A AD 55 11 4A B0 06 4A 79 10A1:B0 0E 4C D8 10 CE 04 D0 49
10A1:B0 0E 4C D8 10 CE 04 D0 49 10A9:AD 04 D0 C9 2C F0 41 60 60
10A9:AD 04 D0 C9 2C F0 41 60 60 10B1:EE 04 D0 AD 04 D0 C9 D4 0B
10B1:EE 04 D0 AD 04 D0 C9 D4 0B 10B9:F0 08 AD C2 12 C9 02 F0 E2
10B9:F0 08 AD C2 12 C9 02 F0 E2 10C1:07 60 20 56 11 4C F1 10 94
10C1:07 60 20 56 11 4C F1 10 94 10C9:AD 04 D0 CD 06 D0 B0 01 8E
10C9:AD 04 D0 CD 06 D0 B0 01 8E 10D1:60 20 DF 11 4C F1 10 EE 70
10D1:60 20 DF 11 4C F1 10 EE 70 10D9:05 D0 AD 05 D0 C9 C8 F0 E6
10D9:05 D0 AD 05 D0 C9 C8 F0 E6 10E1:0F CD 09 D0 90 14 A9 C8 1C
10E1:0F CD 09 D0 90 14 A9 C8 1C 10E9:8D 09 D0 A9 00 8D 03 14 18
10E9:8D 09 D0 A9 00 8D 03 14 18 10F1:20 C4 11 AD 01 CD 29 10 2E
10F1:20 C4 11 AD 01 CD 29 10 2E 10F9:F0 01 60 AD 01 DC 29 0F 96
10F9:F0 01 60 AD 01 DC 29 0F 96 1101:38 E9 0F 4A B0 09 4A B0 2F
1101:38 E9 0F 4A B0 09 4A B0 2F 1109:2A 4A B0 03 4A B0 12 A9 FB
1109:2A 4A B0 03 4A B0 12 A9 FB 1111:01 8D 55 11 A9 78 8D 04 21
1111:01 8D 55 11 A9 78 8D 04 21 1119:D0 A9 94 8D 05 D0 4C 46 C3
1119:D0 A9 94 8D 05 D0 4C 46 C3 1121:11 A9 02 8D 55 11 A9 8B 1D
1121:11 A9 02 8D 55 11 A9 8B 1D 1129:8D 04 D0 A9 94 8D 05 D0 7D
1129:8D 04 D0 A9 94 8D 05 D0 7D 1131:4C 46 11 A9 04 8D 55 11 D9
1131:4C 46 11 A9 04 8D 55 11 D9 1139:A9 82 8D 04 D0 A9 94 8D A6
1139:A9 82 8D 04 D0 A9 94 8D A6 1141:05 D0 4C 46 11 AD 15 D0 42
1141:05 D0 4C 46 11 AD 15 D0 42 1149:09 04 8D 15 D0 A9 FF 8D AE
1149:09 04 8D 15 D0 A9 FF 8D AE 1151:54 11 60 00 00 AD 2B 13 0E
1151:54 11 60 00 00 AD 2B 13 0E 1159:D0 0E AD 2C 13 29 F0 D0 CF
1159:D0 0E AD 2C 13 29 F0 D0 CF 1161:07 AD 2C 13 C9 06 90 14 C4

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# PROGRAMS

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17F9:1D 1D 1D 1D 1D 1D 1D 28
1801:1D 1D 1D 1D 1D 1D 1D 31
1809:BA BB 20 BD 20 BF 12 40 C9
1811:92 20 12 43 44 92 20 20 D5
1819:20 20 12 47 48 92 20 12 F6
1821:4B 4C 92 20 12 4F 50 92 5F
1829:9F D0 CC C1 D9 C5 D2 20 BE
1831:CF CE C5 20 20 20 20 99
1839:20 20 05 CC C5 D6 C5 CC D0
1841:20 20 20 20 20 20 9C D0 1B
1849:CC C1 D9 C5 D2 20 D4 D7 80
1851:CF 20 20 20 20 05 30 30 1D
1859:30 30 30 20 20 20 20 97
1861:20 20 20 20 20 20 31 A2
1869:20 20 20 20 20 20 20 99
1871:20 20 30 30 30 30 20 85
1879:20 20 20 1C 12 20 20 D1 AA
1881:2D D1 D5 C9 D4 20 20 D2 4E
1889:D5 CE 2F D3 D4 CF D0 2D 30
1891:D0 C1 D5 D3 C5 20 20 D2 54
1899:C5 D3 D4 CF D2 C5 2D D2 14
18A1:C5 D3 D5 D4 13 A0 A0 AC
18A9:A0 A0 A0 A0 A0 6F A0 70 E4
18B1:20 20 20 20 20 20 71 33
18B9:A0 A0 70 20 20 20 20 54
18C1:20 20 71 A0 6F A0 A0 A0 22
18C9:A0 A0 A0 A0 A0 A0 5B 5C 2B
18D1:5D A0 A0 A0 A0 6F A0 70 6B
18D9:20 20 20 20 20 20 71 5B
18E1:A0 A0 70 20 20 20 20 7C
18E9:20 20 71 A0 6F A0 A0 A0 4A
18F1:A0 5E 5F 60 A0 A0 61 62 A8
18F9:63 6D 6D 6D 6D 6F A0 70 96
1901:20 20 20 20 20 20 71 84
1909:A0 A0 70 20 20 20 20 A5
1911:20 20 71 A0 6F 6E 6E 6E 14
1919:6E 64 65 66 A0 A0 67 68 6D
1921:69 A0 A0 A0 A0 6F A0 70 C2
1929:20 20 20 20 20 20 71 AC
1931:A0 A0 70 20 20 20 20 CD
1939:20 20 71 A0 6F A0 A0 A0 9B
1941:A0 6A 6B 6C A0 A0 A0 FB
1949:A0 A0 A0 A0 A0 6F A0 70 86
1951:20 20 20 20 20 20 71 D4
1959:A0 A0 70 20 20 20 20 F5
1961:20 20 71 A0 6F A0 A0 A0 C3
1969:A0 A0 A0 A0 A0 A0 A0 9B
1971:A0 A0 A0 A0 A0 6F A0 70 AE
1979:20 20 20 20 20 20 71 FC
1981:A0 A0 70 20 20 20 20 1E
1989:20 20 71 A0 6F A0 A0 EB
1991:A0 A0 A0 A0 A0 F0 F0 F5
1999:F0 F0 F0 F0 F0 F0 F0 CB
19A1:F0 F0 F0 F0 F0 F0 F0 D3
19A9:F0 F0 F0 F0 F0 F0 F0 DB
19B1:F0 F0 F0 F0 F0 F0 F0 E3
19B9:F0 F0 F0 F0 F0 F0 F0 EB
19C1:F0 F0 F0 F0 F0 F0 F0 F3
19C9:F0 F0 F0 F0 F0 F0 F0 FB
19D1:F0 F0 F0 F0 F0 F0 F0 04
19D9:F0 F0 F0 F0 F0 F0 F0 0C
19E1:F0 F0 F0 F0 F0 55 50 7D
19E9:00 00 00 00 00 FF FF 1C
19F1:FF 00 00 00 00 00 00 24
19F9:3C 66 6E 76 66 3C 00 3D
1A01:18 38 18 18 18 7E 00 00 8E
1A09:3C 66 0C 30 60 7E 00 00 76
1A11:3C 66 1C 06 66 3C 00 00 05
1A19:1C 3C 6C 7E 0C 0C 00 00 70
1A21:7E 60 7C 06 66 3C 00 00 C0
1A29:3C 60 7C 66 66 3C 00 00 AD
1A31:7E 66 0C 18 18 18 00 00 62
1A39:3C 66 3C 66 66 3C 00 00 37
1A41:3C 66 3E 06 66 3C 00 00 79
1A49:00 3C 66 7E 66 66 00 00 0E
1A51:00 7C 66 7C 66 7C 00 00 5E
1A59:00 3C 66 60 66 3C 00 00 93
1A61:00 78 6C 66 6C 78 00 00 EC
1A69:00 7E 60 78 60 7E 00 00 CD
1A71:00 7E 60 78 60 60 00 00 5D
1A79:00 3C 60 6E 66 3C 00 00 D3
1A81:00 66 66 7E 66 66 00 00 D0
1A89:00 3C 18 18 18 3C 00 00 03
1A91:00 1E 0C 0C 6C 38 00 00 D3
1A99:00 66 6C 7C 6C 66 00 00 79
1AA1:00 60 60 60 60 7E 00 00 FC
1AA9:00 63 77 7F 6B 63 00 00 86
1AB1:00 66 76 7E 6E 66 00 00 43
1AB9:00 3C 66 66 66 3C 00 00 54
1AC1:00 7C 66 66 7C 60 00 00 AD
1AC9:00 3C 66 66 6E 3C 06 00 B0
1AD1:00 7C 66 66 7C 66 00 00 D5
1AD9:00 3E 60 3C 06 7C 00 00 8F
1AE1:00 7E 18 18 18 18 00 00 5B
1AE9:00 66 66 66 66 3C 00 00 0F
1AF1:00 66 66 66 3C 18 00 00 35
1AF9:00 63 6B 7F 77 63 00 00 B5
1B01:00 66 3C 18 3C 66 00 00 55
1B09:00 66 66 3C 18 18 00 00 8A
1B11:00 7E 0C 18 30 7E 00 00 65
1B19:3F 5E 6E 77 7F 7D 4E 00 3A
1B21:FE 3D BB 77 EF DF B9 00 87
1B29:00 00 F0 F8 F8 F8 00 00 B8
1B31:00 00 0F 1F 1F 1F 00 00 B0
1B39:7F BC DD EE F7 FB 9D 00 F3
1B41:FC 7A 76 EE DE BE 72 57 80
1B49:57 4F 7F 7F 4F 57 57 75 E2
1B51:75 79 7F 7F 79 75 75 7C 91
1B59:7C 7C 7E 7E 7C 7C 7C 3E B1
1B61:3E 3E 7E 7E 3E 3E 3E AE 14
1B69:AE 9E FE FE FE 9E AE AE 66
1B71:EA F2 FE FE F2 EA EA EA 11
1B79:7D 7B 77 6E 5E 3F 00 B9 CC
1B81:DF EF 77 BB 3D FE 00 00 34
1B89:F8 F8 F8 F0 00 00 00 A8
1B91:1F 1F 1F 00 00 00 9D 91
1B99:FB F7 EE DD BC 7F 00 72 DD
1BA1:BE DE EE 76 7A FC 00 00 FB
1BA9:E0 E6 06 60 6E 00 00 7C
1BB1:07 67 60 06 76 70 00 00 27
1BB9:7E 7E 7E 7E 7E 7E 06 D1
1BC1:60 60 60 60 60 60 60 9D
1BC9:06 06 06 06 06 06 7C 76
1BD1:7C 7C 7E 7E 7C 7C 3E 2A
1BD9:3E 3E 7E 7E 3E 3E F8 D6
1BE1:FC 7E 7F 7F 7B 79 78 1F EF
1BE9:3F 7E FE FE DE 9E 1E 78 55
1BF1:78 78 F8 F8 00 00 00 1E 4F
1BF9:1E 1E 1F 1F 00 00 00 7E 1B
1C01:7E 3C 3C 3C 3C 3C 3C 5A
1C09:3C 3C 7E 7E 00 00 00 7E A4
1C11:7E 3C 3C 3C 3C 3C 3C 6A
1C19:3C 3F 7F 7F 00 00 00 27
1C21:1C FC FC FC 00 00 00 F8 0F
1C29:F8 79 7B 7F 7F 7F 7C 19
1C31:FC F0 E0 C0 80 80 C0 7B 4F
1C39:79 78 F8 F8 00 00 00 E0 DB
1C41:F0 F8 7C 7C 00 00 00 FF 87
1C49:FF 78 78 78 78 7F 7F 8F 8F
1C51:FC 1E 0E 0E 1E FC F8 78 81
1C59:78 78 F8 F8 00 00 00 78 13
1C61:3C 1E 0F 0F 00 00 00 7C 8E
1C69:7C 3C 3C 3C 3C 3C 3C C3
1C71:3E 3C 3C 3C 3C 3C 3C AA
1C79:3C 3F 3F 1F 00 00 00 3C B5
1C81:3C FC FC F8 00 00 00 F8 3F
1C89:F8 7C 7E 7F 7F 7F 7B 3E 54
1C91:3E 3C 3C 3C BC FC FC 79 90
1C99:78 78 F8 F8 00 00 00 FC D7
1CA1:FC 7C 3E 3E 00 00 00 FF 23
1CA9:FF FF FF FF FF FF FF FF E1
1CB1:FF FF 81 FF FF FF FF FF 1A
1CB9:F9 F3 E7 CF 9F 3F FF FF DF
1CC1:FF C3 99 81 99 99 FF FF 69
1CC9:FF 81 9F 87 9F 81 FF FF D1
1CD1:FF C3 E7 E7 E7 C3 FF FF C4
1CD9:FF 99 89 81 91 99 FF FF B4
1CEL:FF C3 99 99 99 C3 FF FF B3
1CE9:FF 83 99 99 83 9F FF FF 6A
1CF1:FF C3 99 99 91 C3 F9 FF 77
1CF9:FF 83 99 99 83 99 FF FF 62
1D01:FF C1 9F C3 F9 83 FF FF B9
1D09:FF 81 E7 E7 E7 E7 FF FF FD
1D11:FF 99 99 99 99 C3 FF 00 5A
1D19:00 00 00 00 00 00 00 53
1D21:00 00 00 00 00 00 00 5B
1D29:00 00 00 00 00 00 00 63
1D31:F4 00 00 FC 00 00 F4 00 9F
1D39:00 00 00 00 00 00 00 73
1D41:00 00 00 00 00 00 00 7B
1D49:00 00 00 00 00 00 00 83
1D51:00 00 00 00 00 00 00 8B
1D59:00 00 00 00 00 00 00 93
1D61:00 00 00 00 00 00 00 9B
1D69:00 00 00 00 00 70 00 65
1D71:70 00 00 70 00 00 20 2B
1D79:00 70 00 00 00 00 00 CF
1D81:00 00 00 00 00 00 00 BB
1D89:00 00 00 00 00 00 00 C3
1D91:00 00 00 00 00 00 00 CB
1D99:00 00 00 00 00 00 00 D3
1DA1:00 00 00 00 00 00 00 DB
1DA9:00 00 00 00 00 00 00 01 E4
1DB1:78 00 01 F8 00 01 78 00 CC
1DB9:00 00 00 00 00 00 00 F3
1DC1:00 00 00 00 00 00 00 FB
1DC9:00 00 00 00 00 00 00 04
1DD1:00 00 00 00 00 00 00 0C
1DD9:00 00 00 00 00 00 00 14
1DE1:00 00 00 00 00 00 00 1C
1DE9:00 00 00 00 00 70 00 00 E5
1DF1:20 00 00 70 00 00 70 00 24
1DF9:00 70 00 00 00 00 00 50
1E01:00 00 00 00 00 00 00 3D
1E09:00 00 00 00 00 00 00 45
1E11:00 00 00 00 00 00 00 4D
1E19:00 00 00 00 00 00 00 55
1E21:00 20 00 00 A8 00 00 98 43
1E29:00 00 20 00 00 20 00 02 EB
1E31:9A 00 00 A4 00 00 A8 00 56
1E39:00 68 00 00 A8 00 00 20 F4
1E41:00 02 22 00 00 00 00 42
1E49:00 00 00 00 00 00 00 85
1E51:00 00 00 00 00 00 00 8D
1E59:00 00 00 00 00 00 00 95
1E61:00 20 00 00 A8 00 00 98 83
1E69:00 02 22 00 00 20 00 00 EA
1E71:98 00 00 A4 00 00 A8 00 95
1E79:02 6A 00 00 A8 00 00 20 B6
1E81:00 00 20 00 00 00 00 00 C1

```

```

1E89:00 00 00 00 00 00 00 00 00 C5
1E91:00 00 00 00 00 00 00 00 00 CD
1E99:28 00 00 AA 00 00 69 00 67
1EA1:00 14 00 00 FC 40 03 FF D1
1EA9:C0 0F 3F 00 04 3C 00 00 03
1EB1:38 00 15 EC 00 17 FC 00 D1
1EB9:03 0C 00 00 CC 00 02 8C 71
1EC1:00 00 08 00 00 0A 00 00 27
1EC9:00 00 00 00 00 00 00 00 06
1ED1:00 00 00 00 00 00 00 00 0E
1ED9:28 00 00 AA 00 00 69 00 A7
1EE1:00 14 40 00 3F C0 00 FF 28
1EE9:00 03 FC 00 0F 3C 00 04 F3
1EF1:38 00 00 2F 00 15 3F C0 D0
1EF9:15 30 C0 00 33 00 00 32 B0
1F01:80 00 20 00 00 A0 00 00 06
1F09:00 00 00 00 00 00 00 00 47
1F11:00 00 00 00 00 00 00 00 4F
1F19:28 00 00 AA 00 00 69 00 E8
1F21:00 14 00 01 3F 00 03 FF 74
1F29:C0 00 FC F0 00 3C 10 00 87
1F31:2C 00 00 3B 54 00 3F D4 2F
1F39:00 30 C0 00 33 00 00 32 67
1F41:80 00 20 00 00 A0 00 00 46
1F49:00 00 00 00 00 00 00 00 87
1F51:00 00 00 00 00 00 00 00 8F
1F59:28 00 00 AA 00 00 69 00 29
1F61:01 14 00 03 FC 00 00 FF 3D
1F69:00 00 3F C0 00 3C F0 00 6E
1F71:2C 10 00 F8 00 03 FC 54 B3
1F79:03 0C 54 00 CC 00 02 8C BD
1F81:00 00 08 00 00 0A 00 00 E8
1F89:00 00 00 00 00 00 00 00 C7
1F91:00 00 00 00 00 00 00 00 CF

```

Gus Vakalis drinks his milk every day in Jamaica, New York.

## TURBO POKER

By Mark Neri

Turbo Poker brings the classic game of poker into the computer age. No longer is poker a game of leisurely thought. Turbo Poker requires a fast hand on the joystick and an even faster mind to arrange a relentless storm of cards.

Turbo Poker is written entirely in machine language, but it loads and runs like a BASIC program. To type in Turbo Poker, use MLX, our machine language entry program. See "Typing Aids" elsewhere in this section. When MLX prompts, respond with the following.

Starting address: 0801

Ending address: 0E59

Be sure to save a copy of the program before you exit MLX.

When you are ready to play, type LOAD "TURBO POKER", 8 and press Return. When the cursor reappears, type RUN and press Return again. The Tur-

bo Poker screen will appear.

### Playing the Game

Once the program has begun, select the level you want to play. To choose your level, use a joystick in port 2. Move the stick left and right to move the black level meter. When the needle is toward the left, the game is quite slow. As you move the needle to the right, the speed of the game increases. When the needle is on the far right, the game is extremely fast and quite difficult.

After you've selected a level, press the fire button to begin the game. A card will appear at the left side of the screen and begin to slide across to the right. When the card has gone about halfway across the screen, it will stop, and a new card will enter from the left. The object of the game is to form winning poker hands by guiding the cards with the joystick.

For those unfamiliar with poker, winning hands as well as their point values are shown below.

**Two Pair.** Two pairs of cards with matching numbers. 5 points.

**Three of a Kind.** Three cards of the same number. 10 points.

**Straight.** Five cards with consecutive numbers, of any suit. 20 points.

**Flush.** Five cards, all of the same suit. 30 points.

**Full House.** Two cards of one number and three of another number. 40 points.

**Four of a Kind.** Four cards of the same number. 50 points.

**Straight Flush.** Five cards with consecutive numbers, all of the same suit. 75 points.

**Royal Flush.** Ace, king, queen, jack, and 10, all of the same suit. 100 points.

In Turbo Poker, seven hands of five cards are formed vertically. A hand must contain five cards in order for it to be counted.

As cards slide across the screen, try to position them so that they'll form winning hands. If you try to put a card where there's already a card, the card that's already there will slide right, pushing along any cards that were there before. If any card ends up being pushed off the screen, the game is over. After each card is placed, any winning hands will be removed, and points will be awarded. The cards to their right will fill in the spaces that the removed cards leave. By forming hands and causing them to be removed, you can stop the cards from reaching the right edge of the screen and ending the game. Note that any of the seven columns is a hand, and a winning combination in any of them will be removed.

For each winning hand, your score will increase. The amount by which your score increases depends both on the hand you managed to form and the level you're playing. When you've removed a certain number of hands, your level will increase, and the cards will slide faster.

### TURBO POKER

```

0801:0B 08 C7 07 9E 32 30 36 56
0809:31 00 00 00 20 17 0C 20 47
0811:7F 0D A9 00 85 1C 85 1D 1E
0819:85 1E 85 1F 20 5F 0D 20 CE
0821:CC 0C A0 80 A9 FF 99 FF 37
0829:BF 88 D0 FA 20 67 0B A9 63
0831:00 85 06 85 09 85 0B 85 B5
0839:0A A5 1B 49 0F 85 1A E6 59
0841:1A 20 86 0C 20 85 0B 85 AA
0849:0E 29 0F 85 07 A5 0E 4A 1A
0851:4A 4A 4A 85 08 A5 02 85 1B
0859:04 A5 03 85 05 A5 0B F0 53
0861:05 C6 0B 4C A0 08 AE 00 4E
0869:DC 8A 29 01 D0 15 A5 06 EB
0871:F0 11 C6 06 A9 04 85 0B EA
0879:A5 02 38 E9 78 85 02 B0 11
0881:02 C6 03 8A 29 02 D0 17 57
0889:A5 06 C9 04 F0 11 E6 06 07
0891:A9 04 85 0B A5 02 18 69 A7
0899:78 85 02 90 02 E6 03 8A CC
08A1:29 08 D0 06 85 0A A9 01 6B
08A9:85 1A A5 0A F0 05 C6 0A 8B
08B1:4C C0 08 A5 1A 85 0A E6 55
08B9:09 E6 02 D0 02 E6 03 20 27
08C1:EB 0B 20 A2 0B 20 63 09 61
08C9:A5 09 C9 11 F0 03 4C 56 BB
08D1:08 20 F4 08 A4 1A 20 63 3E
08D9:09 88 D0 FA 20 F4 08 A4 E3
08E1:1A 20 63 09 88 D0 FA 20 A1
08E9:F4 08 20 37 09 20 6E 09 9C
08F1:4C 30 08 A5 02 85 16 A5 87
08F9:03 18 69 D4 85 17 A0 3D 13
0901:B1 02 C8 91 02 88 B1 16 4A
0909:C8 91 16 88 88 C0 FF D0 47

```

# PROGRAMS

```

0911:EF A9 A0 A0 00 91 02 A0 8E
0919:28 91 02 A0 17 91 02 A0 91
0921:18 91 02 A9 05 A0 00 91 BA
0929:16 A0 28 91 16 A0 17 91 7F
0931:16 A0 18 91 16 60 A5 06 16
0939:0A 0A 0A 85 0C A9 C0 85 7A
0941:0D A0 06 B1 0C C9 FF F0 56
0949:05 68 68 4C 0A 0D A0 06 95
0951:B1 0C C8 91 0C 88 88 C0 C5
0959:FF D0 F5 A5 0E A0 00 91 3D
0961:0C 60 AD 11 D0 10 FB AD C4
0969:11 D0 30 FB 60 A9 00 85 2D
0971:0F A0 04 A9 00 85 10 99 1E
0979:3F C0 88 D0 FA A0 16 99 99
0981:43 C0 88 D0 FA A4 0F B9 C5
0989:00 C0 20 E9 09 B9 08 C0 6E
0991:20 E9 09 B9 10 C0 20 E9 98
0999:09 B9 18 C0 20 E9 09 B9 22
09A1:20 C0 20 E9 09 A5 10 D0 66
09A9:36 20 03 0A 20 1B 0A 20 81
09B1:40 0A A6 13 E0 00 F0 07 5C
09B9:20 2F 0D CA 4C B5 09 A5 E6
09C1:13 C9 00 F0 1A 20 BE 0A B7
09C9:E6 1F A5 1F C9 0C D0 0F EC
09D1:A5 1B C9 0F F0 09 E6 1B 3C
09D9:20 F8 0C A9 00 85 1F E6 91
09E1:0F A5 0F C9 08 D0 8A 60 5C
09E9:C9 FF F0 11 48 29 0F AA BF
09F1:FE 44 C0 68 4A 4A 4A 8D
09F9:AA FE 40 C0 60 4A 01 85 66
0A01:10 60 A9 00 85 11 A0 04 20
0A09:B9 3F C0 C9 05 D0 07 A9 A1
0A11:01 85 11 4C 1A 0A 88 D0 C8
0A19:EF 60 A9 00 85 12 AA AD E9
0A21:50 C0 F0 01 E8 A0 0D B9 59
0A29:43 C0 F0 08 E8 E0 05 F0 73
0A31:09 4C 37 0A A2 00 88 D0 5B
0A39:EE 60 A9 01 85 12 60 A5 FC
0A41:11 F0 1D A5 12 F0 14 AD 42
0A49:52 C0 F0 0A AD 44 C0 D0 46
0A51:05 A9 64 4C AD 0A A9 4B D7
0A59:4C AD 0A A9 1E 4C AD 0A 62
0A61:A5 12 F0 05 A9 14 4C AD 1F
0A69:0A A9 04 20 B0 0A E0 01 DF
0A71:D0 05 A9 32 4C AD 0A A9 5E
0A79:03 20 B0 0A E0 01 D0 0E 88
0A81:A9 02 20 B0 0A E0 01 D0 A0
0A89:05 A9 28 4C AD 0A A9 03 40
0A91:20 B0 0A E0 01 D0 05 A9 30
0A99:0A 4C AD 0A A9 02 20 B0 62
0AA1:0A E0 02 D0 05 A9 05 4C 65
0AA9:AD 0A A9 00 85 13 60 A0 26
0AB1:0D A2 00 D9 43 C0 D0 01 52
0AB9:E8 88 D0 F7 60 A4 0F B9 6B
0AC1:00 C0 20 97 0B B9 08 C0 93
0AC9:20 97 0B B9 10 C0 20 97 2C
0AD1:0B B9 18 C0 20 97 0B B9 18
0AD9:20 C0 20 97 0B B9 01 C0 AD
0AE1:99 00 C0 B9 09 C0 99 08 FC
0AE9:C0 B9 11 C0 99 10 C0 B9 43
0AF1:19 C0 99 18 C0 B9 21 C0 67
0AF9:99 20 C0 8C C0 8D D0 2D
0B01:A9 FF 8D 06 C0 8D 0E C0 17
0B09:8D 16 C0 8D 1E C0 8D 26 91
0B11:C0 A9 05 85 0D 85 15 A9 3D
0B19:D9 85 17 85 19 A9 A6 85 FA
0B21:0C 85 16 A9 A3 85 14 85 DC
0B29:18 A2 0E A5 0F 0A 18 65 46
0B31:0F A8 B1 0C 91 14 B1 16 46
0B39:91 18 C8 C0 15 D0 F3 CA E1

```

