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The Apple Journal

February 1985, USA $2.95
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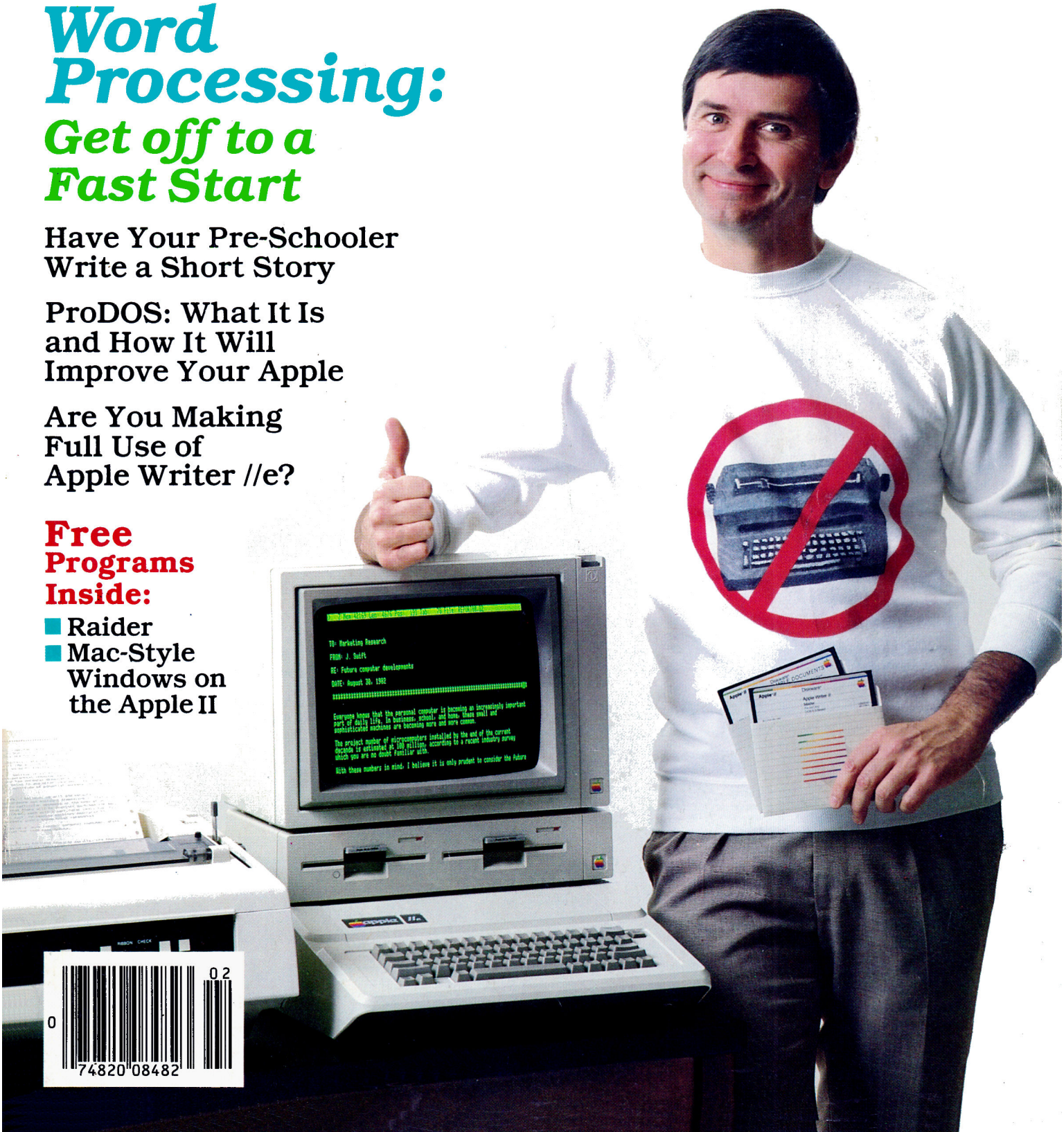

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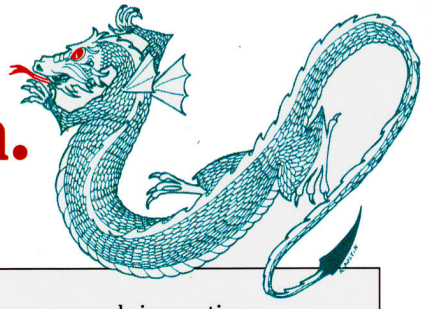

