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COMPUTE

JULY 1992

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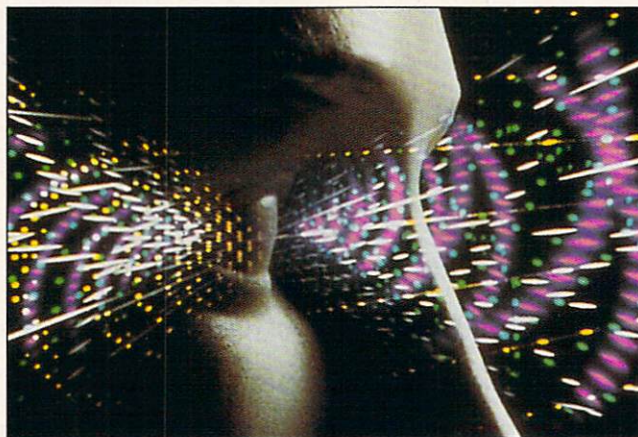
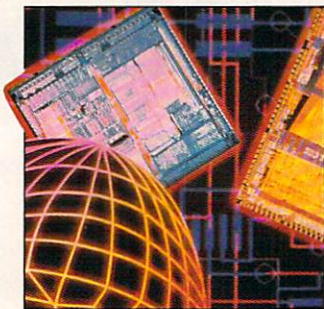
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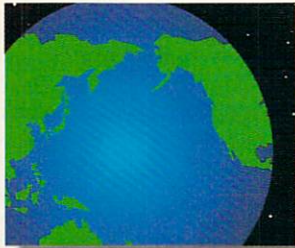
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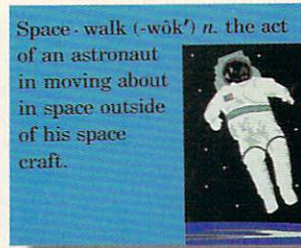
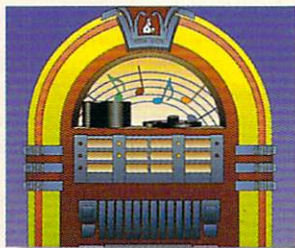
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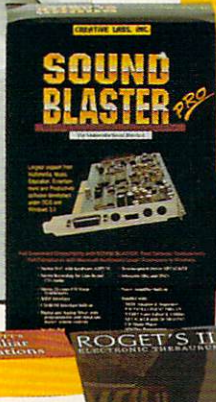
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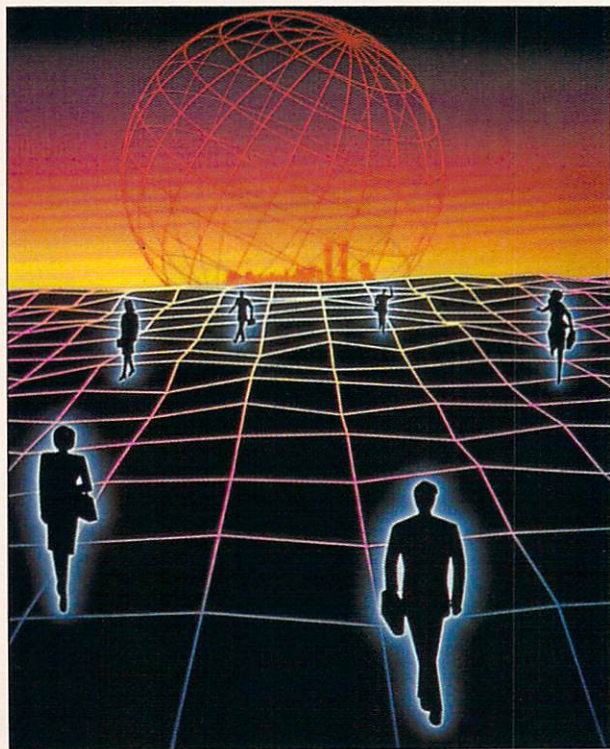
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Clifton Karnes

My favorite day of the year at COMPUTE is the one when all of our readership surveys are tallied and I can see the final results. I'm fascinated by our readers and their preferences. As I turn each page, I feel like I'm uncovering part of an exciting mystery. I know that in the survey's pages, I'll discover how your tastes have changed over the last year, and if our magazine is meeting your needs.

COMPUTE's last survey, printed in the January 1992 issue, was one of our most successful yet, and I want to thank those of you who took the time to complete it and send it in. The response was overwhelming—nearly twice as large as we've ever received. Not only does this show that COMPUTE's readership is an interested and active group, but more responses make the survey's results much more significant.

The response to our January 1992 survey was overwhelming—nearly twice as large as we've ever received.



I want to underscore how important these surveys are to us at COMPUTE. Knowing what kind of equipment you have, what your favorite articles are, and what you like to read about gives us the data we need to create a magazine that provides you with the information you want most.

But these surveys are important for another reason, too: They're just plain interesting. If you've ever wondered how you fit in with COMPUTE's other readers, here's a quick look at what you're like.

The first question on the survey relates to the type of computer you're using. Here we see a marked increase in 386 ownership, from 29 percent in 1991 to 35 percent in 1992. If we look at 286 and 386 machines as a group, then 72 percent of you have these advanced CPUs. It's also noteworthy that the number of you using laptops or notebooks has nearly doubled in the last year, from 5 percent in 1991 to more than 9 percent in 1992.

Just two short years ago, CGA and EGA were the dominant graphics systems, but today, it's a different story. VGA has seen spectacular growth, especially in the last year, moving from 51 percent in 1991 to 73 percent in 1992. Of this 73 percent, 24 percent of you own Super VGA systems.

In peripherals, there are several growth areas. The biggest increase is in mice, scurrying from 71 to 82 percent. We also see 3½-inch disk drives spinning from 68 to 81 percent. Modems have increased their bandwidth from a healthy 58 to 64 percent. And sound cards have blasted from 12 percent to a whopping 21 percent.

When it comes to printers, the tried-and-true dot-matrix is still king of the hill with 85 percent (about 15 percent of you own laser printers).

The operating system information we received from you was a bit of a surprise. In a very short time, MS-DOS 5.0 has become your dominant operating system, with 61 percent. Digital Research's DR DOS clocks in at a respectable 5 percent.

Moving from operating systems to operating environments, Windows has been another boom area, growing from 14 percent in 1990 to 22 percent in 1991 to 31 percent in 1992. GeoWorks comes in at a healthy 12 percent. In the next survey, we're going to find out how many of you are using IBM's new OS/2, version 2.0.

Looking at your favorite columns, we see something very interesting. The order of preference hasn't changed from last year, but the numbers are larger, which indicates that you're reading more of the magazine. For example, "Tips & Tools" is still the number one column, but the readership has grown from 62 percent last year to 68 percent this year. "Feedback," the number two column, was at 48 percent last year and has grown to 59 percent this year.

Looking at favorite topics, we see disk management and MS-DOS leading the list, followed closely by new hardware, how to upgrade your PC, and word processing. Just as with columns, the way you rank these hasn't changed much from last year, but each topic shows a higher percentage of readers interested in it.

With our readership changing as fast as it is, we're going to start running two surveys each year—one in January and one in July. So in this issue of COMPUTE, you'll find another readership survey and another chance to tell us a little about yourselves and your equipment. □

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Every month, from now until November, you'll have the chance to win fabulous prizes by playing the Compute SearchStakes. And by solving a minimum of just two monthly SearchStakes, you'll be in the position to compete for the SearchStakes Grand Prize, to be featured in our upcoming December issue.

IT'S FUN TO PLAY

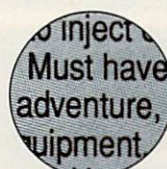
Each of the six picture disks displayed below is a portion of a photo or illustration taken from an ad in this issue. To solve the July SearchStakes, locate the ads from which

these disks were taken and note the page number for each. If the ad has no page number, simply count that page or cover as zero. Then add up all six page numbers. That is the solution to this month's SearchStakes.

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Once you find the solution, you may enter the July SearchStakes automatically on a touch-tone phone by calling 1-900-454-8681. The cost for the call is \$1.50 for the first minute, \$1.00 for each additional minute. Average call is estimated to be 2-3 minutes. Callers must be 18 or older or have a parent's or guardian's permission to place call. You may also enter by mailing your answer on a 3" x 5" piece of paper, along with your name, address, and phone number to: "July Compute SearchStakes," 324 West Wendover Avenue, Suite 200, Greensboro, N.C. 27408 by 8/31/92. For more information on how you may win this month's prize, valued at more than \$1,500, turn to page 40.

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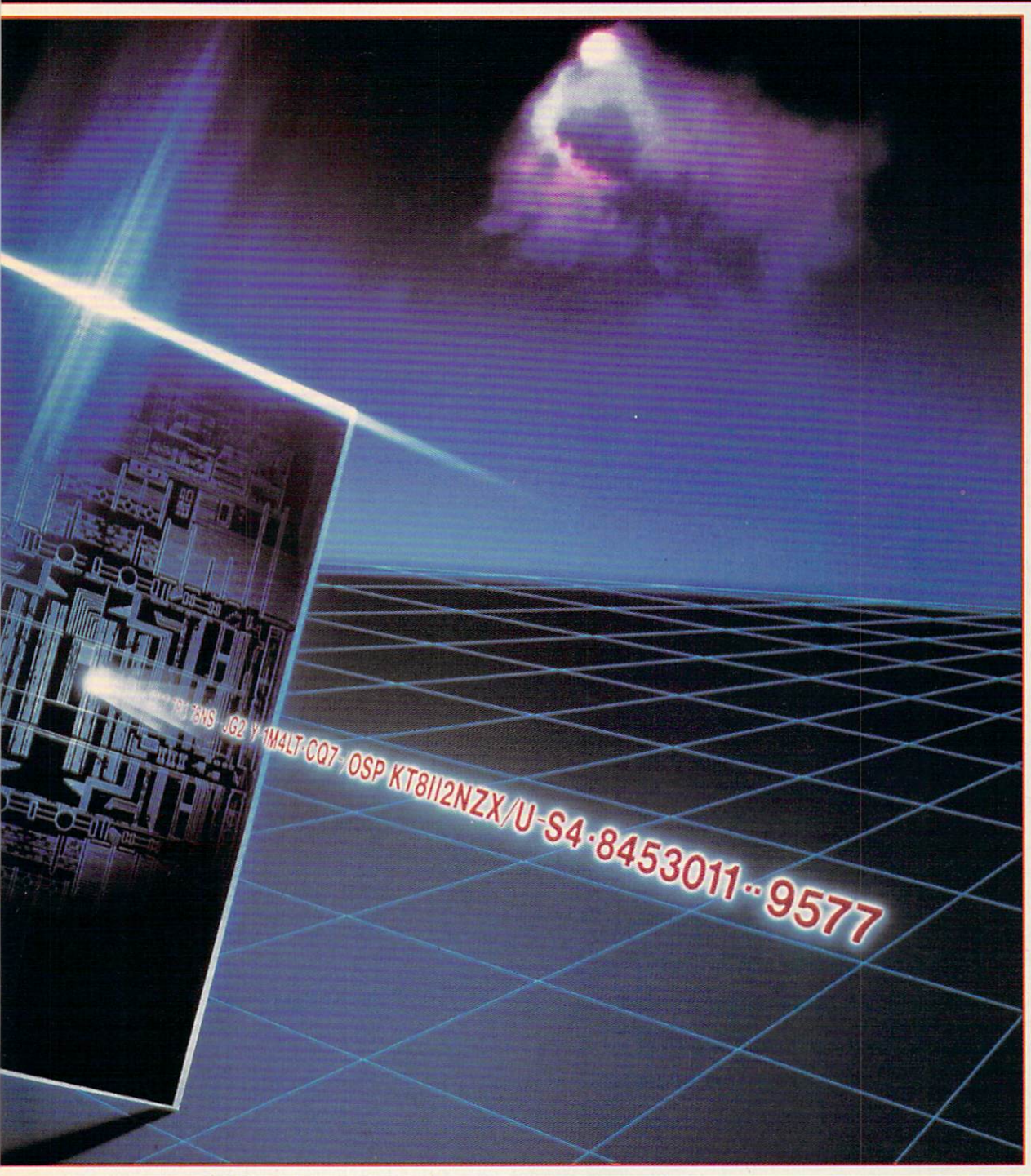


PROGRAMMING YOUR WORD PROCESSOR

BY WILLIAM HARREL



AUTOMATE YOUR COMPUTER:
HOW TO CREATE MACROS
TO MAKE THE MOST OF WORDPERFECT
FOR DOS, WORDPERFECT
FOR WINDOWS, AND WORD FOR WINDOWS.



The word *programming* brings to mind never-ending lines of confusing and unforgiving computer code complete with bugs and a lot of trial and error. Who needs it? Let the programmers program. Just give me software that does what it's supposed to. Sound familiar? What many users fail to realize is that creating program code for a word processor is often no different from performing normal functions within the software. Wouldn't you like to format a letter complete with margins, date, heading, salutation, font style, and signature block—all with one keystroke? Or how about transposing words or paragraphs by merely pressing Alt-T? You can automate these and other routine tasks. It's easy, once you understand how to use your word processor's macro feature.

What's a Macro?

Put simply, a macro is a file containing recorded keystrokes and commands that your word processor can execute. Most word processors come with a macro recorder built in. Turning it on requires only a couple of keystrokes or mouse clicks. As with a high-speed tape recorder, everything you do until you turn off the macro recorder is saved. You can replay the keystrokes anytime you want.

Each of the three word processors discussed in this article—WordPerfect for DOS (WPDOS), WordPerfect for Windows (WPWin), and Word for Windows (WinWord)—handles macros a little differently. But the result is the same: You save time by automating repetitive tasks.

WPDOS lets you create one-keystroke-combination (Alt-letter) macros and one-word macros. The two Windows applications also let you assign macros to keystrokes, although they're a little more difficult. And you can place them on the Button Bar in WPWin and on the Toolbar in WinWord. To learn how, see "Mapping Menus and Keyboards."

Ten Handy Macros

The key to recording macros is to know exactly what you want them to do before you start. Know each step. I go through the process once or twice before invoking the macro recorder.

For practice in creating macros, here are ten popular, useful macros. Note that WPWin doesn't automatically assign macros to keystrokes. You must do that with Preferences; see "Mapping Menus and Keyboards."

Insert Today's Date

WPDOS. To start the macro recorder in WPDOS, press Ctrl-F10 (hold down

the Ctrl key and press F10). Name (or define) the macro by pressing Alt-D. At the Description prompt, type *Insert date and press Enter*. The recorder will now record your keystrokes. Enter the date as you normally do in WPDOS: Press Shift-F5; then press 2. The date is entered. Press Enter twice to put a line between the date and the next text you type, and then press Ctrl-F10 to turn off the macro recorder.

You can now enter the date anytime by simply pressing Alt-D.

WPWin. To start the macro recorder in WPWin, click on the Macro menu; then click on Record. In the Filename field, type *Date* (WPWin automatically gives the file the default WCM macro extension). In the Descriptive Name field, type *Insert date*, and then click on OK. WPWin is now recording keystrokes and commands. (While the recorder is on, the mouse isn't available for selecting text and graphics.) Click on the Tools menu; then click on Date. Select Text from the submenu. Press Enter twice to place a blank line before the next text you type. Now turn off the macro recorder by clicking on the Macro menu and selecting Stop.

To run this macro now, select Play from the Macro menu, find the filename DATE.WCM in the Play Macro dialog box, and double-click on it (or select it and click on the Play button).

WinWord. To start the macro recorder in WinWord, select Record Macro from the Tools menu (version 2.0). Type *Date* in the Record Macro Name field, place the cursor in the Key field, and press Shift-Ctrl-Q (this assigns the macro to this keystroke combination). Type *Insert date* in the Description field and click on OK. WinWord is now recording your keystrokes. To enter the current date, select Date and Time from the Insert menu. Find the date format you want and double-click on it. The date is inserted. Press Enter twice to insert a blank line, and turn off the recorder by selecting Stop Recorder from the Tools menu.

To run this macro now, select Macro from the Tools menu, find the macro Date in the Macro Name list, and double-click on it.

Italicize a Word

To record this macro, you should have some text on your screen.

WPDOS. Begin by placing the cursor anywhere on the word you want to italicize. Start the macro recorder; then define the macro by pressing Alt-I. At the Description prompt, type *Italicize a word* and press Enter. The recorder is on. Press Ctrl-Right Arrow to move the cursor to the next word. Press F12 to turn on Block, and then

press Ctrl-Left Arrow. The word you want to italicize is highlighted. Press Ctrl-F8 for Font, 2 for Appearance, and 4 for Italic. The word is italicized. Press Ctrl-Right Arrow to move the cursor to the next word, and then turn off the macro recorder (Ctrl-F10).

You can run this macro anytime by placing the cursor on a word and pressing Alt-I.

WPWin. Begin by placing the cursor anywhere on the word you want to italicize. Start the macro recorder; then type *Italic* in the Filename field. In the Descriptive Name field, type *Italicize a word* and click on OK. The recorder is on. Press Ctrl-Right Arrow to move the cursor to the next word, press F12 to turn on Select Mode, and then press Ctrl-Left Arrow. The word is highlighted. Press Ctrl-I. The word is italicized. Press Ctrl-Right Arrow to move the cursor to the next word, press F12 to turn off Select Mode, and then select Stop from the Macro menu to turn off the macro recorder.

WinWord. Begin by placing the cursor anywhere on the word you want to italicize. Start the macro recorder and then type *ItalicWord* in the Record Macro Name field. Place the cursor in the Key field and press the I key. In the Description field, type *Italicize a word* and then click on OK. The recorder is on, ready to record your keystrokes. Press Ctrl-Right Arrow to move the cursor to the next word. Press Shift-Left Arrow to select the word. The word is highlighted. Press Ctrl-I. The word is italicized. Press Right Arrow to move the cursor to the end of the word, and select Stop Recorder from the Tools menu.

Spell Check a Word

If you've ever typed a word and then wondered if it was spelled correctly, this macro makes checking it easy. Begin with some text on your page.

WPDOS. Place the cursor on or directly after the word to check. Start the macro recorder, and then press Alt-W to define the macro. Type *Spell check a word* at the Description prompt. Press Ctrl-F2 for Spell; then press 1 for Word. Remember to turn off the macro recorder (Ctrl-F10).

If the word is spelled correctly, the cursor will move to the next word. If it's incorrect, the word will be highlighted. Correct it as you normally would. Return to your document by pressing the Esc key.

WPWin. Place the cursor on or directly after the word you want to check. Start the macro recorder, and type *Spell word* in the Filename field. Type *Spell check a word* in the Descriptive Name field, and click on OK. Press Ctrl-Right Arrow to move the cursor to the

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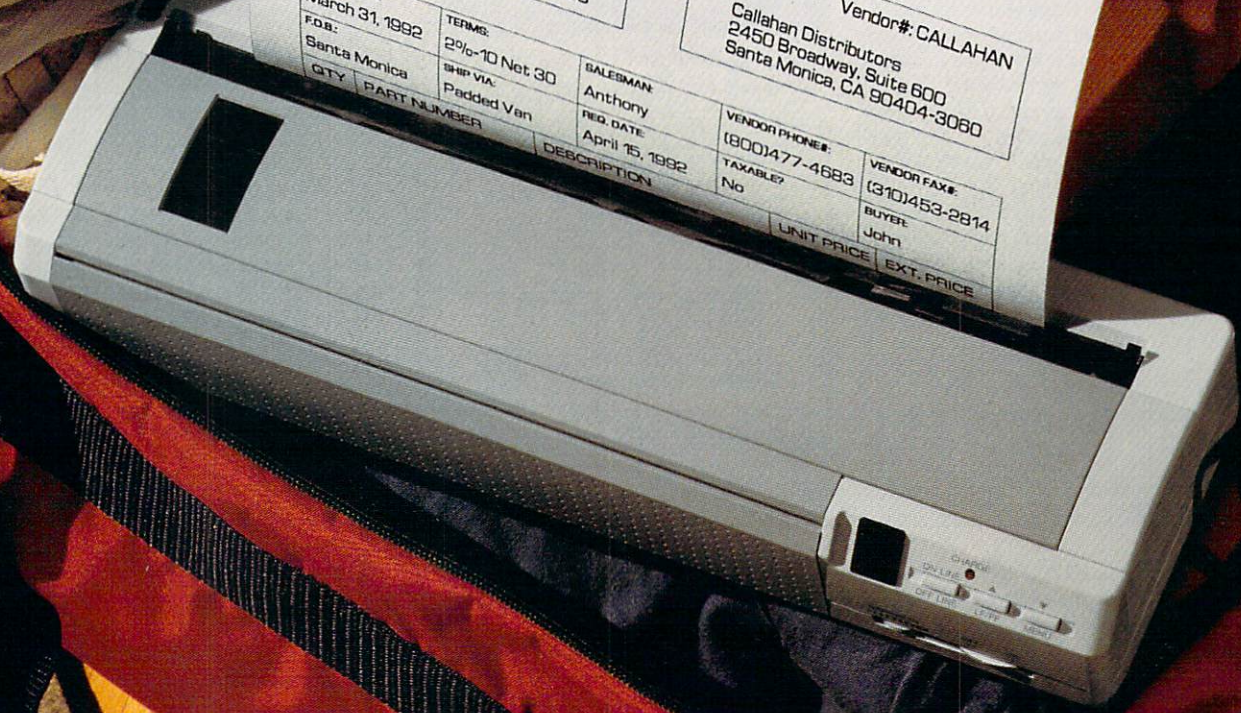
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EDITING MACROS

Why would you want to edit a macro? To make it do something it wasn't programmed to do—such as run (chain) another macro, pause so that you can enter data from the keyboard, or run itself over and over (say, to embolden the first line of 15,000 addresses). Another common reason is to change text in long macros, rather than rerecording them. The more you think about it, the more reasons there are.

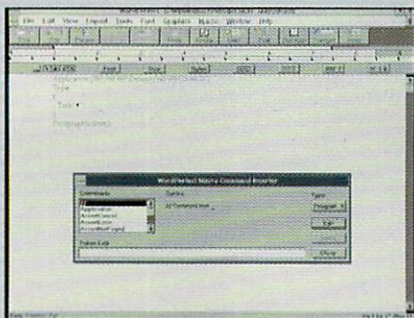
Each program's macro language is different (and complex). Once you've learned to use it, though, you'll increase your efficiency. Here's a review on how to edit macros in WPDOS, WPWin, and WinWord.

WPDOS. To edit a macro in WordPerfect for DOS, the macro file must already exist. First, start the macro editor just as you'd begin to record a macro (press Ctrl-F10). Next, type the name of the macro (*Alt-T* or *Alt-C*, for example) you want to edit; then select 2 for Edit. You can enter text and commands into the macro directly from the keyboard (see the top figure) or by pressing Shift-Ctrl-Page Up to bring up a list of macro programming commands. The WordPerfect 5.1 manual describes each of the commands and how to use them.

WPWin. This program's macros are written and edited in the word processor; see



WPDOS macro editor lets you insert text and commands from the keyboard.



WPWin macros are written and edited in the word processor.

the bottom figure. Edit a macro in WordPerfect for Windows the same way you would a document—select Open from the File menu and load it. You can enter text and commands directly, or you can insert commands with the Macro Command Inserter, which is nothing more than a very sophisticated macro itself. WPWin comes with an extensive macro language. Instructions for using it, however, aren't included. You can order the WPWin Macros Manual—complete with a good tutor and the Macro Command Inserter—from the company for \$19.95.

WPWin also comes with a feature you'll find very handy: a tracer that alerts you to errors in the macro code and possible problems and solutions.

WinWord. Word for Windows comes with a macro editor accessible through the Macro command. Text and commands are entered directly from the keyboard. For commands that use variables, you can use the Variables option, which opens a dialog box containing the variables available to the selected command. The manual doesn't contain much information on Word-Basic, WinWord's macro language, but it's shipped with a file (TECREF.DOC) that you can load and print. TECREF.DOC also has online macro help.

next word. Press F12 to turn on Select Mode, and then press Ctrl-Left Arrow. The word is highlighted. Click on Speller on the Button Bar (or select Speller from the Tools menu), click on Start, and then turn off the macro recorder.

If the word is spelled correctly, a *Spell check completed* box appears. If the word's incorrect, change it as you normally would in WPWin.

WinWord. WinWord doesn't allow you to access the Macro menu while the Spelling dialog box is open. You can create this macro, but it requires some fairly sophisticated programming. See "Editing Macros" below for information on modifying macros.

Transpose Two Words

Begin with some text on your screen.

WPDOS. Place the cursor on the first of the two words you want to transpose. Turn on the macro recorder, and then press Alt-T to define the macro. Type *Transpose two words* at the Description prompt and press Enter. Press Ctrl-Right Arrow to move to the next word. Press F12 to turn on Block; then press Ctrl-Left Arrow. The first word is selected. Press Ctrl-F4 for Move, enter 1 for Block, and then enter 1 for Move. The word is deleted. Now press Ctrl-Right Arrow and press Enter. Turn off the macro recorder.

When you run this macro, be sure to

begin with the cursor on the first word you want to transpose.

WPWin. Place the cursor on the first of the two words you want to transpose. Turn on the macro recorder. Type *Tpose-w* in the Filename field, type *Transpose two words* in the Descriptive Name field, and then click on OK. Press Ctrl-Right Arrow to move to the next word, press F12 to turn on Block, and then press Ctrl-Left Arrow. The first word is selected. Click on Cut in the Edit menu (or on the Button Bar). The word is deleted. Press Ctrl-Right Arrow to place the cursor one space after the word you want to transpose. Select Paste from the Edit menu (or from the Button Bar) and turn off the macro recorder.

When you run this macro, be sure to begin with the cursor on the first word you want to transpose.

WinWord. Place the cursor on the first of the two words you want to transpose. Turn on the macro recorder. Type *TransposeWords* for the Record Macro Name. Press 2 in the Key field and type *Transpose two words* for the Description; then click on OK. Press Ctrl-Right Arrow to move to the next word and Shift-Ctrl-Left Arrow to select the word. Click on Cut in the Edit menu. The word is deleted. Press Ctrl-Right Arrow to place the cursor one space after the next word. Select

Paste from the Edit menu; then turn off the macro recorder.

When you run this macro, be sure to begin with the cursor on the first word you want to transpose.

Count Words

Make sure you have some text on-screen before you start.

WPDOS. Start the macro recorder; then press Alt-C to define the macro. Type *Count words* at the Description prompt and press Enter. Press Ctrl-F2 for Spell and 6 for Count. When WordPerfect stops counting, turn off the macro recorder. Press Esc twice to return to your document.

WPWin. You don't need a macro to count words in WPWin. Simply select Word Count from the Tools menu.

WinWord. WinWord doesn't allow you to access the Macro menu while the Statistics dialog box is open. You can create this macro, but it requires some fairly sophisticated programming. See "Editing Macros" above for information on modifying macros.

Transpose Two Paragraphs

Make sure you have at least two paragraphs of text on your monitor.

WPDOS. Begin with the cursor anywhere in the first of the two paragraphs you want to transpose. Turn on the macro recorder; then press Alt-P to define




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MAPPING MENUS AND KEYBOARDS

Macros are useless if they don't save time and keystrokes. Running macros in Windows applications can take several mouse clicks. And if you forget what you named a macro, you have to scroll through a list looking at descriptions. WPDOS (without keyboard mapping) allows you to assign only 26 macros to Alt-letter combinations. Then, you're relegated to using one-word macros, which require several keystrokes—and it's not always easy to remember what you named them.

Word processors overcome these nuisances in several ways. WPDOS lets you define as many different keyboard setups as you need. In other words, if you use a certain set of macros for letter writing and another set for reports, you can load a different keyboard file for each task. The Windows applications offer even more

files as you have disk space.

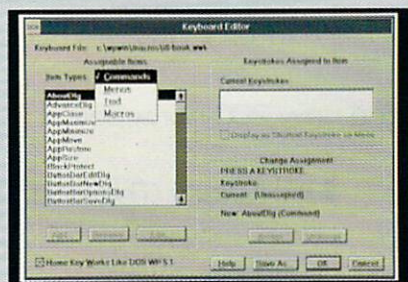
WPWin. Mapping options abound. Not only can you assign macros to Ctrl-x and Shift-Ctrl-x (x being a number, letter, or function key), but you can also assign commands to keystrokes. (Consider this before creating macros that do the same things as commands.) You can assign macros to the Macro menu and Button Bar, and you can create multiple keyboards and Button Bars.

To assign macros to the keyboard, select Preferences from the File menu and Keyboard from the submenu. To assign a macro to an existing keyboard, click on Edit (to create a new keyboard, click on Create). In Keyboard Editor, select Macros from Item Type; then click on Add. You're given a list of macros. Double-click on the macro you want to add and press the

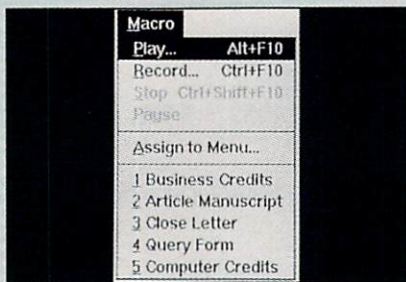
ever. You can assign macros globally or to templates—so be sure you assign macros in the setup you want.

To assign macros to the keyboard, select Options from the Tools menu, and then scroll through the Category icons and select Keyboard. Select the macro you want to assign; then press the keys you want it assigned to (Currently tells you whether the combination is already assigned). Click on Assign and then on OK.

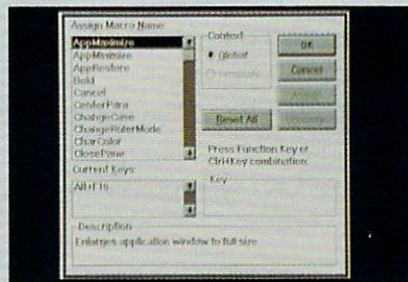
To assign macros to menus, select Options from the Tools menu. Scroll through the Category icons and select Menus. Making sure that Macros is checked in the Show option, select the macro you want to assign; select the target menu in the Menu list; and then, in the Menu Text box, type what you want the menu listing to say (for example, *Transpose words*). If you place



WPWin's Keyboard Editor assigns macros to keystrokes and creates new keyboards.



WPWin lets you assign up to 18 macros to the Macro menu.



WinWord lets you reassign macros to keystrokes through Options.

flexibility—assigning macros not only to keystrokes but also to menus and, in WPWin, to the Button Bar. WinWord 2.0 supports macros on its Toolbar.

Each program's approach is slightly different. The following includes a description of the procedure for each one.

WPDOS. WPDOS supports two types of macros: Alt-letter combinations and word macros. It also lets you change keyboard layouts. To do so, go into Setup (Shift-F1), select Keyboard Layout, and then select Create. You're prompted to name the new keyboard file. Type the new name (eight or fewer characters), highlight the new keyboard name with Down Arrow or Up Arrow, press Enter to select it, and press Enter again to return to the document screen. You can assign macros to the keyboard as desired and create as many keyboard

keys you want to assign the macro to (no Alt combinations are allowed). Click on OK to close Keyboard Editor and again on OK to close Keyboard.

Please note that before you map a macro to the keyboard, it must be run once to be compiled.

To assign macros to the Button Bar, select Button Bar Setup from the View menu; then click on Edit in the submenu. Click on Assign Macro to Button in the Edit Button Bar. Double-click on the macro you want to assign; then click on OK to close the Button Bar editor.

You assign macros to the Macro menu with the Assign to Menu command on the Macro menu.

WinWord. Word for Windows lets you assign macros to any menu, to the Toolbar, and to keystrokes. A word of caution, how-

an ampersand (&) before a letter, then after opening the menu, you can run the macro with a keystroke. &Transpose words would appear on the menu like this: Transpose words. If you also assign a keystroke combination, it would appear as Transpose words Shift+Ctrl+T.

To assign macros to the Toolbar, select Options from the Tools menu, and then scroll through Category icons and select Toolbar. The Options dialog box changes. Select the macro you want to assign from the Macros list, and choose the button you want to represent it from the Buttons list. In the Tool to Change list, select the tool you want to replace. Click on Change and then on Close.

You can assign macros to keystrokes during creation or at any other time with Options.

the macro. At the Description prompt, type *Transpose paragraphs* and press Enter. Press Ctrl-F4 for Move, select 2 for Paragraph, and enter 1 for Move. The first paragraph is deleted. Press F2 for Search, and at the Srch prompt, press Enter to search for a hard return. Press F2 to start the search. The cursor is on the line beneath the second paragraph. Press Enter, and then turn off the macro recorder.

When you run this macro, make sure you place the cursor on the first of the two paragraphs.

WPWin. Begin with the cursor anywhere in the first of the two paragraphs you want to transpose. Turn on the macro recorder; type *Tpose-p* in the File-name field and *Transpose paragraphs* in the Descriptive Name field. Click on OK. Choose Select from the Edit menu and Paragraph from the submenu. Select Cut from the Edit menu. The first paragraph is deleted. Now select Search from the Edit menu. In the Search dialog box, click on the Codes button. Scroll through the list of codes and double-click on HRT; then click on

Close. Click on Search. To insert the first paragraph, select Paste from the Edit menu (or the Button Bar). Turn off the macro recorder.

When you run this macro, make sure you place the cursor on the first paragraph.

WinWord. Begin with the cursor at the beginning of the first line (before the tab indentation) in the first of the two paragraphs you want to transpose. Turn on the macro recorder; type *TransposeParagraphs* for the Macro Record Name and *Transpose adjacent para-*

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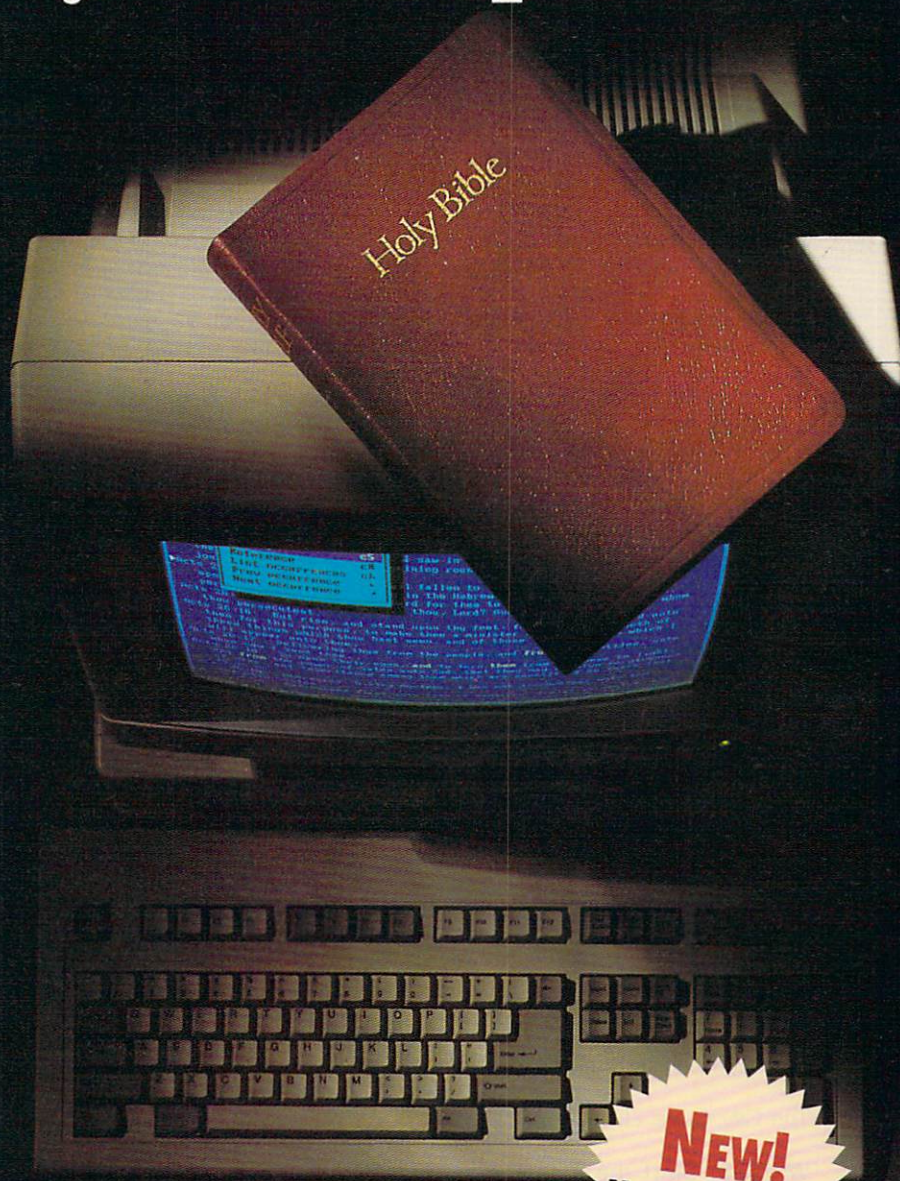
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graphs for the Description. Press P in the Key field. Click on OK. Press Shift-Ctrl-Down Arrow to select the first paragraph. Choose Cut from the Edit menu (or the Toolbar). The first paragraph is deleted. Press Shift-Down Arrow to move to the next paragraph. To insert the first paragraph, select Paste from the Edit menu (or the Toolbar). Turn off the macro recorder.

When you run this macro, be sure to place the cursor at the beginning of the first line in the first of the two paragraphs you want to transpose.

Insert Bullet

You can make items in a list stand out from straight text if you set them up as a bulleted list with a hanging indent.

WPDOS. Begin with the cursor where you want to start a bulleted list. Start the macro recorder and press Alt-B to define the macro. Type *Bullet* at the Description prompt; then press Enter. Press Ctrl-V for Compose. At the Key= prompt, type 4,0 and press Enter. Press F4 for Indent, and stop the macro recorder.

WPWin. Begin with the cursor where you want to start a bulleted list. Start the macro recorder and type *Bullet* in the Filename field and *Insert bullet* in the Descriptive Name field. Click on OK. Press Ctrl-W for WordPerfect Characters. Type 4,0 in the Number field and click on Insert and then on Close. Select Paragraph from the Layout menu, and select Indent from the submenu. Stop the macro recorder.

WinWord. WinWord is shipped with a bullet macro on the Toolbar.

Letter Template

Begin with a new document screen. At the instruction *Type return address*, type in the following information:

Your Name, Title

Your Company

Your Company's Street Address

The City, State ZIP code

WPDOS. Start the macro recorder. Press Alt-L to define the macro, and type *Letter template* at the Description prompt. Press Enter. Press Shift-F8 for Format; select 2 for Page and 5 for Top/Bottom margins. Type 1.75 (or the measurement for your stationery). Press Enter twice. Select 1 for Center Page and Y for Yes; then press Enter. Press 1 for Line, 3 for Justification, and 1 for Left. Then press Enter twice to return to the document screen.

To enter the current date, press Shift-F5, and then select 2 for Date. Press En-

ter twice to insert a blank line. Type *Return address*. Press Enter twice, and then type *Dear*. Press Ctrl-F10 to end the macro record. You're now ready to type the letter.

WPWin. Start the macro recorder. In the Filename field, type *Letter*. Type *Letter template* in the Descriptive Name field. Click on OK. Select Margins from the Layout menu, press Tab twice to move to Top, and type 1.75 (or the measurement for your stationery). Click on OK. Select Page from the Layout menu; then select Center Page from the submenu. Select Date from the Tools menu and select Text from the submenu. Press Enter twice to insert a blank space. Type *Return address*, press Enter twice, and type *Dear*. Turn off the recorder. You're now ready to begin typing the letter.

WinWord. WinWord is shipped with a very sophisticated letter-template macro. It is, in fact, an impressive example of the power of WordBasic, WinWord's macro language. Access the template by selecting New from the File menu and then double-clicking on Letter in the templates list. You can modify margins, fonts, and other settings as needed. Be sure to save the template after you've changed the settings.

Insert Text (Closing a Letter)

Begin with an empty screen or at the end of a letter you want to close. At the *Type the signature block* instruction in each procedure, follow these steps: Type *Thanks for your time and consideration*. Then press Enter. Type *Sincerely*, and press Enter 4 times. Then type in your name, title, and company.

WPDOS. Start the macro recorder, and then press Alt-E. Type *End letter* at the Description prompt and press Enter. Type the signature block. Stop the macro recorder.

WPWin. Start the macro recorder. Type *Close* in the Filename field and *Close letter* in the Descriptive Name field. Click on OK. Type the signature block, and stop the macro recorder.

WinWord. The letter template shipped with WinWord provides several letter-closing options.

Sign a Letter

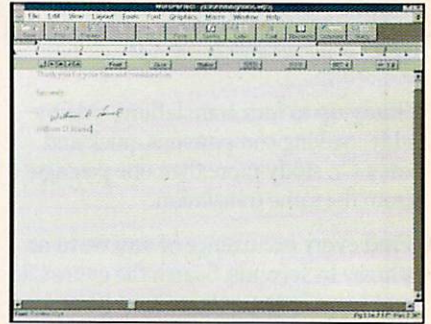
For this macro, you need a scanned image of your signature. If you don't have a scanner, you can have your signature scanned at a desktop publishing service bureau for a nominal fee.

First, use your word processor's graphics import, placing, and sizing options to create a document that looks like the one in the following example.

WPDOS and WPWin users, save the file as SIGNBLOC.WP5. WinWord users, don't save the document; instead,

go to the WinWord procedure below. WPWin users, record the macro at the end of a letter you want to sign.

WPDOS. Turn on the recorder. Press Alt-S to define the macro, type *Sign letter* at Description, and press En-



Using a scanned image of your signature, create a document like this.

ter. Press Shift-10 for Retrieve; then type *SIGNBLOC.WP5* (be sure to include path information, if applicable). Press Y to retrieve current document. Stop the recorder.

WPWin. Select Record from the Macro menu. Type *Sign* in the Filename field and *Sign letter* in the Descriptive Name field. Click on OK. Select Retrieve from the File menu; then type *SIGNBLOC.WP5* for the Filename (be sure to include path information, if applicable). Click on OK; then click on Yes to retrieve current document. Stop the macro recorder.

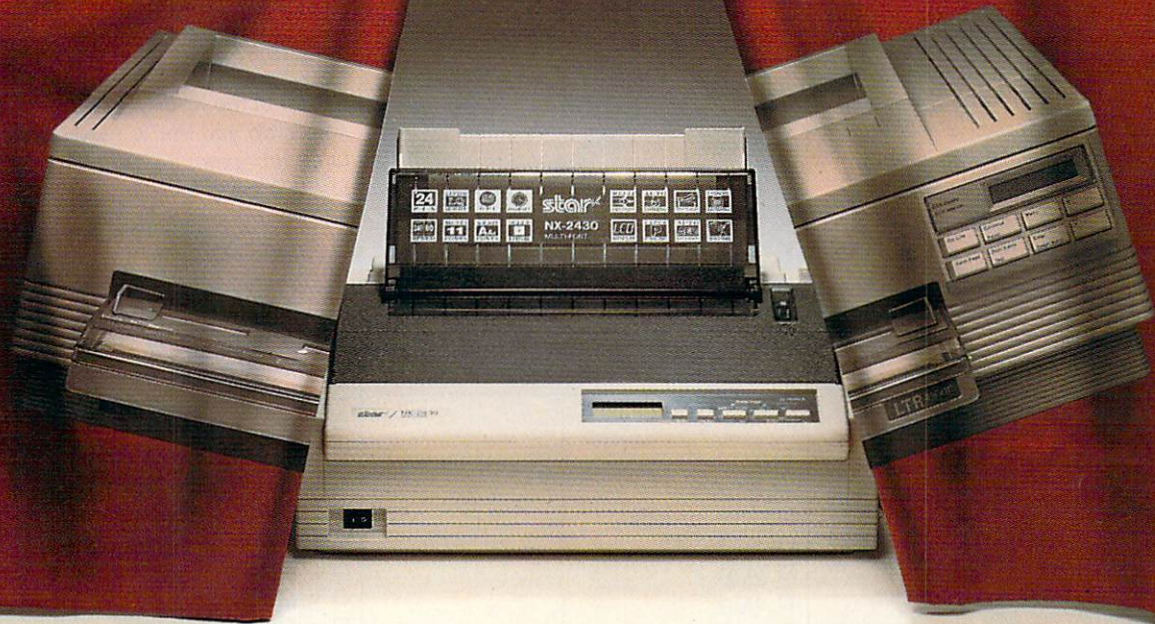
WinWord. The most efficient way to insert data into a WinWord document is with Glossary, an extension of WinWord's Merge feature. The procedure is simple: Select the data you want to include in the glossary, choose Glossary from the Edit menu, name the glossary, and then click on Define. Each time you want to use the data, insert a glossary bookmark using the Field option on the Insert menu.

This procedure is detailed in the WinWord manual. If you'd rather create a macro, the procedure is almost identical to the one in WPWin except that you'd name the signature block file SIGNBLOC.DOC and select File. . . from the Insert menu to retrieve it.

The Sky's the Limit

As macros go, these ten are simple. Once you get the hang of creating them, you're limited only by your ingenuity (and bravado). You can make them pause so you can type text and then restart them again, and you can create different versions of the same document based on different variables. The two for Windows even let you program dialog boxes that ask questions on how to proceed. Let your imagination be your guide. □

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What computer(s) do you own or use?

- 8088/8086 (IBM PC, XT, or compatible), brand _____
- 80286, brand _____
- 80386, brand _____
- Notebook/laptop, brand _____
- Macintosh, model _____
- Game system, brand _____
- Other _____
- I don't own or use a computer.

Which video display system(s) do you use?

- Monochrome
- Hercules
- CGA
- EGA
- VGA
- Super VGA

Which peripheral(s) do you own or use with your computer?

- 5¼-inch disk drive
- 3½-inch disk drive
- CD-ROM drive
- Dot-matrix printer
- Fax modem
- Hard disk
- Laser printer
- Letter quality printer
- MIDI device
- Modem
- Mouse
- PostScript printer
- Sound card
- Speakers



How much memory does your computer have?

- 640K or less
- 1MB
- 2MB
- 4MB
- 8MB

Which operating system(s)/environment(s) do you use?

- MS-DOS version _____
- DR DOS version _____
- OS/2
- Microsoft Windows
- Tandy DeskMate
- Other _____

Which parts of the magazine do you like the most?

- Art Works
- COMPUTE/NET*
- COMPUTE*'s Getting Started With special sections
- Editorial License
- Features
- Feedback
- GamePlay
- Hardware Clinic
- IntroDOS
- Multimedia PC
- News & Notes
- On Disk
- PathWays
- Personal Productivity
- Point & Click
- Programming Power

- Reviews
- SharePak
- Test Lab
- Tips & Tools

Which of the following computer-related topics do you like to read about?

- Databases
- Desktop publishing
- Disk management and MS-DOS
- Education
- Games and entertainment
- Graphics (paint, draw, or CAD)
- How to upgrade your PC
- Integrated software
- Local area networks (LANs)
- Money management
- Multimedia
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- Pen computing
- Programming
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- Word processing
- Other _____

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Where did you get this copy of *COMPUTE*?

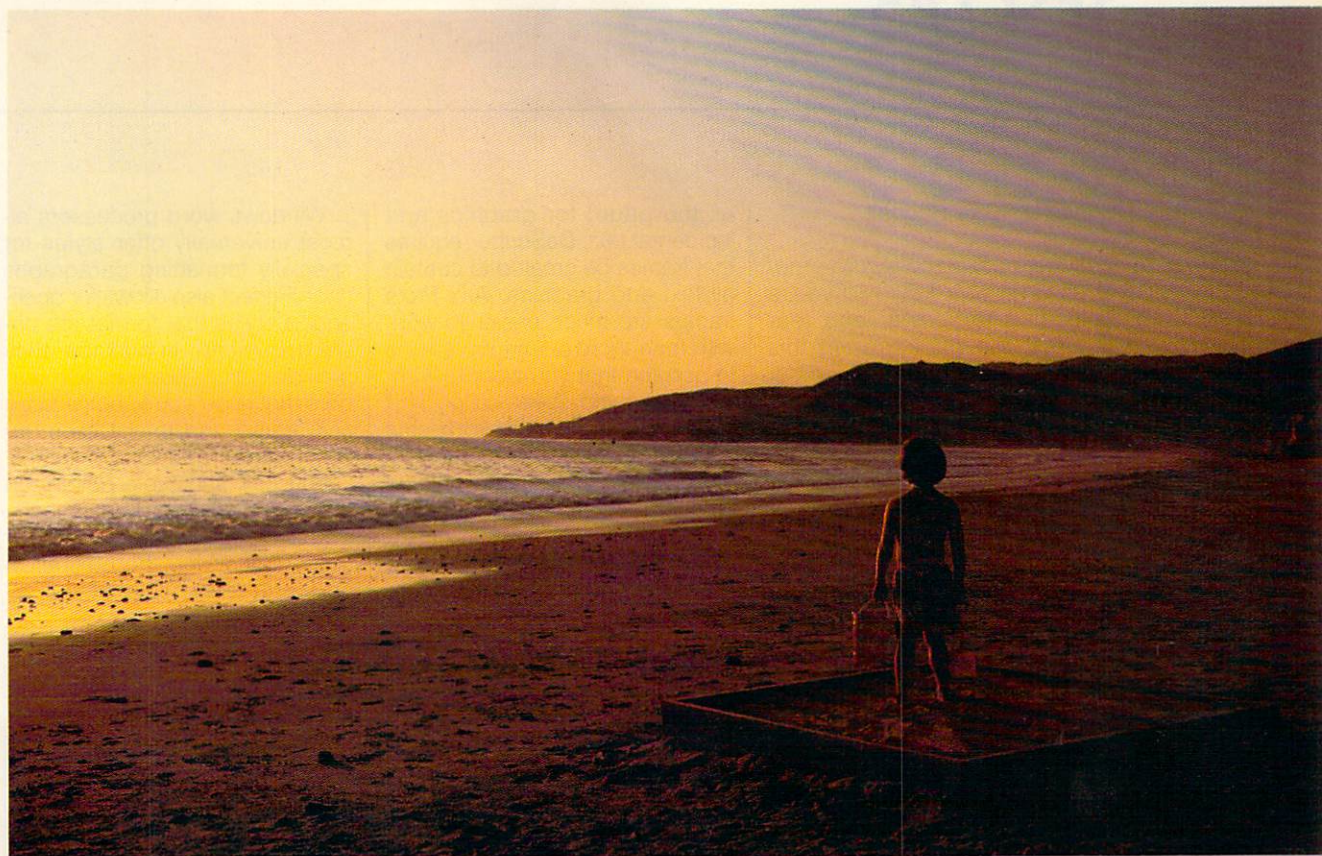
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TEST LAB

Edited by Mike Hudnall

Is there a Windows word processor in your future? If you're looking for power and features, the packages in this month's Test Lab offer a number of capabilities rarely seen in DOS word processors: WYSIWYG editing, desktop publishing's graphical and formatting tools, Windows' interactivity, and a common user interface. Many of the packages also boast special tools to make them stand out from the crowd, such as grammar checkers, complete drawing programs, equation editors, and advanced macro languages.

One requirement shared by all Windows word processors discussed in this section is a powerful computer: at least a 386SX (though a 386DX or one of the 486 chips would be preferable) and 4MB of RAM. Most of the products claim that they can run on a 286 with 1MB of RAM. But when you read this claim, remember that you can also jog underwater. Doing so, however, will test your endurance, and it won't take you very far. If you have a lesser system, you'll have to put up with very poor performance from these programs; in fact, you'd be better off using a DOS word processor or GeoWrite.

That said, let's take a look at the features most of the Windows word processors share. You might think of these as the baseline of features—reasons to make the switch to word processing under Windows. If you're considering a word processor that doesn't offer one or more of the options mentioned here, you'll be missing out on something everyone else takes for granted.

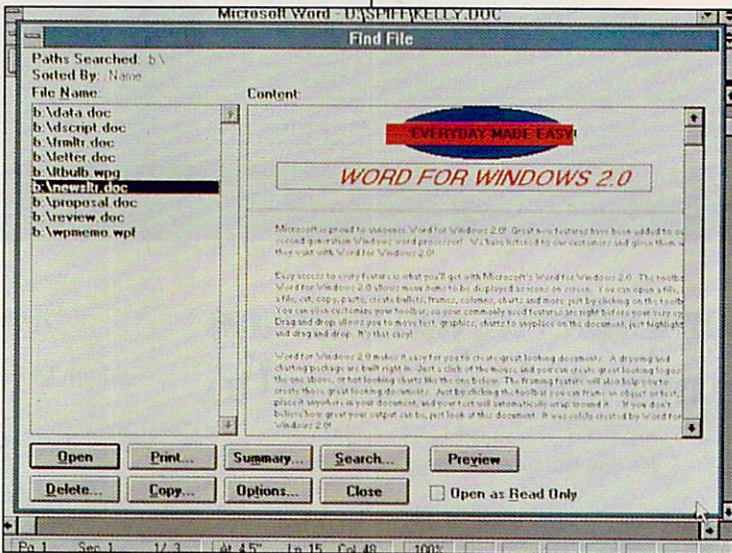
Although most Windows word processors share a majority of features, implementation varies considerably. WordPerfect still uses boxes (entities separate from the page and featuring their own editor) instead of the more common frames (entities integrated into the page and using the same editor

as the page) for graphics and incidental text. DeScribe requires that frames be created to contain all text and graphics. Ami Pro's frames are much easier to work with than Word's. Ami Pro seems to assume that you want to work with the frame itself—sizing and moving it—whereas Word seems to assume that you're more interested in working with the contents of the frame and makes selecting the frame and working with its size and shape more awkward.

Almost all of the word proces-

sors universally offer styles for most formatting paragraphs (WordPerfect also allows for open-ended styles that format the entire document). In addition, they provide options like lines and borders that allow you to box a page or a frame and to put lines between paragraphs and columns.

You can find table editors on many Windows word processors. Most allow you to create a table by simply specifying the number of cells and rows, while others re-



An attractive, easy interface is part of the Windows appeal.

sors feature draft mode (allowing you to work with text as text rather than as formatted copy), but Ami Pro retains almost all of the formatting in draft mode while WordPerfect's draft mode looks almost exactly like what you would find in WordPerfect for DOS (right down to the light gray letters and the blue background).

Most Windows word processors also provide a series of different kinds of views. In addition to the draft mode, most allow you to zoom in on your text to see it enlarged and zoom out to see a whole page or two side-by-side pages at once. Some allow you to specify a view according to percentage of full size.

quire additional information about the width of the table. Some allow for the full range of table customization, including varying column width and row height, different outline schemes, shading, table outline, captioning, and even colors. Most also offer a rudimentary spreadsheet operation.

Not only Windows word processors but nearly all word processors now offer spelling checkers as standard equipment. Thesauruses have also gone from useful extras to must-haves, and now the thesaurus in WordStar for Windows goes the extra mile, offering definitions, alternative words, near synonyms, and antonyms.

Mail merge (or simply merge)

is a powerful feature that you can use for preparing mass mailings for business purposes (you can also use it to generate a Christmas letter or other announcements of family events) using a data file and a form letter.

Most of the programs discussed here offer macros, allowing you to assign a macro to a menu or to an icon bar. In this way, you can make your personal commands as much a part of the program as the commands created by the programmers.

Look for special file managers with your word processor. Look for master document features, too. Most Windows word processors allow you to group document files into complete publications for printing and editing. Most also offer table of contents and index generators that will automatically create these features for a master document, checking each of the component documents in turn.

The remainder of the shared features are common user interface features—the standard keypresses and the file-management and document-processing tools.

What will probably impress you most about these packages is their desktop publishing capabilities. Each approaches desktop publishing in a slightly different way, but all seem to have it as their central focus. Let's face it—no one would put up with a Windows application if it didn't offer superior formatting and control along with its WYSIWYG interface. Many writers will prefer to stick with the DOS word processor they know and love. If you're looking beyond writing and you want to turn out splendid documents, you must ask yourself which tools are most valuable to you, seek out the word processor that offers them, and start publishing.

No one can pick the perfect word processor for you, but the reviews and the features grid in this month's Test Lab will help you make that decision.

ROBERT BIXBY

Ami Pro 2.0
IBM PC and compatibles (80286 or faster), 1MB RAM (2MB or more recommended)—\$495*

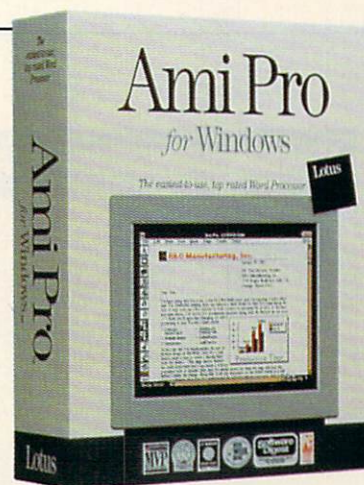
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AMI PRO 2.0

Like the other word processors in this month's Test Lab, Ami Pro 2.0 has a long list of text-editing, page-formatting, screen-display, and file-handling features. It's both fast and polished, as you'd expect with a second-generation application from a company the size of Lotus. Choosing the best of the group is a tough decision; these are all powerful programs. However, Ami Pro clearly stands out from the others in three areas: advanced layout features, extensive support for styles and macros, and a fully integrated design.

Using Ami Pro's layout features, it's relatively easy to create documents that look as though they've been desktop published. Ami Pro uses frames to let you create, move, and alter the size of your graphics. You can fix a frame on a page, repeat it across multiple pages, make it transparent, and have text flow around it. Graphics can be rotated, flipped, scaled, cropped, edited, adjusted for gray scale, and created from scratch with the built-in drawing and charting programs.

Ami Pro includes support for 24-bit color graphics (for 16 million colors) and can create multiple columns of varying widths and gutter sizes. Styles let you save and reuse a document's text and layout preferences. In Ami Pro, styles can include text, graphics, and automatic macros. They're very flexible; you can move a style from a document to a style sheet or the other way around. You can create



global styles that operate across more than one document—so that when you change a style, the connected documents are updated automatically.

The macro language is just as powerful. Add your own menu items and create dialog boxes that change according to the user's response. Once you've created a macro, link it to one of Ami Pro's SmartIcons. These are small icons that you can place at the top, bottom, left, or right of the screen. You can also float them so they can be quickly moved to the least obtrusive position.

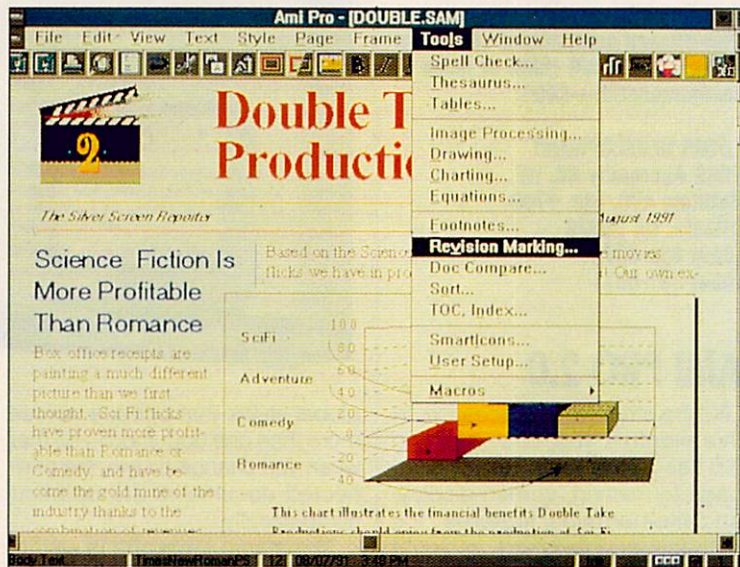
The package ships with 100 icons; you can use the integrated drawing program to create your own. The program comes with 27 preprogrammed SmartIcons, including ones that let you save, print, cut, paste, change viewing levels, show or hide the ruler, and check a document's spelling.

With the new Power Fields feature, you can embed a macro directly into a document. For example, a business letter could automatically request the name of a person, look up the current address in another file, and place the name and address into the letter using a special predefined format.

In the area of integrated design, Ami Pro receives top honors for its group of tightly integrated pro-

*Customers who have purchased a version of Ami Pro since March 1, 1991, are eligible to upgrade to Ami Pro 2.0 for a suggested retail price of \$49. For all other Ami Pro users, upgrades are \$99.

TEST LAB



Use Ami Pro 2.0's revision marking to keep track of document changes.

grams: a draw program, a chart-making program, an image-processing program, a table editor, an equation editor, and an outlining program. Because of its unique integration of component programs, everything in a document can be edited in place, right on the page, including drawings, charts, equations, scanned images, and tables. You make your changes in the document itself, not in a separate screen or view.

Other significant features in Ami Pro include the ability to intelligently import documents in a variety of word processor formats, including WordPerfect, Microsoft Word, Microsoft Word for Windows 1.0, WordStar, MultiMate, DisplayWrite, ASCII, RFT, and DCA. Lotus calls this "no-questions-asked file import." You simply select the file, and the program takes care of converting the file to Ami Pro's native format.

Ami Pro can also import an impressive number of graphics formats, including EPS, PIC, PCX, CGM, HPGL, WMF, TIF, BMP, and DrawPerfect. In addition, you can import data from other kinds of applications, including those that save in dBASE, Paradox, Lotus 1-2-3, Excel, SuperCalc, and

DIF formats. A handy Status Bar lets you quickly alter the current style sheet, typeface, type size, editing mode, page number, and location of the SmartIcon display. It dynamically displays program information by showing such messages as *Playing macros* and *Comparing documents*. It also works with Lotus's own cc:Mail for Windows to let you know when you have new mail.

Add extensive revision marking and document comparison, extremely fast printing, four-level undo, and a free copy of Adobe Type Manager, and you have a powerful word processor that you won't outgrow any time soon. On the downside, you can't edit in the facing-pages view, select a whole document, or flow text from frame to frame. And if you want the macros manual, you'll have to spring for the developer's kit, which costs an additional \$9.95.

All in all, Ami Pro is well rounded and feature rich. It stands up well against any Windows word processor, including Microsoft Word for Windows 2.0. For advanced layout features, it's definitely the one to choose.

DAVID ENGLISH

Circle Reader Service Number 304

DESCRIBE WORD PROCESSOR 3.0

DeScribe Word Processor 3.0 is sort of like a quirky college friend of mine: It doesn't always act the way you expect it to; it's not afraid to take a different route to reach the same destination; and, despite its strange appearance, it's a hard worker that gets the job done. Some of the program's eccentricities can be traced back to its origin—it was first released for IBM's OS/2 operating system.

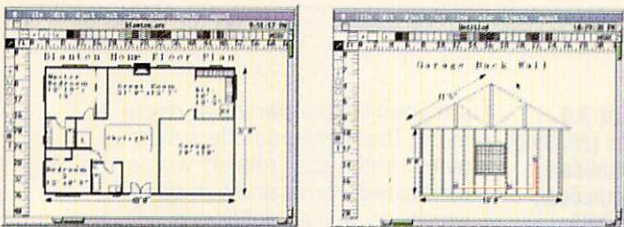
The DeScribe disks include versions for both Windows and OS/2, making the program a logical choice if your working environment includes both operating systems.

DeScribe works with the concept of objects. Each distinct block of text—such as a headline, footnote, outline, or body copy—is treated as a separate object, which can be moved, resized, and restyled. Graphics are treated as objects as well. While this approach makes working with complicated document formats a snap, it does take some getting used to if you've never dealt with an object-oriented word processor.

The text and graphics tools, contained in small, movable toolbar windows, can be sent away or summoned back with a simple click of the right mouse button, so they don't use valuable screen real estate when they're not needed. The dialog boxes and menu choices are logically labeled and arranged, and comprehensive help is available for each item. You hide the toolbars and turn off the rulers and borders to get the maximum amount of text onscreen.

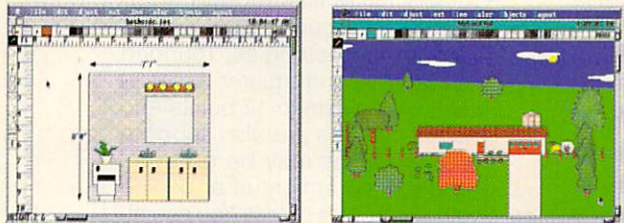
DeScribe deviates from accepted Windows standards in some operations, probably a by-product of its OS/2 heritage. For example, to access a menu, you press and then release Alt before pressing the letter of the menu, instead of holding Alt down while press-

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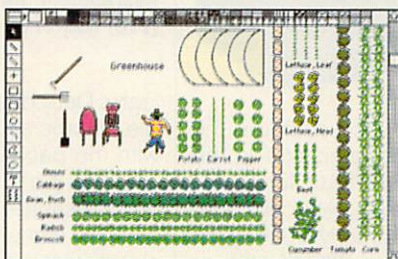
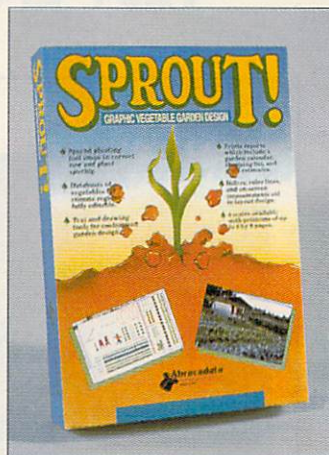
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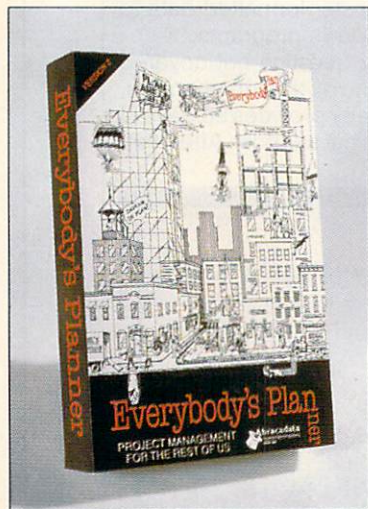
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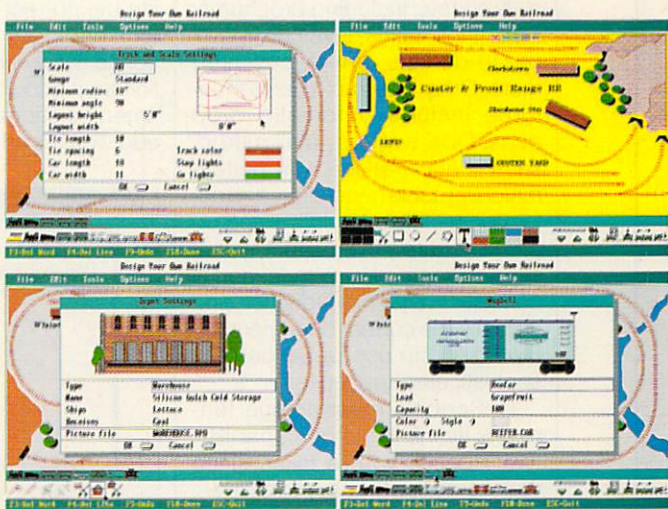
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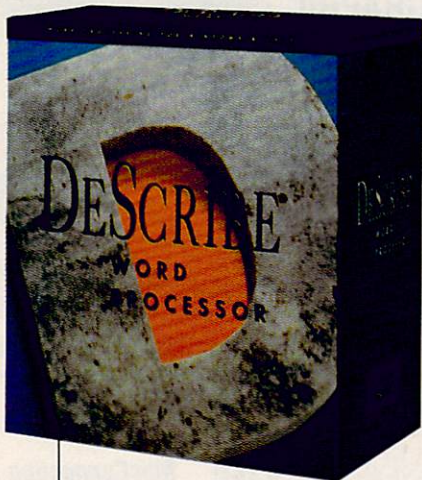


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ing the letter. And perhaps the most annoying omission is the lack of a draft mode for faster screen refreshes. Although DeScribe is reasonably speedy on machines with a 386DX chip or better, it's quite poky on a 386SX.

What makes DeScribe a serious contender in the Windows word processor race? It features a wonderful set of 50 predefined style sheets, including brochures, invitations, faxes, invoices, memos, to-do lists, envelopes, and more. Other well-implemented features include automatic drop caps, DDE support, mail merge, search and replace with pattern matching, table generation, and automatic handling of widows and orphans. There's even a facility that allows programmers to launch a compiler from within DeScribe and compile the current document, allowing you to use DeScribe as a sophisticated text editor.

DeScribe's most unique feature is its infinite undo capability. Every action you've taken since you most recently saved the file—whether it's changing a word or inserting a graphic—can be undone a step at a time.