```

0B41:F0 21 A5 0C 18 69 28 85 C9
0B49:0C 85 16 90 04 E6 0D E6 4F
0B51:17 A5 14 18 69 28 85 14 6B
0B59:85 18 90 04 E6 15 E6 19 FC
0B61:4C 2C 0B C6 0F 60 A2 40 F5
0B69:A9 01 9D 83 C0 CA D0 FA 4E
0B71:A0 04 A9 00 99 8F C0 99 34
0B79:9F C0 99 AF C0 99 BF C0 6A
0B81:88 D0 F1 60 AD 1B D4 29 01
0B89:3F AA BD 84 C0 F0 F5 A9 49
0B91:00 9D 84 C0 8A 60 C9 FF 15
0B99:F0 06 AA A9 01 9D 84 C0 E1
0BA1:60 A5 02 85 16 A5 03 18 4F
0BA9:69 D4 85 17 A4 07 B9 DA 5B
0BB1:0B A0 00 91 02 A0 29 91 05
0BB9:02 A4 08 B9 E7 0B A0 28 6B
0BC1:91 02 A0 01 91 02 A5 08 2D
0BC9:29 02 A0 00 91 16 C8 91 11
0BD1:16 A0 28 91 16 C8 91 16 46
0BD9:60 32 33 34 35 36 37 38 7F
0BE1:39 14 0A 11 0B 01 41 58 23
0BE9:5A 53 A5 04 85 16 A5 05 CB
0BF1:18 69 D4 85 17 A9 A0 A0 A2
0BF9:00 91 04 C8 91 04 A0 28 87
0C01:91 04 C8 91 04 A9 05 A0 86
0C09:00 91 16 C8 91 16 A0 28 23
0C11:91 16 C8 91 16 60 A9 01 30
0C19:8D 21 D0 A9 06 8D 20 D0 6C
0C21:A2 04 A0 18 A9 E8 85 14 31
0C29:85 16 A9 03 85 15 A9 D7 9A
0C31:85 17 A9 A0 91 14 A9 05 46
0C39:91 16 C8 D0 F5 CA F0 07 89
0C41:E6 15 E6 17 4C 33 0C A0 48
0C49:A0 B9 B9 0D 99 FF 03 A9 A4
0C51:06 99 FF D7 99 27 D8 A9 15
0C59:00 99 C7 D8 A9 20 99 C7 27
0C61:04 88 D0 E5 A0 05 B9 7B 1E
0C69:0C 99 FB 04 B9 80 C0 99 2F
0C71:0B 05 88 D0 F1 A9 30 8D 92
0C79:39 05 60 0C 05 16 05 0C D2
0C81:13 03 0F 12 05 AD 1B D4 D0
0C89:29 07 C9 05 B0 F7 85 06 F7
0C91:85 02 A9 00 85 03 06 02 68
0C99:06 02 06 02 A5 02 85 16 6C
0CA1:A5 03 85 17 06 02 06 02 B5
0CA9:06 02 26 03 06 02 26 03 C1
0CB1:A5 02 38 E5 16 85 02 A5 F2
0CB9:03 E9 00 85 03 A5 02 18 F0
0CC1:69 90 85 02 A5 03 69 05 94
0CC9:85 03 60 A0 00 AE 00 DC 13
0CD1:8A 29 04 D0 05 C0 00 F0 23
0CD9:01 88 8A 29 08 D0 05 C0 C6
0CE1:0F F0 01 C8 8A 29 10 D0 54
0CE9:03 84 1B 60 84 1B 20 F8 D7
0CF1:0C 20 63 09 4C 0E 0C A2 6D
0CF9:10 A9 A0 9D 1D 05 CA 0D D5
0D01:FA A4 1B A9 DD 99 1E 05 56
0D09:60 A0 09 B9 25 0D 99 D7 A0
0D11:04 88 D0 F7 AD 00 DC 29 39
0D19:10 D0 F9 AD 00 DC 29 10 5F
0D21:F0 F9 4C 0D 08 07 01 0D F7
0D29:05 20 0F 16 05 12 48 8A 9C
0D31:48 98 48 20 A4 0D A5 1B 60
0D39:18 69 01 C9 0A 90 03 18 27
0D41:69 06 F8 18 65 1C 85 1C F4
0D49:A5 1D 69 00 85 1D A5 1E B4
0D51:69 00 85 1E D8 20 5F 0D C5
0D59:68 A8 68 AA 68 60 A2 03 96
0D61:A0 00 B5 1B 48 4A 4A 7E
0D69:4A 18 69 30 99 33 05 C8 4B

```

```

0D71:68 29 0F 18 69 30 99 33 DF
0D79:05 C8 CA D0 E5 60 A9 FF B2
0D81:8D 0E D4 8D 0F D4 A9 80 F8
0D89:8D 12 D4 A9 8F 8D 18 D4 DB
0D91:A9 14 8D 00 D4 8D 01 D4 EA
0D99:A9 08 8D 05 D4 A9 00 8D 67
0DA1:06 D4 60 A9 10 8D 04 D4 2E
0DA9:20 63 09 A9 11 8D 04 D4 04
0DB1:A2 05 20 63 09 CA D0 FA A8
0DB9:60 A0 C3 F2 C9 D5 F2 C3 23
0DC1:C9 F0 C9 A0 D5 C9 A0 69 C0
0DC9:20 20 5F A0 69 20 20 5F 5D
0DD1:A0 20 A0 69 E9 A0 20 20 21
0DD9:20 20 A0 69 20 20 5F A0 97
0DE1:A0 A0 A0 C2 C2 C2 EB F2 A0
0DE9:CB EB F1 C9 C2 C2 A0 20 42
0DF1:A0 A0 20 A0 20 A0 A0 20 77
0DF9:A0 20 69 E9 A0 A0 20 E2 E2
0E01:E2 A0 A0 20 A0 A0 20 A0 35
0E09:A0 A0 A0 CB CA CB CA 56
0E11:C3 F1 C3 F1 F1 CB A0 20 43
0E19:20 20 E9 A0 20 A0 A0 20 79
0E21:A0 20 DF 5F A0 A0 20 62 B1
0E29:62 A0 A0 20 20 20 E9 A0 AA
0E31:A0 A0 A0 A0 A0 A0 A0 4D
0E39:A0 A0 A0 A0 A0 A0 A0 20 D4
0E41:A0 A0 A0 A0 DF 20 20 E9 9D
0E49:A0 20 A0 DF 5F A0 20 20 AD
0E51:20 20 A0 20 A0 DF 5F A0 7F
0E59:A0 20 00 00 00 00 00 00 CD

```

Mark Neri is a card shark who lives in Longwood, Florida.

## FILE LORD

By Daniel Lightner

There's no end to the data you can manage with this database program for the 64, and it's easy to create and access files with hundreds of records. With File Lord you can keep track of business contacts, birthdays, phone numbers, record collections, friends' addresses, and much more. Plus, File Lord allows you to specify the number of fields and their names in each record. You can also specify the length of each field.

### Getting Started

File Lord is written entirely in machine language; enter it with MLX, our machine language entry program. See "Typing Aids" elsewhere in this section. When MLX prompts, respond with the following values.

Starting address: 0801

Ending address: 19AF 14C8

After you've finished typing in the program, be sure to save a copy to disk under the name of File Lord.



## Using the Program

File Lord is easy to use. You just load and run it as you would any BASIC program. When you first run the program, you must load a file or create a new one. To create a file, choose option 7 of the File Lord menu. Note that you must use the Shift key with all of the options below option 6. After you have selected an option, the computer prompts you to make sure. If the label displayed is correct, press the Y key; if not, press N.

## Number of Fields

If you chose option 7, you'll be prompted for a filename. Enter the name you wish to call the file and press Return. Next, you'll be asked for the number of fields that you wish each record to contain. For example, if you want the file to contain addresses, you'd want to include people's names. So Name would be one field. You'd also want street addresses, so that's two. You'd also want the city, state, and ZIP code for each person. If you want each of these to be a separate field, it might look something like this.

|          |         |
|----------|---------|
| Name     | Field 1 |
| Street   | Field 2 |
| City     | Field 3 |
| State    | Field 4 |
| ZIP code | Field 5 |

In this example there are five fields. So to answer the prompt, you would press the 5 key. File Lord allows up to nine fields.

In the example above, the Name field could've been replaced by three fields to record a person's first name, middle name, and last name. That would've left two fields remaining. We could then include a telephone number and perhaps a field for notes.

## Field Names

When you've entered the number of fields you want, File Lord will ask you to name them. At the prompt, give the name for each field indicated.

## Field Size

When you've finished naming the fields, File Lord will prompt you for the maximum number of characters you want for each field. File Lord will ac-

cept up to 18 characters for each field. If you don't need that many, however, don't enter that many. For example, in a field for telephone numbers, you would only need 3 for the area code, 1 for a dash, 3 more for the prefix, 1 for another dash, and then 4 for the final four digits. It might look like this: 409-555-1212. In this case, you would choose 12 characters. You can abbreviate the states with two-letter postal codes.

When you've finished entering the required data to set up a file, File Lord displays the information and asks if everything is correct. Press N if you wish to make changes in the format.

## Write a Record

Now that you've created a file, let's write a record by selecting option 2. Notice that File Lord prompts you with your field names. You simply enter the required information at the prompt. If you don't know all the correct data, simply enter something fictitious; it can easily be deleted later.

## Read a Record

Select option 1 to read a record. File Lord tells you how many records you have and asks for a number to read. Enter a record number to read it. If several files are available, you can scroll through them by selecting option 4.

If you wish to read a record but can't remember its number, you can select option 5 to search for a string. Suppose you want the file on John Jones. Select option 5 and enter John Jones at the prompt. File Lord will scan the records until it finds that string or reaches the end of the records. When it finds a match, it will display that record onscreen. If it finds more than one record, it will display them one at a time, in the order that they were found.

## Delete a Record

You can delete unwanted information quite easily. Find the record number you wish to delete and then select option 3. When a record is deleted, all the record numbers that are higher will be decreased by one.

## Print a Record

Use option 6 to dump a record to the printer. Make sure your printer is

turned on and ready before choosing this feature.

## Other Options

If you select Delete a File, this option will scratch from the disk the file currently in memory. Use this option if you're modifying a file; scratch the old file before saving the new version.

Save This File will save the file currently in memory, with the filename that you specified when you created it.

Load a file by entering the corresponding option number and following the prompts.

You can view a disk directory by pressing the Shift key and the 4 key simultaneously. To stop a directory listing, press f7. Restart the listing by pressing f5.

Press Shift-Q when you wish to exit File Lord and return to BASIC.

## FILE LORD

```
0801:0B 08 70 17 9E 32 34 30 6E
0809:37 00 00 00 20 20 20 96
0811:20 20 20 20 20 A0 C4 B9 06
0819:3C 08 99 F8 00 B9 FD 08 F6
0821:99 33 03 88 D0 F1 A0 09 4C
0829:B9 0C 08 99 FF 03 88 D0 A1
0831:F7 A9 B0 85 2D A9 19 85 DD
0839:2E 4C 00 01 0D 60 01 B0 20
0841:19 33 13 B9 6E 09 99 E8 5C
0849:07 C8 D0 F7 EE 02 01 EE 19
0851:05 01 C6 F9 D0 ED A2 03 23
0859:20 34 03 F0 33 C9 07 D0 95
0861:16 A2 01 20 34 03 D0 0A A0
0869:A2 04 20 34 03 18 69 07 65
0871:10 05 A2 0A 20 34 03 85 1D
0879:A8 A5 A7 85 A9 A5 FE 85 FB
0881:F7 A5 FF 85 F8 20 6C 03 73
0889:A5 F8 85 FF A5 F7 85 FE 72
0891:E8 20 34 03 D0 1E A2 08 21
0899:20 34 03 A0 02 84 A8 85 2A
08A1:A6 18 A5 FC 65 A6 85 F7 58
08A9:A5 FD 65 A7 85 F8 20 6C EF
08B1:03 4C 13 01 E8 20 34 03 FB
08B9:D0 1C A0 03 84 A8 E8 20 36
08C1:34 03 F0 08 A2 08 20 34 F4
08C9:03 4C 5C 01 A2 0C 20 34 C3
08D1:03 E6 A7 4C 5C 01 E8 20 AF
08D9:34 03 D0 0A E8 20 34 03 B2
08E1:18 69 04 A8 D0 D6 E8 20 37
08E9:34 03 D0 0A A2 02 20 34 21
08F1:03 18 69 06 D0 ED A2 08 A2
08F9:20 34 03 D0 E6 A9 00 85 F7
0901:A7 A4 FB F0 0C 06 FA 2A 37
0909:26 A7 C6 FB CA D0 F2 A8 D8
0911:60 48 B1 FE 85 FA A9 08 FE
0919:85 FB 68 A4 FE D0 02 C6 4A
0921:FF C6 FE C0 E7 D0 DE A4 B5
0929:FF C0 07 D0 D8 A9 37 85 BA
0931:01 58 4C D0 08 A4 A8 F0 49
0939:22 A5 F7 38 E5 A8 B0 03 7E
0941:C6 F8 38 85 F7 A5 FC B5 8A
```

# PROGRAMS

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0949:A8 B0 02 C6 FD 85 FC B1 3A
0951:F7 88 91 FC 98 D0 F8 C4 42
0959:A9 F0 0A B1 F7 C6 FD C6 76
0961:F8 C6 A9 10 EC 60 78 E6 98
0969:01 4C 16 08 60 00 0B 08 73
0971:C8 07 9E 32 30 36 31 00 5D
0979:00 00 E6 9F 78 A5 01 29 E7
0981:FE 85 01 A9 C1 8D 18 03 A6
0989:A9 34 8D 14 03 58 C5 75 EA
0991:BA A2 D5 8D EF B4 DC 79 C2
0999:0F A8 D3 99 00 D4 F0 4E F4
09A1:11 F6 A9 09 8D 05 97 E1 51
09A9:8D 02 D4 A9 0E 20 00 78 A1
09B1:6E F2 93 EA 23 1B 02 27 29
09B9:F0 2F C9 D1 F0 31 C9 32 78
09C1:F0 30 C9 31 F0 32 C9 34 BC
09C9:F0 39 C9 33 F0 3B C9 35 4C
09D1:CF E0 49 93 36 F0 3F C9 24
09D9:29 F0 46 C9 CC F0 48 C9 A6
09E1:28 F0 4A C9 24 F0 4C 4C F3
09E9:4E EE 08 50 0D 84 4C D7 CF
09F1:50 41 2B C8 1C 28 C0 C7 39
09F9:20 1F 0A 5E 41 1C 4E C1 E3
0A01:AC 0B 4C 5E 41 56 0C A5 BE
0A09:90 DF 0C D5 38 1A 05 30 A0
0A11:39 0B BE 0E 5B 05 98 39 9C
0A19:05 CE 0F 4C 46 08 BB 78 4C
0A21:83 3B 63 11 06 F0 E0 8D 86
0A29:85 E5 4C E2 FC A7 A9 92 9D
0A31:21 DD 02 14 B3 B1 A7 41 6C
0A39:39 85 CD 20 0B 61 A1 FC 25
0A41:08 93 4E 11 0D 3B 60 F5 25
0A49:AC 06 42 11 56 0C 10 F3 85
0A51:00 07 75 31 1F 87 31 94 F6
0A59:44 80 EB 3C 1E 15 1E EF 62
0A61:C1 E1 C9 D0 90 03 4C 19 57
0A69:09 C1 2D 52 C3 A9 E7 8C 5E
0A71:E4 AE B2 02 F3 49 0C 14 0B
0A79:F0 49 0C 86 82 2F F6 70 72
0A81:9C 86 A9 F1 1B 20 1C 95 01
0A89:A1 C3 01 54 46 A9 1D CC A4
0A91:AF B0 06 91 FB C8 4C 9D BC
0A99:09 18 81 38 03 10 A8 B0 46
0AA1:18 20 F4 78 0C A8 3C 23 8E
0AA9:00 72 CF EC 9B E8 EC 1C 99
0AB1:E5 94 43 55 10 E7 80 15 D1
0AB9:44 3A 10 40 7A 51 13 1A DD
0AC1:E9 05 60 4C 2B 09 4C 38 2B
0AC9:0F 4C 24 06 71 01 B4 0B 61
0AD1:4C 5E 0C 4C 42 12 4C E7 C4
0AD9:0C E4 6E C5 02 23 30 CE 23
0AE1:87 CE E3 9E 4F F3 2C 8A 01
0AE9:38 10 04 AD E9 18 5F D0 B8
0AF1:D7 03 6D 15 20 D6 CD 07 01
0AF9:01 CE 42 02 F0 BF 47 52 12
0B01:BE 4C 11 C0 C9 05 F0 AD A9
0B09:20 01 12 3C 23 E4 9F 20 81
0B11:A0 0E D4 2C B6 87 18 09 65
0B19:8D 1B D1 C9 30 90 28 C9 71
0B21:3A B0 24 C8 E2 32 82 EF 66
0B29:20 19 14 99 3D 13 4F F6 7D
0B31:15 3C D9 0D 4C 8D 0A 73 0D
0B39:06 F0 8B 6E 21 60 08 3A BB
0B41:10 51 42 18 15 12 90 52 E1
0B49:B8 38 A9 AF ED 94 0E A9 81
0B51:19 ED 79 0E 1B 7E B5 C0 7E
0B59:F0 A0 6D B6 02 5E 1F 60 51
0B61:10 00 C2 AD E9 10 00 5D 9F
0B69:B3 73 00 31 D0 DB D4 02 EA
0B71:B2 02 D0 D3 98 50 61 E1 63

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0B79:41 1A 84 A6 C9 07 D0 F5 B3
0B81:A9 99 FB 6D AE F4 E8 6C B0
0B89:64 0A F1 76 00 D0 05 78 BF
0B91:14 A3 F1 08 11 F0 18 B5 8B
0B99:CF 63 1D 39 40 E1 61 56 4A
0BA1:20 80 88 87 73 CD 43 90 5B
0BA9:51 40 32 45 6B 90 33 02 19
0BB1:B0 CD 02 B0 03 4C A5 82 F5
0BB9:3D 97 92 04 60 1D F0 2D 6D
0BC1:C9 9D F3 42 08 0D F0 9F BC
0BC9:4C 6A 0B ED C9 02 B0 07 9F
0BD1:50 3E 14 2F C5 60 41 00 47
0BD9:83 45 ED 46 65 46 4C 84 86
0BE1:14 3B 0B 20 16 0B 4C 1C C5
0BE9:0B 08 4F 02 95 D4 C6 79 98
0BF1:64 C0 C4 D7 47 06 5C 3C C7
0BF9:36 0A 19 FE 60 C8 4C 05 84
0C01:0C BA D5 8C 66 C0 80 F6 7F
0C09:6D 78 85 FD E8 85 FE 87 69
0C11:5E E7 E4 79 9D DC 07 02 F6
0C19:08 A0 C9 88 C3 D0 88 28 B9
0C21:28 38 05 19 44 D0 0B 28 31
0C29:21 3E 19 C4 1C 9A 84 60 85
0C31:E9 35 0C EB 38 7A 0D 18 A9
0C39:87 AE 69 F9 C8 AD 21 69 36
0C41:10 8E 0C 44 03 41 9C 12 33
0C49:E7 7F ED 9E AC E2 09 44 24
0C51:AE 1A 05 28 F3 6C EA 41 D2
0C59:07 34 30 81 28 CD 91 23 DE
0C61:90 56 A9 AF CC 00 82 10 03
0C69:14 81 14 62 8A 22 50 80 92
0C71:7C B1 FB DD BB F0 27 27 A8
0C79:4E B0 87 34 08 AD 13 0C 42
0C81:00 14 2C 20 36 0C CD AC 50
0C89:FA DE AD AD 02 CD AB 19 1F
0C91:D0 D6 80 78 2C BB 30 1C 2C
0C99:98 0C E8 EC 18 D5 DD B4 75
0CA1:0A A0 34 98 00 88 44 0C AD
0CA9:4C B5 0C 60 A9 04 08 87 D1
0CB1:0A 61 79 0C 42 ED 20 4E 6F
0CB9:0A CE B7 8D B2 94 11 4A AE
0CC1:4F 4E F0 D5 C9 59 D0 6E 84
0CC9:3D A5 FB ED AA 19 35 2F 9B
0CD1:E9 1C F3 22 10 E6 1A 95 6C
0CD9:80 01 A2 04 A0 07 B7 31 C8
0CE1:E0 A2 01 7A 88 C3 07 E0 1D
0CE9:00 A2 11 57 C9 C9 25 BA BC
0CF1:02 A9 01 CC B9 20 FE 45 F3
0CF9:41 A7 6E EC C8 04 8C 47 EF
0D01:0D E7 20 79 0F 7C 04 0B 96
0D09:20 6C AF 02 B0 63 F5 53 B6
0D11:36 F1 1B E2 42 20 88 CA C2
0D19:22 1F 08 93 99 EE 18 BD BC
0D21:92 F4 A9 E8 BD 5A 16 85 8E
0D29:A0 A2 09 20 CE 0E 20 5E AC
0D31:D7 12 45 BA EE 72 B0 05 B7
0D39:63 0B 1A CC 1A 30 D0 F5 01
0D41:AA 81 16 A9 1D 91 FD C8 62
0D49:4C C8 E0 E9 E0 52 CE F6 5B
0D51:70 12 31 4A E5 11 70 61 A8
0D59:02 71 06 FA 40 8C 17 C5 69
0D61:84 71 0B C5 84 E1 A9 3F 16
0D69:D5 3E 76 0C 01 7B 1C 11 CC
0D71:90 CF C9 3A B0 CB D9 1E 2B
0D79:D0 3B DA E0 C9 31 D0 BD A6
0D81:81 32 C9 30 90 B6 C9 39 51
0D89:B0 B2 0D 2F 26 AC B2 AA 31
0D91:9B 02 F0 1B AD 34 BF 49 D0
0D99:A3 A3 18 6D 0A 2A 7C 60 9A
0DA1:95 E0 F0 12 4C EF 0D AD E7

```

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0DA9:36 E0 C4 84 18 69 0A 99 0C
0DB1:A1 19 4C 53 C3 39 B9 72 8A
0DB9:12 7C 13 20 23 71 63 3C 42
0DC1:0F 4C 7F 0E 3C BD 81 A0 C3
0DC9:AD B5 02 B7 F5 60 4C 50 FD
0DD1:0D AE 16 AD 5E E0 21 14 88
0DD9:20 8A 12 38 75 CC 09 02 5F
0DE1:0D 8F 5D D0 E0 01 0D D0 15
0DE9:F6 3C 46 C0 B8 87 FF 22 69
0DF1:7B E4 48 20 0D 84 B1 FB E7
0DF9:C9 2A D0 F2 20 0B 09 8A 96
0E01:97 10 11 06 72 4C D2 B4 8E
0E09:3C 49 20 34 11 A9 10 8D B9
0E11:A7 05 97 E9 10 1F 34 09 42
0E19:35 A0 03 35 9F 0C A0 9F B9
0E21:79 08 17 20 D5 0A 29 C4 CE
0E29:05 8D BA 02 4C 1F 0A 20 B5
0E31:83 8B 7F CD 55 F3 55 80 64
0E39:A2 EE 55 62 71 58 66 C8 B5
0E41:81 A9 E9 85 FB 18 A2 09 AC
0E49:FC AE A5 AC 21 1C FB 20 A0
0E51:D8 9D 07 20 E0 70 01 06 F4
0E59:D0 A9 AF 8D AD 49 00 07 B0
0E61:AE 19 C4 AA D4 2C E9 88 12
0E69:00 68 8D FE 18 8D AB 19 A8
0E71:8D AC 19 60 20 F5 11 20 2D
0E79:98 12 48 B7 0D F0 20 D9 45
0E81:12 18 AD EA 18 69 03 A2 20
0E89:EB A0 18 9E CF 0F E4 CC 02
0E91:0F 34 33 0F 4C 73 19 17 13
0E99:48 E0 BB 4C AD 0E A7 B4 F7
0EA1:20 D0 8D 21 D0 DB 2A 1A 2A
0EA9:A2 A2 92 A0 10 20 BD EC 7D
0EB1:A2 08 59 B9 20 BA 90 C0 B5
0EB9:83 10 08 20 B4 18 6F 85 09
0EC1:B9 20 96 87 92 00 C1 BE E6
0EC9:20 A5 FF C9 30 D0 B7 20 50
0ED1:AB FF A2 2E 77 00 B8 E2 0B
0ED9:57 E0 60 DA 20 C9 78 00 AC
0EE1:9A 40 D0 2F AD B2 07 5C 0B
0EE9:85 F3 29 28 0C 86 38 0D 65
0EF1:B0 A8 20 3F 65 A0 AA 51 DC
0EF9:20 93 A8 38 A0 32 30 02 D3
0F01:82 F0 23 22 C9 50 10 A5 78
0F09:CB C9 03 F0 0F C9 06 E3 7E
0F11:5F 70 90 C1 07 07 71 74 D4
0F19:B1 02 4C 2C E2 01 81 85 16
0F21:4C 26 10 1E 20 C6 FF A9 98
0F29:02 20 C3 19 70 00 D1 34 B5
0F31:4C 44 12 24 D5 8E 68 12 D6
0F39:A2 09 8E 2C A0 B0 85 20 72
0F41:DD 1A 08 AD 39 FD BD 1D 3A
0F49:90 C0 1E F0 02 AD 2B FD CD
0F51:DA 10 8D F1 02 C8 D0 E3 6A
0F59:98 CA F0 11 C9 B0 F0 03 9B
0F61:8D B0 2E 2C F2 02 30 05 FF
0F69:AD EF 02 F0 05 29 7F A0 16
0F71:9C AC CA 10 C4 60 01 00 0D
0F79:0A 00 64 00 E8 03 10 27 C3
0F81:E7 18 45 A9 0F 0D F9 A9 27
0F89:FF 8D 00 94 04 14 8D 01 E0
0F91:46 41 20 1D 85 4A A1 00 91
0F99:30 60 FF D0 FB 63 11 40 C4
0FAl:00 11 CB 4D 4B D0 EE A9 77
0FA9:40 8D 04 04 70 1C AD 21 7C
0FB1:00 59 0C 02 C9 02 D0 06 DD
0FB9:A9 00 8D 18 D4 60 A9 07 62
0FC1:4C F4 60 3A 5C 9B 4E 0A EA
0FC9:C0 E1 9B 11 92 D5 50 C6 98
0FD1:17 03 3B D4 0F 44 12 3C DA

```