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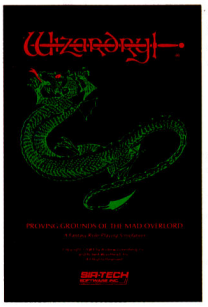

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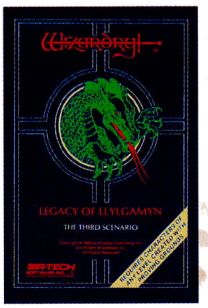

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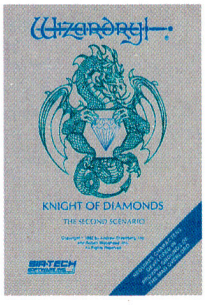
". . . A Landmark in Graphics Advancement" and "The Best Yet" —Softalk



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The Second Scenario

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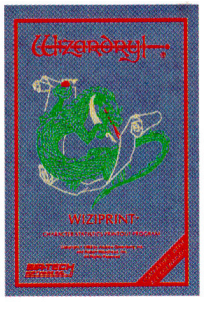

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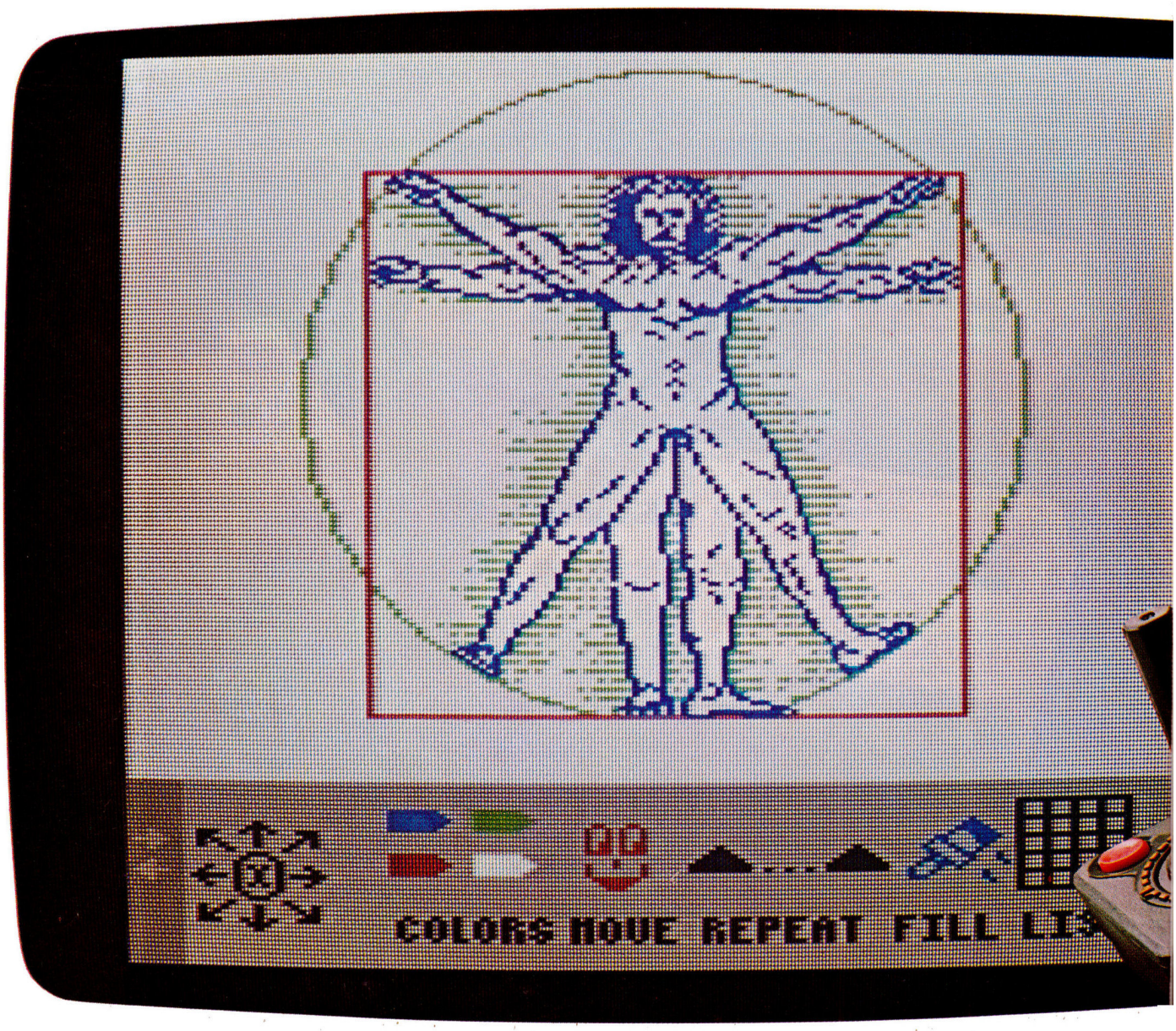