If there's a feature you're missing, such as word count, you can probably add it with DML (DeScribe Macro Language). This comprehensive language, structured like a hybrid of BASIC and Pascal, is reasonably easy to

DeScribe Word Processor 3.0
IBM PC and compatibles (80386SX or faster, 80486 recommended),
3MB RAM (4MB recommended),
CGA or higher graphics (VGA recommended), 2MB free hard disk space (10MB recommended);
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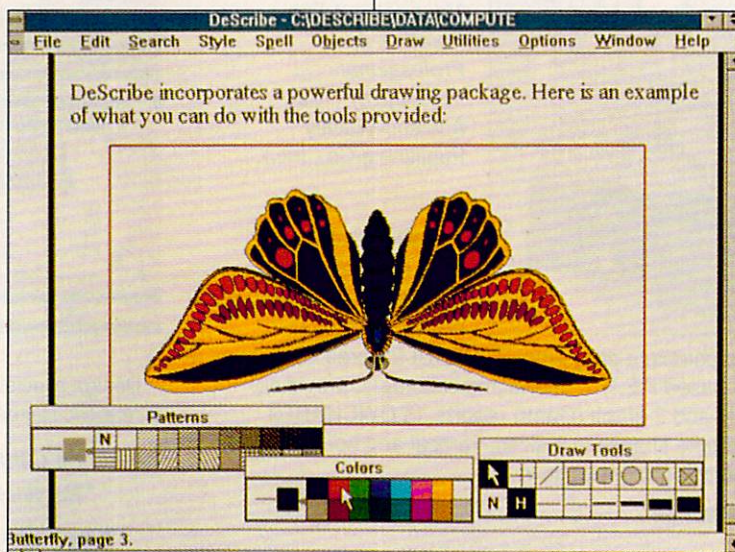
learn. DeScribe includes 30 sample macros and a Macro Manual with the package.

DeScribe's spelling checker and thesaurus are a pleasure to use. You can check the spelling of a particular word, or you can automatically check all the text in a single object or the entire document. The spelling checker also includes definitions, which are particularly handy if you're not sure you're using the correct spelling of a word for a particular context. While DeScribe has a conventional user dictionary, it also allows individual document dictionaries, so you can add words and abbreviations that

are specific to a particular document. The thesaurus offers synonyms, antonyms, related words, contrasted words, and compared words, as well as definitions.

DeScribe's drawing tools are as good as those found in some basic structured drawing programs. You can create art in 16 colors using filled or hollow circles, Bézier curves, ovals, lines, polygons, rectangles, rounded rectangles, and squares. Line sizes from hairline to 12 points and 22 fill patterns are also supported. Graphics may be grouped and placed in front of or behind other graphics or text. You can also import bitmap graphics in 20 formats, thanks to DeScribe's licensed HiJaak technology. Text import and export are flexible as well, with almost 60 different formats supported. Most DOS word processors and spreadsheets are supported, but the only Windows formats included are Ami Pro and Excel. You'll have to use DDE or Microsoft Rich Text Format to transfer formatted data to other Windows programs.

For any question not covered in one of the exemplary manuals, the company provides 90 days of free technical support. After that,



DeScribe lets you import bitmap graphics in 20 formats.

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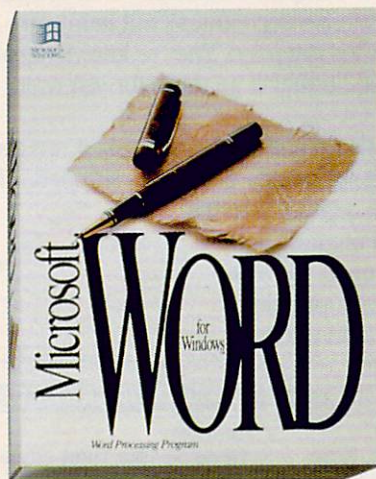
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plan to pay \$95 per year or \$10 for the first three minutes and \$1 per minute after that to get your questions answered. The company also has a support BBS.

If you can live with DeScribe's user-interface oddities, you'll find it a capable and powerful word processor. Although it lacks some features, such as automatic footnotes and a draft mode, its superior object-oriented page-layout capabilities make it an excellent choice for those needing a word processor with desktop publishing capabilities.

DENNY ATKIN

Circle Reader Service Number 305

MICROSOFT WORD FOR WINDOWS 2.0

In Windows-land, Microsoft Word for Windows has always been the word processor to beat. With Ami Pro 2.0 and WordPerfect 5.1 for Windows, the competition's hotter, but for my money, Word for Windows 2.0 is still king of the hill.

WinWord 1.1 was a solid word processor that introduced a feature that was to become the most imitated interface element in the Windows world—the toolbar. With version 2.0 of WinWord, Microsoft has taken the toolbar and dramatically extended it to include a full row of buttons for the most common tasks.

*\$129 for previous users of Word for Windows and for competitive upgrades.

Microsoft Word for Windows 2.0 IBM PC and compatibles (80286 or faster), 2MB RAM, EGA or higher graphics, 5MB free hard disk space (15MB for all options); mouse recommended—\$495*

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Since the features accessed by the toolbar are at the heart of WinWord, let's take a quick toolbar tour. Going from left to right, you'll find buttons for opening and saving files; cutting, copying, and pasting; undoing; creating numbered and bulleted lists; building tables; creating frames; drawing (WinWord has an on-board drawing program); graphing; printing envelopes; checking your spelling; printing; and zooming between full-page and 100-percent views.

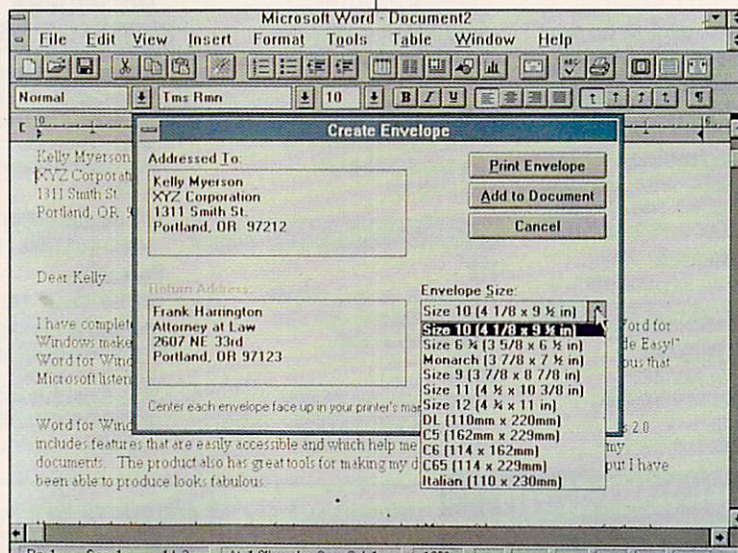
Almost better than these new buttons is the fact that you can add your own. You can map any native WinWord command or any macro you've created to a button. Here's a simple example of a button I've

added to WinWord's toolbar.

I found that I spent a lot of time either typing the date in documents or going through WinWord's menus to insert the current date. I decided it would be nice to have a button on the toolbar for this chore. First, I created a macro to insert the date using the following keystrokes: Alt-I, T, Down Arrow, Down Arrow, Enter. Next, I double-clicked on the toolbar to bring up the options dialog. I selected my insert-date macro's name, indicated where on the toolbar I wanted my button, and chose a button design from the list of those available. I clicked on Change, and my new button was on the toolbar. That's all there was to it.

Looking beyond WinWord's new buttons, you'll find that the ribbon and ruler, familiar from WinWord 1.0, are present in 2.0 but they're combined. The ribbon sports drop-down list boxes for styles, fonts, and font sizes, plus buttons for styles (bold, italic, and underline), justification (left, center, right, and proportional), and tab settings (left, right, center, and decimal), as well as a button to turn paragraph marks on or off.

With 2.0, you can double-click on each of these elements to call



Printing envelopes is a snap with Word for Windows 2.0.

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important dialogs. For example, double-click on the ruler, and you'll pull up the paragraph style dialog box. If you double-click on the ribbon, you'll get WinWord's character-formatting dialog box. And if you double-click on the toolbar, you'll find yourself in WinWord's Option module, where you change buttons and keyboard assignments, among other things.

As you may have gathered from the description of the buttons, there's more to WinWord than just an improved interface—there's a boatload of new features. I'll touch on some of the most important.

For desktop publishing, this version of WinWord has frames. A frame is simply a way of unifying a graphic or a region of text so it can be moved. And moving frames is easy with WinWord's new drag-and-drop capability. To move a frame, select it, click the mouse on it, and drag it to its destination. (Drag and drop works with any WinWord object and is not limited to frames.)

Another great DTP feature is text rotation, which lets you alter the angle at which text appears.

Desktop publishing features are exciting, but those of us using a word processor for day-to-day tasks will be glad to find some impressive business muscle in WinWord. At the top of the list is envelope printing. For a year, I've been debating whether to get a dedicated label printer, but this feature is so nice that I've decided that WinWord and my printer are all I need. To print an envelope, all you do is click on the Envelope button and put an envelope in your printer. If you have an inside address in your letter, WinWord will find it and supply it in the dialog box. If there's no inside address, you simply type it in. This may seem like a small feature, but it's one that will save you hours every month.

As you'd expect with any top-of-the-line word processor, WinWord comes with an on-board spelling checker and thesaurus,

WordPerfect 5.1 for Windows IBM PC and compatibles (80286 or faster, 80386 or faster recommended), 2MB RAM (4MB strongly recommended), hard drive—\$495

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but what's new in 2.0 is a grammar checker. Most writers will get at least some useful advice from this tool.

Other features that bear mentioning include topflight file conversion, superior help for WordPerfect users, excellent print merge, and a first-rate tutorial. When you come down to the bottom line, WinWord is hard to beat. It's done everything I've asked of it and more. I unreservedly recommend it.

CLIFTON KARNES

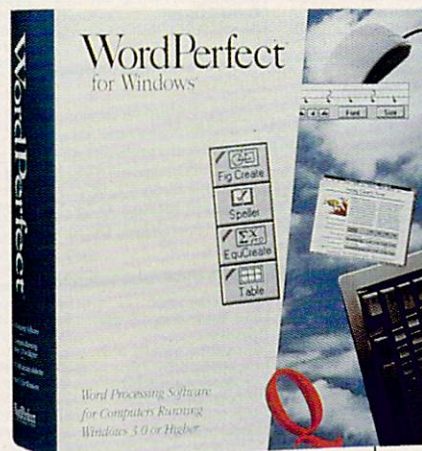
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WORDPERFECT 5.1 FOR WINDOWS

WordPerfect has entered the Windows word-processing arena, and pundits wait with bated breath to see whether it will be a success.

Unlike WordPerfect's entry into the Mac, Amiga, and ST environments, this release comes at the tail end of a pack of serious contenders. It's identified as 5.1 (probably to get an edge on the 2.0s and 1.0s on the market), and it's very much analogous to the latest DOS version, with the advantages of a graphic interface. The major complaint about the DOS version has been the length of time it takes to learn the simplest of tasks. Just setting the margins or defining a page layout takes several keypresses, and the logic of the menu system is enough to try any new user's patience.

WordPerfect 5.1 for Windows is a piece of cake to use. Ironically, the people who'll probably have the most trouble adapting to



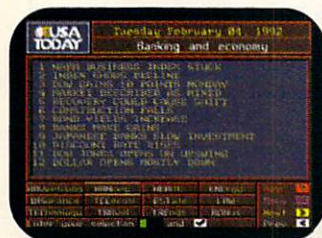
it will be those poor souls who've already invested months and years of effort into learning the DOS version. For them, WordPerfect has provided a keyboard overlay that reminds you a little of the command structure of the DOS version, but no matter what you do, the rules in Windows are different from the rules in DOS.

If you have a large collection of macros from WordPerfect 5.1 for DOS, you can convert them with a handy conversion utility, though some of them won't be usable. But you might need fewer macros because the commands are so much handier in the current version. Also, the macro language has been completely redone, making writing a macro much easier. You can write your macro right in the main editing screen and call it up for editing anytime. WordPerfect for Windows has a rich macro language that provides means to create your own dialog boxes and menus, though in my opinion Ami Pro 2.0 does an even better job in both of these areas.

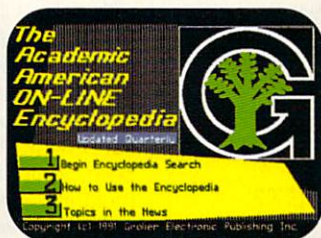
WordPerfect also provides a file manager that allows you to leave behind the superawkward file handler of Windows 3.0 and the merely awkward file handler of Windows 3.1. However, if you've ever used a truly effective file handler like the ones offered for Macintosh or in GeoWorks Ensemble, you'll look at this collection of file managers (including WordPerfect's) and wonder why

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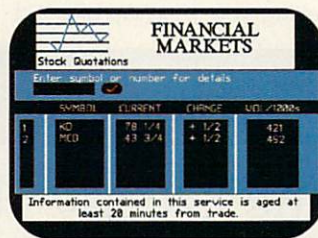
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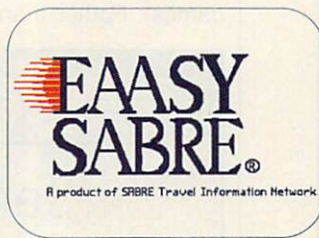
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they can't be better. I know I do.

As for object linking, WordPerfect doesn't have it yet, Microsoft Word for Windows 2.0 just got it, and Ami Pro has always had it. WordPerfect supports DDE, however, so it's not completely linkless, and it features a handy spreadsheet importer that will convert the most common spreadsheet formats into a WordPerfect table for insertion into text.

WordPerfect doesn't handle frames (or boxes, in WordPerfect parlance) as well as Ami Pro, or even as well as Word (though the boxes appear to be more reliable and leakproof than Word's frames). Rather than letting you

an important part of your publication, you should consider Ami Pro over Word or WordPerfect in their current releases.

Another drawback for many users will be WordPerfect's voracious appetite for RAM. I attempted running it on two machines with only 2MB. The 80386 machine simply crashed at regular intervals. When I ran the program on an 80286, it was more insidious and would begin failing in unpredictable ways before eventually dying. On an 80386 with 4MB, its performance was flawless. The lesson is clear: If you have less than 4MB, beef up before installing WordPerfect. It will save hours

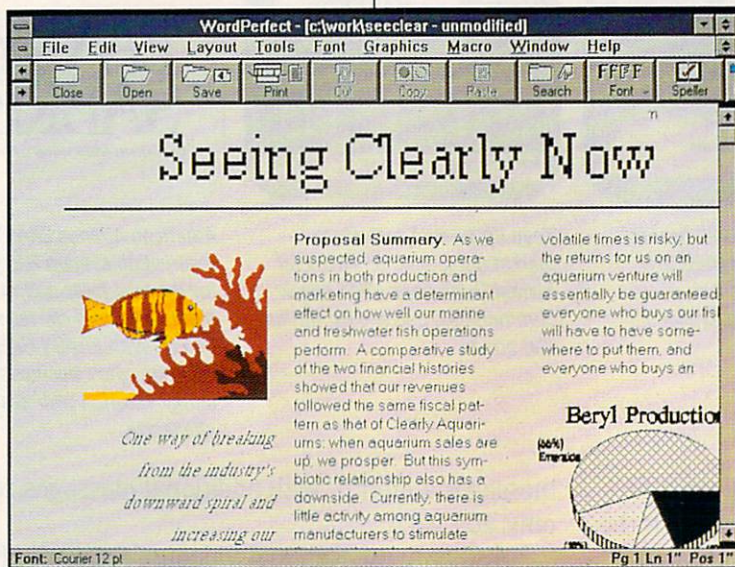
WORDSTAR FOR WINDOWS

WordStar for Windows has the distinction of being the only Windows word processor to offer you WordStar- and WordStar 2000-compatible keystrokes, and for that reason it will automatically attract the attention of longtime users of those DOS programs. The real strengths of this program, however, are advanced text editing and desktop publishing.

In part because it's a Windows product, WSWin handles text editing with lots of flexibility and often with ease. I like being able to use the old WordStar-compatible key commands, and the pull-down menus are fine, but I really like pressing a single button at the top of the screen to choose a paragraph style, font, point size, emphasis (bold, italic, underline, or double underline), or view mode. A press of a button also changes alignment, number of columns, spacing, and other features. There's even a Toolbox bar with buttons that allow you to create and insert graphics. As a touch-typist, I was pleasantly surprised to find how easily I could manipulate text and use the buttons in this interface.

The program's extensive array of text-editing features includes search and replace, spelling checks, a thesaurus, footnotes, endnotes, superscripts, subscripts, headers, footers, and contents- and index-generating capabilities—and the list goes on and on. (See the features grid for the full story.) Gone are the dot commands of earlier WordStar packages, but with Windows, you won't really need them.

According to WordStar, this is the only word processor with a thesaurus that provides synonyms, antonyms, near synonyms, near antonyms, and see-also references. In addition, the thesaurus gives you definitions so that you can choose the best word to convey your meaning. I found 18



WordPerfect commands are easier in Windows, thanks to the interface.

simply select a tool and drag a box, WordPerfect requires you to make at least two menu selections. And when WordPerfect boxes contain text, the text isn't directly editable. You have to double-click on the box, which takes you to a separate text editor, where you enter the text in a distinctly marginal WYSIWYG environment. This procedure is a serious drawback for desktop publishers (although it's a vast improvement over the command structure of the DOS product). If frames are

of frustration with marginal and unpredictable performance.

WordPerfect for Windows is best for users who will be sharing documents with WordPerfect for DOS or another platform. Under these circumstances, DOS WordPerfect users will be drawn to the Windows product and eventually demand to have their own machines refurbished for Windows so they can use WordPerfect for Windows, too.

ROBERT BIXBY

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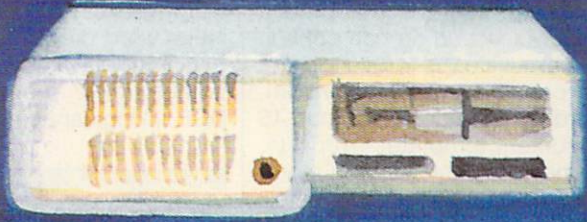
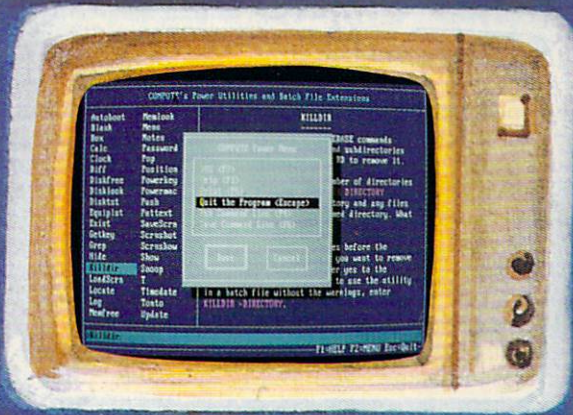
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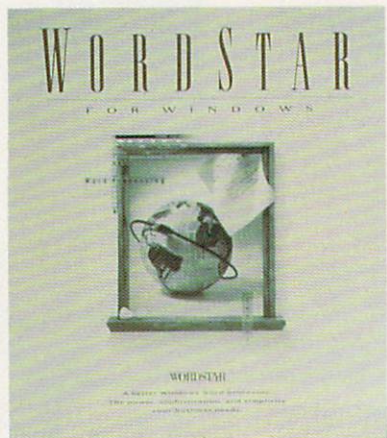
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definitions for the nondescript *good*, and for each definition, there's a list of synonyms—pretty impressive. This degree of help and control is available for a number of features.

The package comes with more than 20 paragraph styles, and each controls over 60 paragraph attributes. Need color in your documents? You can choose from 16.7 million colors for text, graphics, tables, borders, and background. There's even widow and orphan control. To make life easier and show you the capabilities of the program, WordStar provides more than 45 document templates—reports, memos, a newsletter, and more. I like being able to open a new file, designate a template, and replace sample text and graphics with my own for a sharp, impressive document.

Probably the biggest adjustment for you if you're a longtime WordStar user is working with frames in this frame-based program. Whether you're creating or importing text, graphics, or tables, you'll use these frames; and the controls you use will take some getting used to, especially if you're not accustomed to Windows.

For getting a handle on using frames and other features, I found the online tutorial indispensable; the four manuals that come with the program are well

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done, too. If you stick with the tutorial and practice using these frames, the payoff is a remarkable degree of control over the way your document looks.

With WSWin, you also get Bitstream FaceLift, which includes 13 scalable typefaces, and Correct Grammar, the company's grammar checker, which works with several Windows products.

Need to import or reference spreadsheet data files? WSWin can do it. It can also import major graphics formats, including DRW, PLT, EPS, WMF, MacPaint, TIF, PIX, PCX, and BMP. And WordStar offers you a long list of major word processors that you can import from or export to. What's more, in addition to its DDE linking capabilities with oth-

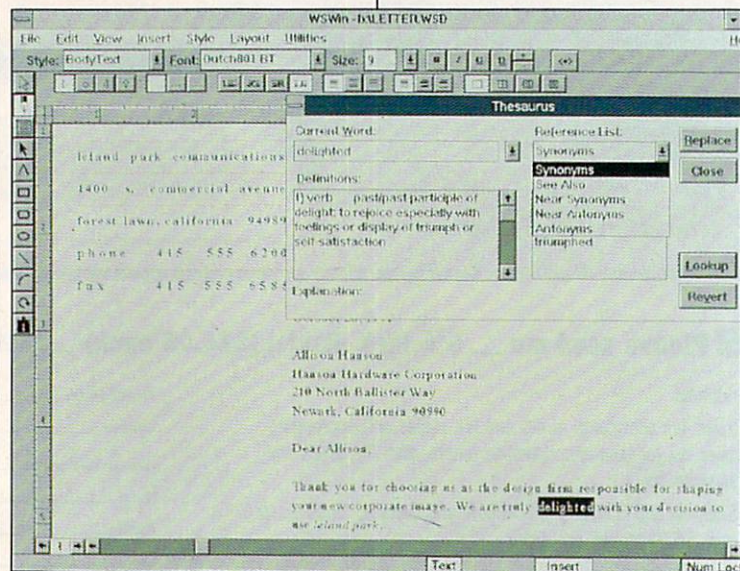
er Windows applications, WSWin offers links to DOS applications.

As powerful and attractive as WSWin is, there are some significant omissions you need to be aware of. For example, you can open only one document at a time, although it's possible to open two versions of the WordStar program. Also, WSWin doesn't offer macros, which keeps you from automating certain procedures. Finally, I wasn't able to get a word count without running Correct Grammar. This isn't a tremendous inconvenience, but the word counts aren't as easy as they were in the DOS version.

I found performance lacking on a 386SX/20 but just fine on a 486SX/25. If you lack powerful hardware and especially if you need speed without a multitude of desktop publishing features, a great DOS word processor like WordStar 6.0 or 7.0 will probably better meet your needs. However, if you want WordStar command-key compatibility and if the features and speed of WSWin meet your needs, it's a capable program you'll want to consider.

MIKE HUDNALL

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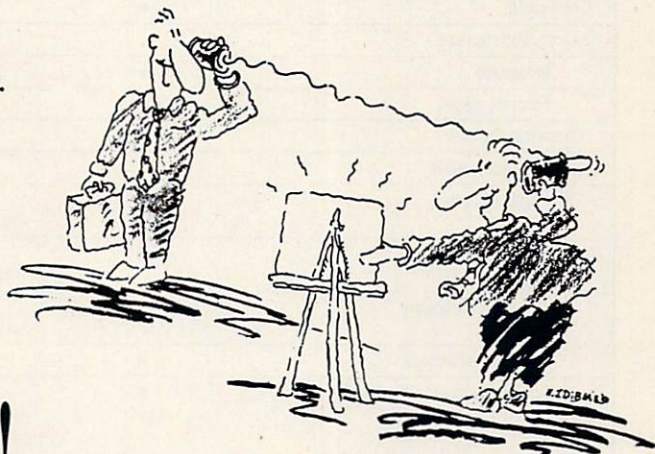


WSWin's thesaurus provides synonyms, antonyms, definitions, and more.

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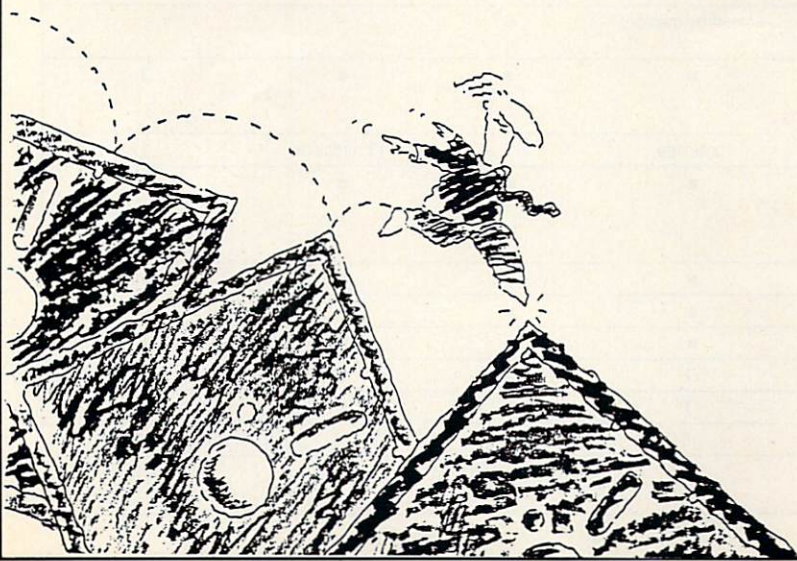
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Windows Word Processor Features

	Ami Pro 2.0	DeScribe Word Processor 3.0	Microsoft Word for Windows 2.0	WordPerfect 5.1 for Windows	WordStar for Windows
TEXT EDITING					
Draft editor	■	□	■	■	■
Search and replace					
Wildcards	■	■	■	□	■
Formats (tags)	■	□	■	■	■
Grammar checker	□	□	■	□	■
Spelling dictionaries					
Legal dictionary	□	■ (option—\$149.95)	■ (option)	□	□
Medical dictionary	□	■ (option—\$149.95)	■ (option)	□	□
Scientific dictionary	□	■ (option—\$149.95)	■ (option)	□	□
Personal dictionary	■	■	■	■	■
Foreign language dictionary	■ (option)	■ (option—\$149.95)	■ (option)	■ (option—\$99.00, \$149.00 for Hebrew and Arabic)	■ (option—\$69.95 each for French, German, Italian, Spanish, or Norwegian)
Thesaurus					
Synonyms	■	■	■	■	■ (also near synonyms)
Antonyms	□	■	■ (and related words)	■	■ (also near antonyms)
Definitions	■	■	■	□	■
Indexing	■	■	■	■	■
Contents generator	■	■	■	■	■
Footnotes	■	□	■	■	■
Endnotes	■	□	■	■	■
Headers	■	■	■	■	■
Footers	■	■	■	■	■
Word counts	■	□	■	■	■ (through Correct Grammar)
Maximum number of documents open at one time	9	limited by memory	9	9	1
Editable macros	■ (ships with 68 macros)	■	■	■	□
Number of undo levels	4	unlimited	1	1 (3 undeletes)	1
Accelerator keys	■	■	■	■	■ (for WSWin, WordStar, and WordStar 2000)
Widow and orphan control	■	■	■	■	■
Autohyphenation	■	■	■	■	■
Autopagination	■	■	■	■	■
Autosave	■	□	■	■	■
Nonprinting annotations	■	□	■	■	■
Number of colors	16 million	16	16	256	16.7 million
Number of paragraph styles supplied	48 (style sheets)	50	4 (more through the templates)	0	24

	Ami Pro 2.0	DeScribe Word Processor 3.0	Microsoft Word for Windows 2.0	WordPerfect 5.1 for Windows	WordStar for Windows
DESKTOP PUBLISHING					
Magnification range	10%–400%	10%–500%	25%–200%	58%–400%	25%–200%
Maximum number of columns	8	20	32	as many as fit on a page	4
Rulers	■	■	■	■	■
Choice of units of measurement (pts., in., picas, cm.)	■	■	■	■	■
Number of built-in templates	48	50	18	0	50
Drawing tools	■	■	■	□	■
Graphic editing	■	■	■	■ (size and color)	■
Scaling	■	■	■	■	■
Cropping	■	■	■	■	■
Number of clip art images	100+	6 (extra disk when you register)	48	36	77
TABLES					
Automatic text wrap in cells	■	■	■	■	■
Equation editor	■	□	■	■	□
Column math	■	□	■	■ (only in tables)	□
Fixed or variable column widths	variable	variable	variable	variable	variable
Table line styles	■	■	■	■	■
TYPOGRAPHY					
Tracking	■	■	■	■	■
Leading	■	■	■	■	■
Kerning	■ (PostScript printers only)	■	■	■	■
Point size range	1–999	any (ATM or PostScript)	1–127	.00001–largest size paper can accommodate	1–792
Degree of increments (how small)	1 point	1/100 point	1 point	1/100 point	1/10 point
CONNECTIVITY					
DDE linking	■	■	■	■	■
OLE	■	□	■	□	□
Links to DOS app files	□	■	■	□	■
Network support	■	■	■	■	■
Number of word processor types supported	33	59	20	13 (not counting version numbers)	73
LEARNING TOOLS					
Online tutorial	□ (manual-based tutorial)	□ (manual-based tutorial and disk examples)	■	□	■
Online help	■	■	■	■	■
Duration of customer support	unlimited	90 days	unlimited	unlimited	life of product
BBS support	□	■	■	■	□
Fax support	■	□	□	■	□
Special help	CompuServe	□	CompuServe	CompuServe, GENie, America Online	CompuServe
■—yes □—no					

NEWS & NOTES

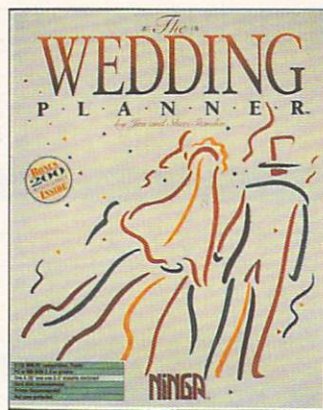
Jill Champion

Get Me to the Church on Time

No one can guarantee a marriage will last, but a new software product from Ninga Software will at least make sure the wedding ceremony is a dream instead of a nightmare. Ninga is a young company determined to fill a niche in the home-software market with Wedding Planner, a complete guide to orchestrating a wedding.

Designed for IBM PCs and compatibles, Wedding Planner helps prospective brides and grooms completely organize all those time-consuming

Wedding Planner takes the stress out of getting married—or at least some of it.



but necessary wedding details in a concise, alphabetical format that's simple to access. Perhaps the biggest advantage of using the program is that it handles all list keeping by tracking invitations, RSVPs, gifts, and thank-you notes. You can view up-to-the-minute information in each of 15 different reports that will tell you, for instance, which RSVPs you're still waiting for.

Daily calendar prompts serve as reminders for an assortment of things, such as when to order the bride's gown and when to book a reception hall. A budget feature allows you to keep a running total of all wedding expenditures. Tips on everything from buying an engagement ring to ordering a wedding

cake are included in the General Wedding Information feature. You can even print out address labels for your invitations and thank-you notes.

Suggested retail price for Wedding Planner is \$49.95. For further information, contact Ninga Software, 736 8th Avenue SW, Suite 330, Calgary, Alberta, Canada T2P 1H4; (800) 265-5555.

Schemers Unite

Don't let the name fool you. *The SCHEMER's Guide*, published by Schemers of Fort Lauderdale, Florida, isn't a handbook for conspiracy; it's a guide to what some astute educators hope will be the future programming language of choice. Scheme is a streamlined programming language, derived from the artificial-intelligence language LISP, which places concept above syntax—unlike BASIC and Pascal.

The president of Schemers, Terry Kaufman, says the way computer science is introduced to students in school these days could jeopardize the country's future as a competitor in the technology marketplace. "Colleges are already noticing a drop in the number of students choosing to major in computer science," Kaufman says.

After spending ten years working for IBM, Kaufman thinks businesses, too, should be concerned about the quality of computer-science knowledge new employees—especially recent college graduates—bring to their jobs. Scheme, he says, is such a simple language to learn (it encompasses object-oriented programming and techniques), yet it's very powerful, and it helps you learn other languages more easily. To find out more, contact Schemers, 4250 Galt Ocean Mile, Suite 7U, Fort Lauderdale, Florida 33308; (305) 776-7376.

Life Can Be Easier

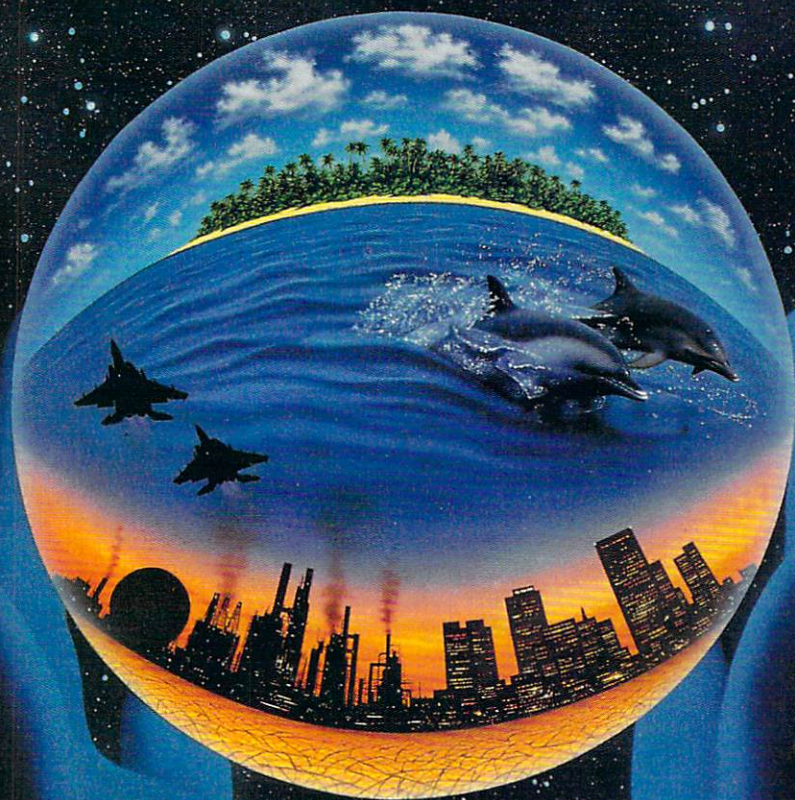
A new development from Microsystems Software should help some of the 43 million disabled Americans who are either currently working or looking for a job. ADAPTA-LAN, a set of local-area-network programs designed for physically challenged users, is installed on a network of IBM PCs or compatibles, providing employees with screen magnification; word prediction; and access to the PC by way of external switches, visual beeps, and more. ADAPTA-LAN's nine software packages include MAGic and MAGic Deluxe screen-magnification software for DOS and Windows; HandiKEY and HandiCODE for PC access without a keyboard; HandiSHIFT and HandiWORD for those with limited keyboarding ability; HandiCHAT for nonspeaking persons; HandiPHONE telephone and modem access for people with physical limitations; and SeeBEEP, a visual indicator of a PC audio beep for the hearing-impaired.

The package retails for \$2,995 per server with an unlimited number of users. For more information, contact Microsystems Software, 600 Worcester Road, Framingham, Massachusetts 01701-5342; (508) 879-9000.

Super Floppy

Maxell says its new Super RD (Reliable and Durable) 3½-inch floppy disk, the MF2-HD, is for "less accommodating" environments—as in ultradusty offices and different floppy drives. One of Maxell's improvements over other disk brands is its patented, airtight Dual Interlocking Flex-Shutter, which provides "a virtually contamination-free internal floppy disk environment." The shutter fits more tightly against the disk casing than other shutters do, helping to

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*VGA screen shots
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Maxell has set the suggested retail prices at \$35.70 for a package of ten unformatted disks and \$38.60 for a package of ten formatted disks.

A Better Mousetrap

The ideal mouse might not be a mouse at all, according to Interlink Electronics, maker of a mouse replacement for those who find conventional mice and trackballs cumbersome.

Interlink has adapted its Force Sensing Resistors (FSRs) to allow you to use a key, button, or joystick as a full two-button mouse with fingertip control. The device is

integrated into your keyboard rather than attached as a peripheral. Toggling a key, button, or joystick lets you control the direction and speed of the cursor.

Interlink's alternatives include a Dedicated Pointer Location, which is like having a two-button mouse integrated into your laptop case or keyboard and with which you can perform point-and-click operations with one hand; a Joystick Pointer, which is a hinged, collapsible stick the size of a keyboard key that's integrated into the keyboard; and the Key Mouse (developed in conjunction with Key Tronic), which is a key-cap pointer that uses FSRs placed under a key cap.

Integration into existing keyboard designs is simple and inexpensive through a fully debugged, single-chip interface that supports RS-232C serial ports, the IBM PS/2 mouse port, and standard bus mouse interfaces. Designed to operate with both DOS and Windows mouse drivers, the devices require no software modification to the host computer. For more information, contact Interlink Electronics, 1110 Mark Avenue, Carpinteria, California 93013-2918; (805) 684-2100.

Slidex Disk-Storage System

Now there's hope that science will cure disk-zap in our lifetimes. The Slidex FD-3000 is a patented filing system for 3½-inch floppies that protects disks from static and magnetism while allowing you to file and retrieve them easily.

Disks are "snapped" onto rigid plastic pages that can be stored as hanging files, in three-ring binders, or as stand-alone books holding up to 24 disks per book. A thick, stainless-steel plate inside the front and back covers provides magnetic protection.

To find out where to buy Slidex disk-storage units, contact TRIWEF (Slidex distributor), 200 Valley Road, Suite 204, Mount Arlington, New Jersey 07856; (201) 770-2800.

Roll-Your-Own Manuals

Any company, large or small, stands to benefit from having a policy handbook that answers questions most often asked by employees—information on salary reviews, company holidays, benefits, leaves of absence, and other critical policies. Lack of such policies can affect employee morale and even result in legal problems down the road. Preparing an employee manual can give employers the impetus to form policies when they haven't previously done so.

Employee ManualMaker has been edited and reviewed by a variety of industry specialists. It includes more than 125 policies and 30 benefits, which are organized, defined, and written for review and customization.

A special primer section includes advice on the best ways to find and hire employees, an employee application with a special preemployment release to help gain information from previous employers, and much more. Employee ManualMaker retails for \$130. For more information, contact JIAN Tools for Sales, 127 Second Street, Los Altos, California 94022; (800) 346-5426.

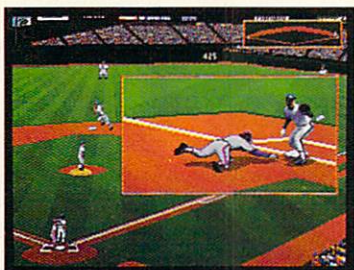
Companies with items of interest suitable for "News & Notes" should send information along with a color slide or color transparency to News & Notes, Attn: Jill Champion, COMPUTE, 324 West Wendover Avenue, Suite 200, Greensboro, North Carolina 27408. Although space is limited, all items will be considered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

Store floppies in Slidex disk-storage unit without worrying about stray static or magnetism.

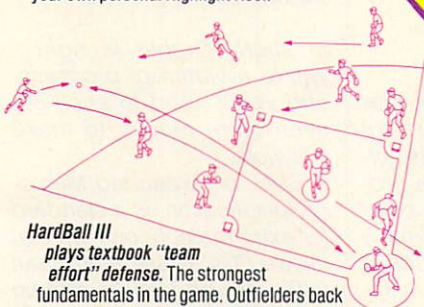




▲ *HardBall III* takes a full cut at major league realism. A power line-up that includes printable stats, standings and box scores; the ability to import data from *HardBall II*, *Earl Weaver II*™ and *Tony LaRussa*™; plus a Team & Player Editor that allows you to alter everything from team logos to a player's ability.



▲ *HardBall III* zooms in on the bang-bang plays. Five camera angles cover the entire ballpark. Watch instant replays and save the best for your own personal Highlight Reel.



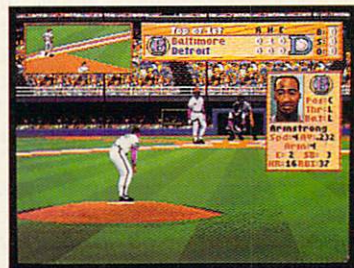
HardBall III plays textbook "team effort" defense. The strongest fundamentals in the game. Outfielders back up one another and infielders act as cut-off men, coming out to take the throw.



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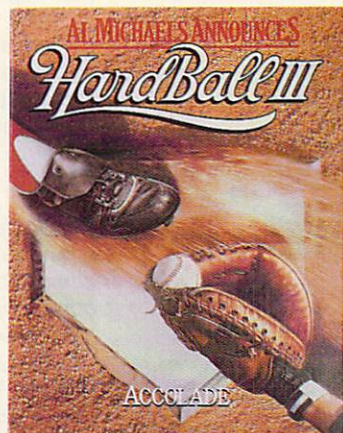
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Padding the phone bill, freeing up directory space, coping with EMS, waiting for the globe to settle, packing your system, and providing for modem errors

Obscene Phone Charges

Please make your readers aware that the FCC is quietly working on a resolution that users of modems should pay extra charges for use of the public telephone network. CompuServe, Tymnet, and Telenet would also be charged as much as \$6.00 per hour per user for use of the public telephone network. The money is to offset funds lost due to devaluation.

If you own a computer or plan to purchase one, telecommunications is probably a big part of your computing life. Charges like this will either kill or severely cripple the commercial online services. Write to the following people to let them know you're opposed to this surcharge.

Chairman of the FCC
1919 M St. NW
Washington, DC 20549

Chairman, Senate Communications Subcommittee
SH-227 Hart Building
Washington, DC 20510

Chairman, House Telecommunications Subcommittee
B-331 Rayburn Building
Washington, DC 20515

Remember that modem users already pay fees for use of the public telephone lines—their phone bills.

ANTHONY J. HONER
DENT, MN

Thanks for letting our readers know about this action. The chairman of the House Telecommunications Subcommittee, Edward Markey, is already opposed to the surcharge. You might have more effect sending your letters to the ranking minority member of the subcommittee, Matthew Rinaldo (Room 2469, Rayburn Building, Washington, DC 20515). Since this is

an issue that seems to come up again and again, and since this is an election year, perhaps it would be a good idea to find out how the congressional candidates in your area stand on this surcharge and vote accordingly.

Space Cadet

When my son was using his Joe Montana Football game, he named one of his leagues DREAM TEAM. This created the directory DREAM TE. The program seems to use it OK and saves game files there, but I want to get into it to erase some of the old files that are taking up room on my hard disk. The DOS command to change directory won't recognize DREAM TE because of the space. What can I do?

CLARK HARPER
WINSTON-SALEM, NC

Although you could not create or access a file or directory with that name using the normal DOS commands, a program that bypasses the command interpreter would have no trouble creating such a directory. The solution is therefore fairly simple. Just get hold of PC Tools and use the PCSHELL program. It provides a desktop from which you can create, rename, access, and delete subdirectories with spaces in their names.

It's My Parity

I have a problem with my 286 clone. Soon after upgrading from a CGA to a VGA system, I started getting memory parity interrupt errors. I get these when using the DOS BACKUP program and when trying to install programs to my hard disk. I replaced the board and monitor with the old CGA versions, and the errors stopped.

I called Orchid, the maker

of the VGA card, and was told that there was a conflict with the video memory at location A000H to C7FFH because another program was trying to use that memory. I was encouraged to buy a memory-manager program, such as QRAM by Quarterdeck. I purchased QRAM, then found out that I need either EMS, EEMS, or Chips and Technologies' shadow RAM. I don't know what these are or where to get them.

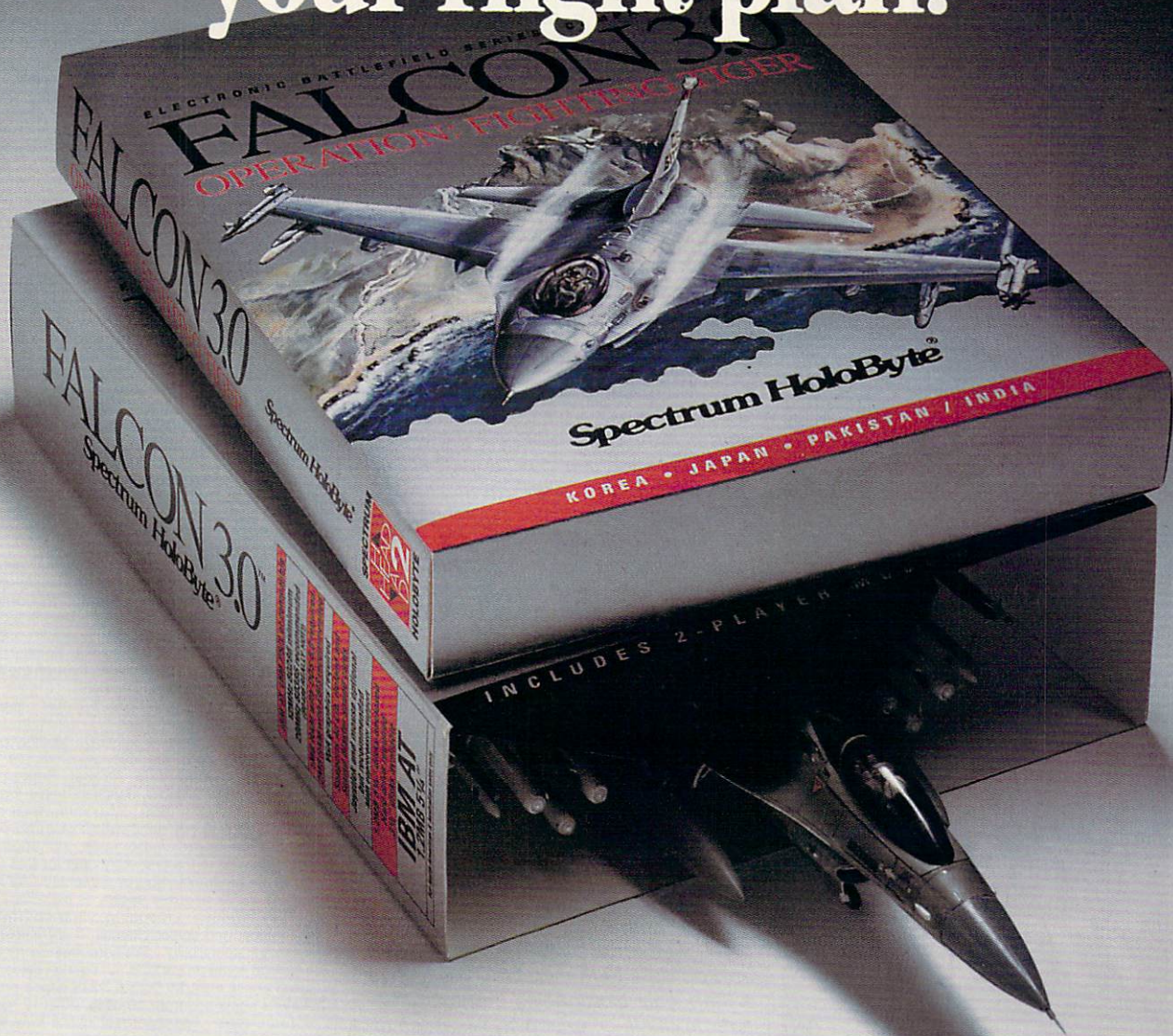
At this time I have a 286 with 1MB of RAM, Phoenix BIOS version 3.1, and DOS 5.0. I use ProDesigner II. Can you tell me what I can do to keep this system and not spend a lot more money to solve this problem?

DAVID J. GRAVERT
DAVENPORT, IA

In short, Orchid is right—you're a victim of progress, and you'll need to shell out even more money to make this work.

EMS, or Expanded Memory Specification, is a standard for extra memory on PCs that allows PCs to use more than 640K, allowing you to add up to 16MB of memory for data storage. It's a hardware/software combination that both memory manufacturers and software developers have agreed upon. The 286 and higher-numbered chips allow use of much more than 640K, but only by running the chip in a different mode, called protected mode, that's nominally incompatible with DOS. That's why OS/2 and the upcoming 32-bit Windows can address huge amounts of memory, but only by running in protected mode and forcing you to run DOS programs in a separate compatibility box mode. This memory, confusingly, is called extended memory and is not compatible with EMS. EEMS is a revi-

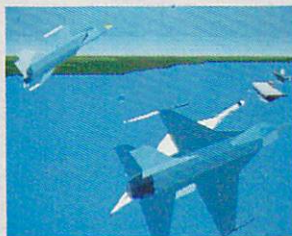
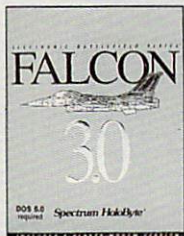
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sion of EMS that allows programs to run in expanded memory. Just to make things even tougher to understand, some software—GRAM included—converts extended memory (which the 286 understands natively) to expanded memory. This is probably the best choice for you, since it gives you both options on your 286. So we suggest you go the extended memory route. This will cost you, at mail-order prices, about \$50-\$100 for an empty extended memory board and about \$60 per megabyte of memory. One meg is enough, but I suggest two or three—or as much as you can afford. The price for EMS boards is similar.

Some things to remember if you purchase EMS:

1. Make sure the chips are fast enough to run on your computer (for example, buy 80-ns chips if those are what your machine is equipped with).

2. Note that to work its magic, an EMS board or emulator snatches 64K from your precious 640K. So if you have 580K free before the EMS is installed, you'll end up with only 516K after—but you'll have access to all the extra memory you can afford.

3. Make sure the software you use—ProDesigner, in this case—knows how to use EMS. Many programs don't.

Golden Globe

PC Globe sounds really good, but what about the way the Soviet Union is changing? Should I wait until that situation is resolved before buying it?

NAOMI R. SMITH
PEKIN, IL

If you wait for the world to settle down and borders to remain firm, you'll have a long wait. Companies that manufacture products on changing situations offer regular upgrades. PC Globe is updated every 12-18 months. The most recent update was in April 1992. The charge to receive these updates is \$35 per year.

Stranger in a Strange Land

I work for the U.S. Foreign Service and have to ship my belongings, including my computer and peripherals, on a fairly regular basis. I already know about packing my hard drive, but I was hoping you could give me some additional pointers on how to secure delicate PC equipment for international transport.

THOMAS C. PROCTOR
JAKARTA, INDONESIA

The best advice is to keep the shipping containers your components

COMPUTE SEARCHSTAKES!

No purchase or phone call required. For automatic entry, call 1-900-454-8681 on a touch-tone phone. The cost for the call is \$1.50 for the first minute and \$1.00 per minute thereafter; average call is estimated to be 2-3 minutes. Charges for calls to the above number will appear on your phone bill. Callers must be 18 or older. To enter monthly SearchStakes drawings, call from 9 A.M. EDT on 4/26/92 through midnight EST 12/31/92 to give your name, address, telephone number, the Compute issue date (month), and the solution for the month you select. To enter the Grand Prize drawing, call from 9:00 A.M. EST 11/1/92 through midnight EST 1/31/93 to give your name, address, telephone number, the solution to the Grand Prize SearchStakes plus the solution to any two of the previous monthly SearchStakes. All call-in entrants will receive a \$5.00 savings coupon toward caller's choice of: (1) Kathy Keeton's newest book, *Longevity*, or (2) a two-year subscription to *Compute*. Multiple coupons may not be combined on a single book or subscription purchase. Call as often as you wish; each call is a separate entry. Call-in entry option is void in GA, LA, MN, OR, NJ and where prohibited.

Alternate Entry Method: Print your name, address, and phone number on a 3" x 5" piece of paper. (1) To enter the monthly drawings, print the Compute issue date (month) and solution for that month on your entry and address your envelope to include the issue date (month), for example: "June Compute SearchStakes." (2) To enter the Grand Prize drawing, print the words "Grand Prize," the Grand Prize solution, plus the solution to any two previous monthly SearchStakes on your entry. Address your envelope: "Compute SearchStakes Grand Prize." Mail all entries, addressed as directed above, to: 324 West Wendover Avenue, Suite 200, Greensboro, N.C. 27408. Enter as often as you wish; each entry must be mailed separately. All write-in entries must be postmarked by 1/31/93 and received by 2/15/93.

For the solution(s), complete rules, and detailed description of prizes including prize values, send a self-addressed stamped envelope to Compute SearchStakes Solutions, Dept. RRS, 1965 Broadway, NY, N.Y. 10023-5965 by 12/31/92; no return postage required for residents of VT and WA. Solutions and prize information will be provided through the issue date in which the request is received.

Odds determined by number of entries received. Prizes/Values: Grand Prize (1), minimum value \$15,000-maximum value \$40,000. Monthly prizes (6), one for each of the following Compute 1992 issue dates: June, July, August, September, October, and November, minimum value \$1,500-maximum value \$7,500. Maximum total prize value: \$85,000. A description of each prize, including its approximate value, will appear in *Compute* prior to the first entry date for that prize. Prizes are not transferable or redeemable for cash. No substitution of prizes except as necessary, due to availability. Licensing, transportation, registration, and dealer charges, if applicable, are winner's responsibility. Winners may be required to pick up some prizes from the nearest dealership. Travel prizes must be from a major airport nearest winner's home and must be used within 12 months of award date. Additional restrictions may apply. Taxes are the winner's responsibility.

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came in, including the styroform blocks that held your computer in place, but we assume that it's too late for that.

If you threw away your original packing materials, you need plastic bags, and lots of 'em. If you receive bags from the federal government, the heavy garbage bags will fill the bill single-strength.

If you're using regular plastic bags, double or triple them so that each unit of your computer is air- and watertight. Put each component in its own bag (use zip-lock sandwich bags for the mouse and cables).

Pack everything in at least one thickness of corrugated cardboard with the highest burst strength you can find. If you're also shipping clothing, it makes excellent packing material.

Just pack your off-season clothing around the computer and save some boxes. With a computer, there's nothing to leak or rub off on your clothes.

If you kept the cardboard inserts that came with your disk drives, reinsert them before moving the computer. This prevents the read/write heads in a disk drive from knocking against each other.

If you threw them away, cut a piece of cardstock about the width of a computer disk and a couple of inches longer (so you can pull it out) for each drive and insert that instead. Protect the keyboard from anything that might press on the keys.

Pro Communication

I enjoyed Tony Roberts's article on telecommunications in the December issue. However, he made one small mistake at the end when he said that ProComm Plus doesn't provide much information about errors.

ProComm Plus creates an error file with the same name as the script file but with an ERR extension. This file will tell you what line in the script contains the error. It also contains information about the nature of the error, such as NO ENDPROC or INVALID TOKEN.

CHET MILLER
 GREAT FALLS, MT

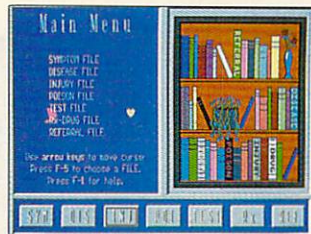
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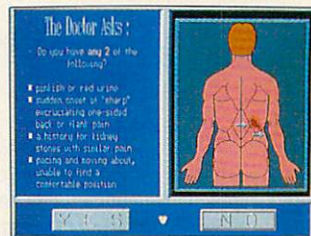


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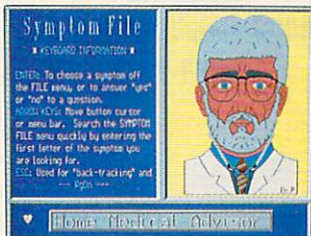
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TIPS & TOOLS

Edited by Richard C. Leinecker

Checking DEBUG Codes

We've started a tradition of publishing small COM programs that you can type in using DOS's DEBUG program. It can be a challenge to get them right, though, since you are entering pure machine code in hexadecimal form.

Here's a program that will give you a checksum value for a COM file. Each DEBUG example we publish from now on will have a checksum value given. To use the program, just type *CHECKSUM FILENAME.COM*, and it'll give you a three-digit value. Compare this number to the number printed in the magazine. If it's different, then you have an error in your typing. If it's the same, chances are pretty good that you haven't made any errors typing it in.

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

DEBUG CHECKSUM.COM

File not found

```
-e 100 be 80 00 ac 0a c0 74 64
-e 108 ac 3c 0d 74 5f 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 bf 70 01 2b f6 b8 00
-e 128 3d cd 21 72 3f 8b d8 8b
-e 130 d7 b9 01 00 b4 3f cd 21
-e 138 8a 05 03 f0 0b c0 75 ef
-e 140 b4 3e cd 21 81 e6 ff 00
-e 148 bb 64 00 8b c6 2b d2 f7
-e 150 f3 04 30 88 05 8b f2 8b
-e 158 d7 b4 09 cd 21 2b d2 8b
-e 160 c3 bb 0a 00 f7 f3 8b d8
```

```
-e 168 0b db 75 df b4 4c cd 21
-e 170 00 24
-RCX
CX 0000
:72
-W
Writing 0072 bytes
-Q
```

Test it out. The checksum you get for CHECKSUM.COM should be 062.

RICHARD C. LEINECKER
MIAMI, FL

Easy Security

If you worry about your PC while you're away from it, there may be an easy way to keep people from accessing your computer when it's left running without supervision. This program waits for you to press the F4 key. It won't respond to any other key, even the Ctrl-Alt-Delete combination. You can put it in your AUTOEXEC.BAT file for a simple password system.

DEBUG PASSWORD.COM

File not found

```
-e 100 b8 09 35 cd 21 89 1e 50
-e 108 01 8c 06 52 01 b8 09 25
-e 110 ba 2d 01 cd 21 83 3e 54
-e 118 01 00 74 f9 8b 16 50 01
-e 120 8e 1e 52 01 b8 09 25 cd
-e 128 21 b4 4c cd 21 50 e4 60
-e 130 3c 3e 75 0c 1e 8c c8 8e
-e 138 d8 c7 06 54 01 01 00 1f
-e 140 e4 61 0c 80 e6 61 24 7f
-e 148 e6 61 b0 20 e6 20 58 cf
-e 150 00 00 00 00 00 00 00
-RCX
CX 0000
:56
-W
Writing 0056 bytes
-Q
```

The checksum for this program should be 147.

You can change it to accept any function key. Find the second hex number in the line that starts -e 130. Its value is 3e. Change this value to anything you want. Remember, though, this isn't an AS-

II code but a raw scan code from the keyboard. Here are the values for function keys 1-10.

F1	3b	F6	40
F2	3c	F7	41
F3	3d	F8	42
F4	3e	F9	43
F5	3f	F10	44

THOMAS E. HINES III
KANSAS CITY, MO

More Printer Control

Several months ago we featured a couple of DEBUG programs that let you send control codes to your printer. Since then we've developed some batch files to do the same thing.

Here's one called FF.BAT that sends a form feed to the printer. To create this file, type *COPY CON FF.BAT* and press Enter. Type *echo* and press the space bar. Hold down the Left-Shift and Left-Alt keys while you type *1* then *2* on the numeric keypad. Type the *>* character and then *prn*. Press Enter to end the line. Then press F6 and Enter to create the file.

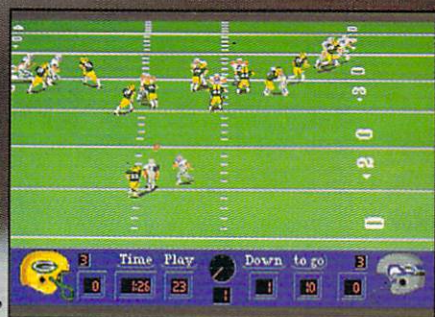
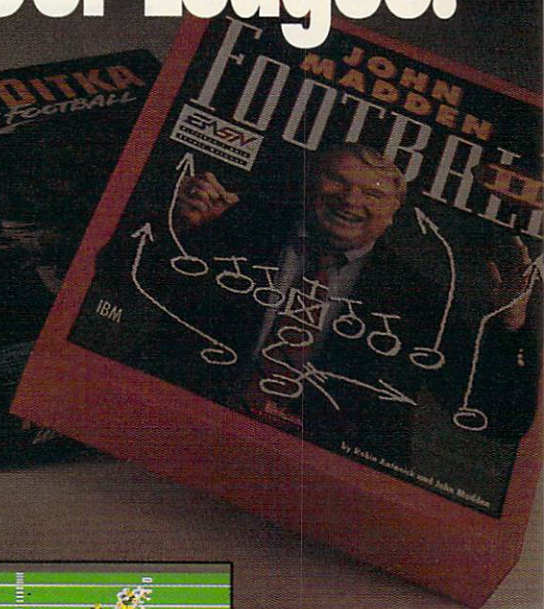
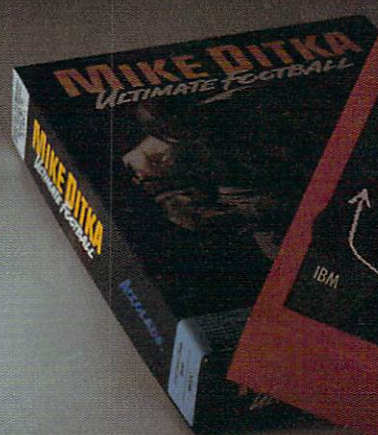
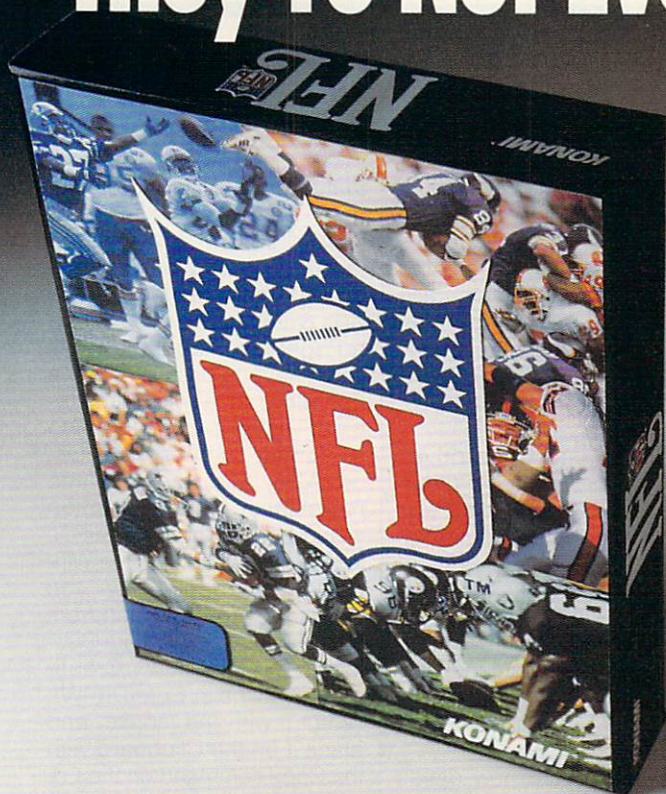
Make sure this batch file is in your path or the current directory and type *FF*. When run, it sends a form feed to your printer.

You can send any single code or combination of codes to your printer. Some of the more common ones are a carriage return (ASCII value 13) and a linefeed (ASCII value 10).

Consult your printer manual for other useful codes like the one for setting the printer to near letter quality or the one for setting it to one of its built-in fonts. Once you've made your list of control codes, you can combine them into one big batch file. Here's a simple example called PCODES.BAT. Where you see {CHARACTER 12}, hold down the Left-Shift and

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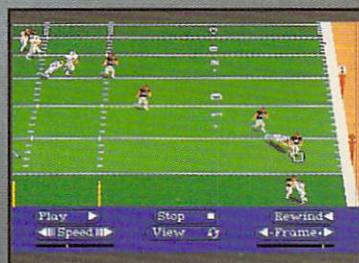
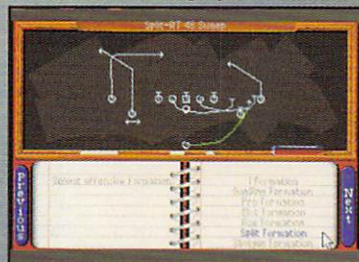
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	Bengals	Season Average
Rushing (No./Yds./Avg)	18/68/4.9	89/240/2.8
Passing (No./Yds./Avg)	10/288/20.9	40/545/13.6
Passing (Comp./Atts)	8/10	29/54
Completion %	0.800	0.537
Fumbling (No./Yds./Avg)	1/50/50.0	1/50/50.0
Fumbles (No./Lost)	0/0	1/0
Intercepted	0	5
Sacked	1	8
1st Downs	8	29
Net Yards	297	657
Touchdowns	2	7
Extra Points	2	5
Field Goals (No./Atts)	1/1	1/2
Safeties	0	0
Penalties (No./Yds)	0/0	1/5
Total Score	17	52
Total Plays	35	175
Time of Possession	12:38	1:45:52
Total Yards	401	1304

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San Diego CHARGERS		Thomas Gage			
No.	Pos.	Height	Weight	Birthdate	Exp.
39	QB	5'11"	203 lbs.	01/25/57	8 yrs.
Intelligence		77	Thomas Gage		
Speed		79	Number	38	
Agility		79	Position	QB	
Endurance		81	Height	5'11"	
Tackling		79	Weight	203 lbs.	
Blocking		41	Birthdate	01/25/57	
Catching		81	Experience	8 yrs.	
Throwing		53	OK Cancel		
Kicking		41			
Injuries		58			

Team	Score	Time
SEAHAWKS BEARS	0	7:11
BUCCANEERS LIONS	0	7:02
EAGLES GIANTS	0	3:11

SPORTS UPDATE

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TIPS & TOOLS

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Left-Alt keys while you type 1 then 2 on the numeric keypad. Where you see [CHARACTER 10], hold down the Left-Shift and Left-Alt keys while you type 1 then 0 on the numeric keypad.

```
@ECHO OFF
IF %1==FF GOTO FORMFEED
IF %1==ff GOTO FORMFEED
IF %1==LF GOTO LINEFEED
IF %1==lf GOTO LINEFEED
IF %1==DP GOTO PRINTDIR
IF %1==dp GOTO PRINTDIR
ECHO .
ECHO To use this batch file, type
ECHO PCODES and what you want
ECHO to send to the printer.
ECHO Here's what's available in
ECHO this batch file.
ECHO .
ECHO FF for form feed
ECHO LF for linefeed
ECHO DP for printing the directory
ECHO .
GOTO END
:FORMFEED
ECHO [CHARACTER 12] > PRN
GOTO END
:LINEFEED
ECHO [CHARACTER 10] > PRN
GOTO END
:PRINTDIR
DIR > PRN
:END
```

COMPUTE EDITORS
GREENSBORO, NC

Drives from A to Z

How would you like to have all of your word-processing files on drive E, games on F, and BASIC programs on G? When you first organized your hard disk, you sectioned things off using subdirectories. Now you can make navigating your system even easier by using the SUBST command to trick DOS into thinking those subdirectories are separate drives.

First, decide the highest drive letter that you'll be using. If it's higher than E, you'll need to add a line to the CONFIG.SYS file. Suppose that M will be the highest drive spec-

ification you want to use. (Z is the absolute maximum.) Call up your CONFIG.SYS file in a text editor. Save a copy of the file as CONFIG.OLD, in case something goes wrong. At the end of the file, type `LASTDRIVE=M` and press Enter. Save the file as CONFIG.SYS. Now you must reboot.

You can define the drives using the SUBST command. Suppose you want F: to refer to your WordStar subdirectory. Type `SUBST F: C:\WS` and press the Enter key. Typing `DIR F:` will now give you a directory of the WS subdirectory. Many other commands besides DIR, such as COPY and DELETE, will work with the F drive.

To create your new drives automatically when your system boots, add the SUBST commands to your AUTOEXEC.BAT to specify the aliases.

Several DOS commands won't work with a substituted drive. They are ASSIGN, FORMAT, BACKUP, RESTORE, LABEL, JOIN, DISKCOPY, DISKCOMP, and FDISK.

RICHARD C. LEINECKER
MIAMI, FL

Making Headlines

One of the drawbacks of early LaserJet compatibles is that they can't print fonts bigger than 30 points. The later models, up through Series II, can print bigger fonts but require huge soft font files to do so. Before I bought my first PostScript printer, I had to relinquish over half of my meager 40MB hard disk to soft fonts—for just three type styles! An alternative to getting squeezed out of your hard disk is creating headlines and decorative fonts in your graphics paint or draw program. CorelDRAW!, Designer, Arts & Letters, Illustrator, Paintbrush, and several other graphics programs come with an assortment of fonts

that can be scaled to almost any size. You can also shade, shape, or color the text. If, for example, you wanted to create a headline in Arts & Letters for inclusion in a PageMaker document, all you'd have to do is create the headline as a graphic element; save it to a common file format such as TIF, PCX, or CGM; and import it into PageMaker. Another option would be to bring the graphic into your document on the Windows Clipboard. Say you want to place a graphic from CorelDRAW! into Ventura Publisher. Here's how: Create your headline in CorelDRAW!, select it with the mouse, and place it on the Clipboard with the Copy command on the Edit menu. Open both Ventura Publisher and the document into which you want to place the headline. Create a frame for the graphic and then choose Paste Metafile from the Edit menu. Ventura will ask you to name the graphic file. After you name the file, it will appear in your document. You can then size, crop, color, or place your headline as you like. Using a graphics program to create the text also allows you to treat the text as a graphic. For example, CorelDRAW! allows you to extrude your text or put a gradient or vector fill in it.

WILLIAM HARREL
VENTURA, CA

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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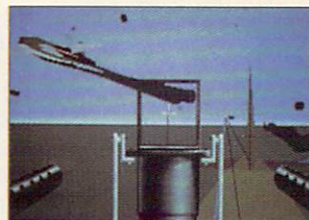
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POINT & CLICK

Clifton Karnes

WINDOWS APPS: BEFORE AND AFTER

Not long ago each PC program came in a single COM file, less than 64K in size. You didn't really install a program in those days—you just copied it to a floppy disk and ran it.