```

0FD9:10 A7 F7 40 C4 13 03 71 D6
0FE1:BA 0F 44 86 47 4C C7 CE DB
0FE9:43 0D 3C 42 09 F5 40 C4 FD
0FF1:18 E3 95 41 BE 33 43 7E A3
0FF9:07 09 2C 71 ED EC 65 78 E0
1001:E8 81 E4 AC C4 11 B3 54 83
1009:F0 4F 43 19 3C 0D 24 F1 BF
1011:F4 C4 53 A3 16 29 8F 43 39
1019:0A 3C 2F 62 F3 40 C4 0F 92
1021:03 B1 E1 91 92 E3 11 15 DF
1029:8F 47 77 3D 1E 71 58 15 22
1031:66 A2 11 B9 52 78 15 10 99
1039:CF 51 D9 B3 04 A8 17 58 55
1041:1B 48 3B 0D 20 72 03 48 52
1049:20 F5 34 C4 DC D3 10 0B 2B
1051:4F 43 C0 3C 0D 1C F1 74 F6
1059:14 0F A5 16 D5 C3 1B CE 20
1061:4C E5 10 83 0D 00 21 33 39
1069:00 C0 08 D0 F5 9A 40 7A DC
1071:12 84 36 C9 59 F0 07 C9 85
1079:4E F0 06 4C 9B 1F 77 01 CB
1081:11 08 00 D9 A5 FD 69 12 D3
1089:40 05 A5 FE 0A 02 FE 60 66
1091:A9 FF 85 FD A9 18 85 FE CE
1099:8E D7 14 09 18 AD 15 01 AC
10A1:A0 02 B2 02 60 17 5B FC 1C
10A9:6E 1C 4C EC 2C 14 DE 19 E8
10B1:9F A9 05 44 90 3E 43 90 85
10B9:91 9D 91 01 C4 20 E4 FF BC
10C1:C9 0A 96 F9 8D 90 C9 81 89
10C9:B0 5A C9 14 F0 3D C9 0D 70
10D1:F0 24 C9 20 F0 E6 C9 22 84
10D9:F0 E2 C9 2C F0 DE C9 7B 39
10E1:B0 DA AD BC 02 87 0F 1E FC
10E9:A2 CC A7 02 F0 CF 95 CA 60
10F1:49 13 F2 28 28 00 F0 BF 3F
10F9:F2 2E 8A 84 0C 0F EE 60 93
1101:06 60 AC A8 C0 01 B0 C1 8B
1109:1C 32 54 38 9A DF E9 E6 E2
1111:02 4C 04 13 08 80 80 4C CF
1119:12 13 71 1A 08 FB E4 19 EB
1121:5A 0A 20 C1 12 6D A4 93 36
1129:9E 91 38 52 B9 EE 18 0C F0
1131:6A EA 27 F4 A9 0D CE 1A B0
1139:0A 43 48 A9 96 67 A2 20 8C
1141:DC 12 BD A1 19 8D E0 32 1B
1149:00 B1 FD C9 1D F0 4F C2 42
1151:23 C0 12 D0 F2 99 46 B0 BF
1159:AD BA 50 35 04 F0 05 A9 F5
1161:60 0D FF 30 66 10 11 32 C1
1169:B1 FB 20 D2 FF 37 1C 38 E1
1171:D0 EE AD B9 02 C9 01 F0 33
1179:0E 18 A5 FB 6D B3 02 85 E0
1181:FB A5 FC 69 00 85 FC 8E 3A
1189:20 B3 12 20 CF 12 CD FE 4E
1191:18 D0 95 60 A9 20 4C C0 D3
1199:40 E1 09 2E 4C E4 13 A9 1E
11A1:00 18 A6 B0 29 AE 0A 2E EF
11A9:90 3C A2 00 BD E5 38 E9 57
11B1:21 22 40 18 BD 88 B1 02 EB
11B9:D0 BD 8D 14 8D C0 05 A0 C0
11C1:00 4C 59 14 95 81 02 6D 87
11C9:B0 42 AD 02 AD B0 02 6D 4C
11D1:B1 02 8D AE 02 C8 CC AF 66
11D9:02 D0 E7 E8 E0 E7 21 C7 6D
11E1:60 A0 05 88 B9 3C C8 99 6F
11E9:40 09 88 C0 00 D0 F3 A9 60
11F1:30 8D 35 03 18 AD CA 09 7C
11F9:69 01 8D 34 03 C9 05 D0 20
1201:DF 4C 28 14 27 03 00 00 B3
1209:00 10 E8 64 0A 01 93 5C 6C
1211:F0 E3 40 96 0F 34 D8 9A AD
1219:2E 2E 47 50 59 41 7F E0 7D
1221:2E 31 39 39 32 D3 8E CC 2E
1229:C3 4F 4D 50 55 BB D0 55 42
1231:42 4C 49 43 41 54 49 4F 24
1239:4E 56 F2 0F C9 21 87 09 54
1241:CC 54 FA 00 90 0B 1C C1 EA
1249:AF C2 0C 95 C0 53 D1 53 1B
1251:68 88 56 45 44 11 11 B5 29
1259:63 C3 31 A7 73 E3 03 34 26
1261:3C 4E 32 7C 3C D7 1A 13 CD
1269:D1 F8 58 F1 33 11 AD F0 09
1271:00 87 8E 38 3C 36 34 7C 6C
1279:3C 32 0C 04 8E 9C 53 78 10
1281:42 36 35 7C 08 33 10 04 F3
1289:3C 1E 66 D3 60 2A 43 23 F7
1291:64 C3 36 27 A4 D2 81 0A 8F
1299:D4 4F 20 D0 52 78 F7 43 B4
12A1:E3 63 C3 37 E7 A3 C3 91 63
12A9:07 CE 78 E4 81 00 19 F1 92
12B1:38 D9 CA 10 08 38 A8 36 6B
12B9:3C 46 3C 9C C1 D3 41 83 42
12C1:70 83 D4 59 03 8C 8D 11 A5
12C9:CC 9F 8D 82 08 4A 81 C1 44
12D1:C1 D9 F0 D8 F0 24 F1 28 1D
12D9:08 20 32 4C 98 4C B0 01 F4
12E1:82 09 88 A6 A2 A3 C2 E3 12
12E9:9A 20 C5 C3 98 61 C6 44 74
12F1:84 00 CC 67 11 0D 11 A8 EF
12F9:81 8C 00 38 96 28 37 2D 76
1301:D1 D1 75 D5 53 C2 D3 90 6E
1309:34 A8 20 D7 43 B3 35 20 98
1311:CB 45 59 0D 00 A6 00 4E 53
1319:1C A1 0D 8D 61 06 A1 79 10
1321:71 20 73 A2 25 88 29 AC EA
1329:F2 96 11 80 F4 68 4F 57 52
1331:8E AD 4E C1 86 87 8D 41 9E
1339:3F 96 AA CC 39 29 0D 4B 9A
1341:8C 6E 41 4D 8F 3F 49 32 84
1349:20 54 4D 3E 43 4F 4E BA D0
1351:02 48 52 44 AC 0C 4F 55 A2
1359:52 AC A0 18 46 93 82 49 38
1361:58 AC 83 73 45 56 EE B4 9C
1369:30 65 49 47 48 40 83 6E 57
1371:86 1D A4 48 05 03 1E 80 2C
1379:B8 65 10 44 D0 70 02 40 28
1381:6D 41 58 49 4D 4D 00 8D 7B
1389:6E 55 4D 42 39 DF 80 88 DC
1391:63 48 41 52 2A 23 20 52 39
1399:4E 50 80 20 2B BA 61 07 1B
13A1:65 41 B0 64 00 49 07 11 6B
13A9:D6 28 31 2D 31 38 29 98 93
13B1:19 04 9A 44 63 69 87 00 CC
13B9:EE 63 76 36 C0 43 45 1C 1C
13C1:C0 2E 0E 0B 99 A9 6F 55 ED
13C9:A0 39 6F 46 20 6D 45 4D 6F
13D1:EE 59 20 21 21 21 1C 62 04
13D9:09 50 6E 4F 24 8D 38 A6 C9
13E1:45 53 45 2C 0A 3E 00 04 38
13E9:00 43 6F 7C 92 C1 7C 63 8E
13F1:2E 23 01 20 98 67 72 65 C6
13F9:73 73 14 70 61 63 65 20 C3
1401:62 61 72 12 0E 39 C7 45 4C
1409:89 C7 E9 86 48 A7 28 43 02
1411:51 3F 1C 20 79 2F 6E DD 7A
1419:55 77 D0 CD 3F 20 93 0D 6F
1421:1C 1D 1D 12 2A 20 71 55 6D
1429:CB 2D 00 63 52 82 3E E0 B2
1431:A1 6E 45 57 A3 9B 77 A7 06
1439:09 5E 36 3C 0C E0 6A 03 C3
1441:E4 43 52 4F 4C 4C DE 88 C5
1449:53 79 A4 EE A0 00 8E 39 58
1451:68 45 41 52 43 48 F4 04 75
1459:1E 20 A4 73 54 82 47 68 08
1461:24 72 45 43 4F 52 14 74 75
1469:4F 20 70 52 49 4E 02 B8 B4
1471:52 88 30 6C 4F 41 44 20 D9
1479:C3 73 41 56 7D 06 61 12 C6
1481:31 64 45 D7 54 82 24 64 DA
1489:49 53 4B 20 66 49 4C 45 CC
1491:20 2A 0D 0D 96 38 BF 53 2F
1499:30 3A 35 D1 11 0F A8 51 93
14A1:8F 93 28 8F 89 14 8F 84 B4
14A9:0A 0F 82 0D 81 2A 2A 2A EE
14B1:CE 60 0E 81 22 00 00 00 44
14B9:C0 00 00 00 00 00 00 00 42

```

Daniel Lightner has had numerous programs published in Gazette. His most recent was File Copier (November 1991). He manipulates his files in Sidney, Montana.

## PIXEL MOVER

By Hong Pham

One of the many interesting features of the VIC-II chip is its ability to support smooth scrolling, both vertically and horizontally. With a single POKE to location \$D011 or \$D016 (53265 and 53270, respectively), the screen will smoothly scroll in a vertical or horizontal direction—but only for seven pixels.

When the seven-pixel limit is reached, a program is required to scroll the screen's contents one character further. BASIC is too slow, however, to move the contents fast enough to prevent annoying jitters.

With Pixel Mover, you can smoothly scroll the entire screen pixel by pixel in eight different directions without any jitters. Or if you like, you can scroll up to eight pixels at a time. Best of all, with Pixel Mover installed, you can do it quite easily with just one powerful SYS command from your BASIC program.

### Getting Started

Because Pixel Mover is written entirely in machine language, use MLX, our machine language entry program, to type it in. See "Typing Aids" elsewhere in this section. When prompted for starting and ending addresses, respond with the following values.

Starting address: CAB0  
Ending address: D001

# PROGRAMS

When you've finished typing in Pixel Mover, be sure to save it to a work disk under the given name because Relocator and Demo, a demonstration program, search for that name.

To activate Pixel Mover, enter the following commands: LOAD "PIXEL MOVER",8,1; NEW; and SYS 51888.

## SYS and POKE Parameters

Because Pixel Mover is totally relocatable, a fixed address should not be used. Instead, use a variable to represent the starting address and use offsets of the variable to access subroutines or memory locations within the program. The default base or starting address is \$CAB0 (51888). For example, if you let SA equal starting address 51888, then SYS 52013 would be written as SYS SA + 125.

### SYS SA

Use this SYS with a variable set to Pixel Mover's starting address to activate the program. An important interrupt program that is necessary for Pixel Mover's subroutines to work is activated once this command is made.

### SYS SA + 51

This SYS will disable Pixel Mover and restore the former interrupt vector.

### SYS SA + 125, *direction, amount*

This scrolls the screen in a direction specified by the first parameter. The following figure illustrates the directional values.

```
7 0 1
 \ | /
6- -2
 / | \
5 4 3
```

The second parameter, a value between 1 and 320, indicates how many pixels to scroll in that direction.

If you are calling this routine from machine language, use JSR SA + \$70 (112). Use the X register to indicate the direction of the scroll, the Y register to indicate the LSB of the amount to scroll, and the accumulator to represent the MSB.

### POKE/PEEK (SA + 87)

This is the shadow location for the VIC-II 53270 location. Read and write to this location instead of the standard 53270 location. For example, to switch to multicolor mode, use POKE SA + 87, PEEK(SA + 87) OR 16 instead of POKE 53270, PEEK(53270) OR 16.

### POKE/PEEK (SA + 92)

Poke or peek to this location instead of using 53265. For example, to switch to hi-res mode, use POKE SA + 92, PEEK(SA + 92) OR 32 instead of POKE 53265, PEEK(53265) OR 32.

### POKE/PEEK (SA + 97)

To change the screen memory or the character memory, poke to this location instead of the standard VIC-II 53272 location.

### POKE 648, *page number*

If you are switching to a new screen memory location, set the corresponding page number to location 648. To determine the page number, divide the screen memory location by 256. The default value for this location is 4 (screen memory set at 1024).

Make sure that the screen location is within the VIC-II's 16K video bank. If there's a need to access memory locations beyond this 16K bank, change the bank accordingly (it's beyond the scope of this article to explain how).

### POKE SA + 700

Poke to this location to set the page number of the buffer screen location. This is the secondary screen where the text is manipulated and then transferred back to the default screen.

When Pixel Mover scrolls the screen by one character, the contents of the default screen are transferred to the secondary screen and then manipulated. Pixel Mover relocates the screen memory to the secondary screen and then transfers the contents in the secondary screen back to the default screen. After this is finished, Pixel Mover defaults back to the original screen memory. Like the default

screen, the secondary screen must be placed in the same bank. When writing large BASIC programs, it's advisable to relocate the VIC-II video bank and screen memory to prevent Pixel Mover from corrupting the BASIC program.

The default value for the location of the secondary screen is \$3C, or decimal 60 (screen memory is at \$3C00, or 15360).

### POKE SA + 706

Set the page number of the color memory buffer location. Pixel Mover copies the contents of the color memory at \$D800 (55296) to a buffer area where the contents are manipulated, and then Pixel Mover recopies them back to the original color memory. Because the color memory can't be relocated and because of the 64's slow speed, colors may smear a bit as the screen scrolls. This problem is easily observed when adjacent contrasting colors are scrolled. Unlike the buffer screen, the color memory buffer can be set to any location in memory provided that it starts on a page. The default value for this location is \$40, or decimal 64 (the buffer location is at \$4000, or 16384).

### POKE SA + 375

Use this command to adjust the vertical scroll delay counter. Slow down or speed up the scrolling speed by increasing or decreasing the delay value (the lower the value, the faster the scrolling speed, and vice versa). The default value is 18.

### POKE SA + 372

This will adjust the horizontal scroll delay counter. The default value is 18.

### POKE SA + 1335

This location adjusts the diagonal scroll speed. The default value is 22.

### POKE SA + 599

Poking this location will set the horizontal scroll wrap on or off. If the argument is a 0, any character that is about to be scrolled off the screen will wrap around and be placed on the next line. Any oth-

er arguments will disable this feature.

### POKE SA + 211

If a 0 is poked to this location, Pixel Mover will scroll the screen one pixel at a time. If any other value is poked to this location, then Pixel Mover will scroll the screen eight pixels at a time.

### Jump Vectors

For every eight pixels scrolled, Pixel Mover performs a JMP to an RTS instruction. You can take advantage of this setup by setting the JMP instruction to jump to your own scrolling routine, such as when you want to display a new line. Be sure to write the new line to the buffer screen and terminate the routine with an RTS. There are four such JMP instructions for the four basic scroll directions: left, right, up, and down. Write the new JMP address to the following offset in low byte, high byte order.

- SA + 608 to move left
- SA + 688 to move right
- SA + 1168 to move up
- SA + 1243 to move down

### A Demonstration

To see what Pixel Mover can do, type in and run Demo. It will demonstrate how different commands can be used to create various effects in your own programs. Demo is written entirely in BASIC. To help avoid typing errors, enter it using The Automatic Proofreader. See "Typing Aids" again. After you've finished typing, be sure to save it to a disk containing Pixel Mover, or the program will crash when you try to run it. If you saved Pixel Mover with some other filename, be sure to use that name in line 40 of Demo.

### A New Location

Pixel Mover was designed to be compatible with other programs, but it resides in an area that's very popular with many other ML programs, such as fast loaders. When Pixel Mover and other ML programs try to use the same memory area, disaster can occur.

Relocator solves this potential problem by relocating Pixel Mover to another area in memory. Since Relocator is written in machine language, type it in

with MLX. At the prompts, respond with the following values.

Starting address: 0801  
Ending address: 0EC8

To relocate Pixel Mover, simply load and run Relocator. When Relocator prompts for a new starting address for Pixel Mover, enter the desired address in hexadecimal. If you know the decimal value but not the hexadecimal value, the following program will convert any decimal value to a hexadecimal equivalent.

```

PE 10 HS = "0123456789ABCDEF": B = 16:
B1 = 2 ↑ B
FP 20 INPUT "ENTER DECIMAL VALUE";N: IF
ABS (N) > B1 - 1 THEN 20
PP 30 NS = "": IF N < 0 THEN N = B1 + N
FF 40 FOR I=1 TO B/4:T = N - (INT (N/16) *
16): NS = MID$(HS,T + 1,1) + NS: N = N/
16
CG 50 NEXT: PRINT NS

```

After Relocator relocates Pixel Mover, insert a work disk to save the new version. If the save is successful, you may exit to BASIC or relocate another copy of Pixel Mover.

### PIXEL MOVER

```

CBA0:78 A9 7F 8D 0D DC A9 81 66
CAB8:8D 1A D0 AD 11 D0 29 7F 2E
CAC0:8D 11 D0 AD 14 03 AE 15 75
CAC8:03 8D 1E CB 8E 1F CB A9 F5
CAD0:FC A2 CA 8D 14 03 8E 15 9E
CAD8:03 AD 18 D0 8D 11 CB 58 0C
CAE0:4C 76 CD 78 A9 81 8D 0E F6
CAE8:DC A9 00 8D 1A D0 AD 1E BD
CAF0:CB AE 1F CB 8D 14 03 8E 0A
CAF8:15 03 58 60 AD 19 D0 8D EB
CB00:19 D0 29 01 F0 17 A9 C8 8D
CB08:8D 16 D0 A9 1B 8D 11 D0 A2
CB10:A9 15 8D 18 D0 A9 01 8D B1
CB18:12 D0 8D BF CC 4C 31 EA 7F
CB20:8E 58 CB 84 27 85 28 20 96
CB28:62 CD 4C 43 CB 20 62 CD 93
CB30:20 F1 B7 8E 58 CB 20 0E 74
CB38:E2 20 8A AD 20 F7 B7 84 4A
CB40:27 85 28 20 57 CB A5 27 30
CB48:D0 02 C6 28 C6 27 A5 28 6A
CB50:D0 F1 A5 27 D0 ED 60 A2 95
CB58:FF F0 15 CA F0 15 CA F0 DD
CB60:21 CA F0 12 CA F0 18 CA 8F
CB68:F0 0F CA F0 0F 4C 95 CC 46
CB70:4C 08 CC 4C 71 CC 4C 7D 63
CB78:CC 4C 89 CC 4C DC CB 4C 41
CB80:45 CC A9 00 F0 0C 20 B9 D4
CB88:CC 20 12 CD 20 26 CC 4C 2D
CB90:D0 CB AD 07 CB 29 07 C9 84
CB98:07 F0 06 EE 07 CB 4C 26 C5

```

```

CBA0:CC 20 12 CD AD 07 CB 29 10
CBA8:F8 8D 07 CB 38 08 20 D0 B0
CBB0:CB 28 B0 0E AD 24 CC C9 90
CBB8:15 90 14 38 E9 14 AA 4C 46
CBC0:2B CC AD 27 CC C9 19 90 99
CBC8:06 38 E9 18 4C BE CB 60 85
CBD0:20 A1 CC 20 B9 CC 20 8D 4B
CBD8:CF 4C AD CC AD 83 CB F0 F1
CBE0:09 20 B9 CC 20 C3 CC 4C FE
CBE8:8C CB AD 07 CB 29 07 F0 E1
CBF0:06 CE 07 CB 4C 26 CC 20 91
CBF8:C3 CC AD 07 CB 29 F8 09 C9
CC00:07 8D 07 CB 38 4C AD CB 38
CC08:AD 83 CB F0 0C 20 B9 CC 03
CC10:20 F7 CE 20 23 CC 4C D0 49
CC18:CB AD 0C CB 29 07 F0 14 9C
CC20:CE 0C CB A9 12 2C A9 12 DE
CC28:AA F0 08 A0 00 88 D0 FD 20
CC30:CA D0 FA 60 20 F7 CE AD F4
CC38:0C CB 29 F8 09 07 8D 0C 0B
CC40:CB 18 4C AD CB AD 83 CB 12
CC48:F0 09 20 B9 CC 20 42 CF 77
CC50:4C 13 CC AD 0C CB 29 07 32
CC58:C9 07 F0 06 EE 0C CB 4C A2
CC60:23 CC 20 42 CF AD 0C CB FF
CC68:29 F8 8D 0C CB 18 4C AD 4C
CC70:CB 20 DA CF 20 08 CC 20 2B
CC78:82 CB 4C F4 CF 20 DA CF A3
CC80:20 82 CB 20 45 CC 4C F4 31
CC88:CF 20 DA CF 20 45 CC 20 3A
CC90:DC CB 4C F4 CF 20 DA CF E8
CC98:20 08 CC 20 DC CB 4C F4 83
CCA0:CF AD 11 CB 29 0F 0D CF DB
CCA8:CD 8D 11 CB 60 AD 11 CB 13
CCB0:29 0F 0D C6 CD 8D 11 CB 43
CCB8:60 A9 00 8D BF CC A9 00 4A
CCC0:F0 FC 60 A2 00 BD 01 FF 41
CCC8:9D 00 FF BD 01 FF 9D 00 50
CCD0:FF BD 01 FF 9D 00 FF BD A4
CCD8:01 FF 9D 00 FF BD 01 D8 78
CCE0:9D 00 FF BD 01 D9 9D 00 CF
CCE8:FF BD 01 DA 9D 00 FF BD 6A
CCF0:01 DB 9D 00 FF E8 D0 CD C8
CCF8:A9 20 8D E7 FF AD 86 02 65
CD00:8D E7 FF 20 CE CF A9 00 67
CD08:F0 05 A2 27 20 D3 CE 4C 5E
CD10:FE CF A2 00 BD FF FF 9D FE
CD18:00 FF BD FF FF 9D 00 FF E1
CD20:BD FF FF 9D 00 FF BD FF EF
CD28:FF 9D 00 FF BD FF 7D 9D 66
CD30:00 F6 BD FF D8 9D 00 FF 7E
CD38:BD FF D9 9D 00 FF BD FF 43
CD40:DA 9D 00 FF E8 D0 CD A9 80
CD48:20 8D 00 FF AD 86 02 8D 70
CD50:00 FF 20 CE CF AD 07 CD ED
CD58:F0 05 A2 00 20 D3 CE 4C 3C
CD60:FE CF AD 88 02 C9 FF D0 B5
CD68:0D A9 FF C9 3C D0 07 A9 6E
CD70:FF C9 40 D0 01 60 AD 88 01
CD78:02 8D 66 CD 85 27 AD 6C B2
CD80:CD 85 28 A5 27 C9 3F 90 33
CD88:0A 38 A5 27 E9 40 85 27 E0
CD90:4C 83 CD A5 28 C9 3F 90 BE
CD98:0A 38 A5 28 E9 40 85 28 02
CDA0:4C 93 CD A5 27 F0 0D 38 AA
CDA8:A5 27 E9 04 85 27 EE C6 CB
CDB0:CD 4C A3 CD A5 28 F0 0D 54
CDB8:38 A5 28 E9 04 85 28 EE F2
CDC0:CF CD 4C B4 CD A9 00 0A AB
CDC8:0A 0A 0A 8D C6 CD A9 00 C6

```

# PROGRAMS

```

CDD0:0A 0A 0A 0A 8D CF CD AD CA
CDD8:18 D0 8D 11 CB 20 AD CC 7E
CDE0:AE 6C CD 8E CA CC 8E 19 51
CDE8:CD 8E FE CE 8E 49 CF 8E A3
CDF0:91 CF 8E 4B CD 8E 7D CF 43
CDF8:8E 6A CD 8E 8E D0 CC 8E 9E
CE00:1F CD 8E 04 CF 8E 4F CF D9
CE08:8E 97 CF 8E 8E D6 CC 8E 53
CE10:25 CD 8E 0A CF 8E 55 CF 59
CE18:8E 9D CF 8E 8E DC CC 8E FC
CE20:2B CD 8E 10 CF 8E 5B CF D8
CE28:8E A3 CF 8E FC CC 8E 32 43
CE30:CF 8E D5 CF 8E C6 CF AE EE
CE38:72 CD 8E E2 CC 8E 31 CD 53
CE40:8E 16 CF 8E 61 CF 8E A9 9E
CE48:CF 8E 83 CF 8E 70 CD 8E 3F
CE50:51 CD 8E 8E 8E CC 8E 37 DE
CE58:CD 8E 1C CF 8E 67 CF 8E 41
CE60:AF CF 8E 8E EE CC 8E 3D D4
CE68:CD 8E 22 CF 8E 6D CF 8E 2A
CE70:B5 CF 8E 8E F4 CC 8E 43 1E
CE78:CD 8E 28 CF 8E 73 CF 8E 13
CE80:BB CF 8E 38 CF 8E 02 CD CF
CE88:AE 88 02 CA 8E 16 CD 8E 83
CE90:46 CF 8E 8E C7 CC 8E FB D5
CE98:CE 8E 94 CF 8E 1C CD 8E DF
CEA0:4C CF 8E 8E CD CC 8E 01 1E
CEA8:CF 8E 9A CF 8E 22 CD 8E 49
CEB0:52 CF 8E 8E D3 CC 8E 07 67
CEB8:CF 8E A0 CF 8E 28 CD 8E 32
CEC0:58 CF 8E 8E D9 CC 8E 0B B0
CEC8:CF 8E A6 CF 8E C9 CF 8E 8D
CED0:D2 CF 60 A0 18 AD 6C CD FF
CED8:8D E4 CE A9 00 8D E3 CE B7
CEE0:A9 20 9D FF FF 18 AD E3 AE
CEE8:CE 69 28 8D E3 CE 90 03 A4
CEF0:EE E4 CE 88 10 EA 60 A2 31
CEF8:00 BD 28 FF 9D 00 FF BD B5
CF00:28 FF 9D 00 FF BD 28 FF AE
CF08:9D 00 FF BD 28 FF 9D 00 CE
CF10:FF BD 28 D8 9D 00 FF BD 5C
CF18:28 D9 9D 00 FF BD 28 DA 18
CF20:9D 00 FF BD 28 DB 9D 00 56
CF28:FF E8 D0 CD A2 27 A9 20 1E
CF30:9D C0 FF AD 86 02 9D C0 E1
CF38:FE CA 10 F2 20 CE CF 4C 63
CF40:FE CF A2 00 BD D8 FF 9D 96
CF48:00 FF BD D8 FF 9D 00 FF A3
CF50:BD D8 FF 9D 00 FF BD D8 33
CF58:FF 9D 00 FF BD D8 D7 9D FD
CF60:00 FF BD D8 D8 9D 00 FF 82
CF68:BD D8 D9 9D 00 FF BD D8 86
CF70:DA 9D 00 FF E8 D0 CD A2 AD
CF78:27 A9 20 9D 00 FF AD 86 D5
CF80:02 9D 00 FE CA 10 F2 20 15
CF88:CE CF 4C FE CF A2 00 BD C3
CF90:00 FF 9D 00 FF BD 00 FF DA
CF98:9D 00 FF BD 00 FF 9D 00 1E
CFA0:FF BD 00 FF 9D 00 FF BD 5A
CFA8:00 FF 9D 00 D8 BD 00 FF B9
CFB0:9D 00 D9 BD 00 FF 9D 00 71
CFB8:DA BD 00 FF 9D 00 DB E8 C2
CFC0:D0 CD A2 07 BD F8 FF 9D 70
CFC8:F8 FF CA 10 F7 60 A2 07 CC
CFD0:BD F8 FF 9D F8 FF CA 10 D4
CFD8:F7 60 AD 27 CC AE 24 CC EA
CFE0:8D F5 CF 8E F7 CF A9 16 10
CFE8:4A AA E8 E8 E8 8D 27 CC 9C
CFF0:8E 24 CC 60 A9 FF A2 FF 13
CFF8:8D 27 CC 8E 24 CC 60 00 C0

```

## DEMO