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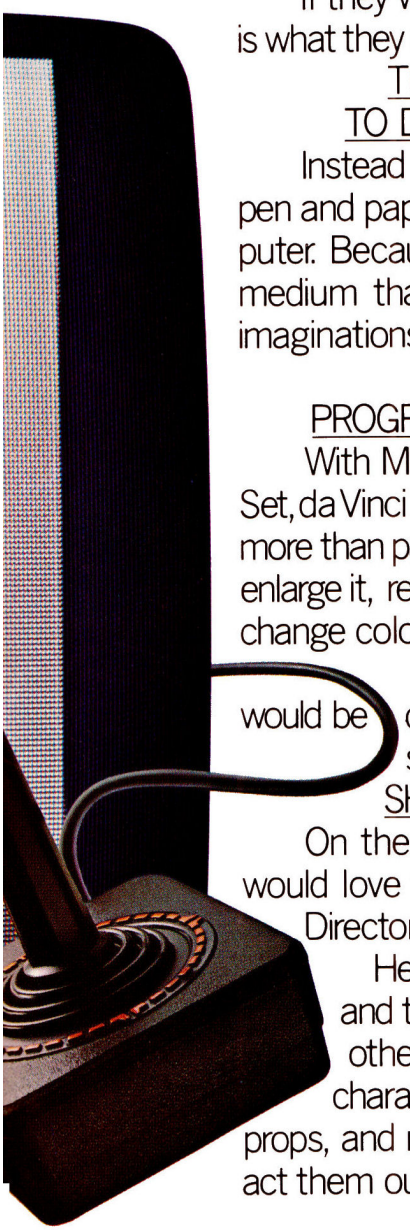

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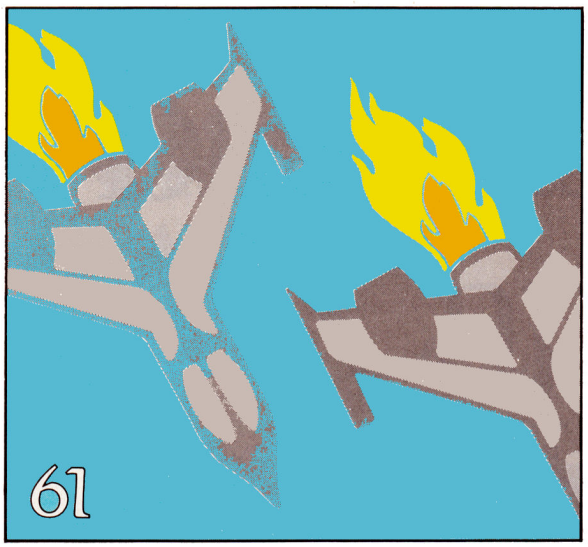



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by Lee Swoboda
Make room for ProDOS, Apple's latest disk operating system. Learn about file structure in the first of our six-part tutorial series.

Word Processing Illuminated — 41
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At last, word processing made simple. A layman's guide to the world of computerized typing.

Word Processors for Under $100 — 46
Replacing your typewriter? Check out our budget-conscious list of word processors.

Cracking the Code — 50
by Don Lancaster
Apple Writer's WPL is a powerful secret tool you've probably overlooked. Here's one of its many facets, as explained by a WPL expert.

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Your Apple II can generate Macintosh-style windowing for help screens and nested menus.

Galactic Invasion — 61
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Defend your military base from foreign invaders in Raider, a strategic war game.

The Docile Printer — 75
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This printer-control program lets your printer know who's boss.

Holding Your Own — 81
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An easy, do-it-yourself project: End keyboarder's neck strain by building a handy copyholder.