The next level in size escalation came when programs started to require overlays, which allowed parts of a program to be shuttled in and out of memory as needed. And as programs became more complicated, additional support files for printing and various other things were added. To install these programs that occupied several files, you simply copied all the files on the distribution disks to your hard drive.

Things are not so simple in Windows-land. Windows apps can use scores of files, and the installation programs are notoriously sloppy about distributing these files all over your hard disk as well as making changes to your CONFIG.SYS, AUTOEXEC.BAT, WIN.INI, SYSTEM.INI, or all four.

Typically, a program will deposit its main files in a special subdirectory (or group of subdirectories) it creates on your hard disk, and it will add an INI file to your Windows subdirectory. It may also add a file or two to your SYSTEM subdirectory. And it will probably alter your AUTOEXEC.BAT (to include itself on your already bulging path), perhaps add a driver or two to your SYSTEM.INI or CONFIG.SYS files, and almost certainly make some entries to your WIN.INI file.

There's really no problem with all of this until you want to get rid of one of these programs. Where are all the files? And what changes were made to your system files that you need to undo?

Because Windows programs tend to install files in so many subdirectories and alter so many files, each program should have its own uninstall option. I've never seen one that does, however.

Here's a solution. With the two batch files listed below, called Before and After, you can create a list of all the changes a program makes when it installs itself.

The principle is simple. You run Before before you install any new software. It makes a list of every file on your hard disk. To this list it appends the contents of your CONFIG.SYS, AUTOEXEC.BAT, WIN.INI, and SYSTEM.INI files.

Next you install your software, and after you've finished, you run After. The first thing After does is make a list of all the files on your system and the contents of your system files, just like Before has done. But this list includes the files added by the program you've just installed as well as any changes made to your system files. Next, After compares the list it's just made with Before's list. Any files added or deleted from your system show up in the comparison, as well as any changes to your system files.

Here's the listing for BEFORE.BAT:

```
@echo off
cls
c:
cd \windows
echo [BEFORE] Recording files on
disk (this will take a while) . . .
chkdsk/v >c:\snapshot.tmp
echo [BEFORE] Checking system
files . . .
copy c:\snapshot.tmp + c:\autoexec.bat + c:\config.sys +
c:\windows\win.ini + c:\windows\system.ini
>nul
echo [BEFORE] Cleaning up . . .
erase c:\snapshot.tmp
cd \
```

The CHKDSK command with the V switch isn't used very often, but it's great for us. It causes CHKDSK to list every file on the disk with its complete path. We redirect its output to SNAPSHOT.TMP.

The next step is to append the system files to SNAPSHOT.TMP and store the complete list in a new file, BEFORE.TXT. Now we have a snapshot of our system before we install a new program.

Here's the listing for AFTER.BAT:

```
@echo off
if "%1" == "" goto end
cls
c:
cd \windows
echo [AFTER] Recording files on
disk (this will take a while) . . .
chkdsk/v >c:\snapshot.tmp
echo [AFTER] Checking system
files . . .
copy c:\snapshot.tmp + c:\autoexec.bat + c:\config.sys +
c:\windows\win.ini +
c:\windows\system.ini
c:\after.txt >nul
erase c:\snapshot.tmp
echo [AFTER] Checking for
changes . . .
fc c:\before.txt c:\after.txt >c:%1
type %1 | more
goto stop
:end
echo Please specify a filename for
the changes.
:stop
```

When you run After, you'll need to specify a filename for the changes it finds.

The first few lines of After do just what Before does—they make a snapshot of your system.

The line `fc c:\before.txt c:\after.txt >c:%1` compares the two snapshots and puts the results in the file you specified on the command line.

You can then use the file created by After to locate the files introduced and altered by the installation. □

**Cleaning up after
Windows installation
programs is
simpler than you'd
expect.**

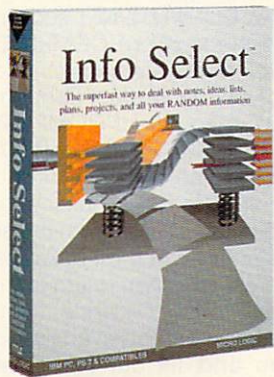
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Should you use an east or west coast supplier? To make decisions you need facts. Now you can view the facts any way you like ... as fast as you can think. You'll make the best decisions ever -- and fewer expensive mistakes.



Phone notes



Client info



Decisions



Management

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Info Select allows you to: add columns of numbers; store data in EMS; use template or free-form windows; import and export files, screens, and databases; move, join, and duplicate windows and much more.



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Editor's Choice "First rate" PC Magazine

COMPUTE/NET

Troy Tucker

THE PERFECT TIME TO GET ONLINE

If you're new to the online scene, then you'll be pleased to learn that COMPUTE resides on both GENie and America Online. Our section is called COMPUTE/NET, and in it you'll find the same high-quality programs and articles that you enjoy in our magazine. If you're not online yet, then you probably don't know what you're missing.

Online services have much to offer you. Subscribers enjoy instant access to news, weather, travel, stocks, reviews, software, and more. You'll find the rates very reasonable, too. You can sign on to GENie for free and access the basic services during nonprime time hours for about \$4.95 a month. America Online offers free software, a free trial membership, and free connect time so you can try out their service. The rate for basic services on America Online is \$5.95 a month. So, if you're not online--get online. And, don't forget to visit us when you do.

This month in COMPUTE/NET we're featuring a few data management utilities that we think you'll enjoy. We have a super spreadsheet called QubeCalc, a file viewer called List64, and an incredible database program called PC Data Control. We also have several games such as: Ed's Chess, Mah Jongg, Hearts, and Bass Tour.

You'll find QubeCalc quite useful. It's a low-cost spreadsheet alternative that doesn't skimp on features. You can store all kinds of data in row, column, and page format. You can calculate across, up, down, and through other spreadsheets that you create by linking modules together. This powerful program in-

cludes sixty functions, macros, sorting, context-sensitive help, and graphics.

List64 is an excellent multi-purpose file viewer. It lets you search files for text, mark and write selected text, and clean up files written in nontext formats. You move around in the documents with all of the usual commands. It features online help, a ruler, a hex display, and it even allows you to customize the colors.

Our last feature program is PC Data Control. With it, you can create large databases. You can sort, calculate totals, create reports, and search as many as 25 parameters at once using wildcards, values, ranges. You can opt for case-sensitive searches, too. It even autodials numbers, if your computer is equipped with a modem.

Ed's Chess is a challenging chess game. The playing pieces are drawn with character graphics, so almost anyone can play. Mah Jongg is a classic strategy puzzle game that will have you happily perplexed for hours. Avid bass fishermen will want to be sure to download Bass Tour, an excellent bass fishing simulator.

Look for this month's feature programs in our New Uploads library. When you enter the COMPUTE/NET area, just access this library to find the latest program uploads. Featured programs will reside in this library for a few weeks, then they'll be transferred to our main pc library.

COMPUTE/NET has much more to offer than just software. Be sure to visit our product ordering section for the latest products. COMPUTE Books has added some new titles that you can purchase directly online. Titles include Desktop Publishing with GeoWorks, Big Book of PC Sports, Castlevania: The Official Hint Book, Official Guide to Sid

Meir's Civilization, and more.

Ordering is simple. First, go to the COMPUTE/NET section. Use the keyword COMPUTE. If you're on America Online, click on the Product Ordering icon, then select COMPUTE Books. You'll see all of the titles available. Select one of the titles to get a description and the price. Jot down the order number of the books that interest you, then return to the main Product Ordering menu. Click on the Order a Product icon and fill out the order form. For GENie users, select option 9 from the menu, then select COMPUTE Books by pressing option 3. You'll see a description of each book and its price. Then you'll see a prompt to order the book or move on to the next book.

For those of you who visit COMPUTE/NET on America Online, I have a surprise for you. COMPUTE/NET is getting a whole new look and feel. We're re-structuring the entire area so that it's much easier to navigate. You'll be able to quickly find all the information you're looking for. The columns and reviews will be broken down into more specialized categories. We'll be adding new things, too. Look for our color logo and exclusive chat area. We hope to have most of these changes in effect by the time you read this, so stop in and take a look.

We're working hard to meet your online needs. If you have any questions, comments, or suggestions about COMPUTE/NET, please feel free to write to me here at COMPUTE Publications in Greensboro or send E-mail. My GENie address is TROYGT, and my America Online screen name is TROY GT—that's with a zero. I'm on both services daily, and I'm looking forward to hearing from you. Don't forget to stop in and visit COMPUTE/NET. See you online! □

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ON DISK

Tony Roberts

ORGANIZE YOUR HARD DRIVE

This issue's PC Disk offers you a computer system tuneup. You'll be able to defragment your hard disk, tune your caching software, copy high-capacity disks in a single pass, and keep close tabs on disk, memory, and environment space.

WinPost lets Windows users create computerized yellow sticky notes, and Switcher makes changing screen resolutions a snap.

Disk Organizer

After a hard disk has been used for a few months, some of its luster seems to fade. Access to files becomes sluggish and labored.

This is a result of the way DOS stores files. Over time files become fragmented, or spread out across the disk. DOS keeps a road map to these fragmented files, so it has no problem locating them, but access time may be increased.

To bring a fragmented hard disk back up to speed, you use a software tool called a defragmenter. Disk Organizer, from Soft GAM's Software, is just such a tool.

Disk Organizer straightens up your hard disk by moving files and directories into optimal positions. Disk Organizer includes several switches and modes that permit you to specify how the defragmentation and subsequent testing should occur.

But first, a word of warning. As the program itself will tell you, *back up your data first*. Defragging a disk involves moving files and rewriting the disk's FAT (File Allocation Table). Normally, all goes well, but it's possible for unusual hardware, TSR conflicts, or natural disaster to upset the process. Be sure to have back-

ups. Also, if you use disk-compression software, follow the manufacturer's advice about defragmenting compressed volumes.

Allen Morris's Disk Organizer is shareware and carries a \$30 registration fee. A good defragger has a place in everyone's software library.

Cache Test

Disk-caching programs are one of today's most popular performance enhancers. Everyone running Windows uses one, and DOS users can speed up their systems by setting up disk caches. Disk caches really make a difference if you run disk-intensive programs such as database managers.

The big question, though, is how much memory to allocate to the cache. The idea is to achieve the greatest performance gain for the smallest amount of memory. George Spafford faced this problem with the computers at his office and created Cache Test to help him determine the best settings.

Using the program is simple. Set up your cache, run the program, and record the results. Then adjust the cache and test again until you discover what works best for your specific system.

Cache Test is shareware and can be registered for \$5.

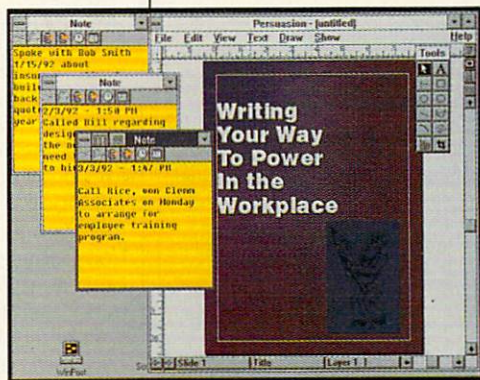
CPYDSK

I've yet to meet anyone who enjoys the disk swapping that's required to copy a high-density disk. All that aggravation shouldn't be necessary, and now, thanks to CPYDSK, your swapping days are over!

With a normal DISKCOPY, floppy shuffling is necessary because DOS cannot access enough memory to make the complete copy in a single pass. CPYDSK skirts this problem by using your hard disk as a temporary storage area if memory runs short.

Copies can be made in a single pass, and what's more, multiple copies can be created with only one reading of the source disk. CPYDSK also can speed your work by copying only live data.

CPYDSK is shareware created by Rawls Frazier and Mark Ferrel. The registration fee is only \$10.



WinPost lets you create and manage up to 100 little yellow Post-it-type notes, and they don't fall off!

Space

Ever wonder how much disk space is left? Space offers a unique look at available disk space. Space creates a graphic display of disk use for one or more drives. If multiple drives are specified, statistics are provided for the combination of all the drives as well as for each drive individually.

The program also can provide visual and auditory warnings if disk space falls below user-specified percentages. These warning points can be specified for each drive individually as well as for the combination of all drives.

Space, programmed by Ioannis Hadjiionnou, is shareware. Space can be registered for only \$10.

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WinPost

WinPost is a Windows personal information manager that follows the little-yellow-sticky-note metaphor. The program allows you to create and manage up to 100 reminder notes.

Each WinPost note can be colored and sized according to your desires, and each note offers full editing capabilities, including cut-and-paste options. Notes are created, modified, and viewed easily through menu selections, but all commands have keyboard equivalents to provide faster access.

WinPost includes a layout feature, which allows you to group related notes into logical categories, and an alarm feature, which allows you to create reminder notes that pop up onscreen at specified dates and times so you won't forget an appointment.

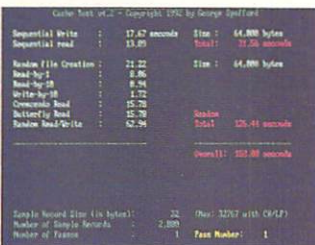
Nobuya "Higgy" Higashiyama, the creator of WinPost, says the program was born as a Windows programming exercise. After his effort was enthusiastically received by friends and associates, he decided to make it available as shareware. WinPost carries a \$30 registration fee.

Switcher

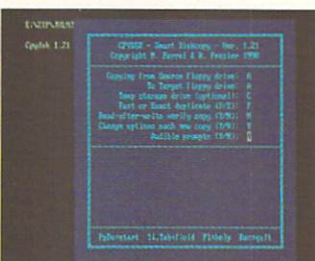
Switcher gives Windows users who frequently switch screen modes an ingenious way to save time and trouble. The program, from Robert Salesas of Echalon Development, makes changing from 16-color to 256-color modes, or vice versa, a snap.

To use the program, you simply teach Switcher what modes you regularly use. After that, just run the program, select the desired mode from a menu, and click on the Restart Windows button. Switcher handles the rest.

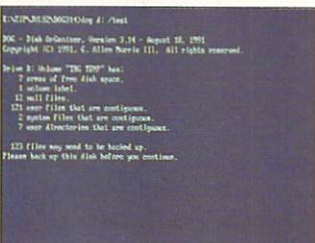
All of this is much simpler—and far faster—than going



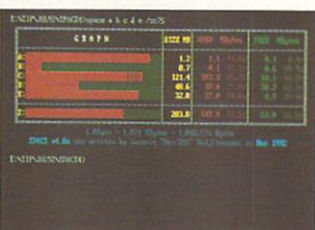
Cache Test



CPYDSK



Disk Organizer



Space

through the Windows Setup program. And there's an added bonus for anyone who uses a customized Windows startup screen. Switcher preserves your startup screen rather than reinstalling the Microsoft logo screen.

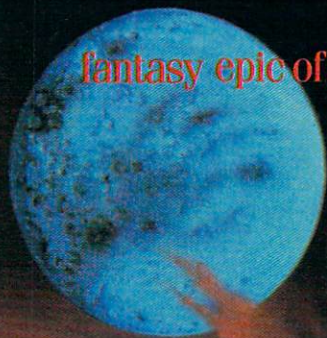
Switcher, which comes from the creators of WinCLI and other Windows software, is a free program. No registration fee is required. □

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Circle Reader Service Number 167

PROGRAMMING POWER

Tom Campbell

MAKE YOUR OWN ONLINE HELP

This month we'll start off with a bang by transforming some Turbo Pascal example code from an interesting demo into a commercial-quality application. And it's all free for the downloading.

One of my favorite additions to Turbo Pascal 6.0 is the EDITORS unit; it lets you add a multiwindow text editor with search and replace to your applications by adding just a few lines of code.

It suffers a couple of limitations; namely, there's no online help, and word-wrap isn't supported. This month on COMPUTE/NET you'll find solutions to both problems and an example of adding help to your application.

The executable file size of the multiwindow editor TVED2 is 111K—not bad for an editor with state-of-the-art menus, snappy dialogs, multiple windows, hypertext help, search and replace, support for any wacky text mode you can throw at it, and word-wrap. (The self-extracting archive file TVED.EXE is quite large, as it also includes the source, help files, and documentation.)

It all began as a communal project on CompuServe's BPROGA (Borland's Pascal forum) late last year. Al Anderson (ID 71610,3214) modified the EDITORS.PAS example file so that it supported word-wrap, and he requested volunteers for testing and assembly language optimization. I dispatched the latter in record time because it didn't need optimization: Al's code was so efficient that it didn't even show up on the profiler.

I then foolishly offered to implement a help system based on the help engine provided as one of the example files. In three hours, I had the

code up and running; I wrote the text for the help system in another day and a half. I had the easy part; Al pulled yeoman duty and made his code available free, a remarkable gift deserving special praise.

Borland's documentation on both the editor and the help system is hard to come by. You have to scrape it out of obscurely named files in at least three directories, and depending on the manual's edition, you'll find little or no mention of it in print. That's because Borland terms this "example" code.

This column details the construction of an editor employing online help and its help files. TVED.EXE repackages all the relevant information in one place; refer to the files TVED2.PAS and HELP.DOC while reading. Even if you don't need a text editor, all of the lessons apply to any Turbo Vision application using online help.

Following is an overview of the processes used to add hypertext help to your application; they're detailed step by step in README.1 (the theory) and TVED2.PAS (the implementation).

First, you must write a help source file to run through TVHC.PAS, the help compiler. TVHC eats your source and spits out an indexed HLP file for your application to use at runtime and a PAS file you'll need at compile time. Here's a tiny help source file: *.topic NoContext=0.h*. To quit, hold down ALT and press X.

The line *.topic Save File-Save Save* writes the document to a file on disk. See also *{Save as...SaveAs}*.

The line *.topic SaveAs File-Save as . . .* lets you write the document to a different filename, thus preserving the current document and automatically replacing it with the newly created one.

The topic whose value is 0 will be displayed whenever help is requested in a context for which no help has been defined.

Later topics will be given values that increment by 1 each time, so *Save* will be 1 and *Save as . . .* will be 2.

Lines starting with a period are used to generate values for the help system, and commands embedded within the text are set off by curly braces to indicate hypertext links. The source file above would create this PAS file:

```
unit edhelp; interface
const hcNoContext = 0; hcSave
= 1; hcSaveAs = 2;
implementation
end.
```

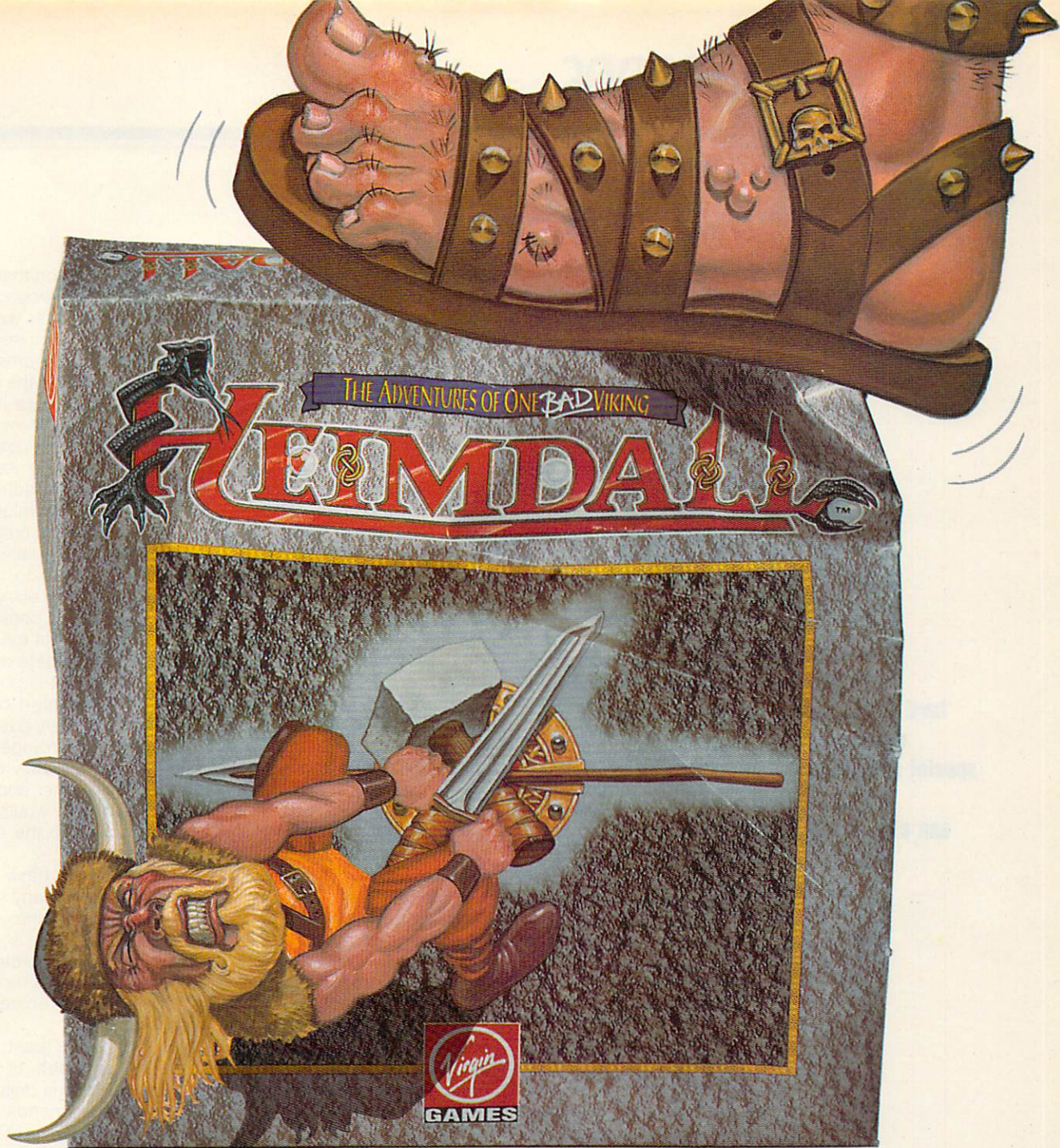
It took the *.topic* links, inserted *hc* in front of each, and wrapped up these constant values in public unit declarations. Add that file to your USES clause and mix well. TVHC is surely a no-frills program, but it makes online help a cakewalk.

After creating the help file, you need to add a couple of methods to your TApplication descendant, add a help command to the status line, and assign help constants to any menu or TView-descended object for which you need help, like this: *HelpCtx := hcSaveAs;*

HelpCtx is a field in all TView descendants; it provides a hook for help systems like the one that comes with Turbo Vision. If you can't remember which objects are descended from TView, the compiler willingly reminds you: An *Unknown identifier* message when you try to write to HelpCtx means it isn't!

Don't settle for less. Just download TVED.ZIP and follow these steps; you'll end up with a help system rivaling that of any commercial product. All for free. □

TVHC is surely a no-frills program, but it makes online help a cakewalk.



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INTRODOS

Tony Roberts

ORGANIZING LARGE DRIVES

Having a big, fat hard drive is wonderful, but managing large amounts of storage presents a new set of challenges.

For example, how should you set up your hard disk—one huge partition or two or more smaller ones? Let's look at the advantages and drawbacks of each setup.

The main advantage of assigning the entire disk to one large partition is convenience. Navigation is a little easier with everything in one place, but you run some risks.

Keeping huge amounts of data in one partition is like carrying all your eggs in one basket. If the FAT (File Allocation Table) for that partition gets scrambled, your entire data set could end up fried.

By breaking up your disk into partitions, each with its own FAT, you have some protection. If one FAT becomes damaged, your loss will be limited to the information in that partition.

Another issue to consider is cluster size and wasted space. A cluster is the smallest unit of assignable disk space, and an unnecessarily large cluster size wastes some of that precious space.

To check the cluster size of your disk, run CHKDSK. Near the bottom of the CHKDSK display, you'll see a line saying *X bytes in each allocation unit*. This tells you the cluster size. Every file is allocated disk space in clusters.

If your disk is a floppy disk, that cluster will likely be 1024 bytes. A 1-byte file would be allocated one cluster and occupy 1024 bytes of disk space.

Hard disks ranging in size from about 18MB to 120MB have cluster sizes of 2048K. Larger hard disks assign space in units of 4096K. So a

1-byte file on a 100MB hard disk would occupy 2048 bytes, and the same file on a 200MB hard disk would occupy 4096 bytes.

Let's say you have a hard disk with a 4096-byte cluster. Assume the disk holds 2500 files. The data in each file fills some clusters and *partially* fills one—the last—cluster. Some of these last clusters will be nearly empty, some will be nearly full, and most will be somewhere in between. For the sake of discussion, let's say the last cluster of each file averages one-half cluster (2048 bytes) of unfilled space.

Multiply the average unfilled space (2048 bytes) by the number of files (2500). You get 5,120,000 bytes of space that your files occupy but don't actually use.

If you break your hard disk into smaller partitions which use 2048-byte clusters, you can recover half of that unfilled space. Assuming that the average last cluster is still half-full, you've reduced your occupied but unused space to 2,560,000 bytes.

If you keep thousands of files on your hard disk, a smaller cluster size can pay off by giving you extra room to work. On the other hand, if your disk is used to store only a few multimegabyte database files, larger partitions may be a better choice. Your database will have room to grow, and you won't be concerned about running out of real estate for your data.

Breaking up a disk into partitions also helps at backup time. Imagine backing up a 200MB disk onto floppies. You can see that you'll want to be selective about what you backup. Some data you'll want to backup daily, some occasionally, some never.

I have all of my work files on one partition, and I backup

my changed files on that partition daily. I use a second partition for files I never want to backup. I use this for test files or shareware programs that I'm trying out. If I like the product and intend to use it and register it, I move it to my main partition. If not, I just delete it.

My third partition is used for telecommunications activity—files to upload or download as well as incoming and outgoing messages. I backup this partition occasionally to make sure I can restore all of my programs, scripts, and configuration files, but I'm not too concerned about the data on this partition. If the file is important, it gets either printed out or moved to my primary partition.

Because I've arranged my disk this way, my daily backups are much faster and less intrusive than they would be if I had to deal with the entire hard disk.

Whether you have one huge partition or many smaller ones, you still have the same amount of data, and you must take pains to protect it. The larger your hard disk, the larger your loss if something goes wrong.

At the very least, run CHKDSK on each of your hard disk partitions daily. You can put the commands to do this in your AUTOEXEC.BAT file, and you'll learn early if anything is out of whack on your drive. At the first hint of a problem, take quick corrective action.

If you have a more powerful disk-fix utility, use it rather than CHKDSK to make sure your storage areas are sound. Such utilities are more comprehensive and easier to use than CHKDSK.

If your hard disk isn't set up the way you'd like, stay tuned. Next month we'll look at the FDISK command and discuss how to use it to partition your computer's hard disk. □

With large hard drives, you need to pay special attention to partitions and cluster size.

INTRODUCING

COMPUTE NET

COMPUTE NET

COMPUTE RoundTable

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COMPUTE/NET on GENie had a terrific grand opening. The comments ranged from "I've never seen a RoundTable open up with so much information" to "This makes my modem and computer system worth their price."

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HARDWARE CLINIC

Mark Minasi

HOW MODEMS WORK, PART 2

Last month, we looked at how PCs transferred data over phone lines at the start of the computer revolution.

Originally, a bulletin board system (BBS) would basically toss the data over the phone lines to the receiving computer, and the computer would capture the data as it came in, line noise and all. Line noise wasn't a problem then, as we were usually communicating at 300 bps, and phone lines look almost perfectly clean to 300-bps modems.

Then came faster modems, at 1200 bps and up. Pushing phone performance made for occasional errors—still no more than a bad bit every hour or two, but a measurable amount.

XMODEM was the first attempt in the PC world to solve the problem of transporting data over phone lines and ensuring that any errors in transmission were caught and automatically corrected.

XMODEM has been largely outclassed by newer transfer methods, but it retains a great strength—it's ubiquitous. You can find the old guy everywhere. Every communications program supports XMODEM, at a minimum.

Nonetheless, XMODEM has four deficiencies. First, its block size is too small and makes for inefficient transfers. (We'll see why this month.) Second, it requires the operator to tell both the receiver and the sender the name of the file. Third, it only transfers one file at a time. Fourth, its checksum-based error-detection scheme is too simple in the eyes of some people. These four weaknesses led to the development of today's file-transfer methods or, as they're commonly called, protocols.

Block Party

For the rest of this column, I'll talk about that first characteristic, block size. It's the really big difference in the newer protocols—the transfer block size. That's the big story—and the secret to increasing the speed of your file transfers by as much as 300 percent.

Recall how XMODEM works. The sender sends the first 128 bytes of the file, then waits while the receiver determines whether or not the 128-byte block has transferred without transmission errors, using a simple checksum. Once the receiver has acknowledged the receipt of the first block, the sender sends the next 128 bytes, and so on.

The key to understanding why this is really inefficient (for most applications) is in knowing that the process of the receiver's checking the checksum and sending the acknowledgment to the sender may take more time than is required to send the entire block in the first place.

To see this, imagine this exaggerated scenario. You're communicating at 9600 bps with a BBS. This is 960 bytes per second, so each XMODEM 128-byte block takes about .13 second. Suppose it took 1 second for each acknowledgment to be computed and sent. That would mean that the sender would be spending .13 second sending, then 1 second waiting, then .13 second sending, then 1 second waiting, and so on. You would only be transmitting the file 11 percent of the time. While the average situation isn't that bad, it's close. For example, many communications programs save each block to disk as it's being received, so changing the block size from 128 to 1024 would reduce the number of disk accesses by a factor of 8.

Catching Some Z's

Today's protocols allow for blocks ranging in size from 128 bytes to 1024 bytes. YMODEM, ZMODEM, and the CompuServe Quick "B" protocol are three popular examples. Your communications software probably allows you to set your block size, but the interesting question is, What is it already set to? I use Crosstalk for Windows extensively, and I like it a lot, but I'd used it for about a month before I realized that it set all protocol block sizes to 128 bytes by default. To see just how important block sizes are, I transferred several large files from CompuServe using block sizes of 128 and 1024. The 128-byte block size averaged a throughput of 362 bytes per second; the 1024-byte block averaged 987 bytes per second. A stunning difference that didn't cost me a cent—but it sure saves me money in CompuServe charges.

Now, there's a caveat to understand about setting your block sizes large. If you have a noisy line and your protocol discovers that a 128-byte block has been garbled, the sender need only resend 128 bytes. But when lines are noisy and you're using 1024-byte blocks, every block with even a single bad bit in it requires that you resend 1024 bytes. So the rule in picking block sizes is this: The cleaner the line, the larger the block size. Experiment to find the best block size, and don't just accept the default block size. You'll probably find that local calls are more noise-free than long-distance calls—optical fiber lines notwithstanding.

Calling a Timeout

A related performance tip has to do with timing. After the sender has sent the block of data, it will wait a specified amount of time for the ACK

New modem protocols have made online communications a lot easier.

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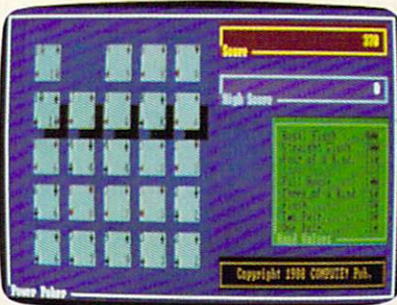
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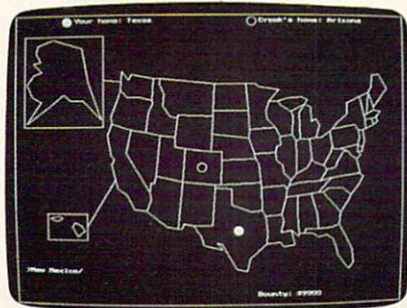
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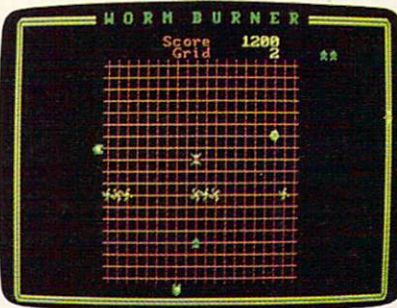
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that means "I got the data OK; send me the next block" or the NAK that means "I didn't quite get that; please re-send it." But the receiver can't acknowledge what it didn't get, so in case there's been a line hit that obliterates an entire block, the sender will only wait a certain amount of time for the receiver's response. If it doesn't get it, the sender assumes that the data was lost, and resends. The question of how long it waits is where timing comes in.

Crosstalk for Windows, for example, allows you to set protocol timings to sloppy (wait a long time for acknowledgments), loose, normal, and tight. As before, a clean line can handle more strenuous timing than a noisy line, so finding your best settings will require some experimentation. I found that the best throughput I could achieve with sloppy timing was 894 bytes per second, but I got a throughput of 974 with tight timing. In both cases, I was doing 1024-byte block size transfers with a 9600-bps modem. That's 9 percent knocked off my CompuServe bill.

My final suggestion this month for speeding up your file transfer has to do with error-correcting modems. We've been talking about protocols such as XMODEM, YMODEM, and ZMODEM that let the computers on either end of a conversation make sure that the data transfer is error-free. Notice the word *computers*. There are programs running in your computer and the sender's computer that support the file-transfer protocol. It takes two to tango, so you've got to have both sides supporting the same protocol. But some modem manufacturers have taken a different tack. They've built a file-transfer protocol into the modems themselves. To see why, let's look at a non-PC application

of data communications.

Once, I was doing some consulting for a doctor. I noticed that he had a printer and a modem sitting all by themselves off in the corner. I asked what the printer did.

"That sends us the results of our lab tests," he replied. "We used to have to wait for results in the mail, or we'd have to pester the lab on the phone. Now, the printer just comes to life a few times a day, and their computer uses our printer to deliver the lab test reports."

Nifty, I thought. The lab sold him a normal Okidata dot-matrix printer with a serial interface and a modem—a regular old PC-type smart modem. But a problem occurred to me—what about line noise? I'd hate to get a report that said, "CANCER DIAGNOSIS: P^%SKD##{." Looking closely at the modem, I noticed that it had a label that said, "MNP Level 5/Error Free." The testing company uses modems with built-in file-transfer protocols. Such modems use protocols with small blocks, usually under 32 bytes in size. One way to tell if you're working with an error-correcting modem is to see if the text appears on your screen in spurts. The modems are examining the data in small groups, so, after acknowledging that the data is error-free, the data is released to the PC, which quickly puts it up on the screen.

If you have an MNP modem or one that supports V.42 or V.42 bis, you've got an error-correcting modem. *MNP* stands for *Microcom Networking Protocol*, and it's an error-detecting and -correcting standard developed by Microcom. V.42 is the name of a modem standard promulgated by the CCITT (Consultative Committee on International Telephones and Telegraphs, a committee of a commission

of the United Nations). All the V. standards refer to modems. V.22 bis is the standard that most 2400-bps modems are built around, V.32 is a very popular 9600-bps standard, and V.24 is the standard that describes the serial ports on your PC.

Paying the Overhead

It seems that if the modems do the hard work of file transferring, that can't be a bad thing. In fact, it's valuable in many cases, but the vast majority of phone lines (in the U.S., anyway) are fairly clear. And, of course, there's a price to pay—it takes time for the modems to do the error checking, and that's time that they're not transferring data. My experience is that the extra overhead of the modem error checking usually doesn't pay off.

Think about disabling error checking (it's sometimes called ARQ) if your modem has this built in. You can generally turn it off either with a DIP switch or by altering your modem's setup string to include the three characters *&MO*. Again, my experimentation showed a best-case transfer of 974 bytes per second when error checking was disabled versus 894 bytes per second when it was left on.

What about when you do have noisy lines? Should you disable error checking and set your protocol block size small, or should you let the modems handle the error checking and use the maximum protocol block size? Definitely the latter, for two reasons. First, modem protocols have less overhead than most PC file-transfer protocols. Second, my unscientific tests with noisy phone lines have shown that modem protocols recover from noise much better than PC file-transfer protocols do. Given the choice, let the modem do it. □

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SHAREPAK

Bruce M. Bowden

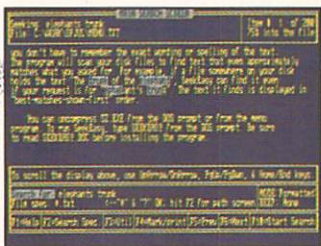
A FANTASTIC FOURSOME

July's SharePak disk contains an interesting mix of three wide-ranging utilities and one highly original game. SeekEasy searches your files for approximate text strings using a "fuzzy logic" technique. EZ-SHOW lets you capture graphic and text screens, and then create a slide show with them. Appointment Book will handle the appointment calendars for ten people simultaneously. The arcade-style game

July's SharePak
brings you
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Save fellow godmothers in
F.Godmom.



Fuzzy logic looks for files in
SeekEasy.

F.Godmom will keep you on the edge of your seat through 50 levels.

Shareware is software released to bulletin board systems and computer networks as an alternate way of marketing. COMPUTE's SharePak comes to you with programs which are among the best of the shareware we've seen, and we see a lot—hundreds of titles every month. The savings to SharePak subscribers in time, energy, and online fees are significant.

SeekEasy

SeekEasy is a text-search utility with intelligence. With SeekEasy, you don't have to remember the exact wording or spelling of the text. The program will scan your disk files to find text that even approximately matches what you asked for. For example, if a file somewhere on your disk holds the text "The trunk of the elephant is . . .," SeekEasy can find it even if your request is for *ephalant's trunk*. The text it finds is displayed in "best-matches-shown-first" order.

SeekEasy can be set to search through one file, all the files in a directory, those in a directory and all its sub-directories, or those within a whole drive's worth of files. It will scan all file types: word processor, database, even COM and EXE files. It can be told which filenames or file types to include or ignore. It shows you the items it finds during its search in the order of best matches first, as determined by its "fuzzy logic" algorithms. As you can see, SeekEasy is a well-written and thoroughly fascinating utility to use.

SeekEasy works on any PC or compatible with DOS 2.0 or higher and at least 256K of RAM. The program also runs under Windows 3.0.

EZ-SHOW 1.0

EZ-SHOW helps you create professional desktop presentations, slide shows, and product demos *without using scripts!* The set of files contains a screen-capture program, a presentation-creation program, and a royalty-free show program. The capture program works with almost anything your screen can display, from text screens to Super VGA graphics. It's a TSR, sitting in about 9K of memory until you invoke it to do a

screen capture with specially designated hot keys. The presentation creator lets you group your pictures for a slide show, using point-and-shoot menus, mouse support, and built-in help. The features include picture fades, individual picture delays, user flow control, branching, background processing, EGA palette editor, and much more.

EZ-SHOW requires an IBM PC or compatible running DOS 2.1 or higher with a CGA, EGA, MCGA, or VGA display.

Appointment Book 1.0

Appointment Book is a general-purpose appointment maker that lets you keep track of appointments for up to ten people. When you invoke the program, it gives you the current day's appointments. If more than one appointment at the same time has been made for a person, the software will highlight the times for which there is a conflict. You can search for open appointment slots on any date or for any scheduled appointments according to date or user parameters.

Appointment Book works on any IBM PC or compatible with DOS 2.0 or higher.

F.Godmom Version 2.1

F.Godmom stands for *fairy godmother*. In this arcade-style game you play a fairy godmother on a mission to free 50 of your fellow fairy godmothers. Armed with a magic wand of transformation, you must make your way across 50 levels while avoiding killer crabs and dangerous dimensional implosions. If you succeed, your fellow fairy godmothers will be freed and will dance for joy in your honor. If not, it's curtains for you.

F.Godmom was written for machines with CGA, EGA, or VGA monitors. □

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Any calendar will tell you the eighties are over, but you'd never know it by looking around an airport. America's get-it-now business road show teems with mobile executives squeezing every ounce of productivity they can from pay phones, sky pagers, cellular linkups, and public fax stations.

Enter another weapon: the portable computer. Smaller, faster, more powerful, and less expensive than ever, laptop and notebook computers have become terror weapons in the road warrior's arsenal.

But portable computers aren't just for business anymore. They make great second computers for the office, for home, or for school. Or they can be used as mobile communications centers. And while you might not believe it, the time is coming when a portable computer will replace that desktop computer you're using now.

Portable computers are the fastest growing segment of the computer market and have garnered a loyal follow-

ing among computer users of all stripes. These small and powerful systems have the potential for increasing productivity while at the same time granting flexibility in work schedules and environments. They can serve as a second computer in the office or at home, can travel as a communications tool, or even take over the functions of a desktop personal computer.

But for first-time buyers, the array of laptops and notebooks can be intimidating. Balancing the expense against the gains is possible only when you can determine your needs, and then match a system to those requirements and your personal preferences.

To make the right fit between your power needs and the constraints of your budget, you must develop a strategy. This guide will help you determine where you stand in the field of portable computing. Use it to develop your personal strategy for buying the laptop or notebook system you need.

For Under a Grand

Here's the kind of machine you can expect to find for less than \$1,000.

System Profile:

- 80C86, V20, or 10-MHz 80286 processor
- CGA-compatible super-twist backlit LCD display
- 1MB of RAM
- Internal high-density 3½-inch floppy drive
- 20MB hard drive

Buyer Profiles:

- Students
- Writers
- Occasional travelers
- Anyone looking for a second home computer

If you're ready for a second computer but the money around your house is tight, you can get a serviceable laptop computer for under \$1,000. You probably won't get VGA-compatible displays or 20-MHz processing speed, but you'll get enough of a machine for word processing, modest number crunching, and telecommunicating. If you're a

student or if you have a student in your house, if you plan to do only word processing, or if you need a laptop only for occasional travel, then a portable computer in this price range should enter your consideration.

You'll be able to find several brand-name laptops in this category through mail-order outlets, including the Toshiba 1000XE, the Hyundai Super LT-3, and the Bondwell B310SX. The Toshiba is an XT-class system, the Hyundai offers AT-class performance, and the Bondwell actually contains a 386SX chip. Each of the packages in this price range includes a hard drive, backlit LCD, and high-density floppy drive. At the time this feature was written, each package was advertised in the \$1,000 range.

Bundle any of these laptops—or comparable systems—with the right software, and you have a very capable portable computer. Use an integrated software package such as Microsoft Works or Spinnaker's Eight-

ARTICLE
BY PETER SCISCO

Computer
hardware is getting smaller
and changing faster.
Here's a guide for keeping up

In-One for light number crunching, word processing, and contact management (with the built-in database modules). If you want a more intuitive environment, you could use DeskMate or GeoWorks Ensemble. Integrated packages usually offer file import/export capabilities in standard formats such as ASCII, WK1, and dBASE. Tandy's DeskMate adds task switching (as does DOS 5.0); Ensemble provides multi-tasking within its own applications, even with an XT-class machine.

Save the money you would have spent on a more powerful system to outfit your inexpensive laptop with an external pocket modem. That will increase your productivity by linking you to information services and by providing a remote link to your desktop computer.

For a Couple of G's

This is what you can expect to find for between \$1,000 and \$2,000.

System Profile:

- 12-MHz 80286, 16- or 20-MHz 386SX processor
- VGA-compatible backlit LCD display
- 1MB of RAM (minimum)
- High-density 3½-inch floppy drive
- 20MB hard drive (minimum)
- Internal or external modem
- DOS 5.0

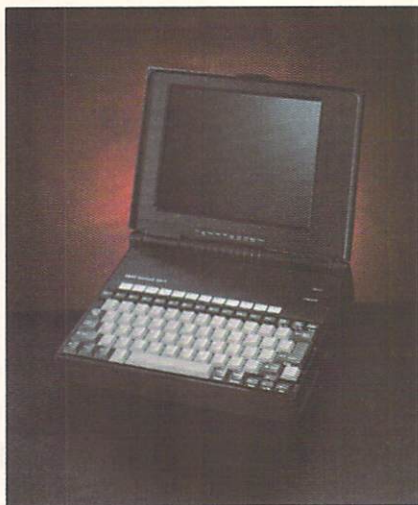
Buyer Profiles:

- Business students
- Number-crunchers
- Traveling salespeople
- Telecommunicators
- Marketing professionals

If you find that your computing needs are more substantial than those described in our first category, you can spend a little more for a speedy AT-class (or better) laptop that will work nearly as well as your desktop computer. As prices continue to drop, the price differential between the 286- and the 386SX-based notebooks becomes less and less a factor.

It's clear that if you need to run moderately powerful character-based applications while on the road, you'll need the power and extra memory that a laptop in this price range will give you. If your work is in marketing and accounting, you'll appreciate the ability to run applications like Lotus 1-2-3 or Borland's Quattro Pro. Salespeople will want the extra speed and power to run contact-management software. And every professional who needs to communicate with corporate headquarters or with home will appreciate the telecommunications capabilities available in this price range.

To find top-end machines at the low



The midrange ZEOS notebook computer is both practical and popular.



The Sharp PC-6781 offers monochrome graphics at \$3,599.

YOU CAN HEAR IT COMING

Last fall at COMDEX, Media Vision—the maker of the Pro Audio Spectrum and Thunderboard sound cards—was talking about a board-level sound device for laptops and portables that would allow computer users to take advantage of sound-enhanced applications while on the road.

This past January, the company announced what it called Transportable Sound Technology for use in battery-powered sound peripherals designed for laptops. Media Vision uses a proprietary audio chip set that takes up less space and has lower power requirements than other leading chip-set designs.

A second peripheral manufacturer, Media (without the Vision) showed what it called the Sound Commander T last fall at COMDEX. The portable sound device was designed to connect with a portable computer via a shared serial port. It's compatible with Sound Blaster and will run on a single nine-volt battery.

end of this price range, you'll have to shop mail-order companies or direct sellers. The number of notebooks that promise the power of desktop computers is mind-boggling. But among these, a few recognizable names stand out. ZEOS, for example, offers several notebook computers that fit our profile ranging in price from \$1,295 (12-MHz 286) to \$1,795 (20-MHz 386SX). Recent advertisements list the NEC Ultralite 286f at \$999.

Radio Shack has had the Tandy 1800 HD sale priced at \$1,299. This system matches the basic system profile for this group and comes with DeskMate and America Online software (an internal 2400-bps modem is optional at \$199). The 1800 HD is housed in a smart-looking black case that resists dirt and scratches.

Further up the price and features ladder, Wyse Technology recently cut the price of its DecisionMate Model 30 to \$1,895. This 20-MHz 386SX system tips the scales at barely 4½ pounds (including battery) and offers one of the most comfortable keyboards on the market (though the small function keys in a double row in the upper right corner take some getting used to).

The DecisionMate exceeds our system profile with its 30MB hard drive, soft leather carrying case, copy of Traveling Software's Laplink (with cables), and Battery Watch. Optional equipment includes an extended-life battery (for up to 4½ hours of battery power at an additional two pounds) and snap-in modules for fax/modem capabilities, mouse input, and a second serial port (each module weighs between five and seven ounces). An external 1.44MB floppy drive is included.

Another 386SX 20-MHz notebook computer within this price range is the Acer Acros (available at several consumer electronics stores). This system boasts a fast hard drive and comes bundled with MS-DOS 5.0, Windows, and Spinnaker's PFS WindowWorks.

With the variety of systems available between \$1,000 and \$2,000, it's easy to find portables as powerful and functional as the typical desktop machine. You might not be able to put all of your applications on a 20MB hard drive, but you should be able to get your critical applications loaded. If your system gets crowded, you can always use a compression program like Stac Electronics' Stacker to increase your hard disk space.

Two Thousand to Infinity

If you have plenty of money to spend, you can get plenty of computer. Here's the kind of highflier you can find if the sky's the limit.

System Profile:

- 20- or 25-MHz 386SX or 386SL processor
- VGA-compatible backlit LCD display
- 2MB of RAM (minimum)
- High-density 3½-inch floppy drive
- 40MB hard drive (minimum)
- Internal or external modem
- DOS 5.0

Buyer Profiles:

- Critical field personnel
- Mobile executives
- Windows users
- Status seekers

Once you get above the \$2,000 mark, there are few limits on what a portable computer can do. Leading-edge engineering has put 80MB hard drives, 25-MHz processors, paper-white VGA displays, and graphical interfaces within reach of power-hungry professionals. In fact, with the right components, you could easily configure a portable computer to work as your only computer (adding an external monitor and keyboard for the office). No longer would you have to transfer or copy files or log on to your desktop machine from a remote site (at long-distance charges). All of your critical applications and files would stay with you wherever you go.

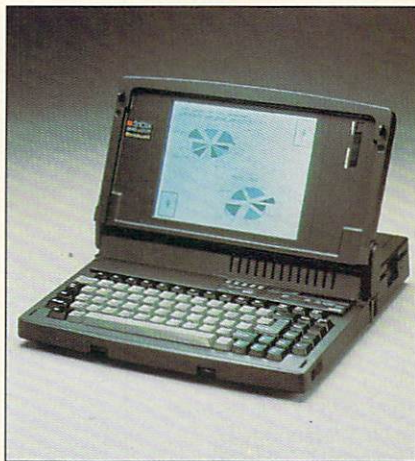
This kind of price range also brings into view Intel's top-of-the-line notebook processor, the 386SL, which is designed to extend battery life by using less power than its 386SX counterpart. Some notebook and laptop computer makers are using AMD's 386SXL processor (and watch for additional Intel competition from other chip companies). Either way, a notebook or laptop in this category can rightfully boast the speed and power to scream past many desktop systems.

So what's the latest in this top category? If you work with sensitive data and you believe that James Bond movies carry a cachet of adrenaline-charged excitement, the BCC SL007 from Beaver Computer is your machine. Its 20-MHz 386SL chip rides herd on a 32K cache memory and works in tandem with a DES encryption processor (optional) to encode and decode sensitive data on the fly. The SL007 ships standard with 4MB of RAM, a 62MB hard drive, VGA graphics, send/receive fax/modem, Windows, WinFAX, plus other features, all housed in a soft-touch black casing that resists scratches. Very cool stuff.

If you're a power user who needs room to move, consider Advanced Logic Research's line of expandable portables, the VIP M series. Each VIP M notebook can move from a 20-MHz

386SX workhorse to a 25-MHz 486DX screaming demon through a CPU-module upgrade. If you need something in between, a 20-MHz 486SX upgrade is also available.

The advent of color laptops and notebooks makes this upper echelon even more attractive. Sharp and Toshiba—to name but two companies—offer col-



The Bondwell B310SX offers 386SX performance for a low price.

GUERRILLA CONNECTIONS

Not every hotel will be kind enough to furnish your room with a data-capable phone—or even modular phone line jacks. If you find yourself in this situation, your first option is to call the front desk and ask that an RJ-11 jack be connected to the existing telephone line. Speak with authority and make it clear that you're a modern businessperson who requires the latest technology. Many hotels are willing to do anything within reason to accommodate their business customers.

If the hotel management won't cooperate, cordially inform them that your company won't use their facilities in the future. Then get to work setting up your own connection. Rather than ripping the phone lines from the wall (bad form, that—and it leaves you liable to prosecution), use a kit you can pick up at most electronic stores. Your kit should contain one RJ-11 module with four wires with attached clips, a set of clip leads, and wire snips.

Cut off all of the leads from the RJ-11 module but the red and green ones (you can do this ahead of time). Now, if you take off the telephone receiver mouthpiece, you can remove the voice pickup just inside. (If the telephone doesn't have a removable mouthpiece, you're on your own.) Attach your clip leads (the ones connected to the green and red wires) to the prongs that are now visible. When you want to use your modem, take the telephone off the hook and dial through your computer.

or notebooks with fantastic displays that are even sharper than what you see on a desktop. These machines top out at about the price of a Saturn GSL automobile. Start saving now. Sharp's active matrix color PC-6881 should be available by the time you see this.

What You Need

Here are some items you should look for in your portable computer package.

- Flexible power-saving features for extending battery life. Such features might include an automatic "sleep mode" for disk drives and screen, the ability to switch to a slower processing speed, the use of nonvolatile RAM for data storage, and the ability to switch off unused I/O ports.
- Software bundles that add value to your purchase, like MS-DOS 5.0, Windows, an integrated productivity program like Eight-In-One, or a file-transfer program like LapLink.
- A sharp, fast display (VGA compatible if you can afford it) with sufficient backlighting and easy-to-work adjustment controls that will allow you to work in varied lighting conditions.
- A hard drive that tests faster than a 20-millisecond average access time. If you use a slower drive, you'll feel that you've sacrificed too much to get away from your desk.
- A comfortable, well-spaced keyboard that fits your typing style and resists double-strikes.
- Well-spaced I/O ports that will accept a printer, an external monitor, and a serial device simultaneously.

Microsoft's Portable Initiative

Last winter, Microsoft announced its Portable Computing Initiative, the first phase of which is Advanced Power Management (APM); a ROM version of MS-DOS 5.0; a data-transfer utility; and solid-state memory support.

The APM specification was developed jointly by Microsoft and Intel and is designed to extend the battery life of portable computers by up to 25 percent during full-on conditions. APM works by allowing the system BIOS and operating system to share critical power-management data while preserving compatibility between the hardware and software during the power-conservation process. An APM driver for MS-DOS 5.0 has shipped, and a Windows 3.1 driver followed soon after. APM is also compatible with non-APM applications. Though APM can be implemented on any of the i86-processor family, Intel built specific APM-support features into its 386SL chip. These features allow portable computer makers to implement APM functions and to keep APM overhead to a minimum.

The data-transfer utility, called Interlnk, supports a transfer rate of up to 36K per second via a parallel port. It also supports serial transfers. Microsoft's support of solid-state memory will help developers port their disk-based DOS applications to "smart cards" like Flash Memory and SRAM cards.

Several portable computer makers, including Toshiba, Everex, Epson, Zenith, and NEC, support the Portable Computing Initiative. Portable computers designed according to the new specifications should be available on the market in early 1993.

So What's It Gonna Be?

No matter what kind of computer user you are—hobbyist, white-collar worker, student, mobile executive, road warrior, power user—there's a portable computer in your future. The latest laptops and notebooks compete with desktop systems in terms of power and speed and are far better machines in terms of desktop real estate and portability. But don't write off older 8088-based, dual-floppy systems. You can get them used for a very good price, and even older portable systems with less processing power still offer a flexible solution to the problems of a fluid information environment. And flexibility is the best power you can buy. □

PICK ONE UP AND WALK AWAY

For more information about the computer systems mentioned in this article or for information on other laptop, notebook, and portable computers, contact the companies listed below.

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Irvine, CA 92718
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AST
16215 Alton Pkwy.
Irvine, CA 92713
(714) 727-4141

BCC
(Beaver Computer)
174 Component Dr.
San Jose, CA 95131
(408) 944-9000

BONDWELL INDUSTRIAL
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Fremont, CA 94538
(510) 490-4300

HYUNDAI ELECTRONICS AMERICA
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San Jose, CA 95134
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SHARP ELECTRONICS
Sharp Plaza
Mahwah, NJ 07430
(201) 529-8200

STANDARD COMPUTER
12803 Schabarum Ave.
Irwindale, CA 91706
(800) 662-6111

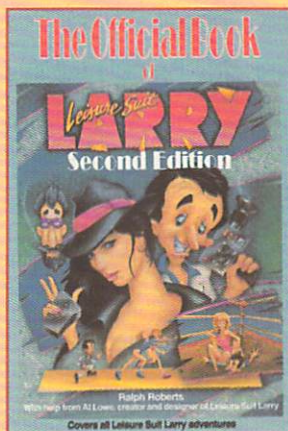
TANDY
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(817) 390-3011

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(800) 334-3445

WYSE TECHNOLOGY
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(408) 473-1200

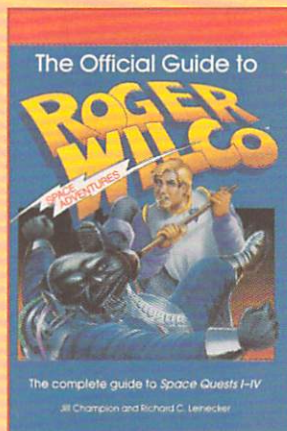
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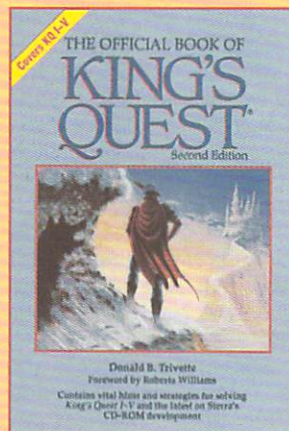
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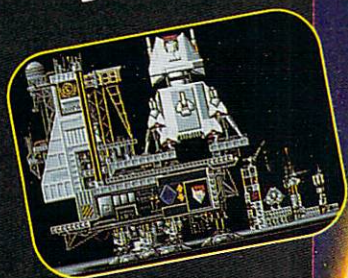
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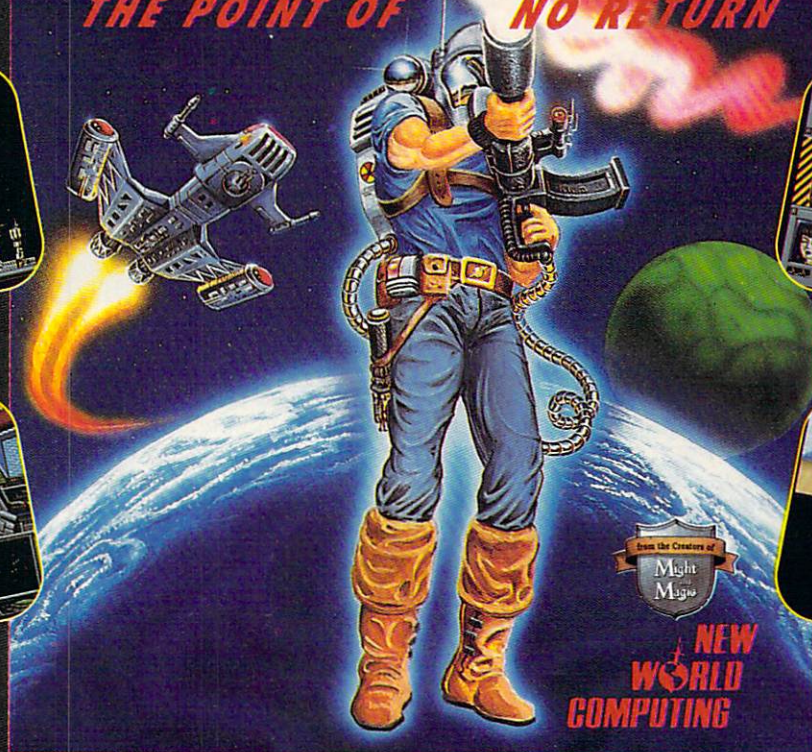
DESIGN



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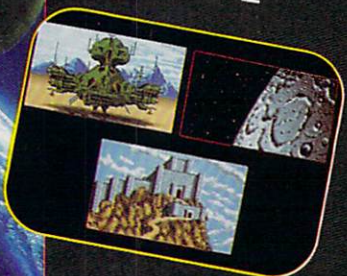
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Peter Scisco

MICROSOFT WORKS FOR WINDOWS

You might never get your hands on a free lunch, but your business can still feast on Microsoft Works. Of all the integrated software packages available for IBM and compatible computers, Works is superior in its blend of critical home office and small business applications. Easy to learn, it boasts a consistent interface and is affordable. The word processor, database, spreadsheet, and telecommunications modules offer solid if not breathtaking performance. If you're running a home office or a small business, Works might be the only software you need.

Several subtle changes make the Windows version of Works different from the DOS version. For example, there's no telecommunications module because you can use Windows' Terminal. This illustrates the major advantage of the Windows version: instant access to the Windows accessories.

Differences are immediately apparent when you launch Works from the Program Manager. The opening screen offers a selection of five buttons: Word Processor, Spreadsheet, Database, WorksWizards, and Open Existing File. A single click on one of these buttons propels you to almost instant productivity.

Each application module shares common functions with the others. For example, no matter which of the applications you're using, you can always open an existing file, regardless of the native format. If you're writing a letter, you

can open a spreadsheet. If your spreadsheet and word processor are open, you can open a database. Each module is fully operational within its application and within its own window. Windows can be cascaded or tiled for easy task switching and viewing, and cutting and pasting between the applications is a snap.

Veteran Works users who've recently moved to Windows will be surprised to find that the DOS command structure works side by side with the Windows commands. For example, you can cut a block of text using keyboard commands from Windows (Shift-Delete) or DOS (Ctrl-X). This may confuse some Windows users, as the Edit menu lists only the DOS commands.

Each application has a row of icons across the top of its window, a familiar sight to veteran Windows users. These buttons put the most common editing tasks right at your fingertips and are easily related to the functions they perform. Generally, the icon buttons from the upper left to the center of the screen govern common functions such as font selection, type size, typefaces, and alignment. A group of buttons to the right of center features functions specific to

each application. In the database, for example, this group switches between list and form view, launches a query, and creates a report.

This general overview of Works hints at the program's greatest strength—its interactive sharing of information and data between applications. This sort of sharing is general to all well-designed Windows applications, but not all software developers exploit the benefits of DDE and DLL. In Works, however, the solid interactive design doesn't come at the expense of any particular application.

The Works word processor is much more robust than Windows Write. It will import Write files and documents produced in WordPerfect (5.0 and 5.1) and Word for Windows (1.x) as well as those saved in ASCII, RTF, or dBASE formats. This translation capability makes it well suited for use as an extended-office application. When you take work home, you won't have to spend hundreds of dollars buying the high-powered applications you use at the of-



file; just save your files to disk in the right format and import them into Works for editing.

You won't confuse Works' word processor with high-end programs like Ami Pro, but any small business worker will be able to create smart-looking documents right away. Want to include a sketch? Open up the integrated Draw program, create a picture, and place it in your document. Want to create a form letter? Select the database fields you want from any available Works database file, create objects in any of the other applications, and then paste them into your document. Commands and tasks are especially intuitive.

The word processor also has a Note-It function that you can use to place a pre-designed icon in your text, accompanied by captions. Place the icon and the associated text note in your document. Then, when you double-click on the icon, the note is displayed. Unfortunately, Note-It is severely underdocumented and is available only in the word processor. You can append a note to a spreadsheet or database file, however, by bringing those files into the word processor and then appending a note near the placed object.

Weaker than the word processor, Works' spreadsheet is good enough for most small business tasks and for home budgeting. As in Excel, an "instant sum" key allows you to add columns or rows of numbers quickly without having to enter a formula. If the range of cells you want isn't selected, you can modify the selection with your mouse.

You can use buttons for setting cell-number attributes such as currency, percent-

age, or general. Chart making is also easy.

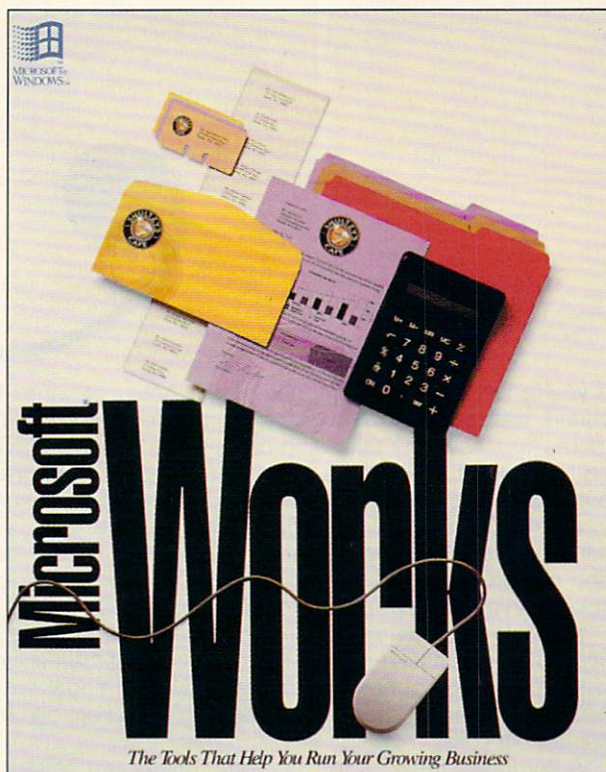
Microsoft has succeeded in keeping the Works spreadsheet from stealing away potential Excel customers. But the company omits functions that would've made this a stronger home office application. For example, the spreadsheet won't import Excel files directly. You have to save your Excel worksheet as a WKS file or as a Lotus-compatible WK1 file and then open it as a spreadsheet in Works.

The spreadsheet is also light on text formatting. If, for instance, you try to change the point size of the text within a cell, the change is made to the entire spreadsheet. Again, you can paste the worksheet into the word processor to make these changes.

Works' free-form, flat-file database is its strongest element. The database plays host to WorksWizards, pre-designed interactive "macrotemplates" that guide users through various database functions and reports, such as creating mailing labels, address books, and form letters. In this version of Works, the Wizards are linked closely to the database functions. Wizards are different from standard templates (also provided) in that they prompt you for information and then create the document that matches your input—the program compiles the forms and imports the necessary data.

If you have a computerized contact list (an address book, for example) at work, you can export it as a text file and then import it into the Works database. Works will also directly import and export dBASE III and IV files, retaining field names during translation.

Anyone using Works as a



small business application will be able to produce reports for inventory, accounts receivable, and sales tracking. Works' database reports can also be copied to the other modules; database fields are separated by tabs when you send them to the word processor and by rows and columns in the spreadsheet.

This kind of ease and automation prompts Microsoft to put the slogan "Software for people" on the Works for Windows box. Along with many other companies, Microsoft realizes that exploiting the power of the PC means making that power readily accessible. Combine Works with Windows, and you have just about all of the productivity software you'll ever need. □

IBM PC and compatibles (80286 or faster); 640K RAM, 256K configured as extended memory (1MB recommended); EGA, VGA, 8514/A, or Hercules; one floppy drive and one hard drive; Microsoft or compatible mouse—\$199; multimedia PC version—\$199

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Circle Reader Service Number 303



If you're like many technophiles, your house is wired for sound, with a stereo in the living room feeding speakers in rooms far away. Your television down in the den is connected to cable, a VCR, and another set of speakers to crank out "The Simpsons," "Dinosaurs," and "Northern Exposure" in stereo. Your house is threaded with phone lines; you have extensions in every room, a second line for the kids, and maybe a third in your home office. Your fax machine is linked to your phone, phone to modem, modem to PC.

But your computers, crucial to your lifestyle and home office, suffer in isolation. They're islands, entire of themselves, with no way to connect other than low-tech sneakernet, where you wear out shoe leather shuffling disks from one machine to another.

A computer network for the home office can serve the same purpose as one in the corporate office: It links PCs for easy file transfer and communication, and makes it possible to share a printer among several systems. Your home computer network can save you time—and money, too—just as a downtown business's computer connections make it a more productive workplace.

And though the word *network* may conjure up images of cables snaking underfoot, it can be no more difficult to create, install, and run a home office net than it is to connect a printer, plug in a cable, or dial the phone.

Full Service or à la Carte?

Office-bound networks serve four basic functions.

- Sharing files between or among computers
- Printing to a central printer from any machine
- Running applications from a central system
- Passing along electronic mail

The first three make sense in a home network, but the last, E-mail, may seem ridiculous unless your office is spread throughout a very large house. But E-mail makes sense if there are more than two employees in your office, whether it's located in a house or an office building. It allows for paperless memos, messages for coworkers who are away temporarily, and an alternate route for the friendly give-and-take that makes an office cohesive and fun.

Depending on how much money and effort you want to

put into your home computer network, you can go for full service—file sharing, printer sharing, and software pooling—or simply share files and perhaps a peripheral or two.

LAN software and hardware packages are popping up everywhere—from computer store shelves to back pages of computer magazines. There are also numerous non-LAN products that can perform basic LAN tasks like file transfer. File-transfer utility programs like LapLink Pro and modem-oriented products like ProComm can handle the simplest needs.

From this modest beginning, you can work your way from a two-node, "peer-to-peer" (which means that no one computer is dedicated to operating the network) LAN all the way to full-scale multinode networks traversing thousands of miles. To find the right LAN for you, first evaluate the equipment you want to tie together. Where is that equipment located? What do you want to do with it? And how much equipment will you add to it later?

Most small LANs operate on the Ethernet standard. The Ethernet standard is analogous to the Hayes standard used for modems. Other standards include ARCnet and IBM's Token Ring. A good LAN works in the background unnoticed by the computer user. Typical LANs require each node—each individual computer system tied into the network—to have an Ethernet-compatible or other standard network adapter card.

Most LAN starter kits come with two Ethernet-compatible cards, thereby providing a simple two-node LAN. Peripheral equipment (printers, modems, plotters, scanners, CD-ROM drives, fax boards, and so forth) generally don't require individual nodes but are linked through a computer on the LAN instead. Most LANs can share printers and CD-ROM drives. Modems, plotters, and/or scanners are handled by only a few.

At a minimum, the average LAN offers file transfer, peripheral and software applications sharing, and electronic mail. Most include security features.

There are two basic LAN configurations: peer-to-peer and client-server. In a peer-to-peer network any machine can access applications and files on any other machine on the network. A client-server network is a hierarchical structure in which a client machine accesses another machine called a

GETTING WIRED

ARTICLE BY GREGG KEIZER

**Save time and energy.
Let your computers swap files, share
applications, talk to each other.**

server. The client uses applications from and stores files on the server's hard disk. A client is also sometimes called a redirector or a workstation. Some LANs (PromiseLAN in particular) can have peer-to-peer units, client units, and a server unit on the same network. The best LANs for personal productivity are peer-to-peer, unless you have a spare 386 lying around that you can use as the network server.