```

DA 10 REM PIXEL MOVER DEMO
DR 20 REM COPYRIGHT 1992 - COM
    PUTE PUBLICATIONS INTL L
    TD - ALL RIGHTS RESERVED
JD 30 REM
KJ 40 A=A+1:IF A=1 THEN LOAD"P
    IXEL MOVER",8,1
PM 50 SA= 51888:EN= SA+125:XP=
    SA+87:YP= SA+92:D1= SA+
    375:D2= SA+372:WR= SA+59
    9
AS 60 SP= SA+211:TK= SA+51:B1=
    53280:B2= 53281:SC= PEE
    K(648)*256
PR 70 EF= -65536:P= 1000:S2= 5
    1700:C= 0:CK =C:X= 782:Y
    = 781
RJ 80 SP$="{22 SPACES}":REM 22
    SPACES
HA 90 REM ---- ML CHROUT WEDGE
    ----
AH 100 REM (TOTALLY RELOCATABL
    E; SET S2 TO START ADDR
    ESS OF WEDGE)
HR 110 DATA 141,-16,142,-18,14
    0,-20,165,154,201,3,240
    ,9,169,0,162,0,160,0,76
EP 120 DATA 202,241,173,-16,20
    1,13,240,4,201,17,208,2
    36,164,214,192,24,208,2
    30
QD 130 DATA 169,0,170,160,8,32
    ,-112,198,214,32,16,22
    9,76,-15,-65536
CB 140 REM ----
AJ 150 READA:ZA=ABS(A):IFA=EFT
    HEN220
QH 160 CK=CK+ZA:IFSGN(A)=-1THE
    N180
JR 170 POKES2+C,A:C=C+1:POKE B
    1,A:GOTO150
MM 180 IFZA>1000THENZZ=SA+ZA-1
    000:GOTO200
CC 190 ZZ=S2+ZA
FG 200 HI=INT(ZZ/256):LO=ZZ-HI
    *256:POKES2+C,LO:POKES2
    +C+1,HI:C=C+2:GOTO150
DF 210 REM ----
JF 220 IF CK<>7031THEN PRINT"E
    RROR IN DATA STATEMENTS
    !":STOP
AF 230 SYS TK:SYS 65418:SYS SA
MP 240 HI=INT(S2/256):LO=S2-HI
    *256:POKE 806,LO:POKE 8
    07,HI:REM SET NEW VECTO
    R
DQ 250 POKE B1,0:POKE B2,0:POK
    E 648,224:PRINT"{4}
    {CLR}":POKE648,SC/256
PQ 260 POKE SP,0:POKE YP,23:RE
    M ENTER 24 ROW MODE
RR 270 POKE D2,18:SYS EN,0,200
    :POKE D2,30
MA 280 PRINT"{8}{CLR}":GOSUB11
    10
BE 290 PRINT SPC(14)"{13 P}"

```

```

ES 300 PRINT SPC(14)"{5}{RVS}
    {SPACE}PIXEL MOVER "
KE 310 PRINT SPC(14)"{4}{13 Y}
    {8}"
JX 320 PRINT:PRINT "{2 SPACES}
    COPYRIGHT 1992 BY COMPU
    TE PUBLICATIONS"
RD 330 PRINT:PRINT "{3 SPACES}
    WELCOME TO PIXEL MOVER,
    THE SMOOTH"
CR 340 PRINT"SCROLLING PROGRAM
    FOR THE COMMODORE 64!"
GM 350 PRINT"WITH PIXEL MOVER,
    YOU CAN SMOOTHLY"
AG 360 PRINT"SCROLL THE WHOLE
    {SPACE}SCREEN ONE PIXEL
    AT A"
CC 370 PRINT"TIME IN ALL EIGHT
    DIRECTIONS, EVEN"
CK 380 PRINT"FROM BASIC!{YEL}"
GD 390 PRINT:PRINTSPC(6)"PRESS
    A KEY TO CONTINUE...."
EC 400 SYS EN,0,40
DP 410 GETA$:IF A$="" THEN410
MD 420 SYS EN,0,152
SE 430 POKE WR,1:POKE D1,19:PO
    KE D2,19:POKE XP,192:PO
    KE YP,19
FM 440 PRINT"{5}{CLR}":GOSUB11
    20
GP 450 X1=9:Y1=8:GOSUB1170:PRI
    NTLEFT$(SP$,21);
XB 460 PRINT SPC(19)" {6}PRESS
    A NUMBER FROM{5} ";
RG 470 PRINT SPC(19)" {6}1 TO
    {SPACE}8 FOR A
    {7 SPACES}{5} ";
JK 480 PRINT SPC(19)" {6}DIFFE
    RENT SCROLL{3 SPACES}
    {5} ";
XD 490 PRINT SPC(19)" {6}DIREC
    TION. PRESS C {5} ";
GD 500 PRINT SPC(19)" {6}TO CO
    NTINUE....{4 SPACES}{5}
    ";
HC 510 PRINT SPC(19)LEFT$(SP$,
    21);
KH 520 GETA$:IFA$="C"THEN580
XX 530 IF A$="" THEN520
AF 540 V= VAL(A$):IF V<1 OR V>
    8 THEN520
GR 550 IF V=3 THEN SYS EN,2,32
    0:GOTO440
RF 560 IF V=7 THEN SYS EN,6,32
    0:GOTO440
AE 570 SYS EN,V-1,200:GOTO440
KQ 580 PRINT "{5}{CLR}":GOSUB1
    110:POKE YP,23:POKE D2,
    30
XG 590 PRINT"{4 SPACES}THE HOR
    IZONTAL AND VERTICAL"
SB 600 PRINT" SCROLLING SPEED
    {SPACE}CAN BE CHANGED"
FA 610 PRINT"FOR....":SYS EN,
    0,40
ES 620 POKE D1,1:POKE D2,1:REM
    ADJUST DELAY TIMING VA
    LUE

```

```

KR 630 PRINT SPC(11)"FASTER SC
ROLLING...."
FJ 640 SYS EN,0,88:SYS EN,2,32
0
QX 650 POKE D1,40:POKE D2,40
BX 660 PRINT SPC(8)"OR SLOWER
{SPACE}SCROLLING...."
DB 670 SYS EN,0,88:SYS EN,6,24
0
JQ 680 POKE YP,19:POKE D1,18:P
OKE D2,18:POKE WR,0:PRI
NT"{5}{CLR}";:GOSUB1120
JH 690 X1=11:Y1=10:GOSUB1170
RB 700 PRINT "{6}YOU CAN ALSO
{SPACE}HAVE{5} ";
AP 710 PRINT SPC(21)" {6}HORIZ
ONTAL SCROLL{5} ";
CH 720 PRINT SPC(21)" {6}WRAP
{SPACE}ON....{6 SPACES}
{5} ";
RF 730 SYS EN,2,320
PD 740 X1=11:Y1=14:GOSUB1170:P
RINT "{YEL}{2 SPACES}HI
T A KEY.... {5}
{2 SPACES}"
PM 750 GET A$:IF A$="" THEN750
MH 760 X1=19:Y1=13:GOSUB1170:P
RINT "{6} OR OFF."
FQ 770 X1=11:Y1=14:GOSUB1170:P
RINT "{5}++++++"
JR 780 POKE WR,1:SYS EN,6,320
XH 790 POKE SP,1:REM SET TO 8
{SPACE}PIXEL SCROLLING
BB 800 POKE D1,30:POKE D2,30
HB 810 PRINT "{5}{CLR}":GOSUB11
20
AM 820 X1=9:Y1=9:GOSUB1170
XQ 830 PRINT "{6}YOU CAN SCROL
L EIGHT{5} ";
KB 840 PRINTSPC(18)" {6}PIXELS
AT A TIME... {5} ";
AQ 850 PRINTSPC(18)" {6}ENTER
{SPACE}A NUMBER
{6 SPACES}{5} ";
KQ 860 PRINTSPC(18)" {6}BETWEE
N 1 AND 8.{4 SPACES}{5}
";
DA 870 PRINTSPC(18)" {6}PRESS
{SPACE}C TO CONTINUE.
{5} "
EQ 880 GET A$:IF A$="C"THEN930
XS 890 V=VAL(A$):IF V<1 OR V>8
THEN880
CR 900 IF V=3 THEN SYS EN,2,40
:GOTO810
PF 910 IF V=7 THEN SYS EN,6,40
:GOTO810
CX 920 SYS EN,V-1,25:GOTO810
CK 930 POKE YP,23:POKE SP,0:PO
KE D1,18:POKE D2,18:POK
E XP,200
QA 940 PRINT "{5}{CLR}":GOSUB11
10:POKE D2,30
GJ 950 PRINT "{5 SPACES}PIXEL M
OVER SUPPORTS THESE"
KP 960 PRINT "{2 SPACES}FEATUR
E S FOR OPTIMAL COMPATIBI

```

```

LITY"
CE 970 PRINT "{2 SPACES}AND FLE
XIBILITY:":PRINT
JG 980 PRINT "{2 SPACES}{4}*{8}
YOU CAN CHANGE THE SCR
EEN MEMORY"
DR 990 PRINT "{4 SPACES}OR THE
{SPACE}VIDEO BANK AND P
IXEL MOVER"
XF 1000 PRINT "{4 SPACES}WILL A
DAPT TO THESE CHANGES.
"
CB 1010 PRINT:PRINT "{2 SPACES}
{4}*{8} THE {3}PIXEL M
OVER RELOCATOR{8} WILL
"
RG 1020 PRINT "{4 SPACES}RELOCA
TE A COPY OF PIXEL MOV
ER TO"
QF 1030 PRINT "{4 SPACES}ANY LO
CATION IN MEMORY."
QA 1040 PRINT:PRINTSPC(5)"{6}H
IT {YEL}{RVS} SPACE
{OFF}{6} TO RESTART TH
IS"
PD 1050 PRINTSPC(3)"DEMO. HIT
{SPACE}ANY OTHER KEY T
O QUIT."
XA 1060 SYS EN,0,40
AE 1070 GET A$:IF A$="" THEN10
70
XB 1080 IF A$="" THEN230
GH 1090 POKE YP,24:SYS TK:SYS
{SPACE}65418:SYS 65409
:END
CC 1100 REM ----
FG 1110 X1=0:Y1=24:GOSUB1170:R
ETURN:REM PLOT CURSOR
{SPACE}TO BOTTOM OF SC
REEN
AS 1120 POKE YP,PEEK(YP)AND239
QD 1130 PRINT "{HOME}{A}{38 R}
{S}";
JP 1140 FORI=1 TO 23:PRINT "{Q}
++++++
++++++{W}";:
NEXT
PD 1150 ZZ=SC+960:POKE ZZ,109:
FOR I=ZZ+1 TO ZZ+38:PO
KE I,113:NEXT:POKE ZZ+
39,125
KR 1160 PRINT "{HOME}";:POKE YP
,PEEK(YP)OR16:RETURN
BH 1170 POKE X,1:POKEY, Y1:SYS5
8636:RETURN

```

### RELOCATOR

```

0801:0E 08 6E 19 9E 20 28 32 71
0809:30 36 34 29 00 00 00 78 50
0811:A2 FF 9A 20 A3 FD 20 15 32
0819:FD 20 5B FF 58 A2 09 BD B8
0821:6F 0D 9D 00 80 CA 10 F7 27
0829:A9 05 20 D2 FF A9 93 20 6E
0831:D2 FF A9 00 20 90 FF A9 CC
0839:06 8D 20 D0 8D 21 D0 A2 F5
0841:02 A0 09 18 20 F0 FF A9 8B
0849:0F 8D 86 02 A9 AF 20 60 E1
0851:0C A9 98 A0 0D 20 1E AB BF

```

```

0859:20 68 0C A9 0B 8D 86 02 4D
0861:A9 B7 20 60 0C 18 A0 02 42
0869:A2 06 20 F0 FF A9 B5 A0 12
0871:0D 20 1E AB 18 A0 00 A2 74
0879:09 20 F0 FF AD 6E 0D F0 66
0881:03 4C EB 08 A9 DA A0 0D 2B
0889:20 1E AB A0 04 A2 0A 18 87
0891:20 F0 FF A9 03 A0 0E 20 5F
0899:1E AB 20 73 0C 20 73 0C B2
08A1:20 E4 FF F0 FB A9 23 A0 77
08A9:0E 20 1E AB A9 05 A6 BA B0
08B1:A0 FF 20 BA FF A9 10 A2 2B
08B9:78 A0 0D 20 BD FF A9 00 13
08C1:20 D5 FF A5 90 30 04 29 28
08C9:0F F0 1F A9 31 A0 0E 20 64
08D1:1E AB A9 49 A0 0E 20 1E 41
08D9:AB 20 E4 FF C9 59 F0 07 01
08E1:C9 4E D0 F5 6C FC FF 4C 87
08E9:10 08 A9 01 8D 6E 0D A9 33
08F1:5A A0 0E 20 1E AB A9 00 0E
08F9:8D ED 0C 85 CC A9 01 8D C2
0901:86 02 20 E4 FF F0 FB C9 AE
0909:0D F0 21 C9 14 F0 0D A2 BF
0911:0F DD 88 0D F0 20 CA 10 B1
0919:F8 4C 03 09 AD ED 0C F0 D9
0921:E1 A9 14 20 D2 FF CE ED 35
0929:0C 4C 03 09 AD ED 0C C9 4C
0931:04 90 CF 4C 58 09 AE ED 5A
0939:0C 9D EE 0C 20 D2 FF EE 92
0941:ED 0C AD ED 0C C9 04 D0 42
0949:B9 20 E4 FF C9 14 F0 CC 2A
0951:C9 0D F0 D8 4C 4A 09 A9 7E
0959:01 85 CC A9 20 20 D2 FF A8
0961:AE EE 0C AC EF 0C 20 78 3B
0969:0C 8D E6 0C AE F0 0C AC 80
0971:F1 0C 20 78 0C 8D E5 0C 79
0979:20 73 0C A9 71 A0 0E 20 DE
0981:1E AB 20 9B 0A A9 81 A0 E5
0989:0E 20 1E AB A9 00 85 CC 4E
0991:8D ED 0C 20 E4 FF C9 0D 31
0999:F0 26 C9 14 F0 2A C9 20 0C
09A1:90 F1 C9 80 B0 03 4C AE 92
09A9:09 C9 A0 09 E6 AE ED 0C A9
09B1:E0 10 F0 DF 20 D2 FF 9D 3E
09B9:B3 0E EE ED 0C 4C 94 09 A9
09C1:AD ED 0C F0 CE 4C DE 09 25
09C9:AE ED 0C F0 C6 A9 14 20 64
09D1:D2 FF A9 00 9D B3 0E CE 29
09D9:ED 0C 4C 94 09 A9 01 85 2F
09E1:CC A9 20 20 D2 FF 20 73 15
09E9:0C A9 95 A0 0E 20 1E AB 02
09F1:AE ED 0C A0 0D B9 AF 0E B6
09F9:9D B3 0E EE ED 0C E8 C8 B2
0A01:C0 04 D0 F1 18 AD E7 0C 03
0A09:6D E9 0C 8D F4 0C AD E8 C4
0A11:0C 6D EA 0C 8D F5 0C AD AE
0A19:E9 0C AE EA 0C 85 FD 86 A2
0A21:FE A9 00 85 90 AD ED 0C 9A
0A29:A2 B3 A0 0E 20 BD FF A9 12
0A31:05 A6 BA A0 05 20 BA FF F0
0A39:20 0C FF A5 90 30 04 29 5E
0A41:0F F0 03 4C AB 0C A2 05 16
0A49:20 C9 FF AD E5 0C 20 D2 2D
0A51:FF AD E6 0C 20 D2 FF A0 5B
0A59:00 B1 FD 20 D2 FF A5 90 0E
0A61:30 04 29 0F F0 03 4C AB 7C
0A69:0C E6 FD D0 02 E6 FE 38 EB
0A71:AD F4 0C E5 FD 8D F3 0C 93
0A79:AD F5 0C E5 FE 0D F3 0C E1
0A81:B0 D7 A9 05 20 C3 FF 20 99

```

```

0A89:CC FF 20 73 0C 20 73 0C 13
0A91:A9 A1 A0 0E 20 1E AB 4C F4
0A99:DA 08 20 1E 0C 20 A4 0A 37
0AA1:4C D6 0B 18 AD E3 0C 6D F6
0AA9:E7 0C 8D EB 0C AD E4 0C 12
0AB1:6D E8 0C 8D EC 0C A0 00 E9
0AB9:A2 00 B1 FD DD 3B 0D F0 1C
0AC1:2B E8 E0 30 D0 F6 A2 00 6C
0AC9:DD F8 0C F0 10 E8 E0 4F D0
0AD1:D0 F6 91 FB 20 E0 0B 20 B8
0AD9:F4 0B 4C B7 0A 91 FB 20 DE
0AE1:E0 0B B1 FD 91 FB 20 E0 DC
0AE9:0B 4C D8 0A 91 FB 20 E0 EF
0AF1:0B B1 FD 8D ED 0C 20 E6 57
0AF9:0B B1 FD 8D ED 0C 20 E6 67
0B01:0B 38 AD EB 0C ED ED 0C 1F
0B09:8D EF 0C AD EC 0C ED EE A0
0B11:0C 0D EF 0C 90 50 38 AD 13
0B19:E3 0C ED ED 0C 8D EF 0C 43
0B21:AD E4 0C ED EE 0C 0D EF 59
0B29:0C B0 3B 38 AD ED 0C ED 87
0B31:F3 0C 8D EF 0C AD EE 0C ED
0B39:ED E4 0C 8D F0 0C 18 AD 6F
0B41:E5 0C 6D EF 0C 8D F1 0C 80
0B49:AD E6 0C 6D F0 0C 8D F2 0E
0B51:0C A0 00 AD F1 0C 91 FB 4F
0B59:20 ED 0B AD F2 0C 91 FB 1E
0B61:2D ED 0B 4C D8 0A A0 00 59
0B69:AD ED 0C 91 FB 20 ED 0B B3
0B71:AD EE 0C 91 FB 20 ED 0B FB
0B79:4C D8 0A A0 00 B1 FD 8D 87
0B81:ED 0C C8 B1 FD 8D EF 0C D7
0B89:C8 B1 FD 8D EE 0C C8 B1 F3
0B91:FD 8D F0 0C 38 AD EF 0C 4D
0B99:ED E3 0C 8D EF 0C AD F0 F5
0BA1:0C ED E4 0C 8D F0 0C 18 F6
0BA9:AD EF 0C 6D E5 0C 8D EF 55
0BB1:0C AD F0 0C 6D E6 0C 8D C4
0BB9:F0 0C A0 00 AD ED 0C 91 2E
0BC1:FB C8 AD EF 0C 91 FB C8 24
0BC9:AD EE 0C 91 FB C8 AD F0 5C
0BD1:0C 91 FB C8 60 20 1E 0C 2A
0BD9:AD F7 0C 20 33 0C 60 20 F2
0BE1:E6 0B 4C ED 0B E6 FD D0 57
0BE9:E2 E6 FE 60 E6 FB D0 02 6B
0BF1:E6 FC 60 38 A5 FB ED E9 2D
0BF9:0C 8D ED 0C A5 FC ED EA DF
0C01:0C 8D EE 0C 38 AD ED 0C 81
0C09:ED E7 0C 8D EF 0C AD EE 66
0C11:0C ED E8 0C 0D EF 0C B0 79
0C19:01 60 68 68 60 AD E3 0C EA
0C21:AE E4 0C 85 FD 86 FE AD 59
0C29:E9 0C AE EA 0C 85 FB 86 B2
0C31:FC 60 8D ED 0C A9 00 8D 05
0C39:EE 0C 18 AD E9 0C 6D ED F1
0C41:0C 85 FB AD EA 0C 6D EE 6C
0C49:0C 85 FC 18 AD E3 0C 6D 6C
0C51:ED 0C 85 FD AD E4 0C 6D 7A
0C59:EE 0C 85 FE 4C 7C 0B A2 99
0C61:17 20 D2 FF CA D0 FA 38 2F
0C69:20 F0 FF E8 A0 09 18 4C 02
0C71:F0 FF A9 D0 4C D2 FF 8E 44
0C79:F4 0C 8C F5 0C A0 00 AD 90
0C81:F4 0C D9 88 0D F0 03 C8 D5
0C89:D0 F8 98 0A 0A 0A 0A 8D 16
0C91:F3 0C A2 00 AD F5 0C DD 36
0C99:88 0D F0 03 E8 D0 F8 8A 8E
0CA1:0D F3 0C 8D F3 0C AD F3 B6
0CA9:0C 60 A9 05 20 C3 FF 20 95
0CB1:CC FF 20 73 0C A9 31 A0 75

```

```

0CB9:0E 20 1E AB A9 49 A0 0E 21
0CC1:20 1E AB 20 E4 FF C9 59 FC
0CC9:F0 07 C9 4E D0 F5 4C 10 41
0CD1:08 4C 05 0A A9 00 8D 04 AE
0CD9:80 8D 05 80 8D 06 80 6C 30
0CE1:FC FF B0 CA 00 40 4F 05 DF
0CE9:00 40 00 00 00 00 00 12
0CF1:00 00 00 00 00 00 1F A9 F1
0CF9:A2 A0 A5 B5 A1 B1 A4 B4 6D
0D01:A6 B6 B0 F0 90 C9 C5 D5 4E
0D09:C1 D1 D0 A6 B6 85 95 81 75
0D11:91 84 94 86 96 C6 D6 E6 74
0D19:F6 C0 C4 CC E0 E4 EC E9 A2
0D21:E5 F5 E1 F1 69 65 75 61 34
0D29:71 30 10 29 25 35 21 31 0E
0D31:09 05 15 01 11 49 45 55 51
0D39:41 51 AD BD B9 AC BC 20 F3
0D41:CD DD D9 AE BE 4C 6C 8D 6D
0D49:9D 99 8C 8E CE DE EE FE E1
0D51:CC EC ED FD F9 6D 7D 79 A4
0D59:2D 3D 39 0D 1D 19 4D 5D 96
0D61:59 2C 2E 3E 6E 7E 4E 5E 45
0D69:0E 1E A9 A2 A0 00 D5 0C 2E
0D71:10 08 C3 C2 CD 38 30 50 3A
0D79:49 58 45 4C 20 4D 4F 56 E6
0D81:45 52 2E 4F 42 4A 2A 30 4D
0D89:31 32 33 34 35 36 37 38 9B
0D91:39 41 42 43 44 45 46 48 67
0D99:08 12 98 20 50 49 58 45 EE
0DA1:4C 20 4D 4F 56 45 52 20 15
0DA9:52 45 4C 4F 43 41 54 4F D3
0DB1:52 20 92 00 9A 43 4F 50 20
0DB9:59 52 49 47 48 54 20 31 B7
0DC1:39 39 31 20 42 59 20 48 EE
0DC9:4F 4E 47 20 50 48 41 4D 7D
0DD1:2F 56 39 31 31 31 32 32 38
0DD9:00 05 49 4E 53 45 52 54 EB
0DE1:20 57 4F 52 4B 20 44 49 9D
0DE9:53 4B 20 43 4F 4E 54 41 56
0DF1:49 4E 49 4E 47 20 50 49 F6
0DF9:58 45 4C 20 4D 4F 56 45 B6
0E01:52 00 54 48 45 4E 20 50 49
0E09:52 45 53 53 20 41 20 4B D0
0E11:45 59 20 54 4F 20 43 4F 40
0E19:4E 54 49 4E 55 45 2E 2E C9
0E21:2E 00 9F 4C 4F 41 44 49 5E
0E29:4E 47 2E 2E 2E 2E 0D 00 2B
0E31:0D 9E 2D 2D 2D 2D 20 44 96
0E39:49 53 4B 20 45 52 52 4F A1
0E41:52 20 2D 2D 2D 2D 00 00 3F
0E49:54 52 59 20 41 47 41 49 44
0E51:4E 20 28 59 2F 4E 29 3F 7B
0E59:00 0D 9A 52 45 4C 4F 43 6E
0E61:41 54 45 20 41 44 44 52 D3
0E69:45 53 53 20 3A 20 24 00 04
0E71:9F 52 45 4C 4F 43 41 54 BD
0E79:49 4E 47 2E 2E 2E 0D 00 DD
0E81:0D 9A 53 41 56 45 20 46 97
0E89:49 4C 45 20 4E 41 4D 45 5F
0E91:3A 20 05 00 9F 53 41 56 96
0E99:49 4E 47 2E 2E 2E 2E 00 4D
0EA1:41 4E 4F 54 48 45 52 20 30
0EA9:28 59 2F 4E 29 00 2C 50 EC
0EB1:2C 57 00 00 00 00 00 00 B9
0EB9:00 00 00 00 00 00 00 00 D5
0EC1:00 00 00 00 00 00 00 00 DD

```

Hong Pham is the author of Ramdrive 64 (November 1991). He moves pixels in Antigonish, Nova Scotia, Canada.

## BATCH FILE 64

By Cameron Kaiser

Most computers, with the exception of the 64 and 128, offer a provision for running batch files. A batch file contains one or more instructions that are executed as if they were being typed on the keyboard. IBM users will recognize a batch file called AUTOEXEC, the one which automatically executes as the computer is booted.

A batch file is useful because it allows the computer to store and remember sequences and commands for you. Then every time that file is run, the computer executes those commands. For example, you could create a batch file to run a program that requires a special way of starting; it might call for a SYS address that's difficult to remember. All you'd have to do is load the batch file, and it would load the program and issue the necessary SYS command.

### Typing It In

Batch File 64 gives you the power to create batch files that can run on their own, without the batch file creator. The program consists of two sections: BF64, a BASIC program, and Pbox, a machine language routine.

The first part, BF64, is written entirely in BASIC. To avoid typing errors, use The Automatic Proofreader to enter it. See "Typing Aids" elsewhere in this section. Be sure to save a copy of BF64 before you run it.

Pbox is the machine language portion of the program. To enter it, use MLX, our machine language entry program; see "Typing Aids" again. Be sure to save Pbox on the same disk as BF64. Save it with the filename PBAX because BF64 loads that filename when it executes.

### Getting Started

To begin, load and run BF64. On the opening screen, you'll see a reminder about a couple of POKEs and the message indicating 1278 free bytes. We'll look at these later.

You'll then see a prompt that indicates line 1. This is where you enter the first line of your batch file. This can be any legal command, program line, or code found in Commodore BASIC. The only stipulation is that a line must



not exceed 75 characters in length.

When you've finished with the first line, press Return. The computer will pause while it commits the statement to memory. Then a prompt for line 2 will appear.

Enter the second line of your batch file, remembering the 75-character limit. Press Return at the end of the line. Continue in this manner until you've entered all of your desired commands. The computer won't let you exceed the 1278 bytes that are available for these commands. If you exceed that number, you'll get an error message. To determine how many bytes remain, press Ctrl-B on an empty line.

### Type Carefully

Before you press Return, be very sure that what you have onscreen is what you want to see echoed in your batch file. You cannot edit a line once it has been entered into memory.

Another thing to be aware of is that the computer acts as though it were in perpetual quote mode, that odd state where the 64 echoes cursor commands as reversed characters. If you try to cursor back to something on the line you're working on, all you'll get is a bunch of reversed control codes. To go back and change something, use the Del key.

Because the batch file program replaces part of the 64's operating system, you need to turn off Batch File 64 before running some programs. To do this, make sure that the last line of your batch file looks like this next line.

**POKE 788,49:POKE 789,234: final command**

In this case, *final command* is the last command of the program. For example, to run a BASIC program called Spectre, you could use the batch file below. Since RUN is the last command, enter the POKes just before it.

**LOAD "SPECTRE",8  
POKE788,49: POKE789,234: RUN**

When you've finished entering your batch file, press Ctrl-A on a blank line. The computer will ask you if you really want to stop. If you've finished entering commands, press Y. If you wish to continue, press N.

### Saving Files

Insert a disk to save the batch file. The computer will prompt you for a filename and a two-character ID. Enter these. The computer will process the code, save it to disk, and reset itself.

### Running Files

To try out your batch file, load the filename with the ,8,1 extension. If all goes well, you should see SYSC:NEW and the commands of the batch file printed rapidly to the screen and entered into the computer.

Every effort has been made to make sure that Batch File 64 won't interfere with any program it loads. That doesn't mean that it's foolproof, however. Any program that modifies locations above \$CA00 (51712) will cause erratic behavior at best and a complete system crash at worst unless the batch file program has been taken out of the way. If you want to load a program that does this, use a batch file like the one below.

**IF A THEN SYS address  
A=1: LOAD "filename",8,1  
POKE788,49: POKE789,234: RUN**

In this example, *filename* is the machine language program being called, and *address* is its starting address.

### Deleting Files

To delete a batch file, you must erase three files. The first filename is the one that you originally named and saved, the second is the same with M added as its first letter, and the third is BS plus the two-letter ID. For example, if the batch file you created was called ZORBA and the ID was ZB, then you would have to delete the files named ZORBA, MZORBA, and BSZB.

### BF64