Templates Boiled Down to Size — 82
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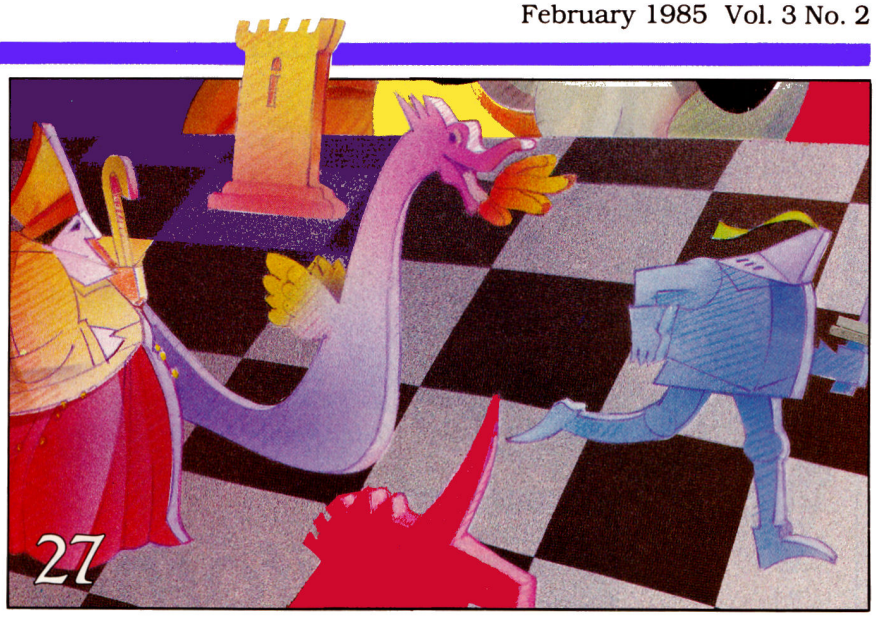

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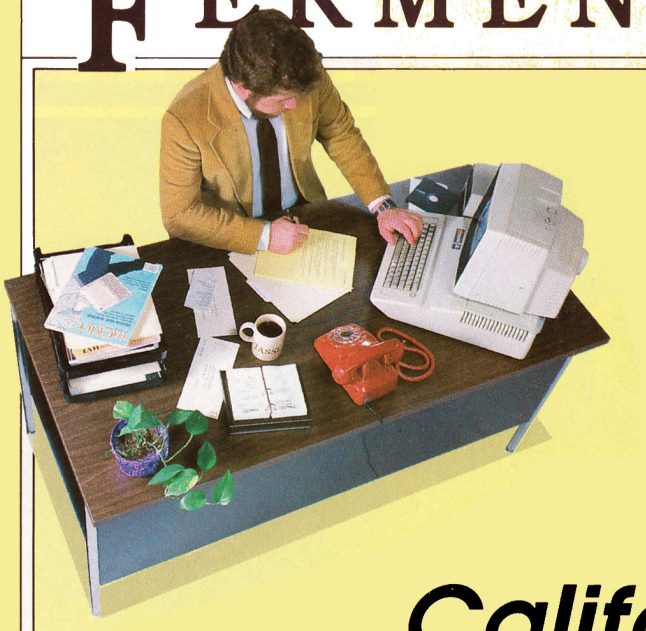

California Dreamin'

Don't hang by your thumbs waiting for this one, but we're laying better than even odds that Apple is sitting on a new computer. Chances are you've already heard of the elusive IIx, a 16-bit marvel rumored to be the newest scion in the Apple II line. We've been tracking the story for about eight months now, and though the scuttlebutt blows hot and cold, our best guess is that where there's smoke, there's fire.

Nose for News

Based on sleuth work we've done in and around Apple headquarters, here's a rundown on the secret machine:

The IIx will be a selectable 8/16-bit machine available in 1986. At its core will be the 65816 MPU, a potent CMOS microprocessor from Western Design Center in Mesa, Arizona. In its 16-bit native mode, this little powerhouse will address up to 16 megabytes of memory, and, in its power-up, 8-bit mode, it'll address 64 kilobytes.

Presumably, compatibility with existing Apple II software will be built into the new computer, though it will be far more than a //e with a new CPU. This machine will probably require a new motherboard and will most likely employ 256K memory chips.

Its fast CPU clock speed, 5.0 MHz, will exceed that of Intel/IBM's 8088. This, coupled with a CPU that addresses 16 *times* the memory of an IBM PC, will make it a strong contender for use in business. One highly-placed source describes the IIx as "A working man's approach to a mainframe."

If the alleged new computer measures up to the conjecture it's generating, we'll see a product that will turn the industry on its ear. Meanwhile, Apple seems content to let the rumors fly. Stay tuned to this magazine for further bulletins.