When you're shopping for a LAN, variables to compare include maximum number of nodes, total RAM required, unique features, system requirements, additional purchases required, and price. See the accompanying grid ("LAN Alternatives") for information on low-cost LANs.

Number of the Network

The simplest and least expensive network is one that simply moves files from one computer to another via existing phone lines.

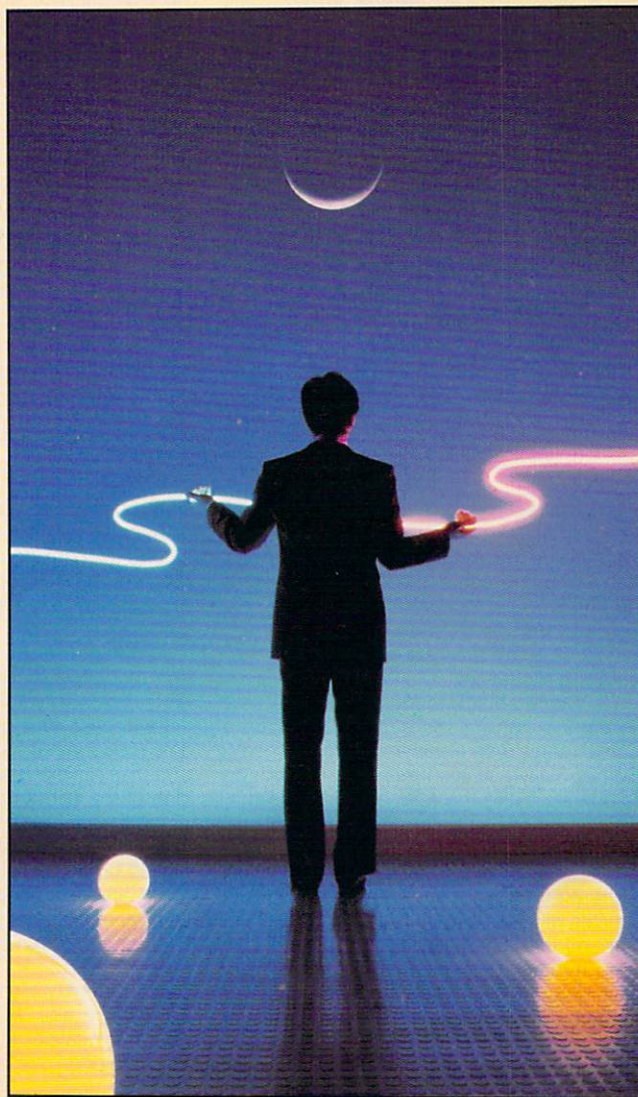
One file-transfer network takes advantage of your local phone company and LapLink Pro, a state-of-the-art file-transfer package for the PC. It may not be a network per se, but in a two-computer, two-phone line household, the combination gets you the same results.

LapLink Pro makes it easy to transfer files over a serial cable, but Traveling Software, the manufacturer, also sells connectors that allow you to string simple four-connector phone line between serial ports. A company spokesman said that he had successfully sent messages over 150 feet of serial cable, but if you are using unshielded phone line or live in an area with lots of radio emissions (from computers, CBs, and even garage door openers), you will need to keep the distances shorter than this or risk data corruption.

LapLink Pro's batch file transfer, clear progress gauges, and split screen—familiar to users of the earlier laptop-to-desktop LapLink software—make it a snap to use. Of course, with the program running, the source PC can't be used for anything else, but if your network needs are limited to moving files, it's a workable, bargain-basement remedy.

Mixing Metaphors

If you're connecting Macintoshes and PCs at home, you're only able to share files and printers. Since Macintoshes and



PCs use different microprocessors and different operating systems, you can't run Mac applications on the PC.

Apple's own LocalTalk network, with capabilities built into the most recent Macintosh operating system software, System 7.0, lets you link to PCs. Like the LapLink Pro connection, the simplest Mac-to-DOS LocalTalk network relies on the standard telephone lines in your house or office.

You'll need a PhoneNet Card PC from Farallon for your PC, one of the company's PhoneNet connectors for the Macintosh, and a phone outlet near each computer. Farallon's PhoneNet is completely compatible with Apple's own LocalTalk, but it sends the bits and bytes across the two unused wires found in most home phone lines (if your phone line doesn't have them, you can install separate phone wire and jacks yourself or have a phone-company installer do it). By relying on existing cabling, PhoneNet can save you a considerable amount of money, particularly if your computers are at some distance from one another.

The PhoneNet Card PC only works with PCs that operate at 25 MHz or slower, but for those computers, it's a terrific way to share files with Macs or to use a laser printer with two different systems. In effect, the PhoneNet Card PC and its accompanying software turn the PC into just another workstation on the LocalTalk network. You can share files and transfer them from Mac to PC, PC to PC, or PC to Mac, as well as print to a PostScript printer connected to the net.

If your PCs are using DOS 5.0, you can move all but 2K of the 134K re-

WHY NETWORK?

The hardest part about installing a home computer network might be convincing yourself (or your family) that it makes sense. It does in many situations, and here's what you can do if you invest your system-improvement dollars in a net:

- Store everything on a 386 or 486 equipped with a large hard drive; then run applications and call files over the network to cut costs and centralize backup.
- Make any employees of your home-based business as productive as you are on the PC.
- Justify more easily the cost of a printer, since it can be used with several computers.
- Mix Macs and PCs in the same house, and still keep them talking.
- Let your kids run programs from their own PCs—games, educational titles, applications for homework—without worrying about keeping track of disks.

quired for the PhoneNet memory-resident software into high memory, out of the way of your applications.

Of all the true network alternatives, PhoneNet is the quickest way to get your Macintoshes and PCs talking.

Dollar Net

You might think full-fledged networks are prohibitively expensive. If your image is of tens of computers, yards of cable, and pricey network software, then you're probably right. In a home office, though, you can get by inexpensively, even if you need a full-blown network that's capable of moving files, sharing printers, and running applications from a central system.

MOSES Computers' PromiseLAN is a good example. For \$199 (about a third less if you buy it by mail), you get a starter kit that links two PCs in a full-service network. Included in the kit are the necessary network adapters, software, and telephone cabling.

PromiseLAN is a real network, in that you can transfer files between computers and run applications from one PC's hard drive on another machine. You do get what you pay for, though. PromiseLAN can only connect as many as five computers, and it transmits data at a slow 1.79 megabits per second (Mbps), while most office networks move data at the Ethernet standard of 10 Mbps. But in many home offices, where convenience and low cost are as important as a long features list, neither limitation matters.

Do you want to stretch your cash even farther? Then The \$25 Network may be just the thing. This software and cable package really costs only \$25, and it connects as many as five systems with phone wire jacked into a serial port in each machine. Transmission speed is even slower than PromiseLAN's—only 115 kilobits per second (Kbps)—but certainly acceptable for printing and file copying (a 150K file moves from PC to PC in just over ten seconds, for instance). The \$25 Network lets you run programs on any of the networked PCs, but unless the programs are fairly small, the data-transfer speed makes this impractical.

Much faster and more complete in its features than either PromiseLAN or The \$25 Network, LANtastic is a network that's inexpensive enough for the home office. Buy the LANtastic AE-2

WHY NOT?

Although setting up a home network might be an enjoyable project, particularly for someone who enjoys setting up stereos and stringing cable, there are many other practical ways to coordinate the use of a small number of personal computers, most of which are less expensive than installing a network.

- Newer Macintoshes can read and write 3½-inch PC disks, so you can run a small office with Macs and PCs on sneakernet: Simply shuttle files back and forth on floppies, using the Mac as the translator. (Older Macs can be upgraded to read and write PC disks.)

- Removable hard disks allow you to use sneakernet with huge files and whole suites of applications. If you don't want to spend that much, tape drives are becoming remarkably inexpensive and are very compact, allowing you to move multimegabytes from machine to machine for around \$250 plus the \$30 cost of a tape cartridge. The downside of networking with

sneakernet is that tape devices have a relatively slow data-transfer rate. They were designed for backing up document files, not moving applications around. Bernoulli drives would be another portable mass-storage option.

- Many programs have severe restrictions on network use. A true network won't let more than one machine have read-write access to a given document at one time (because one user could save the file and then another could save a different version of the same file, destroying the work of the first person). But many applications also have restrictions on their use when installed on a network. Check your application manual under the section on network use. More than likely, it will tell you that only one person can use the application at a time. You'll often find that software can't be used on a network unless you purchase a special version or a special utility that makes it network compatible. This kind of software often makes a statement in the us-

er's agreement that using it on a network without a site license is illegal—and site licenses can be very expensive.

- Because of the costs involved, a full-featured network doesn't begin to pay for itself in dollars or in convenience unless you have four or five nodes operating. The lesson here is that starting a two- or three-node network using most network options makes sense if you have plans to expand in the near future, but it would be prohibitively expensive if that's as far as you intend to go.

- For printer sharing, a simple A/B switch box will serve as well as a network and cost far less. Even sneakernet works pretty well for printer sharing. For print jobs that will generate printer files smaller than the capacity of a floppy disk, I direct the printer output to disk, transfer the disk to the computer connected to the printer, and use the command COPY A:PRINT.FIL PRN to send the file to the printer.

—ROBERT BIXBY

Ethernet Starter Kit for \$699 (less by mail), and you get two AE-2 Ethernet adapter cards, a 25-foot length of coaxial cable, and the software to connect as many as 300 workstations.

Expandability is less important than the fact that the network runs at a full 10 Mbps, you get built-in electronic mail (in case you have an assistant), and you have access to all disk and printer resources on the network. This is called a peer-to-peer network—all the networked PCs act simultaneously as both servers and workstations.

The result is a lightning-fast network that can take advantage of a large hard disk on one system and a laser printer connected to another.

Through the Ether

But what if you don't want to drill holes through walls or floors, or even go to the trouble of laying cable? Though it may seem like science fiction, you can connect computers in the home office with a wireless network that sends its signals via radio waves.

The LAWN (Local Area Wireless Network) boxes from O'Neill Communications cost \$398 each (the printer node needs a special adapter, so it costs \$489); connect to the serial port of each PC and printer on the network; and though not extraordinarily fast

(19.2 Kbps), offer file transfer, E-mail, and printer sharing.

If you have computers scattered around the house, LAWN dramatically cuts the network-setup time. It easily transmits data through walls, even floors. It's rated as an FCC Class B device, which means that it won't interfere with other computers, televisions, or high-fidelity equipment in the house.

LAWN is expensive to install—a two-computer-one-printer network runs nearly \$1,300—but if you'd rather compute than lay cable, it's an excellent alternative for a 1990s home office.

Tomorrow's Home Office Today

You may think that a home office network is a frivolous expense when you've got a business to run and money to make. But put a network purchase into the same context as any other office upgrade, like a hard disk or a CD-ROM drive, and you may discover that the money (and perhaps time) spent will be worthwhile.

If you work by yourself in a one-computer office, a network is obviously unnecessary. But if your home sports more than one computer (whether they are used for business or not), a network can pay for itself.

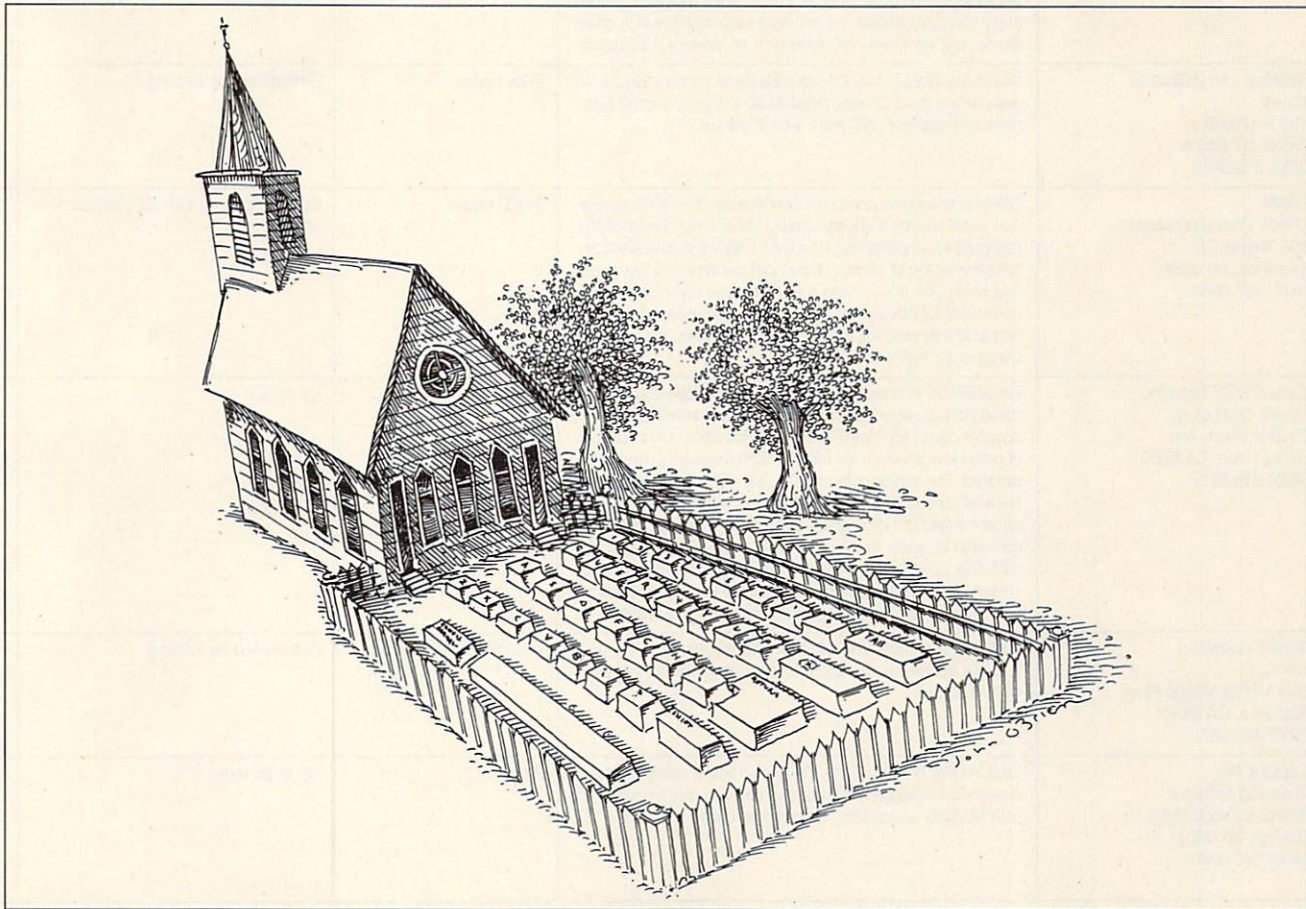
Home-based businesses with more than one PC and more than one work-

er benefit most from a network. If you hire help, even for such clerical concerns as correspondence or filing, link another PC to your primary machine, and you can improve your employees' productivity and your own. In fact, the more computers and workers you have to coordinate, the greater your network payoff will be. Therefore, any small business with five or more employees, all using computers, should seriously consider the network alternative.

Next in line is the single-system office that shares the house with another PC, perhaps one used by your spouse or children. With a peer-to-peer network like PromiseLAN, it's easier to justify the cost of a large hard drive or a laser printer because the end cost is distributed over several users and machines. Your kids can keep their applications and files on your PC's drive, even use your laser printer, if you have a network.

A home computer network may sound like an exotic beast, but it can be an inexpensive way to multiply the capabilities of all the machines—and computer users—under your roof.

COMPUTE intern Autumn Miller contributed to this article and created the chart on the following pages. □



LAN Alternatives

LAN	Comment	Capacity	Distance
<p>LANtastic Artisoft 691 E. River Rd. Tucson, AZ 85704 (800) 846-9726 (602) 293-6363</p>	<p>LANtastic is one of the most full-featured LANs available for a small-to-medium operation. Fast data transmission; quick data access with resource caching and random access caching; and a multitude of printing, security, and system-management features too numerous to mention put LANtastic at the top of the list.</p>	<p>2-300 nodes</p>	<p>Determined by cabling</p>
<p>PhoneNET Card PC/LocalTalk Farallon Computing 2000 Powell St., Ste. 600 Emeryville, CA 94608 (510) 596-9000</p>	<p>The new Macintosh computers come with built-in network capability. PhoneNET ties a PC into an established Mac LocalTalk network, permitting PCs to access and share Apple/Mac printers and files. Will work with Windows.</p>	<p>With AppleTalk Phase 2, address support for up to 16 million nodes</p>	<p>Up to 4500 feet</p>
<p>The \$25 Network Information Modes P.O. Drawer F Denton, TX 76202 (800) 628-7992 (817) 898-1294</p>	<p>The \$25 Network ties computers together by connecting standard telephone wire to standard serial ports. No adapter cards are necessary. Its abilities are limited (no file locking), but the price is a grabber.</p>	<p>2-5 nodes</p>	<p>Up to 160 feet</p>
<p>MAXLAN MAXLAN 11083 Wilkinson Ave. Cupertino, CA 95014 (800) 234-1688 (408) 739-2581</p>	<p>MAXLAN supports sharing fax, disk drives, printers, files, and applications and will soon have E-mail. While it can be used as a peer-to-peer network, the developers state that network performance increases by dedicating one computer as the server. Will work with Windows.</p>	<p>2-64 nodes</p>	<p>Up to 1670 feet</p>
<p>PromiseLAN MOSES Computers 15466 Los Gatos Blvd., Ste. 201 Los Gatos, CA 95032 (408) 358-1550</p>	<p>While PromiseLAN is slower than some previously mentioned LANs, it offers many full-scale features, such as print spooling and file and record locking. PromiseLAN adjusts transmission speeds to accommodate slower XT's without affecting the other computers tied into the network. MOSES Computers also sells the more powerful ChosenLAN, for up to 53 nodes, and SwiftLAN, which connects notebook computers through an external adapter card attached to the parallel port. The PromiseLAN software isn't available without the MOSES Computer adapter cards, since MOSES's proprietary standard makes the software incompatible with other cards. Will work with Windows with no special installation.</p>	<p>2-8 nodes</p>	<p>Up to 500 feet between machines</p>
<p>NetWare Lite (software) Novell 122 E 1700 S Provo, UT 84606 (800) 526-5463</p>	<p>Novell has adapted its full-scale NetWare server-based software into a peer-to-peer small-scale LAN for a small business environment. Will work with Windows.</p>	<p>2-25 nodes</p>	<p>Determined by cabling</p>
<p>LAWN O'Neill Communications 100 Thanet Cir. Princeton, NJ 08540 (609) 497-6800</p>	<p>LAWN is a wireless computer connectivity device using special radio transmitters attached to the serial ports of the computers and peripherals involved. LAWN software also contains the option of dividing the LAWN network into four separate networks. If you need a LAN for sharing a large database file, LAWN is not the option to choose. LAWN is primarily intended for E-mail, transferring files, and sharing peripherals. Will work with Windows.</p>	<p>2-100 nodes</p>	<p>Up to 500 feet without obstructions</p>
<p>EasyOFFICE Network Server Technology 2332-B Walsh Ave. Santa Clara, CA 95051 (800) 835-1515</p>	<p>EasyOFFICE connects computers and peripherals by their serial ports through a small central control box. No network adapter cards are needed, and the standard LAN features of peripheral sharing, file transfer, and messaging are incorporated. The major difference is that with the EasyOFFICE Network, one computer cannot access applications from another computer's disk drive, but you can transfer files. You can also operate another computer from your computer, with the remote PC's video display appearing on your screen. This limits application sharing to text-based applications, like word-processing programs and spreadsheets.</p>	<p>2-32 nodes</p>	<p>Up to 500 feet</p>
<p>10NET (software) Sitka 950 Marina Village Pkwy. Alameda, CA 94501 (800) 445-8677</p>	<p>10NET is a full-featured LAN suitable for home office use. It offers numerous printing and security options. Will work with Windows.</p>	<p>Determined by cabling</p>	<p>Determined by cabling</p>
<p>LapLink Pro Traveling Software 18702 N.Creek Pkwy. Bothell, WA 98011 (800) 343-8080</p>	<p>LapLink Pro is not a LAN; it's a file-transfer utility program designed for laptop computers. It can be used equally well with desktop computers. No adapter cards required.</p>	<p>2 nodes</p>	<p>Up to 25 feet</p>

Transmission Rate	RAM Used	System Requirements	Add-Ons	Price
10 Mbps (megabits per second)	40K on server, 12K on client	IBM PC or compatible, hard disk recommended	Longer cables, if desired	\$699 for AE-2 starter kit, including two adapter cards, software for up to 300 nodes, and cables; \$299 for node add-ons
Up to 230.4 Kbps (kilobits per second; speed depends on network type)	Not available	IBM PC or compatible (up to 25 MHz), 384K RAM, hard disk recommended	None	\$295 for software and hardware for one node, \$195 for software only (adapter card required, node hardware cannot be purchased without the software)
115 Kbps	30K	IBM PC or compatible	None	\$25 for startup kit
10 Mbps	Less than 52K for client/server	IBM PC or compatible, 512K RAM, hard disk recommended	Longer cable, if desired	\$515 for starter kit with two 8-bit adapter cards, software, and 20-foot cable; \$575 for starter kit with two 16-bit adapter cards, software, and 20-foot cable; \$149 for software only (unlimited users, adapter cards required); node add-ons: \$205 for 8-bit card; \$229 for 16-bit card
2 Mbps	26K for full peer-to-peer network, 16K for server, 10K for client	IBM PC or compatible, 640K RAM, hard disk (not required for client)	Longer telephone wire or cables, if desired	\$199 for starter kit with two adapter cards, software, and 25 feet of telephone wire; node add-ons: \$109 per adapter card
Determined by cabling	50K on client server, 25K on client	IBM PC or compatible, hard disk	Network adapter card for each PC	\$99 per node
Serial link 19.2 Kbps	25K	IBM PC or compatible, 512K RAM, hard disk recommended	None	\$398 for each PC, serial printer, and modem transmitter; \$489 for each parallel printer transmitter (software is included with each transmitter)
115 Kbps on ATs and 386s, 19.2 Kbps on XTs	45K	IBM PC or compatible, 640K RAM, serial port, hard disk recommended	Longer cable, if desired	\$499.95 for four connections; \$749.95 for eight connections
Determined by cabling	93K minimum (comes with its own memory manager)	IBM PC or compatible, 640K RAM, hard disk recommended	Network adapter cards and cables not included in starter pack	\$299 for three-node starter pack, software only; \$799 for ten-node value pack, software only; \$129 for node add-ons, software only
115 Kbps (cable), 9.6 Kbps (modem)	440K RAM	IBM PC or compatible, 512K RAM, modem	None	\$169.95 for software and cables

—AUTUMN MILLER

PERSONAL PRODUCTIVITY

Rosalind Resnick

BETTER TO GIVENS THAN TO RECEIVE

Charles Givens has made a fortune telling other people how to get rich. Now, the king of self-help financial books has set his sights on conquering the market for money-management software. His debut program is WealthStarter with Charles J. Givens (Reality Technologies, 3624 Market Street, Philadelphia, Pennsylvania 19104; 215-387-6055; \$59.95). Simply load the Givens program into your home computer (the sales pitch goes) and make the master—Charles Givens himself—your personal investment coach.

"My strategies change people's lives," Givens says. "There hasn't been software before that did that."

Indeed, there hasn't. But Givens's rags-to-riches story shows that he's no stranger to doing what others believe to be impossible. Born in Deca-

tur, Illinois, to middle-class parents, Givens got hooked on self-improvement books growing up, dropped out of college, and went on to make and lose three fortunes. In the early 1980s, he started peddling tapes on investing. When a local newspaper reporter mistakenly overstated his wealth, Givens seized upon the angle of the millionaire telling ordinary folks how to make money.

Today, the Charles J. Givens Organization in Orlando has 425,000 dues-paying members nationwide. Givens's books, *Wealth Without Risk* and *Financial Self-Defense*, have sold millions of copies and topped the *New York Times* bestseller list for years.

But along with success has come controversy. Givens's detractors say that his advice—tips such as "Don't buy bonds when interest rates are rising" and "When in doubt, deduct it"—is simplistic at best and, at worst, downright dangerous. Last year, the *Wall Street Journal* reported that the Securities and Exchange Commission and North Dakota state securities regulators were investigating several Givens companies.

Givens isn't fazed by people who say his investment advice is too simple. Givens says that investment is a long-term strategy and it's better in the short run to increase the power of the money you currently earn. As for the government regulators: "When a business is as big as [ours], they ought to take a look."

How you'll feel about Givens's software will probably depend on your view of his investment philosophy. As Givens says in his promotional literature, "If you like my books, you'll love my software." If, on the other hand, you think the books are hogwash, you probably won't think much of the software, either.

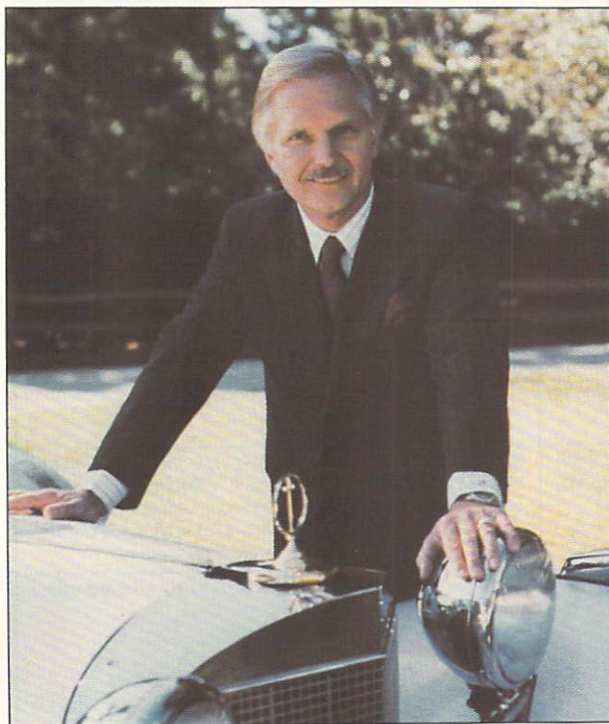
Stripped down to its essentials, WealthStarter with Charles J. Givens is little more than a set of basic spreadsheets with 300 of Givens's trademark tips tossed in. Some examples are "Put your financial goals in writing," "Purchase a plastic box for checks," and "Create your dream list." In fact, one of the program's key features is a blank Dream List worksheet with room for 100 dreams such as "Buy two ponies" and "Retire with lots of money." Another feature is an electronic version of Givens's 7-Step Financial Plan, which includes some rather obvious planning steps like "Itemize Your Expenses" and "Achieve Your Goals." Givens's spreadsheets, meanwhile, don't do much more than you could do with a sheet of paper and a \$5 calculator.

That's not to say, of course, that WealthStarter is totally without merit. For financial novices who've never mapped out a budget or tallied up their net worth, Givens's program is a good place to start. The program's easy-to-follow screens prompt you to type in personal financial data and help you build a 12-month budget and personal balance sheet in a matter of minutes. If you're already using Quicken to pay your bills and write your checks, you can import this data directly into WealthStarter.

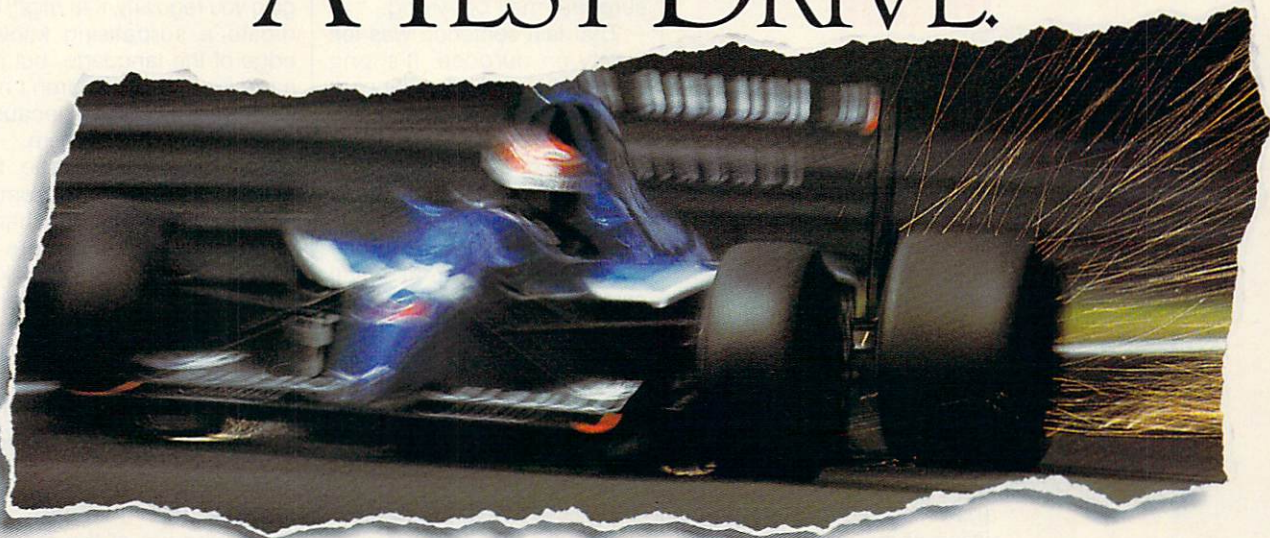
For newcomers, WealthStarter offers 400 pages of tutorials on stocks, bonds, mutual funds, and other topics.

WealthStarter with Charles J. Givens won't make you rich overnight—though it can help you get your financial house in order and give you the discipline you need to sock away money and invest it wisely. And, finally, consider this: Givens himself has lived out 175 of his 188 original dreams, including becoming one of the richest men in America. □

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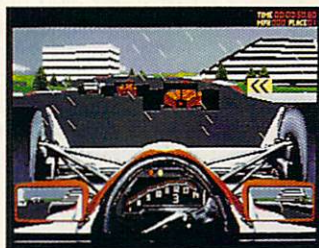
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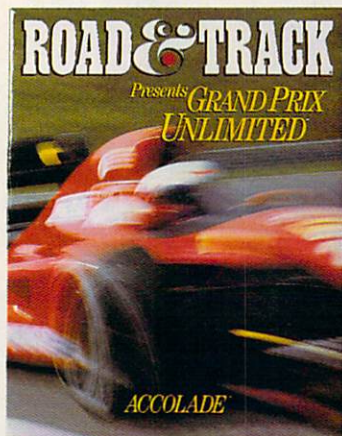
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ART WORKS

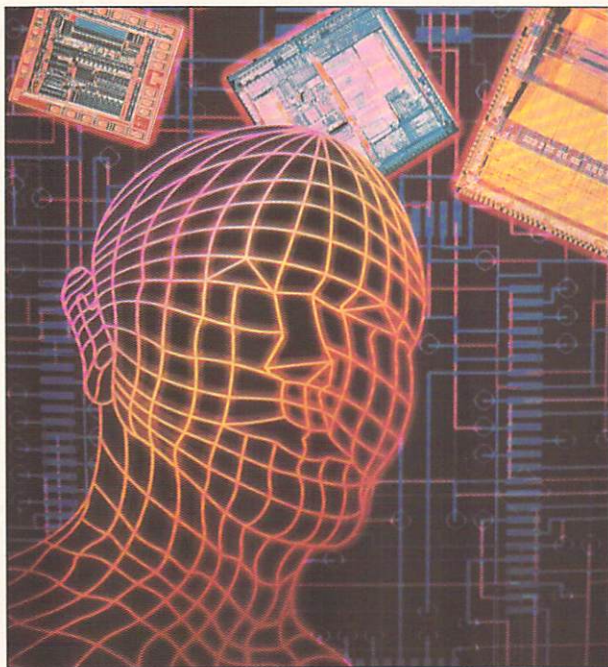
Robert Bixby

TAKING CARE OF THE TENSE

Desktop publishers need a ready resource for style and grammatical advice. I consider myself lucky in this regard because I live in a university town where there are plenty of people experienced in professional copy editing. We have a city library with an excellent reference desk staff. And on top of this, I work for a magazine of national reputation. Any questions I have regarding style or usage are a telephone call away from being answered. In fact, I might spend less time getting the question answered than deciding which of my many resources is the most appropriate to use under the circumstances.

It's a lonelier task elsewhere in the world, particularly for a desktop publisher who doesn't have a community of writers and editors. Most writers end up editing their own work as they turn to publishing, and in that situation, it isn't

People base serious judgments about your intelligence on whether your writing follows the rules of standard English.



what you don't know that's dangerous, but what you know for sure that may be wrong.

That last sentence was left knotty on purpose. It's long and difficult and full of dependent clauses and seemingly antecedentless pronouns. It's an example of the kind of sentence that gives a writer/editor fits. Is it right? Is it wrong? If it's wrong, how do you fix it? Sometimes it's all right to make small grammatical mistakes, if doing so improves the flow of the writing. But someone has to draw the line between bad writing and a refreshing departure from the strictures of the language. The author is the worst person for that job.

And then there are the mistakes that everyone makes, particularly if he/she/they didn't have the kind of English instruction that seems to have become obsolete—agreement between subject and verb and between pronoun and antecedent. Here's a simple test to check your knowledge: Is data singular, or are data plural? (Actually, it/they can be either.)

If you face these questions every day, you need a grammar checker. Grammar checkers will save you from embarrassment, from error, and from obfuscation. Despite what might seem to be a liberal climate in the writing world, where virtually anything is considered acceptable syntax, serious judgments are made about you and your intelligence based on whether your writing follows the rules of standard English. You can say, "It don't matter to me" and be well thought of. But if you *write* it in anything but dialogue, you'll lose all your authority.

On the other hand, if you don't face questions about grammar every day in your editing, you're in even greater need of a grammar checker. The English language has

more catches than a mile of barbed wire. If they aren't snagging you regularly, that *might* indicate a surpassing knowledge of the language, but it's more likely that you aren't noticing the problems because you aren't aware of them.

True, the work done by grammar checkers is sometimes too complex for them. The more creative you are in your word use, the more likely they are to misunderstand your intent and improperly flag a sentence. That was the kernel from which many of the derisive early reviews grew: Reviewers, usually professional writers with years of experience, would run their copy through the checker and then poke fun at the results. Checkers have improved to the extent that professionals often use them routinely. The chief improvements (beyond better programming) include allowing you to shut off one feature or another and providing specialized feature presets for checking technical writing, business writing, casual writing, and so forth.

In addition to detecting actual errors in your writing, however, a grammar checker can catch you when you lapse into passive voice. Believe it or not, even if your sentences hew to all of the rules of good grammar, they can still be terrible sentences if they're written in passive voice. If you write "The window was broken, and the house was burglarized" instead of "The burglar smashed the window and ransacked the house," you're guilty of using passive voice. Grammar checkers will alert you to this bad habit and force you to mend your ways.

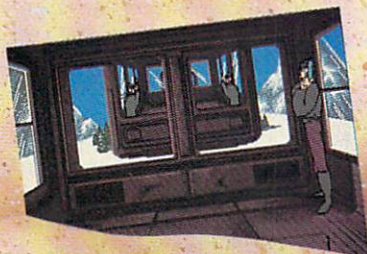
A grammar checker won't necessarily make you a better writer. But a grammar checker can be your best friend when it comes to making copy as clean as possible. □

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Guy Spy

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DISCOVERY CHOICE

ANTicipate the needs of your colony and fight hand-to-hand combat in this captivating simulation.

Clayton Walnum

SIMANT

Maxis's first software "toy," SimCity, let simulation lovers become the mayors of their own towns. SimEarth, the second program in the line, imbued players with the power to forge a world. Now, Maxis gives us SimAnt, which takes us not farther out into the universe, but down into the ground, where we control the destiny of a nest of ants.

This switch from the grand scale of SimEarth to the backyard microcosm of SimAnt marks Maxis's return to a more easily manageable scenario. Players who found the immensity of SimEarth overwhelming will be pleased with SimAnt's relative simplicity. With the excellent onscreen and in-manual tutorials, a novice ant lord needs only an hour or two to master basic gameplay.

Still, in spite of its restraint, SimAnt provides both an engrossing game and an interesting introduction to the lives and times of these pesky, ubiquitous six-legged critters. Over the course of the simulation, you'll control where the ants build their homes, how they find their food, and when they invade rival nests. You'll even lead them to ultimate victory as they overrun the yard's house and drive its occupants screaming into the night. Along with the fun, you'll learn much about these amazing insects.

The program's easily manageable, Windows-like interface makes controlling your colony a snap. Using the Edit window, you can zoom in on the underground nest. There you'll see ants hatching, storing food, nurturing their young, and performing other activities. By switching to the



surface view, you can see your ants scurrying across the ground as they hunt for food, battle enemies, and avoid such deadly dangers as spiders, ant lions, and lawn mowers. Finally, in the Map window, you get a bird's-eye view of an entire patch or an expanded view that includes all 192 patches, with graph lines showing the relative strengths of the black and red armies.

Like SimEarth, SimAnt can be played on several levels. If you're a beginner, you'll probably start with the quick game, in which you must increase the size of your colony until you can kill all the red ants in your patch. When you've graduated to the full game, you must not only increase the size of your colony but also migrate to other patches in a quest to annihilate the red ants and drive the humans from their house. Finally, in the experimental mode, you manipulate the ants' universe in several ways, studying the effects your actions have on your tiny guinea pigs.

A full game of SimAnt involves leading your horde through several stages of play. At first, you have only a newly hatched queen, who

must dig a hole and start laying eggs. The first egg hatches into the yellow ant, which is the ant you control. Your initial task is to guide it to food.

You find food by switching to the overhead view in the Map window, which shows the entire patch. After you've located the green area that marks a food cache, send your yellow ant scurrying after it. Watch out for spiders and ant lions, which love to munch on unwary insects. By the time you bring a few food balls back to the nest, other ants will have hatched. You can then recruit them to help gather food.

Before long, you'll have built up a strong and thriving nest. When you've outpopulated the red ants (and have plenty of food for energy), you can recruit an army of soldier ants to attack the red nest and destroy the red queen. Then you can breed new queens to send to new patches. You continue in this way until you've destroyed all the red ants and taken over the humans' house.

During a game, you have many tools at your disposal

which allow you to control the ants and their universe (a backyard). You can, for example, display the various chemical scents (nest, trail, and alarm) your ants leave behind as they move about a patch. In addition, the Caste control allows you to choose the percentage of breeders, workers, and soldiers born into your nest. The Behavior control lets you decide how many ants forage for food, dig new tunnels, or nurture the young. The History window provides access to graphs depicting ant populations, food storage, colony health, and even the number of ants eaten or killed.

For ease of play, the most commonly used functions are represented by buttons on the windows. Also, a menu bar provides access to many additional functions, including game saving and loading, game speed, music and sound toggles, and window selection. One menu function, aptly named Silly, turns your ants into wisecracking smart alecks who frequently stop what they're doing to blurt out such nonsense as "Eat poison, spider face!" and "Better dead than red!"

In the experimental mode, the simulation operates much differently than in either of the game modes. To start, you're given a patch containing small black-ant and red-ant nests. You're also given a menu of tools that you can apply to the nests and their occupants. The Barriers tool, for example, lets you build walls anywhere you like on the current patch. Other tools include the Dig/Fill tool for digging or filling in holes, the Add Food tool for feeding hungry ants, the Drop Trails tool for creating chemical

trails, and the Insecticide tool for quickly killing off excess population.

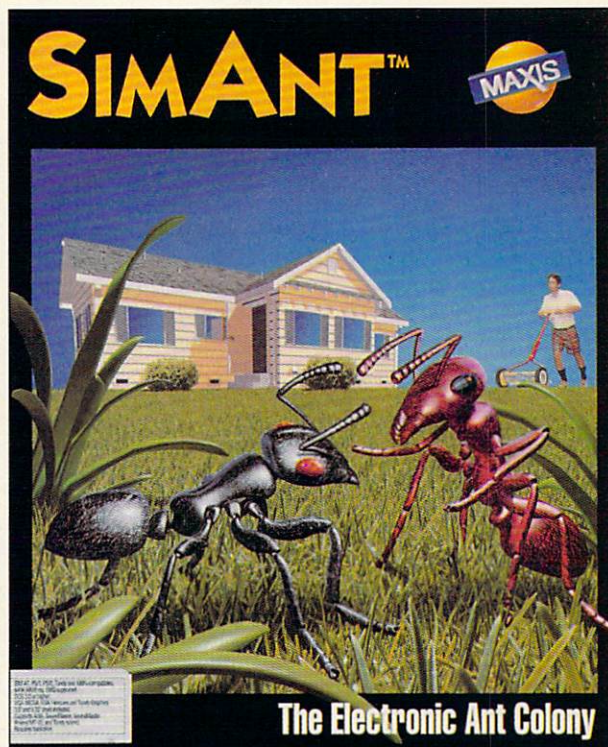
One of SimAnt's most impressive features is its Information window, which is a HyperCard-like database containing mounds of information about ants. Clicking on a card's subject buttons takes you to other cards, while clicking on a highlighted word displays a little pop-up window containing the word's definition. All the cards are linked into a complex tree that lets you follow any subject line you like. Most of the cards in the stack contain pictures as well as text.

SimAnt's well-written manual is a joy to read. Every page contains not only detailed program instructions but also plenty of humorous sidelines that will keep you grinning as you learn.

As with any good manual, you first get a quick overview of the game's objective. Then you're guided through a hands-on tutorial that will have you controlling your ants in a surprisingly short time. Peppered throughout the manual are dozens of ant puns. You'll groan at such atrocities as "An ant with a split personality is a sibilANT."

The second section of the manual offers a wealth of information about ants in the real world to readers who want to improve their gameplay or just increase their knowledge about these tiny insects. From general facts about ants to the specifics of how they eat, communicate, reproduce, and fight—everything you've ever wanted to know about these insects is here.

The manual's third section offers ANTcillary (blame Max- is) information about ants, including many sources for fur-



ther study, both fictional and nonfictional. Section 4 of the manual is a complete glossary, bibliography, and index.

All said and done, SimAnt is a war game, albeit one that blends education with blood-letting. What sets it apart from other war games is its unique scenario. Your soldiers don't have two legs; they have six. The battlefield isn't the countryside of Europe; it's a house and its backyard. Your soldiers use no fancy weaponry; they fight hand to hand. Nevertheless, as in any other war game, the object is to defeat the enemy and take over its territory.

Of course, to be successful in SimAnt, you must learn all you can about ants and their behavior. What a sneaky way to get an education. □

IBM PC and compatibles; 640K RAM; EGA, MCGA, VGA, Hercules, or Tandy graphics; hard drive; supports Ad Lib, Sound Blaster, Sound Master, Roland MT-32, and Tandy sound—\$59.95

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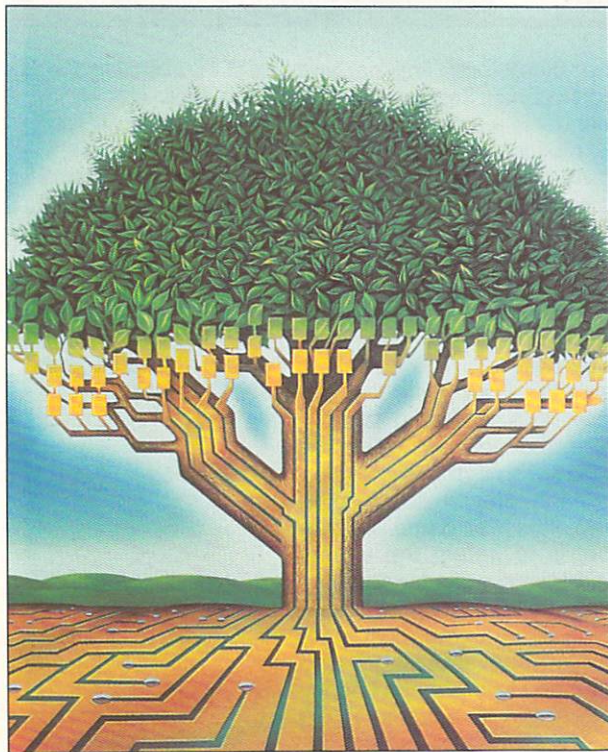
Steven Anzovin

ECO LOGIC

Green computing seems to be catching on in many forms—especially in telecommuting and recycling.

Telework advocates have long predicted that the computer will replace the car, and recently you could see some solid evidence of that. Commuters who once had to drive for hours to corporate centers in Los Angeles and San Diego now have an alternative that's closer to home. The Riverside Telecommuting Center, about 60 miles southeast of Los Angeles in the town of Riverside, is a pioneering effort at creating a satellite corporate computing center. Several companies, including Pacific Bell, Edison, Xerox, IBM, and Disney, are leasing or plan to lease office space in the center for white-collar employees who live in the Riverside area to let them avoid the three-hour commute into the city.

Going green makes good sense for business and for personal reasons.



CD-ROMs have finally arrived, along with the Multimedia PC. Because many CD-ROMs contain time-dependent information, the discs become useless as soon as the information on them is outdated. And unlike floppy disks, useless CD-ROMs can't be reused, so most people just toss them. A CD manufacturer called Digital Audio Disc, a Sony subsidiary in Terre Haute, Indiana, melts down discs that don't pass quality control and uses them to make CD packaging, but as yet there's no company that recycles used CD-ROMs and audio CDs from consumers. Likewise, it's possible to recycle the jewel box and plastic tray that CD-ROMs and audio CDs are packaged in, but so far only the world's largest jewel box and tray manufacturer, Atlanta Precision Molding, has the facilities to do it, and the company recycles only its own scrap. There's a niche for an enterprising plastics entrepreneur who wants to get into compact disc recycling.

In another development, some CD-ROM distributors are turning away from plastic CD packaging altogether. Apple Computer, which sends out thousands of CD-ROMs to Apple developers every month, now protects its discs with a cardboard sleeve instead of a jewel box, as does Educorp, the biggest distributor of commercial Macintosh CD-ROMs. By the way, if you have lots of floppy disks you want to recycle, a company called Covenant Recycling Services (201-838-1336) will recondition them and sell them through a middleman to schools and other outlets.

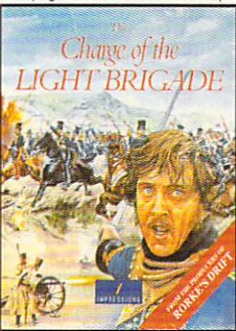
In a previous column I mentioned a Mac program called DynoPage that makes it easy to print documents on both sides of the paper. Robert G. Chaplick of Wheaton, Mary-

land, notes that there are two much less expensive PC utilities for double-sided printing. One is a shareware program called Microtxt, which can be found in shareware catalogs and on several online services; the other is PRNCOL (available for \$15 from Steve Fox, 11515 113th Place NE, Kirkland, Washington 98033). Chaplick uses PRNCOL for all his printing and recommends it highly. If you want recycled paper to print on, there are several mail-order sources, including Earth Care Paper (4601 Hammersley Road, Madison, Wisconsin 53711; 608-277-2900) and Inmac (1111 West North Carrier Parkway, Suite 200, Grand Prairie, Texas 75050; 800-547-5444). Inmac even offers hard-to-find recycled fanfold paper.

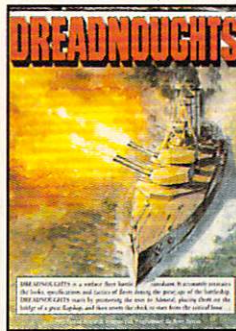
More and more people are saving money by recycling their laser toner cartridges and reinking their printer ribbons. Be sure, by the way, to use the newer soy-based ribbon inks rather than petroleum-based inks and to keep ribbons well inked to lubricate the printer head. Did you know that you can refill the ink cartridge in your Hewlett-Packard DeskJet or DeskWriter printer by yourself? Bruce Marchesani of Lyndhurst, New Jersey, sent in this tip. Simply use a hypodermic syringe to inject the empty cartridge with a new supply from a bottle of standard Shaeffer ink, which can be purchased in any stationery store, or use a soy-based ink of similar viscosity. (Syringes are available from your local surgical supply house.) There's a little pinhole in the top of the ink cartridge that allows you to do this.

Share your tips on green computing. Send your ideas to me at Box 2173, Amherst, Massachusetts 01004. Maybe you'll see your name and idea in a future column. □

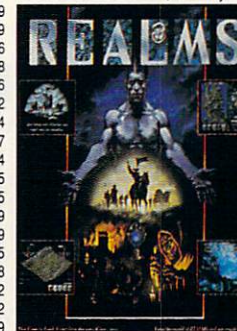
IBM WARGAMES	IBM STRATEGY	IBM STRATEGY	IBM SPORTS	IBM TRADITIONAL	IBM ROLE PLAYING	IBM SIMULATION	HINT BOOKS
Action Stations \$29	Conquered Kingdoms \$36	SimEarth \$41	Gretsky League \$26	Centerfold Doses \$21	Might & Magic 1 or 2 \$12	F15 SE2 Scenario Disk \$17	AD&D HINTBOOKS \$10
Action Stations Scen 1 \$14	Crisis in the Kremlin \$37	Star Control 2 \$37	Hardball 2 \$28	Check Mate DOS/WIN \$36	Might & Magic 3 \$37	F15 Strike Eagle 3 \$44	Bard's Tale 1 - 3 Ea \$10
Allied Forces Bundle \$29	Dragon Lord \$129	Starfleet 1 or 2 \$38	Hardball 3 \$34	Chessmaster 3000 \$33	Might & Magic 4 \$39	F19 Stealth Fighter \$29	Buck Rogers 1 \$10
Arvo Civil War 1 - 3 Ea \$22	Dune \$22	Task Force 1942 \$39	John Elway's QB \$39	Chessmaster 3000 WIN \$38	Pirates \$37	F22 ATF \$34	Buck 2: Matrix Cubed \$10
Ancient Art of War \$29	Empire \$31	Theatre of War \$32	LH 3 in 1 Football \$36	Dealers Choice Poker \$32	Planet's Edge \$37	Falcon 3.0 \$42	Civilization \$16
Battles of Napoleon \$32	Empire Deluxe \$42	Traders \$29	LH Boxing \$36	Edwrd O Thrp Blck Jck \$19	Sea Rogue \$39	Flight Simulator 4.0 \$39	Dynx Great War Planes \$16
Bismark \$42	Final Conflict \$34	Utopia \$31	LH College Basketball \$36	Femmes Fatale \$26	Sentinel Worlds \$15	Fly Grand Canyon 3D \$45	Elvra 1 or 2 \$10
Blitzkrieg Ardennes \$29	FireTeam 2200 \$29	Visions of Aftermath \$12	LH Full Count Baseball \$36	Femmes Fatale Disk \$18	Space 1889 \$16	Gunsip \$32	Harpoon Battlebook \$19
Bravo Romeo Delta \$37	FireTeam Const Kit \$25	Warlords \$29	LH Hockey \$36	GO Master 5 Dix \$109	Space Inc \$34	Gunship2000 \$39	Indy Jones Lst Crsade \$10
Campaign \$29	Fort Apache \$34	Worlds at War \$29	LH Pro Basketball \$36	GO Master 5 DOS/WIN \$39	Spellbound \$39	Harrier Combat Sim \$6	Indy Jones Fate Atlantis \$10



'CHARGE OF THE LIGHT BRIGADE' recreates the battle of Balaclava during the Crimean War. Defend using the smaller British, French, and Turkish Forces or the attacking Russians. Features animated figures, individual or group commands, 2 players & an improved mouse interface. **\$34**



'DREADNOUGHTS' is a surface fleet battle simulator. It recreates the look, specifications, and tactics of fleet combat. Features 3D views, comprehensive manuals and sea charts, a potent English command parser, 1 or 2 player mode and computer controlled ships, gunnery and damage control. **\$42**



'REALMS' is a strategy game in a fantasy setting. You can control 128 armies, each a thousand strong with definable battle formations consisting of 6 distinct humanoid races. March your men over 125,000 square miles of fractally generated landscape to obtain countless followers and gold. **\$29**

Carriers at War \$37	Global Conquest \$39	Indy Jones L Crsd vga \$27	LH Team Disks \$16	GO Master 5 Toolkit \$39	Wizards 5 \$32	Heros of the 357th \$32	Jetfighter 2 \$16
Carrier Strike \$42	Global Effect \$32	Indy Jones Fate Atlantis \$38	LH League Leaders \$16	Grand Slam Bridge \$22	Wizards 6 Cosmic Frg \$37	Hyperspeed \$37	Loom \$10
Charge Light Brigade \$34	Koshan Conspiracy \$32	King's Quest 1Enhncd \$34	LH Utility Disks \$16	Hong Kong Mah Jong \$32	Wizards 7 Crusaders \$39	Jet Fighter 2.0 \$39	Lord of the Rings 1 or 2 \$10
Civil War WSI \$42	Lemmings \$39	King's Quest 2 or 3 \$28	Links Golf \$37	Hoyle Book Games 1or2\$21		Land, Sea & Air 1or2 \$39	LucasArts Adventure \$16
Cohort \$34	Lemmings Data Disk \$12	King's Quest 4 \$34	Links Golf WIN \$39	Hoyle Book Games 3or4\$29		Life & Death 1or2 \$23	Magic Candle 1 or 2 \$10
Conflict: Korea \$37	L'Empereur \$37	King's Quest 5 or 6 VGA\$39	Links Course 1 - 6 Ea \$17	Jeopardy Silver Edition \$15		M1 Tank Platform \$34	Marian Dreams \$13
Conflict: Middle East \$37	Liberty or Death \$37	Leather Goddesses 2 \$42	Madden Football 2 \$32	Monopoly \$24		Mantis Exprmtl Fghtr \$34	Matrix Cubed \$10
Conflict in Vietnam \$9	Lost Admiral \$34	Leisure Suit Lrry 2, 3, 5 \$34	Magic Johnson Fst Brk \$37	Omar Sharif on Bridge \$37		Dark Queen of Krynyn \$32	Mega fortress \$37
Decision at Gettysburg \$29	Lost Admiral Enhanced \$38	Leisure Suit Lrry Bundle \$39	Mario Andretti Racing \$17	Penthouse Jigsaw \$24		Death Knights of Krynyn \$20	Megafrtrss Msn 1 or 2 \$27
Dreadnoughts \$42	Lost Admiral Scenario \$23	Loom \$19	ML Basbil Mng's Chlng \$24	Risk WIN \$29		Dragons of Flame \$12	Red Baron VGA \$34
Dreadnoughts:Ironclads \$29	Medieval Lords \$37	Lost in LA \$37	ML World Series Disks \$17	Scrabble Deluxe \$34		Eye of the Beholder \$32	Red Baron Msn 1 or 2 \$24
Dreadnoughts: Bismark \$29	Merchant Colony \$34	Lost Treasures Infocom \$42	ML TD 1982 - 1990 Ea \$17	Shanghai 2 \$24		Eye of the Beholder 2 \$38	Red Storm Rising \$12

'NEMESIS GO MASTER' 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 & tutor, Joseki Genius adds complex corner openings, Tactical Wizard and GO Scribbler. **\$109**

ML Franchise Disks Ea \$20	Stratego \$31	Strip Poker 3 \$31
Microleague Basketball \$28	Strip Poker Data 1-5 Ea \$19	Strip Poker Data 1-5 Ea \$19
ML Personal Pro Golf \$39	Trump Castle 2 \$29	Strip Poker Data 1-5 Ea \$19
ML Football Deluxe \$39	Video Poker DOS/WIN \$34	Wheel of Fortune Gold \$15
ML Ftbl Team Disks \$11	Video Poker \$29	Wordtris \$29
Michael Jordan Fit Sim \$44	Wheel of Fortune Gold \$15	World Champ Backgmn \$24
Mike Ditka Football \$60	World Champ Backgmn \$24	World Champ Cribbage \$24
NFL Challenge \$31	World Champ Cribbage \$24	
NFL Football \$15		
NFL 1984 - 1987 Ea \$31		
NFL 1988 - 1991 Ea \$22		
NFL Proleague Football \$32		
Nicklaus Signature Edit \$39		
Nicklaus SE Clip Art \$24		
Nicklaus Unlimited Golf \$29		
NG Clip Art \$17		
NG Course 1, 2, 3, 4, or 5\$15		
Pete Rose Baseball \$9		
PGA Tour Golf \$32		
PGA Tour Golf Win \$38		
PGA Tour Golf Disk 1 \$37		
PGA Tour Golf Lid Edit \$45		
PGA Tour Golf Lid Edit \$34		
Pro Football Analyst \$34		
Pro Tennis Tour 2 \$32		
Road to the Final Four \$37		
Reel Fish'n \$12		
Reel Fish'n \$12		
Tom Landry Football \$29		
Tony LaRussa Baseball \$29		
T LaR Fantasy Managr \$15		
T LaRussa Stadiums \$15		

'AD&D BUNDLE' includes Champions of Krynyn, Mantis Exprmtl Fghtr, Dark Queen of Krynyn, Death Knights of Krynyn, Dragons of Flame, Eye of the Beholder, Eye of the Beholder 2, Stratego, Strip Poker 3, Strip Poker Data 1-5 Ea, Trump Castle 2, Video Poker DOS/WIN, Wheel of Fortune Gold, Wordtris, World Champ Backgmn, World Champ Cribbage.

Wizards 5 \$32	Heros of the 357th \$32	Jetfighter 2 \$16
Wizards 6 Cosmic Frg \$37	Hyperspeed \$37	Loom \$10
Wizards 7 Crusaders \$39	Jet Fighter 2.0 \$39	Lord of the Rings 1 or 2 \$10
	Land, Sea & Air 1or2 \$39	LucasArts Adventure \$16
	Life & Death 1or2 \$23	Magic Candle 1 or 2 \$10
	M1 Tank Platform \$34	Marian Dreams \$13
	Mantis Exprmtl Fghtr \$34	Matrix Cubed \$10
	Mega fortress \$37	Might & Magic 3 \$16
	Megafrtrss Msn 1 or 2 \$27	Planet's Edge \$16
	Red Baron VGA \$34	Populus 1&2 Official Str \$16
	Red Baron Msn 1 or 2 \$24	Power Monger \$16
	Red Storm Rising \$12	Quest for Clues 2, 3or4 \$21
		Railroad Tycoon \$10
		Savage Empire \$10
		Secret Mrykyl Islnd 1or 2 \$10
		SIERRA HINTBOOKS \$10
		SimCity/Simthru \$20
		Starflight 1 or 2 \$10
		Strategy Plus 3-11 Ea \$8
		Strategy Plus 12-18 \$5
		Ultima 4 - 7 Ea \$10
		Ultima Avatar Adventrs \$14
		Wizards 6 Cosmic Frg \$12
		Wizards 7 Crusade \$12
		Yeager's Air Combat \$16

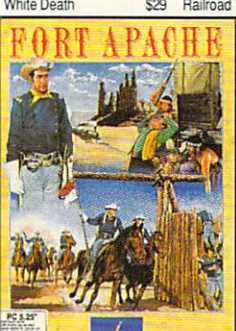
Fire Brigade \$34	GEN OTRS GAMES \$24	Gettysburg:Turning Pnt \$37	Halls of Montezuma \$24	Harpoon \$25	Harpoon Set 2 or 3 \$19	Harpoon Set 4 \$24	Harpoon Challenger Pak \$42	Kampfruppe \$37	MacArthur's War \$29	Panzer Battles \$22	Patriot \$38	Patriot Battle Sets Ea \$24	Pattion Strikes Back \$37	Red Lightning \$12	Rommel North Africa \$24	Rorke's Drift \$34	Second Front \$37	SIM CAN GAMES \$36	Storm Across Europe \$12	Third Reich \$27	Typhoon of Steel \$12	UMS 2 \$19	UMS 2 Civil War \$24	UMS 2 Desert Storm \$20	UMS 2 Planet Editor \$28	V for Victory \$38	Waterloo \$12	Western Front \$37	White Death \$29
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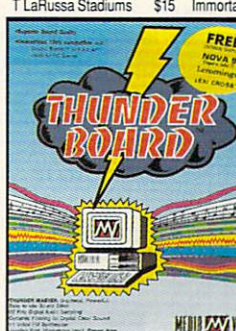
'NEMESIS GO MASTER' is the ultimate computer GO program. With the simplicity of checkers and the complexity of chess, GO is a serious strategy game. Includes: GO MASTER a basic GO player & tutor, Joseki Genius adds complex corner openings, Tactical Wizard and GO Scribbler. **\$109**

'THE PERFECT GENERAL' is a turn based ground war game. Features 12 years of play testing, VGA maps, easy to use mouse or keyboard interface, 14 scenarios, strong artificial intelligence, hidden movement, line of sight option, in depth player ranking system, 2 player, with modern support. **\$34**

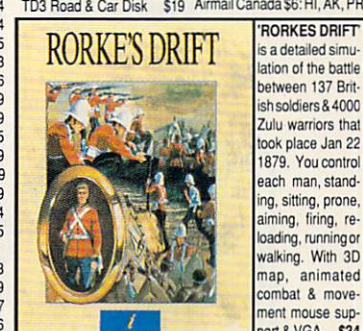
Sailing Simulator \$39	Sailing Sim Voyages Ea \$34	Secret Weapons Ltwwf \$44	S Weapons Exp1-4 \$21	Shuttle \$34	Sierra Hintbooks \$10	SimCity/Simthru \$20	Starflight 1 or 2 \$10	Strategy Plus 3-11 Ea \$8	Strategy Plus 12-18 \$5	Ultima 4 - 7 Ea \$10	Ultima Avatar Adventrs \$14	Wizards 6 Cosmic Frg \$12	Wizards 7 Crusade \$12	Yeager's Air Combat \$16
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'FORT APACHE' lets you take charge of a detachment of cavalry troopers in the wild west. You are responsible for training them and bringing their combat abilities up to par. Features individual or group control, choice of weapons, a wide variety of missions, detailed troop stats, a large play area, & promotions. **\$34**



'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**



'RORKE'S DRIFT' is a detailed simulation of the battle between 137 British soldiers & 4000 Zulu warriors that took place Jan 22 1879. You control each man, standing, firing, reloading, running or walking. With 3D map, animated combat & movement mouse support & VGA. **\$34**

A Train \$42	Armada 2525 \$32	Bandit Kings Anc. China \$37	Battle Isle \$32	Breach 2 Enhanced \$19	Breach 2 Scenario Disk \$15	Castles \$36	Castles Disk 1 \$19	Civilization \$39	Command HQ \$19
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Rampart \$27	Realms \$29	Renegade Legion Intrcpl \$12	Revolution 76 \$29	Romanc 3 Kingdm 1or2 \$42	Rules of Engagement \$37	Second Conflict WIN \$34	Siege \$38	Sim Ant \$37	SimCity \$29	SimCity Graphic 1 or 2 \$23
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4D Boxing \$17	4th & Inches \$9	ABC Boxing \$32	All American College Fb \$36	APBA Baseball \$28	APBA 1908 - 91 Ea \$21	APBA Basketball \$28	APBA Bowling \$19	APBA Football \$49	APBA Micro Manager \$32	Greens \$34	Gretsky Hockey 2 \$34
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T LaR Teams 1901-68 \$15	Weaver Baseball 2.0 \$32	Weaver Commisnr 2.0 \$21	Weaver 2.0 1990 Teams \$16	Weaver 2.0 Comm Edit \$56	World Circuit \$34	Amanillo Slim Poker \$12	Backgammon WIN \$19	Battle Chess WIN \$29	Blackjack DOS/WIN \$19	Legacy of Necromancer \$29	Lord of the Rings 1 \$34	Lord of the Rings 2 \$37	Loremaster \$39	Lure of the Temptress \$37	Magic Candle 1 \$12	Magic Candle 2 \$37	Mechwarrior \$34	Megatraveller 1 \$16	Megatraveller 2 \$19	Megatraveller 3 \$39
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TFH & BH1942 \$44	Ultrabots \$37	Virtual Reality Studio \$49	Virtual Commander 1 \$39	WC1 Mission 1 or 2 \$19	WC1 Bundle \$45	WC2 Operations 1 or 2 \$27	WC2 Speech Pack \$15	Wolfpack \$15	Yeager's Air Combat \$38
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MULTIMEDIA PC

David English

INSTANT LIBRARY

We hear a lot about how a single CD-ROM can hold a roomful of books. It sounds great, but do you really want your books on a small plastic disc? You wouldn't want your phone book available only on disc; you would have to boot up your computer every time you needed to make a phone call.

On the other hand, you might like an encyclopedia on CD-ROM—you could perform elaborate searches, paste portions of the text directly into your word processor, hear music and speeches, and pay much less for the electronic version than the traditional multi-volume hardcover edition.

The company that's done the most to champion the cause of books on disc is the Bureau of Electronic Publishing (141 New Road, Parsippany, New Jersey 07054; 800-828-4766).

The Bureau not only publishes its own titles but sells other CD-ROMs as well. Its catalog is an excellent short course in the technology of CD-ROM and the many titles that are available in this rapidly changing market.

The Bureau's most recent title under its own name is Great Literature—Personal Li-

brary Series (\$99). It contains over 900 classic literary works: 72 plays (including those of Aeschylus and nearly all of Shakespeare's); 75 essays (including "The Sayings of Confucius" and "The Gettysburg Address"); 31 biographies, journals, and letters (including *Plutarch's Lives* and *The Autobiography of John Stuart Mill*); 461 poems (including *Paradise Lost* and *Rime of the Ancient Mariner*); 199 fictional works (including *Thousand and One Nights*, *Canterbury Tales*, *Divine Comedy*, and *Alice's Adventures in Wonderland*); 32 historical documents (including "The Declaration of Independence" and "The Constitution of the United States"); and more.

It's a treasure trove of well-known and obscure works combined with hundreds of color illustrations, excerpts of period music, and CD-quality readings by television and movie stars. (Where else can you hear George Kennedy read Antony's "Friends, Romans, countrymen . . ." speech?)

The easy-to-use search engine lets you quickly find any word or passage on the disc and organize the index by author, title, or type of literature. It may not all be great literature, and you may miss the fancy leather bindings, but you certainly get your money's worth with this CD-ROM.

You say you don't have time to read the great works of literature? You're more a Monarch Notes type of person? Then you'll be interested in the Bureau's Monarch Notes on CD-ROM (\$99). It contains the full text of the entire collection—over 200 different titles. Use it to help you through that nineteenth-century novel course or to impress your semiliterate friends.

Actually, Monarch Notes on CD-ROM can be a valuable supplement to your reading of the

great works of literature and is a useful companion piece to the Bureau's Great Literature CD-ROM. Like the Literature CD-ROM, Monarch Notes includes pictures and illustrations, as well as selected readings.

For history buffs, the Bureau offers U.S. History on CD-ROM (\$395). It contains the full text of 107 books on U.S. history, including books on Pearl Harbor, the Apollo expeditions to the moon, the Manhattan Project, America's drug habit, U.S. environmental quality, black Americans, and much more. Throw in the Nixon Watergate tapes, Congress's three-volume Iran-Contra Affair report, and 1000 VGA photos, maps, and tables of historical events, and you have enough material to challenge any armchair historian.

If your quest for knowledge leads you toward a more global view, you might take on the Bureau's two world-class titles: *Countries of the World* (\$395) and *World Fact Book* (\$99).

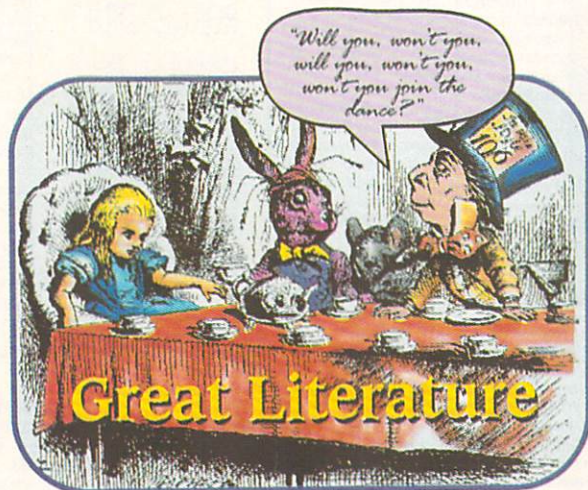
Countries of the World includes 106 different U.S. Army Country Handbooks, each ranging from 200 to 500 pages. The Handbooks are supplemented with information from 151 U.S. embassies and hundreds of color maps.

World Fact Book is produced annually by the CIA for U.S. government officials. Along with the text, it includes selected maps, flags, and national anthems. No, the CIA didn't include its classified information.

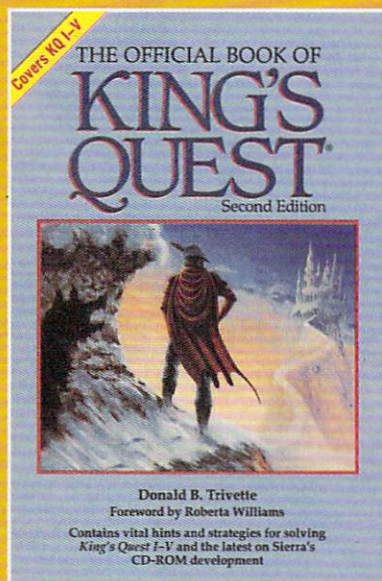
All five of these CD-ROMs run under DOS. While they don't require an MPC, they will run on one. In addition, the same disc works with both PCs and Macs.