```
CP 1 REM COPYRIGHT 1992 - COMP  
UTE PUBLICATIONS INTL LTD  
- ALL RIGHTS RESERVED  
AQ 5 IFA=0THENA=1:LOAD"PBAX",8  
,1  
AX 10 POKE53272,23:POKE648,4:P  
OKE56576,151:PRINT"{CLR}  
{7}{N}{H}{K}";:POKE53280  
,14:POKE53281,6  
XP 20 PRINT"{3 DOWN}BATCH FILE  
CREATOR{DOWN}"  
RB 30 PRINT"ENTER POKE788,49:P
```

```
OKE789,234:"  
FX 35 PRINT"BEFORE THE FINAL C  
OMMAND."  
KJ 40 PRINT  
AH 50 PRINT"{DOWN}1278 BYTES F  
REE":PRINT:BF=1278:LN=1  
HD 60 SPIEL$=""  
HF 70 PRINTLN"{LEFT}:";:POKE20  
4,.  
FR 80 POKE198,0:WAIT198,1:GETA  
S  
JX 90 IFLEN(SPS)=0AND(A$=CHR$(  
13)ANDAS=CHR$(20))THEN80  
MK 92 IFLEN(SPS)=75ANDAS<>CHR$(  
20)ANDAS<>CHR$(13)THEN8  
0  
SE 93 IFA$=CHR$(13)THEN130  
KR 94 IFA$="{A}"THENPOKE204,1:  
POKE212,.:PRINT" ":GOTO1  
90  
KB 95 IFA$="{B}"THENPOKE204,1:  
POKE212,.:PRINT" ":GOTO1  
82  
PK 100 POKE212,1:PRINTAS;  
XH 110 IFA$<>CHR$(20)ANDAS<>CH  
R$(13)THENSPP$=SP$+A$:GO  
TO80  
FS 120 IFA$=CHR$(20)THENSPP$=LE  
FT$(SP$,LEN(SPS)-1):GOT  
O80  
MD 130 POKE204,1:POKE212,.:PRI  
NT" ":SP$=SP$+CHR$(13)  
PD 140 Z=LEN(SPIEL$):IFBF-Z<=0  
THENPRINT"OVERFLOW -- R  
ETYPE LINE OR QUIT":GOT  
O60  
SH 150 FORX=0TOLEN(SPS)-1  
FC 160 POKE51969+(1278-BF),ASC  
(MID$(SP$,X+1,1)+CHR$(0  
)):BF=BF-1  
PA 170 NEXTX:POKE51969+(1278-B  
F),0  
XP 180 LN=LN+1:GOTO60  
RC 182 PRINT"{DOWN}{LEFT}"BF"BY  
TES FREE{DOWN}":GOTO60  
RJ 190 PRINT"{DOWN}VERIFY -- A  
RE YOU FINISHED? (Y/N)"  
HP 200 WAIT198,1:GETAS:IFA$<>  
"Y"ANDAS<>"N"THEN200  
MS 210 IFA$="N"THENPRINT:GOTO6  
0  
RC 220 PRINT"{CLR}{9 DOWN}ENTE  
R A FILENAME FOR THIS B  
ATCH FILE:"  
FX 222 OPEN2,0:INPUT#2,A$:CLOS  
E2:PRINT  
GE 230 PRINT"ENTER AN 2 CHARAC  
TER ID:"POKE204,.  
PR 240 WAIT198,1:GETCS:PRINTCS  
:WAIT198,1:GETDS:PRINT  
DS:POKE204,1:POKE198,0  
XA 250 Q$="M"+A$:SYS57812Q$,8,  
1:POKE193,0:POKE194,202  
:POKE174,253:POKE175,20  
7  
SC 260 SYS62954:POKE51699,ASC(  
"S"):POKE51700,ASC(CS):  
POKE51701,ASC(D$)
```

# PROGRAMS

```

AB 270 OPEN1,8,2,"0:"+A$+",P,W
"
QC 280 PRINT#1,CHR$(0)CHR$(1);
:FORX=51389TO51711:PRIN
T#1,CHR$(PEEK(X));:NEXT
CR 290 CLOSE1
JE 300 PRINT"{CLR}{BLU}10 IFA=
0THENA=1:LOAD"CHR$(34)Q
$CHR$(34)",8,1"
HC 301 PRINT"20 A$="CHR$(34)"S
YSC:NEW"CHR$(34)"+"CHR$(
13):POKE198,9"
MH 310 PRINT"30 FORX=1TO9:POKE
630+X,ASC(MID$(A$,X,1))
:NEXT:C=51712:POKE828,0
"
AK 320 PRINT"40 SYS828"
XC 330 PRINT"SAVE"CHR$(34)"BS"
CSD$CHR$(34)",8"
KX 340 PRINT"{3 DOWN}SYS64738"
XD 350 POKE198,7:POKE631,19:FO
RX=1TO6:POKE631+X,13:NE
XTX:NEW
  
```

## BPAX

```

C8BD:02 02 02 02 02 02 02 02 4F
C8C5:02 02 02 02 02 02 02 02 57
C8CD:02 02 02 02 02 02 02 02 5F
C8D5:02 02 02 02 02 02 02 02 67
C8DD:02 02 02 02 02 02 02 02 6F
C8E5:02 02 02 02 02 02 02 02 77
C8ED:02 02 02 02 02 02 02 02 7F
C8F5:02 02 02 02 02 02 02 02 87
C8FD:02 02 02 02 02 02 02 02 8F
C905:02 02 02 02 02 02 02 02 98
C90D:02 02 02 02 02 02 02 02 A0
C915:02 02 02 02 02 02 02 02 A8
C91D:02 02 02 02 02 02 02 02 B0
C925:02 02 02 02 02 02 02 02 B8
C92D:02 02 02 02 02 02 02 02 C0
C935:02 02 02 02 02 02 02 02 C8
C93D:02 02 02 02 02 02 02 02 D0
C945:02 02 02 02 02 02 02 02 D8
C94D:02 02 02 02 02 02 02 02 E0
C955:02 02 02 02 02 02 02 02 E8
C95D:02 02 02 02 02 02 02 02 F0
C965:02 02 02 02 02 02 02 02 F8
C96D:02 02 02 02 02 02 02 02 01
C975:02 02 02 02 02 02 02 02 09
C97D:02 02 02 02 02 02 02 02 11
C985:02 02 02 02 02 02 02 02 19
C98D:02 02 02 02 02 02 02 02 21
C995:02 02 02 02 02 02 02 02 29
C99D:02 02 02 02 02 02 02 02 31
C9A5:02 02 02 02 02 02 02 02 39
C9AD:02 02 02 02 02 02 02 02 41
C9B5:02 02 02 02 02 02 02 02 49
C9BD:02 02 02 A9 00 20 90 FF 4F
C9C5:A9 02 A6 BA A0 01 20 BA 33
C9CD:FF A9 04 A2 35 A0 02 20 C6
C9D5:BD FF A2 FF A0 FF A9 00 F4
C9DD:20 D5 FF 86 2D 84 2E A9 E0
C9E5:00 85 7A A9 08 85 7B 20 32
C9ED:60 A6 4C AE A7 42 4F 4F 04
C9F5:54 A9 0A 85 14 A9 99 E0 13
C9FD:84 FF 0E A9 00 85 FD A9 EB
CA05:CB 85 FE A9 19 8D 14 03 86
CA0D:A9 CA 8D 15 03 A9 01 85 73
CA15:FB 85 FC 60 A5 FC C9 00 64
  
```