The Home Front

Just like other Apple owners, we're always looking for new applications for the home. Let's face it, the abundant uses for Apples in business and education give us plenty to write about already. But what can you do with the home-based Apple?

Organizing personal finances, improving information acquisition and management, controlling the home environment and appliances, and home security are only some of the ways Apples are being pressed into service on the home front. If our hunch is correct, many of you are already making your Apples earn their keep. How about sharing what you are doing with the rest of America? Here's how:

Send us a brief description of how you're using your Apple in serious home applications, and we'll publish the best of the ideas in an upcoming issue of *inCider*. We'll pay up to $50, depending on the quality and content, for those we publish. (See, the Apple's paying for itself already.) The focus will be on practical applications other than entertainment and education.

If you've written a program for a home application, we'd like to see that, too. Send a listing printout, along with a brief manuscript and a copy of the program on disk. We'll pay (well) for the programs selected for publication and we'll promptly return any programs not accepted.

So, whether you're using off-the-shelf software or a program you've written yourself, send your entry to:

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by Paul Quinn

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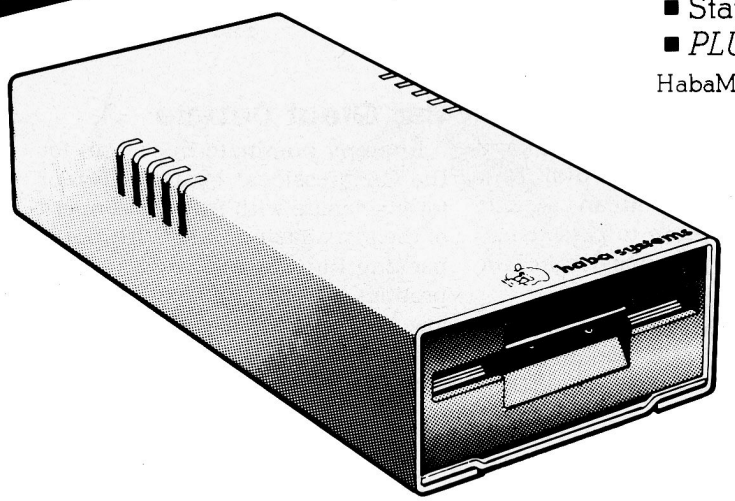

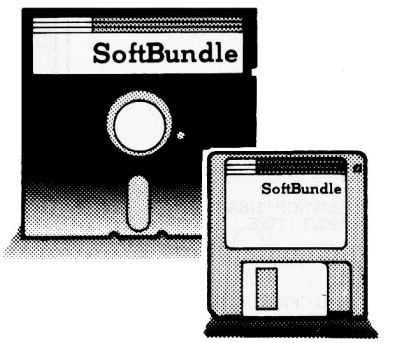

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LETTERS

Saving the Day

I found a problem with the program listing for "Screen Saver" (November 1984, p. 65). Line 610 reads HOME: X = PEEK (Z) + PEEK (Z) + (Z) + PEEK (Z). It should read HOME: X = PEEK (Z) + PEEK (Z) + PEEK (Z) + PEEK (Z).

Kerry J. Lanz asked if there was a way to boot ProDOS without destroying hi-res memory. You may not be able to do that, but you can save it to a ProDOS disk: Save the hi-res picture as described in Mr. Lanz's article, then use ProDOS utilities to copy files from the DOS 3.3 disk to a ProDOS disk. Then, you can use your MousePaint program to personalize the picture and your Imagewriter Kit to print it.

Captain Hugh T. Cook
406 Creach Drive
Warrensburg, MO 64093

//champion

I have just finished reading "//c vs. PCjr" (August 1984, p. 80). Ms. Eisenberg's view of IBM closely resembles Boxer's view of Comrade Napoleon in the book *Animal Farm*: "IBM is always right." This especially showed through when she pooh-poohed Apple's significant advantage in available software and then reiterated her belief in almighty IBM's power in the market. She remarks that Apple's available software is redundant. Obviously, we should all drive the same car, use the same gas, and eat the same food. Here in the New Orleans area, we firmly believe that variety is the spice of life. Why shouldn't this hold true for software also? Every user has different needs, and it may quite easily take four word-processing programs to satisfy the majority of the users' needs.

My boss recently bought a home computer. He decided on an Apple //c because of the availability of quality software and hardware. One look at the PCjr and he said, "Is this one of those game machines for the television?" He didn't give jr a second thought.