If you're looking to build up your reading library but you don't have a lot of shelf space, take a look at these and other CD-ROMs from the Bureau of Electronic Publishing. □

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Personal
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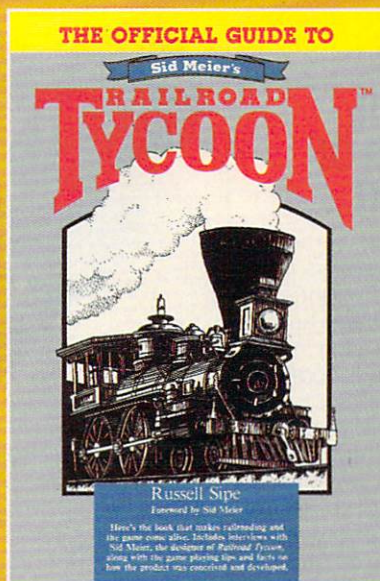


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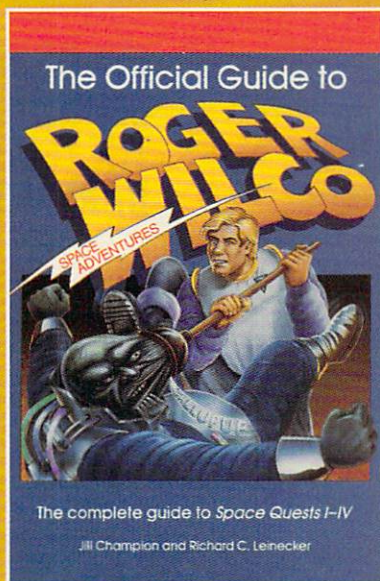
THE OFFICIAL BOOK OF KING'S QUEST, SECOND EDITION

Here's the source for hints, tips, and background for the newest adventure, *King's Quest V*. This new volume includes more clues, maps, and inside details, along with more ways to add even more fun to all five of the best-selling King's Quest games. Covers *King's Quest I - V*.



THE OFFICIAL GUIDE TO SID MEIER'S RAILROAD TYCOON

This is the book that makes railroading and the game come alive. Inside players will find interviews with Sid Meier, the designer of Railroad Tycoon, along with facts on how the product was conceived and developed. Also includes formulas the program uses to determine income and expense.



THE OFFICIAL GUIDE TO ROGER WILCO'S SPACE ADVENTURES

For the first time, Space Questers can learn what goes on in the mind of the most legendary janitor in the universe. Inside, you'll find complete maps for every Space Quest scenario, point values for every reaction, and Roger's walk-through to the finish of all the games. Covers *Space Quest I - IV*.

YES!

I want more hints and tips! Please send me the books checked below.

- The Official Book of King's Quest, Second Edition (2452) \$12.95
 The Official Guide to Roger Wilco's Space Adventures (237) \$14.95
 The Official Guide to Sid Meier's Railroad Tycoon (2443) \$12.95

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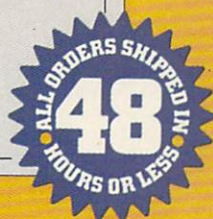
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7H92C



ENTERTAINMENT CHOICE

Sharp graphics and digitized sounds make this game's absorbing story line come to life and captivate you with unsurpassed adventuring.

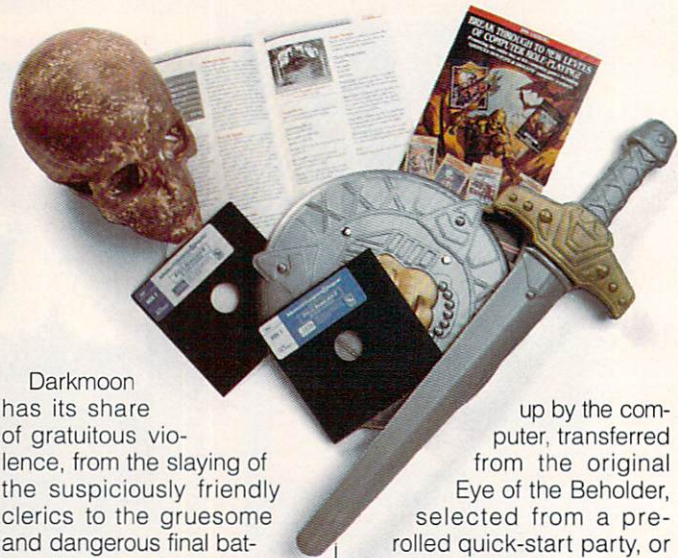
Alfred C. Giovetti

EYE OF THE BEHOLDER II: THE LEGEND OF DARKMOON

You and the other heroes of the battle for the sewers have settled in for your night's repast before the warm hearth of the most inviting inn in Waterdeep when there comes a call for assistance. Soon, you find yourself slogging through the torrential rain with your friends, wincing at the peals of thunder as you approach a dark doorway. A rough-looking, large servant greets you and quickly ushers you into the presence of Khelben, one of the ruling lords of Waterdeep. After being briefed on recent disappearances of important agents and some other strange happenings in the area, you're teleported into the center of an adventure—far from the meal and bed of the inn.

And you're launched into perhaps the best of all first-person adventure games, full of seat-of-the-pants suspense and hair-pulling mystery. Strategic Simulations' Eye of the Beholder II: The Legend of Darkmoon will capture your imagination and hold you prisoner in front of your computer for days—nay, weeks—of entertainment.

Darkmoon is true to the rules, classes, artifacts, and locations contained within the Forgotten Realms Fantasy World, a favorite world in Advanced Dungeons and Dragons. In many ways, one of the most exciting things about this excellent adventure is its faithful portrayal of this popular fantasy world.



Darkmoon has its share of gratuitous violence, from the slaying of the suspiciously friendly clerics to the gruesome and dangerous final battle with the red dragon. Many of the monsters from the first Eye of the Beholder are back to plague the party of four adventurers and as many as two nonplayer characters. There are new, more lethal monsters. Frost giants pummel your entire group with one blow from a massive six-foot fist. Medusas positively rivet those unable to escape their irresistible charms. You're never really sure what will be lurking around the next corner or what will come looking for you out of the distant shadows.

Exploration and mapping are needed to get through the maze, so get out the pencils, rulers, and graph paper, as this game lacks an automapping feature. Some of the puzzles are the find-the-minuscule-button type; others involve knowing the pattern of levers to pull or the floor switches to weight with stones. Solutions range from the obvious to the obscure. Some require the tedious process of kicking all walls to see if they hide a secret wall; others require a basic knowledge of statistical combinations and permutations.

Characters can be rolled

up by the computer, transferred from the original Eye of the Beholder, selected from a pre-rolled quick-start party, or modified to fit the statistics of your favorite character from any computer or paper-and-pencil role-playing game. They're constructed from two genders, six basic attributes, nine types of two-dimensional moral alignment, and six basic professions as provided in the Advanced Dungeons and Dragons second edition. You can—and should—take your favorite characters and weapons into the game.

Darkmoon's interface is little changed from its award-winning predecessor. The first-person perspective uses the upper left portion of the screen. The remainder of the screen is filled by the character display, compass, mouse-activated cursor icons, and message area. The compass is replaced by a Spell menu when a holy symbol or spell book is clicked on. Clicking on a character portrait changes the character display to an equipment or attribute list. Equipment is displayed in paper-doll fashion, so that you actually put "clothes" on the character graphics or place weapons in their hands.

The first-person display

changes little in combat, save for the approach of the antagonist. Played through a Sound Blaster sound card, digitized sounds of metal on metal and grunts of characters punctuate the battle realistically. Combat is carried out in real-time and involves clicking on weapons to strike opponents in a melee, to launch missiles, or to open the Spell menu to select an appropriate combat spell. Arrows, daggers, rocks, and spells can be seen flying through the air toward their intended targets.

If the battle grows too intense, you can back away or turn and run to find a safe place on another level or beyond a stout door that you hope will hold the monsters back. Objects and characters shown in the 3-D-perspective window are represented with a depth and substance that suspend disbelief, giving you a feeling of truly being there.

Click on switches to operate them, on beds to search them, on items in the scene for more precise descriptions of how they feel, or on Dwarven, Elven, or other script for an instant translation from party members who know the language. Exploration is very much like walking down a hallway and picking up objects to examine them. And when you place an object on the floor, it stays there until you return to retrieve it.

Darkmoon's engrossing plot is revealed in a series of character-interaction scenes. In each of these scenes, the dungeon display is replaced by a screenwide graphic of the nonplayer character who's talking or a prominent game feature, such as the temple of Darkmoon.

Characters are awarded ex-

perience for completing quests, finding significant items, solving puzzles, and making the correct choice when given an option. Adventuring players' characters speak right up when they have the skill to notice something important about the immediate surroundings of the party, giving you the feeling that you're part of a group of real people. Characters also speak up if the party is asked to commit an act contrary to their moral alignment with respect to good, evil, chaos, and order, adding more personality to the characters.

Strategic Simulations responded to some of the criticism of the first Eye of the Beholder by adding several new features to Darkmoon. For instance, Darkmoon has six user-definable save-games, which will be needed, since there are several dead-end situations you can encounter in the game. Also, there's a higher level of player interaction and story development that engages you in the conflict.

Player interaction is, however, still somewhat limited. Darkmoon allows for the recruitment of only six nonplayer characters, but they're very interesting and unpredictable, giving character recruitment some bite. And there's only manual combat.

Darkmoon does have a few bugs. Make sure that the party has three glowing orbs prior to passing through the unintentionally one-way crimson ring portal in the crimson tower. Cleric-fighter-mage multi-class characters cause the game to lock up when area-affect spells are thrown at the party. The keyboard control of movement occasionally is unresponsive during a battle,



which caused my party to be killed off several times in the final climactic battle with Dran Draggore. Still, these problems were only a little annoying when compared to the enjoyable gameplay that snuck up and stole 40 hours of time from my life.

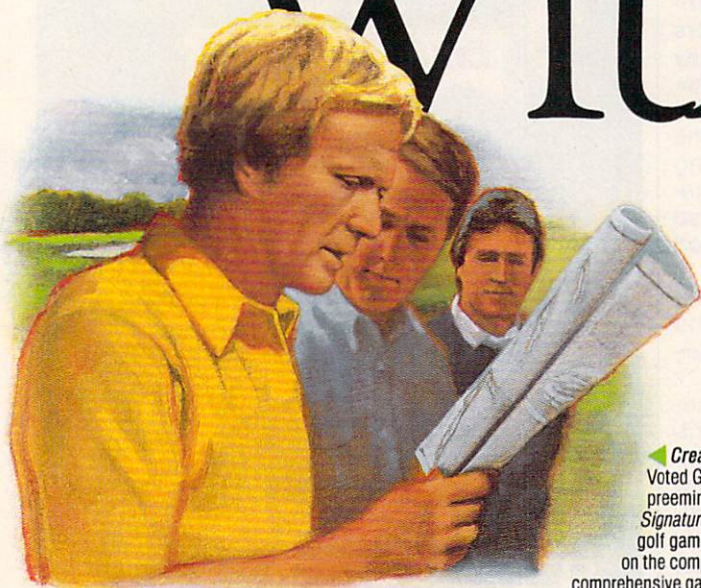
This is one of the best real-time, first-person-perspective games ever produced. The graphics are much sharper and more attractive than those of previous games; when combined with the coordinated digitized sound effects, they pull you into the realtime action. Eye of the Beholder II: The Legend of Darkmoon has a rich story line, improved graphics, spectacular animation, and a satisfying finale. Also, it's a lot of fun to play. □

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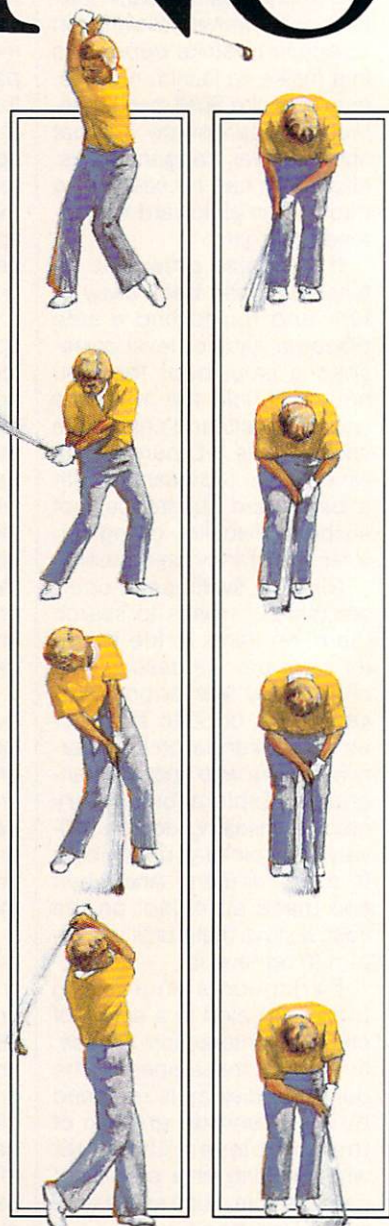
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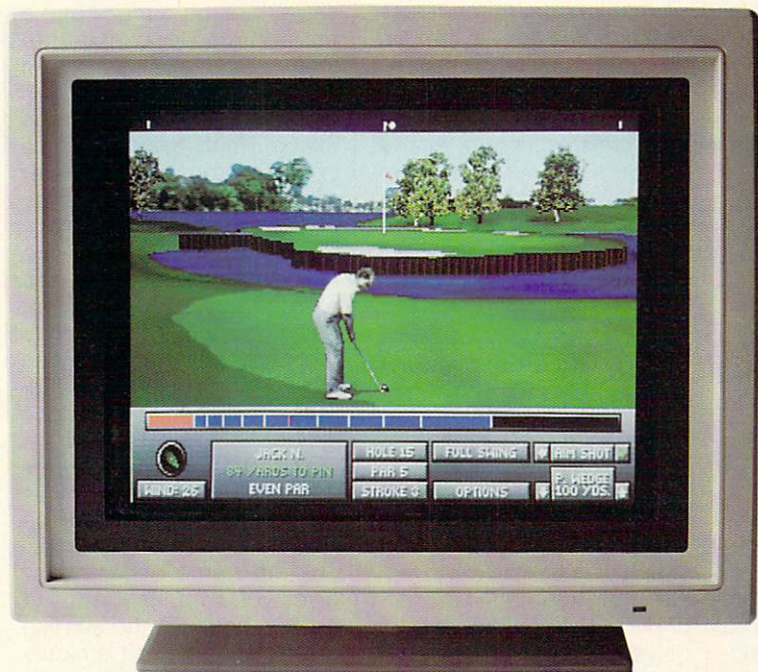


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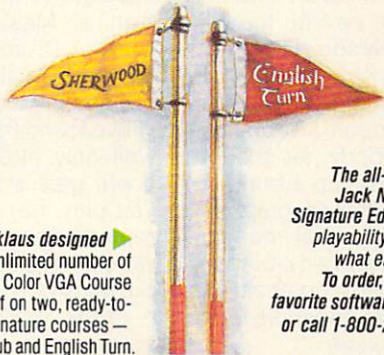


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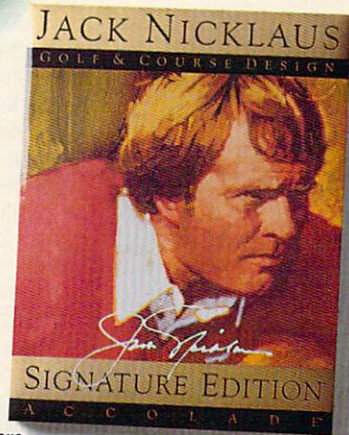
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GAMEPLAY

Orson Scott Card

A DIFFERENT KIND OF GAME

Let's face it—the Windows environment hasn't exactly been a gamer's paradise. It's a matter of s-p-e-e-d—Windows doesn't have any!

Admittedly, on a 486 machine with a graphics coprocessor and 8MB of RAM, Windows can run any game fast enough for fun. But even on this Mother of All Machines, which we use for all the serious applications (like typesetting and playing Mon-

nancially successful, because Microsoft has come back with the sequels: Windows Entertainment Pack Two and Windows Entertainment Pack Three (WEP2 and WEP3). Furthermore, Symantec has joined in with the Symantec Game Pack, which has the same concept but brings to the form a style of its own.

I can safely say that no games have ever been played by so many people for so many hours in my house. Part of the reason is the Windows environment itself. That friendly tabletop has a warm, familiar sense of clutter that reminds everybody of sitting around the kitchen table.

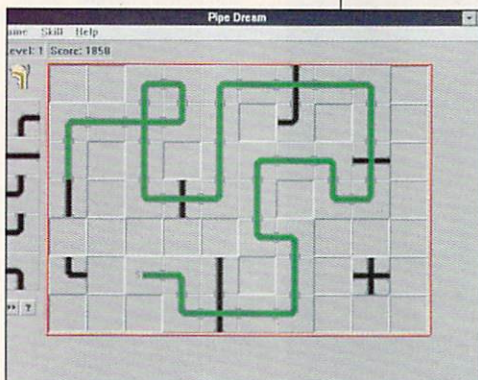
You get a window full of great games, and most importantly, the games themselves are like Windows—very friendly, simple to use, kind of

squares. The Symantec set includes enjoyable versions of Jacks and Pickup Sticks, both of which will give your mouse a serious workout.

The Microsoft packs have the usual mix of solitaire card games and tile puzzles, a licensed version of Pipe Dream, and even some simple action games—golf, skiing, and some arcade-style games like the one where you maneuver an ever-growing snake through a maze and a cat-and-mouse chase-and-strategy game. Every one of them is fun, and some of them are brilliant. FreeCell, for example, is simply the best single solitaire game I've ever played. It would be a pain to play with real cards, but the programmers have made the card handling smooth and easy. These entertainment packages prove that there's room in the world for games that don't give you frantic deadlines and that don't take place in a kill-or-be-killed world.

Oh, there are problems here and there. Most of us have pretty much given up on Pipe Dream; at the higher levels, the game occasionally gives you screens that can't be won because the starting or finishing pipe unit is blocked by an immovable obstacle. And the word game WordZap (kind of a high-tech Boggle) is marred by a second-rate dictionary: It refuses to allow three- and four-letter words that every Scrabble player knows. It's frustrating to lose to the computer because it doesn't know that *fey* and *fay* are words, for instance. Nothing is perfect, but I want to emphasize that the glitches here are few and far between. Until you can lay your hands on a fast 486 with a graphics accelerator to make Windows handle real animation, these games are worth opening the window to see. □

Simplicity and fun are the watchwords for the early crop of Windows games from Microsoft and Symantec.



key Island 2), it still takes a noticeable amount of time to redraw the screen and shift from one view to another. And that's deadly for action and story games.

But that doesn't mean there can't be good games for Windows. They just have to be games of a different kind. Microsoft itself pointed the way with the first Windows Entertainment Pack (WEP). The concept was simple and obvious. (All good ideas are obvious once somebody has thought of them.) Develop a bunch of small games that are graphically simple or that can be played in a slow environment, package them together, and sell the whole caboodle for an irresistible price.

The first Windows Entertainment Pack must have been fi-

fun just to hang around with. The Symantec games, in fact, are downright familiar, since they're the games we all played as school kids. For instance, there's a pretty good Hangman (you can select categories like states or cities or computer companies), and there's also an excellent version of Mastermind called Code Breaker. Memory Blocks is an attractive version of Concentration. My wife and I have found that you can play well only once a day. Your score gets worse every time you play, because you keep remembering where objects were in the games you played previously.

In the familiar Smart Dots, you first draw rows and columns of dots and then try to combine them to make

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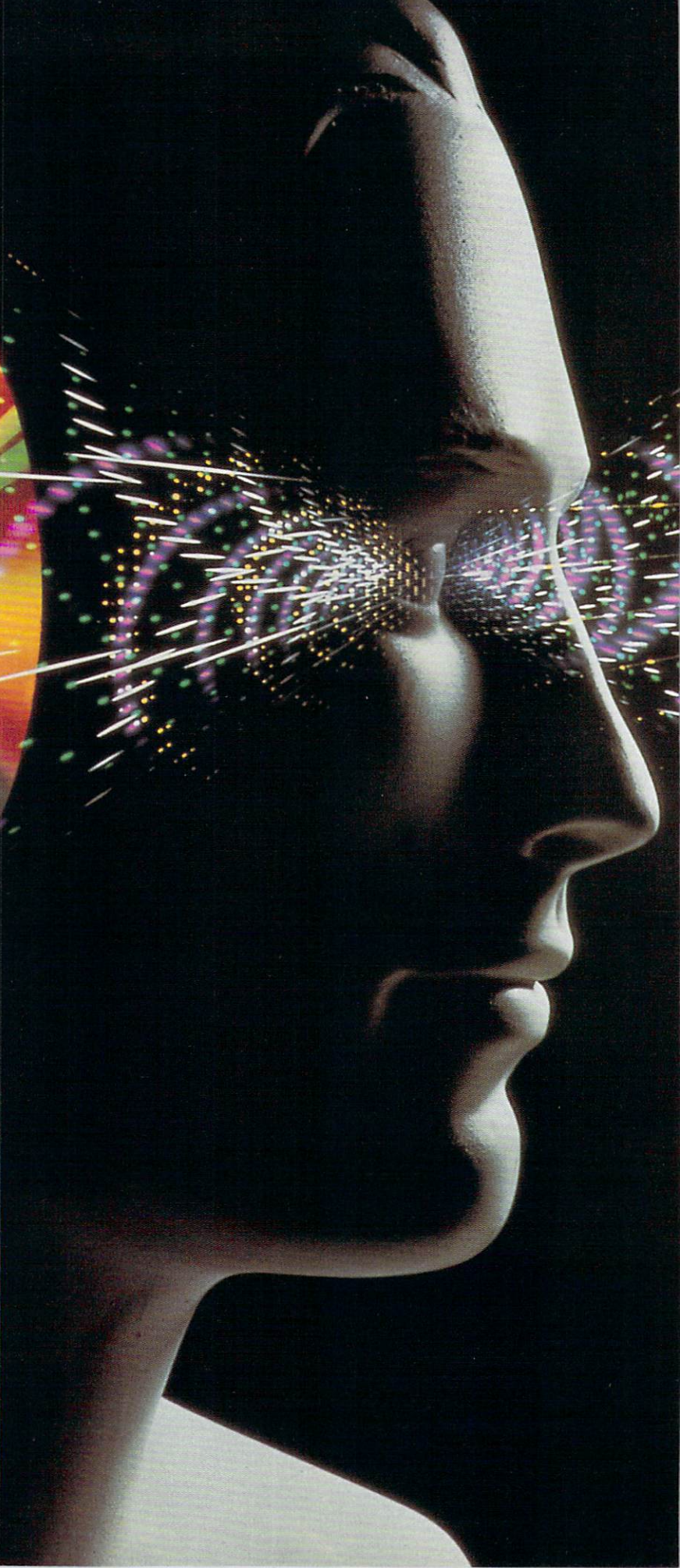
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Get Ready For Multimedia

ARTICLE
BY GREGG KEIZER

WHAT IS THIS THING CALLED
MULTIMEDIA?
AND WHAT WILL IT DO FOR
ENTERTAINMENT?



Multimedia gets tossed around like a chip of ice in the North Atlantic, bandied about by PR drones who know it only as a hot button that's supposed to make entertainment-software consumers salivate. But don't be intimidated: you already know multimedia.

If you're playing PC games that have been produced in the last couple of years, they're probably full of multimedia: still images, animated graphics, sound effects, sweeping musical scores, even human-sounding speech. When you use *multimedia* as an adjective today, though, you mean all that and a little more. The term refers to an integrated presentation that includes massive numbers of images, herky-jerky video clips, soar-

ing stereophonic music, and plenty of digitized speech. More often than not, the presentation comes on a compact disc, not a floppy.

In fact, MPC (Multimedia Personal Computer), the single established multimedia hardware/software standard, relies on the compact disc, among other requirements. So while *multimedia* may be a burning buzzword, it's really nothing more than another step down the same entertainment road you've been traveling all along.

Still, you're probably not prepared for the multimedia game titles that will straggle onto the shelves this year. To keep up with the technological times, you need to beef up your home PC. Assuming you have a 386SX or 386 equipped with 2MB-

4MB of RAM, VGA or Super VGA, and a hard disk in the 40MB-80MB range, you'll spend \$600-\$1,200 to make it multimedia-ready.

The most expensive add-on is a CD-ROM drive. Multimedia of all kinds, games included, needs the storage space that only a compact disc—with more than 600MB—provides.

Once priced at stratospheric levels, CD-ROM drives now are much more affordable. One of the lowest-priced is Tandy's CDR-1000, a \$400 internal drive that's fairly easy to install yourself. An external drive is a possibility, too, if your PC doesn't have an empty drive bay or if you don't mind losing a bit of desktop real estate. A good choice here is the Sony Laser Library, a drive-and-software combination that features an external Sony CD-ROM drive and six CD-ROM titles; the Laser Library typically costs around \$600.

As you look for a CD-ROM drive, remember that many (but not all) of 1992's multimedia entertainment programs will sport the MPC logo. Only MPC-compatible drives are guaranteed to play MPC-labeled software. The Tandy CDR-1000 meets MPC specs, for example, while the Sony CDU-535 included in the Laser Library doesn't (though the Sony CDU-541 internal drive *is* MPC-ready).

An MPC CD-ROM drive will run MPC and non-MPC multimedia CD titles, while a non-MPC CD-ROM drive restricts you to DOS multimedia CDs. While the future of MPC isn't guaranteed, Microsoft's interest and backing can't be ignored. Whether MPC succeeds or fails is a matter that will be decided by PC users as a whole, but by sticking with MPC-compatible components, you're covering all bets. If MPC takes off, you're ready. If it doesn't, your PC will still be able to run DOS CD multimedia titles.

Final verdict? The smart move is to get an MPC-compatible CD-ROM drive for your computer.

Sound On!

Your second major multimedia addition is a sound card. Something has to pump out the stereo sound effects, musical scores, and voice-overs.

If your PC sounds off with an Ad Lib audio board, one of the two de facto standards in PC audio, yank it out. It just can't carry the tunes and speech that developers are cramming on compact disc-based multimedia games. If your system includes a Sound Blaster board, the other current standard, you're safe—for now.

What if you haven't made the move to audio or you settled for a pre-Gold Ad Lib? Then you can choose from a va-

riety of audio cards, including Sound Blaster Pro, Ad Lib Gold 1000, and the new 16-bit Media Vision Pro AudioSpectrum and Ad Lib Gold 2000 boards.

All are more expensive than previous-generation cards, but as a rule, they are easier to install, they sound better, and they include more features. All four meet MPC specifications, in that they're capable of producing digitized speech and can be connected to MIDI equipment (the latter's for creating multimedia presentations of your own, not for gameplay).

Only two of these boards offer 16-bit sound: the Media Vision and the Ad Lib Gold 2000 cards. You can't get 16-bit sound from any of the current upgrade kits. The next jump in PC audio will be 16-bit sound, so while all the cards satisfy current multimedia needs, only two are ready for the future of multimedia. The others will do for the next couple of years, though, as publishers stretch to take advantage of their features. Keep this in mind as you decide how much to spend for sound on your multimedia system.

One thing you can safely buy is a pair of self-amplified speakers to put beside your PC. Headphones handle multimedia sound, of course—every audio

board includes a headphone jack—but you'll find the experience much more comfortable and natural when the roar of dragons and the wail of the wounded come out of larger speakers. After all, you don't watch television with headphones on, do you?

Self-amplified speakers—some made expressly for PCs, some not—are available from a variety of sources. Both Radio Shack and Bose market excellent powered speaker systems.

Put Card A in Slot B

The quickest way to move up to multimedia entertainment is with an upgrade kit. Several companies sell these all-in-one collections of CD-ROM drive, interface card, audio board, connecting cables, and Microsoft Windows 3.1 with multimedia functionality. All you add is your home PC.

The adventurous will strike out on their own and patch together a multimedia game-playing machine by grabbing a CD-ROM drive here and a sound card there. That much work isn't worth it for most. Nor is it a big money saver.

The fact is that a package like Media Vision's Multimedia PC Upgrade Kit is hard to turn down. Although it lists at nearly \$1,000, most mail-order dealers

PRODUCT INFORMATION

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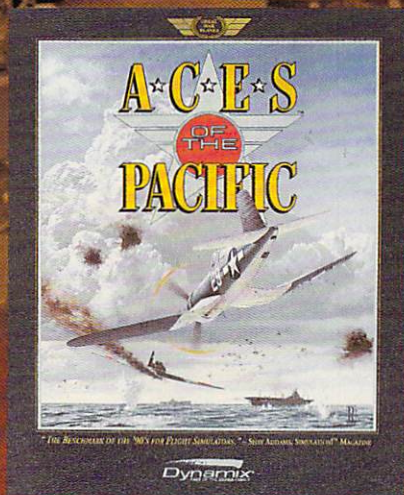


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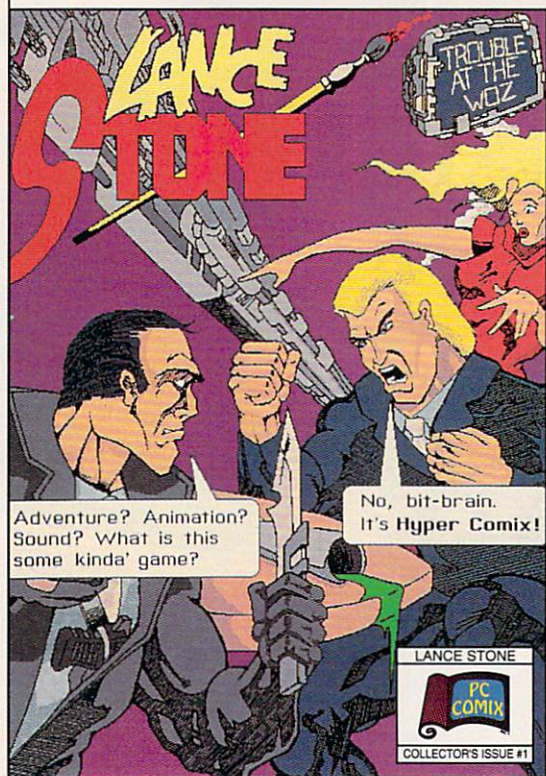
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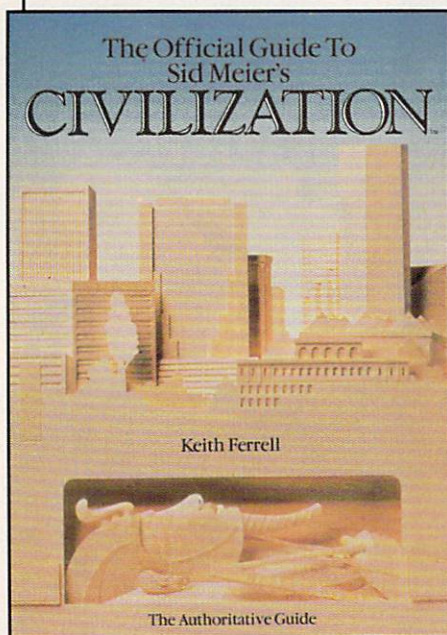
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sell it for around \$750. Included in the Upgrade Kit are a Sony CDU-541 external CD-ROM drive, a Pro AudioSpectrum sound card that doubles as the SCSI interface card, Windows with Multimedia Extensions, and two CD titles. Fill an empty slot with the Pro AudioSpectrum and an empty drive bay with the CDU-541, and inside an hour, your PC's ready to play CD games.

Other companies promise similar feats of computer transformation. CompuAdd, Creative Labs (Sound Blaster), Tandy, and Video Seven are four more sources for multimedia upgrade kits. Each relies on its own pairing of sound board and CD-ROM drive, but in the end, any one of them makes your PC a multimedia game machine.

That's a Lot of Quarters, Pal

For all the ease with which you can turn your current PC into a multimedia game player, though, the biggest question still hasn't been asked.

Is the price you pay for the move to multimedia worth it? After all, that much money translates into 15-20 top-priced PC games or a lot of quarters down at the mall arcade.

Whether the price is a bargain depends on how badly you want to lead the charge into multimedia games.

It's unlikely that you'll see more than a couple of dozen CD and/or MPC games through the end of 1992. A scant few have made it out developers' doors so far—*BattleChess*, *Where in the World is Carmen Sandiego?*, and *King's Quest V*, for starters—and the trickle won't turn into a flood anytime soon. And PCs won't even be the only place you can play CD games. Video-game decks from Sega and Nintendo will get CD capability either late this year or early next.

On the positive side, remember that a multimedia computer can do more than play games. It'll run *any* CD title, whether a reference work for the home office or an educational disc for the kids. And it'll keep working hard with word processors, page-layout software, spreadsheets, and databases.

The bottom line for multimedia entertainment is fuzzy. If you want to stay state-of-the-art and can't bear to miss even the beginning of the most amazing home entertainment since VGA color met PC games, go multimedia now. If you can bide your time, do so; when an irresistible game comes along, you can upgrade quickly and easily.

Clearly, computers are headed for a more integrated way of dealing with sound, speech, and moving images. Whether that trend makes its way into your house depends on how important games are to you and your family. □

64/128 VIEW

Mad Man Software is a new company with a new adventure game for the 64. Its average playing time is between 200 and 400 hours.

Tom Netsel

The rat looked as big as a Volkswagen, and it was charging straight at our hero. Outrunning such a creature was impossible. His only chance was to stand and fight, a pitifully small sword his only weapon. He drew it and took a swing at the rampaging rodent. Would the rat engulf him, or would his puny blow strike home?

As we held our breaths awaiting the outcome, it took a minute before we realized that nothing had happened. The rat was still there, our hero was still there, but the screen had frozen. Our first encounter with the game's first monster, and the program locked up. This was one of those embarrassing moments that can occur when a software representative demonstrates his company's latest product.

Reboot. Try again. Same thing. Groan! I was feeling sorry for Gene Barker. He's a recent graduate from the Colorado School of Mines who'd flown to North Carolina from Colorado to show the Gazette staff Messiah III: Nemesis, an adventure game for the 64 that he's been developing for almost six years. Now, when the game's lead character aims his first blow at the very first monster, years of programming grind to a halt.

Wait a minute! This 128 has a defective SID chip, and the program relies on one of the computer's voices to generate random numbers to help decide a battle's outcome. The program's in a loop, waiting for a random number to appear, and that chip is as silent as Harpo Marx! We

could be here until Godzilla comes home. Let's go down the hall and try another machine.

As I said, when someone comes all this way to demonstrate a major new release for the 64, you want things to go well. After all, there's not exactly a flood of new titles sweeping that market these days. In fact, it would take a madman to start a new company aimed at developing software for that veteran market. And that's just what Barker and ten associates have done. Their company is called Mad Man Software (7610 West 5th Avenue, Suite 200, Lakewood, Colorado). For the past year, they've been polishing Barker's game, and Messiah III should be ready by this fall or Christmas.

Messiah III is no lightweight arcade adventure, as we saw when we ran it on another machine. We were treated to a richly detailed adventure game that's the first of a six-game saga. Messiah III, which should sell for around \$60, consists of more than one megabyte of code. That's six disk sides. Disk access times have been reduced, however, so that the longest load should take no more than 12 seconds.

While we await the final version for review, Barker estimates the average playing time will take between 200 and 400 hours. When many new games are measured in megabytes, Barker doesn't feel the 64's memory constraints have placed limits on his creativity. "It's the game's design which dictates its power," he says, "not the machine." □

GAZETTE

64/128 VIEW

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Anybody who'd start a new company based on a new adventure game for the 64 must be a madman, but that's just what Gene Barker and friends have done. By Tom Netsel.

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Questions and answers about time, word processors, modems, programming languages, and MIDI

INPUT Time

Is there a way to change the value of TI\$ by using an INPUT statement from within a BASIC program?

KARL ROSEMAN
DENVER, CO

Try the following line in your program. It should do the trick nicely.

10 INPUT "NEW TIME"; TI\$

When the program runs and you see the INPUT prompt, enter your response with six digits in an HHMMSS format. HH equals hours, MM equals minutes, and SS equals seconds. For example, 123456 will set TI\$ to read 12:34:56. If you enter more or fewer digits, you'll get an ILLEGAL QUANTITY message. If the number is greater than 23:59:59, the clock resets to 00:00:00.

Bug-Swatter

The ending address of File Lord (May 1992) is incorrect. The correct address is 14C0. This affects MLX only and not the File Lord program. We prepared the listing after the documentation, and it was then that we noticed how long the program was. To make it easier to type in, we compressed the program with Mega-Squeeze but neglected to change the ending address.

The compression program may have affected the way the program starts. If you type RUN and get a READY message, simply type RUN again, and File Lord should start. The program on Gazette Disk wasn't affected.

80-Column Word Processor

Is there a word processor for the 64 that has a true 80-column screen? I am looking for one that's like the 128 or IBM, not a 40-column screen such as GEOS, which scrolls to reveal 80 columns. I am not look-

ing for one that simply has a preview screen either. Is there one that exists with this feature?

JON PERSINGER
INDIANAPOLIS, IN

You might try Script 64, published by Richvale Telecommunications of Canada. To the best of my knowledge, however, that company is no longer in business. You might locate a used copy of the program for about \$9 at Bare Bones Software, 940 4th Avenue, Suite 222, Huntington, West Virginia 25701, (800) 638-1123. Call or write for a free catalogue of used 64 and 128 software. They also carry Amiga products. Supplies are limited, so check with the company before ordering.

Modem Woes

I have a 64 with an Arotek 12C modem used as a Volks 6480. I would like to play modem games with a friend, but I need the originate and answer codes that will correspond with my friend's Commodore 1670 modem. I can't find this information in the manual. Can you supply me with these codes?

MARTIN BOUTIN
LONGUEUIL, PQ
CANADA

Your modem, which can be used as a Volks 6480, is no longer in production, but you should have no problem using it to connect with your friend. It requires no special originate or answer codes or settings. It's Hayes compatible in that it supports automatic answering (ATA) and automatic dialing (ATDT) commands, just as your friend's 1670 does. You should be able to contact each other just as easily as you can connect with a local BBS.

Check the terminal or game software you're using

for requirements specific to that program. It may require manual dialing or answering. Also check the echo or duplex modes to make sure you both can see what each of you is typing. If you still think the modem is at fault, call Arotek's service department at (503) 582-2118 from 8:00 a.m. to 4:30 p.m. Pacific time on weekdays.

Pascal Wanted

I am currently taking a course in Pascal at high school, using Turbo Pascal on a Macintosh. I have a 64 at home, and I would like to use Pascal with it. Is there such a compiler and where can I obtain it?

MIKE SMITH
CRYSTAL, MN

Contact Abacus, 5370 52nd Street SE, Grand Rapids, Michigan; (800) 451-4319, and ask about Super Pascal 64 (\$19.95). It implements the full Jensen & Wirth compiler plus extensions for graphics. It has a complete source file editor, a full assembler, and a utility package.

MIDI Info

I am interested in music and would like to get into MIDI. Is there a MIDI system available for the 64?

EDNA WILLIAMS
BRIDGEPORT, CT

Contact Dr. T's Music Software, 100 Crescent Road, Needham, Massachusetts 02194; (617) 455-1454, and ask for its free catalog of MIDI hardware and software. Dr. T offers a 64 MIDI starter pack that includes its Keyboard Controlled Sequencer, a MIDI interface, and two MIDI cables for \$180. A version for the 128 retails for \$275. You'll have to supply your own MIDI keyboard or other MIDI instrument. □

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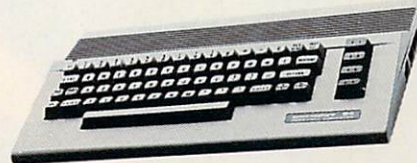
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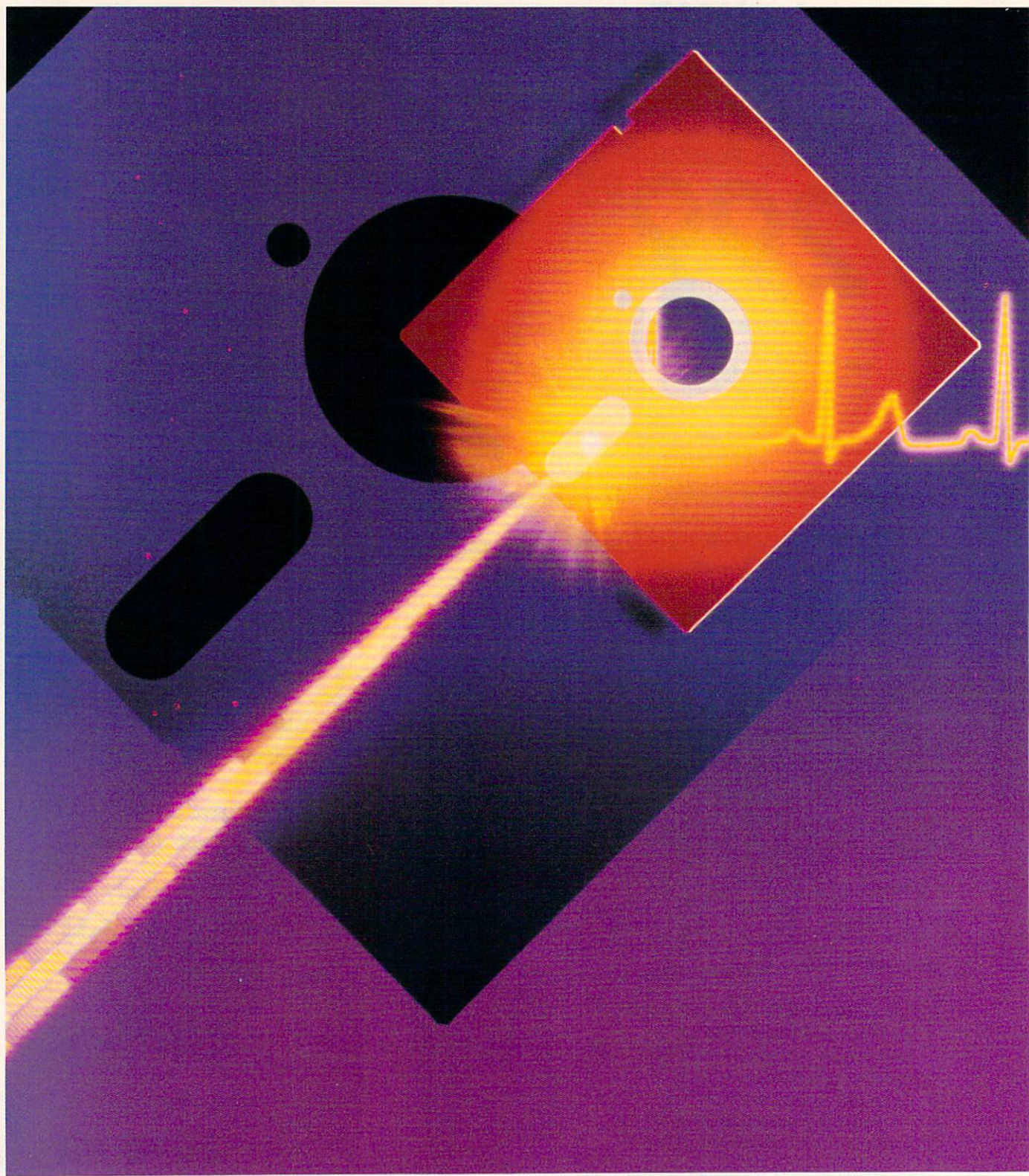
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FOR GREATER STORAGE CAPACITY IN A
SMALLER PACKAGE, THE 1581 IS
THE BIG DRIVE IN THE LITTLE BEIGE BOX.

BY GEORGE GUNN

The 1581 drive is a great piece of hardware for anyone who owns a 64 or 128, and it's also compatible with Plus/4, Commodore 16, and VIC 20. The 1581 is smaller than either the 1541 or 1571, yet it stores much more data on its disks. The 1581's 3½-inch disk holds nearly a megabyte of information (808,960 bytes). After formatting, 3,160 blocks are available to the user, with 40 blocks reserved for the disk's main directory. On a 1541, this would be equivalent to 4¼ floppies, each with 664 available blocks!

Having all this space makes it possible to store a huge number of files on one disk, but the directory scrolls off the screen if you have more than 22 files. This can make file management particularly difficult.

For this reason, the 1581 has a feature known as partitions. A partition is a space on a disk which the user sets aside for special use. For all intents and purposes, each partition is seen by the computer as a separate disk. Within the limits of certain parameters, you can create numerous partitions on each disk, with each partition containing whatever files you wish. Each partition can also have its own directory. You can even store files with the same filename on the same disk, because the computer thinks each partition is a separate disk drive.

Logical Disk Organization

When creating partitions, it's helpful to remember the 1581's logical disk organization. Although each 1581 disk is double-sided, the computer sees it as single-sided, with 80 tracks per disk (numbered 1-80) and 40 sectors (or blocks) per track (numbered 0-39).

It might be helpful to think of a formatted disk as consisting of a series of concentric circles. Each circle is a track, and each track is divided into several sectors.

Each partition must consist of one or more complete tracks; thus, a partition must be a multiple of 40 sectors in length and must begin on sector 0 of a given track. Remember that track 40 is reserved for the disk's main directory, so tracks 1-39 are available for partitioning, as are tracks 41-80. A partition may not include or pass over track 40.

Creating Partitions

The commands for creating partitions described in the 1581 user's guide are unwieldy and difficult to understand. Of greater help is the Partition Aid program on the demo disk that's supplied with the drive. Through a series of screens and prompts, this program asks for the partition name, beginning

track and sector, and total number of blocks you want in the partition. Suppose you want to create a partition called Arcade Games and set aside 600 blocks for it. After loading and running Partition Aid on the demo disk, you'd be presented with a screen that lists the following options.

1. SHOW PARTITIONS
2. CREATE PARTITIONS
3. DIRECTORY
4. CHANGE UNIT
5. QUIT

Since we don't have any partitions at this time, you'd skip the first choice. Choosing option 2 would take you to the next screen called Create a Partition. Here you'd see the following instructions on your screen.

MODIFYING SPEEDSCRIPT

Most people set their 1541 or 1571 as drive 8 and designate the 1581 as drive 9. If you use SpeedScript, which normally uses drive 8, there was formerly no easy way to save your files to drive 9 and use the 1581 as the data storage device.

Now there's a way to alter the program to access drive 9 instead. This will let you load SpeedScript from a 1541 or 1571 and save data to the 1581. Of course, since SpeedScript is fairly small, you can save this modified version to the 1581 and direct all of its disk commands to drive 9. To accomplish this, load a copy of SpeedScript into memory, but don't run it. Then enter the following two lines below in immediate mode.

```
POKE 4843,9: POKE 4908,9: POKE 5274,9:  
POKE 5873,9: POKE 5967,9  
POKE 6367,9: POKE 6883,9: POKE 7003,9:  
POKE 7073,9
```

Then save the modified program to disk using a unique filename, such as SPEEDSCRIPT9. All disk commands will now access device number 9. You won't be able to switch at will between drive 8 and drive 9 from within SpeedScript, but you can choose to work from whichever version of SpeedScript you wish. If you try to alter such a program, however, be sure you don't alter your only copy of it. Make a backup copy first.

Of course, you must set the switches on the back of your 1581 to the proper combination. If both of your drives are set to the same device number, your system will lock up.

To set the drive number, turn off your 1581's power and look at the drive from the rear. To set it for drive 8, push both switches to the up position. To set it for drive 9, pull the left switch down and push the right switch up. To set the 1581 to drive 10, set the left switch up and the right one down. Pull both switches to the down position to set it for drive 11.

TO CREATE A SUBDIRECTORY YOUR PARTITION MUST

- (1) START ON SECTOR 0
- (2) BE AT LEAST 120 BLOCKS
- (3) BE A MULTIPLE OF 40 BLOCKS

At the prompt *Enter a partition name*, you would enter *Arcade games*.

Next, you're prompted for the beginning track. Since track 40 is reserved for the disk's directory, it may not be used. The partition may begin on any other track on the disk. This prompt appears onscreen as follows.

FIRST TRACK (1-39 or 41-80)
?

We'll begin this partition on the first track of the disk, so we should enter the number 1. Next, you're prompted for the first sector.

FIRST SECTOR (0-39)
?

For practically all purposes this would be 0, so enter 0 at the prompt.

Finally, you're prompted for the number of blocks you want in the partition. This must be a minimum of 120 and a multiple of 40.

NUMBER OF BLOCKS IN PARTITION
?

We're making a partition of 600 blocks (which, by the way, covers 15 tracks since $600/40=15$), so at this prompt we enter the number 600.

After this last prompt, all the necessary information has been gathered, and we're taken to a third screen, bearing the title *Create a Partition*. At the top of the screen we see the following message.

CREATING PARTITION: ARCADE
GAMES STATUS: 0 OK 0 0

Next, we're asked if we want to make a subdirectory for this partition. For most uses, you'll need a subdirectory, so at the prompt type *Yes*.

This brings up another prompt asking for a directory name. Here you should type the Partition Name *Arcade games*.

Finally we are prompted for the familiar two-character alphanumeric ID, well known to users of CBM BASIC. Let's number this partition 01.

From this prompt, the drive checks its status and tells us to press a key to continue.

We're then returned to the opening screen, where we may exit by pressing number 5. At this point we have placed a partition of 600 blocks on

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tracks 1 through 15 of the disk. The first track of this partition will be reserved for the partition's own directory. On the disk's main (root) directory, the partition will show up as the following.

600 "ARCADE GAMES" CBM

Partition from BASIC

The series of prompts in this program makes the process very easy. Of course, you can create partitions from BASIC if you can decipher the following code given in the user's manual.

```
PRINT#file#,"/0:partition name,"+
CHR$(starting track)+ CHR$(starting sector)+
CHR$( < # of sectors)+ CHR$( > # of sectors)+
",C"
```

Especially confusing are the expressions < # of sectors and > # of sectors. Evidently a misprint in the book has placed these two expressions in reverse order. After much experimentation, I've found that they essentially refer to the range of sectors contained in the partition. The expression < # of sectors should refer to the high number of this range (600 in our example above), and > # of sectors should refer to the bottom of this range (0 in our example). However, since a CHR\$ value may fall only within the range of 0-254, any partitions of more than 254 sectors have to use an adjusted value.

The > and < signs actually refer to the high byte and low byte for a given expression. There's a way to calculate values for partitions greater than 254 sectors. If N equals the number of sectors for a partition, the high byte would be represented by INT(N/256). The low byte would be represented by N-(low byte)*256. Thus, for our partition of 600, the high byte is INT(600/256) = 2. The low byte is 600-2*256 = 88. So, to create our partition of 600 blocks, we'd issue the following commands.

```
OPEN 15,8,15
PRINT#15,"/0:ARCADE GAMES,"+ CHR$(1)+
CHR$(0)+ CHR$(88)+ CHR$(2)+ ",C"
```

CHR\$(1) refers to the starting track of 1. CHR\$(0) refers to the partition's beginning sector in track 1. CHR\$(88) refers to the 600 block partition's low byte. CHR\$(2) refers to the 600 block partition's high byte.

Another Format

At this point the required blocks have been set aside as a partition, but the partition can't be used yet. It has to be formatted before you can store files in it even though the disk itself has already been formatted. This creates a partition directory (or subdirectory) on

the first track of the partition. So, with the disk still in the drive, the new partition is selected by the following line.

```
PRINT#15,"/0:ARCADE GAMES"
```

Then the NEW or HEADER commands are used to format this partition area. Enter the following line.

```
PRINT#15,"NO:ARCADE GAMES,01":
CLOSE15
```

CARTRIDGES

In addition to holding more information, the 1581 loads programs significantly faster than the 1541 or 1571. Because of a slightly different DOS than that used in a 1541, the 1581 isn't compatible with some fast load cartridges. I use the Epyx Fast Load Cartridge with my 1541, but it has to be disabled before I use the 1581. There are a couple of fast load programs for the 1581, and these work quite well.

Recently, I bought a Super Snapshot cartridge, after reading that it was compatible with the 1581 drive. After using it for a while, I'm very impressed with the performance of this cartridge. Most of its features work quite well with the 1581. The only shortcoming I've found is that its file utility isn't able to scratch a file from within a partition.

The partition is now ready to be used. We've done in BASIC what the Partition Aid program did for us through a series of easy-to-understand prompts. Files in the partition may now be written to, read from, scratched, re-named, and so on.

If you're interested in constructing your partitions from BASIC rather than using Partition Aid, the following table may prove useful. Consult it for a list of the high byte and low byte values of the given numbers of sectors.

No. of Sectors	High Byte	Low Byte
120	120	0
160	160	0
200	200	0
240	240	0
280	24	1
320	64	1
360	104	1
400	144	1
440	184	1
480	224	1
520	8	2
560	48	2
600	88	2
640	128	2
680	168	2
720	208	2
760	248	2

Partition Management

Now that you have partitions on your disk, how do you make practical use of them? One of the more useful purposes for partitions is grouping similar files. For example, on my SpeedScript word processing disk, I've set up one partition for the word processor itself. I have SpeedScript's accompanying programs and utilities (mail merge, 80-column preview, right margin justified, columns, and so on) in a partition located at tracks 1-8 (320 blocks). In addition, I have made three other partitions out of tracks 9-39 for holding document files. I call these DOCUMENTS1 (tracks 9-19), DOCUMENTS2 (tracks 20-29), and DOCUMENTS3 (tracks 30-39).

In each partition, the first track is reserved for a directory of that partition; the rest of the tracks are available for files. This partition directory doesn't show up when the disk's main (or root) directory is listed. After the partition has been selected, the computer treats that partition as if it were a disk in itself, and its own directory may be listed. On the disk's main directory, partition names are listed like other files, but the three-letter code (PRG,USR,SEQ) for a partition is CBM. Thus, on the word processor disk I described above, the disk's main directory looks like the following.

```
320 "SPEEDSCRIPT"      CBM
400 "DOCUMENTS1"      CBM
360 "DOCUMENTS2"      CBM
360 "DOCUMENTS3"      CBM
5 "CHANGE UNIT"       PRG
51 "1581 FAST LOADER" PRG
1 "1581 PATH"         PRG
12 "COPY 81"          PRG
1651 BLOCKS FREE
```

The first four items are my partitions, the next four items are utilities I commonly use with the 1581 drive that are stored on the unpartitioned part of the disk, and the last item lists the blocks still available.

Partition Selection

Once the disk is inserted in the drive, a partition can be selected from BASIC. The syntax for selecting a partition follows.

```
OPEN 15,8,15,"/0:partition name"
```

Of course, if you're using the 1581 as device 9, you should substitute the number 9 for the 8 in this statement. Once the partition has been selected, you simply work with it as if it were a separate disk of its own, loading, saving, verifying, validating, and so on. All of these commands affect only the selected par-

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tion, not the rest of the disk.

With the 64, all of the familiar BASIC 2 commands, NEW, COPY, RENAME, SCRATCH, INITIALIZE, and VALIDATE, which work with the 1541 drive, work with the 1581. If you have a 128, use the BASIC 7.0 commands as with the 1571. A partition's directory may also be listed from within the partition with the standard LOAD "\$",8: LIST.

Rather than using BASIC, I prefer using 1581 Path, a short machine language program that appeared in the June 1990 Gazette. This one-block program offers a simplified syntax for selecting partitions, loading programs, and moving between partitions.

From within your word processor, it's usually quite easy to move from partition to partition. Most word processors have a command for accessing the disk drive. In SpeedScript, the keypress sequence is Ctrl-Å. After pressing these keys you simply type /*partition name* and hit Return. If you need to go to the disk's main directory, enter Ctrl-Å, simply type /, and press Return. This should result in the message 02, *partition selected*.

Using Different Device Numbers

A potential software problem involves programs that routinely access drive 8. If you're using the 1581 as drive 9,

you'll encounter problems. If you're familiar with machine language monitors or disk sector editors, you may be able to modify such programs to work from drive 9. Most programs use the following six-byte combination to open a disk file.

A9 02 A2 08 A0 02

These bytes are the same as the BASIC command OPEN 2,8,2. To access other drives in BASIC, substitute the new drive number instead of using 8. The most recently accessed drive number is stored in memory location 186.

In machine language, therefore, you'd change the *A2 08* to *A2 BA* so the program would load its files from the drive from which you booted it.

Utilities for the 1581

In addition to 1581 Path, which I've already mentioned, the utilities that come on the demo disk supplied with the 1581 are very good. Also, I have found several Gazette programs worthwhile additions to my 1581 library.

Check out 1581 FastLoader (January 1990). This program provides high-speed data transfers that are up to nine times faster than the standard Kernal load routine. It works with both the 64 and 128 and allows you to relocate

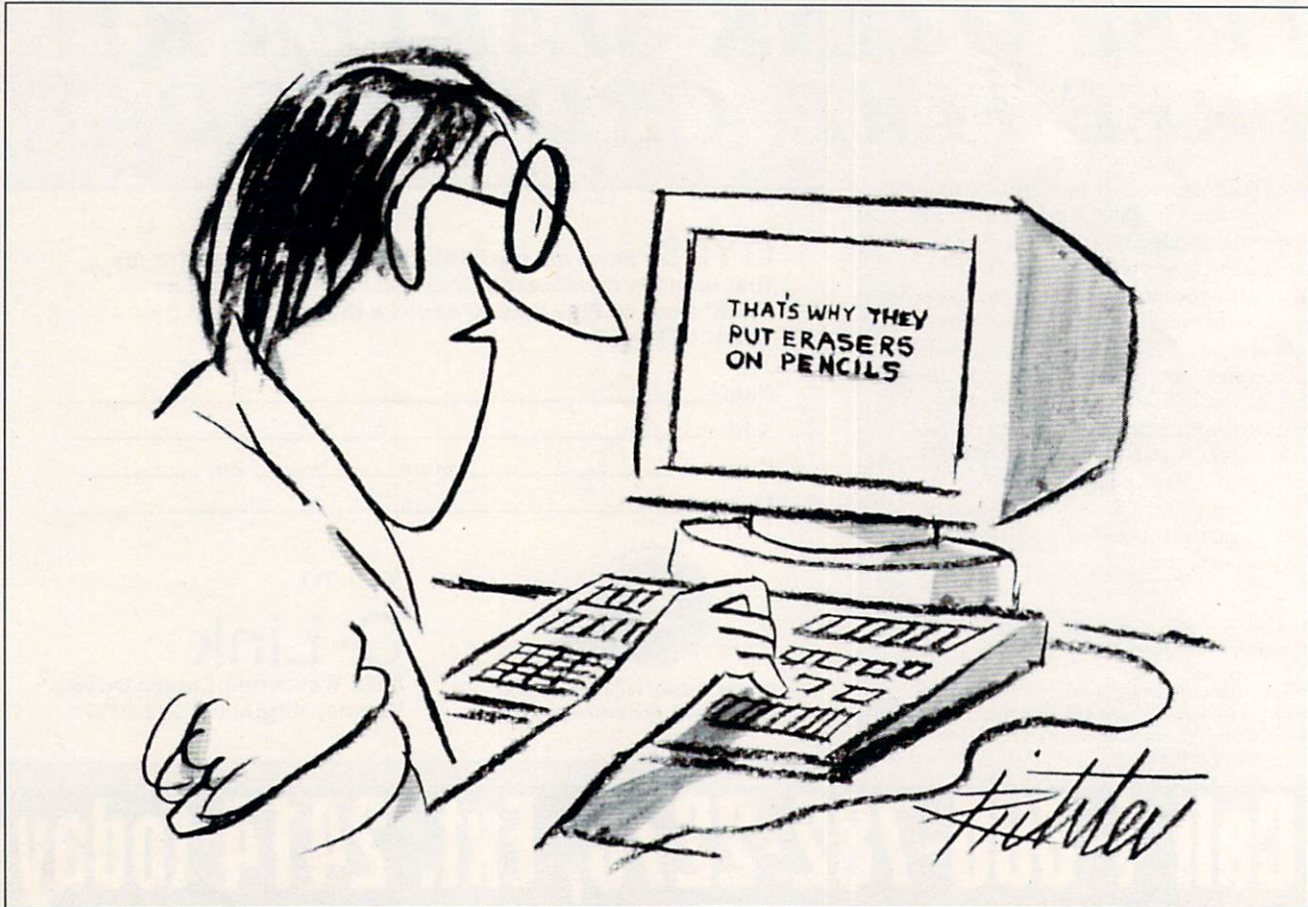
the program to nearly any memory location and to create autoboot files.

Copy 81 (November 1989) allows you to copy any BASIC or machine language file from the root or a partition of one disk to the root or a partition of another disk. It also lets you copy files from the root or partition of one disk to another partition on the same disk.

Another helpful program is 1581 Directory Sorter (July 1989). It sorts your directory entries in both alphabetical and reverse alphabetical order. It also allows you to arrange files manually in any order you want. This utility has the ability to detect whether it's running on a 64 or 128 and whether the 128 is in 40- or 80-column mode. In 128 mode, the program uses fast mode whenever possible. Unfortunately, this program works only on the disk's main directory, not on a partition's directory.

All in all, I highly recommend the 1581 drive to all 64 and 128 users. Its speed and storage capacity are immense improvements over the 1541 drive and, to a lesser extent, over the 1571 drive. Rigid-shelled 3½-inch disks are easier to handle and store than vulnerable 5¼-inch floppies. □

George Gunn is a Commodore owner who lives in Redding, California.



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CHIP'S CHALLENGE

If you love puzzles, then Chip's Challenge from Epyx is for you. As the game begins, Chip MacCallahan, a real nerd, finds out he may be able to join his beloved Melinda's computer club, the Bit Busters. However, there's a catch to this offer. He must first complete 144 levels of a maze-like puzzle before he can attain the highest membership privilege of this very exclusive club. (That privilege is to be near Melinda, of course!) Your job is to help Chip complete these levels so he can be close to the love of his life.

The first few levels of Chip's Challenge are easy. But don't be fooled; the game gets more challenging as you progress to the higher levels. Each level is slightly more difficult than the previous one, but you have more than one chance to pass a level. For example, if you get killed by a monster, then you get to try that level again.

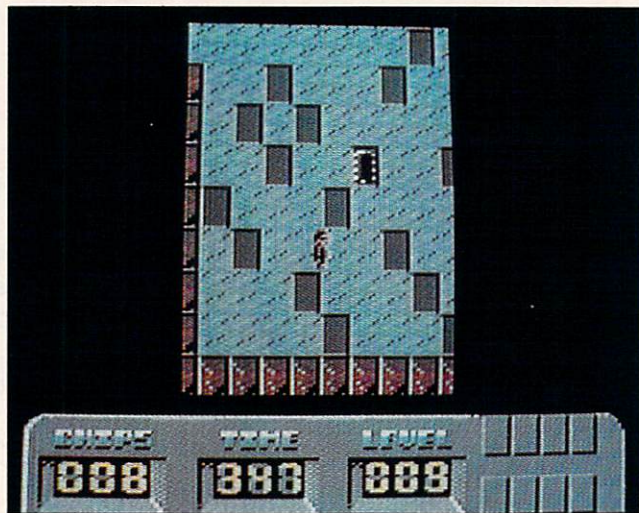
Some levels provide hints on what to do; others don't. From time to time you'll encounter levels that seem impossible to pass. Don't lose sleep over this, though. After several tries, the game gives you the option of continuing at this level or going to the next. It's best to avoid both of these options, however. Since scores are based on what level you reach and how quickly you pass to the next level of play, restarting or not completing a level only lowers your score.

If you exit the game for any reason, you don't have to start at the first level. Just remember the code for the level you reached, and you can start again at that point

Each level has different types of puzzles to solve. No matter what obstacles you encounter, you must pass through a blinking exit to go to the next level. You may have to find your way through a maze in a certain amount of time. At another level, you may have to col-

lected along the way.

There are many items to aid you at each level. Shields are important in that they allow you to walk through fire or even on water. Cleats prevent you from slipping on ice. Another very useful item is a magnet. If you manage to get



You'll find plenty to keep you busy as you try to complete 144 levels of maze-like puzzles in Chip's Challenge.

lect a required number of microchips or other items while avoiding creatures that chase you. Some chips and items may be hidden or placed where they aren't easy to find. You'll have to solve a problem or two to get to these items. For example, walls can appear that were once invisible, or you may have to find a way to cross a castle moat.

Sometimes the order of how you try to accomplish a task is vital. At some of the more difficult levels, more than one type of puzzle must be solved at the same time. An information window always displays your level, the amount of time you have remaining to complete that level, the number of chips still to be collected, and the tools or keys you've

one of these, then you have control on force floors. If you can't get through a colored door, you may need a key of the same color. Colored buttons can also unlock doors for you and sometimes either control the movements of creatures you may encounter or deactivate bombs. Sometimes these creatures are guarding these keys or items you need. Blocks of dirt help you get across water. Numerous teleports jump you to other areas of the puzzle within that same level.

Chip's Challenge is very easy to learn and play. You use your joystick to control Chip's movements. The manual tells you what types of obstacles you'll face, but the experience you gain along the way is important, too. As

you progress to higher levels, you'll know more of what's expected of you and have a better idea of how to solve a particular puzzle. Thus, what you learn from early levels can help later in the game. For example, you may realize that certain creatures move in similar patterns or shoving a particular block on the water will help you build a bridge to cross a moat.

The documentation is brief but effective in getting you on your way to solving the 144 levels of puzzles. After a quick reading, you'll know what to expect and pick up some useful hints. It also provides a list of items and obstacles that you'll encounter while playing the game.

The graphics and sound for Chip's Challenge were average for the 64. Sometimes I found it was hard to tell what an onscreen item was supposed to be. If you have the manual nearby, most of the items in question can be matched to appropriate items from the list. The game's music gets boring after the first ten levels, so I did turn down the volume.

Overall, I rate Chip's Challenge highly. This delightful and interesting one-player game is a lot of fun to play. It'll keep you amused for hours and test your problem-solving skills as well.

Chip really wants to join the Bit Busters to be with Melinda, but he needs your help. Are you up for a real challenge? Chip is anxiously waiting for you at level 1!

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PERFECT PRINT

I love GEOS. I use it all the time, but there's practically no way around the weak link in its system. GEOS dot-matrix printouts look like they've been, well, printed on a dot-matrix printer. Professional Page on Amiga or geoWrite on the IBM use beautiful scalable fonts that make dot-matrix printouts rival laser printouts for quality. With GEOS, unless you have a laser printer, you're stuck with blocky, jaggy, amateurish-looking fonts.

That's all changed now, because Creative Micro Designs, a company that seems determined single-handedly to carry the Commodore computers through the 1990s, has released Perfect Print, a new print package for geoWrite. Its printouts, using the GEOS LQ application, are incredible!

Let's get a few details straight. For one thing, Perfect Print works only with geoWrite. It won't work with geoPublish, no matter how hard we might wish. GEOS LQ, which produces the incredible geoWrite printouts, is only one part of the Perfect Print package.

Also included are a set of HQ (for High Quality) printer drivers and fonts designed to work especially well with each other. These drivers are standard GEOS printer drivers that work with any application, enhancing the printouts by using advanced interpolation techniques. They offer better results than the drivers that come with the GEOS system, even better than double-strike drivers. They aren't the stars of the Perfect Print show, though. You can find printer drivers on QuantumLink that will outperform the ones in the Perfect Print package.

The star of the Perfect Print package is GEOS LQ. Nothing anywhere can beat it. You won't believe it the first time one of these printouts comes slowly (and I do mean slowly) out of your lowly 9-pin workhorse.

I'm not talking about some pattern that's been

der the printhead.

To be fair, there are a few niggling inconveniences. Speed is the primary trade-off, as I mentioned above. A full page from geoWrite can take ten or fifteen minutes to print. Also, larger point sizes don't have the exquisite quality of the smaller ones. As a

This text is formatted in California 10-point. I'm going to print it out using an Epson 24-pin printer and the LQ-1500 printer driver. I'll switch to 14 point, **bold face**, *italics*, and **outline** modes and even print a graphic:



This text is formatted in CaliforniaLQ 10-point. I'm going to print it out using an Epson 24-pin printer and Perfect Print's "GEOS LQ" system. I'll switch to 14 point, **bold face**, *italics*, and **outline** modes, use a fancy-styled font, and even print a graphic:



Here are examples of the way GEOS prints text and graphics (above). Beneath them are similar examples from Perfect Print.

overprinted so many times that all the jaggies have been mashed into the weave of the paper and struck so repeatedly that a small font looks like a smudge. No, this is print with absolutely perfect details, with precise curves and angles—even on a six-point font in italics. I'm talking printouts to die for!

Oh, come on, you say; there must be a catch. The manual is probably sketchy and obscure. The setup procedure probably requires a degree in advanced systems analysis to implement. The thing probably overheats the printer. But, no, the manual is clear and concise. It contains more information than most users will ever need. The setup procedure is straightforward, and your printer won't get hot un-

der the printhead. matter of fact, the larger sizes are basically printed using the same kind of interpolation routine used in the HQ drivers, which is good but not perfect. And while you can use most of the features of geoWrite, you can't use the page, date, or time functions in the header or footer to let the system print those for you automatically.

The only fonts that will print out in such high quality are the specially designated LQ fonts. Of course, there are more than 40 such fonts available with plenty of great designs to choose from. If you're so inclined, you can always convert or create more using the font-creation utilities included on the disk. On top of this, CMD has been actively soliciting some of the leading font designers to con-

vert their fonts to LQ format.