```

CALD:F0 14 A4 FB B1 FD 8D 77 9C
CA25:02 C8 D0 02 E6 FE 85 FC 63
CA2D:84 FB A9 01 85 C6 4C 31 5A
CA35:EA 00 FF 00 7F BB FF 00 2B
CA3D:FF 00 18 00 00 00 00 00 D5
  
```

Cameron Kaiser writes batches of files and other interesting programs in La Mesa, California. □

## TYPING AIDS

MLX, our machine language entry program for the 64 and 128, and *The Automatic Proofreader* are utilities that help you type in Gazette programs without making mistakes. To make room for more programs, we no longer include these labor-saving utilities in every issue, but they can be found on each *Gazette Disk* and are printed in all issues of *Gazette* through June 1990.

If you don't have access to a back issue or to one of our disks, write to us, and we'll send you free copies of both of these handy programs. We'll also include instructions on how to type in Gazette programs. Please enclose a self-addressed, stamped envelope.

Write to Typing Aids, COMPUTE's Gazette, 324 West Wendover Avenue, Suite 200, Greensboro, North Carolina 27408.

Gazette is looking for utilities, games, applications, educational programs, and tutorial articles. If you've created a program that you think other readers might enjoy or find useful, send it on disk to

**Gazette Submissions Reviewer**  
**COMPUTE Publications**  
**324 W. Wendover Ave.**  
**Ste. 200**  
**Greensboro, NC 27408**

Please enclose an SASE if you wish to have the materials returned.

# ONLY ON DISK

Here are the bonus selections available only on May's Gazette Disk.

## Cosmic Freighter 128

By Daniel A. Smith  
 Follansbee, WV

In this graphic adventure game for the 128, you and up to three other players are engaged in a game of cosmic economics. As captains of space freighters, you haul intergalactic freight between planets, trying to earn a buck. Each player starts with \$100,000 to make a down payment on a freighter, pick up a cargo, and buy fuel and supplies. Your destination could be any of 17 planets. Making deliveries to outlying planets pays the largest fees, but there's more danger out there too!

Ion storms and space pirates are two hazards you might face. If you have the cash and can afford them, a Neutroshield and a stealth unit could help you avoid these obstacles.

If you can juggle your fuel supplies, loan payments, and maintenance schedules, you might become an intergalactic tycoon with a fleet of ships. On the other hand, you could wind up as a cloud of orbiting space debris.

## Gazette Gallery

Picture of the Month  
*Desert*  
 By Robert Woodall  
 Rural Hall, NC

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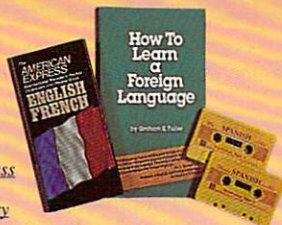
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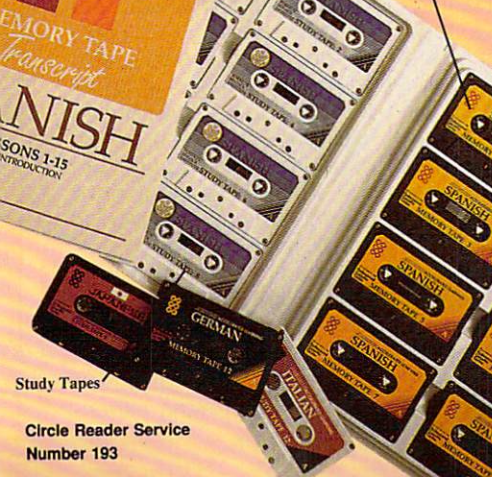
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## PACKARD BELL 520SX

Whether you're thinking about dipping your toes in the home-computing waters or you're already wet and looking to get wetter, the Packard Bell 520SX might be the machine you need. It's easy enough for a novice to use, yet it's powerful enough and packaged with sufficient software to offer a potential step up.

The machine comes with enough software installed for you to start computing quickly, and setup is a breeze. If you've ever set up a computer before, you should be able to handle this one with your eyes closed. The Quick Start Guide covers the most basic MS-DOS commands and contains useful illustrations that show how everything should be put together. If you're a brave and adventurous first-timer, you'll be glad to find that the back of the computer is fairly well marked, with both icons and abbreviations showing where everything is supposed to go. The Packard Bell comes with another User's Manual that goes into a lot more detail than you'll probably ever need. But hang on to it—your computer repair person will need this book to make repairs and upgrades.

The case is sturdy, and it opens easily to a very serviceable layout. Because the 520SX is so well equipped, there are only two reasons you'd ever need to get into the case: to add more memory or to add another expansion card. The case has a warranty seal on it, so if you upgrade before your warranty runs out, you may void it.

The 520SX comes with 2MB of SIMMs (Single Inline Memory Modules) and is up-

gradable to 16MB. The memory modules are easily accessible and should take the novice computer user about an hour to install. Use only high-quality 265K, 1MB, or 4MB × 9MB SIMMs; otherwise, you could have problems with some programs.

backup or remove one of your floppy drives to get a tape backup to work. If Packard Bell had placed its on/off switch somewhere else on the computer, you'd have one more drive bay.

Today's all-in-one motherboards, such as the one



*Easy to set up, easy to use, powerful, and packaged with plenty of software: the Packard Bell 520SX.*

Adequate ventilation can be a concern if you're using your computer in a warm environment. With its roomy case, the Packard Bell 520SX looks as if it will keep cool satisfactorily. Its fan is moderately noisy but not disturbing. Because this machine comes with a 125MB hard drive, a tape backup would be a good next purchase. If you're good with a blowtorch, you might wedge a tape backup system somewhere under the 5¼-inch drive. If not, you may have to look toward an external tape

that comes with the Packard Bell 520SX, have several advantages and disadvantages. The main disadvantage is that if a component on the motherboard goes bad, you could have to replace the entire motherboard—a costly proposition. However, manufacturers say the new boards are cooler and more efficient. (I'd imagine that they're also less expensive to manufacture.) The advantage to the consumer is a smaller computer on the desktop. With so many ports located on the mother-

board, including the keyboard, mouse, parallel, and two serial ports, you have four 16-bit expansion slots left on your computer. The 520SX comes with a modem already installed, leaving you three open expansion slots.

The cost of expanding this computer is only as expensive as your best deal, but be wary of too good a deal. You get what you pay for, and sometimes problems don't crop up until it's too late to point fingers. Sixteen megabytes of RAM should be adequate for most of today's needs, and it will probably be a few more years before most programs you run will be able to utilize that much memory. If you want to add more drives, you'll probably have to replace existing drives with bigger ones or look at external drives. If Packard Bell would just move the power switch, the expansion capabilities would be the same as for most other computers on the market.

The monitor is a high-resolution, 14-inch Super VGA type that has a good set of program utilities to run a variety of software in 1024 × 768 mode. When I ran the 1024 × 768 mode from DOS and then tried to run some other software, the system froze up every time. The Windows 3.0 screen drivers installed easily, however, and Windows ran without a hitch.

The 520SX comes with several nice features. It has its own unique Windows-like opening screen, which experienced computer users will probably discard quickly in favor of Windows 3.0 or their own menu programs. However, this program is an excellent tool for beginners because it protects them from encountering the DOS prompt, which can be a harrowing experi-

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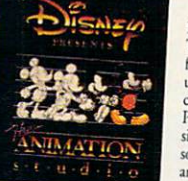


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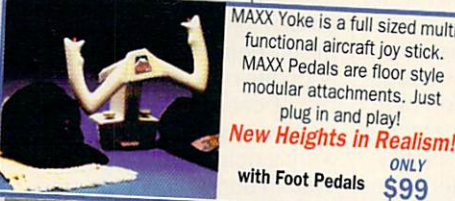
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ence for first-time users.

LotusWorks comes installed and ready to go. Works is a combination word processor with spelling checker and thesaurus, spreadsheet with graphics, database, and communications package. The documentation for Works is printed by Lotus. You'll probably want to get a third-party book on Works; this documentation is awfully dry. The reference guide has a large index which, if scanned, can be more advantageous than reading the book cover to cover.

This computer also sports a mouse and internal modem/fax, both of which worked well in software packages I tested. To test the mouse and modem, I dialed out on Prodigy, which is included with the 520SX. The fax capabilities took a little while to get up and running, and the documentation didn't always match what the software was showing on the screen. I found it easier to figure out using trial and error.

Packard Bell computers seem to be some of the lowest-priced computers around that offer a basic software set to help get you going. Because these computers are sold primarily through deep-discount department stores, the only technical support is by telephone.

Even so, if you want a good starter computer or a powerful upgrade, give the Packard Bell 520SX a look. It's easy to set up and use, and it comes with enough software to satisfy the average home computer user.

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Packard Bell 520SX—\$1,500

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## KID PIX

Brøderbund has come up with another winner in Kid Pix, its well-received kids' paint program available previously for Macintosh computers. The IBM version adds sound to sight, which doubles the kid appeal and makes it fun for adults, too.

The program starts off with a bang—or, rather, a vaudeville-style cymbal shim-

who swallows the last thing you did—and he usually has something to say about it!

One feature that's bound to be very popular with kids is the rubber stamp. This is a collection of more than 100 full-color pieces of clip art that kids can select and add to their pictures. They can even edit them with the Options menu. This should be particularly useful for that large body of children (and

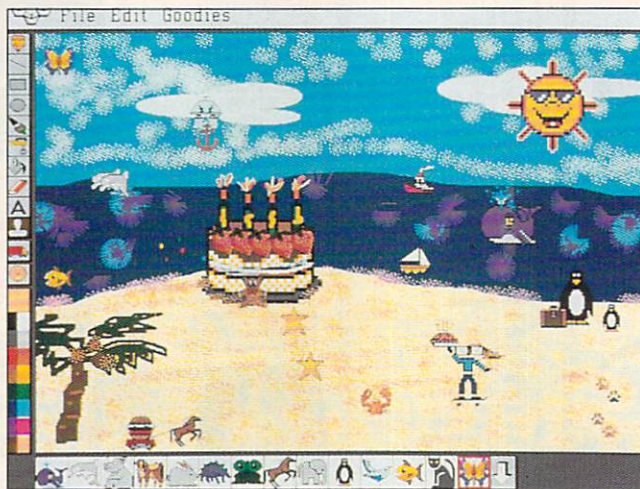
I argue over whose turn it is to play. Your kids will never outgrow this paint program. Even if they get too old to enjoy the sound effects, the art effects are as sophisticated as anything an adult paint program could provide.

BETH ANN MURRAY

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Kids can create drawings and use clip art with Kid Pix.

my. Every time your child clicks the mouse, there's an audible response, even if it's just an exaggerated button-clicking sound. The program uses icons that are caricatures of classic paint icons, plus some special effects found only in Kid Pix.

One of my favorite special effects is the eraser. Brøderbund didn't stick with boring old white erasers—what kid would want that? For example, take the firecracker eraser, an instant hit with my children. What colors! What noise! You can even "erase" a white screen, and it's just as much fun. There's a countdown eraser and several others, but I won't reveal them and spoil your surprise. There's also an "undo" man

adults) who want to make their own art but are really dissatisfied with their own original drawings.

The talking alphabet is fun and educational because your child can see and hear letters. Text can be placed without knowledge of the keyboard; just select the letter, position the pointer, and click.

You must have sound support to get the most from Kid Pix. Brøderbund recommends the Sound Source from Walt Disney Software. In fact, Brøderbund has included a coupon worth \$10 off the Sound Source. Other sound devices are also supported.

This program is so much fun that my four-year-old and

## SUPERPRINT 2.0

Windows has never been known for its speed; the Windows printer drivers in particular seem glacially slow. And if you've done any serious word processing or desktop publishing, you know that the typefaces you see on-screen often look nothing like the typefaces that see print. Windows favors fonts for the printers, relying for its screen fonts on a rather simplistic default set that looks accurate only in a small number of cases.

In a rare example of software's actually speeding up system performance, SuperPrint solves both those problems at once. Incredibly, SuperPrint can make a Hewlett-Packard or compatible laser printer operate at its rated speed when printing under Windows, while at the same time giving you access to thousands of different typefaces and creating screen fonts to match them. SuperPrint intercepts a number of Windows font and print queue routines and replaces

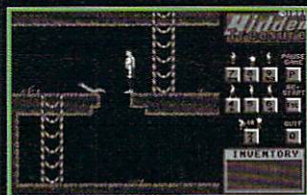
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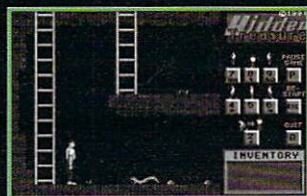
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them with its own, effectively replacing the Windows printer drivers altogether. The catch is that it works "only" on HP-compatible DeskJet, PaintJet, and laser printers; Epson-compatible dot-matrix printers; and Canon laser printers. Chances are that your own printer falls into one of these categories.

Which typeface should you use? While Adobe and Bitstream offer programs that allow you to match screen and printer fonts—albeit much slower than SuperPrint—those companies' offerings work only with their own typefaces. SuperPrint, on the other hand, supports PostScript Type 1, AGFA Intellifont, Bitstream version 2, Bitstream Fontware, DTC Nimbus Q, and HP bitmap fonts. On top of that, SuperPrint's modular design allows you to include other typeface formats if the need arises.

A suite of three programs, SuperPrint comes with several popular typeface families. The installation procedure carefully lets you know what it's doing at each step and allows you to override its choices. After installation, treat SuperPrint like a standard Windows printer driver with extra options. The SuperText and SuperQueue modules appear as icons. When a Windows application displays any text, SuperText checks to see if the font chosen in the application (which is a printer font) has a matching screen font. If not, the screen font is generated automatically.

Since a file is created for the screen font, you should always have a megabyte or two free on your hard disk (ouch!). SuperQueue allows printing to take place in the background—my preference—or in the foreground, where it's somewhat faster.

Foreground printing allows your Windows program to print at your laser printer's rated speed; my HP IIP printed at about four pages per minute.

Surprisingly, earlier versions of SuperPrint were slow at printing text but delivered spectacular per-



First-time buyers will find plenty to like and little to complain about with the Smith Corona Acer PC 330/386SX HD.

formances when paired with graphics-intensive programs. Imagine CorelDRAW! outperforming Microsoft Word for Windows! Thankfully, that all changed with version 2.0, which sucks up soft fonts into its own font cache.

Finally and emphatically, you're not left out if you rely on a dot-matrix printer. I tried SuperPrint with several Windows text editors and word processors and was very happily surprised with the dot-matrix output. Print quality was superb. If you have the free disk space, SuperPrint is that rarest of animals: software that speeds up your hardware and adds new value to old equipment.

TOM CAMPBELL

IBM PC and compatibles, Windows 3.0—\$195

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## SMITH CORONA ACER PC 330/386SX HD

At one time or another, most people acknowledge that they could use a personal computer for *something*. Of

MS-DOS 5.0, and an assortment of desktop accessories, the Acer arrives with this software already installed. The proud owner need only flip through the Getting Started booklet and follow the plain-English instructions. In less than ten minutes, the up-and-running Acer will take users to exactly the software they want or need to run—courtesy of a simple graphical interface. Just point and click on the adeptly fashioned icons or use the function keys to select programs to run.

Most notable of all the software packages provided, Works allows data exchange between the spreadsheet, the database, the telecommunications program, and the word processor. Even the most inexperienced user will soon grasp the principles of opening multiple windows and copying text or numbers from one window to another. The concise paperback manual explains Works' functions in all the necessary detail, but the on-disk walk-through puts a first-time user right in the thick of things. Although the constituent programs seem a bit on the simplistic side, they'll serve the average user quite well. And as an introduction to the principles of word processing, telecommunications, and spreadsheet and database management, these applications can offer a gentle and productive education.

More powerful than the Works word processor, Smith Corona's Personal Word Processor offers most of the features that anyone could need in a text editor. With its online thesaurus, 90,000-word correct-as-you-type spelling checker, and handy keyboard template to remind users of available functions, Personal Word

course, today's extravagance-shy consumer can hardly justify shelling out a few thousand dollars just to organize recipes and manage the home budget. Besides, everyone knows that prices fall as technology matures—why not wait a year and buy today's PC for next to nothing?

But what if you could find a fast machine that comes equipped with everything you need to get started and promises to keep pace with the next generation of software? Well, Smith Corona offers a good reason to buy today—the Acer PC 330/386SX HD.

A prime example of mature technology at an affordable price, the Acer allows even the most uncertain beginners to fulfill their dreams of what a home computer should do almost from the moment they unpack the boxes. Smartly bundled with Smith Corona's Personal Word Processor, Microsoft Works 2.0,



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will quickly become a favorite way both to handle all correspondence and to type all papers.

The Desktop Reference accessories—accessible from Personal Word or the main menu—include a calculator, a calendar/personal scheduler, a spelling checker, and a thesaurus. Selection of these utilities from the main menu may occur via mouse pointer or function keys, but once loaded most programs operate under keyboard control. Newcomers to PCs probably won't miss extensive mouse support, but the Acer has more than enough speed to support a truly graphical environment. I have to wonder why Windows 3.0 didn't earn a spot in the initial software lineup. After all, the only thing more fun than having your brand new computer put you to work immediately is having it do so with mouse-controlled, pull-down menus. Installed later, though, Windows works its usual wonders on the traditionally somber PC operating system. Many purchasers of the Acer will want to consider a trip to the software boutique to pick up a copy of Windows for themselves.

The Acer itself will look right at home in almost any environment. While its gray and white plastic case will hardly win any beauty contests, the exterior of the machine wins some points for simple functioning. No one will mistake the tiny, recessed reset button for the larger, flush-with-the-case power button. Both of these reside on the front of the machine along with a number of indicator lights. The 3½-inch and 5¼-inch high-density disk drives sit to the right of the buttons and indicators. Interior access to the machine poses little difficulty;

the top slides off after you release two latches hidden behind the front panel.

Most people won't need more than the Acer's two internal 16-bit expansion slots, though with the addition of a sound card for game playing and an increasingly necessary modem connected to the serial port, expansion's limited to a single card. A printer connects via its own port, and the included two-button mouse also claims its own socket. The boxy Acer merits a smaller footprint for its slot sacrifices, but purchasers should note that the upper limits of expandability loom on the horizon at all times. Still, with an 80386SX machine running at 20 MHz, 2MB of RAM, and a speedy 80MB hard drive, only jaded PC veterans will complain. The .39-mm dot pitch VGA color monitor, with its nonglare, 14-inch screen, crowns the system. Its crystalline displays will rarely draw a negative comment from anyone. Both the monitor and the computer have a 12-month limited warranty that covers parts and labor.

Running a wide variety of software gave the Acer no trouble at all. Nothing—not even the latest wave of Origin high-end entertainments, not even Windows-based multitasking—caused a crash. Notoriously cranky items of hardware, such as scanners, worked on the first try, and inserting cards into the Acer's expansion slots took only moments. The Acer might not offer many slots, but, unlike some other PCs, this machine willingly accepts and surrenders expansion cards.

In every way a trooper, the Smith Corona Acer PC 330/386SX HD could serve as a model for PC congeniality. Its friendly tutorials will

quelch new-user technofears, and the bundled software affirms that computers can offer some productivity right out of the box. Recommended for the first-time computer shopper, the Acer earns high marks for convenience, reliability, and a benevolent attitude toward its users.

DAVID SEARS

Smith Corona Acer PC 330/386SX HD—\$1,995 SMITH CORONA Consumer Affairs—PC Support 839 Rte. 13 S Cortland, NY 13045 (800) 443-5748

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## PICK 'N PILE

If you like Tetris-style puzzles, you'll go bonkers over Pick 'N Pile, a game of columns and tumbling shapes that leaves your mouse smoking. In this UBI Soft offering, you rearrange colored balls on the screen to create matching columns, which, upon being formed, vanish from the screen. The object is to destroy all the balls on the screen before the timer runs out.

Although all the balls in a column must be identical before they'll vanish, a column can contain bonus objects, which give you more time or boost your score when they disintegrate along with a column. For example, hourglasses add ticks to your countdown timer, bonus-point cubes add to your score, and bonus-multiplier cubes multiply the column's points by a value of 1–6.

Other extra items include bombs that destroy nearby objects, flowerpots that smash anything upon which they fall, fires that multiply rapidly and block columns, and death heads, which accelerate the timer if they touch the bottom of the screen.

Piling balls and objects isn't as easy as just shuffling them around. The higher you pile a column without support from the sides, the more likely it is to tumble. Wall cubes can be placed in supporting positions, but time is valuable, so avoid moves that don't remove balls.

All in all, Pick 'N Pile is a colorful and addictive game that'll delight any puzzle-game enthusiast.

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In Free Spirit's early learning program Barney Bear Goes to School, young children (ages 2–5) keep company with Barney Bear as he gets ready for school. When the scene moves into the classroom, children participate in a variety of gamelike activities involving letters, shapes, words, numbers, and electronic paints.

There are no written instructions to stumble over. A robotic synthesized voice tells chil-

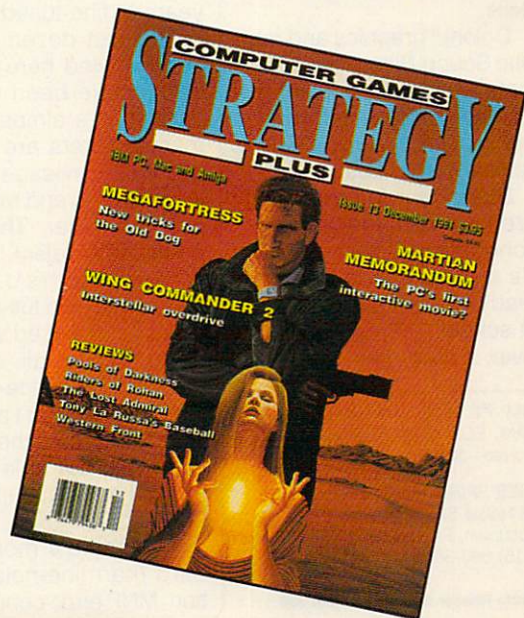
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dren how to proceed. It may suggest they find Barney a shirt of a particular color to wear or a specific breakfast food to eat. It may invite them to play an activity. Whenever youngsters carry out spoken instructions, the voice speaks encouraging words of positive reinforcement.

Even young preschoolers will have fun with Barney Bear. Kids discover several interesting objects to explore. It doesn't take them long to learn that when the cursor changes from a hand pointer to a smiley face, they can select the underlying item—simply by clicking the mouse—to hear a realistic sound effect or music clip. There are words to spell, numbers to count, and 15 black-line pictures to color. The mysterious voice counts to 10 or recites the alphabet, if prompted.

Barney Bear Goes to School is an engaging early learning program reminiscent of Brøderbund's Playroom—though not quite of the same caliber. It introduces preschoolers to computers while building basic skills.

Colorful graphics and realistic Sound Blaster sound effects elicit squeals of laughter. Kids enjoy manipulating the mouse as they explore software activities.

So encourage your children to visit the little red schoolhouse with Barney. It's a great way to get them ready for their own first days at school.

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## U.S. ROBOTICS SPORTSTER V.32/PC

This Cadillac of modems makes my four hours online each day just cruise by. What's so special about this internal modem? For one thing, 9600 bauds. For another

thing, MNP5 compression are implemented. These are techniques that help modems communicate more accurately, and, in some cases, with fewer data bits sent for the same amount of information. Not all services support MNP features. When I connect to America Online, I have to make sure these features are disabled or I have

transmission, then it's an even better choice. This modem won't be obsolete next year or even the year after. It's on the forefront of consumer electronics and will serve you well for years to come.

Since I spend many hours online, this modem is a good investment for me. Rather than send back the one loaned for this review, I'm planning to buy it when the U.S. Robotics rep calls to ask for its return.

RICHARD C. LEINECKER



*Listing at \$549, the U.S. Robotics Sportster V.32/PC isn't cheap, but it's a full-sized, full-featured modem.*

er thing, as close to glitch-free communications as I've ever experienced. It's a well-engineered piece of hardware that will give you many years of fine-tuned service.

The last dozen modems I've installed here at COMPUTE have been compact models. It's almost like the manufacturers are trying to get better mileage by leaving out parts and making the cards smaller. These modems don't reject line noise very well. But this U.S. Robotics modem is a full-size card that's jam-packed with stuff. It combines all of those parts for great line-noise rejection. They don't add to the probability that the modem will break down; in this age of solid-state circuitry, that's unlikely.

And there's more to the card than line-noise rejection. MNP error-control proto-

trouble connecting. The manual offers adequate technical assistance with these problems, though casual computer users may have trouble plowing through the jargon.

The card was simple to install. It comes set for the most common configuration found, COM 1 and IRQ 4. That fit my system perfectly, so I didn't have to mess with switches. But if you do have to make changes, the DIP switches are on the back. That means you don't have to take your computer's case off to change settings.

This modem isn't inexpensive. The list price is \$549, but street prices are lower than that. For many people, the price tag is too high. But if 9600 bauds will save you money in connect charges, it starts to make sense. And if you rely on error-free data

U.S. Robotics Sportster V.32/PC—  
\$549

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Circle Reader Service Number 367

## TOPTRAK

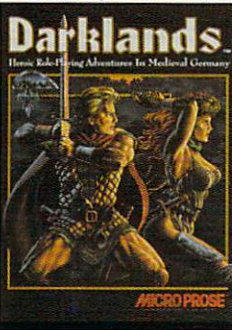
Are you mousebound? Short on scurrying space? Amazed at the maze of paper and equipment your mouse must negotiate? Kraft's sleek and capable Toptrak offers a sensible solution.

I put it on top of my monitor, on my leg, beside a keyboard—anywhere I can find a little spare room. It plugs into either a 9-pin or a 25-pin serial port, and the long cord gives you plenty of room to place it where you need it.

Kraft's memory-resident Speed Panel program lets you adjust sensitivity (how fast the computer responds to movement) up to 1150 dots per inch. Want to use Toptrak with programs that aren't mouse-driven? Try Kraft's Menukey program.

You'll like the way this trackball feels. It's smaller than other trackballs and contoured with rounded corners and a forward-sloping design to fit the hand more comfortably. If you want, you can pick it

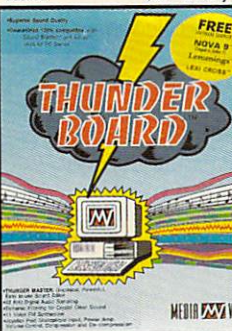
| IBM WARGAMES          |      | IBM STRATEGY          |      | IBM ADVENTURE         |      | IBM SPORTS            |      |
|-----------------------|------|-----------------------|------|-----------------------|------|-----------------------|------|
| Action Stations       | \$29 | Fort Apache           | \$34 | Advnrs Willie Beamish | \$34 | LH Team Disks         | \$15 |
| Amer Civil War 1-3 Ea | \$22 | Genghis Khan          | \$37 | Colonel Bequest       | \$34 | LH League Leaders     | \$15 |
| Battles of Napoleon   | \$32 | Global Conquest       | \$39 | Conquests of Longbow  | \$34 | LH Utility Disks      | \$15 |
| Bismark               | \$42 | Gold of the Americas  | \$12 | Conspiracy Deadlock   | \$34 | Links Golf            | \$37 |
| Blitzkrieg Ardennes   | \$29 | Imperium              | \$26 | Countdown             | \$37 | Links Golf WIN        | \$39 |
| Bravo Romeo Delta     | \$37 | Lemmings              | \$32 | Court Action          | \$29 | Links Course 1-6 Ea   | \$17 |
| Campaign              | \$29 | Lemmings Data Disk    | \$19 | Cruise for a Corpse   | \$34 | Madden Football       | \$21 |
| Carrier Strike        | \$42 | L'Empereur            | \$37 | Deja Vu 2 Lost in LV  | \$12 | Madden Football 2     | \$32 |
| Carriers at War       | \$37 | Lost Admiral          | \$34 | Don't Go Alone        | \$12 | Magic Johnson Fst Brk | \$ 6 |
| Charge Light Brigade  | \$34 | Lost Admiral Scenario | \$23 | Eco Quest 1           | \$34 | Magic Johnson MVP     | \$18 |



**DARKLANDS** draws upon the lore, myths and superstitions of medieval Germany to create a realistic fantasy role-playing game. A new menu system that provides more traditional RPG options than ever before. Characters fight in real-time combat to allow skills that develop them to grow and develop. \$39

|                        |      |                         |      |                           |      |                          |      |
|------------------------|------|-------------------------|------|---------------------------|------|--------------------------|------|
| Civil War SSI          | \$42 | Medieval Lords          | \$37 | Lost Treasures Infocom    | \$42 | Mario Andretti Racing    | \$32 |
| Cohort                 | \$34 | Merchant Colony         | \$34 | Magnetic Scrolls Bndl     | \$37 | ML Basbl Mnggr's Chng    | \$24 |
| Conflict Korea         | \$37 | Nobunaga 1 or 2         | \$37 | Martian Memorandum        | \$37 | ML World Series Disks    | \$17 |
| Conflict: Middle East  | \$37 | Nuclear War             | \$12 | Murder by the Dozen       | \$15 | ML TD 1982 - 1990 Ea     | \$17 |
| Conflict in Vietnam    | \$12 | Operation Combat        | \$15 | Police Quest 1            | \$28 | ML All Stars             | \$17 |
| Decision at Gettysburg | \$29 | Pacific Theater of Oper | \$42 | Police Quest 2 or 3       | \$34 | ML Franchise Disks Ea    | \$20 |
| Fire Brigade           | \$34 | Perfect General         | \$34 | Rise of the Dragon        | \$34 | Microleague Basketball   | \$28 |
| GEN QTRS GAMES         | \$24 | Perfect General Disk 2  | \$23 | Secret Monkey Island 1yga | \$38 | ML Personal Pro Golf     | \$28 |
| Gettysburg:Turning Pnt | \$37 | Populous                | \$21 | Secret Monkey Island 2    | \$38 | ML Football Deluxe       | \$39 |
| Halls of Montezuma     | \$24 | Populous 2              | \$38 | Sex Olympics              | \$24 | ML Ftbl Team Disks       | \$17 |
| Harpoon                | \$37 | Power Monger            | \$34 | Sex Vixens from Space     | \$12 | Michael Jordan Fit Sim   | \$44 |
| Harpoon Set 2 or 3     | \$19 | Power Monger WW1        | \$21 | Space Quest 2             | \$28 | Mike Ditka Football      | \$34 |
| Harpoon Set 4          | \$24 |                         |      |                           |      | NFL Challenge            | \$60 |
| Harpoon Challenger Pak | \$54 |                         |      |                           |      | NFL 1984 - 1987 Ea       | \$15 |
| Kampgruppe             | \$37 |                         |      |                           |      | NFL 1988 - 1991 Ea       | \$22 |
| MacArthur's War        | \$29 |                         |      |                           |      | NFL Proleague Football   | \$49 |
| Panzer Battles         | \$22 |                         |      |                           |      | Nicklaus Signature Edit  | \$42 |
| Patriot                | \$38 |                         |      |                           |      | Nicklaus SE Clip Art     | \$24 |
| Patriot Battle Sets Ea | \$24 |                         |      |                           |      | Nicklaus Unlimited Golf  | \$29 |
| Patton Strikes Back    | \$37 |                         |      |                           |      | Nicklaus Greatest 18     | \$27 |
| Red Lightning          | \$12 |                         |      |                           |      | NG Clip Art              | \$17 |
| Rommel North Africa    | \$24 |                         |      |                           |      | NG Course 1,2,3, 4, or 5 | \$15 |
| Rorka's Drift          | \$34 |                         |      |                           |      | Pete Rose Baseball       | \$ 9 |
| Second Front           | \$37 |                         |      |                           |      | PGA Tour Golf            | \$32 |
| SIM CAN GAMES          | \$36 |                         |      |                           |      | PGA Tour Golf WIN        | \$32 |
| Storm Across Europe    | \$12 |                         |      |                           |      | PGA Tour Golf Disk 1     | \$17 |
| Typhoon of Steel       | \$12 |                         |      |                           |      | PGA Tour Golf Ltd Edit   | \$45 |
| UMS 2                  | \$19 |                         |      |                           |      | Pro Football Analyst     | \$34 |
| UMS 2 Civil War        | \$24 |                         |      |                           |      | Pro Tennis Tour 2        | \$32 |
| UMS 2 Desert Storm     | \$20 |                         |      |                           |      | Reel to the Final Four   | \$37 |
| UMS 2 Planet Editor    | \$20 |                         |      |                           |      | Road Fish'n              | \$12 |
| V for Victory          | \$38 |                         |      |                           |      | Sport of Kings           | \$18 |
| Waterloo               | \$12 |                         |      |                           |      | Tom Landry Football      | \$29 |
| Western Front          | \$37 |                         |      |                           |      | Tony LaRussa Baseball    | \$32 |
| White Death            | \$29 |                         |      |                           |      | T LaR Fantasy Managr     | \$15 |

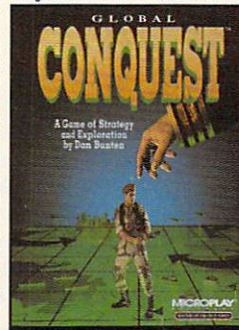
| IBM STRATEGY           |      | IBM ADVENTURE       |      | IBM STRATEGY             |      |
|------------------------|------|---------------------|------|--------------------------|------|
| Armada 2525            | \$32 | Romanc 3 Knqdm tor2 | \$42 | Train                    | \$ 6 |
| Bandit Kings of China  | \$37 | Rules of Engagement | \$37 | Uninvited                | \$12 |
| Battle Isle            | \$32 | Second Conflict     | \$34 | Where Amrcas Pst CSD     | \$37 |
| Breach 2 Enhanced      | \$19 | Siege               | \$38 | Where Europ. USA, time30 | \$37 |
| Breach 2 Scenario Disk | \$15 | Sim Ant             | \$37 | Where World CSD          | \$27 |
| Castles                | \$36 | SimCity             | \$29 | Where World CSD Dlx      | \$49 |



The **'THUNDER BOARD'** is a sound board that is 100% compatible with Soundblaster and Adlib. It reproduces digitized sounds using an 8 bit DAC. Features include dynamic filtering, 11 voice FM music synthesizer, sampling rate up to 22 KHz, microphone input, joystick port, and a 2 watt power amplifier. \$84

|                       |      |                        |      |                         |      |
|-----------------------|------|------------------------|------|-------------------------|------|
| Castles Disk 1        | \$19 | SimCity Graphic 1 or 2 | \$23 | Hardball 3              | \$34 |
| Civilization          | \$39 | SimEarth               | \$41 | Indianapolis 500        | \$17 |
| Command HQ            | \$19 | Star Control 2         | \$37 | International Sports Ch | \$29 |
| Conquered Kingdoms    | \$36 | Starfleet 1 or 2       | \$38 | John Elway's QB         | \$ 6 |
| Crisis in the Kremlin | \$37 | Sword of Aragon        | \$28 | Lakers v Celtics        | \$ 9 |
| Dune                  | \$34 | Task Force 1942        | \$39 | LH 3 in 1 Football      | \$30 |
| Empire                | \$31 | Theatre of War         | \$32 | LH Boxing               | \$30 |
| Empire Deluxe         | \$29 | Traders                | \$32 | LH College Basketball   | \$30 |
| Final Conflict        | \$34 | Visions of Aftermath   | \$12 | LH Full Court Baseball  | \$30 |
| FireTeam 2200         | \$29 | Warlords               | \$29 | LH Hockey               | \$30 |
| FireTeam Const Kit    | \$25 | Worlds at War          | \$29 | LH Pro Basketball       | \$30 |

| IBM ADVENTURE         |      | IBM SPORTS            |      | IBM TRADITIONAL         |       |
|-----------------------|------|-----------------------|------|-------------------------|-------|
| Advnrs Willie Beamish | \$34 | LH Team Disks         | \$15 | GO Master 5 Dlx         | \$109 |
| Colonel Bequest       | \$34 | LH League Leaders     | \$15 | GO Master 5 Dlx WIN     | \$109 |
| Conquests of Longbow  | \$34 | LH Utility Disks      | \$15 | GO Master               | \$34  |
| Conspiracy Deadlock   | \$34 | Links Golf            | \$37 | GO Master 5 DOSWIN      | \$39  |
| Countdown             | \$37 | Links Golf WIN        | \$39 | GO Master 5 Toolkit     | \$39  |
| Court Action          | \$29 | Links Course 1-6 Ea   | \$17 | Grand Slam Bridge       | \$22  |
| Cruise for a Corpse   | \$34 | Madden Football       | \$21 | Jeopardy Silver Edition | \$15  |
| Deja Vu 2 Lost in LV  | \$12 | Madden Football 2     | \$32 | Monopoly                | \$24  |
| Don't Go Alone        | \$12 | Magic Johnson Fst Brk | \$ 6 | Omar Sharif on Bridge   | \$37  |
| Eco Quest 1           | \$34 | Magic Johnson MVP     | \$18 | Penthouse Jigsaw        | \$24  |

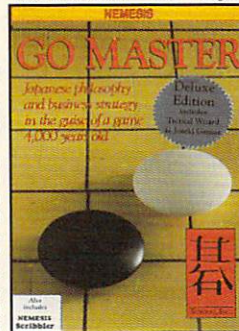


**GLOBAL QUEST** is the first strategy game that allows up to 4 players to compete while exploring a random world via modem, link, or LAN. You face up to four cutthroat computer adversaries, each with a distinct personality. Features 3 world view sizes and control of land, sea & air forces. \$39

|                        |      |                         |      |                     |      |
|------------------------|------|-------------------------|------|---------------------|------|
| Mario Andretti Racing  | \$32 | Risk                    | \$24 | Flames of Freedom   | \$28 |
| ML Basbl Mnggr's Chng  | \$24 | Risk WIN                | \$32 | Hero's Quest 2 or 3 | \$34 |
| ML World Series Disks  | \$17 | Scrabble Deluxe         | \$34 | Hyperspeed          | \$34 |
| ML TD 1982 - 1990 Ea   | \$17 | Shanghai 2              | \$31 | Immortal            | \$27 |
| ML All Stars           | \$17 | Stratego                | \$31 | Lord of the Rings 1 | \$34 |
| ML Franchise Disks Ea  | \$20 | Strip Poker 3           | \$31 | Lord of the Rings 2 | \$37 |
| Microleague Basketball | \$28 | Strip Poker Data 1-5 Ea | \$19 | Loremaster          | \$39 |
| ML Personal Pro Golf   | \$28 | Trump Castle 2          | \$32 | Magic Candle 1      | \$15 |
| ML Football Deluxe     | \$39 | Video Poker DOSWIN      | \$34 | Magic Candle 2      | \$37 |
| ML Ftbl Team Disks     | \$17 | Wheel of Fortune Gold   | \$15 | Matrix Cubed        | \$32 |
| Michael Jordan Fit Sim | \$44 | Wordtris                | \$29 | Mechwarrior         | \$34 |
| Mike Ditka Football    | \$34 |                         |      | Megatraveller 1     | \$16 |

| HINT BOOKS               |      | HINT BOOKS               |      |
|--------------------------|------|--------------------------|------|
| AD&D HINTBOOKS           | \$10 | AD&D HINTBOOKS           | \$10 |
| Bard's Tale 1 - 3 Ea     | \$10 | Bard's Tale 1 - 3 Ea     | \$10 |
| Buck Rogers 1 or 2       | \$10 | Buck Rogers 1 or 2       | \$10 |
| Civilization             | \$16 | Civilization             | \$16 |
| Elvira 1 or 2            | \$10 | Elvira 1 or 2            | \$10 |
| Harpoon Battlebook       | \$19 | Harpoon Battlebook       | \$19 |
| Indy Jones Lst Crsade    | \$10 | Indy Jones Lst Crsade    | \$10 |
| Indy Jones Fate Atlantis | \$10 | Indy Jones Fate Atlantis | \$10 |
| Loom                     | \$10 | Loom                     | \$10 |
| Lord of the Rings 1 or 2 | \$10 | Lord of the Rings 1 or 2 | \$10 |
| Magic Candle 1 or 2      | \$10 | Magic Candle 1 or 2      | \$10 |
| Marian Dreams            | \$13 | Marian Dreams            | \$13 |
| Matrix Cubed             | \$16 | Matrix Cubed             | \$16 |
| Might & Magic 3          | \$10 | Might & Magic 3          | \$10 |
| Planet's Edge            | \$16 | Planet's Edge            | \$16 |
| Populous 1&2 Offcl Str   | \$16 | Populous 1&2 Offcl Str   | \$16 |
| Power Monger             | \$10 | Power Monger             | \$10 |
| Quest for Clues 2, 3or4  | \$21 | Quest for Clues 2, 3or4  | \$21 |
| Railroad Tycoon          | \$10 | Railroad Tycoon          | \$10 |
| Savage Empire            | \$10 | Savage Empire            | \$10 |
| Secret Mnky Islnd 1or 2  | \$10 | Secret Mnky Islnd 1or 2  | \$10 |
| SIERRA HINTBOOKS         | \$10 | SIERRA HINTBOOKS         | \$10 |
| Simcity/Timearth         | \$20 | Simcity/Timearth         | \$20 |
| Starflight 1 or 2        | \$10 | Starflight 1 or 2        | \$10 |
| Strategy Plus 3-11 Ea    | \$ 8 | Strategy Plus 3-11 Ea    | \$ 8 |
| Strat Plus 12-18         | \$ 5 | Strat Plus 12-18         | \$ 5 |
| Ultima 4 - 7 Ea          | \$10 | Ultima 4 - 7 Ea          | \$10 |
| Wizardry 6 Cosmic Frg    | \$12 | Wizardry 6 Cosmic Frg    | \$12 |
| Wizardry 7 Crusade       | \$12 | Wizardry 7 Crusade       | \$12 |
| World Class Soccer       | \$28 | World Class Soccer       | \$28 |

| IBM STRATEGY            |      | IBM STRATEGY            |      |
|-------------------------|------|-------------------------|------|
| 4D Boxing               | \$32 | 4D Boxing               | \$32 |
| 4th & Inches            | \$12 | 4th & Inches            | \$12 |
| 1992 Winter Olympics    | \$32 | 1992 Winter Olympics    | \$32 |
| ABC Boxing              | \$32 | ABC Boxing              | \$32 |
| All American College Fb | \$36 | All American College Fb | \$36 |
| APBA Baseball           | \$28 | APBA Baseball           | \$28 |
| APBA 1908 - 91 Ea       | \$28 | APBA 1908 - 91 Ea       | \$28 |
| APBA Basketball         | \$21 | APBA Basketball         | \$21 |
| APBA Bowling            | \$19 | APBA Bowling            | \$19 |
| APBA Football           | \$49 | APBA Football           | \$49 |
| Bo Jackson Baseball     | \$32 | Bo Jackson Baseball     | \$32 |
| Games Winter Chng       | \$34 | Games Winter Chng       | \$34 |
| Grand Prix Circuit      | \$17 | Grand Prix Circuit      | \$17 |
| Greens                  | \$34 | Greens                  | \$34 |
| Gretsky Hockey 2        | \$34 | Gretsky Hockey 2        | \$34 |
| Gretsky League          | \$26 | Gretsky League          | \$26 |
| Hardball 2              | \$28 | Hardball 2              | \$28 |
| Hardball 3              | \$34 | Hardball 3              | \$34 |
| Indianapolis 500        | \$17 | Indianapolis 500        | \$17 |
| International Sports Ch | \$29 | International Sports Ch | \$29 |
| John Elway's QB         | \$ 6 | John Elway's QB         | \$ 6 |
| Lakers v Celtics        | \$ 9 | Lakers v Celtics        | \$ 9 |
| LH 3 in 1 Football      | \$30 | LH 3 in 1 Football      | \$30 |
| LH Boxing               | \$30 | LH Boxing               | \$30 |
| LH College Basketball   | \$30 | LH College Basketball   | \$30 |
| LH Full Court Baseball  | \$30 | LH Full Court Baseball  | \$30 |
| LH Hockey               | \$30 | LH Hockey               | \$30 |
| LH Pro Basketball       | \$30 | LH Pro Basketball       | \$30 |

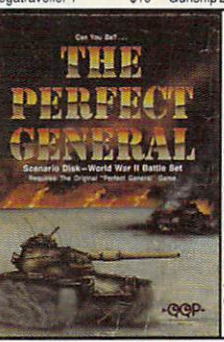


**'NEMESIS GO MASTER 5 DELUXE'** is the ultimate computer GO program. With the simplicity of checkers and the complexity of chess, GO is a serious strategy game. Includes: GO MASTER-a basic GO player and tutor, Joseki Genius adds complex corner openings, Tactical Wizard and the Scribbler. \$109

| IBM TRADITIONAL        |      | IBM ROLE PLAYING        |      |
|------------------------|------|-------------------------|------|
| Amarillo Slim Poker    | \$15 | Bard's Tale 1           | \$15 |
| Battle Chess WIN       | \$29 | Bard's Tale 2           | \$15 |
| Blackjack DOSWIN       | \$34 | Bard's Tale 3           | \$34 |
| Centerfold Squares     | \$21 | Bard's Tale Cnstrctn St | \$31 |
| Check Mate DOSWIN      | \$36 | Battletech 2            | \$31 |
| Chessmaster 3000       | \$32 | Bloodwych               | \$27 |
| Chessmaster 3000 WIN   | \$38 | Buck Rogers 1           | \$12 |
| Dealers Choice Poker   | \$34 | Buck Rogers 2           | \$32 |
| Edward O Thrp Blck Jck | \$29 | Captain Blood           | \$ 9 |
| Femmes Fatale          | \$28 | Captive                 | \$30 |

| IBM AD & D              |      | IBM SIMULATION         |      | IBM SIMULATION           |      |
|-------------------------|------|------------------------|------|--------------------------|------|
| AD&D Bundle             | \$38 | Aces Europe Msn 1 or 2 | \$27 | Strike Commander         | \$45 |
| Champions of Krynn      | \$32 | Allied Forces Bundle   | \$24 | Tank                     | \$37 |
| Curse of Azure Bonds    | \$32 | ATP                    | \$37 | Team Yankee              | \$34 |
| Dark Queen of Krynn     | \$32 | B17 Flying Fortress    | \$39 | Team Yankee 2            | \$29 |
| Death Knights of Krynn  | \$32 | Battlefield 2000       | \$37 | Test Drive 2: Collection | \$34 |
| Dragon Strike           | \$12 | B3c Aldrin Race Spc    | \$37 | TD2 Data Disks 1-4 Ea    | \$15 |
| Dragons of Flame        | \$12 | Design yr own Railroad | \$29 | Test Drive 3             | \$32 |
| Eye of the Beholder     | \$32 | Elite Plus             | \$19 | TD3 Road & Car Disk      | \$19 |
| Eye of the Beholder 2   | \$38 | F17A Nighthawk         | \$42 | TFH & BH1942             | \$44 |
| Gateway Savage Front    | \$32 | F14 Tomcat             | \$26 | Thunderhawk              | \$24 |
| Heroes of the Lance     | \$12 |                        |      |                          |      |
| Pool of Darkness        | \$38 |                        |      |                          |      |
| Pool of Radiance        | \$32 |                        |      |                          |      |
| Secret of Silver Blades | \$32 |                        |      |                          |      |
| Shadow Sorcer2er        | \$32 |                        |      |                          |      |
| Treasurs Savage Front   | \$32 |                        |      |                          |      |
| War of the Lance        | \$ 9 |                        |      |                          |      |

| IBM ROLE PLAYING        |       | IBM ROLE PLAYING        |       |
|-------------------------|-------|-------------------------|-------|
| Celtic Legends          | \$32  | Celtic Legends          | \$32  |
| Champions               | \$38  | Champions               | \$38  |
| CHARACTR EDITORS        | \$16  | CHARACTR EDITORS        | \$16  |
| Conan                   | \$32  | Conan                   | \$32  |
| CyberSpace              | \$29  | CyberSpace              | \$29  |
| Darklands               | \$39  | Darklands               | \$39  |
| Dusk of the Gods        | \$38  | Dusk of the Gods        | \$38  |
| Elvira 1 Mistress Dark  | \$34  | Elvira 1 Mistress Dark  | \$34  |
| Elvira 2 Jaws Cerberus  | \$42  | Elvira 2 Jaws Cerberus  | \$42  |
| Fire King               | \$19  | Fire King               | \$19  |
| Flames of Freedom       | \$28  | Flames of Freedom       | \$28  |
| Hero's Quest 2 or 3     | \$34  | Hero's Quest 2 or 3     | \$34  |
| Hyperspeed              | \$34  | Hyperspeed              | \$34  |
| Immortal                | \$27  | Immortal                | \$27  |
| Lord of the Rings 1     | \$34  | Lord of the Rings 1     | \$34  |
| Lord of the Rings 2     | \$37  | Lord of the Rings 2     | \$37  |
| Falcon 3.0              | \$42  | Falcon 3.0              | \$42  |
| Flight of the Intruder  | \$37  | Flight of the Intruder  | \$37  |
| Flight Simulator 4.0    | \$39  | Flight Simulator 4.0    | \$39  |
| Fly Grand Canyon 3D     | \$45  | Fly Grand Canyon 3D     | \$45  |
| Gand Prix               | \$24  | Gand Prix               | \$24  |
| Gunship                 | \$34  | Gunship                 | \$34  |
| Gunship 2000            | \$39  | Gunship 2000            | \$39  |
| F15 Strike Eagle 2      | \$19  | F15 Strike Eagle 2      | \$19  |
| F15 Strike Eagle 3      | \$44  | F15 Strike Eagle 3      | \$44  |
| F15 SE2 Scenario Disk   | \$17  | F15 SE2 Scenario Disk   | \$17  |
| F19 Stealth Fighter     | \$24  | F19 Stealth Fighter     | \$24  |
| F22 ATF                 | \$39  | F22 ATF                 | \$39  |
| Falcon 3.0              | \$42  | Falcon 3.0              | \$42  |
| Flight of the Intruder  | \$37  | Flight of the Intruder  | \$37  |
| Flight Simulator 4.0    | \$39  | Flight Simulator 4.0    | \$39  |
| Fly Grand Canyon 3D     | \$45  | Fly Grand Canyon 3D     | \$45  |
| Gand Prix               | \$24  | Gand Prix               | \$24  |
| Gunship                 | \$34  | Gunship                 | \$34  |
| Gunship 2000            | \$39  | Gunship 2000            | \$39  |
| Adlib Surround Sound    | \$64  | Adlib Surround Sound    | \$64  |
| Adlib Telephone Module  | \$64  | Adlib Telephone Module  | \$64  |
| Adlib Speakers          | \$45  | Adlib Speakers          | \$45  |
| Flight Stick            | \$13  | Flight Stick            | \$13  |
| Flight Stick w Falcon   | \$46  | Flight Stick w Falcon   | \$46  |
| Sound Blaster           | \$109 | Sound Blaster           | \$109 |
| Sound Blaster Pro       | \$189 | Sound Blaster Pro       | \$189 |
| Snd Blaster Speakers    | \$65  | Snd Blaster Speakers    | \$65  |
| Thrustmaster Joystick   | \$199 | Thrustmaster Joystick   | \$199 |
| Thrustmstr Pro Joystick | \$109 | Thrustmstr Pro Joystick | \$109 |
| Thrustmstr Weap Cntrl   | \$79  | Thrustmstr Weap Cntrl   | \$79  |
| Thunder Board SndBrd    | \$84  | Thunder Board SndBrd    | \$84  |
| Thunder Board Spkrs     | \$15  | Thunder Board Spkrs     | \$15  |



**THE PERFECT GENERAL** is the Perfect General! Includes the following scenarios: Pegasus Bridge, Sicily, Guadalcanal, Kasserine Pass, Gafsa, Anzio, Utah Beach, Omaha Beach, Okinawa, Saipan, Gazala-Bir Hacheim, Iwo Jima, Arnheim, Oahu, and Kharkov. \$23

|                      |      |                     |      |
|----------------------|------|---------------------|------|
| Megatraveller 2      | \$19 | Harrier Combat Sim  | \$ 9 |
| Megatraveller 3      | \$39 | Heros of the 357th  | \$32 |
| Might & Magic 1 or 2 | \$12 | Hyperspeed          | \$34 |
| Might & Magic 3      | \$37 | Jet Fighter 2.0     | \$39 |
| Might & Magic 4      | \$42 | Knights of the Sky  | \$29 |
| Life & Death 1       | \$24 | Life & Death 1      | \$24 |
| Life & Death 2       | \$32 | Life & Death 2      | \$32 |
| M1 Tank Platoon      | \$34 | M1 Tank Platoon     | \$34 |
| Mantis Exprmtl Fgtr  | \$34 | Mantis Exprmtl Fgtr | \$34 |
| Megafortress         | \$37 | Megafortress        | \$37 |
| Megaftrns M          |      |                     |      |

up and operate it with one hand, even more easily if you plug in the optional foot pedal (not the ideal tool for double-clicking). Large left and right buttons above and to the side of the ball give way with relative ease—only slightly harder to press than the buttons on some mice. Pressing the button directly above the ball achieves the same effect as pressing the right and left buttons simultaneously. The fourth button, just above the middle one, comes in handy with programs that involve dragging. You don't have to hold down the left button and operate the ball simultaneously. Just press once to lock the button. Then manipulate the ball and your cursor in the right direction, and press the locked button again to unlock it. Grooves run across it to provide tactile, as well as visual, differentiation from the other buttons.

I found the ball in this trackball a real pleasure to use—smooth and responsive with no skidding or grinding. As far as I can tell, you can't remove the ball for cleaning as you can with other devices, so you'll need to keep this one from getting dirty.

Laptop users, take note. The Toptrak's low-current, compact design makes it a candidate for portable pointing, though it's not as compact as the current crop of notebook-specific pointing devices. If clutter cuts into your productivity and you're tired of mousing around, consider the Toptrak.

MIKE HUDNALL

Toptrak (bundled with foot pedal and TelePaint)—\$99.95

KRAFT SYSTEMS  
450 W. California Ave.  
Vista, CA 92083  
(619) 724-7146

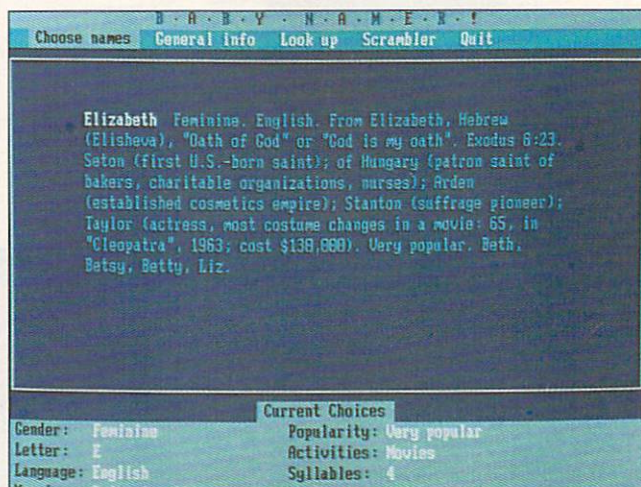
Circle Reader Service Number 368

108 COMPUTE MAY 1992

## BABY-NAMER!

One day you'll probably have to bestow a special name on someone or something—possibly your newborn child. Since I'm a confirmed bachelor, though, babies don't much concern

advice that didn't sway me in any particular direction. The manual's tips on searching proved more useful, and the appendices offer the necessary explanations and descriptions of search categories. Clearly targeted at the expectant couple, Baby-



Give your kid a handle with Baby-Namer!, which gives the expectant parent more than 14,000 names from which to choose.

me. Even so, using StudyWare's Baby-Namer!, I did run across a number of choice monikers for my future cats, dogs, and short story characters.

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## WINDOWS

|              |       |           |       |                   |       |                |       |                |       |          |       |          |       |                   |       |                 |       |                  |       |                    |        |                    |       |                 |       |          |        |      |       |              |       |           |       |              |       |              |       |                |       |                 |       |             |       |
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## WINCONNECT

If you regularly work on both laptop and desktop computers, transferring files between the two, you know what a headache it can be to keep the files in each machine up-to-date. With WinConnect, Traveling Software aims to simplify the process.

WinConnect is a new approach to keeping laptop and desktop files up-to-date without constantly checking file dates and shuttling files back and forth. Other approaches, à la GetC's File Shuttle, use cables to transfer actual copies of files between two computers. File Shuttle's method is convenient in most situations, but deciding which files to shuttle to which computer can be time-consuming, especially if you've made changes to files on both computers.

With WinConnect, you only have one decision to make: Which files have to be ready to travel? Once that decision is made, important files go on the laptop only. Use the 25-foot cable and WinConnect's software to turn the laptop into a file server for the desktop machine. When you need key files, you load them from the laptop server to the desktop client, work on them, and put them to bed on the laptop. Through the magic of WinConnect and the LAST-DRIVE statement, the desktop machine gets fooled into thinking the drives on your laptop are its own extra drives.

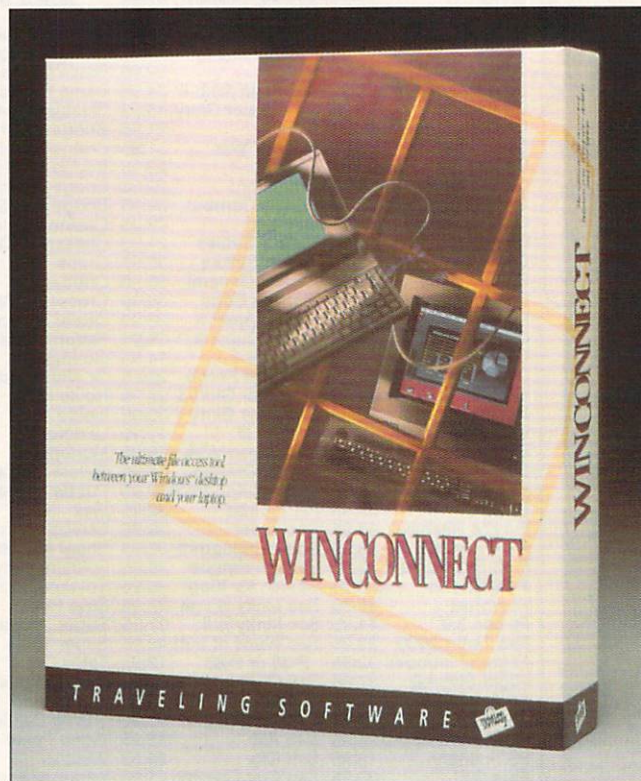
You can use any existing port, COM 1-COM 4 and LPT 1-LPT 3, to link client and server. Data travels over the cable at a default speed of 115,200 bps, but you can only open data files, not run programs that reside on the server. For example, you

would open Microsoft Excel or Lotus 1-2-3 on the desktop client and call a particular spreadsheet from the laptop server. To use the files both on the road and at the office, you need to have Excel or 1-2-3 on both computers. If you want to run programs from the server only,

menu, including a red hDC logo on every control menu on every Windows program you run, no matter who makes it—kind of like having an advertisement inset in every frame of the video you bought . . . and every other video you own. But wait! Before you tear the program off

made actual copies of the server files through File Enhancer, floppies, or a program like File Shuttle. But if you want to forget about updating files when the red phone rings and you have to take the Batplane to Belgium, check it out.

REBECCA ROHAN



*Traveling Software's WinConnect simplifies the process of transferring files from desktop to laptop.*

you need a remote-control program like Carbon Copy Plus. WinConnect includes hDC File Enhancer, which adds a small menu of house-keeping tools so you can delete, copy, move, replace, and append files, and create and delete directories across the cable.

The actual WinConnect software is written by hDC, the people who make First Apps and Windows Express, and adds the same type of additions to the Windows

disk, hunt up MicroApp Manager, choose Options, and select Tear Off to jettison the ads and keep the program. You must uninstall other hDC applications before installing WinConnect so WinConnect can reconfigure the HDCLIB.DLL file.

WinConnect may be just the ticket for having all the files you need ready to go at all times. If someone grabs your laptop and runs, however, you won't have copies on the desktop unless you've

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## XTREE GOLD 2.5

Less than six months after installing a second 30-mega-byte hard disk in my computer, I found that I was running out of space. Time to clean house *again*. I needed serious hard drive help—fast.

XTree Gold 2.5 means serious help for hard disk users. Always a premium hard disk management utility, this version has my head spinning with the scope and magnitude of its features and functions. When it comes to housecleaning, XTree and a mouse can actually make the job seem like fun.

XTree splits the screen into several boxes, giving you information on disk size, volume name, and the files in your currently selected directory. I've always liked XTree's tree-structured display of all the directories and subdirectories on any selected disk. Thankfully, this distinctive feature has survived all updates.

As you move through the graphic display of directories, a list of the files that reside in each highlighted directory appears along the bottom of the screen, just above a display of available





commands. If you'd like to see more of the file list in a given directory, just click the mouse on the directory tree display or hit the Return key, and the tree-structured display will be replaced with a display of all the filenames in the current directory that will fit in the box.

Commands are given to XTree in a number of ways. In fact, you can enter most XTree commands several ways. With the keyboard always active, you can type a command, use a multitude of hot keys, or simply highlight a command with the arrow keys and hit Return.

XTree also supports a two-button mouse (the middle button on a three-button mouse will remain inactive), and if you choose to run it this way, you'll find the program to be one of the most mouse-intensive packages on the market today.

You can drag a highlight down directory listings to select individual files, tag files for action by clicking, or give virtually any program command by clicking directly on the display of available commands.

A series of pull-down menus across the top of the screen gives you full command of all the program's powers and capabilities. Again, you can access these pull-down command menus from the keyboard or with the mouse.

Of course, the number of files residing on most hard disks can overwhelm you when they're all displayed on-screen. That's why XTree makes it easy to sort any displayed list of files by name, extension, date, or size. Within any of those sort categories, you can also choose to reverse the order (from smaller to larger, oldest to newest, and so forth). You can even

choose to display files sequentially, in the order in which they appear in your particular directory path.

I was particularly impressed with the program's Unsort option, which lets you put a file list into the same order you'd see with DOS's DIR command. This might seem insignificant, but most similar disk utilities won't do this, and there are times when you might need your files sorted in this manner. One of those times might be when you use XTree's Print Directory function to generate a hardcopy list of current files.

XTree allows you to split the screen into two displays. This capability is almost a necessity if you want to move files from one subdirectory to the other or search for those pesky duplicate files that grow on your hard disk like mildew in the basement.

When it comes to tracking down duplicate files, XTree doesn't just split the screen into two directory displays and leave you to look for them yourself. The program's Compare function will automatically locate all files with the same names or dates. You can also search for all unique files—files without duplicates—or have it find files of the same name with the newest date or oldest date.

The Compare Directory command will search specified directories on your disk and locate matching files with the same criteria selections that are available in the Compare File command. You can also tell XTree to search selected directories or entire disks for files containing specified text strings. This makes it easier to find, for example, all letters addressed to one company in your Mail subdirectory, even

though that company's name might never appear in the filenames themselves.

But the point of locating all these duplicate and unnecessary files is to find the ones you need to delete or move and clean up all that clutter. With XTree, you can just tag files as you go and then tell the program to take a specified action on the files you've tagged. This can be done file by file, or you can tell the program to tag all files that fit certain criteria. XTree will even tag every file on your hard disk.

Once they're tagged, it's easy to move files to another disk or directory, delete them, or even archive them. You archive with PKZIP and you can compress entire directories or even an entire disk to save space. When you restore the files from an XTree archive, just type the name of the archived file and it self-extracts, re-creating the file structure.

But wait! Before you delete that file or entire directory, you might want to take a peek inside and make sure it's a file you no longer need on your hard drive. In addition to the prodigious number of spreadsheet, database, and word processor formats that you can view with XTree, you can now display graphics files. The formats supported include BMP, DWG, GIF, IFF, LBM, IMG, MacPaint, MSP, PCX, PIC, TIFF, and WPG!

Something in a file that you'd like to change? Load 1Word, XTree's built-in word processor, and make any changes you need. While 1Word doesn't support a mouse, I don't think you'll be too disappointed. 1Word is surprisingly feature-laden for a built-in program.

XTree also includes a program launcher that allows

you to run your favorite programs with the click of a mouse button. Choosing files associated with applications, like DOC files for word processors, will load the application first, then the associated file—a handy option.

XTree Gold 2.5 does so much that all of its features and functions can't possibly be discussed here. Just remember that the program is a large one. You'll need a bit of hard disk space to get it all installed, but installation is so easy and the program is now so complete that I heartily recommend you sacrifice the disk space to harness this workhorse for the betterment of your computer system.

ALAN R. BECHTOLD

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## REMOTE RX

Diagnose computer problems from afar? Thanks to the communications abilities of Remote Rx, that's exactly what you can do. Operate a remote PC almost as if you were running your own, with the ability to copy files between machines and even execute programs on the remote computer. With its diagnostic abilities, you can find out whether the other machine really has an EGA card and not VGA, as the user claims, or if an intermittent bug is due to faulty RAM or bad disk sectors.

The minuscule requirements list for Remote Rx (basically, 256K RAM and any monitor, plus a Hayes-compatible modem) allows you to run the program on just

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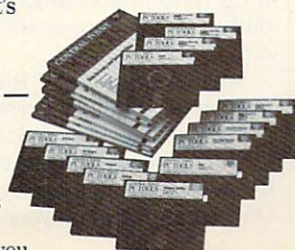
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about any PC you encounter. This PC physician even practices on Novell networks. Remote Rx comes with two sets of disks, one for the controller (local site) and one for the remote site. Merrill & Bryan thoughtfully provided these disks in both 3½- and 5¼-inch low-density format. While the manual explains all its terms and even includes them in a glossary, you should be a reasonably experienced PC user with knowledge of most DOS commands and subdirectories, and a rudimentary knowledge of communications, especially if you plan to service someone else's PC. There isn't an install program; you're directed simply to copy the files into their own directory. The files on the distribution disks are listed in an appendix, along with explanations.

Using Remote Rx, you can test all types of RAM: normal, extended, and expanded. My favorite RAM-test feature displays the bad chip graphically, by its position on the circuit board. You can view and edit the information in your computer's CMOS RAM: system time and date, disk drive types, and so on. The program identifies device drivers, interrupts, the contents of the DOS environment table, and parallel and serial ports. You can test every mode for every common video board, the keyboard, and serial and parallel ports. The last two require simple cap devices not included with the product. Also, you can test the game port, paddles, joysticks, mice, and disk drives. PS/2 users will appreciate PS/2-specific features such as a report of all POS devices installed, by name and ID.

Remote Rx prints snazzy

reports on everything it tests and can test in batch mode while you're away. The user interface is immaculate. Snappy menus sport a well-chosen, customizable color scheme, and the program operates equally well with mouse or keyboard. A handy User menu at the far right of the screen lets you install programs with inspired ease. Any function that doesn't execute instantly can be interrupted, and the help screens offer a print option.

Remote Rx would be a design and documentation tour de force in any software category, but it possesses elegance almost unheard of in a diagnostics program. If you've become the office or neighborhood guru, Remote Rx won't stop midnight calls from distressed PC owners, but it will help you handle them without leaving your home office. My diagnosis: Get Remote Rx, do your good deed, and get back to bed.

TOM CAMPBELL

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## THE WORD PROCESSOR

Sometimes even serious Bible students can find Bible research sheer drudgery that leaves them in a somewhat less-than-devout mood. Fortunately, Biblical Research Systems' THE WORD Processor line of software reduces the tedium of Bible study and allows more time for reflection.

Both browsers and serious students will find THE

WORD Processor software a joy to use. There are six translations available: King James, New International, Revised Standard, New Revised Standard, Spanish, and New King James, each separately available in the Verse Search package.

You can display the Biblical text in full-screen format or in a window sized to choice. If you want to compare versions, different translations may be displayed simultaneously, either side by side or in overlapping windows. Scroll through the text with the cursor keypad, or jump to any part of the Bible by entering book, chapter, and verse using the Verse Search program. When you can't remember chapter and verse, Verse Search goes a concordance one better, allowing you to enter the word or phrase you're looking for and then leap from verse to verse until you find what you want.

Besides the essential Bible text, THE WORD Processor line provides several very welcome study aids as add-ons. If you'd like to follow a theme in a particular verse throughout the Bible, use the Chain Reference program to supply a list of related verses and display the texts on command, or access Librarian for lists of verses dealing with particular Biblical people or topics, or create your own specialized lists. The Personal Commentary add-on replaces cramped marginal notation with plenty of room to write (and, if you like, print out) your own commentary on individual verses.

The Chronological Bible supplement provides a historical outline of events in Scripture and allows you to call up relevant Biblical texts. Once you've finished your re-