GEOS LQ is one of the more user-friendly programs around. You can start it from within geoWrite, using an included desk accessory. The control panel screen includes features you've probably never considered. The system fully supports both 9- and 24-pin printers, and everything is well explained in the documentation. You need know virtually nothing about control codes or your printer's inner workings to use GEOS LQ.

If you have any technical expertise, though, you'll find it possible to affect the GEOS LQ system at a basic level by changing the configuration files. These files are actually geoWrite documents, containing the various information your system needs to properly use GEOS LQ. Since they're standard geoWrite documents, they can be examined and altered quite easily. Some variations are already included on the disk, such as a file to set page length to label height and another to tell GEOS LQ to look for the fonts on a different drive from the one geoWrite is on.

These nifty touches are just icing on the cake, however. Unless you use GEOS for geoPublish or geoPaint only, you won't want to be without the Perfect Print package. Once again, CMD takes the Commodore and GEOS to unexpected and incredible heights.

STEVE VANDER ARK

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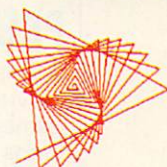
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REVIEWS

PREDATOR 2

So many computer games based on movies are nothing more than poor games wrapped in catchy visuals and logos from the film they represent. That's why you should be especially careful when buying games of this type. You should look beyond the references to and scenes from the film and search for some indication of what the game's all about.

Predator 2 has a strong basic game element that was adapted to fit the movie's plot. This is the way it's supposed to work. Predator 2 is a four-level shoot-'em-up that puts the player in the heat of battle in 1997 Los Angeles. You play the part of Danny Glover's character in the movie, Detective Lieutenant Mike Harrigan. Your ultimate goal is to beat the Predator creature that is stalking Los Angeles. You must survive four levels of action before the climactic battle. Each level is tougher than its predecessor and gives you less time to breathe. Although Predator 2 isn't difficult to play, only the best of the best will make it through the game. Most of your efforts will be spent trying to surpass your previous score in an attempt to make to the end.

Game mechanics are simple. Move the cross hairs around the sideways-scrolling screen with a joystick (recommended) or keyboard and press the fire button or space bar to fire your current weapon. Take out all the criminals who show signs of resistance and do it quickly. Power items make your stay on the current level more manageable. These include better and faster-firing weapons, body armor, and ammo clips that appear occasionally on the screen. Fire at them to collect them. A wave of criminals at the end of each level usually depletes your reserve lives and eliminates your chance for success. During this last volley, all of your shots must be well placed or the enemy will overwhelm you.

It'll take a few games before you get anywhere with Predator 2. More than any other computer game, good aim and conservation of ammo are extremely important. If you hold down the fire button, your weapon will continue to fire at its maximum rate. The Mark I Assault Shotgun shoots as fast as a machine gun, and it's very tempting to spread your fire. It's important to shoot the enemy in short bursts rather than laying down a constant bombardment because you'll need the firepower later in the level. Therein lies the key to Predator 2. Successful players will

learn to anticipate the enemies' appearances and eliminate the enemies before they get a chance to shoot. The longer you avoid return fire, the longer your current life lasts, and the better your chance at finishing the game.

The four levels are varied, with numerous challenges and unique features. You see the Predator's outline in all of the levels as he stalks his prey, but don't fire at him! If you do, he turns one of his weapons on you instead of the criminals. The first level takes place on the Los Angeles streets, with drug criminals against the police. It's a practice level compared to what's coming next.

The second level thrusts you into the penthouse apartment of the drug lord Ramon Vega. There are more criminals, and they come from all directions. The third level takes place in the subway tunnels. Just as in the real world, the subway's lights affect gameplay, especially when they shut off and you can't see the enemy. If you can survive, you'll soon confront the Predator. The last level opens the doors of a slaughterhouse for your infiltration. This abandoned warehouse is the perfect lair for the Predator. An exciting battle concludes the game—if you can make it this far.

Graphics are standard for Predator 2. This late in the life cycle of the 64, developers are more concerned with providing a good game with good graphics than they are with providing a poor game with great graphics. Predator 2 is the former. You can distinguish the guns before you collect them, but to help the less experienced, the name of each gun appears below it on the screen. An addictive theme tune makes Predator 2 a bit more exciting. Sound effects are fairly common. From a bells-and-whistles point of view, Predator 2 doesn't have much to offer. What shines through is strong gameplay.

Predator 2 is the latest product from the Konami/Image Works partnership for the 64 and 128. It makes good use of the machine's sprite and animation capabilities and packs a lot of fun in a simple game framework.

The constant challenge and addiction most players will find in Predator 2 is especially attractive to diehard shoot-'em-up fans. See if you can take out one of the more intelligent and deadly hunters in the universe!

RUSS CECCOLA

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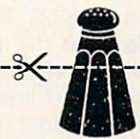
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BEGINNER BASIC

Larry Cotton

JOYSTICK OUTPUT

As we all know, the ubiquitous joystick has been around almost as long as the computer. When plugged into one of the 64's two joystick ports, it becomes an input device, translating hand movement to input the computer can use.

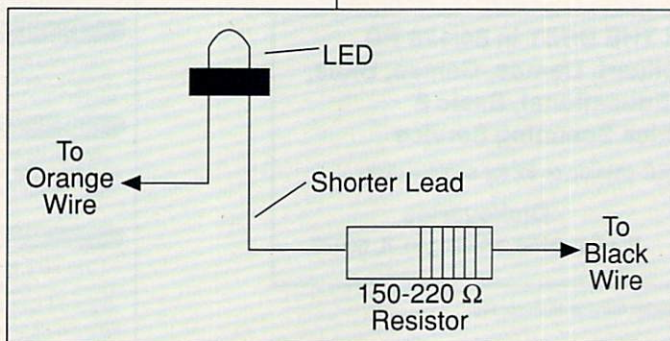
Few people know that joystick ports can also be used for output. Perusing the *Programmer's Reference Guide*, I noticed two little-mentioned memory registers—56322 and 56323—known as Data Direction Registers (DDR) for ports

a 17, bits 0 and 4 will be set for output. (All the rest will be at 0, for input.) Thus, one can independently control each of a particular joystick port's lines. It happens that bit 4 of 56323 controls port 1's fire button line.

How can we put this knowledge to use? Let's do a little work with some hardware. Locate a discarded joystick and remove its cable. If you don't have one, Radio Shack sells a connector (catalogue number 276-1538), but you'll have to wire it yourself.

Most joysticks use six wires

Joystick ports are usually input devices that receive data. Here's an easy way to reverse that flow.



A and B. These are ports 2 and 1, respectively, as labeled on the computer.

These two registers, when properly programmed, have the ability to change a joystick ports' direction of data flow from input to output! Address 56322 controls joystick port 2's memory register 56320; 56323 controls port 1's register at 56321. They behave similarly to the DDR at 56579, which determines whether the user port lines at 56577 are set for input or output.

Each memory register in the 64 contains one byte, or eight bits. Those bits (numbered 0 through 7) can be controlled independently from BASIC with the Poke command.

If you poke memory register 56323 with a 1, for instance, bit 0 will contain 1; it will be set for output. If you poke it with

within the cable: the ground, the four direction lines (up, down, right, left), and the fire button. The fire button wire is usually orange, and the ground wire is usually black.

Select these two wires and join them with an LED and a resistor, as shown above. Connect the shorter lead of an LED to either end of a 150-220-ohm resistor and the longer lead to the orange fire button wire. Complete the circuit by attaching the free end of the resistor to the black ground wire.

If you don't happen to have LEDs at home, try Radio Shack's super-bright LED, catalogue number 276-087.

Now enter the following.

```
10 NT=900:FT=300:B=3: REM ON  
TIME, OFF TIME, AND NUMBER  
OF BLINKS
```

```
20 POKE56323,17: REM FIRE  
BUTTON OUTPUT, DISABLES  
KEYBOARD, TURNS LED OFF  
30 FORT=1TOFT:NEXT  
40 FORI=1TOB  
50 POKE56321,16  
60 FORT=1TONT:NEXT  
70 POKE56321,0  
80 FORT=1TOFT:NEXT  
90 NEXT  
100 POKE56323,0: REM  
RESTORE TO NORMAL
```

Save the program to disk before going any further!

Memory register 56323 normally contains a 0. Because of the way the 64's keyboard is wired, poking values to that register will interfere with the keyboard's normal operation. To try this, poke a 1 to 56323.

Turn your computer off and on again to restore keyboard operation. Plug the joystick cable into port 1. (That's the port closest to you.) Load and run the above program. The LED should blink three times and possibly will glow softly afterwards. The LED turns off completely when the line is changed to output.

Line 10 defines the constants NT, FT, and B for LED on-time, off-time, and number of blinks. Try changing these values. Line 20 pokes the DDR with a 17, which disables the keyboard and changes the fire button line to output. Poking a 16 works also but leaves the cursor in a strange place.

Lines 30, 60, and 80 control the times the LED is on or off. Line 40 begins a FOR-NEXT loop for the number of blinks; line 90 ends it. Lines 50 and 70 turn the fire button wire on (positive DC voltage) and off (ground potential), respectively. Line 100 restores port 1 to normal operation.

We'll look at more useful applications next month and learn how to control small electrical appliances. □

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MACHINE LANGUAGE

Jim Butterfield

SIMPLE STACK USAGE

The stack is used automatically by many activities. When your program calls a subroutine with JSR, the stack stores the return address. Later, the subroutine returns with RTS, and the stack delivers the stored address. Similar actions take place with RTI and interrupts. In every case, the stack is returned to its former condition automatically when the job is done.

The stack takes care of itself so well that it often remains a mystery to programmers. Since they don't often use the four stack-manipulation commands, programmers feel ill at ease with them. Here are those commands.

PHA Push (copy) the contents of A to the stack.

PLA Pull the contents of the stack into A.

PHP Push (copy) the PSW (program status word) to the stack.

PLP Pull the contents of the stack into the PSW.

Using these commands is simple. Do you have something in the A register that you know you will need soon but not right now? Push it to the stack with PHA. You can store it there for a while then bring it back later with PLA. Perhaps you have a condition flag that you'll want to test later in the program but not immediately? Push all the flags with PHP, and bring them back with PLP when you want to test them.

There's only one vital rule that you must follow: If you put it on the stack, you *must* take it off. Leave a messy stack, and your program will crack. The last thing that you pushed

onto the stack is the first thing you must pull. After you push something to the stack, be very careful that your code never branches away, leaving a bad stack in place.

Let's write a small but useful program that uses the stack commands. It's a program to print the contents of a sequential file to the screen or to a printer.

The program will connect to the input file, take a byte, and disconnect. It will then connect to the output file, send that byte, and again disconnect. Then it will test to see if the input has signaled end-of-file (EOF). If not, back we go to do it all again.

The EOF condition is signaled in variable ST (status), address \$90 on current Commodore 8-bit machines. But here's the catch: It's signaled immediately following the input operation. If you examine the logic flow described above, you'll see that we test for EOF after we've performed an output operation. That's the right program point to do the test, but by that time, variable ST will have lost the vital EOF signal that was present after the program performed the input operation.

That means we should test the value of ST immediately after the input but we shouldn't branch based upon that test until a later program point. How may we preserve the condition flags? We do it with the PHP and PLP instructions.

A second problem arises. We read a byte from our input file by means of a call to the Kernal subroutine at \$FFE4. The value is placed into register A, which is just where we'll want it for output. Our next call, however, is to \$FFCC in order to disconnect from the input stream, and that will destroy the contents of the A register. The easiest solution is to preserve A with

the PHA and PLA instructions. Gosh, this is easy. Let's go to the code.

Logical file 1 will have been opened as our input; logical file 2 as our output. First, let's connect to the input stream.

```
2000 A2 01    LDX #$01 ;
           logical file 1
2002 20 C6 FF JSR $FFC6 ;
           connect input
2005 20 E4 FF JSR $FFE4 ;
           input a byte
```

Now we test ST, address 90. A value of 0 means that we aren't at EOF and there are no other problems. Loading ST into the Y register will automatically set the Z flag if the value is 0; otherwise, the Z flag will be cleared. Either way, we'll push the flag to the stack and test it later.

```
2008 A4 90    LDY $90 ;
           read ST (Z flag)
200A 08      PHP    ;
           save conditions to stack
```

The byte we received from the input stream is still in the A register. But we're about to make a couple of calls that will wipe it out. So let's put that on the stack, too. Remember that since it's the most recent thing we've put on the stack, it must be the first thing we pull.

```
200B 48      PHA    ;
           save input byte
```

Now that the byte is safely stacked, we can disconnect our input.

```
200C 20 CC FF JSR $FFCC ;
           restore default I/O
```

Then we connect to our output stream, logical file 2.

```
200F A2 02    LDX #$02 ;
           logical file 2
2011 20 C9 FF JSR $FFC9 ;
           connect output stream
```

The stack takes care of itself so well that it often remains a mystery to programmers.

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Now that we've connected, we're ready to output. All we have to do is pull the data byte and send it.

```
2014 68      PLA
; restore input byte
2015 20 D2 FF JSR $FFD2
; output it
```

We've used the Kernal subroutine at \$FFCC before, to disconnect the input stream. Now we use it to disconnect the output stream.

```
2018 20 CC FF JSR $FFCC
; restore default I/O
```

Now the program is ready to test for EOF. Let's bring back the Z flag that we stashed quite a while ago.

```
201B 28      PLP
; restore condition flags
201C F0 E2   BEQ $2000
; if not EOF, do it again
201E 60      RTS
; else back to BASIC
```

The BASIC code pokes the machine language code in

place, opens the input and output files, and then calls the machine language with a SYS command. When the ML program returns control, BASIC closes the two files.

This example of stack usage runs on all recent Commodore 8-bit computers. To run this program on the older CBM and PET computers, change the value 144 to 150 in line 100 and the value 4388 to 4396 in line 250.

```
100 DATA 162,1,32,198,255,
32,228,255,164,144,8,
72,32,204,255
110 DATA 162,2,32,201,255,
104,32,210,255,
32,204,255,40,240,
226,96
200 FOR J=8192 TO 8222
210 READ X
220 POKE J,X
230 T=T+X
240 NEXT J
250 IF T<>4388 THEN STOP
300 INPUT "NAME OF INPUT
FILE";F$
310 OPEN 15,8,15
320 OPEN 1,8,3,F$
330 INPUT# 15,E,$,E1,E2
```

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```
340 IF E<>0 THEN PRINT
E;E$;E1;E2:STOP
350 INPUT "OUTPUT TO
SCREEN OR PRINTER";D$
360 D$=LEFT$(D$,1)
370 IF D$="S" THEN
A=3:GOTO 400
```

```
380 IF D$="P" THEN A=4:GOTO
400
390 GOTO 350
400 OPEN 2,A
410 SYS 8192
420 CLOSE 2
430 CLOSE 1
```

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 printed copies of both of these handy programs for you to type in. We'll also include instructions on how to type in Gazette programs. Please enclose a self-addressed, stamped envelope. Send a self-addressed disk mailer with appropriate postage to receive these programs on disk.

Write to Typing Aids, COMPUTE's Gazette, 324 West Wendover Avenue, Suite 200, Greensboro, North Carolina 27408.

GEOS

Steve Vander Ark

IN SEARCH OF A BETTER DESKTOP

Which GEOS application do you use the most? You might think it's geoWrite, but it's the deskTop. The deskTop lets you erase and copy files, page through disk directories, and load and run applications. The deskTop is like home base—where you go when you click on Quit.

Whenever you hit a quit button, GEOS looks for and runs the file called DESKTOP. Obviously, it wouldn't do to have an unsuspecting user rename his or her deskTop. That's why it's invisible to the system and why it isn't called an application in its info box. It's a GEOS system file 4, which is a file type you can't rename.

The deskTop, especially the 2.0 version, is very efficient, but it has some faults. Moving from page to page on the notepad, for example, is a fairly slow process, since the system must load each page and its icons separately. Also, the deskTop provides only marginal support for a third disk drive and until recently provided none at all for devices such as CMD's RAMLink.

Over the years, programmers have created several different file-handling applications to supplement the deskTop. These programs buy speed by using text instead of icons to list files. Most of them patch the GEOS system with a different filename so that a Quit command returns you to them instead of the deskTop. Here's a list of such programs.

DualTop. DualTop, as its name implies, does the deskTop one better by displaying the directories of two disks side by side. Standard file functions are accomplished by highlighting the filename and then clicking on one of the buttons on the screen. DualTop

supports three drives, including RAM drives.

On Q-Link, the 128 version is called 128DTV27.SFX, uploaded by RedSonia. DUALTOP is the 64 version, uploaded by JBUS.

WormDesk. This program provides all normal file functions, as well as an elaborate view system. The directory displayed can consist of only one type of file at a time. This usually is fine, but once in a while it's nice to be able to peruse an entire directory, an option not available on WormDesk.

The Q-Link filename is WORMDESK5.0, uploaded by geoWorm. It's for the 64 only.

QwikTop. The QwikTop screen is divided into eight boxes, each of which displays the files from a single page of the deskTop's notepad. The result is that you get to see seven pages at once, plus the border, with filenames shown in text. QwikTop saves space by including only the most often-used file functions, but the fact that you can view most of a disk's files at once and move them around from page to page almost instantly makes this one a joy for those of us who like to organize our disks. This one's a winner!

Q-Link filenames are QWIKTOP, uploaded by IL-LINI70, and QWIKTOP128.2, uploaded by GEOREP JIM.

Mini-Desk. This Jim Collette masterpiece is a desk accessory which provides access to a few essential file-handling options while you're within another application. I find this nifty program especially helpful when I'm working on a project where the application and the document are both in RAM. Mini-Desk lets me copy the file I'm working on to another drive, assuring me of a current copy even if the power fails.

Released as part of CommPlex Software's GeoWizard disk, the entire package is

\$16.95 from CommPlex Software, 6782 Junction Road, Pavilion, New York 14525.

Switcher. To avoid the delay while one application quits to the deskTop and another one loads, Switcher avoids the deskTop and provides a dialog box from which to open the next application. This isn't really a full-fledged deskTop replacement, but if your work requires moving from program to program, Switcher will certainly keep you jumping. Its very small size makes it a boon for single-drive geoPublish users. Its Q-Link filename is SWITCHER 1.3, uploaded by Student t.

gateWay. GateWay is more than a deskTop alternate. It's a full-blooded replacement with lots of great features. Until recently, gateWay was the only file-handling system which supported CMD's RAM-Link and RAMDrive. For more information, see the Gazette review (November 1991).

GateWay (\$29.95) is available in 64 and 128 versions from Creative Micro Designs, P.O. Box 646, East Longmeadow, Massachusetts 01028.

geoShell. GeoShell takes the GEOS environment full circle, replacing the graphics interface of the deskTop with text commands. While this might seem to you like a step backwards, the many hot-key commands and the speed of this program might instead lead you to decide that it's the most efficient file-handling routine around. For example, by typing the filename of a file on the current disk and pressing Return, geoShell quickly scans the directory and then loads and runs the file. There's no need to page through a slew of icons or scroll through a directory.

For more information about geoShell, contact Maurice Randall, 215 East Harris, Charlotte, Michigan 48813. □

The GEOS deskTop is a very efficient program, but it has its faults. Here's a look at some deskTop alternatives.

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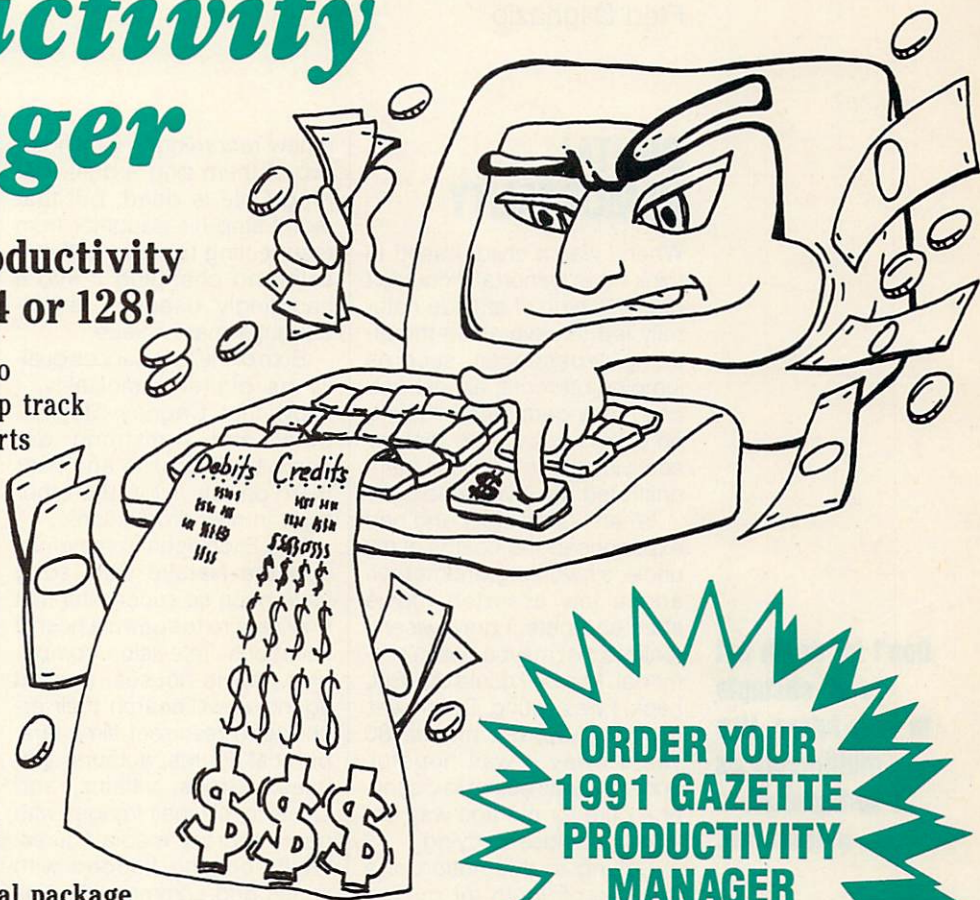
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D'IVERSIONS

Fred D'Ignazio

DIGITAL IMMORTALITY

When I was a child, I used to think I was immortal. I couldn't die. This type of attitude naturally led to several life-threatening experiences, such as jumping off roofs, almost getting hit by cars, and climbing on cliffs. I concluded that my surviving these activities demonstrated my invulnerability.

When I grew older and had experienced the deaths of my uncle, a favorite grandmother, and a few assorted movie stars and pets, I grew wiser. I realized that maybe I wasn't immortal. Maybe I could die. But, heck, I was young. Death was probably 50, 60, maybe 80 years away. I was hopeful. Someone was bound to discover a cure for old age way before I got close to dying.

I clung to this notion of a fountain of youth for quite a few years, but now it's starting to dry up. It's getting harder to believe in medical miracles. I'm 43, and there doesn't seem to be a miracle drug on the horizon. In fact, things seem to be getting worse. With the upsurge in crime, violence, AIDS, and so on, I feel far more at risk now than I did when I was younger.

The other night I was watching television, feeling kind of blue, and I spotted a commercial that features Elton John playing alongside Louis Armstrong, Humphrey Bogart, and James Cagney. Through special digital techniques, movie images of these long-dead superstars have been added to a new ad that features a very much alive Elton John.

The next night I tuned into the Grammy Awards and saw Natalie Cole win a Grammy for her song "Unforgettable." To create this version, she used digital techniques to weave her father's original song into

a new recording in which the two of them sing a duet. Nat King Cole is dead, but that didn't stop his daughter from resurrecting his unforgettable solo and changing it into a hauntingly beautiful father-daughter masterpiece.

Both of these instances qualify as digital immortality. I know that Cagney, Bogart, Cole, and Armstrong are dead, but I did see and hear them on television the other night in new productions.

The Elton John commercial and the Natalie Cole song have been so successful that they're sure to spawn a host of imitations. Television companies, movie houses, and ad agencies will search their archives to resurrect film stars, political figures, authors, athletes, heroes, villains, and saints to mix their images with contemporary media figures. We'll soon be flooded with songs and commercials digitally combining the dead and the undead: Marilyn Monroe with Madonna, W. C. Fields with Danny DeVito, Lou Gehrig with Jose Canseco, Teddy Roosevelt with George Bush, Steve Martin with the Three Stooges.

In fact, virtual immortality is nothing new. We've been getting accustomed to it for years. What's the effect of media stars dying? If they're popular, it doesn't mean that we no longer see them. All it means is that we don't get any new material. We still see reruns of their best work.

Are Bing Crosby and Danny Kaye gone? It doesn't seem like it after I've watched *White Christmas*. What about Judy Garland? Not after seeing *Wizard of Oz* with my three-year-old. How about Spencer Tracy, John F. Kennedy, or Jim Morrison? It's hard to imagine Lucille Ball gone after watching one of her wonderful "I Love Lucy" episodes.

The truth is that my memory of a star's death pales in comparison to the vivid, poignant evidence of his or her survival on the television or movie screen. The stars seem still alive when I see them in the midst of news programs, sitcoms, and commercials that feature the products and celebrities of the here and now.

This brings me to my own death, or, hopefully, my own virtual immortality. I may give up on cryogenics, miracle drugs, and fountains of youth, but I might still achieve immortality through multimedia.

I can see a whole new industry springing up as funeral homes retrofit middle-aged and older Americans with digital re-creations of their lives. They can interview us to capture our voices and images. They can scan in photographs and digitize home movies and audio tapes to capture us during our youth and our adulthood. They can embed us in the era in which we lived and put a spin on the whole presentation. How do we want to be remembered? Nostalgically? Romantically? Dashingly? Respectfully? Producers at multimedia funeral homes will be able to remaster our lives digitally and dramatize them according to our wishes.

"This Is Your Life, Fred D'Ignazio." That's what I'll get. I'll pay about a thousand dollars. It'll take only a couple of days to create at the local funeral home equivalent of a one-hour Insty-Prints or Moto-Photo. I'll be packaged on CD-ROM. I'll get a dozen copies to distribute to my wife, children, and close friends. Whenever they miss me or want to remember how I was, they'll boot up my disc in their computer, and I'll spring to life, just like Bogart, Armstrong, Cagney, and Cole.

I'll be immortal. I won't notice, but others will. □

Don't let death act as an obstacle to your future. Use multimedia as a springboard to immortality.

PROGRAMS

POP-UP

By Richard Penn

While entering data for an applications program, you suddenly need to make a calculation. You press a key, call up a calculator screen, determine the answer that you need, and then continue with your main program.

The telephone rings while you're working on a report, and you need to check a date while discussing an appointment. You press a key, call up a calendar, and then return to your report.

Afterward, prior to printing your report, you call up a smart help screen—one that knows you're ready to print and displays only a summary of printer commands, not the ten previous pages of instructions that you don't need.

If you think this sounds like something only an expert programmer could do in machine language, you're wrong. Pop-Up allows you to add pop-up desk tools to BASIC programs as easily as writing a GOSUB subroutine, and it lets you call them with a single command!

Typing It In

Pop-Up consists of three programs. The first is the actual machine language routine, so you'll need to use MLX, our machine language entry program to enter it. See "Typing Aids" elsewhere in this section. When MLX prompts you, respond with the values given below.

Starting address: C000

Ending address: C607

Before exiting MLX, save a copy of this program with the name POP-UP. The enclosed demonstration program looks for that name when it runs.

A second machine language program contains sprite data for an on-screen calculator that's used in the demonstration program. Again, you'll need MLX to type it in. When MLX prompts you, respond with the following values.

Starting address: 3E00

Ending address: 3FFF

When you've finished typing, be sure to save a copy of the program as CALCULATOR.SPR.

Finally, Demo is a BASIC program

that shows how to use Pop-Up. To prevent typing errors, enter it with The Automatic Proofreader; see "Typing Aids" again elsewhere in this section.

Put It to Work

To use Pop-Up in your own applications, add lines 30-40 of Demo to the beginning of your BASIC programs. Now let's take a look at how it works.

Two Commands

Pop-Up works by setting up a branch key. Whenever f1 is pressed, the running BASIC program is suspended, and execution branches to a selected line. This subroutine, which runs independently with its own variables, contains the code for the pop-up tool. Pressing f1 again returns you to the main program without a hint that anything ever happened. Think of it as a powerful GOSUB key that jumps to a subroutine with its own screen, VIC-II chip, and variables.

There are only two commands to learn. The first, SYS 49752, *line*, enables Pop-Up and selects the line to branch to. This command should be used at the beginning of your program. The second command, SYS 49877, disables Pop-Up.

Programming Desk Tools

A BASIC routine for an accessory such as a calculator is practically no different from any other subroutine, except that you must write it as a stand-alone program that loops endlessly. Think of an accessory as a new program that runs from the main program whenever you press f1. This new program continues until you press f1 again to exit. You'll see a programming example of this by using a calculator in Demo.

When you press f1, the machine language routines save all important information about the main program, such as BASIC pointers, screen and color memory, the VIC-II chip, and variables. Then BASIC jumps to the subroutine selected by the SYS 49752, *line* command and executes it, just as if RUN were typed. This subroutine has its own variables (2559 bytes stored at memory locations 50689-53247) that are cleared each time you press f1. The display, however, isn't cleared, so

your pop-up tools can be printed over the current screen for a window effect. The only quirk is that the cursor is positioned one column to the right of the home location whenever f1 is pressed the second time.

No changes made to the screen or sprites by the subroutine called by Pop-Up are permanent. Pressing f1 again restores the original program and screen. The only exception is the SID chip, which cannot be peeked and therefore cannot be saved.

More Than One

What if you want several accessories? Include a menu at the beginning of the Pop-Up subroutine for the user to select. You might include a calculator, calendar, and notepad.

When programming Pop-Up tools, it's best to write them separately and then merge them with your main program once they're debugged. This is because only the main set of variables is available to the BASIC editor. If you press Run/Stop while a Pop-Up subroutine is running and then type PRINT A, the value of A in the main program, not the subroutine, will be returned.

Also, note that a renumbering utility won't recognize the new SYS 49752, *line* command. You'll have to change its line number yourself.

Smart Help Screens

Suppose you have a two-part program in which you first enter data and then print a report. Some programs offer a help key, and dumb help screens are always displayed in the same sequence. That means users who need information about printing but don't need help for entering data have to see the data-entry help screen anyway because it comes first. Smart help screens eliminate flipping through unwanted screens because they know where you are in a program and only display relevant information.

Programming them with Pop-Up is easy. In our example program, you might insert the command POKE 679,1 at the beginning of the data-entry routine, and POKE 679,2 at the start of the report-printing routine.

The help screen subroutine (called with f1) would check location 679 with a line such as IF PEEK(679)=1 THEN

PROGRAMS

2000 : REM PRINT DATA ENTRY HELP SCREEN. If it contained a 1, the data-entry help screen would be printed. If location 679 held a 2, the program would jump to 3000 where a report help screen would be displayed. For a longer program, just include more flags and IF/THEN statements.

New Look and Feel

Pop-Up gives BASIC a new look and feel. Never before could software written in BASIC be so user-friendly, nor did the BASIC programmer have so much power at his fingertips. The possible click-on accessories are limited only by your programming ability.

Even if you don't want to program your own accessories, you can use the demonstration's Pop-Up calculator in your own programs by including lines 20-60 and 1000-1390.

POP-UP

```
C000:A2 02 B5 00 9D FD A2 E8 1D
C008:E0 FB D0 F6 A9 FF 85 FB D6
C010:A9 00 85 FC A9 F6 85 FD 19
C018:A9 A3 85 FE A0 00 B1 FB 5C
C020:91 FD E6 FD D0 02 E6 FE 02
C028:E6 FB D0 02 E6 FC A5 FB C8
C030:C9 10 D0 EA A5 FC C9 03 1B
C038:D0 E4 A9 00 85 FB A9 04 04
C040:85 FC A9 07 85 FD A9 A6 87
C048:85 FE B1 FB 91 FD E6 FD 92
C050:D0 02 E6 FE E6 FB D0 02 52
C058:E6 FC A5 FB C9 E8 D0 EA 7F
C060:A5 FC C9 07 D0 E4 A9 00 0B
C068:85 FB A9 D8 85 FC A9 EF D1
C070:85 FD A9 A9 85 FE B1 FB 8B
C078:91 FD E6 FD D0 02 E6 FE 5A
C080:E6 FB D0 02 E6 FC A5 FB 21
C088:C9 E8 D0 EA A5 FC C9 DB 82
C090:D0 E4 A2 00 BD D0 9D 35
C098:D7 AD E8 E0 2F D0 F5 BA FF
C0A0:8E 06 AE A9 36 85 01 A2 C7
C0A8:02 BD 00 A0 95 00 E8 E0 04
C0B0:D9 D0 F6 A2 F3 BD 00 A0 93
C0B8:95 00 E8 E0 FB D0 F6 A9 EA
C0C0:EB 85 FB A9 A0 85 FC A9 72
C0C8:FF 85 FD A9 00 85 FE B1 CB
C0D0:FB 91 FD E6 FD D0 02 E6 01
C0D8:FE E6 FB D0 02 E6 FC A5 6B
C0E0:FB C9 6D D0 EA A5 FC C9 3F
C0E8:A2 D0 E4 AE FC A2 A9 37 74
C0F0:85 01 9A A9 F6 8D 24 03 9C
C0F8:A9 C1 8D 25 03 A9 13 8D 36
C100:77 02 A9 0D 8D 78 02 A9 C1
C108:02 85 C6 A9 1A 8D 02 03 6F
C110:A9 C2 8D 03 03 A2 1A B5 87
C118:D8 09 8D 95 D8 CA D0 F7 3F
C120:A2 08 BD F7 07 9D EA C5 78
C128:CA D0 F7 4C 31 EA A9 36 C7
C130:85 01 A2 02 BD FD A2 95 8B
C138:00 E8 E0 FB D0 F6 A9 FF 87
C140:85 FB A9 00 85 FC A9 F6 25
```

```
C148:85 FD A9 A3 85 FE A0 00 E6
C150:B1 FD 91 FB E6 FD D0 02 F0
C158:E6 FE E6 FB D0 02 E6 FC 05
C160:A5 FB C9 10 D0 EA A5 FC 6A
C168:C9 03 D0 E4 A9 00 85 FB 4E
C170:A9 04 85 FC A9 07 85 FD BC
C178:A9 A6 85 FE B1 FD 91 FB BF
C180:E6 FD D0 02 E6 FE E6 FB 2E
C188:D0 02 E6 FC A5 FB C9 E8 3B
C190:D0 EA A5 FC C9 07 D0 E4 AC
C198:A9 00 85 FB A9 08 85 FC 1A
C1A0:A9 EF 85 FD A9 A9 85 FE 83
C1A8:B1 FD 91 FB E6 FD D0 02 49
C1B0:E6 FE E6 FB D0 02 E6 FC 5D
C1B8:A5 FB C9 E8 D0 EA A5 FC 50
C1C0:C9 DB D0 E4 A2 00 BD D7 F0
C1C8:AD 9D 00 D0 E8 E0 2F D0 91
C1D0:F5 AE 06 AE A9 37 85 01 DC
C1D8:9A 4C F3 C5 EA EA A9 1A
C1E0:83 8D 02 03 A9 A4 8D 03 F7
C1E8:03 A9 57 8D 24 03 A9 F1 8E
C1F0:8D 25 03 4C 31 EA A9 57 89
C1F8:8D 24 03 A9 F1 8D 25 03 5A
C200:08 A9 00 20 90 FF 28 20 EA
C208:60 A6 AD EB C2 85 15 AD DF
C210:EC C2 85 14 20 A6 A8 4C E7
C218:AE A7 78 8D E9 C2 8E EA 29
C220:C2 A9 83 8D 02 03 A9 A4 CE
C228:8D 03 03 A9 57 8D 24 03 6C
C230:A9 F1 8D 25 03 A9 00 8D 57
C238:E7 C2 A9 36 85 01 A2 2D 9D
C240:BD FD A2 95 00 E8 E0 39 70
C248:D0 F6 A9 37 85 01 AD E9 12
C250:C2 AE EA C2 58 4C 83 A4 0C
C258:A9 EE 85 FB A9 C2 85 FC 3F
C260:A9 00 85 FD A9 A0 85 FE 25
C268:A0 00 B1 FE 91 FD E6 FD 84
C270:D0 02 E6 FE E6 FB D0 02 76
C278:E6 FC A5 FD C9 FD D0 EA 18
C280:A5 FE C9 A2 D0 E4 20 FD 54
C288:AE 20 8A AD 20 F7 B7 A5 8F
C290:14 8D EC C2 A5 15 8D EB D5
C298:C2 A9 00 8D E7 C2 78 A9 A7
C2A0:AB 8D 14 03 A9 C2 8D 15 9A
C2A8:03 58 60 A5 C5 CD E8 C2 26
C2B0:F0 20 8D E8 C2 C9 40 F0 A5
C2B8:19 C9 04 D0 15 AD 8D 02 47
C2C0:D0 10 AD E7 C2 49 02 8D B3
C2C8:E7 C2 F0 03 4C 00 C0 4C 71
C2D0:2E C1 4C 31 EA 78 A9 31 38
C2D8:8D 14 03 A9 EA 8D 15 03 DF
C2E0:A9 00 8D E7 C2 58 60 00 A3
C2E8:04 40 00 03 EA FF 94 FF 31
C2F0:00 AA B1 91 B3 22 22 00 DA
C2F8:00 4C 00 FF 00 04 00 00 A1
C300:02 00 7F CB 19 16 00 0A 60
C308:76 A3 04 EA 0B 00 00 00 3B
C310:76 A3 B3 BD 51 00 00 00 98
C318:00 01 08 01 C6 01 C6 01 B9
C320:C6 FF CF 00 00 FF CF FA 9F
C328:FF FA 00 4F 0C 5C 4E D3 A5
C330:17 03 02 53 41 24 18 1E 62
C338:18 FF 0B 00 00 00 1E 18 81
C340:00 03 4C B7 00 00 69 17 77
C348:62 17 00 00 00 00 00 0A D0
C350:76 A3 19 00 00 00 00 90 AF
C358:CB 7A 00 00 00 76 00 80 BE
C360:A3 E6 7A D0 02 E6 7B AD 20
C368:06 02 C9 3A B0 0A C9 20 B1
C370:F0 EF 38 E9 30 38 E9 D0 19
```

```
C378:60 80 4F C7 52 58 40 FF 2B
C380:00 00 55 FF 00 00 00 00 B2
C388:03 00 00 80 00 00 00 24 BD
C390:6C 55 00 00 00 00 00 00 A3
C398:00 00 00 00 D6 17 00 00 33
C3A0:3C 03 00 00 00 06 00 60 7F
C3A8:08 FA 9F 00 00 00 00 E6
C3B0:A0 01 08 04 00 00 08 0C 26
C3B8:00 04 00 02 20 00 00 00 62
C3C0:04 00 00 27 00 85 00 FF D2
C3C8:00 00 FF FF 00 00 FF FF 50
C3D0:00 00 FF FF 00 00 FF FF 58
C3D8:00 20 20 34 39 37 35 35 F5
C3E0:00 30 30 30 30 FF 00 00 FE
C3E8:FF FF 00 00 FF FF 00 00 70
C3F0:FF FF 00 00 FF FF 00 00 78
C3F8:FF FF 00 00 FF FF 00 00 80
C400:FF FF 00 00 FF FF 00 00 89
C408:FF FF 00 00 FF FF 00 00 91
C410:FF FF 00 00 FF FF 00 00 99
C418:FF FF 00 00 FF FF 00 00 A1
C420:FF FF 00 00 FF FF 00 00 A9
C428:FF FF 00 00 FF FF 00 00 B1
C430:FF FF 00 00 FF FF 00 00 B9
C438:FF FF 00 00 FF FF 00 00 C1
C440:FF FF 00 00 FF FF 00 00 C9
C448:FF FF 00 00 FF FF 00 00 D1
C450:FF FF 00 00 FF FF 00 00 D9
C458:FF FF 00 00 FF FF 00 00 E1
C460:FF FF 00 00 FF FF 00 00 E9
C468:FF FF 00 00 FF FF 00 00 F1
C470:FF FF 00 00 FF FF 00 00 F9
C478:FF FF 00 00 FF FF 00 00 02
C480:FF FF 00 00 FF FF 00 00 0A
C488:FF FF 00 00 FF 7D EA 00 DD
C490:FF 00 22 0E BC 81 7D EA 11
C498:7D EA 00 17 C8 0E BC 81 86
C4A0:85 BD 0C BD BA 0E 0F FF E5
C4A8:7D EA 02 07 20 21 DA E4 7C
C4B0:0D 07 FF 7D 78 85 01 00 36
C4B8:22 CF E5 00 0A 14 E1 64 CC
C4C0:A5 85 A4 81 F4 17 81 80 B2
C4C8:00 00 00 01 86 60 00 00 18
C4D0:00 0E 01 0C 74 A7 79 A6 9A
C4D8:9C 2C 9E 35 32 30 39 35 DC
C4E0:00 35 00 00 00 00 00 00 B7
C4E8:2E 4F 42 4A 22 2C 38 2C A8
C4F0:31 00 00 00 00 00 00 00 13
C4F8:00 00 00 00 00 00 00 00 82
C500:00 00 00 00 00 00 00 00 8B
C508:00 00 00 00 00 00 00 00 9B
C510:00 00 00 00 00 00 00 00 93
C518:00 00 00 00 00 00 00 00 A3
C520:00 00 00 00 00 00 00 00 AB
C528:00 00 00 00 00 00 00 00 B3
C530:00 00 00 00 00 00 00 00 BB
C538:00 00 00 00 00 00 00 00 C3
C540:00 00 00 00 00 00 00 00 CB
C548:00 00 00 00 00 00 00 00 D3
C550:00 00 00 00 00 00 00 00 DB
C558:00 00 00 00 00 00 00 00 65
C560:0E F6 04 0A 00 02 10 00 F9
C568:00 48 EB 00 00 00 00 00 83
C570:00 00 00 00 00 00 00 00 FB
C578:00 00 00 00 00 00 00 00 04
C580:00 A9 57 8D 24 03 A9 F1 AC
C588:8D 25 03 A9 00 85 15 A9 09
C590:64 85 14 20 A6 A8 4C AE 53
C598:A7 00 00 00 00 00 00 00 F7
C5A0:00 00 00 00 00 00 00 00 2C
```



```

C5A8:00 00 00 00 00 00 00 00 34
C5B0:00 00 00 00 00 00 00 00 3C
C5B8:00 00 00 00 00 00 00 00 44
C5C0:00 00 00 00 00 00 00 00 4C
C5C8:00 00 00 00 00 00 00 00 54
C5D0:00 00 00 00 00 00 00 00 5C
C5D8:00 00 8B E3 83 A4 7C A5 61
C5E0:1A A7 E4 A7 86 AE CB 00 01
C5E8:00 B0 DA 56 00 9F 04 74 5C
C5F0:6B 8E 53 A2 08 BD EA C5 3D
C5F8:9D F7 07 CA D0 F7 4C DF BD
C600:C1 00 00 00 00 00 00 00 6E

```

CALCULATOR.SPR

```

3E00:5E 5E B0 5E 5E B0 5E 5E 10
3E08:B0 BE BE B0 AA AA B0 AA 7B
3E10:AA B0 FF FF F0 00 00 00 95
3E18:00 00 00 00 00 00 00 00 94
3E20:00 00 00 00 00 00 00 00 9C
3E28:00 00 00 00 00 00 00 00 A4
3E30:00 00 00 00 00 00 00 00 AC
3E38:00 00 00 00 00 00 00 3F F3
3E40:AA 5E 5E AA 5E 5E AA 5E 40
3E48:5E AA BE BE AA AA AA AA 62
3E50:AA AA FF FF FF 00 00 00 6C
3E58:00 00 00 00 00 00 00 00 D4
3E60:00 00 00 00 00 00 00 00 DC
3E68:00 00 00 00 00 00 00 00 E4
3E70:00 00 00 00 00 00 00 00 EC
3E78:00 00 00 00 00 00 00 5A 4F
3E80:5E 5E 5E 5E 5E 5E 5E 5E FC
3E88:5E BE BE BE AA AA AA AA A7
3E90:AA AA FF FF FF 00 00 00 0D
3E98:00 00 00 00 00 00 00 00 15
3EA0:00 00 00 00 00 00 00 00 1D
3EA8:00 00 00 00 00 00 00 00 25
3EB0:00 00 00 00 00 00 00 00 2D
3EB8:00 00 00 00 00 00 00 5A 8F
3EC0:6A A5 5E 6A A5 5E 6A A5 6F
3EC8:5E 6A AB FE 6A AA AA 6A 32
3ED0:AA AA 7F FF FF 00 00 00 3D
3ED8:00 00 00 00 00 00 00 00 55
3EE0:00 00 00 00 00 00 00 00 5D
3EE8:00 00 00 00 00 00 00 00 65
3EF0:00 00 00 00 00 00 00 00 6D
3EF8:00 00 00 00 00 00 00 00 75
3F00:55 55 50 AA AA B0 AA AA 4B
3F08:B0 AA AA B0 5A 5A B0 5E E5
3F10:5E B0 5E 5E B0 5E 5E B0 08
3F18:BE BE B0 AA AA B0 AA AA 7E
3F20:B0 AA AA B0 5A 5A B0 5E FD
3F28:5E B0 5E 5E B0 5E 5E B0 20
3F30:BE BE B0 AA AA B0 AA AA 96
3F38:B0 AA AA B0 5A 5A B0 A5 5D
3F40:55 55 55 AA AA AA AA 14
3F48:AA AA AA AA 5A 5A EA 25
3F50:5E 5E EA 5E 5E EA 5E 5E 92
3F58:EA BE BE AA AA AA AA 7E
3F60:AA AA AA AA 5A 5A AA FC
3F68:5E 5E AA 5E 5E AA 5E 5E A1
3F70:AA BE BE AA AA AA AA 76
3F78:AA AA AA AA 5A 5A C0 2B
3F80:55 55 55 AA AA AA AA 54
3F88:AA AA AA AA 55 55 55 07
3F90:55 55 55 55 55 55 55 0F
3F98:FF FF FF AA AA AA AA C1
3FA0:AA AA AA AA 5A 5A 5A 5E 6E
3FA8:5E 5E 5E 5E 5E 5E 5E 27
3FB0:BE BE BE AA AA AA AA C0

```

```

3FB8:AA AA AA AA 5A 5A 5A C0 E8
3FC0:55 55 55 6A AA AA 6A AA 10
3FC8:AA 6A AA AA 65 55 55 65 C7
3FD0:55 55 65 55 55 65 55 91
3FD8:6B FF FF 6A AA AA 6A AA 33
3FE0:AA 6A AA AA 6A A5 5A 6A 58
3FE8:A5 5E 6A A5 5E 6A A5 5E BF
3FF0:6A AB FE 6A AA AA 6A AA 95
3FF8:AA 6A AA AA 6A A5 5A A5 AB

```

DEMO

```

FF 20 POKE53280,0:POKE53265,11
      POKE53281,0:PRINT"{CLR}"
      POKE53265,27
BA 30 POKE147,0:SYS57812"POP-U
      P",8,1:SYS62631
FX 40 POKE147,0:SYS57812"CALCU
      LATOR.SPR",8,1:SYS62631
EH 50 :
EB 60 SYS49752,1020:REM ENABLE
      POP-UP AND SET LINE TO
      {SPACE}BRANCH TO
MJ 70 :
KC 80 A$="{RED}{13 SPACES}COPY
      RIGHT 1992"+CHR$(13)
GE 90 A$=A$+"{4 SPACES}COMPUTE
      PUBLICATIONS, INTL, LTD
      "+CHR$(13)
EC 100 A$=A$+"{10 SPACES}ALL R
      IGHTS RESERVED":FORT=1T
      06:A$=A$+CHR$(13):NEXT
BJ 110 B$="{YEL}{9 SPACES}POP-
      UP DEMO PRESS <F1>":FOR
      T=1T06:B$=B$+CHR$(13):N
      EXT
AX 120 FORT=1TOLN(A$):PRINTMI
      D$(A$,T,1);:FORDL=1T040
      :NEXT:NEXT
GP 130 FORT=1TOLN(B$):PRINTMI
      D$(B$,T,1);:FORDL=1T040
      :NEXT:NEXT
MM 140 GOT0120
PM 150 :
PP 1000 REM POP-UP CALCULATOR
SX 1010 :
DQ 1020 V=53248:POKEV+21,0:S=2
      55:FORT=2040T02047:POK
      ET,S:S=S-1:NEXT
AX 1030 FORT=39T046:POKEV+T,12
      :NEXT:POKEV+37,15:POKE
      V+38,11:POKEV+28,255
DQ 1040 S=0:FORT=0T06STEP2:POK
      EV+T,32+S:S=S+48:NEXT
HK 1050 S=0:FORT=8T014STEP2:PO
      KEV+T,32+S:S=S+48:NEXT
RM 1060 FORT=1T07STEP2:POKEV+T
      ,98:NEXT:FORT=9T015STE
      P2:POKEV+T,140:NEXT
ES 1070 POKEV+29,255:POKEV+23,
      255:POKEV+21,255
GJ 1080 PRINT"{HOME}{5 DOWN}":
      FORT=1T07:PRINT"
      {RIGHT}{23 SPACES}":NE
      XT
QA 1090 POKEV+27,255:PRINT"
      {HOME}{7 DOWN}"TAB(15)
      "{2}C 7 8 9":PRINT
KK 1100 PRINTTAB(4)"{RED}M+ *
      {SPACE}+" % {3 SPACES}

```

```

      {2}. 4 5 6":PRINT
DH 1110 PRINTTAB(4)"{RED}MR /
      {SPACE}- = {3 SPACES}
      {2}0 1 2 3"
QX 1120 GOSUB1280
QM 1130 RT=V:O1$=OP$
JC 1140 GOSUB1290:V1=V:O2$=OPS
BK 1150 IF01$="+ THENRT=RT+V1
BE 1160 IF01$="- THENRT=RT-V1
MS 1170 IF01$="* THENRT=RT*V1
CH 1180 IF01$="/ ANDV1=0 THEN12
      10
SR 1190 IF01$="/ THENRT=RT/V1
SP 1200 IFLEN(STR$(RT)) < 12 THEN
      1230
HG 1210 PRINT"{HOME}{7 DOWN}
      {2 RIGHT}{6 SPACES}ERR
      OR":GETA$:IFAS<>"
      {HOME}"ANDA$<>"{CLR}"T
      HEN1210
XM 1220 GOT01120
GA 1230 PRINT"{HOME}{7 DOWN}
      {2 RIGHT}{11 SPACES}":
      PRINT"{HOME}{7 DOWN}"T
      AB(13-LEN(STR$(RT)))RT
AK 1240 IFO2$<>=" THENO1$=O2$:
      GOT01140
RB 1250 POKE198,0:WAIT198,1:GE
      TA$:IFAS$=" THEN1250
GP 1260 IFAS$="+ ORAS$="- ORAS$="
      * ORAS$="/ THENO1$=A$:G
      OT01140
HF 1270 D$="":C=0:DP=0:Z=0:GOS
      UB1310:GOT01130
XD 1280 PRINT"{HOME}{7 DOWN}
      {2 RIGHT}{BLU}
      {10 SPACES}0"
GE 1290 D$="":B$="{11 SPACES}":
      C=0:DP=0:Z=0
MP 1300 POKE198,0:WAIT198,1:GE
      TA$
BM 1310 IFAS$="{HOME}"ORAS$="
      {CLR}" THENCLR:GOT01120
QC 1320 IFZAND(A$="+ ORAS$="- "O
      RA$="* ORAS$="/ ORAS$="
      ") THENOP$=A$:V=VAL(D$)
      :RETURN
ME 1330 IFAS$=" ANDDP=0 THENDP=
      1:GOSUB1370:GOT01360
PK 1340 IFASC(A$) < 48 ORASC(A$) >
      57 ORC > 9 THEN1300
DG 1350 IFAS$="0" ANDDP=0 ANDVAL(
      D$)=0 THENGOSUB1390:GOT
      01300
DE 1360 D$=D$+A$:PRINT"{HOME}
      {7 DOWN}"TAB(2)LEFT$(B
      $,11-LEN(D$))D$:C=C+1:
      Z=1:GOT01300
SD 1370 IFVAL(D$)=0 THEND$="0":
      C=1:Z=1
JG 1380 RETURN
RA 1390 PRINT"{HOME}{7 DOWN}
      {2 RIGHT}{10 SPACES}0"
      :Z=1:RETURN

```

Richard Penn is a prolific Commodore programmer who lives in Montreal, Quebec, Canada.

MIMIC 128

By Joseph Sheppard

I set out to design this diversion just to show my parents that all my hours in front a computer weren't a waste of time. Mimic 128 does a good job of showing off how easy it is to use the 128's sound and graphic commands in BASIC.

Mimic 128 is a simple but entertaining game that's similar to the hand-held electronic game Simon Says. The computer lights one of four colored panels at random and plays a corresponding musical tone. You're to press the joystick up, down, left, or right to light the same panel in response. If you're successful, the computer will repeat the sequence, adding an additional panel each time to the series. The object is to mimic the computer, lighting the same sequence of panels.

Entering the Program

Mimic 128 is written entirely in BASIC 7. To help avoid typing errors, enter the program with The Automatic Proofreader; see "Typing Aids" elsewhere in this section. Be sure to save a copy of the program to tape or disk before you exit Proofreader.

High Scores

For those with a competitive nature, Mimic 128 has a high-score sequential file named MM.HS that keeps track of the best player's name, date, and the number of panels he or she has properly responded to. The first time the program is run, MIMIC searches for this file. Since no such file exists, the first player will beat a high score of 0. The first player is guaranteed a spot on the disk for at least one session, no matter how badly he or she plays.

Tape Support

Players using tape drives should modify the OPEN statements in lines 35 and 30120 to ,1 instead of ,8. Also, tape users should immediately play a game to establish the high-score file directly behind the section of tape where the game file has been saved.

After you finish a game, the computer will check to see if you made the high score. If so, you'll be asked for the appropriate information. After a game, you'll be presented with a menu whose choices consist of Try again,

Continue, and End. Select Continue if you wish to continue with the current game. The computer won't accept a high score based on the continuation of an old game, however. Try again starts a new game, and End returns you to BASIC.

One last note: Be sure to explore the sound capabilities of your machine. Feel free to alter the sound envelopes, producing different tones and sounds for each panel. You can also make the final sound of the game (the one generated when you mess up) a little less dramatic and frightening.

MIMIC 128

```
MM 5 REM COPYRIGHT 1992 - COMPUTE PUBLICATIONS INTL LTD
    - ALL RIGHTS RESERVED
CG 10 DIM MD$(60),MC(60),MC$(60)
QR 20 COLOR0,1:COLOR4,1
EE 30 PRINT "{CLR}":PRINT "DIFFICULTY LEVEL (1-EASIER TO 5-BORING)":GETKEYDL
RE 32 IFDL<ORDL>5 THEN30
FG 35 OPEN2,8,2,"MM.HS,S,R"
RB 36 INPUT#2, ZN$(1),ZZ$(1),ZD$(1)
PG 37 DCLOSE
MB 38 ZZ(1)=VAL(ZZ$(1))
SJ 60 PRINT "{CLR}":FORZ=1TO12:PRINT:NEXTZ:PRINT "{12 SPACES}SETTING UP BOARD":PRINT "{10 SPACES}TEN SECONDS, PLEASE.":SLEEP2
QE 70 FAST
RR 80 GOSUB10000
HP 90 SLOW
QS 100 NT=RND(TI):NT=INT(RND(1)*4+1)
XA 110 NT$=STR$(NT)
RQ 120 IFNT=1THENNN$="C":X=17:Y=9:C=6
QX 130 IFNT=2THENNN$="D":X=26:Y=12:C=7
JK 140 IFNT=3THENNN$="E":X=17:Y=15:C=8
PX 150 IFNT=4THENNN$="F":X=9:Y=12:C=3
EF 160 MS$=MS$+NN$
FK 170 COLOR2,2:FORZ=1TO600:NEXTZ:GOSUB20000
SA 180 A$=""
KS 190 FORT=1TO(LEN(MS$))
MM 200 MC(T)=JOY(2)
MX 202 IFMC(T)=1THENMC$(T)="C":X=17:Y=9:C=6:GOTO210
GD 203 IFMC(T)=3THENMC$(T)="D":X=26:Y=12:C=7:GOTO210
QS 204 IFMC(T)=5THENMC$(T)="E":X=17:Y=15:C=8:GOTO210
JA 205 IFMC(T)=7THENMC$(T)="F":X=9:Y=12:C=3:GOTO210
```

```
HS 206 GOTO200
SS 210 IFMC$(T)<>MD$(T)THEN240
SD 220 CHAR2,X-1,Y,"CORRECT"
KJ 221 PLAYMC$(T)
GA 222 FORZ=1TODL+75:NEXTZ
XK 224 COLOR3,C
KR 226 CHAR3,X-1,Y,"{7 SPACES}"",1
CF 234 A$=A$+MC$(T)
JP 236 NEXTT
DA 238 IFAS=MS$THEN100
XQ 240 SOUND2,2500,60,2,2470,2,1,3048
SH 243 SOUND3,2000,50,2,,3,3
QF 990 PRINT"YOU GOT";LEN(MS$)-1;"CORRECT!":SLEEP3
XK 994 IFQ=0THENGOSUB30000
GK 995 FORZ=1TO24:PRINT:NEXTZ:INPUT"{BLU}DO YOU WISH {SPACE}TO (T)RY AGAIN,(C)ONTINUE{3 SPACES}OR (E)ND";M$
KJ 996 IFM$="T"THENQQ=0:PRINT:PRINT:PRINT:A$="" :MS$="" :PRINT:PRINT:PRINT:GOTO100
SQ 997 IFM$="C"THENQQ=1:PRINT:PRINT:PRINT:GOTO170
GG 998 GRAPHIC0,1:END
QJ 10000 REM **{2 SPACES}GRAPHIC SETUP{2 SPACES}**
MH 10001 REM **{2 SPACES}PLAYING BOARD{2 SPACES}**
HQ 10005 GRAPHIC4,1,23:COLOR1,2
SH 10100 WIDTH2:DRAW1,28,46TO73,46TO78,53TO83,46TO127,46TO142,75TO142,123TO127,152TO83,152TO78,145TO73,152TO28,152TO14,125TO14,74TO28,46:WIDTH1
FB 10110 DRAW1,51,66TO105,66TO85,90TO71,90TO51,66
AR 10120 DRAW1,72,109TO84,109TO104,132TO51,132TO72,109
EH 10130 DRAW1,95,93TO115,75TO129,75TO129,123TO115,123TO95,105TO95,93
GC 10140 DRAW1,61,105TO61,93TO41,75TO29,75TO29,123TO041,123TO61,105
AQ 10200 COLOR1,16:COLOR2,3:COLOR3,7
GR 10210 PAINT2,50,100,1
ED 10220 PAINT3,101,100,1
DG 10230 COLOR2,6:COLOR3,8
ES 10240 PAINT2,60,75,1
SB 10250 PAINT3,75,120,1
GD 10300 CHAR1,17,12,"MIMIC"
AB 10999 RETURN
FR 20000 REM{2 SPACES}***{2 SPACES}LIGHT UP PANEL{2 SPACES}***
RB 20100 FORT=1TOLEN(MS$)
KK 20110 MD$(T)=MID$(MS$,T,1)
```



```

GH 20120 NEXTT
HD 20130 FORT=1TOLN(MS$)
JD 20140 PLAYMDS(T)
BD 20142 IFMDS(T)="C"THENX=17:
Y=9:C=6
DD 20144 IFMDS(T)="D"THENX=25:
Y=12:C=7
QH 20146 IFMDS(T)="E"THENX=17:
Y=15:C=8
XC 20148 IFMDS(T)="F"THENX=9:Y
=12:C=3
RQ 20150 CHAR2,X,Y,"PRESS"
KM 20160 FORZ=1TODL*100:NEXTZ
QB 20170 COLOR3,C
AS 20180 CHAR3,X,Y,"{5 SPACES}
",1
ER 20190 NEXTT
FG 20199 RETURN
JP 30000 MS=LEN(MS$)-1
EM 30010 IFMS<ZZ(1) THENRETURN
QD 30020 GRAPHIC0,1
DK 30030 PRINT"{RED}CONGRADULA
TIONS! YOU HAVE JUST
{SPACE}BEAT THE
{2 SPACES}PREVIOUS RE
CORD OF"
BF 30040 PRINT"{GRN} ";ZZ(1);"
{RED} SET BY {GRN}";Z
NS(1);" {RED}ON {GRN}
";ZDS(1);"{RED}"
CX 30050 GETKEYAS
RA 30060 PRINT:INPUT"WHAT IS Y
OUR NAME";ZNS(1)
ER 30070 INPUT"WHAT IS TODAY'S
DATE";ZDS(1)
PA 30080 ZZ(1)=MS:GS=CHRS(13)
JB 30100 PRINT:PRINT"{BLU}ONE
{SPACE}MOMENT; SAVING
SCORES..."
RP 30110 SCRATCH"MM.HS"
RJ 30120 OPEN2,8,2,"MM.HS,S,W"
EE 30130 PRINT#2,ZNS(1)GS ZZ
(1)GS ZDS(1)
QS 30140 DCLOSE
HK 30150 GRAPHIC4,0,23
AD 30160 RETURN

```

Joseph Sheppard lives in West Fork, Arkansas.

SPEEDPURGE

By Daniel Lightner

SpeedCheck is a popular utility program that checks for misspelled words in any SpeedScript word processing document. It examines text word by word, comparing words in the document with entries in its dictionary. If the program comes across a word it doesn't recognize, it highlights the word on your screen so that you can correct any misspellings immediately. If SpeedCheck comes across a correctly spelled word that isn't in its dictionary, it will also highlight that word. These new words can then be added to

SpeedCheck's dictionary. As you work with SpeedCheck, you can create your own personalized dictionary disks, which may contain thousands of words.

Words on the SpeedCheck dictionary disk are kept in sequential files, with one file for each of the 26 letters of the alphabet. As new words are added, they are tacked onto the end of the appropriate file. This makes adding words to the dictionary fast and simple, but it makes looking up words slower because words are added in random—rather than alphabetical—order. Within the file for Z, for example, *zebra* might be found between *zymurgy* and *zipper*.

The only way to find a particular item in randomly ordered data is to search sequentially from the first item until the desired item is found. Thus, when SpeedCheck looks up a word, it must hunt through all the words with the same initial letter before it can determine whether or not that word is present.

People who use SpeedCheck know how easy it is to have dictionary files containing duplicate words. SpeedCheck's Disk Manager program can help, but it's difficult to find duplicates if there are many words between them. Sometimes there may be three or four duplicate words hogging space on the disk, slowing down SpeedCheck.

Purging files manually for duplicate words can be a tedious task for a human, but it's an ideal chore for a computer. SpeedPurge is just such a utility. It searches SpeedCheck dictionary files for duplicate words and deletes them.

Entering the Program

SpeedPurge is a fairly short BASIC program. To help avoid typing errors, however, enter the program with The Automatic Proofreader. See "Typing Aids" elsewhere in this section. When you've finished typing, be sure to save the program to disk.

Purging Your Files

SpeedPurge is easy to use; just load and run it. When you're ready to start, place the disk containing the SpeedCheck dictionary files in drive 8. SpeedPurge prompts for a filename, and you enter the letter of the alphabet that represents the file that you wish to check. For example, press A to check the A file and B to check the B file.

SpeedPurge reads the file into an array and converts it to ASCII format. Then it checks the entire file for duplicate words. When SpeedPurge finds a match, it displays the word and the locations in the file where the match was found. Then it deletes one of the pair. It then continues searching until another match is found or until the entire file has been checked. When it has finished checking the file, SpeedPurge asks whether or not you wish to save the corrected file. Obviously, if no matches were found, there would be no need to save the file. Press N if you don't want to save it; press Y if you do.

After it has finished saving the file, SpeedPurge asks if you wish to check another file. Type Y to continue checking files or N to exit SpeedPurge.

SPEEDPURGE

```

SH 5 REM COPYRIGTH 1992
HK 10 REM COMPUTE PUBLICATIONS
INTL LTD
MP 15 REM ALL RIGHTS RESERVED
RG 20 CLR:DIMA$(500):OPEN15,8,
15
PK 25 PRINT"{CLR}{DOWN}
{12 RIGHT}{7}SPEEDPURGE
{2 DOWN}"
EG 30 POKE53280,0:POKE53281,0
EC 35 INPUT"{BLU}FILE {RED}(A-
Z) {BLU}";F$
XR 40 IFLN(F$)>1THEN25
PD 45 IFASC(F$)<65ORASC(F$)>90
THEN25
PS 50 OPEN2,8,2,"0:"+F$+"",S,R"
:GOSUB225:B$=F$:X=1:POKE
781,2:SYS65478:SYS65487
BG 55 SYS65487:A=PEEK(780)
KA 60 IFA>127THENA=A-64:B$=B$+
CHRS(A):A$(X)=B$:B$=F$:X
=X+1:GOTO80
CR 65 IFA=39THEN75
DH 70 IFA<64THENA=A+64
JM 75 B$=B$+CHRS(A)
QJ 80 IFST=0THEN55
QE 85 CLOSE2:POKE781,0:SYS6547
8:X=X-1
KS 90 Z=1
PQ 95 IT=0:PRINT"{DOWN}{7}":FO
RT=ZTOX:A$=A$(T):PRINT"
{UP}{8 SPACES}{8 LEFT}";
T:"-";X:FORR=1TOX
EQ 100 IFA$=A$(R)THENIFR<>TTHE
NGOSUB220
FS 105 NEXTR,T
KA 110 IFIT=0THEN125
AG 115 IFIT=XTHENX=X-1:GOTO95
RP 120 FORT=ITOX-1:A$(T)=A$(T
+1):NEXTT:X=X-1:GOTO95
FA 125 PRINT"{BLU}":FORT=1TOX:
PRINT;A$(T):A$(T)=RIGH
T$(A$(T),LEN(A$(T))-1)

```


PROGRAMS

```

EP 130 B$="":FORR=1TOLEN(A$(T)
)-1:A=ASC(MID$(A$(T),R,
1)):IFA>63THENA=A-64
MB 135 B$=B$+CHR$(A):NEXTR:A=A
SC(RIGHT$(A$(T),1)):A=A
+64:B$=B$+CHR$(A)
SJ 140 A$(T)=B$:NEXTT
SR 145 PRINT"{DOWN}{7}SAVE THI
S FILE {RED}Y/N"
RE 150 GETA$:IFA$=""THEN150
GP 155 IFA$="N"THEN190
FG 160 IFA$<"Y"THEN150
AR 165 PRINT#15,"S0:"+F$:GOSUB
230
QS 170 OPEN2,8,2,"0:"+F$+"S,W
":POKE781,2:SYS65481:PO
KE780,13:SYS65490
PK 175 FORT=1TOX:FORR=1TOLEN(A
$(T)):A$=MID$(A$(T),R,1
):A=ASC(A$):POKE780,A
AD 180 SYS65490
JS 185 NEXTR,T:CLOSE2:POKE781,
3:SYS65481:GOSUB230
KG 190 PRINT"{DOWN}{3}FINISHED
!"
RK 195 PRINT"{DOWN}{7}DO ANOTH
ER FILE {RED}Y/N"
CS 200 GETA$:IFA$=""THEN200
KG 205 IFA$="Y"THEN200
XX 210 IFA$="N"THENCLOSE15:END
XX 215 GOTO200
JD 220 PRINT"{DOWN}{BLU}FOUND
{SPACE}A MATCH! {RED}";
CHR$(34);A$(R);CHR$(34)
;" {BLU}";T;"{RED}&
{BLU}";R
GA 225 Z=T:IT=R:T=X:R=X:RETURN
SS 230 INPUT#15,EN,EM$,ET,ES
MF 235 PRINT"{DOWN}{RED}"EN;EM
$;ET;ES:IFEN>1THENCLOSE
15:STOP
MF 240 RETURN

```

Daniel Lightner programs and raises Himalayan cats in Sidney, Montana.

ALPHABETIZER

By Todd Piltingsrud

As many 64 and 128 programmers know from experience, original and public domain programs can quickly fill up your disk library. Finding a desired file is no problem when there are only a few programs on a disk, but when file after file scrolls by during a directory listing, it can be a hassle. Wouldn't it be easier if all files were in alphabetical order?

Alphabetizer was written as a solution to that problem. It reads a disk directory, reorganizes it, and then saves it back to disk in alphabetical order. The directory stays in alphabetical order until you add additional files or programs.

Alphabetizer consists of two pro-

grams. The main program is in BASIC. To help avoid typing errors, enter it with The Automatic Proofreader. See "Typing Aids" elsewhere in this section. Be sure to save a copy of the program before you exit Proofreader.

This program loads a short machine language program. You'll have to use MLX, our machine language program, to enter it. Save it with the name ALPHA.ML, as this is the name used by the BASIC program. When MLX prompts, respond with the following values.

Starting address: C000

Ending address: C147

Putting Disks in Order

Using Alphabetizer is simple. After running it, select a disk you want to alphabetize and place it in the drive. Press A to alphabetize it or press D to see its directory. When you have finished, press Q to quit.

ALPHABETIZER