search, you can go into the Lesson Editor feature of Librarian to write your exegesis, importing Bible verses as you need them, or you can use your own word-processing software in conjunction with the memory-resident Verse Typist, which lets you import verses from anywhere in the Bible into your own text.

But the real stars in THE WORD Processor's crown may be Greek Transliterator and Hebrew Transliterator, each based on Strong's Exhaustive Concordance. If you don't know the Biblical languages, the transliterators provide the Greek and Hebrew originals and definitions for Biblical words in any verse you choose—or you can trace them by the standard Strong's reference numbers appended to them. Through either transliterator, you can find (for example) that hell is not quite the same place in the New Testament as in the Old, that love may mean anything from simple affection to sacrificial selflessness, and that a son might be either a direct or a remote descendant, depending on the context. The Strong's numbers also show how words relate to or derive from one another, providing more flexibility than a simple interlinear translation.

The ease of Biblical access and the consolidation of research sources make THE WORD Processor's Bible and study aids very valuable tools for pastors and Bible students. Despite its wealth of features, its commands are easy to learn and are backed up by clearly written documentation and a tutorial disk that walks you through its functions. What the printing press began with the increase in Bibli-

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## CALIFORNIA GAMES II

Surf, sand, and sun—they're back in California Games II, a sequel to the original game that matched you up with some of the best dudes and dudettes in the Valley. This time around, you and up to seven other players can play new games with better graphics.

During the hang-gliding competition, you soar over seaside cliffs, performing stunts and throwing water balloons at the targets below. Just like the real thing, it's a lot harder than it looks. Ideally, you'd catch thermals to stay airborne, but it's difficult to read the wind currents when you're on the other side of the computer screen.

You have more control when you're snowboarding. If you survive the cliffs, tree stumps, and rocks, you'll face the Snowbowl and the grassy Obstacle Course. You'll find even more fun things there—like ice patches—to trip you up.

Jet surfing is less backbreaking. You can go through the ramps and course markers like a ghost and not wipe out. Nevertheless, you must stay on the course to earn points. The ramps on the Ramp-O-Mania course give you some excitement and extra points. Because you can spend most of your time finding your way back to the course, however, an overhead view of it during your run would be helpful.

You do have such a view to guide you as you skateboard through the California Aqueduct. That way, you're less likely to smash your face into the wall. If you do, it's a repulsive sight, but it's actually the biggest thrill of the skateboarding competition. After the first tunnel, you skateboard a little too slowly, and the fun of the stunts wears thin.

You could say the same for the bodyboarding competition when the wave breaks. You can easily memorize the obstacle course back to the beach, since it doesn't change. While you're riding the wave, though, you can perform

stunts to some groovin' surf music.

The biggest disappointment of California Games II is that there are no big rewards when you finally finish a competition—no trophies, no hunky dudes or fabulous babes kissing you. You just get to live, and you won't have "fault dude" behind your name on the scoreboard. But with its VGA graphics, colorful lingo, and lively music, California Games II can at least let you pretend you're in California.

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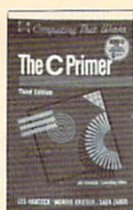
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## SPEAK OUT

Ever since I learned that Congress could approve its own pay raises, I've been waiting for software that would make writing politically charged missives practical. Speak Out sent me on a letter-writing spree and filled my correspondence with appropriate names and addresses. Directing disapproval or kudos to almost anyone on the government dole has never been simpler.

"Apathy is democracy's biggest enemy," declares Speak Out Software's president Ken Rosmarin. "A nation of sheep eventually begets a government of wolves—which means politicians make bad decisions when good people don't speak out." With its ample database, Speak Out encourages you to strike a blow for democracy by putting often tedious-to-track-down information instantly in your hands. You'll find the names and addresses of all elected federal officials, the government officials of one selected state (you select which one during installation), federal agencies, the Supreme Court members, the mayors of the 100 largest cities, and the CEOs of the Fortune 200 companies. You can make use of listings for the leaders of foreign countries, the United Nations, international organizations, foreign embassies in the U.S., and U.S. embassies in foreign countries.

Worth its purchase price in database assets alone, Speak Out throws a rudimentary but functional word processor in as well. You can easily master the database's uncomplicated interface, even in the heat of anger over planetary deforestation. A search feature, however, is noticeably absent. Scrolling through long lists using Page Down consumes too much time for my taste. However, the manufacturer assures me that a complete keyword search function, as



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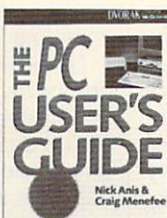
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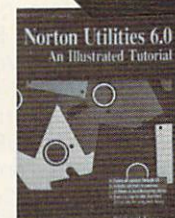
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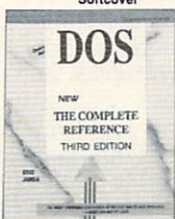
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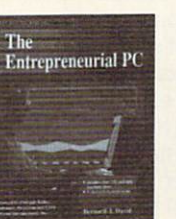
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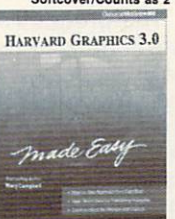
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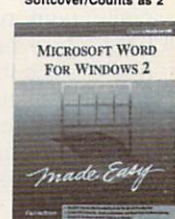
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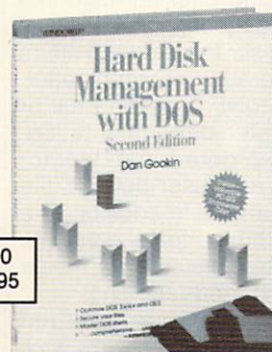
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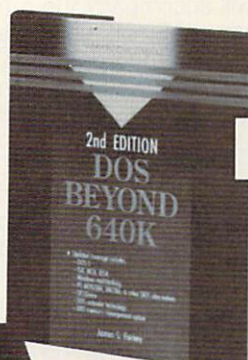
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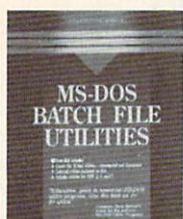


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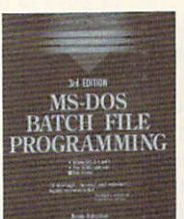
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One of the most common problems PC users face is file fragmentation, a DOS condition that forces the drive to work harder than it has to. Multisoft's PC-Kwik Power Disk, a full-featured disk optimizer, provides both immediate relief and long-term preventive maintenance.

Power Disk works its magic by rejoining splintered files and packing them into a single contiguous area of the disk. The program offers numerous reorganization strategies, including full or partial defragmentation, DOS-ordered subdirectories, and user-defined file placement. In addition, the program performs complete file-structure analysis, media testing, and reporting.

Multisoft claims improved performance on any size fixed or removable storage media: MFM (standard XT or AT), RLL, IDE, ESDI, and SCSI hard drives; floppy disks (360K to 1.4MB); cartridges; read/write optical drives; and even RAM disks. Its restrictions—no more than 32,768 files per disk or 32 directory levels—are well within the limits of most users.

The program's best feature is its highly configurable batch mode operation, automatically optimizing either on a conditional basis (depending on the percentage of fragmentation) or on a regular schedule. This technique benefits high-usage systems, where extensive copying, moving, and deleting of files can result in daily fragmentation.

In terms of speed, compatibility, and sheer user-friendliness, Power Disk tops almost all competitors. Unfortunately, the program's lofty list price will probably discourage many potential buyers, especially when the massive PC Tools and Norton Utilities are within easy grasp. Proportionally priced, these packages offer competent disk optimizers, plus a whole lot more.

Power Disk is the right tool—but at the wrong price. Sometimes being the best just isn't good enough.

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## STREETS ON A DISK

Can't get there from here? Maybe you need Streets on a Disk, an update of a sophisticated mapping program that's been around and evolving for several years.

The system consists of a base package, which contains the mapping software itself, and sets of accessory files—the maps. In my case, I received a map of Guilford County, North Carolina.

You can use Streets to locate streets or addresses, plan travel routes, and estimate travel costs. Want to know where Galway Drive is? Type in the name, and the street is highlighted. Want to get from here to there? The program includes a route calculation feature that scans all available pathways and picks the one its data says is most efficient.

The street maps, which include everything from interstate highways to footpaths, are used in conjunction with place maps, which you build to suit your needs. Using the map editor, you can add points of interest such as hotels, restaurants, or clients to your map. The place maps work as overlays to the street maps, so you can create several separate place maps to work with a single underlying street system.

Adding places is a simple process of pointing to the place's location on the map and then identifying it. Alter-

natively, if you have hundreds of locations to plot, Streets includes a feature called Autoplace, which reads a text file containing place information and locates those places on the map.

One of the program's more interesting features, Autoroute, finds the best route between any two points you specify. Depending on the distance, the number of streets involved, and the speed of your computer, this process can take several minutes—or hours—to complete.

I tested Autoroute with several of my regular destinations here in Greensboro, North Carolina, and found that, while it usually got me from here to there, it didn't always choose the routes I've found to be the most efficient. Streets on a Disk can figure mileage and calculate travel time (each street has a speed value associated with it), but the program doesn't have access to the intangibles, such as the stoplight that always seems to be red or the intersection where traffic's always backed up.

After calculating a route, the program can print out both a map and a set of detailed travel instructions.

The program's map files are constructed from government data and are quite accurate with a few exceptions: One-way streets are not identified, roads that have been recently built or recently relocated are not shown, and the program may incorrectly interpret some highway overpasses as intersections.

According to Klynas Engineering, the program's creator, these problems are to be expected, but all of them can be corrected with the help of the street editor.



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In fact, the maps are working documents that users are expected to edit.

Streets on a Disk is not the easiest-to-use program in the world. Although it permits the use of the keyboard and/or mouse, the interface is nonstandard and difficult to use. For example, to make a menu bar selection, you click the right mouse button until the option you want is highlighted and then click the left button to select it. The documentation, while providing generally adequate information about using the program's features, is antiquated in appearance.

Despite the unusual interface, Streets on a Disk is an extremely powerful mapping tool that includes many more features and utilities than have been mentioned here. If you have heavy-duty mapping requirements, you should give this program a good look, keeping in mind that you'll need a fast system and a large amount of hard disk space to run it.

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## ENGLAN

Gentry Software has tried to eliminate one of the bugaboos of learning to program with its latest version of EngLan.

Because you select program commands from a menu, you can't make syntax errors. It's impossible to forget a semicolon or misspell a variable name. These nitpicking rules of pro-

gramming languages have scared many new challengers away from programming, so Gentry Software should be commended for chasing off this particular programming demon.

By solving one problem, however, EngLan has created others. The interface stumbles and falters throughout the program. For example, to make a simple revision in your program, you must exit the program-writing mode and return through the program-viewing mode. And EngLan offers no default choices. A familiar feature of most software, defaults let you press the Enter key to indicate the most likely response. Many little twists and turns in the program, which aren't limited to the examples cited above, make the interface problems even more significant.

Interface problems affect the ease of use of a program; the manual and tutorial affect the ease of learning. EngLan has multiplied its problems with its poorly designed documentation. Parts of it are good enough for any beginner. Other parts, however, simply obscure the concepts they're meant to teach. The tutorial, for instance, includes a lesson on how to clear a screen but fails to provide anything on the screen to clear. Many sections of the tutorial ignore the implications of each command, failing to play one command off the next. Although you can easily understand what each one does, you can't really see how they work together to create a useful program.

Gentry Software's purpose was to create an easy-to-learn, easy-to-use programming language, only EngLan doesn't have the ergonomic, educational kick

to meet this challenge. If you want to learn to program, either find a good class or wait for Gentry Software to rework EngLan. With one more update, directed at the interface and the tutorial, EngLan could be a fine educational experience.

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## ECO-ISLAND

Jeez—what a mess! You're minding your own business there on trash-filled Eco-Island when suddenly M-Kar, a friendly space alien, crashes his spaceship and seeks your help. But his craft isn't the only thing littering the landscape. Eco-Island itself is knee-deep in gunk and garbage.

The only way to rebuild M-Kar's ship is to collect all the trash on the island and recycle it into the form of a spaceship. To power the spacecraft, you must conserve electricity. You must also save enough water to take along on the trip. All of these tasks comprise First Byte's Eco-Island, a new game featuring Zug the Megasaurus, whom you might remember from the popular Dinosaur Discovery Kit. This new game quickly draws you into the challenge of cleaning up the island and getting M-Kar home before his parents start to worry about him.

Eco-Island is a big place—with lots of trash! The game comes with a map to help you get from Zug's EcoCenter (location of the recycling machine) to all the best plac-

es to pick up trash. There are four trash bins to fill, plus water and power gauges. When a bin is full, you go back to the recycling center and send it through the recycling machine, which makes useless garbage into vital parts for M-Kar's new spaceship. As you pick up trash (using a simple point-and-click method), interesting facts about trash are relayed on the screen.

Two gauges measure water and power conservation. When you turn off an unnecessary fountain, you gain lots of water. Turning off a billboard light saves lots of electricity. Both are necessary for M-Kar to get his ship working and supplied for his trip home.

You meet several different characters during your search for trash. They speak through the internal speaker or a sound booster, such as the Covox Speech Thing. Some of them have hidden surprises, including large amounts of valuable recyclables, which delighted my son. Some characters say mean things, but that only makes collecting the trash more exciting.

There are several "live" areas on each screen, giving clues about where trash is stashed. It's always worthwhile to attempt to talk to inanimate objects: trees and rocks—even statues!

This innovative game is fun, and it really teaches recycling. My four-year-old was quickly able to understand the game and manipulate the controls well enough to both collect trash and conserve water and electricity. The two of us learned how to categorize trash into plastic, aluminum, paper, and organic waste. Now, we can't go anywhere without my son's pointing out all the

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Signature \_\_\_\_\_

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trash and wanting to pick it up and put it away.

The age range for this game is from four to nine years. I have a feeling that older players, accustomed to fast-paced arcade games, will find the slow pace of picking up garbage extremely frustrating. I did. I wish the makers had developed a method of highlighting all the plastics to dump at once, rather than forcing me to pick up each cup, one at a time. The more I played, the more aggravated I got. Luckily, you can save your game, so if you've gotten almost all the trash and have to stop playing you don't have to start from scratch.

My second complaint is that I couldn't win! I don't know if I just wasn't clever enough or if there was some kind of glitch in my software, but I simply couldn't find the last character. I never learned how the game ends or what M-Kar's spaceship looks like. However, the average seven-year-old, who is more computer literate than middle-aged old me, might have better luck.

BETH ANN MURRAY

IBM PC and compatibles; 640K RAM; EGA, MCGA, or VGA; hard drive; Ad Lib, Sound Blaster, Covox Speech Thing, IBM Speech Adapter, or IBM ACPA recommended—\$39.95

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## PROFIT AND LOSS

Cumbersome, hard to learn, and fraught with pitfalls, most accounting packages just frustrate the average small business owner. It's no wonder that some people aren't inclined to spend the time needed to learn how to be an accountant and still meet the challenge of running a small business. In creating Profit and Loss, Sensible Software has attempted to help—not frustrate—the small-business owner.

The DOS-based P&L attempts to bring all the power of modular accounting packages to a checkbook-based, single-entry system. Many small businesses don't require a balance sheet and reconciliation of owner's equity, but they do require the profit-and-loss and cash-flow statements P&L provides.

P&L leaves out confusing accounting concepts such as accrual accounting, double entry, assets, liabilities, and owner's equity for simplification. Potential buyers, however, should be warned that this program may not be suitable for corporations and partnerships from whom the IRS requires a balance sheet.

P&L goes beyond programs like Quicken to provide many of the mod-

# "THE NATURAL SOLUTION FOR THINNING AND FALLING HAIR!"



## REGAIN THE APPEARANCE YOU ONCE HAD!

"M. Malley—Ft. Lee, NJ"—Regains the appearance he once had in six months.

These unretouched photos clearly demonstrate the effectiveness of "Naturally Yours" in treating thinning and falling hair—



**WHY NOT FIND OUT WHAT IT CAN DO FOR YOU...WITHOUT ANY RISK... BY ACCEPTING THE FIRST FULL MONTH'S SUPPLY AS MY FREE GIFT!**

## "NATURALLY YOURS"

## RESULTS ACCLAIMED WORLDWIDE!

### •AWARDS—

In the United States it won approval as a "Best Product"—which selects only the world's most highly regarded products!

### •LICENSED IN FAR EAST

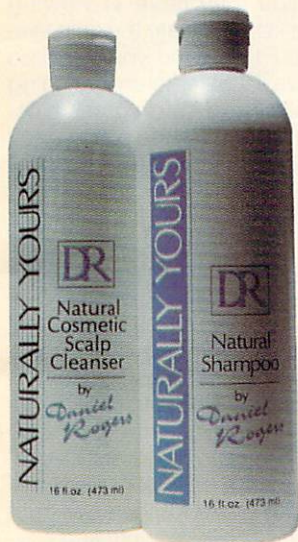
The—only—product approved and licensed in "The Republic of South Korea" as a natural treatment for thinning hair!

### •PASSED GOVERNMENT SUPERVISED TESTING—

Extensive testing was performed for approval and licensing of "Naturally Yours" in South Korea.

### •RESULTS ACCLAIMED ON NATIONAL TV—

Actual testimonial told on ABC-TV's—"Sally Jessy Raphael Show"



## WHAT IT WILL DO FOR YOU—

If you suffer from thinning and falling hair...Now there is a revolutionary new product known as "Naturally Yours" that has achieved a proven 90% success rate in making hair—look and feel—thicker and fuller!

## YOU RISK NOTHING!

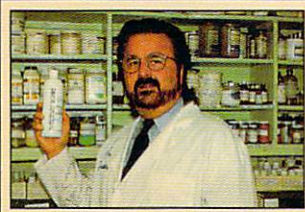
"Naturally Yours"—is a natural, safe, and effective treatment for thinning hair. It consists of an herbal based shampoo and scalp cleanser that is applied in your own home. A treatment so effective that it is backed by a—30 day money back guarantee!



Carmen Lopez—Before treatment

## IT CHANGED HER LIFE!

A 16 year old girl named Carmen Lopez suffered hair loss on more than 60% of her scalp! Life had become unbearable and the other children tormented her constantly. Her mother vowed to end her condition. For 6 years she went from doctor to doctor—spending thousands on every known and medically accepted treatment for thinning hair—with no results!



## EXPERTS AGREE ON EFFECTIVENESS!

Dr. J. Libermanski—  
"Owner of a Leading Laboratory"

### TESTIMONIAL STATEMENT—

"I know of nothing else more effective than "Naturally Yours" in treating thinning and falling hair!"

Then she turned to "Naturally Yours." Mrs. Lopez called and said, "Please, you are my last hope. My daughter is getting worse, both physically and mentally. You've got to help her." She fought to hide her tears and then said—

"God—Please give me the strength to smile."

Three weeks later she called yelling hysterically—"It works, it works, it really works! Everyone said it was impossible! Doctors said it wouldn't work! Friends laughed at my daughter—But their laughter turned to amazement when they saw her!"

### A New Life!



Carmen Lopez — After Treatment with Sally Jessy Raphael

She even had the courage to appear on—"The Sally Jessy Raphael Show" and tell millions of viewers about her traumatic experience. The audience gasped in amazement—the doctor was speechless—even Sally Jessy Raphael hugged

Carmen. It changed her life and it could change yours!

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You'll get the results with "Naturally Yours" and your purchase is fully guaranteed!—*You risk nothing!* Imagine, for only \$1.78 per day for the next 90 days—it could change your life! **So act now—**

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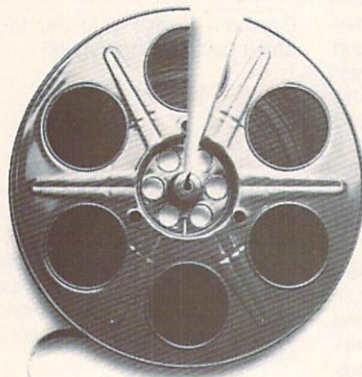
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ules found in very-high-priced, double-entry accounting systems: order entry, purchasing, inventory, payroll, point of sale, vendor list, pricing, and so forth. And it has an impressive list of easy-to-use features, graphs, and reports that make it more than basic accounting.

Perhaps one of the best features is

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| 53,423.90           |  |           |           |
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| 4                   | 1/2/90 104 20 Deposit                          |           | 537.21    |
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*Profit and Loss sacrifices accounting sophistication for ease of use.*

P&L's script-based report generator, which can produce any type of custom report. A compiler reduces the report to a faster, more compact form of a script. Realizing that the 320-page report generator manual could be more confusing than double-entry accounting, the authors provide more than 300 ready-made report overlays and will design simple custom reports for \$18 each.

Like Quicken, P&L has a bill-paying module. Auto Pay identifies which bills are due, makes a list of checks, and applies them to the items currently due. It also makes sure you don't pay bills before they're due, and it helps you take advantage of vendor discounts based upon time payment. This software doesn't have an electronic bill-paying option, however, nor does it integrate with the CheckFree electronic bill-paying system.

Computerized timecards let employees punch in from anywhere in the system. The timecards will increase in usefulness once Sensible Software makes this program network compatible.

The payroll module can handle overtime, special shifts, holiday pay, and an infinite amount of withholding options, but it won't automatically compute withholding taxes or generate the IRS and state payroll forms that employers must submit to the government. You need to look up the numbers in the appropriate table or calculate the correct amounts manually before entering the tax into the system.

P&L can run two credit checks while in order-entry mode to see if customers are overdue paying their accounts and to see if they've exceeded their credit limits. You can then increase their credit, hold the order, and/or view their prior transactions. Orders can be aged and discounted based on a system of variables.

Order entry uses nine modules to generate orders, invoices, and charges. You can bill with interest through invoices and monthly statements. You can set 49 prices for each product based upon six quantity breaks, seven price levels, and a discount of normal pricing.

The inventory module computes inventory using three of the four accepted methods: FIFO, LIFO, and average cost. Shopping allows you to set order quantities and will automatically generate a purchase order when products need restocking. You can then customize the purchase orders before sending them.

P&L's audit trail system maintains a narrative record of transactions for reference when you want to sort out any confusion you may have in viewing transactions lists. Activate the help system with the F1 key and you'll access an impressive list of features, including 1.6MB of online text, index, and a glossary. You can access help from any point in the program or use the help indexed to your specific location.

The new retail-sales module allows for over-the-counter and point-of-sale transactions in a cash register or storefront environment. It uses a universal customer record that allows easy review of register sales. The module generates a single invoice for each business day.

You can build deposits from a variety of items to allow for online reconciliation of the day's income to daily bank deposits. This provides a traditional audit trail for income and allows for the easy identification of daily cash receipts and payments made by credit customers against their open orders and accounts.

P&L comes in compressed form on six 360K 5¼-inch disks, with exchanges available for 3½-inch. You need 5MB to 20MB of hard disk space, depending on the size of your business.

Not for those well versed in the double-entry system of accounting or for those who require features like depreciation, accrual-basis accounting, balance sheet, and statement of owner's equity, P&L does cater to a specific audience. Those who have neither the time nor the inclination to learn traditional accounting and who want to leave accounting to accountants but still need an easy-to-use, checkbook-based accounting system to keep track of their businesses will find P&L to their liking.

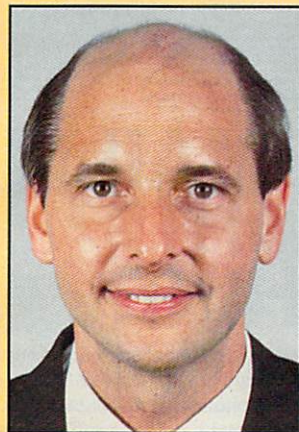
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# END BALDNESS AND THINNING HAIR

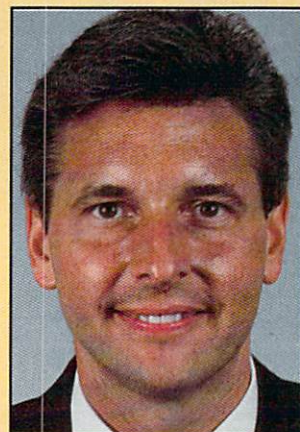


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**In announcing Hair Dynasty, I said:**

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**Daniel R. Trimper, President of Hair Dynasty For Men**



## IMPROVE YOUR APPEARANCE

Right now you could dramatically improve your appearance and look years younger without the use of dangerous drugs, painful surgery, or unsightly hairpieces. Whether you want complete or partial coverage—or you just wish to add volume, thickness, or length to your existing hair—*Hair Dynasty has the solution for you.* Only Hair Dynasty offers you the very latest, state-of-the-art hair-addition methods that are designed specifically with your lifestyle and personal needs in mind.

## GET RID OF YOUR HAIR PROBLEM FOR GOOD

If you are beginning to lose hair or already have a bald spot—*Hair Dynasty has the solution!* You will always feel comfortable whether you're swimming, jogging, skiing, or even closing that *big deal*. And when you're sharing your most intimate moments with your loved one or you're surrounded by thousands of people, only you will know you owe your self-confidence and great appearance to Hair Dynasty. But don't take my word for it. . . .

## YOU RISK NOTHING!

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- **See yourself with new hair again!**
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Choose how you want to look! We'll take your picture and then design a hair-replacement system on your image. You choose and design your hair line, hairstyle, and hair length. We will then give you a color picture of the *new you!*

This is a major breakthrough!

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## MY LOSS IS YOUR GAIN!

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## IT COULD CHANGE YOUR LIFE!

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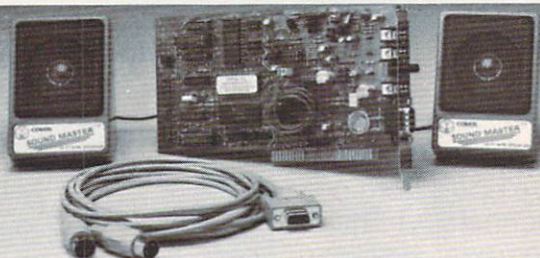
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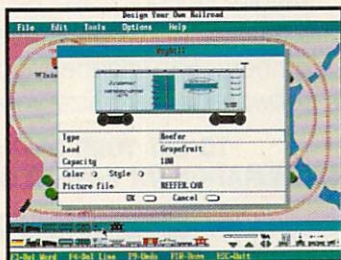
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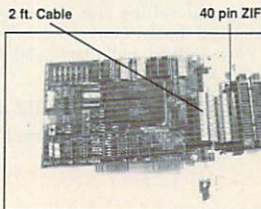
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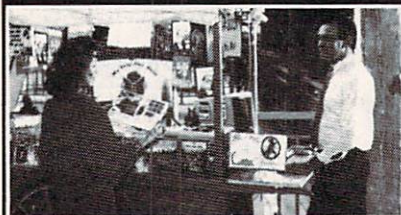
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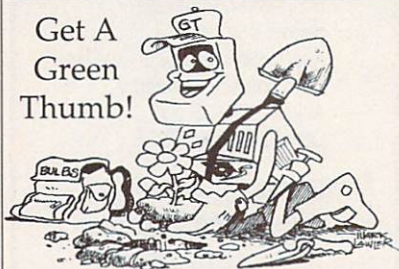
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# LATE-BREAKING NEWS

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**Hot new products from Tandy, Momena, and Fujitsu; getting the numbers on MicroLeague Sports; getting a Mario education; and more**

## Speed Demon

Tandy has just announced a new 25-MHz 486SX personal computer upgradable to 50 MHz, with a price tag below \$3,000. Key features of the model 4825 SX are a 25-MHz 80486SX microprocessor (an optional 80487SX coprocessor is available) and support for future double-performance Intel microprocessors, allowing you to upgrade to 50 MHz; 4MB of RAM, expandable to 32MB on the main logic board; three 16-bit ISA slots and one 5¼-inch device slot; two serial ports, one parallel port, and one mouse port; one 3½-inch 1.44MB floppy drive and support for a 2.88MB floppy drive; a built-in 120MB SmartDrive hard drive; 16-bit Super VGA graphics upgradable to 1024 x 768 in 256 colors; preinstalled MS-DOS 5.0, Windows 3.0, Microsoft Works for Windows, and a software sampler; 101-key enhanced keyboard; two-button PS/2-style mouse; and a one-year warranty. The price for the standard configuration with a hard drive is \$1,999; the multimedia PC version costs \$2,799. For further information, contact Tandy, 400 Tandy Center Atrium, Fort Worth, Texas 76102; (817) 390-3861.

## No Longer So Remote

Now that its civil suit with Microcom has been settled, Ocean Isle Software has begun shipping version 2.1 of its ReachOut remote-control software for Windows. The upgraded version takes less than two seconds to show a Windows pull-down menu, using a 2400-baud modem. Other upgrade features include support for Super VGA and EGA, Windows 3.1, and all nonstandard DOS text modes, as well as overall speed and error-reporting improvements. Suggested retail prices are as

follows: Modem version, \$179; Host Only version, \$129; Viewer Only version, \$99; Network version (base price), \$295. If you have further questions, contact Ocean Isle Software, 80 Royal Palm Boulevard, Suite 202, Vero Beach, Florida 32960; (407) 770-4777.

## The Momena Has Arrived

The long-awaited Momena 20-MHz 386SX pen-based computer is now available to consumers. A key feature of the 6.3-pound notebook-sized computer is its Command Compass, a patented feature that allows users to flip through and modify information at the stroke of a pen. The entire package includes a number of tools and applications developed specifically for the Momena: a presentation package, a note taker that uses electronic "ink," an electronic calendar and address file, a handwriting-recognition trainer, and more. Suggested retail price for the Momena is \$4,995. If you would like to know more about the Momena, contact Momena, 295 North Bernardo Avenue, Mountain View, California 94043; (415) 969-3876.

## Make an Impression

Fujitsu recently cut the price of its DL3600 Small Business PrintPartner to \$799, hoping to better compete with other printers in the midrange category. Popular for its versatility among home and small-business users, the 24-wire dot-matrix DL3600 features color-chart and rapid-forms printing, a draft-mode speed of 360 cps, and typewriter emulation for filling in single forms. The printer has a two-year warranty and is packaged with coupons for free font cards and free ribbons. If you'd like to find out more about the DL3600 Small Business PrintPartner, contact Fujit-

su America, 3055 Orchard Drive, San Jose, California 95134-1318; (408) 432-1300.

## Luigication

Nintendo has signed a licensing agreement with Software Toolworks to develop "edutainment" software featuring Nintendo's famous Mario Brothers characters for PCs and Nintendo systems. The first title of the series, Mario Is Missing, centers around Luigi's danger-filled search for his brother Mario and will be available this fall. Pricing for the software hasn't yet been established. For further information, contact Software Toolworks, 60 Leveroni Court, Novato, California 94949; (415) 883-3000.

## Reach Out and TDD Someone

Microsoft has a new technical support line for its hearing impaired customers: (206) 635-4948. Through the TDD (Telecommunications Device for the Deaf) service, customers can call Microsoft and relay their questions to a support person, and the call will be returned via a TDD modem within four business hours. Phone call charges for using the TDD line are the same as regular long-distance phone charges. For further information, contact Microsoft, One Microsoft Way, Redmond, Washington 98052-6399; (206) 882-8080.

## Stats Entertainment

MicroLeague Sports signed an exclusive marketing agreement with USA TODAY Sports Center. MicroLeague game players can download realtime statistics directly from USA TODAY Sports Center without additional software. If you want to know more about the new stats service, contact MicroLeague Sports, 2201 Drummond Plaza, Newark, Delaware 19711-5711; (302) 368-9990. □

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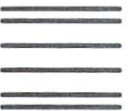
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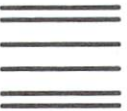
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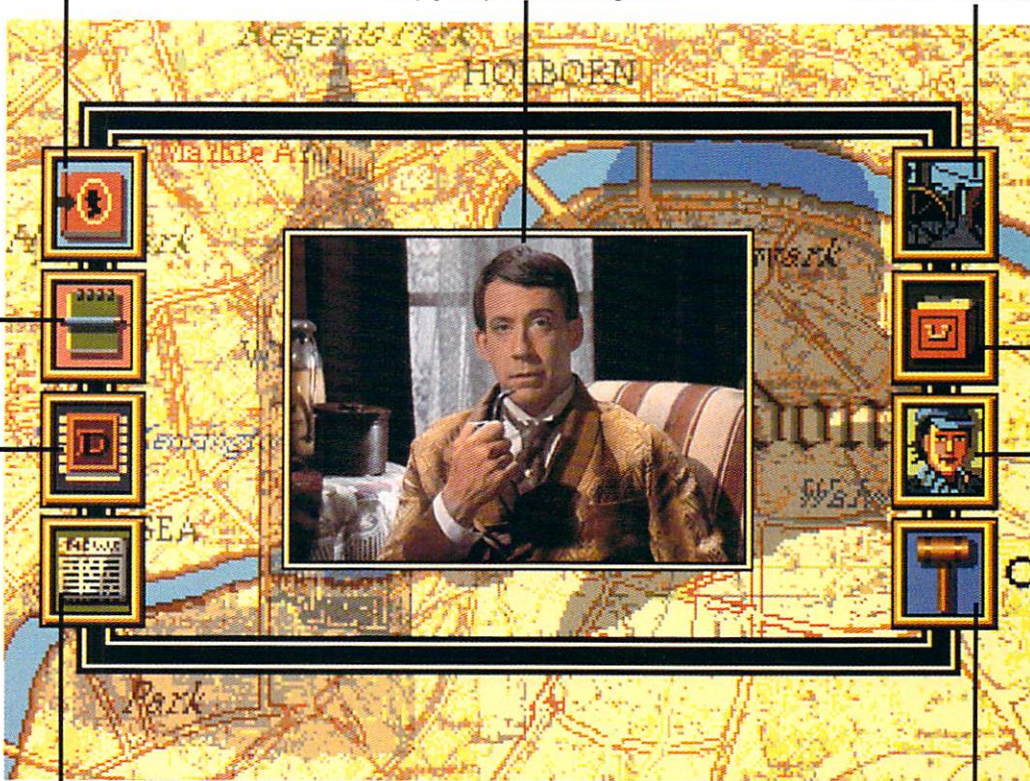
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