```

CP 1 REM COPYRIGHT 1992 - COMP
UTE PUBLICATIONS INTL LTD
- ALL RIGHTS RESERVED
CG 5 IFPEEK(49152)<>160THENLOA
D"ALPHA.ML",8,1
QB 10 PRINT"{CLR}"TAB(11)"
{DOWN}{A}*****
{S}"
HQ 20 PRINTTAB(11)"_A - ALPHAB
ETIZE-" :PRINTTAB(11)"_D
{SPACE}- DIRECTORY
{2 SPACES}_"
HS 25 PRINTTAB(11)"_Q - QUIT
{7 SPACES}_" :PRINTTAB(11)
"{Z}*****{X}"
RM 27 POKE56,142:CLR:DIMEF$(14
4),SP$(144),SS$(144)
EX 30 GETA$:IFA$="A"THEN80
EA 40 IFA$="D"THENSYS49411:GOT
0680
QP 60 IFA$<"Q"THEN30
CB 70 PRINT"{CLR}";:END
DK 80 PRINT"{DOWN}READING DIRE
CTORY";:OPEN1,8,15,"I":G
OSUB660:CLOSE1
PS 90 SYS49152:I1=PEEK(7):PRIN
T"FILES"
KR 230 PRINT"{DOWN}ALPHABETIZI
NG":FORT=1TOI1:SP$(T)=S
P$(T)+FP$(T):NEXT
KP 240 N=I1:LI=1:B(LI)=N+1:M=1
DD 250 J=B(LI):I=M-1:IFJ-M<3TH
EN360
JD 260 MI=INT((I+J)/2)
KM 270 I=I+1:IFI=JTHEN320
MB 280 IFSP$(I)<=SP$(MI)THEN27
0
KX 290 J=J-1:IFI=JTHEN320

```

```

RX 300 IFSP$(J)>=SP$(MI)THEN29
0
PX 310 SP$=SP$(I):SP$(I)=SP$(J
):SP$(J)=SP$:GOTO270
EH 320 IFI>MITHENI=I-1
XS 330 IFJ=MITHEN350
QC 340 SP$=SP$(I):SP$(I)=SP$(M
I):SP$(MI)=SP$
KR 350 LI=LI+1:B(LI)=I:GOTO250
BC 360 IFJ-M<2THEN390
EM 370 IFSP$(M)<SP$(M+1)THEN39
0
BC 380 SP$=SP$(M):SP$(M)=SP$(M
+1):SP$(M+1)=SP$
GR 390 M=B(LI)+1:LI=LI-1:IFLI>
0THEN250
QM 400 FORT=1TOI1:FP$(T)=RIGHT
$(SP$(T),5):SP$(T)=LEFT
$(SP$(T),27):NEXT
PS 410 OPEN1,8,15,"I":GOSUB660
:OPEN8,8,8,"#":I2=1:PRI
NT"{DOWN}WRITING DIRECT
ORY"
EH 420 PRINT#1,"B-P";8;0
PP 430 C=0:READS:IFI1-I2<8THEN
PRINT#8,CHR$(0)CHR$(255
);:GOTO450
JB 440 PRINT#8,CHR$(18)CHR$(S)
;
DJ 450 PRINT#8,RIGHT$(FP$(I2),
3);:GOTO470
GE 460 PRINT#8,FP$(I2);
XD 470 PRINT#8,SP$(I2);
SA 480 IFI2=I1THEN510
PX 490 I2=I2+1:C=C+1:IFC<8THEN
460
HD 500 READS:PRINT#1,"U2";8;0;
18;S:GOTO420
CG 510 A$="" :FORT=1TO32:A$=A$+
CHR$(0):NEXT
SG 520 C=C+1:IFC=8THEN540
XA 530 PRINT#8,A$;:GOTO520
MR 540 READS:PRINT#1,"U2";8;0;
18;S:CLOSE8:SYS49411:GO
TO680
JH 550 DATA 4,1,7,4,10,7,13,10
,16,13,2,16,5,2,8,5,11,
8,14,11,17,14,3,17,6,3,
9,6
HQ 560 DATA 12,9,15,12,18,15,0
,18
RE 660 INPUT#1,A,B$,C,D:IFA=0T
HENRETURN
PP 670 PRINTA;B$;C;D
GQ 680 CLOSE1:PRINT"{DOWN}PRES
S RETURN"
CQ 690 GETA$:IFA$<">CHR$(13)THE
N690
AM 700 RUN

```

ALPHA.ML

```

C000:A0 08 20 EC C0 A9 00 85 D8
C008:02 A9 8E 85 03 A0 02 20 DD
C010:CF FF C8 D0 FA A9 00 F0 0F
C018:0E 20 CF FF 91 02 A5 90 13
C020:D0 0E C8 D0 F4 E6 03 91 8E
C028:02 C8 91 02 C8 4C 19 C0 99
C030:20 3B C1 38 A5 03 E9 8D E6
C038:85 03 A2 04 46 03 66 02 DE

```



```

C040:CA 10 F9 4C 9B C0 24 30 87
C048:A5 2F 85 03 A5 30 85 04 46
C050:A0 00 B1 03 DD 97 C0 F0 48
C058:15 A0 02 18 B1 03 65 03 B5
C060:48 C8 B1 03 65 04 85 04 E8
C068:68 85 03 4C 50 C0 C8 B1 6D
C070:03 DD 98 C0 D0 E3 18 A5 F5
C078:03 69 0A 95 03 A5 04 69 90
C080:00 95 04 60 A2 02 2C A2 06
C088:00 A9 03 18 75 03 95 03 3C
C090:A9 00 75 04 95 04 60 46 99
C098:D0 53 D0 A2 02 20 48 C0 7D
C0A0:A2 00 86 07 20 48 C0 A9 02
C0A8:00 85 FB A9 8E 85 FC A0 CA
C0B0:02 B1 FB F0 2B A0 00 A9 B3
C0B8:05 91 03 C8 A5 FB 91 03 51
C0C0:C8 A5 FC 91 03 20 87 C0 31
C0C8:A0 00 A9 1B 91 05 C8 18 CB
C0D0:A5 FB 69 05 91 05 C8 A5 79
C0D8:FC 91 05 20 84 C0 E6 07 DB
C0E0:A2 F8 A9 20 20 8B C0 C6 A0
C0E8:02 D0 C4 60 A9 08 AA 20 21
C0F0:BA FF A9 02 A2 46 A0 C0 55
C0F8:20 BD FF 20 C0 FF A2 08 4F
C100:4C C6 FF A0 00 20 EC C0 80
C108:20 D7 AA A0 04 20 A5 FF DC
C110:88 10 FA 48 20 A5 FF A8 FF
C118:68 AA 98 A4 90 D0 1C A0 78
C120:06 84 D3 20 CD BD E6 D3 4B
C128:20 A5 FF 20 16 E7 D0 F8 12
C130:20 D7 AA A5 C6 D0 04 A0 8B
C138:02 D0 D2 A9 08 20 C3 FF 2E
C140:4C CC FF 00 00 00 00 00 1D

```

Todd Piltingsrud has subscribed to Gazette for three years and has never seen a utility that alphabetizes a directory. So he wrote one. He lives in New Richland, Minnesota.

DUPLICATE 1541

By Daniel Lightner

When you want to copy files from one disk to another with Commodore BASIC, you must first load a file, swap disks, and then use the SAVE command. This process can become tedious when you copy a disk that contains numerous programs and files.

Unlike some computers, the 64/128 doesn't come with a built-in DISKCOPY command. Using a utility program to do the job for you is one way around this problem. Duplicate 1541 is just such a utility. With it and a 1541 disk drive, you can make exact copies of any floppy disk that isn't copy-protected.

Typing It In

Duplicate 1541 is written entirely in machine language, but it loads and runs like a BASIC program. To enter it, use MLX, our machine language entry pro-

gram; see "Typing Aids" elsewhere in this section. When MLX asks for starting and ending addresses, respond with the following values.

Starting address: 0801

Ending address: 0DA8

When you've finished typing in Duplicate 1541, be sure that you save a copy of the program to disk.

Making Copies

Before attempting to copy a disk, it's a good idea to place a tab over its write-protect notch. This is just a precaution in case an accident occurs during the copy process.

When you run Duplicate, it'll prompt you to place the source disk in drive 8. This is the disk that you wish to copy. After you press the space bar, Duplicate 1541 reads the disk name and ID and starts reading sectors into memory starting at track 1. When the computer's memory is filled, the program will prompt you to place a target disk in the drive. Remove the source disk, place a blank disk in the drive, and press the space bar.

Your blank disk doesn't have to be formatted; Duplicate 1541 automatically formats it for you. To copy an entire disk, this process must be repeated three more times. You'll be prompted when to swap disks.

Duplicate 1541 isn't exactly a speedster, but it'll get the job done. To boost the copying speed a bit, the program blanks the screen and sets the 1541 to 1540 mode. If your disk has only a few files on it, copying them manually may be faster.

Duplicate 1541 will inform you when the copying process is complete. You'll then be asked if you wish to make more copies. If you do, tap the Y key. Press the N key, and Duplicate 1541 will return your computer to BASIC. When it has finished all of its tasks, Duplicate 1541 restores the screen and returns the drive to 1541 mode.

DUPLICATE 1541

```

0801:0B 08 C8 07 9E 32 30 36 76
0809:31 00 00 00 A9 00 8D 20 3A
0811:D0 8D 21 D0 78 A5 01 29 A3
0819:FE 85 01 58 20 91 0B 20 2D
0821:CC FF A9 20 8D B2 02 20 2A

```

```

0829:EC 0A A9 08 20 B1 FF A9 59
0831:6F 85 B9 20 93 FF A0 00 71
0839:B9 93 0C 20 A8 FF C8 C0 26
0841:0B D0 F5 20 AE FF A9 08 9C
0849:20 B1 FF A9 6F 85 B9 20 95
0851:93 FF A0 00 B9 9E 0C 20 BF
0859:A8 FF C8 C0 09 D0 F5 20 7A
0861:AE FF A2 02 20 C6 FF A0 F9
0869:00 A2 00 20 CF FF C9 A0 D6
0871:F0 04 9D 38 03 E8 C8 C0 40
0879:12 D0 F0 A9 2C 9D 38 03 CA
0881:E8 A0 00 20 CF FF 9D 38 22
0889:03 E8 C8 C0 02 D0 F4 8E 46
0891:34 03 A2 00 20 C6 FF 20 0D
0899:E3 0A A2 00 20 EB 0B 20 59
08A1:43 09 20 06 0B A9 02 20 1D
08A9:C3 FF 20 B4 0B 20 9F 0B 0E
08B1:20 E3 0A A2 00 20 EB 0B 99
08B9:20 A2 09 20 EC 0A 20 E3 59
08C1:0A A2 01 20 EB 0B 20 43 B0
08C9:09 20 06 0B 20 E3 0A A2 1F
08D1:01 20 EB 0B 20 A2 09 20 56
08D9:EC 0A 20 E3 0A A2 02 20 24
08E1:EB 0B 20 43 09 A2 03 20 DB
08E9:EB 0B 20 43 09 A2 04 20 E5
08F1:EB 0B 20 43 09 20 06 0B D2
08F9:20 E3 0A A2 02 20 EB 0B F1
0901:20 A2 09 A2 03 20 EB 0B 92
0909:20 A2 09 A2 04 20 EB 0B A2
0911:20 A2 09 20 EC 0A 20 E3 B2
0919:0A A2 05 20 EB 0B 20 43 8A
0921:09 A2 06 20 EB 0B 20 43 32
0929:09 20 06 0B 20 E3 0A A2 80
0931:05 20 EB 0B 20 A2 09 A2 3C
0939:06 20 EB 0B 20 A2 09 4C 6E
0941:69 0B A9 08 20 B1 FF A9 F1
0949:6F 85 B9 20 93 FF A0 00 8B
0951:B9 A7 0C 20 A8 FF C8 C0 45
0959:07 D0 F5 20 A3 0A 20 AE 18
0961:FF 20 B7 FF C9 00 D0 F9 5C
0969:A2 02 20 C6 FF A0 00 20 60
0971:CF FF 91 FB C8 C0 00 D0 77
0979:F6 A2 00 20 C6 FF 20 3C 64
0981:0A 20 D5 0A AD CF 02 CD 7A
0989:CB 02 D0 0F AD CD 02 CD 83
0991:C7 02 D0 01 60 20 2C 0A 18
0999:4C 43 09 20 22 0A 4C 43 DA
09A1:09 A2 02 20 C6 FF A9 08 B4
09A9:20 B1 FF A9 6F 85 B9 20 F7
09B1:93 FF A0 00 B9 B5 0C 20 7E
09B9:A8 FF C8 C0 07 D0 F5 20 CC
09C1:AE FF A2 02 20 C9 FF A0 68
09C9:00 B1 FB 20 D2 FF C8 C0 B2
09D1:00 D0 F6 A2 03 20 C9 FF 4D
09D9:20 3C 0A A9 08 20 B1 FF 0B
09E1:A9 6F 85 B9 20 93 FF A0 E0
09E9:00 B9 AE 0C 20 A8 FF C8 6D
09F1:C0 07 D0 F5 20 A3 0A 20 63
09F9:AE FF 20 B7 FF C9 00 D0 DA
0A01:F9 20 D5 0A AD CF 02 CD F3
0A09:CB 02 D0 0F AD CD 02 CD 05
0A11:C7 02 D0 01 60 20 2C 0A 99
0A19:4C A2 09 20 22 0A 4C A2 93
0A21:09 18 AD CF 02 69 01 8D B7
0A29:CF 02 60 18 AD CD 02 69 45
0A31:01 8D CD 02 18 A9 00 8D F7
0A39:CF 02 60 A9 08 20 B4 FF 86
0A41:A9 6F 85 B9 20 96 FF 20 CD
0A49:A5 FF 8D E0 02 C9 30 D0 58
0A51:0D 20 A5 FF 8D E1 02 C9 6A

```


PROGRAMS

```

0A59:30 D0 09 4C AB FF 20 A5 E2
0A61:FF 8D E1 02 A0 02 20 A5 28
0A69:FF 99 E0 02 C8 C9 0D D0 78
0A71:F5 20 AB FF A9 08 20 C3 6F
0A79:FF 20 40 B0 20 CC FF A9 2C
0A81:0D 20 D2 FF A9 1D 20 D2 53
0A89:FF 20 D2 FF A0 00 B9 E0 59
0A91:02 20 D2 FF C8 C9 0D D0 61
0A99:F5 68 68 68 68 A0 17 4C 96
0AA1:6E 0B AE CD 02 A9 00 20 39
0AA9:0A 0C A0 00 B9 FB 02 20 BB
0AB1:A8 FF C8 CC B0 02 D0 F4 24
0AB9:A9 20 20 A8 FF AE CF 02 95
0AC1:A9 00 20 0A 0C A0 00 B9 EB
0AC9:FB 02 20 A8 FF C8 CC B0 58
0AD1:02 D0 F4 60 18 A5 FB 69 78
0AD9:00 85 FB A5 FC 69 01 85 3E
0AE1:FC 60 A9 A8 85 FB A9 0D C8
0AE9:85 FC 60 20 40 0B A0 00 7D
0AF1:B9 C2 0C 20 D2 FF C8 C0 FF
0AF9:2C D0 F5 20 E4 FF C9 20 F3
0B01:D0 F9 4C 19 0B 20 40 0B 7D
0B09:A0 00 B9 ED 0C 20 D2 FF 0C
0B11:C8 C0 2C D0 F5 4C FC 0A 33
0B19:20 9F 0B AD 11 D0 29 EF 71
0B21:8D 11 D0 A9 08 20 B1 FF 1B
0B29:A9 6F 85 B9 20 93 FF A0 2C
0B31:00 B9 BC 0C 20 A8 FF C8 7A
0B39:C0 03 D0 F5 4C AE FF A9 B0
0B41:02 20 C3 FF AD 11 D0 09 35
0B49:10 8D 11 D0 A9 08 20 B1 59
0B51:FF A9 6F 85 B9 20 93 FF 8D
0B59:A0 00 B9 BF 0C 20 A8 FF 25
0B61:C8 C0 03 D0 F5 4C AE FF B7
0B69:20 40 0B A0 00 B9 18 0D 2F
0B71:20 D2 FF C8 C0 33 D0 F5 43
0B79:20 E4 FF C9 00 F0 F9 C9 F6
0B81:4E F0 07 C9 59 F0 06 4C 5F
0B89:79 0B 4C E2 FC 4C 20 08 38
0B91:A0 00 B9 4B 0D 20 D2 FF 72
0B99:C8 C0 5D D0 F5 60 A9 01 82
0BA1:A2 92 A0 0C 20 BD FF A9 24
0BA9:02 A2 08 A0 02 20 BA FF 7A
0BB1:4C C0 FF A9 4E 8D 35 03 CE
0BB9:A9 30 8D 36 03 A9 3A 8D 86
0BC1:37 03 18 AD 34 03 69 03 95
0BC9:8D 34 03 AD 34 03 A2 35 17
0BD1:A0 03 20 BD FF A9 0F A2 40
0BD9:08 A0 0F 20 BA FF 20 C0 D6
0BE1:FF A9 0F 20 C3 FF 20 3C E0
0BE9:0A 60 BD 76 0C 8D C5 02 60
0BF1:8D CD 02 BD 7D 0C 8D 07 5D
0BF9:02 BD 84 0C 8D C9 02 8D F6
0C01:CF 02 BD 8B 0C 8D CB 02 22
0C09:60 8D B4 02 8E B3 02 A2 55
0C11:00 8E B0 02 A2 09 8E B5 0F
0C19:02 A0 B0 AD B3 02 DD 56 03
0C21:0C AD B4 02 FD 57 0C 90 57
0C29:0F 8D B4 02 AD B3 02 FD 21
0C31:56 0C 8D B3 02 C8 D0 E3 1D
0C39:98 CA F0 11 C9 B0 F0 03 75
0C41:8D B5 02 2C B5 02 30 05 AB
0C49:AD B2 02 F0 05 29 7F 20 20
0C51:61 0C CA 10 C4 60 01 00 21
0C59:0A 00 64 00 E8 03 10 27 9D
0C61:8C B1 02 AC B0 02 99 FB F3
0C69:02 C9 20 F0 04 C8 8C B0 15
0C71:02 AC B1 02 60 01 09 11 36
0C79:12 19 1A 1F 08 10 11 18 D0
0C81:19 1E 23 00 00 00 00 12

```

```

0C89:00 00 14 14 14 12 11 11 81
0C91:10 23 55 31 20 32 20 30 72
0C99:20 31 38 20 30 42 2D 50 4C
0CA1:20 32 20 31 34 34 55 31 BB
0CA9:20 32 20 30 20 55 32 20 40
0CB1:32 20 30 20 42 2D 50 20 7A
0CB9:32 20 30 55 49 2D 55 49 41
0CC1:2B 0D 9A 20 20 50 55 54 49
0CC9:20 1C 53 4F 55 52 43 45 18
0CD1:20 9A 44 49 53 4B 20 49 0F
0CD9:4E 20 44 52 49 56 45 20 1D
0CE1:1C 50 52 45 53 53 20 53 36
0CE9:50 41 43 45 0D 9A 20 20 6A
0CF1:50 55 54 20 1C 54 41 52 1B
0CF9:47 45 54 20 9A 44 49 53 5F
0D01:4B 20 49 4E 20 44 52 49 D6
0D09:56 45 20 1C 50 52 45 53 0F
0D11:53 20 53 50 41 43 45 0D FA
0D19:96 20 20 43 4F 50 59 20 4D
0D21:43 4F 4D 50 4C 45 54 45 C4
0D29:44 20 21 21 21 0D 0D 9A 95
0D31:20 20 4D 41 4B 45 20 41 12
0D39:4E 4F 54 48 45 52 20 43 54
0D41:4F 50 59 3F 20 1C 59 2F 89
0D49:4E 0D 96 93 0D 20 20 44 47
0D51:55 50 4C 49 43 41 54 45 55
0D59:20 31 35 34 31 0D 9A 20 CC
0D61:20 43 4F 50 59 52 49 47 39
0D69:48 54 20 31 39 39 32 0D F3
0D71:20 20 43 4F 4D 50 55 54 AB
0D79:45 20 50 55 42 4C 49 43 B6
0D81:41 54 49 4F 4E 53 20 49 B8
0D89:4E 54 4C 20 4C 54 44 0D B4
0D91:20 20 41 4C 20 52 49 81
0D99:47 48 54 53 20 52 45 53 51
0DA1:45 52 56 45 44 0D 0D EA 6D

```

Daniel Lightner is a regular contributor who lives in Sidney, Montana.

RAILROAD SOLITAIRE

By Donald G. Klich

Have you ever been caught up in a simple game that's so challenging that you have a hard time turning it off? Railroad Solitaire for the 128 is just such a game.

This card game for one person was originally created to be used as a pastime while traveling by train, since little space was available for conventional games of solitaire. The object of the game is ultimately to discard the entire deck while working with only the four currently dealt cards.

Typing It In

Railroad Solitaire is written entirely in BASIC 7.0 and works with a 40-column screen. To help avoid typing errors, enter it with The Automatic Proofreader; see "Typing Aids" elsewhere in this section. Be sure to save a copy of the program before you exit Proofreader.

Playing a Hand

You may discard the middle two cards of the set of four that appear onscreen if the bracketing cards are of the same suit or value. If all four cards match in suit or value, then all four can be discarded. If you can't play, you must request another card. This card is placed at the right-hand side of the screen, and the card on the left is moved offscreen and temporarily "lost." When discards occur, lost cards from the left move back to fill the spaces. If you're lucky enough to have insufficient lost cards to fill in from the left, new cards will be dealt to fill in from the right.

Onscreen prompts will tell you which keys to press to discard or request cards. Unlike solitaire played with actual cards, this computerized version won't let you cheat or make an improper move.

When you've gone through the deck, discarding all that you can, the game will end, and you'll be informed of any remaining cards. You'll then have the opportunity to play again and better your score.

Be prepared for long hours of play to beat the odds. It took the author an hour to win, just so he could test all the logic involved.

RAILROAD SOLITAIRE

```

EQ 10 REM COPYRIGHT 1992 - COM
      PUTE PUBLICATIONS INTL L
      TD - ALL RIGHTS RESERVED
PR 20 REM $$ CONTAINS SUIT CHA
      RACTERS
MJ 30 REM $$$ CONTAINS SUIT PI
      XELS
KH 40 REM C CONTAINS SUIT COLO
      RS
CX 50 REM V$ CONTAINS CARD LAY
      OUT DATA
SB 60 REM DN CONTAINS DECK CAR
      D VALUES
FJ 70 REM DS CONTAINS DECK CAR
      D SUITS
BF 80 REM WN CONTAINS WORK CAR
      D VALUES
KB 90 REM WS CONTAINS WORK CAR
      D SUITS
GH 100 REM DP/WP ARE THE DECK/
      WORK POINTERS
CJ 110 DIMS$(4),V$(13),DN(52),
      DS(52),WN(52),WS(52):TS
      =52:Q=0
QH 120 C(0)=11:C(1)=1:C(2)=11:
      C(3)=1:C(4)=2

```



```

GQ 130 SS(0)=CHR$(154):SS(1)=C
HR$(152):SS(2)=CHR$(147
):SS(3)=CHR$(129):SS(4)
=CHR$(64)
GB 140 FORI=0TO51STEP13:FORJ=0
TO12:DN(I+J)=J:DS(I+J)=
I/13:NEXTJ:NEXTI
QG 150 VS(0)="A 03081656563236
"
HE 160 VS(1)="2 04081656563216
3256"
MH 170 VS(2)="3 05081656563216
32563236"
EP 180 VS(3)="4 06081656562416
401624564056"
FQ 190 VS(4)="5 07081656562416
4016245640563236"
AD 200 VS(5)="6 08081656562416
40162456405624364036"
HS 210 VS(6)="7 09081656562416
40162456405624364036324
6"
JG 220 VS(7)="8 10081656562416
40162456405624364036324
63227"
SA 230 VS(8)="9 11081656562416
40162456405624294029244
340433237"
BF 240 VS(9)="1012081656562416
40162456405624294029244
3404332223250"
FA 250 VS(10)="J 0208165656"
RK 260 VS(11)="Q 0208165656"
KE 270 VS(12)="K 0208165656"
MJ 280 VS(13)="{2 SHIFT-SPACE}
00"
BE 290 COLOR0,2:COLOR1,1:COLOR
4,2:GOSUB840:WIDTH2:GRA
PHIC2,1,21
SH 300 FORI=0TO3:CHAR1,0,10,SS
(I):DRAW1,3,8TO4,8TO4
,83TO3,83:SSHAPESS$(I),
0,80,7,87:NEXTI:CHAR1,0
,10,""
DB 310 REM ****SHUFFLE DECK
CH 320 PRINT"[BLK]{7 SPACES}I'
M SHUFFLING THE DECK":F
ORI=1TO100:F=INT(RND(1)
*51):T=INT(RND(1)*51):B
N=DN(F):BS=DS(F):DN(F)=
DN(T):DS(F)=DS(T):DN(T)
=BN:DS(T)=BS:NEXTI
HA 330 REM ****INITIAL SETUP
CS 340 FORDP=0TO3:WN(DP)=DN(DP
):WS(DP)=DS(DP):NEXT:WP
=DP:GOSUB770
KK 350 PRINT"[BLK]ENTER {CYN}C
{BLK}TO RECEIVE A CARD
":PRINT"ENTER {CYN}2
{BLK}TO DISCARD THE MID
DLE CARDS":PRINT"ENTER
{SPACE}{CYN}4 {BLK}TO D
ISCARD ALL CARDS":IFDP>
52THEN570
MQ 360 GETKEYS:IFZ$<"C"THEN4
20
QG 370 IFDP=52THEN570:ELSE:GOS
UB400:GRAPHIC2,1,21:GOS
UB770:GOTO350
RB 380 REM ****ROUTINE TO READ
A CARD
EP 390 IFDP>=52THENWN(WP)=13:W
S(WP)=4:WP=WP+1:RETURN
KB 400 WN(WP)=DN(DP):WS(WP)=DS
(DP):DP=DP+1:WP=WP+1:RE
TURN
MD 410 REM ****ROUTINE TO REMO
VE MIDDLE CARDS
MM 420 IFZ$<"2"THEN470
GE 430 IFWN(WP-4)=WN(WP-1)THEN
450
DA 440 IFWS(WP-4)<WS(WP-1)THE
NSOUND1,4000,5:GOTO350
PE 450 WN(WP-3)=WN(WP-1):WS(WP
-3)=WS(WP-1):WP=WP-2
DQ 460 IFWP>3THENGRAPHIC2,1,21
:GOSUB770:GOTO350:ELSE:G
OSUB390:GOTO460
JR 470 IFZ$<"4"THENSOUND1,400
0,5:GOTO350
RQ 480 REM ****ROUTINE TO REMO
VE ALL FOUR CARDS
KQ 490 IFWN(WP-4)<WN(WP-3)THE
N520
CS 500 IFWN(WP-3)<WN(WP-2)THE
N520
DQ 510 IFWN(WP-2)=WN(WP-1)THEN
WP=WP-4:GOTO460
SS 520 IFWS(WP-4)<WS(WP-3)THE
N550
AX 530 IFWS(WP-3)<WS(WP-2)THE
N550
JF 540 IFWS(WP-2)=WS(WP-1)THEN
WP=WP-4:GOTO460
MX 550 SOUND1,4000,5:GOTO350
FE 560 REM ****SAVE SCORE ROU
TINE
RB 570 SOUND1,8000,5:PRINT"
{BLK}GAME OVER. YOU HAD
";WP-Q;" CARDS REMAINI
NG":IFWP-Q<TSTHENTS=WP-
Q
MX 580 PRINT"YOUR BEST SCORE I
S ";TS
CE 590 Q=0:PRINT"PLAY AGAIN? Y
/N":GETKEYS:IFZ$="Y"TH
ENGRAPHIC2,1,21:GOTO320
XD 600 IFZ$="N"THENEND:ELSE570
QF 610 REM ****DISPLAY A CARD
HH 620 COLOR1,C(S):CHAR1,X+1,Y
+1,MID$(VS(V),1,2):IFV=
9THENCHAR1,X+6,Y+8,MID$
(VS(V),1,2):ELSECHAR1,X
+7,Y+8,MID$(VS(V),1,2)
GP 630 X=X*8:Y=Y*8
KA 640 FORI=0TO((VAL(MID$(VS(V)
),3,2)))-1)*4STEP4
KX 650 GSHAPESS$(S),X+VAL(MID$
(VS(V),5+I,2)),Y+VAL(MI
D$(VS(V),7+I,2)):NEXTI
DR 660 COLOR1,1:BOX1,4+X,4+Y,6
7+X,75+Y:COLOR1,8:IFV<
10THEN690
BH 670 CIRCLE1,36+X,40+Y,12,16
,90,270:CIRCLE1,36+X,40
+Y,4,8,90,270
GQ 680 DRAW1,40+X,40+YTO40+X,2
4+YTO48+X,24+YTO48+X,40
+Y:DRAW1,24+X,40+YTO32+
X,40+Y:PAINT1,28+X,44+Y
:GOTO750
GR 690 IFV<11THEN720
HM 700 CIRCLE1,36+X,40+Y,12,16
:CIRCLE1,36+X,40+Y,4,8:
PAINT1,28+X,40+Y
HH 710 DRAW1,36+X,54+YTO40+X,6
0+YTO47+X,60+YTO39+X,51
+Y:PAINT1,44+X,58+Y:GOT
O750
CG 720 IFV<12THENRETURN
BP 730 DRAW1,24+X,56+YTO24+X,2
4+YTO32+X,24+YTO32+X,56
+YTO24+X,56+Y:PAINT1,28
+X,28+Y:DRAW1,32+X,36+Y
TO40+X,24+YTO48+X,24+YT
O32+X,44+Y:PAINT1,44+X,
26+Y
DE 740 DRAW1,32+X,36+YTO40+X,5
6+YTO48+X,56+YTO36+X,32
+Y:PAINT1,40+X,48+Y
SX 750 WIDTH1:BOX1,19+X,16+Y,5
2+X,63+Y:WIDTH2:RETURN
BS 760 REM ****DISPLAY THE WIN
DOW
MM 770 FORZ=0TO3:V=WN(WP-4+Z):
S=WS(WP-4+Z):X=10*Z:Y=5
:IFV=13THENQ=Q+1
SG 780 GOSUB620:NEXTZ:IFQ=4THE
N820
DM 790 IFQ<2THENRETURN
BP 800 IFWN(WP-4)=WN(WP-3)THEN
820
FD 810 IFWS(WP-4)=WS(WP-3)THEN
820
XM 820 PRINT"{5 SPACES}YOU WIN
!!!!":SOUND1,10000,5:G
OTO590
FF 830 REM ****GAME INSTRUCTIO
NS
AB 840 GRAPHIC0,1:PRINT"{RED}
{5 DOWN}{11 SPACES}RAIL
ROAD SOLITAIRE":PRINT"
{BLU}{2 DOWN}THIS GAME
{SPACE}WAS INVENTED FOR
PLAYING ON A":PRINT"TR
AIN WHERE SPACE TO SPRE
AD OUT IS RARE."
AB 850 PRINT"{DOWN} THE IDEA O
F THE GAME IS TO DISCAR
D THE":PRINT"CARDS THAT
ARE BETWEEN END CARDS
{SPACE}OF THE":PRINT"SA
ME VALUE OR SUIT.
{2 SPACES}ALL FOUR CARD
S CAN"
FC 860 PRINT" BE DISCARDED IF
{SPACE}THEY ARE OF THE
{SPACE}SAME":PRINT"VALU
E OR THE SAME SUIT.":P
RINT" IF THERE IS NO PLA
Y GET THE NEXT CARD.":P
RINT"{3 DOWN}PRESS ANY
{SPACE}KEY TO START"
EH 870 GETKEYS:RETURN

```

Donald G. Klich lives in Mount Pros-
pect, Illinois.

128 GRAPHIC DUMP

Donald G. Klich

Here are two programs similar to the 128 text screen dumps submitted by Bruce Bowden (Screen Dump 128, December 1991). Rather than working with text, however, these programs will dump bitmapped graphic screens to your printer.

While you can't scale the pictures you send to a printer, you may select either of two different-sized printouts. Graphic Small prints a picture that is 40 x 25 characters in size, and Graphic Large prints one 80 x 50 characters. Both of these utilities are easy to install and use. They're also fairly short, so it won't take you long to type them in.

Typing It In

Graphic Small and Graphic Large are both written in BASIC. To help avoid typing errors, enter the programs with The Automatic Proofreader; see "Typing Aids" elsewhere in this section. Be sure to save copies of your programs before exiting Proofreader.

Printing Pictures

Load and run either program as you would a normal BASIC program. When you run either program, there will be a slight pause, and then the READY prompt will return. The programs use function keys f1, f2, and f3 and put machine language code in locations \$1300-\$13AS. After you run one of the programs, you can then load and run an application that contains a graphic screen. When you reach the point that you'd like a printout of the screen, press the Stop key. Make sure your printer is turned on and ready.

Small Pictures

If you're using Graphic Small, proceed by pressing f1. (Be sure your printer is turned on and ready.) The screen will be garbled and then go blank. At this point, press f2. Shortly after that, your picture will start to print. When the printout is complete, the picture onscreen will be ungarbled.

Large Pictures

To use Graphic Large, load and run the program and then run your graphics program as above. Press f1 and f2 to start the printing process, but press

f3 when the printing is complete to return to the applications program. You can continue with your graphics program by entering a CONT command.

These programs have been tested only on a Seikosha SP1000A and an Epson FX-80 printer, but they should work on other graphics printers, too. Make sure any printer interface you may be using is set for transparent mode.

For those interested in modifying these programs for other printers, two printer-control commands are used in lines 60 and 70 in Graphic Small. The first instructs the printer to suppress the vertical spacing between lines, and the second precedes each print-line set to instruct the printer to print in graphics mode. Note that abbreviated commands (uppercase characters) are used at times so that the required BASIC code will fit in the special area reserved for function key definitions.

GRAPHIC SMALL

```
EQ 10 REM COPYRIGHT 1992 - COMPUTE PUBLICATIONS INTL LTD - ALL RIGHTS RESERVED
CG 20 REM GRAPHIC SCREEN PRINTER FOR COMMODORE 128
SK 30 REM THIS PROGRAM, ONCE ACTIVATED WILL DUMP THE CURRENT GRAPHICS SCREEN
JX 40 REM TO THE PRINTER DEVICE 4. {2 SPACES} IT IS ACTIVATED BY THE F1 AND F2 KEYS,
AB 50 REM IN A 40 BY 25 CHARACTER DISPLAY
SM 60 KEY1,"OP1,4:PR1,CH(27)CH(65)CH(8):SYS4864:FAST"+CHR$(13)
JX 70 KEY2,"FOA=8192TO16191STE320:PR1,CH(27)CH(42)CH(4)CH(64)CH(1);:FOB=0TO319:PR1,CH(255-PEE(A+B));:NE:PR1:NE:SLOW:SYS4864:CL01:END"+CHR$(13)
GC 80 KEY3,"":KEY4,"":KEY5,"":KEY6,"":KEY7,"":KEY8,""
EB 90 FORQ=4864TO4987:READZ$:POKEQ,DEC(Z$):NEXT
GB 100 DATA 18,90,13,00,00,00,00,00,00,00,18,18,18,FF,FF,18,18,18,00,00,00,09,00,85,FB,A9,20,85,FC,A0,00,A2,00,B1,FB,99,03,13,C8,C0,08,D0,F6,A0,00,18,AD,15,13
HP 110 DATA 1E,03,13,69,00,E8,E0,08,F0,07,0A,8D,15,13,4C,2E,13,99,0B,13,A2,00,8E,15,13,C8,C0,08,D0,
```

```
DE,A2,00,A0,00,B9,0B,13,91,FB,EA,C8,C0,08,D0,F5,A0,00,18,A9,08
SM 120 DATA 65,FB,85,FB,A9,00,65,FC,85,FC,C9,3F,D0,07,A5,FB,C9,40,D0,01,60,4C,22,13
```

GRAPHIC LARGE

```
EQ 10 REM COPYRIGHT 1992 - COMPUTE PUBLICATIONS INTL LTD - ALL RIGHTS RESERVED
CG 20 REM GRAPHIC SCREEN PRINTER FOR COMMODORE 128
SK 30 REM THIS PROGRAM, ONCE ACTIVATED WILL DUMP THE CURRENT GRAPHICS SCREEN
EA 40 REM TO THE PRINTER DEVICE 4. IT IS ACTIVATED BY {SPACE}THE F1, F2 AND F3 KEYS
RC 50 REM IN A 80 X 50 CHARACTER DISPLAY
FG 60 KEY4,"":KEY5,"":KEY6,"":KEY7,"":KEY8,""
ES 70 KEY1,"OP1,4:PR1,CH(27)CH(65)CH(8):SYS4864:FAST:A$=CH(27)+CH(42)+CH(4)+CH(128)+CH(2):D=252:E=251:F=255"+CHR$(13)
KE 80 KEY2,"FOA=8192TO16191STE320:FOC=1TO2:PR1,CH(13);AS;:FOB=0TO319:POKE,(F-PEE(A+B)):POK(253,C:SYS4988:PR1,CH(PEE(D));CH(PEE(D));:NEB,C,A"+CHR$(13)
BS 90 KEY3,"SLOW:SYS4864:CL01"+CHR$(13)
JP 100 FORQ=4864TO5029:READZ$:POKEQ,DEC(Z$):NEXT
CG 110 DATA 18,90,13,00,00,00,00,00,00,00,18,18,18,FF,FF,18,18,18,00,00,00,09,00,85,FB,A9,20,85,FC,A0,00,A2,00,B1,FB,99,03,13,C8,C0,08,D0,F6,A0,00,18,AD,15,13
DE 120 DATA 1E,03,13,69,00,E8,E0,08,F0,07,0A,8D,15,13,4C,2E,13,99,0B,13,A2,00,8E,15,13,C8,C0,08,D0,DE,A2,00,A0,00,B9,0B,13,91,FB,EA,C8,C0,08,D0,F5,A0,00,18,A9,08
JP 130 DATA 65,FB,85,FB,A9,00,65,FC,85,FC,C9,3F,D0,07,A5,FB,C9,40,D0,01,60,4C,22,13,A5,FD,C9,01,F0,08,06,FB,06,FB,06,FB,06,FB,A9,00,85,FC,A2,04,18,06,FB,90,06,A9
FD 140 DATA 03,05,FC,85,FC,CA,F0,07,06,FC,06,FC,18,90,EB,60
```

Donald Klich, who lives in Mount Prospect, Illinois, is the 128 programmer who wrote Railroad Solitaire.

QUIZ WIZ

By Rizwaan Ahmed Khan

Quiz Wiz is a program for creating multiple-choice quizzes on the 64. The program is so easy to use that even a beginner can use it without reading the instructions. Just select the menu options.

Quiz Wiz lets the parent or teacher enter questions and answers on a variety of subjects. The program then creates a quiz in multiple-choice format with the correct answer and three wrong answers for each question. It provides the correct answers and a score when the student finishes the quiz.

When you enter a question and answer, you aren't required to supply three possible answers as alternate choices. The program asks the question and then supplies the correct answer along with three other choices that it selects at random from the other answers you've entered. The correct answer is never in a predictable location.

Entering the Program

Quiz Wiz is written entirely in BASIC. To help avoid typing errors, enter it with The Automatic Proofreader; see "Typing Aids" elsewhere in this section. Be sure to save a copy of the program before you exit Proofreader.

Make New Entries

When you first run the program, select the option to make new entries. You're then prompted to choose a subject. If the subject you want isn't on the screen, press the Up Arrow key and define the subject of your choice.

You may then enter questions and answers. Each question and answer is allowed a maximum of 80 characters. To exit during the input process, press the @ key and then press Return.

Continue Making Entries

Note the menu. If you wish to continue making entries, select the appropriate choice. If you select the option to make new entries, all work in memory will be erased.

Correction Mode

You can flip through your entries by pressing the < and > keys. When you find the question you want, press Return, and a small menu will appear.

This menu will allow you to fully edit or delete your entries. In this mode, you can rename the topic chosen by pressing the R key.

In correction mode you cannot enter the main menu by pressing the @ key. In this mode, you can use the cursor keys for more editing potential. After you've made any corrections, press Return to exit to the main menu.

Saving Files

When you've entered a minimum of four questions and their answers, you may then save your file. Save files by selecting that option from the main menu. If you try to save a file with a name that is already on the disk, the earlier version will first be scratched.

Loading Files

Load a saved file into memory anytime you want to take a quiz. Any entries that may still be in memory will be erased. After loading, you're automatically quizzed in multiple-choice format. To see a directory at any time, press the D key.

Scratching Files

Select this option from the main menu to erase any file on disk. You need only enter the filename to have the program erase it.

Quiz Time

A quiz begins right after loading, but if you've entered at least four questions, you can take a test immediately. Press the Commodore key; then press the letter next to the answer of your choice.

If you answer incorrectly, the correct answer will be displayed for a short time. At the end of the quiz, your mistakes will again be displayed. You can flip through them by pressing Return. This process lets you review your errors for as long as you wish. After reviewing the final mistake, the computer will display your score. You may then exit to the main menu by pressing f1 or take the quiz again by pressing the Commodore key.

Adding New Entries

You can exit the quiz at any time by pressing f1. To enter more questions, select the option from the menu to continue making entries.

Tape Support

Users with tape drives can easily alter the program to suit their needs. Change the OPEN commands in lines 390 and 1007 to tape format. Then delete lines 62, 80, 915, 930, 935, 980, 982, 985, 986, 987, 990, 992, 993, 995, and 997. These lines contain the routines for calling the disk directory and for scratching files.

QUIZ WIZ

```
ME 0 REM COPYRIGHT 1992 COMPUT
E PUBLICATIONS INTL LTD -
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PB 1 DIMD$(200):DIMES$(200):DIM
FS$(400):PRINTCHR$(8):PRIN
TCHR$(14)
MQ 5 PRINT"{CLR}{WHT}{2 DOWN}
{4 SPACES}{RVS}
{11 SPACES}{YEL}QUIZ WIZ
{WHT}{14 SPACES}":PRINT"
{6 SPACES}MENU:"
XD 10 PRINT"{DOWN}{6 SPACES}
{YEL}{RVS}PRESS (1) TO M
AKE NEW ENTRIES.":POKE53
281,2:POKE53280,6
XJ 15 IFES(4)<>"THENPRINT"
{DOWN}{6 SPACES}{RVS}
{YEL}PRESS (2) TO SAVE E
NTRIES."
XD 20 PRINT"{DOWN}{6 SPACES}
{RVS}{YEL}PRESS (3) TO L
OAD ENTRIES.":IFES(1)=""
THEN30
FX 25 PRINT"{DOWN}{6 SPACES}
{RVS}{YEL}PRESS (4) TO C
ONTINUE{OFF}{19 SPACES}
{RVS}MAKING ENTRIES."
CQ 30 IFES(1)<>"THENPRINT"
{DOWN}{6 SPACES}{RVS}
{YEL}PRESS (5) FOR CORRE
CTION MODE."
RK 35 PRINT"{DOWN}{6 SPACES}
{RVS}{YEL}PRESS (6) TO S
CRATCH FILES."
BD 40 PRINT"{DOWN}{6 SPACES}
{RVS}{CYN}PRESS F1 TO RE
TURN TO MENU.{DOWN}"
XG 45 PRINT"{12 SPACES}BY
{2 SPACES}RIZWAAN KHAN"
DF 46 PRINT"{HOME}{2 DOWN}":FO
RI=1TO19:PRINT"{WHT}
{4 RIGHT}{+}{31 RIGHT}
{+}{3 RIGHT}":NEXT
JE 50 PRINT"{4 SPACES}{RVS}
{33 SPACES}{OFF}";
BF 55 GETA$:IFA$="5"THENIFES(1
)<>"THENJ=1:GOTO715
BB 60 IFA$="1"THEN940
HA 62 IFA$="D"THEN980
AG 65 IFA$="2"ANDES(3)<>"THEN
360
MG 70 IFA$="3"THEN435
JX 72 IFA$="L"THEN1000
AF 75 IFA$="4"THENZES="1":GOTO
```


PROGRAMS

```

175
KP 80 IFAS="6"THEN915
MJ 85 IFPEEK(56321)=223ANDES(4
)<>"THENM=1:W=1:Q=0:GOT
0520
EK 90 GOTO55
XQ 95 PRINT"{OFF}{CLR}{HOME}
{3 DOWN}{10 SPACES}{PUR}
{RVS}DEFINE SUBJECT"
XQ 100 PRINT"{DOWN}{11 SPACES}
{WHT}1)MATH"
PE 105 PRINT"{DOWN}{11 SPACES}
2)ECONOMICS"
HF 110 PRINT"{DOWN}{11 SPACES}
3)SCIENCE"
KS 115 PRINT"{DOWN}{11 SPACES}
4)HISTORY"
MF 120 PRINT"{DOWN}{11 SPACES}
5)GEOGRAPHY"
BA 125 PRINT"{DOWN}{11 SPACES}
6)ENGLISH"
SD 127 PRINT"{DOWN}{11 SPACES}
↑)OTHER{2 SPACES}"
XS 130 GETAS:IFAS="1"THENN$="M
ATH":GOTO175
BE 135 IFAS="2"THENN$="ECONOMI
CS":GOTO175
HG 140 IFAS="3"THENN$="SCIENCE
":GOTO175
BS 145 IFAS="4"THENN$="HISTORY
":GOTO175
QG 150 IFAS="5"THENN$="GEOGRAP
HY":GOTO175
BA 155 IFAS="6"THENN$="ENGLISH
":GOTO175
RS 160 IFAS=CHR$(133)THENDB$="
":GOTO5
XX 165 IFAS="↑"THENINPUT"SUBJE
CT":N$:GOTO175
KR 170 GOTO130
AG 175 PRINT"{CLR}{BLU}{RVS}
{40 SPACES}":IFDB$="1"TH
ENDB$="":GOTO5
ED 180 IFZE$="1"THENX=X+1:ZE$="
"
MD 185 PRINT"{GRN}{HOME}{RVS}
{SPACE}QUESTION NUMBER"
X"{YEL}SUBJECT:"N$""
GJ 190 PRINT"{WHT}{HOME}
{2 DOWN}{5 SPACES}ENTER
QUESTION (@ TO QUIT)"
{3 SPACES}:POKE53280,2
EQ 191 IFDB$="1"THENPRINT"
{YEL}{HOME}{3 DOWN}
{2 RIGHT}"DA$":PRINT"
{HOME}{3 DOWN}";
HS 195 INPUTD$(X):IFD$(X)="@"A
NDDB$="1"THEN190
SD 245 IFD$(X)="@"ANDX<>1THENX
=X-1:ZE$="1":GOTO5
RF 246 IFD$(X)="@"ANDX=1THEN5
RE 247 IFDB$="1"ANDD$(X)<>"TH
END$(X)=LEFT$(D$(X),80)
:GOTO845
PS 250 IFD$(X)<>"THEND$(X)=LE
FT$(D$(X),80):GOTO275
XS 255 PRINT"{CLR}{HOME}{BLU}
{RVS}{40 SPACES}":GOTO1
85
KD 275 PRINT:PRINT"{HOME}
{13 DOWN}{WHT}{DOWN}
{4 SPACES}ENTER ANSWER"
HH 276 IFDB$="1"THENPRINT"
{YEL}{HOME}{15 DOWN}
{2 RIGHT}"EA$":PRINT"
{HOME}{15 DOWN}";
XX 280 INPUTE$(X):IFE$(X)="@"A
NDDB$="1"THEN275
XQ 285 IFDB$="1"ANDES(X)<>"TH
ENE$(X)=LEFT$(E$(X),80)
:GOTO845
RA 290 IFES(X)="@"THEN5
XX 335 IFES(X)<>"THENE$(X)=LE
FT$(E$(X),80):X=X+1:GOT
0175
GR 340 GOTO275
PR 360 NAM$="":PRINT"{CLR}
{DOWN}TYPE IN FILE NAM
E TO SAVE":INPUTNAM$:IF
NAM$=""THEN5
KJ 390 K$="":OPEN7,8,0,NAM$:IN
PUT#7,K$:IFK$=""THENCLO
SE7:GOTO405
JS 395 CLOSE7:PRINT"{2 DOWN}S
CRATCHING OLD FILE.":FT
$="S0":FT$=FT$+NAM$
FM 400 OPEN15,8,15,FT$:CLOSE15
SG 405 OPEN7,8,1,NAM$:PRINT"
{CLR}{HOME}{6 DOWN}
{6 SPACES}{WHT}SAVING :
"NAM$":PRINT#7,N$:PRI
NT#7,X
BQ 410 FORJ=1TOX:PRINT#7,D$(J)
:NEXTJ:ZE$="1"
MP 415 FORJ=1TOX:PRINT#7,E$(J)
:NEXTJ:CLOSE7:M=1:FX=0:
Q=0
EH 430 PRINT"{CLR}{HOME}
{11 DOWN}{6 SPACES}***
{SPACE}DATA HAS BEEN SA
VED ***"
KF 431 FORI=1TO2000:NEXTI:GOTO
520
PR 435 PRINT"{CLR}{RVS}{WHT}
{DOWN}LOAD ERASES ANY
{SPACE}WORK IN MEMORY.
{4 SPACES}ARE YOU SURE
{SPACE}(Y/N)"
DD 440 GETAS:IFAS="N"THEN5
PA 445 IFAS="Y"THEN1000
DA 450 GOTO440
DP 520 ZX=X:PRINT"{CLR}{HOME}
{SPACE}SCORE={RVS}"Q"
{OFF}{4 SPACES}QUESTION
NUMBER={RVS}"W"{OFF}"
EB 525 PRINT"TOTAL NUMBER OF Q
UESTIONS="X":POKE53280
,6:POKE53281,6
HK 530 PRINT"{YEL}{RVS}
{40 SPACES}";
JG 535 PRINT"{UP}{3 SPACES}
{RVS}SUBJECT : "N$""
CR 540 PRINT"{WHT}QUESTION:
{GRN}{RVS}"D$(M)"{OFF}
{DOWN}":FS
KB 545 Y=INT(4*RND(1))+1
RA 550 T=INT((X+1-1)*RND(1))+1
:U=INT((X+1-1)*RND(1))+
1:V=INT((X+1-1)*RND(1))
+1
FQ 555 IFES(M)=ES(T)ORES(M)=ES
(U)ORES(U)=ES(T)THEN550
EM 556 IFES(V)=ES(M)ORES(V)=ES
(T)ORES(V)=ES(U)THEN550
RH 560 IFY=1THEN575
MA 562 IFY=3THEN570
QB 565 IFY=2THEN580
GJ 567 PRINT"{RVS}{WHT}A {8}"E
$(T)"{DOWN}":PRINT"
{RVS}{WHT}B {8}"E$(U)"
{DOWN}":PRINT"{RVS}
{WHT}C {8}"E$(V)"{DOWN}
"
BG 568 PRINT"{RVS}{WHT}D {8}"E
$(M)"{DOWN}":L$="D":GOT
0585
MH 570 PRINT"{RVS}{WHT}A {8}"E
$(T)"{DOWN}":
RF 571 PRINT"{RVS}{WHT}B {8}"E
$(U)"{DOWN}":
JD 572 PRINT"{RVS}{WHT}C {8}"E
$(M)"{DOWN}":L$="C":PRI
NT"{RVS}{WHT}D {8}"E$(V
)"{DOWN}":GOTO585
KS 575 PRINT"{WHT}{RVS}A {8}"E
$(M)"{DOWN}":
SF 576 PRINT"{RVS}{WHT}B {8}"E
$(T)"{DOWN}":
KM 577 PRINT"{RVS}{WHT}C {8}"E
$(U)"{DOWN}":L$="A":PRI
NT"{RVS}{WHT}D {8}"E$(V
)"{DOWN}":GOTO585
GF 580 PRINT"{WHT}{RVS}A {8}"E
$(U)"{DOWN}":
SS 581 PRINT"{RVS}{WHT}B {8}"E
$(M)"{DOWN}":
HP 582 PRINT"{RVS}{WHT}C {8}"E
$(T)"{DOWN}":L$="B":PRI
NT"{RVS}{WHT}D {8}"E$(V
)"{DOWN}":GOTO585
AM 585 GETAS:IFAS="N"THEN585
XJ 590 IFAS=CHR$(133)THENFX=0:
Q=0:GOTO5
SQ 595 IFAS<>"A"ANDAS<>"B"ANDA
S<>"C"ANDAS<>"D"THEN585
CS 600 IFAS=L$THENQ=Q+1:PRINT"
{WHT}{2 SPACES}{RVS}COR
RECT!!":FORJ=1TO500:NE
XTJ:GOTO610
GX 605 GOTO655
AD 610 M=M+1:IFW=ZXTHENAD=FX-1
:FX=0:GOTO880
FQ 615 W=W+1:GOTO520
BP 620 PRINT"{CLR}{HOME}
{2 DOWN}{OFF}{WHT}YOU
{SPACE}SCORED{WHT}{RVS}
"Q"{OFF}OUT OF{WHT}
{RVS}"X"{OFF}QUESTIONS
":POKE53281,3
BR 625 IFX/2<=QTHENPRINT"
{2 DOWN}{2 SPACES}{RVS}
YOU PASSED!":GOTO632
GP 630 PRINT"{DOWN}{RVS}SHAME
ON YOU, YOU FAILED!!!"

```



```

HR 632 PRINT" {DOWN}{RVS}PRESS
      'F1' TO EXIT."
HF 635 PRINT"{DOWN}{RVS}PRESS
      {SPACE}COMMODORE KEY TO
      DO THE TEST AGAIN":GOT
      0640
DS 640 GETAS:IFAS=CHR$(133)THE
      N5
GP 645 IFPEEK(56321)=223THENM=
      1:W=1:Q=0:GOTO520
KS 650 GOTO640
EP 655 PRINT"{RVS}INCORRECT!
      {OFF} THE ANSWER IS":FS
      (FX)=D$(M):FX=FX+1:FS(F
      X)=E$(M):FX=FX+1
FD 660 IFY=1THENPRINT"{RVS}A
      {OFF}"E$(M)"";FS:GOTO67
      5
ES 665 IFY=2THENPRINT"{RVS}B
      {OFF}"E$(M)"";FS:GOTO67
      5
BE 670 PRINT"{RVS}C {OFF}"E$(M
      )"";FS:GOTO675
AH 675 FORJ=1TO2:POKE54276,0:P
      OKE54277,0:POKE54272,0:
      POKE54296,15
JX 680 POKE54277,129:POKE54276
      ,23
RG 685 POKE54273,137:POKE54272
      ,43:NEXTJ:FORI=1TO1500:
      NEXTI:GOTO610
EB 690 POKE1024,82:POKE1025,65
      :POKE1026,75:POKE1027,7
      2:POKE1028,65:POKE1029,
      78
JH 691 GOTO585
HR 715 PRINT"{YEL}{CLR}{HOME}
      {RVS}{11 SPACES}CORRECT
      ION MODE{14 SPACES}";
BF 720 PRINT" {RVS}{WHT} TOTAL
      QUESTIONS ENTERED="X""
      :POKE53281,6:POKE53280,
      2
DK 725 PRINT" {RVS}{CYN}QUESTI
      ON NO."J"{GRN}SUBJECT:"
      N$"{DOWN}";
DB 730 PRINT"{YEL}{RVS}QUESTIO
      N:{8}"D$(J)"":PRINT
XS 735 PRINT"{YEL}{RVS}ANSWER:
      {8}"E$(J)""
SB 740 PRINT"{DOWN} {RVS}{YEL}
      PRESS'<' TO FLIP THROUG
      H ENTRIES."
EP 741 PRINT" {RVS}{WHT}PRESS'
      RETURN'FOR CORRECTION."
FA 743 PRINT" {RVS}{WHT}PRESS'
      R'TO RENAME SUBJECT."
GE 745 GETAS:IFAS=CHR$(13)THEN
      VB=X:X=J:DB$="1":GOTO78
      8
BD 750 IFAS="."THEN782
HD 755 IFAS=CHR$(133)THENDB$="
      ":GOTO775
MG 760 IFAS="R"THENAS="":DB$="
      1":GOTO95
HH 765 IFAS=","THEN785
RJ 770 GOTO745
DM 775 IFVB>0THENX=VB:GOTO5
XP 780 GOTO5
QF 782 IFJ=XTHENJ=1:GOTO715
GF 783 J=J+1:GOTO715
JH 785 IFJ=1THENJ=X:GOTO715
JM 786 J=J-1:GOTO715
BX 788 PRINT"{DOWN} {6}{RVS}PL
      EASE SELECT --
      {3 SPACES}"
EG 790 PRINT" {RVS}(1) ALTER Q
      UESTION."
GR 795 PRINT" {RVS}(2) ALTER A
      NSWER.{2 SPACES}"
JD 800 PRINT" {RVS}(3) ALTER B
      OTH.{4 SPACES}"
DB 805 PRINT" {RVS}(4) DELETE
      {SPACE}BOTH.{3 SPACES}"
      :DA$=D$(X):EA$=E$(X)
AD 815 GETAS:IFAS="1"THENS=1:P
      RINT"{CLR}":GOTO190
GC 820 IFAS="2"THENS=2:PRINT"
      {CLR}":GOTO275
MK 825 IFAS="3"THENS=3:PRINT"
      {CLR}":GOTO190
AP 830 IFAS="4"THENMK=VB-J:DB$
      ="":GOTO860
BD 836 IFAS=CHR$(133)THENDB$="
      ":X=VB:GOTO5
PR 840 GOTO815
QF 845 IFS=1ORS=2THENX=VB:DB$=
      "":GOTO5
KM 850 IFS=3THENS=S+1:GOTO275
KJ 855 X=VB:DB$="":GOTO5
FF 860 IFJ=1ANDES(J+1)=""THENR
      UN
ER 865 IFS(J+1)=""THENS(J)="
      ":E$(J)="" :VB=VB-1:X=VB
      :GOTO5
SD 870 PRINT"{2 DOWN}
      {2 SPACES}{WHT}DELETING
      ...":FORI=1TOMK:AD$=D$(
      J+1):AV$=E$(J+1)
XK 875 D$(J)=AD$:E$(J)=AV$:J=J
      +1:NEXTI:VB=VB-1:X=VB:E
      $(J)="" :D$(J)="" :GOTO5
EE 880 IFFS(FX)=""THEN620
PM 885 PRINT"{CLR}{OFF}{HOME}
      {2 DOWN} {BLK}THE ONES
      {SPACE}YOU GOT WRONG AR
      E-{DOWN}":POKE53281,1
CS 890 PRINT" {RED}QUESTION -
      {SPACE}"F$(FX)"";FS:F$(
      FX)="" :FX=FX+1
FP 895 PRINT" ANSWER - "F$(FX)
      "";FS:F$(FX)="" :PRINT"
      {2 DOWN} {RVS}{CYN}PRES
      S RETURN"
AR 900 GETAS:IFAS<>CHR$(13)THE
      N900
QS 905 IFAD=FXTHENFX=0:GOTO620
MK 910 FX=FX+1:GOTO880
RK 915 PRINT"{CLR}{DOWN} NAME
      {SPACE}OF FILE TO SCRAT
      CH":INPUTRS:IFFRS=""TH
      EN5
XF 920 PRINT"{DOWN} INSERT DIS
      K CONTAINING FILE AND P
      RES{3 SPACES}{RVS}RETU
      RN"
PQ 925 GETAS:IFAS<>CHR$(13)THE
      N925
AE 930 FT$="S0":FT$=FT$+FR$:O
      PEN15,8,15,FT$:CLOSE15
RS 935 PRINT"{2 DOWN}
      {2 SPACES}{RVS}{WHT}FIL
      E HAS BEEN SCRATCHED":F
      ORI=1TO3000:NEXTI:GOTO5
XX 940 PRINT"{CLR}{DOWN}{WHT}
      {SPACE}{RVS}MAKING NEW
      {SPACE}ENTRIES WILL ERA
      SE ANY OLD{OFF}
      {3 SPACES}{RVS}ENTRIES
      {SPACE}IN MEMORY"
AQ 945 PRINT" {RVS}{WHT}ARE YO
      U SURE (Y/N)"
AF 950 GETAS:IFAS="N"THEN5
HX 955 IFAS="Y"THEN965
DF 960 GOTO950
DS 965 CLR:DIMDS(500):DIMES(50
      0):X=1:GOTO95
KK 970 PRINT"{DOWN}{2 SPACES}
      {RVS}FILE NOT FOUND":OP
      EN15,8,15,"UJ":FORI=1TO
      2000:NEXTI:CLOSE15:RUN
MB 980 I=1:PRINT"{WHT}{CLR}":O
      PEN2,8,0,"$":GET#2,AS:G
      ET#2,AS
CM 982 IFI=2THENI=1:GOTO992
DD 985 GET#2,L$:GET#2,L$:IFST=
      64THENCLOSE2:GOTO992
XJ 986 GET#2,LB$:GET#2,HB$:LN=
      ASC(LB$+CHR$(0))+256*AS
      C(HB$+CHR$(0))
MM 987 PRINT LN;
DD 988 GET#2,AS:IFAS=""THENI=I
      +1:PRINTCHR$(13);:GOTO9
      82
CD 990 PRINTAS;:GOTO988
KD 992 PRINT"{DOWN} {RVS}PRESS
      ANY KEY"
CX 993 GETAS:IFAS=""THEN993
QJ 995 IFST<>64THENPRINT"{CLR}
      ":GOTO985
JM 997 GOTO5
FH 1000 CLR:DIMDS(200):DIMES(2
      00):DIMES(400):PRINTCH
      RS(8):PRINTCHRS(14)
MH 1005 PRINT"{CLR} {RVS}{WHT}
      TYPE IN FILENAME TO LO
      AD":INPUTNAM$:IFNAM$="
      "THENRUN
EK 1007 N$="" :OPEN7,8,0,NAM$:I
      NPUT#7,N$
EK 1008 INPUT#7,X:IFN$=""THENC
      LOSE7:GOTO970
BR 1009 PRINT"{CLR}{HOME}
      {5 DOWN}{4 SPACES}LOAD
      ING : {RVS}"NAM$""
HB 1010 FORJ=1TOX:INPUT#7,D$(J
      ):NEXTJ:ZE$="1"
JC 1012 FORJ=1TOX:INPUT#7,E$(J
      ):NEXTJ:CLOSE7:M=1:FX=
      0:Q=0:W=1:GOTO520

```

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Machine Language Entry Program MLX for Commodore 64

Ottis R. Cowper

Type in and save some copies of MLX—you'll want to use it to enter future ML programs from Gazette. When you're ready to enter an ML program, load and run MLX. It asks you for a starting address and an ending address. These addresses appear in the article accompanying the MLX-format program listing you're typing.

If you're unfamiliar with machine language, the addresses (and all other values you enter in MLX) may appear strange. Instead of the usual decimal numbers you're accustomed to, these numbers are in *hexadecimal*—a base 16 numbering system commonly used by ML programmers. Hexadecimal—hex for short—includes the numerals 0–9 and the letters A–F. But even if you know nothing about ML or hex, you should have no trouble using MLX.

After you've entered the starting and ending addresses, you'll be offered the option of clearing the workspace. Choose this option if you're starting to enter a new listing. If you're continuing a listing that's partially typed from a previous session, don't choose this option. A functions menu will appear. The first option in the menu is Enter Data. If you're just starting to type in a program, pick this. Press the E key and type the first number in the first line of the program listing. If you've already typed in part of a program, type the line number where you stopped typing at the end of the previous session (be sure to load the partially completed program before you resume entry). In any case, make sure the address you enter corresponds to the address of a line in the listing you are entering. Otherwise, you'll be unable to enter the data correctly. If you pressed E by mistake, you can return to the command menu by pressing Return alone when asked for the address. (You can get back to the menu from most options in the program by pressing Return with no other input.)

Entering a Listing

Once you're in Enter mode, MLX prints the address for each program line for you. You then type in all nine numbers on that line, beginning with the first two-digit number after the colon (:). Each line represents eight data bytes and a checksum. Although an

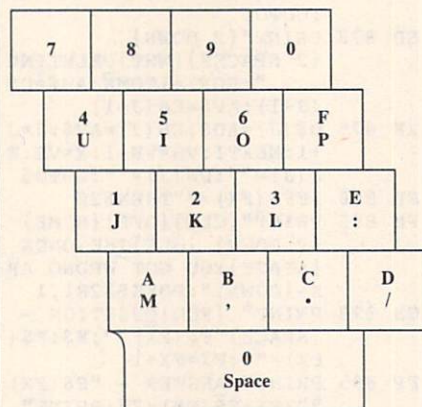
MLX-format listing appears similar to the "hex dump" listings from a machine language monitor program, the extra checksum number on the end allows MLX to check your typing.

When you enter a line, MLX recalculates the checksum from the eight bytes and the address and compares this value to the number from the ninth column. If the values match, you'll hear a bell tone, the data will be added to the workspace area, and the prompt for the next line of data will appear. But if MLX detects a typing error, you'll hear a low buzz and see an error message. The line will then be redisplayed for editing.

Invalid Characters Banned

Only a few keys are active while you're entering data, so you may have to unlearn some habits. You *do not* type spaces between the columns; MLX automatically inserts these for you. You *do not* press Return after typing the last number in a line; MLX automatically enters and checks the line after you type the last digit.

64 MLX Keypad



Only the numerals 0–9 and the letters A–F can be entered. If you press any other key (with some exceptions noted below), you'll hear a warning buzz. To simplify typing, a numeric keypad function is included. The keypad is active only while entering data. Addresses must be entered with the normal letter and number keys. The figure below shows the keypad configuration.

MLX checks for transposed characters. If you're supposed to type in A0

and instead enter 0A, MLX will catch your mistake. There is one error that can slip past MLX: Because of the checksum formula used, MLX won't notice if you accidentally type FF in place of 00, and vice versa. And there's a very slim chance that you could garble a line and still end up with a combination of characters that adds up to the proper checksum. However, these mistakes should not occur if you take care while entering data.

Editing Features

To correct typing mistakes before finishing a line, use the Inst/Del key to delete the character to the left of the cursor. If you mess up a line badly, press Clr/Home to start the line over. The Return key is also active, but only before any data is typed on a line. Pressing Return at this point returns you to the command menu. After you type a character, MLX disables Return until the cursor returns to the start of a line. Remember, press Clr/Home to quickly get to a line-number prompt. To make corrections in a line that MLX has redisplayed for editing, compare the line on the screen with the one printed in the listing and then move the cursor to the mistake and type the correct key. The cursor-left and -right keys provide the normal cursor controls. (The Inst/Del key now works as an alternative cursor-left key.) You cannot move left beyond the first character in the line. If you try to move beyond the rightmost character, you'll reenter the line. During editing, Return is active; pressing it tells MLX to recheck the line. You can press the Clr/Home key to clear the entire line if you want to start from scratch or if you want to get to a line-number prompt to use Return to get back to the menu.

Display Data

The second menu choice, Display Data, examines memory and shows the contents in the same format as the program listing (including the checksum). When you press D, MLX asks you for a starting address. Be sure that the starting address you give corresponds to a line number in the listing. Otherwise, the checksum display will be meaningless. MLX displays program lines until it reaches the end of the program, at

which point the menu is redisplayed. You can pause the display by pressing the space bar. (MLX finishes printing the current line before halting.) Press the space bar again to restart the display. To break out of the display and get back to the menu before the ending address is reached, press Return.

Other Menu Options

Two more menu selections let you save programs and load them back into the computer. These are Save File and Load File. When you press S or L, MLX asks you for the filename. You'll then be asked to press either D or T to select disk or tape.

You'll notice the disk drive starting and stopping several times during a load or save. This is normal behavior. MLX opens and reads from or writes to the file instead of using the usual LOAD and SAVE commands. Also note that the drive prefix O: is added to the filename (line 750), so this should *not* be included when entering the name. This also precludes the use of @ for save-with-replace, so be sure to give each version saved a different name.

Remember that MLX saves the entire workspace area from the starting address to the ending address, so the save or load may take longer than you might expect if you've entered only a small amount of data from a long listing. When you're saving a partially completed listing, make sure to note the address where you stopped typing.

MLX reports the standard disk or tape error messages if any problems are detected during the save or load. It also has three special load error messages: INCORRECT STARTING ADDRESS, which means the file you're trying to load does not have the starting address you specified when you ran MLX; LOAD ENDED AT address, which means the file you're trying to load ends before the ending address you specified when you started MLX; and TRUNCATED AT ENDING ADDRESS, which means the file you're trying to load extends beyond the ending address you specified when you started MLX. If you see one of these messages and feel certain that you've loaded the right file, exit and rerun MLX, being careful to enter the correct start-

ing and ending addresses.

The Quit menu option has the obvious effect—it stops MLX and enters BASIC. The Run/Stop key is disabled, so the Q option lets you exit the program without turning off the computer. (Of course, Run/Stop-Restore also gets you out.) You'll be asked for verification; press Y to exit to BASIC, or press any other key to return to the menu. After quitting, you can type RUN again and reenter MLX without losing your data, as long as you don't use the Clear Workspace option.

The Finished Product

When you've finished typing all the data for an ML program and saved your work, you're ready for the results. Refer to the corresponding article for details on loading and running the program.

An Ounce of Prevention

Don't take chances—use The Automatic Proofreader to type the new MLX, and then test your copy *thoroughly* before first using it to enter any significant amount of data. Make sure all the menu options work as they should. Enter fragments of the program starting at several different addresses; then use the display option to verify that the data has been entered correctly. Test the save and load options to ensure that you can recall your work from disk.

64 MLX

```
SS 10 REM VERSION 1.1: LINES 8
    30,950 MODIFIED, LINES 4
    85-487 ADDED
EK 100 POKE 56,50:CLR:DIM IN$,
    I,J,A,B,A$,B$,A(7),N$
DM 110 C4=48:C6=16:C7=7:Z2=2:Z
    4=254:Z5=255:Z6=256:Z7=
    127
CJ 120 FA=PEEK(45)+Z6*PEEK(46)
    :BS=PEEK(55)+Z6*PEEK(56)
    :H$="0123456789ABCDEF"
SB 130 R$=CHR$(13):L$="{LEFT}"
    :S$=" ":D$=CHR$(20):Z$=
    CHR$(0):T$="{13 RIGHT}"
CQ 140 SD=54272:FOR I=SD TO SD
    +23:POKE I,0:NEXT:POKE
    {SPACE}SD+24,15:POKE 78
    8,52
FC 150 PRINT "{CLR}"CHR$(142)CH
    R$(8):POKE 53280,15:POK
    E 53281,15
EJ 160 PRINT T$ "{RED}{RVS}
    {2 SPACES}{8 @}
```

```
{2 SPACES}"SPC(28)"
{2 SPACES}{OFF}{BLU} ML
X II {RED}{RVS}
{2 SPACES}"SPC(28)"
{12 SPACES}{BLU}"
FR 170 PRINT "{3 DOWN}
    {3 SPACES}COMPUTE!'S MA
    CHINE LANGUAGE EDITOR
    {3 DOWN}"
JB 180 PRINT "{BLK}STARTING ADD
    RESS{4}";:GOSUB300:SA=A
    D:GOSUB1040:IF F THEN18
    0
GF 190 PRINT "{BLK}{2 SPACES}EN
    DING ADDRESS{4}";:GOSUB
    300:EA=AD:GOSUB1030:IF
    {SPACE}F THEN190
KR 200 INPUT "{3 DOWN}{BLK}CLEA
    R WORKSPACE [Y/N]{4}";A
    $:IF LEFT$(A$,1)<>"Y"TH
    EN220
PG 210 PRINT "{2 DOWN}{BLU}WORK
    ING...";:FORI=BS TO BS+
    EA-SA+7:POKE I,0:NEXT:P
    RINT"DONE"
DR 220 PRINTTAB(10)" {2 DOWN}
    {BLK}{RVS} MLX COMMAND
    {SPACE}MENU {DOWN}{4}":
    PRINT T$"{RVS}E{OFF}NTE
    R DATA"
BD 230 PRINT T$"{RVS}D{OFF}ISP
    LAY DATA":PRINT T$"
    {RVS}L{OFF}OAD FILE"
JS 240 PRINT T$"{RVS}S{OFF}AVE
    FILE":PRINT T$"{RVS}Q
    {OFF}UIT{2 DOWN}{BLK}"
JH 250 GET A$:IF A$=N$ THEN250
HK 260 A=0:FOR I=1 TO 5:IF A$=
    MID$( "EDLSQ",I,1)THEN A
    =I:I=5
FD 270 NEXT:ON A GOTO420,610,6
    90,700,280:GOSUB1060:GO
    TO250
EJ 280 PRINT "{RVS} QUIT ":INPU
    T "{DOWN}{4}ARE YOU SURE
    [Y/N]";A$:IF LEFT$(A$,
    1)<>"Y"THEN220
EM 290 POKE SD+24,0:END
JX 300 IN$=N$:AD=0:INPUTIN$:IF
    LEN(IN$)<>4THENRETURN
KF 310 B$=IN$:GOSUB320:AD=A:B$
    =MID$(IN$,3):GOSUB320:A
    D=AD*256+A:RETURN
PP 320 A=0:FOR J=1 TO 2:A$=MID
    $(B$,J,1):B=ASC(A$)-C4+
    (A$>"@")*C7:A=A*C6+B
JA 330 IF B<0 OR B>15 THEN AD=
    0:A=-1:J=2
GX 340 NEXT:RETURN
CH 350 B=INT(A/C6):PRINT MID$(
    H$,B+1,1);:B=A-B*C6:PRI
    NT MID$(H$,B+1,1);:RETU
    RN
RR 360 A=INT(AD/Z6):GOSUB350:A
    =AD-A*Z6:GOSUB350:PRINT
    "=";
BE 370 CK=INT(AD/Z6):CK=AD-Z4*
    CK+Z5*(CK>Z7):GOTO390
```


PROGRAMS

```

PX 380 CK=CK*Z2+Z5*(CK>Z7)+A
JC 390 CK=CK+Z5*(CK>Z5):RETURN
QS 400 PRINT"{DOWN}STARTING AT
      {4}";:GOSUB300:IF IN$<>
      N$ THEN GOSUB1030:IF F
      {SPACE}THEN400
EX 410 RETURN
HD 420 PRINT"{RVS} ENTER DATA
      {SPACE}":GOSUB400:IF IN
      S=N$ THEN220
JK 430 OPEN3,3:PRINT
SK 440 POKEL98,0:GOSUB360:IF F
      THEN PRINT IN$:PRINT"
      {UP}{5 RIGHT}";
GC 450 FOR I=0 TO 24 STEP 3:B$
      =S$:FOR J=1 TO 2:IF F T
      HEN B$=MID$(IN$,I+J,1)
HA 460 PRINT"{RVS}"B$LS$;:IF I<
      24THEN PRINT"{OFF}";
HD 470 GET A$:IF A$=N$ THEN470
FK 480 IF (A$>" / "ANDA$<":)OR(A
      S$>"@ "ANDA$<"G") THEN540
GS 485 A=- (A$="M") -2*(A$="," ) -
      3*(A$="." ) -4*(A$="/") -5
      *(A$="J") -6*(A$="K")
EX 486 A=A-7*(A$="L") -8*(A$=":
      ") -9*(A$="U") -10*(A$="I
      ") -11*(A$="O") -12*(A$="
      P")
CM 487 A=A-13*(A$=S$):IF A THE
      N A$=MID$("ABCD123E456F
      0",A,1):GOTO 540
MP 490 IF A$=R$ AND((I=0)AND(J
      =1)OR F) THEN PRINT B$;:
      J=2:NEXT I=24:GOTO550
KC 500 IF A$="HOME" THEN PRI
      NT B$:J=2:NEXT I=24:NEX
      T:F=0:GOTO440
MX 510 IF (A$="{RIGHT}") ANDF TH
      ENPRINT B$LS$;:GOTO540
GK 520 IF A$<>L$ AND A$<>D$ OR
      ((I=0)AND(J=1)) THEN GOS
      UBL060:GOTO470
HG 530 A$=L$+S$+L$:PRINT B$LS$;
      :J=2-J:IF J THEN PRINT
      {SPACE}L$;:I=I-3
QS 540 PRINT A$;:NEXT J:PRINT
      {SPACE}S$;
PM 550 NEXT I:PRINT:PRINT"{UP}
      {5 RIGHT}";:INPUT#3,IN$
      :IF IN$=N$ THEN CLOSE3:
      GOTO220
QC 560 FOR I=1 TO 25 STEP3:B$=
      MID$(IN$,I):GOSUB320:IF
      I<25 THEN GOSUB380:A(I
      /3)=A
PK 570 NEXT:IF A<>CK THEN GOSU
      B1060:PRINT"{BLK}{RVS}
      {SPACE}ERROR: REENTER L
      INE {4}":F=1:GOTO440
HJ 580 GOSUB1080:B=BS+AD-SA:FO
      R I=0 TO 7:POKE B+I,A(I
      ):NEXT
QQ 590 AD=AD+8:IF AD>EA THEN C
      LOSE3:PRINT"{DOWN}{BLU}
      ** END OF ENTRY **{BLK}
      {2 DOWN}":GOTO700
GQ 600 F=0:GOTO440
QA 610 PRINT"{CLR}{DOWN}{RVS}
      {SPACE}DISPLAY DATA ":G
      OSUB400:IF IN$=N$ THEN2
      20
RJ 620 PRINT"{DOWN}{BLU}PRESS:
      {RVS}SPACE{OFF} TO PAU
      SE, {RVS}RETURN{OFF} TO
      BREAK{4}{DOWN}"
KS 630 GOSUB360:B=BS+AD-SA:FOR
      I=BTO B+7:A=PEEK(I):GOS
      UB350:GOSUB380:PRINT S$
      ;
CC 640 NEXT:PRINT"{RVS}";:A=CK
      :GOSUB350:PRINT
KH 650 F=1:AD=AD+8:IF AD>EA TH
      ENPRINT"{DOWN}{BLU}** E
      ND OF DATA **":GOTO220
KC 660 GET A$:IF A$=R$ THEN GO
      SUB1080:GOTO220
EQ 670 IF A$=S$ THEN F=F+1:GOS
      UBL080
AD 680 ONFGOTO630,660,630
CM 690 PRINT"{DOWN}{RVS} LOAD
      {SPACE}DATA ":OP=1:GOTO
      710
PC 700 PRINT"{DOWN}{RVS} SAVE
      {SPACE}FILE ":OP=0
RX 710 IN$=N$:INPUT"{DOWN}FILE
      NAME{4}";IN$:IF IN$=N$
      {SPACE}THEN220
PR 720 F=0:PRINT"{DOWN}{BLK}
      {RVS}T{OFF}APE OR {RVS}
      D{OFF}ISK: {4}";
FP 730 GET A$:IF A$="T" THEN PR
      INT"T{DOWN}":GOTO880
HQ 740 IF A$<>"D" THEN730
HH 750 PRINT"D{DOWN}":OPEN15,8
      ,15,"I0":B=EA-SA:IN$="
      0":+IN$:IF OP THEN810
SQ 760 OPEN 1,8,8,IN$+" ,P,W":G
      OSUB860:IF A THEN220
FJ 770 AH=INT(SA/256):AL=SA-(A
      H*256):PRINT#1,CHR$(AL)
      ;CHR$(AH);
PE 780 FOR I=0 TO B:PRINT#1,CH
      R$(PEEK(BS+I));:IF ST T
      HEN800
FC 790 NEXT:CLOSE1:CLOSE15:GOT
      O940
GS 800 GOSUB1060:PRINT"{DOWN}
      {BLK}ERROR DURING SAVE:
      {4}":GOSUB860:GOTO220
MA 810 OPEN 1,8,8,IN$+" ,P,R":G
      OSUB860:IF A THEN220
GE 820 GET#1,A$,B$:AD=ASC(A$+Z
      $)+256*ASC(B$+Z$):IF AD
      <>SA THEN F=1:GOTO850
RX 830 FOR I=0 TO B:GET#1,A$:P
      OKE BS+I,ASC(A$+Z$):IF(
      I<>B) AND ST THEN F=2:AD
      =I:I=B
FA 840 NEXT:IF ST<>64 THEN F=3
FQ 850 CLOSE1:CLOSE15:ON ABS(F
      >0)+1 GOTO960,970
SA 860 INPUT#15,A,A$:IF A THEN
      CLOSE1:CLOSE15:GOSUB10
      60:PRINT"{RVS}ERROR: "A
      S
GQ 870 RETURN
EJ 880 POKEL83,PEEK(FA+2):POKE
      187,PEEK(FA+3):POKEL88,
      PEEK(FA+4):IFOP=0 THEN92
      0
HJ 890 SYS 63466:IF(PEEK(783)A
      ND1) THEN GOSUB1060:PRIN
      T"{DOWN}{RVS} FILE NOT
      {SPACE}FOUND ":GOTO690
CS 900 AD=PEEK(829)+256*PEEK(8
      30):IF AD<>SA THEN F=1:
      GOTO970
SC 910 A=PEEK(831)+256*PEEK(83
      2)-1:F=F-2*(A<EA)-3*(A>
      EA):AD=A-AD:GOTO930
KM 920 A=SA:B=EA+1:GOSUB1010:P
      OKE780,3:SYS 63338
JF 930 A=BS:B=BS+(EA-SA)+1:GOS
      UBL010:ON OP GOTO950:SY
      S 63591
AE 940 GOSUB1080:PRINT"{BLU}**
      SAVE COMPLETED **":GOT
      O220
XP 950 POKEL47,0:SYS 63562:IF
      {SPACE}ST>0 THEN970
FR 960 GOSUB1080:PRINT"{BLU}**
      LOAD COMPLETED **":GOT
      O220
DP 970 GOSUB1060:PRINT"{BLK}
      {RVS}ERROR DURING LOAD:
      {DOWN}{4}":ON F GOSUB98
      0,990,1000:GOTO220
PP 980 PRINT"INCORRECT STARTIN
      G ADDRESS (" ;:GOSUB360:
      PRINT")":RETURN
GR 990 PRINT"LOAD ENDED AT ";:
      AD=SA+AD:GOSUB360:PRINT
      D$:RETURN
FD 1000 PRINT"TRUNCATED AT END
      ING ADDRESS":RETURN
RX 1010 AH=INT(A/256):AL=A-(AH
      *256):POKEL93,AL:POKEL
      94,AH
FF 1020 AH=INT(B/256):AL=B-(AH
      *256):POKEL74,AL:POKEL
      75,AH:RETURN
FX 1030 IF AD<SA OR AD>EA THEN
      1050
CR 1040 IF (AD>511 AND AD<6528
      0) THEN GOSUB1080: F=0
      : RETURN
HC 1050 GOSUB1060:PRINT"{RVS}
      {SPACE}INVALID ADDRESS
      {DOWN}{BLK}":F=1:RETU
      RN
AR 1060 POKE SD+5,31:POKE SD+6
      ,208:POKE SD,240:POKE
      {SPACE}SD+1,4:POKE SD+
      4,33
DX 1070 FOR S=1 TO 100:NEXT:GO
      TOL090
PF 1080 POKE SD+5,8:POKE SD+6,
      240:POKE SD,0:POKE SD+
      1,90:POKE SD+4,17
AC 1090 FOR S=1 TO 100:NEXT:PO
      KE SD+4,0:POKE SD,0:PO
      KE SD+1,0:RETURN

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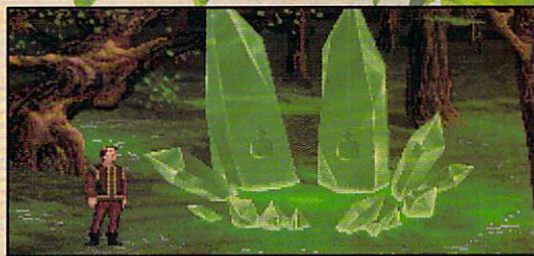
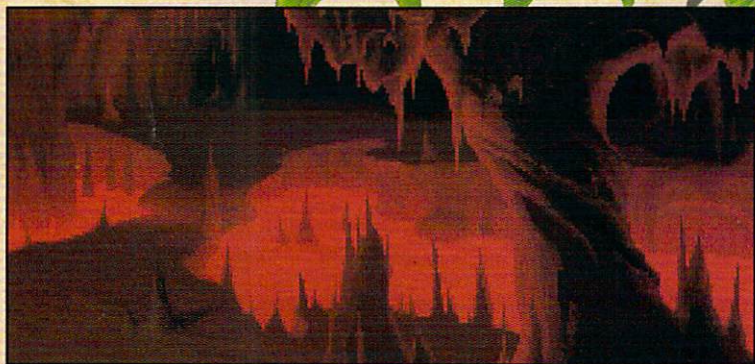
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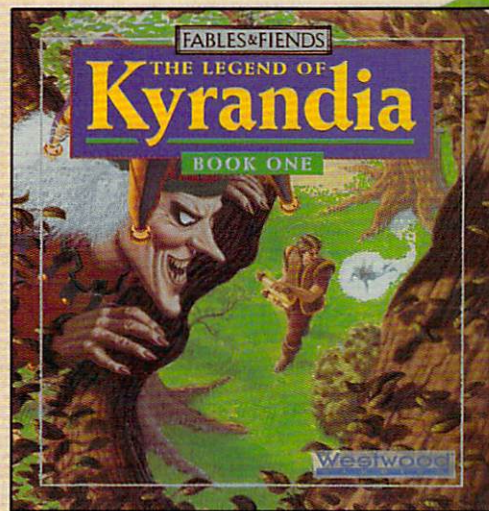
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Circle Reader Service Number 158

TANDY 4825 SX TANDY 4850 EP

What if I told you that you could get the performance of a 486 computer, service from a local computer retailer, and state-of-the-art video and hard disk performance—all for about \$2,000? If you're in the market to upgrade your computer to a high-end business system for graphics processing, you'd probably ask for a telephone number. And what if I told you that the system I just described is a Tandy? You'd probably say, "The folks who brought us the RL 1000?"

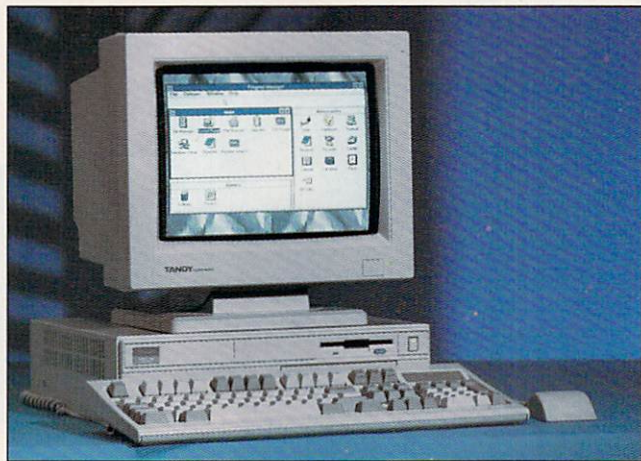
That's right. The company that wants to put a computer in every kitchen also wants to put a 486 screamer on your desktop. And with the price and performance of its new 486-based series, Tandy just might do it.

Starting with the 4825 SX, computer users in small businesses who need leading-edge performance from their computers are finally within reach of that kind of power. An Intel 486SX processor supplies true 32-bit performance. If you've been working with a 386SX-based computer, the difference in performance is absolutely radical, especially with Windows applications.

The 4825 SX compares favorably to a 33-MHz 386 system, and it has one special feature: It's completely upgradable to a 50-MHz 486 system. Now you're talking power. But what does this performance mean in real terms? For most home offices, 486 power is overkill. But the biannual question posed by Intel continues: With prices this good, what are you waiting for?

In my own home office, I use an Insight 386SX running at 16 MHz, with 4MB of RAM and 1MB of video memory. Not state-of-the-art, but so far it's been good to me. In my evaluation of these two new Tandy systems, I did some testing and came up with some numbers that made my pride and joy look like a mere rookie at Darling-

ance, but the Tandy machines still ran circles around my home computer. For graphical computing, you can expect performance improvements from 100 percent (4825 SX) to 180 percent (4850 EP) over a 16-MHz 386SX system. This just goes to show that



With Tandy's new 4825 SX and 4850 EP, you can get the power of a 486 system at less than the usual 486 price.

ton Motor Speedway.

With character-based applications such as spreadsheets, word processors, and databases, the results are predictable. Compared to my 386SX, the 4825 SX and the 4850 EP crunched numbers about 312 percent and 335 percent faster, respectively. In word processing, the improvements ranged up 297 percent and 316 percent. And when it came to database performance, the 4825 SX outperformed my home machine by 298 percent, while its bigger cousin boasted an improvement of 300 percent. The Overall Norton Performance Index placed the 4825 SX at 64.3 and the 4850 EP at 93.3. By comparison, my 386SX rates a 7.2. Whoa! Eat my silicon!

The numbers weren't quite as impressive when it came to Windows perform-

ance, but the Tandy machines still ran circles around my home computer. For graphical computing, you can expect performance improvements from 100 percent (4825 SX) to 180 percent (4850 EP) over a 16-MHz 386SX system. This just goes to show that

chips rated at 80 ns).

Video memory is also easily enhanced by adding four video memory chips that mount directly into sockets on the main board. As it ships, the video controller is capable of 640 x 480 resolution in 256 colors. If you're planning to turn one of these systems into a dedicated graphics workstation, you may want to upgrade to Super VGA (SVGA). Tandy doesn't sell the video memory chips, although a Radio Shack dealer can order them for you from another vendor.

This much power demands equal amounts of storage space, and Tandy delivers with a 120MB IDE hard disk governed by an internal controller that can support a maximum of two drives. A single 1.44MB floppy drive also comes standard with either unit. There's room for another 5¼-inch drive device, which can be a floppy drive, a second hard disk, or a CD-ROM drive.

Outside, both systems use a high-profile 101-key keyboard that provides ample tactile feedback and comfort. Both systems also ship with a Tandy two-button mouse that plugs into a PS/2-style connector in the back of the system unit. The mouse is the most disappointing element in the entire system—if I spend more than \$2,000 on a computer (monitor not included), I want something more than a \$10 mouse. Many clone manufacturers offer a Logitech or Microsoft mouse with their systems; Tandy should, too.

I reviewed these systems with a Tandy VGM-440 VGA monitor, which is capable of 1024 x 768 resolution in 256 colors (SVGA), provided you upgrade the video memory to 1MB. Other less

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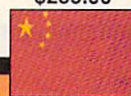
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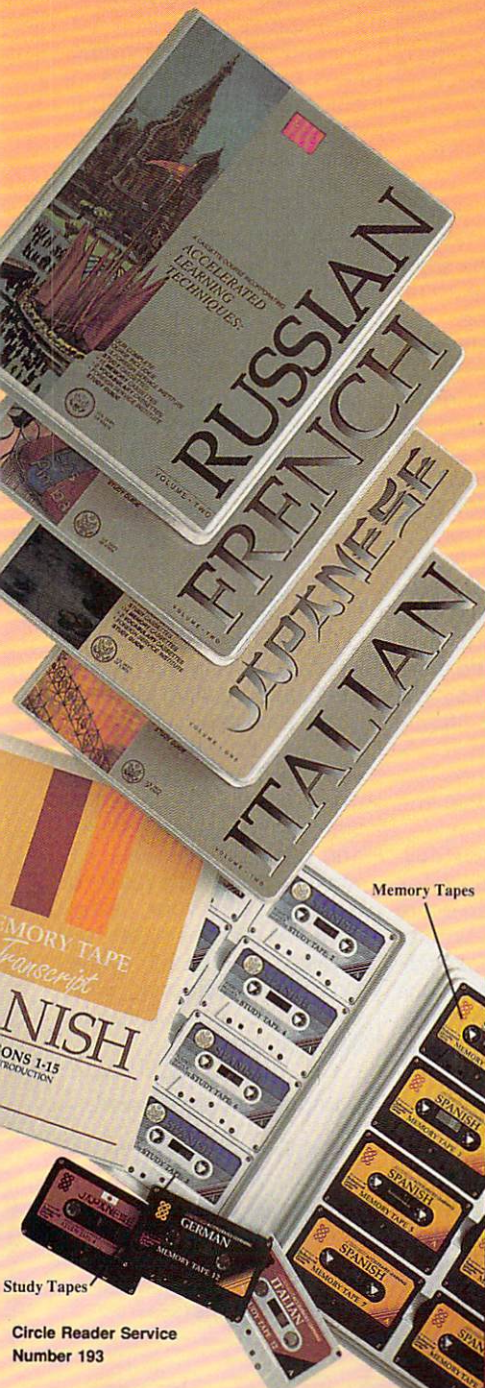
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Memory Tapes

Study Tapes



expensive Tandy VGA monitors are available, but they don't support the Super VGA mode. Alternatively, you could use a non-Tandy VGA monitor.

According to Intel, the customer can perform the processor upgrade from the 4825 SX to the 4850 EP, which is fine for large businesses with a dedicated MIS staff. But for small businesses and home offices, Tandy recommends taking the system into a Radio Shack store and having a dealer perform the upgrade, which involves removing the 486SX chip and replacing it with a 50-MHz chip—no other modifications are required.

Overall, these are very capable systems at competitive retail prices. You can probably do better with mail-order shopping, perhaps saving enough to buy a monitor or finding a 25-MHz 486SX system that includes a monitor for around \$2,000. Even so, risking capital on mystery components isn't always the best solution for home office entrepreneurs and small businesses. When compared to those of mainline direct sellers like Dell and ZEOS, the Tandy systems aren't that much more expensive. And with the upgrade path to full 50-MHz performance, these machines aren't likely to be obsolete for years to come.

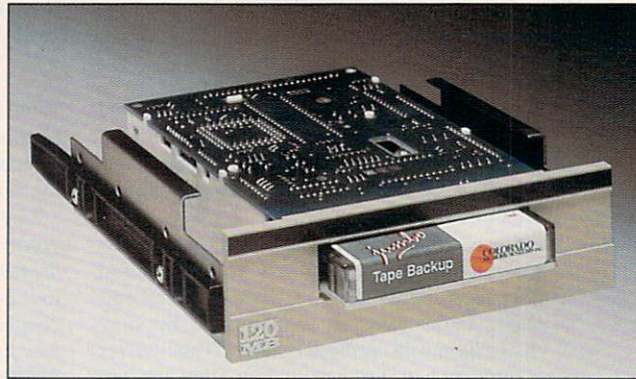
But isn't that what they said about the 386?

PETER SCISCO

Tandy 4825 SX—\$1,699 (with floppy drive), \$1,999 (with 120MB hard disk), \$2,799 (with MPC upgrade)
Tandy 4850 EP—\$2,398 Tandy VGM-440 monitor (Super VGA capable)—\$599

TANDY
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Circle Reader Service Number 361



Throw away your floppies and quit worrying about a hard drive crash: The Jumbo Tape Backup System is here!

JUMBO TAPE BACKUP SYSTEM

When it comes to backing up information on floppies, my philosophy isn't exactly mainstream. I've found myself in a defensive position when discussing the subject. You see, I hate backing up my hard drives because I already have hundreds of floppies in storage. Adding 50 more would compound my organizational difficulties. I only back up the few directories in which my current work is found.

This system works, even when I trash one of my work files—until the dreaded hard drive crash, that is. (And recently I've had more than my share, since I just wrote a disk utility that includes an optimizer.) At these catastrophic junctures, I realize everyone else was right: I should've backed up the entire drive. Rectifying things takes me hours—and reminds me how much I hate application-installation programs. Until recently, I continued my insane approach to data backups.

Enter the hero, Colorado Memory Systems' JUMBO Tape Backup System 120. Since it's been installed, I haven't had a single disaster

that took more than 15 minutes to fix. And I haven't lost any data—just the small amount of time it took to restore things from tape.

How easy is it? Extremely. Once it's installed, the software is on your hard drive. For extra safety I copied the software to floppy in case the absolute worst happened. It never has, but it would've been easy enough to run the restore software from floppy.

To start the software, you just type TAPE. Just about everything you do is with function key-controlled menus. They're plain and simple in appearance but perfectly functional. When you're restoring your life's work, you don't really care what the menus look like.

The backup options cover all bases. You can back up an entire drive, an entire directory, selected directories, and selected files in directories. What's great is the unattended backup feature. If you enable this, your computer will automatically back itself up at the designated time. It's smart enough to know when the computer is in use and beeps at you if it's time to do the backup and you're in the way. I set mine for Saturday morning at 4:00, and it provided safety while I slept.

Restoring is just as easy as backing up. You can select which files and directories you want or restore the entire drive. The JUMBO system isn't lightning fast, though. An entire 65MB hard drive takes about 25 minutes to back up and about the same amount of time to restore.

Although complete instructions for installation are included, I wouldn't recommend doing it yourself unless you're totally at home inside your PC. I installed the JUMBO system in two different computers and experienced the same difficulties both times. The mounting hardware wasn't what my two systems expected. That meant I had to scrounge around among spare pieces to find what I needed. And the instructions for connecting the cables, while complete, didn't go the extra mile for beginners. I had no trouble installing the hardware, but it's easy to see that some people would. Don't let that discourage you from buying the device; just plan on getting a professional to install it.

If you hate backing up your hard drive, get one of these babies. It'll save you time, trouble, floppy disks, and hassles when your co-workers debate the merits of backing up your entire drive. I've seen the system advertised in the \$200 range. Not bad, considering what it'll save you in the long run.

RICK LEINECKER

JUMBO Tape Backup System 120—\$250
JUMBO Tape Backup System 250—\$350

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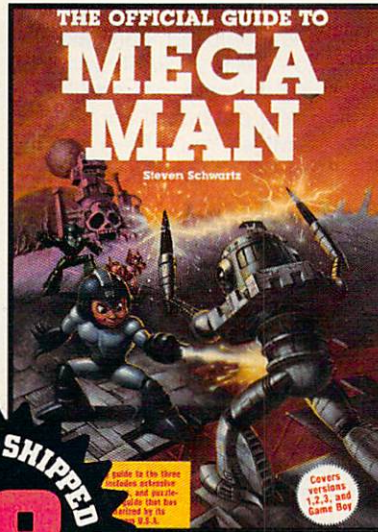
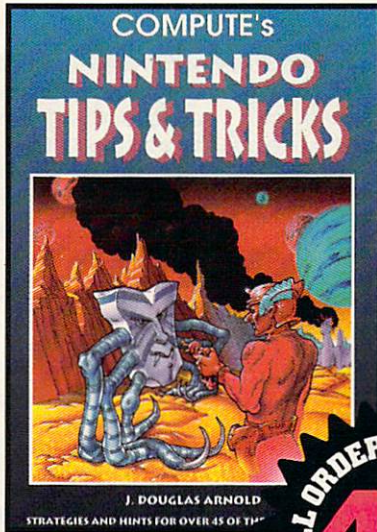
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BUST THE MOST DIFFICULT NINTENDO PUZZLES WITH THESE BOOKS FROM COMPUTE

COMPUTE'S NINTENDO TIPS & TRICKS

Here are hundreds of tips and tricks for the most popular Nintendo games.

This book focuses on super tips to help even the most experienced Nintendo player solve the most perplexing puzzles and defeat clever enemies.



THE OFFICIAL GUIDE TO MEGA MAN

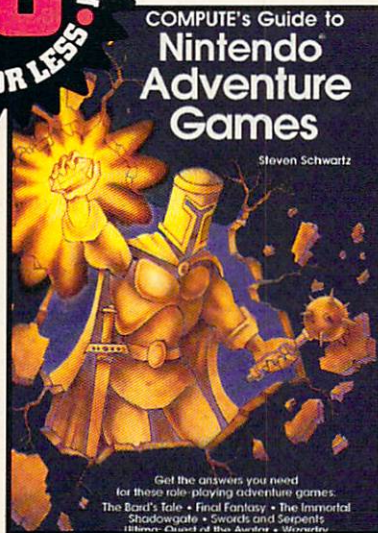
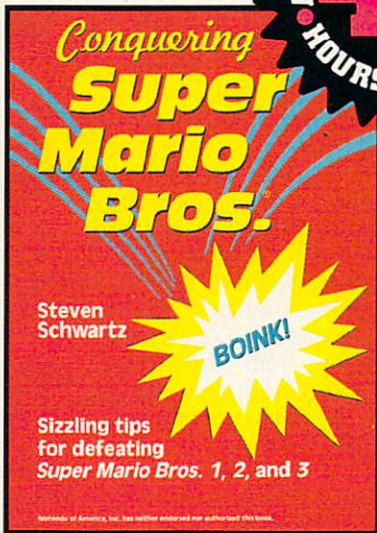
This is the complete playing guide to all four of the best-selling Mega Man games, including Mega Man Game Boy.

Features include extensive playing tips, screen shots, and puzzle-busting hints. Schwartz is known for.

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This book focuses on playing tips and techniques for mastering the three most popular Nintendo games. Fully illustrated with screen shots.

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Includes tips and strategies for half a dozen of the most popular Nintendo Adventure games. Covers *The Bard's Tale*, *Crystalis*, *Final Fantasy*, *The Immortal*, *Shadowgate*, *Swords and Serpents*, and *Ultima*.

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MAGNAVOX HEADSTART 386SX-20CD

The decision about which computer to purchase often boils down to what's included in the package. And this package—the Magnavox Headstart 386SX-20CD with a 3½-inch floppy drive, a CD-ROM player, and a Microsoft-compatible mouse—has some pretty neat stuff. It's bundled with the easy-to-use graphical interface GeoWorks Ensemble, Lotus 1-2-3 Version 2.2, and plenty of CD-ROM software for the whole family.

You can use the system almost straight out of the box. Since the setup guide is a mere seven diagramed pages, you can pretty much unwrap the computer, put it on your desk, and plug it in. The slimline case is well laid out and should fit easily even on small tables.

The Magnavox has an all-in-one motherboard, which means that all of your peripheral ports are built into the motherboard. The downside to this is that if one of the ports goes bad, you'll have to replace the whole motherboard. Also, since a CD-ROM drive is included with this system, you have only three expansion slots in the back. However, this kind of system tends to cost less than one with the traditional add-on type of motherboard—a plus if you're on a strict budget.

The Maxtor 80MB IDE hard drive should give most home users all the storage space they'll need for quite a while. Two megabytes of RAM are standard. One possible drawback, however, is how the Magnavox handles memory expansion. While

the computer can take up to 16MB of RAM, you can install only an additional 8MB on board by adding SIMMs. You'll have to buy an expansion card for additional memory above that, which means using up another slot. If memory expansion is a priority on your list when you're computer shopping, you probably should consider a more expandable machine.

The monitor you get with this system is a Super VGA with 800 × 600 resolution and 16 colors. Again, because the video-adaptor card is built in, you're limited in your ability to upgrade. If you disable the on-board video controller, you'll have to use yet another expansion slot in the back of the computer.

Despite its expansion limitations, this Magnavox becomes a very friendly machine when bundled with GeoWorks Ensemble. Ensemble—similar to Windows 3.0 in that it's an icon-oriented, point-and-click interface—provides you with an easy means of accessing your other applications, along with some convenient desktop tools and a couple of games. One nice aspect of Ensemble is that a simple Ctrl-Esc allows you to listen to your audio CDs on the CD-ROM player (with the included headphones) while working in another application. When not listening to music, you'll want to take advantage of the software included for the CD-ROM player.

Supporting a variety of the most popular word processors, Microsoft Bookshelf offers up a nice collection of writing resources: *The American Heritage Dictionary*, *Bartlett's Familiar Quotations*, *The Chicago Manual*

of Style, and more. The program loads in as memory resident, so it's easily accessed from your favorite word processor. Unfortunately, GeoWrite, the word processor included with Ensemble, doesn't support this part of Bookshelf; in order to use the memory-resident feature, you'll have to use another word processor.

The New Grolier Electronic Encyclopedia contains all 21 volumes of the current *Academic American Encyclopedia*. This easy-to-use program makes looking up topics a snap, and the graphics are superb. An IBM-compatible version is also included on the CD-setup disk.

For learning world geography, PC Globe PAK is a gold mine. The extensive databases of PC Globe and PC USA are definitely this software's shining stars, with information on more than 190 countries ranging from population statistics to tourist attractions. You can even listen to 177 national anthems from around the world. GeoJigsaw, also included, is an onscreen geography puzzle.

For children, The Manhole is an easy-to-use audiovisual fantasy exploration program. Point the mouse and click, and you're headed in a new direction. Every cubbyhole you prod hides a surprise.

Microsoft Small Business Consultant and Stat Pak offer a world of information at your fingertips. They support most popular word processors, but, once again, GeoWrite isn't supported. You'll find an array of useful information—from books to government publications—for any type of business professional.

For most home computer buyers, the Magnavox Head-

start 386SX-20CD with a CD-ROM drive is a turnkey system with enough software to keep you happy for a long time. New computer buyers should find this package worth a close look.

JILL CHAMPION

Magnavox Headstart 386SX-20CD with 2MB RAM, 80MB hard drive, 3½-inch floppy drive, CD-ROM drive, mouse, software, and Super VGA monitor—\$2,099

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Circle Reader Service Number 363

OBJECTVISION 2.0

There are database programs. There are development systems. There are forms designers. And lately, hybrid products that claim to be all three have come along. ObjectVision 2.0 for Windows is one program that makes such a claim.

It is, in fact, a very powerful database toolkit that makes formerly difficult Windows jobs childishly simple.

Borland coyly refuses to offer a one-line description of ObjectVision, so I'll follow Borland's lead and instead summarize what you can do with the program. ObjectVision can be used to create databases in dBASE, Paradox, ASCII, and Btrieve formats. You can create filters for these databases using a simple forms approach. You can design forms for these databases visually, with full control over fonts and color support as well. The design tools mimic those of a rudimentary-but-capable draw program (but ObjectVision can import bitmaps via the Windows Clipboard). Most onscreen objects, such as fields, database tables, and buttons,

can perform user-defined actions using visual "event trees" that do many of the same things a simple programming language could do, without forcing you to program.

Borland originally downplayed the ability of ObjectVision 1.0 to create databases, instead touting it as a front end for other database systems, notably dBASE and Paradox. But as often happens with software, those pesky users insisted on doing their own thing with it—and that turned out to be custom application development. Users were also unwilling to part with \$495 (the original price for ObjectVision 1.0) for a database program that didn't have a traditional programming environment.

Borland sensibly paid attention to their needs, soon tilting the development of 2.0 toward the creation of sophisticated data-management systems under Windows. The company went one step further and allowed the free distribution of ObjectVision runtime modules. The result is that people who were formerly not identified as database experts (the same people who are willing to take a crack at macros in 1-2-3 or WordPerfect but who don't identify themselves as programmers) are suddenly able to quickly create seamless, freely distributable database applications that run under Windows.

And while ObjectVision 2.0 does lack the scripting language it so richly deserves, it's able to perform many of the kinds of tasks that would be enormously complicated using languages such as SQL or dBASE. One of ObjectVision's unsung features is the ability

of a single onscreen form to update many different databases using many different formats at once. For example, your innocent-looking order entry form can automatically update your dBASE customer file, a Paradox inventory table, and an ASCII mailing list file, all without requir-

Is ObjectVision for you? See if any of the following apply: Do you need to develop Windows database applications of elementary-to-medium complexity? Are you fairly sure that you can get by without a programming language to back you up (or do you not know any pro-

Date	Payee / Memo / Category	C	Payment	Deposit	Balance
6/6/91	Paycheck			592.34	592.34
6/15/91	Paycheck			592.34	1,184.68
6/17/91	Savings		100.00		1,084.68
6/22/91	Paycheck			592.34	1,677.02
6/24/91	Savings		200.00		1,477.02
6/29/91	Paycheck			592.34	2,069.36
7/1/91	Service Charge		5.00		2,064.36
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10/10/91	Telephone		45.61		538.83
10/11/91	Cash/Coins Company		48.32		490.51

Starting Balance Difference: 0.00 Balance: 490.51

Cleared Transactions: 5 Deposits: 2,374.36 Cleared Balance: 539.21

13 Checks & Payments: (1,835.15) Statement Balance: 490.89

Mark all transactions that appear on your statement as cleared.

Press F12 to edit this transaction.

Microsoft Money looks and sounds so much like Quicken you may forget which one you're using, but Money is the simpler of the two.

ing a single line of programming and all without the knowledge of the user. ObjectVision is so adept at managing multiple relations that I'm sure many users are already creating applications that would be regarded as quite advanced by database theorists, even though the very same users might not know a thing about set theory.

Network users should note that even at its surprisingly low price, ObjectVision supports a half-dozen networks if the database files are in Paradox format. On the other hand, owners of small businesses or prospective personal users should also pay close attention, because there's no faster way I know of to get a high-performance database written than with ObjectVision 2.0.

gramming languages)? Are you a consultant who wants to distribute turnkey applications with record turn-around? Do you need to whip together a slick forms package for an existing database in dBASE, Paradox, ASCII, or Btrieve format?

If you answered yes to any of the above, ObjectVision is a no-brainer. There's no better deal for a hundred and fifty bucks.

TOM CAMPBELL

IBM PC and compatibles (80286 or faster); 1MB RAM (2MB recommended); EGA, VGA, 8514/A, or Hercules; 2.5MB hard disk space; Windows 3.0; mouse recommended—\$149.95 (\$49.95 for upgrade)

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MICROSOFT MONEY

It's never been easy to keep track of finances. If you think keeping your own records is difficult, just remember the Romans. It took them ten times the time and personnel to keep records in Roman numerals than it would have if they had used the Arabic number system. Venetian merchants used a secret system of Arabic number-based recordkeeping that has been refined over the centuries to the system of recordkeeping widely used today. The advent of the computer has made some recordkeeping easier, but you still need to learn how to use a computer. Microsoft Money helps.

Microsoft Money combines an easy-to-use interface, Windows 3.0, with a checkbook ledger that has been expanded to incorporate two special accounting journals: the cash payments and cash receipts journals. For accounting aficionados, Money is a cash-basis accounting system that may require an accountant to do end-of-year adjustments to convert it to an accrual basis for certain types of businesses. Other end-of-year adjustments may be required to convert the information to the needed format for certain financial statements and income tax returns. Money comes with a variety of foolproof, easy-to-use features that will make the task of recordkeeping less painful.

Money, which was released shortly before Intuit's Quicken 5.0 for Windows, looks very similar to Quicken and has many similar features. Its manual even has a

chapter especially written for Quicken users, and the program has a feature which converts Quicken data files to Money's format. Even many of Money's command keystroke combinations are borrowed directly from Quicken. Money uses the same check forms developed for Quicken by Deluxe Business Systems, which are available for dot-matrix and laser printers. Money is so similar to Quicken that they even sound alike. Both have the same data entry-confirmation beep. With Quicken's user base of more than 2 million, imitation is not just the sincerest form of flattery. This type of imitation is an attempt at 100-percent compatibility with the industry standard.

Money has some very useful innovations that go beyond its status as a Quicken look-alike. Smart Fill is a feature that, on the second and subsequent entries of a payee or payer, will complete the entry of a transaction after the first few letters of the name are entered. Money can also use aliases and codes to simplify data entry. By using a code for a repetitive transaction, the entire transaction will fill in without any further input. In making data entry significantly easier, Smart Fill helps encourage the user to enter all transactions in the system. (An incomplete set of records can be worse than no records at all.)

Also included with Smart Fill is Smart Reconcile, which takes you step by step through the process of reconciling your bank statement. Errors in reconciliation are searched for intelligently, automating the otherwise manual techniques for checking accounting errors and providing hints of what to

look for. Transactions involved in the reconciliation are marked with the word *reconciled* for future reference. Money's Smart Fill and Smart Reconcile features give you intelligent ways to use the computer to make the tedious job of record-

use the check-register format and provide for multiple files for multiple businesses, properties, and accounts. Both programs are versatile enough to handle all of the business and personal financial situations of the average individual, small busi-



This island governor's unique method of food consumption is only one of many wonders in Monkey Island 2: LeChuck's Revenge.

keeping significantly easier.

To Money's detriment, Quicken is still the leader in available features. Quicken can track investments, link up to the Checkfree electronic check-paying network, and manage assets. But wait—there's more! Quicken has links to tax categories, more intelligent data entry, two check-printing formats, loan amortization, percentage allocations, hot-key access to reports and the check register, a payroll module, memorized and customizable reports, two-level password security, a more detailed and useful toolbar, and many more categories and classes than Money's two of each. In many ways, Quicken is more versatile than Money. And there are even more versatile programs than Quicken on the market—for a higher price.

Both Money and Quicken

business entrepreneur, or property owner. Although neither Money nor Quicken is the be-all and end-all of accounting systems, both are good programs. Each may require some intelligent setup and some analysis at the end of the year to make it useful. If you need the expanded versatility of Quicken, Money may not be the way to go. But if it's a simple, attractive, easy-to-use, foolproof system that you need, then Money beats Quicken hands down.

ALFRED C. GIOVETTI

IBM PC and compatibles (80286 or faster), EGA or VGA, 1.7MB hard drive space, Windows 3.0, printer (to print checks); Microsoft or compatible mouse recommended—\$69.95

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MONKEY ISLAND 2: LECHUCK'S REVENGE

Consult your recipe for Peg Leg Rot and swig a hearty mug of grog. Guybrush Threepwood, goofball hero of Lucasfilm Games' *The Secret of Monkey Island*, has returned in *Monkey Island 2: LeChuck's Revenge* to do battle yet again with his decomposing nemesis, the ghost pirate LeChuck.

The games in the *Monkey Island* series are brightly animated adventures with a pirate-era setting and a warped sense of humor. You wear the paltry beard of Guybrush Threepwood, a pirate wannabe at the beginning of *The Secret of Monkey Island* and a LeChuck-conquering hero as *Monkey Island 2* begins. I couldn't get far enough in the first game to lay eyes on LeChuck, however, much less defeat him.

Fortunately, *Monkey Island 2* features an optional Easy mode "for beginners and magazine reviewers." (Ahem.) Unfortunately, even when playing "Monkey 2 Lite," I still couldn't figure out a way for Guybrush to vanquish LeChuck in round 2 of their ongoing enmity. My Guybrush remains lost under Dinky Island, getting zapped from room to room whenever LeChuck puts the pins to his Guybrush voodoo doll.

Whether you have better luck playing this game or not, you'll enjoy yourself. Unlike many other adventure games, Lucasfilm games actually encourage you to take chances—and to take it easy. As Guybrush, you can spout rude putdowns at unfriendly guards without

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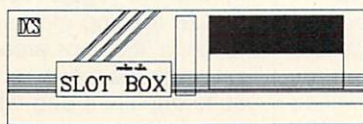
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fear of reprisal, and you can venture into unfamiliar places—a skull-shaped voodoo hut hidden in a swamp, the bedroom of an unconscious island governor who awakens only long enough to open his mouth for a spray of food from bedside tubes—without having to worry about sudden death.

Along with this easygoing approach, you'll find engaging animated scenes, from closeups of navigational maps detailing peril-fraught seas (avoid the Forbidden Rhombus and the Forbidden Right Circular Conic Cross-Section) to topographical macro views of the islands Guybrush wanders. Before he even encounters the newly reanimated LeChuck, Guybrush must search for clues to lead him to the lost treasure that's every pirate's dream: Big Whoop. The animated game has a cinematic feel, from the lovely opening shot of Scabb Island to the mood-setting music.

Monkey Island 2 is worth playing for the sounds alone. I first tried it using only my computer's internal speaker, then ran it through a Covox Sound Master II. The difference was astounding. A game of adequate, squawking sound effects quickly became something akin to a movie, with impressive flourishes of sound to accompany every tumble and capture. The music was even more impressive, with clattering Caribbean rhythms enlivening the opening credits, jaunty pirate music accompanying the opening scene, and springy reggae sounds emanating from the speakers every time Guybrush boarded the ship of the dreadlocked Captain Dread.

Combine that music with fine animation and abun-



It may have more power than you need, but the Practical Peripherals PM9600 is an excellent 9600-bps modem.

dant humor, and you have as enjoyable an adventure game as anyone could hope for—even if you never do vanquish LeChuck.

EDDIE HUFFMAN

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Circle Reader Service Number 366

PRACTICAL PERIPHERALS PM9600

Macros and programming make telecommunications faster, but how about getting the information across the telephone lines more quickly—say, four times faster than the standard 2400-bps modem? I had a chance to try out the Practical Peripherals PM9600 modem and liked it so much I bought one for myself. I've installed a variety of modems for COMPUTE's staff, but this one really grabbed my at-

ention. It was easy to install and configure, and it worked perfectly the first time I used it.

Before you consider buying the PM9600, ask yourself if you need a 9600-bps modem. Although theoretically it's four times faster than a 2400-bps modem, that's true only when your computer is talking directly to another computer or when you're on a bulletin board system. When you're connected to online services, delays introduced at every stage of the connection will reduce your effective transmission rate to something less than four times the rate of a 2400-bps modem.

Here's how 2400 bps and 9600 bps compare on my computer when I download files from GENIE. At 2400 bps, the transfer rate is around 138 characters per second (cps); at 9600 bps, it's about 340 cps. That's roughly 2½ times as fast.

Bear in mind, too, that 9600-bps connect charges are greater. You pay a higher hourly rate when connected at the faster speed. However, you'll still end up saving if you're downloading many files. And it's an even greater savings if you're pay-

ing long-distance charges.

Another good point: This internal modem is incredibly simple to install and run. I opened up my computer and removed the old modem; then I looked at the back of the Practical Peripherals modem where the COM port switches are located (and thoughtfully marked) to make sure it was set to COM 1. After inserting the card in a slot, I closed the computer and turned it on. I ran my telecommunications software, set it for 9600 bps, and took off. I experienced no interrupt or IRQ conflicts, had no oddball initialization strings to deal with, and faced nothing incompatible or out of the ordinary.

How did the modem work? Great. You might expect line noise and extraneous garbage to enter the data stream, since the transfer speed is much greater, but I didn't find that to be true. In fact, I experienced less line noise with this modem than with some 2400-bps modems I've used. It seems that Practical Peripherals' system of noise filtering is up to the task of the extra speed.

These modems are great for remote-control computing, too. For regular system use like reading messages, though, a 9600-bps probably isn't worth the money unless you're impatient and willing to pay for fast menu and text-file updates.

If you're thinking about buying a modem or upgrading the one you have, though, consider the PM9600. It's an excellent choice.

RICHARD C. LEINECKER

Practical Peripherals PM9600—\$599

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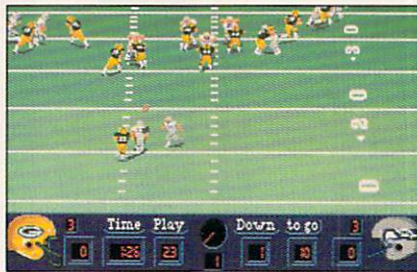
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REVIEWS

NFL

Couch coaches looking for the ultimate football computer game might end their search with Konami's NFL, a football simulation program that lets the player compete in both statistical and hands-on, arcade-style football. With a huge selection of options, there's little in the game that can't be manipulated in some fashion or another, yielding a sports contest that will please any type of player.



Frustrated with pro football? Run the league yourself with NFL.

Before the game begins, you can choose from several keyboard and joystick configurations, as well as set either player as a computer-run opponent. In addition, you determine whether you'll be playing a statistical game (coach only) and whether you'll choose player substitutions and drafts or leave these chores to the computer. You also have the ability to toggle such options as penalties, weather conditions, player fatigue, and player injuries.

After configuring NFL, you're offered three game modes: Training Camp, Pre-season Game, and Road to the Super Bowl. In the training camp, you edit teams, players, and your playbook, as well as run through your plays on the practice field. In a preseason game, you choose two teams to battle it out in a single game. Finally, on the road to the Super Bowl, you create your own league and set off for the ultimate football victory. In this game mode, you'll not only play football but also scout out your opponents, review your weekly schedule, analyze player and game statistics, trace your progress on the play-off tree, and participate in drafts and trades.

Once on the field, if you've chosen the coach-only option, you need do little more than select your team's plays and watch the computer run them. However, if you've decided on the hands-on approach, you must control your players on the field after you've given them their plays. Since NFL is a fairly complete simulation, controlling

your players well takes practice. You can choose from many plays, including passing, receiving, diving, straight-arming a defender, punting, and tackling.

After a play is completed, the instant-replay option offers a chance to analyze your team's efforts. With the VCR-type controller, you can view the play at different speeds or even frame by frame, as well as change the viewing angle. Other controls include rewind and stop.

NFL features digitized voices and effects throughout, and although you'll get the best audio results by using a sound card like Sound Blaster, the program wrings some surprising sound even from your PC's lowly built-in speaker. In addition, the graphics and animation are all top quality, providing a realistic and fun sports simulation.

Because it can be configured for different depths of gameplay, NFL is a great choice for any football fan. Those who like to get their hands dirty with the details of handling a league have plenty to keep them busy, whereas players who just want to grunt and sweat can march right out onto the field, ignoring the editing options. For either type of football fan, NFL comes highly recommended.

CLAYTON WALNUM

IBM PC and compatibles; 640K RAM; EGA, MCGA, or VGA; supports Ad Lib, Sound Blaster, and Roland sound; joystick and hard drive recommended—\$49.95

KONAMI
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Circle Reader Service Number 368

QUICKVERSE 2.0

Students of the Bible sometimes need serious tools to further their studies. QuickVerse 2.0 delivers an onscreen Bible that practically invites serious study. With several popular translations of the Bible available, along with Hebrew and Greek Transliterated Bible, this Parsons Technology product can give scriptural scholars some welcome assistance.

The QuickVerse screen remains neat and uncluttered, even when simultaneously displaying multiple translations. A function bar along the top provides access to pop-up menus detailing specific program functions (easy-to-remember keyboard shortcuts are also available). But most of the screen is devoted to the text area, which displays up to four windows of single-spaced text. With all four active, your computer presents two rows of two windows each. No side-by-side arrangement is available, making parallel stud-

ies slightly more tiresome than with other packages.

One text window is always designated as the active window, and you navigate therein using the Home, End, Page Up, Page Down, and cursor keys. Text in the active window can scroll independently or in synchronization with identical references in other windows. Synchronization, however, is an all-or-nothing prospect. If you want to sync any windows, you'll have to sync them all.

It's fascinating to read a passage while there are multiple translations on-screen for easy comparison, and most users will spend much time doing just that. But QuickVerse's search features make the program really notable. Say a particular word catches your interest—*forgiveness*, for instance. QuickVerse can search out and identify every occurrence within the text, listing them all on your screen. You can then look at individual occurrences or step through them one at a time. QuickVerse ignores case but not punctuation—a trait that you can use to add precision to your searches.

What if you don't know how to spell the word you want to find? If you want to find *Nebuchadnezzar*, for example, just check the alphabetical listing of all words occurring in the current translation. Alternately, use QuickVerse's wildcard feature. Type the first few letters followed by an asterisk (in this case, *neb**), and you'll find all passages containing words beginning with the letters *neb*. Unfortunately, the wildcard feature works only at the end of a word, so an educated guess at the first few letters can prove crucial.

Looking for related words? Boolean search capabilities allow you to pinpoint verses containing specific combinations of words or any of several given words. There is no way to search for words occurring a given distance apart (for example, the word *forgiveness* when it's located within five words of the word *neighbor*), but the Boolean approach actually seems to be more useful.

How about phrases? QuickVerse searches for phrases of up to ten words or 127 characters, whichever comes first. Punctuation need not be included, so there's no need to worry about all those commas. Phrase searches stop at verse boundaries, however. In fact, if you try looking for a phrase that crosses verse boundaries, the program will tell you that it's not in the Bible.

In any case, you can easily set search limits. You can search a range of verses, a single book, a range of books, or a group of books. If you

don't specify a limit, the search will cover the entire Bible.

Once you've found your word or phrase, QuickVerse allows you to write your own comments on that particular word or phrase. It's like writing in the margins of a printed Bible—a genuinely handy way to record your thoughts as you study. The package offers a wide range of printing features, of course, including the ability to print those notes with the text.

Is QuickVerse really quick? Indeed it is, despite what sometimes seems like a lot of hard disk accessing. Even on a turtle-slow 16-MHz machine, locating a phrase never took more than a few seconds—much faster than any text search using traditional reference-book techniques, as page-weary Sunday school teachers will attest. The result: less time spent looking things up and much more time to spend looking them over.

What's missing? An autoscrolling feature would aid casual reading. Some might wish for the Apocrypha, and those with a bent toward comparative studies might wish the text windows were side by side instead of stacked two over two. But for many pastors, Sunday school teachers, and other students of the Bible, QuickVerse 2.0 may take Bible study to a more comfortable level.

STEVE HUDSON •

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DESTINATION: MARS!

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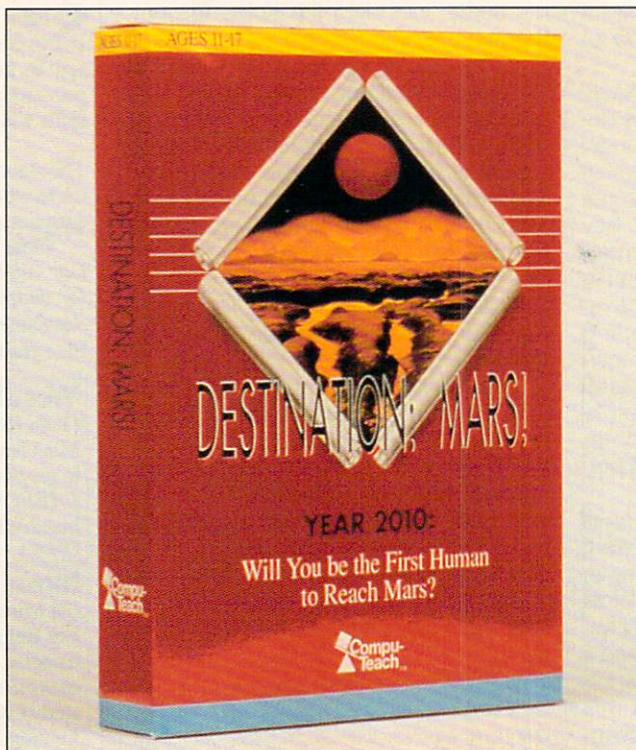
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rover you complete experiments, carry out activities at several bases, and finally match wits against your competitors as you race to find their secret resource areas.

Many of the tasks you have to accomplish are fun, and it's a thrill when you finally get to Mars after many missions. VanDam Publishers' *Mars Atlas*, which comes with the program, is an informative resource with great maps. Compu-Teach's own user's manual contains detailed instructions on program operation and lots of information about astronomy, biology, chemistry, geology, and physics.

Although some of the challenges will be satisfying to complete, parts of the program are really annoying. For example, to finish each experiment, you're given a multiple-choice question. Assuming you're able to figure out the question itself, you should be all right. If you choose incorrectly, the program responds with *Wrong!* and jumps you right into another situation. I was left in the dark many times. Why couldn't the program have said *Let's look at this problem again or You should have chosen . . . ?* I ended up learning absolutely nothing from my mistakes.

You'll need your good judgment to survive emergency situations which come about as you navigate through the game. Although I normally trust mine, I was often frustrated when choosing what I thought to be the best solution, only to have the computer respond with *Wrong!* A crew member compensated—or something to that effect. I'm still puzzled as to why some of my answers were wrong. I also doubt the educational—and moral—soundness of a pro-



In many ways Destination: Mars! is a great adventure game, but some of its educational aspects leave a lot to be desired.

gram that (1) ignores such an opportunity to build research skills and promote good planning, (2) gives only negative feedback and doesn't explain why your response isn't good, and (3) glosses over your mistakes by implying that they're OK because someone else will cover for you.

My other beefs are relatively minor. I think it's overly optimistic to recommend the age level as 11-17, considering some of the chemistry and physics problems you have to swim through. Younger players may find themselves over their heads. Also, although the user's manual attempts to bring each scene in the game to life by including details about your living conditions, computer equipment, and fellow travelers, it would be more effective if this were put right in-

to the program. Even the most studious kids are likely to skip over the manual and miss all these special touches.

The program's technical operation is perfect, the graphics are great, and the supplemental materials are thorough. I give these areas the highest rating. However, while *Destination: Mars!* may be built on a sound premise, there's a lot of room for improvement before this program can truly be called educational.

KRISTEN STERNBERG

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Circle Reader Service Number 370

SOUND MASTER II

Settling for the internal speaker that comes in your computer makes about as much sense as settling for an AM radio in a new car. Both get the job done up to a point, but by settling for them, you're missing out on a lot. Besides, like an AM radio in a car, a computer's internal speaker sounds terrible.

So you decide to upgrade. But which custom sound system will you choose for your computer? AdLib? Sound Blaster? Well, how about a sound card that covers those bases and more at a list price only slightly higher than its competitors? The Covox Sound Master II emulates the most popular sound cards and offers several other worthwhile features. It comes packaged with hardware and software that allows you to channel your internal speaker's sounds through the sound card, issue voice commands, and link your MIDI keyboard directly to the card for compositional interaction.

All of these features won't appeal to everyone, of course, and not all are accessible to everyone. For instance, you have to have an 80386 or higher processor to take advantage of both the Sound Blaster compatibility and the SMulator technology, which makes Sound Master II work with software that requires other sound cards. Beyond such limitations, though, lies dramatic sound improvement.

Simply running the internal speaker through the Sound Master II smooths out a lot of aggravating squawks and bleats. The dramatic difference comes with games and other sound-intensive software. Once plugged into an expansion

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Circle Reader Service Number 246

slot, the card and its pair of blue mini-speakers transformed tinkly music and ragged jet whooshes (as heard through my internal speaker) into a majestic wall of sound. Both arcade games like Thunderstrike and adventure games like The Secret of Monkey Island benefited greatly from the upgrade.

And while digitized computer speech still leaves a lot to be desired compared to the real thing, Sound Master II told me everything I needed to hear, both when using its test programs and when using software like Super Solvers Spellbound!

But why stop at digitized speech? Speak yourself, and tell your computer what to do. The software accompanying the Sound Master II allows you to issue voice commands to run macros. Say, "Give me a directory," and you'll get one, or you can use your imagination. I issued a James Brown-style "Hah!" to start my word processor.

Sound Master II also comes packaged with PC-LYRA, a basic music-composition program. In addition, you can record sounds to RAM or a hard disk and sample at a rate of 100 to 25,000 samples per second using the software that comes with the card, most of which is relatively easy to learn and use.

For all its positive attributes, Sound



Get the Covox Sound Master II and end weak internal speaker sound.

Master II isn't without its flaws. The cord for the speakers allows them to be placed only about a foot apart, a distance I found to be insufficient. Some of the software comes without a printed manual, requiring you to print one from a text file. And the printed manual you do get—a dual edition covering both the Sound Master II hardware/software package and the PC-LYRA program—is woefully inadequate. It has only a few vague illustrations, no clear overview of the features available, no index for the Sound Master II section, and no troubleshooting guide. I found it easier to put the software through its paces using trial and error than to plow through the book. When a company makes a product this good, I wish it would go all the way

and give it a comparable manual.

Hardware and software both delivered, however, which matters more. My irritating internal speaker has now been tamed, and Sound Master II has opened a window to a broad world of sound. It's an excellent package, whether for games and music or for bossing your computer around.

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OPTIONS

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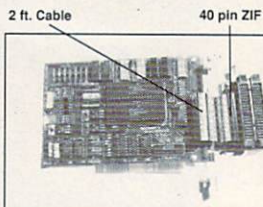
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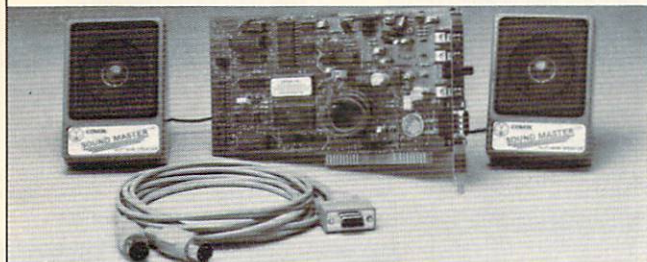


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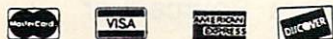
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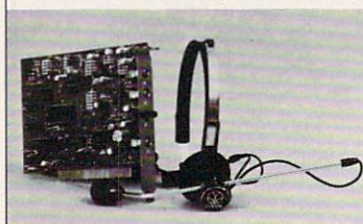
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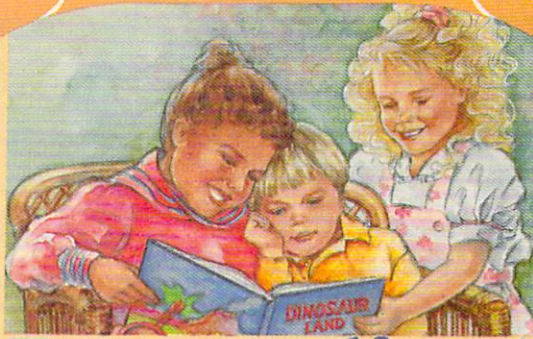
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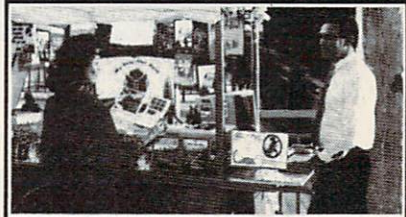
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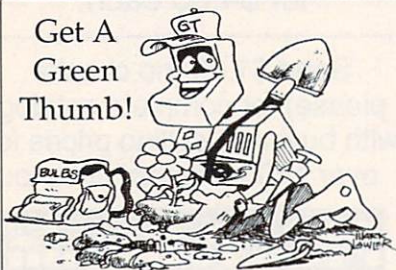
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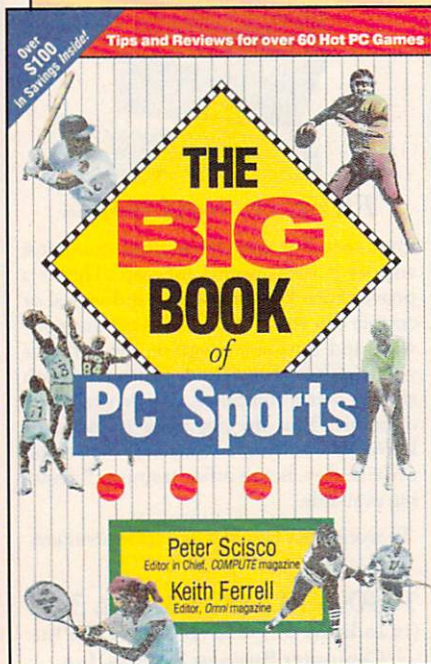
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Irvine says this type of innovation could revolutionize the laptop/palmtop computer field. Laptops could be downsized even more and made lighter, since the hard drive and bulky battery packs that now limit downsizing would be eliminated. The "solid-state" technology would significantly extend the life of much smaller batteries, and computer functions could be greatly enhanced to include every function now performed by much larger systems.

Software Rental

Software rental by computer and video stores, although illegal since passage of the Software Rental Act of 1990, is a growing trend, according to the March 1992 issue of *AdWeek's Marketing Computers*. However, this trend, says the journal, is one the Software Publishers Association should be applauding rather than fighting. Instead of encouraging software piracy, such stores are actually pointing the way to a new type of software channel into which software makers could deliberately introduce second-string, for-rent software.

Since software companies make so much of their money from upgrades, that strategy could continue, along with selling 900-number support, manuals, and training tapes.

Beast on a Lease

Along the same lines, leasing computer hardware is also a growing (but legal) trend in the business world, according to Computer Service & Rental Centers (484 Wrightwood Avenue, Elmhurst, Illinois 60126; 708-291-1616). Even the best-equipped businesses have periodic short-term needs for supplemental PCs and peripherals; for instance, when a computer goes down, businesses may not be able to afford the downtime while it's being repaired. Renting or leasing is also a good option when companies need additional computers for training classes, peak work periods, out-of-town trade shows, and other temporary situations. Cost efficiency, no maintenance, and access to the latest equipment are cited as the biggest advantages of renting over buying.

Curtis Goes Green

Curtis Manufacturing (30 Fitzgerald Drive, Jaffrey, New Hampshire 03452; 603-532-4123), maker of computer-related equipment, recently joined the growing list of environmentally conscious companies with its new "minimalist packaging" for selected product lines. The new design cuts down on the amount of paper needed to produce packaging and "only uses what is required to bring the product safely to the consumer," according to product literature. Curtis's first products to use downsized packaging are economy-line printer legs and surge protectors. The company's planned new product lines will follow suit.

Sunblock for Your PC

Computer users concerned with the radiation emitted from computer terminals may want to try Alpha Block, a spray-on coating for computer screens that (the distributors claim) filters "harmful rays" emitted by monitors. The product literature makes no specific claim that the product blocks electromagnetic radiation sometimes blamed for miscarriages and other health problems among heavy users of computers. Rather, it states that the product works on the screen the way sunblock works on your skin to filter the sun's rays, which means that it blocks ultraviolet radiation. If you would like further information, contact Westwind Traders, P.O. Box 433, Louisville, Colorado 80027; (303) 937-9512.

Top Early Childhood Software

High/Scope Educational Research Foundation, a nonprofit research and development organization based in Ypsilanti, Michigan, bestowed its 1992 Best Early Childhood Software award on four software products: Kid Works (Davidson & Associates), KidPix (Brøderbund), The Playroom (Brøderbund), and The Treehouse (Brøderbund). High/Scope Foundation, which receives no fees or monetary consideration from software publishers or distributors for software reviews, publishes an annual *High/Scope Buyer's Guide to Children's Software: Annual Survey of Computer Programs for Children Aged 3 to 7*. Parents and educators who purchase High/Scope's detailed *Buyer's Guide* will find more than 500 reviews of children's software inside. The guide costs \$19.95 from High/Scope Press, 600 North River Street, Ypsilanti, Michigan 48198-2898; (313) 485-0704. □

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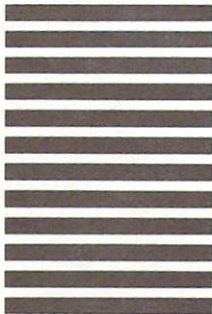
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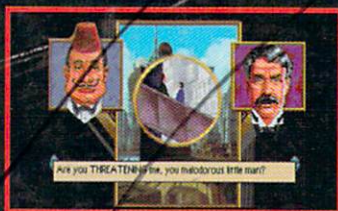
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