I am glad to see that your major thrust will be in the Apple II area. It truly is the most versatile computer for the money on the market today, bar none.

Martin J. Hrovat
Rt. 1 Box 335-J
Lot #109
Slidell, LA 70458

The Great Debate

I hereby nominate Bob Ryan for the Congressional Medal of Honor for his debate with Amee Eisenberg of the *jr* magazine staff! With Apple backing him up with such a great product as the //c, Bob could hardly lose, but he obviously did his homework well. Give the Purple Heart to Amee for dedicating the //c to those of us in the "Pepsi generation" with her dying breath.

I admit I got a good laugh at first reading of Mr. Kitzerow's letter suggesting that Apple build a mainframe. While I think Apple is best to leave the larger computers to the geniuses who built Cray and the VAX, with the research and effort they've put into the MC68000 microprocessor they ought to introduce a good minicomputer in the PDP 11/34 class. It isn't that big of a step from a "loaded" Lisa when you think about it.

John Townsend, Jr.
136 South 20th Street
Terre Haute, IN 47803

Wizfix Details

I noticed some errors in recent changes made to Wizfix. In line 663, one plus sign (+) should be an asterisk (*). Without this correction, once you have dropped an item, it doesn't register on the screen.

```
663 FOR K = B TO 8 : POKE BASE +
    58 + 8*K,PEEK (BASE + 66 + 8*K):
    NEXT : POKE BASE + 122,0
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In the Wizfix changes in the May

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LETTERS

Letters, Alan Popow adds a "(" after the PEEK statement in line 589. The missing parenthesis is in line 586, not line 589.

I'd like to thank Kerry Lanz for "Wizfix" and Alan Popow and William Walters for their helpful changes. They have added a lot of fun to "Wizardry" and "Knight of Diamonds."

Tad Green
14425 N.E. 10th Place
Bellevue, WA 98007

Sorry, Wrong Number

John Granfield attempts to compare the Novation Apple-Cat II and the Hayes Micromodem IIe in his article, "Buying Your First Modem" (August 1984, p. 57). Unfortunately, he has confused the old Hayes Micromodem with the newer Hayes Micromodem IIe. The latter is, in fact, 100 percent self-contained, having shed the external microcoupler box that Granfield refers to.

Also, Mr. Granfield errs in stating that the Micromodem IIe dials exclusively by rotary pulse. The unit can dial via pulse or touch tone by dialing either a P or a T before the telephone number (refer to the Hayes user's manual, page 4-4).

Other than that, congratulations on a fine issue on telecommunications. As an educational telecommunications writer, I perceive that the modem is quickly becoming the most important piece of peripheral equipment that one can add to his or her microcomputer.

Doug Schooler
Ohio State University
College of Education
1459 Brookeville Avenue
Columbus, OH 43229

As a confused neophyte in the realm of telecommunications, I was even more confused by John Granfield's review of the Hayes Micromodem IIe (August 1984, p. 57).

Upon reading the article, I discovered "dialing is exclusively by rotary pulse. . .it cannot be used with long-distance services such as Sprint or MCI." I was disappointed because I would be unable to use a modem with my long-distance service.

Fortunately, I mentioned this to a local dealer who told me that the Micromodem IIe does access touch-tone dialing. I also called Hayes Microcomputer Products and they assured me it does touch-tone dialing.

It's misleading and irritating to find a product review with a blatant error like this. Did Mr. Granfield actually use the product? Did he read the documentation? The fact that the Micromodem IIe does touch-tone dialing is even mentioned in product advertisements as well as on the box it comes in!

Ray Lyon
7200 N.W. Second Avenue
#110
Boca Raton, FL 33431

The inCider *staff and John Granfield apologize for this error. Thank you for notifying us and not letting this slide by. It's good to know our readers are up on things.* —*eds.*

A Little Support

I have a criticism of your software reviews. Software is useless if it does not support the user's printer. All too often, the reviewer fails to take that into account. Frankly, it doesn't matter how good the software is if it doesn't support a printer; data confined to a softly glowing screen is next to useless.

For example, your review of the Print Shop (September 1984, p. 132) strongly implies that a printer other than those specified might work. Such is not the case. Only the printers specified by the publisher will work.

Other reviews in the same issue don't even mention printers. If you scanned the ads in your publication, you would find that there are myriad printers available for the //c, yet a lot of software doesn't consider this. If



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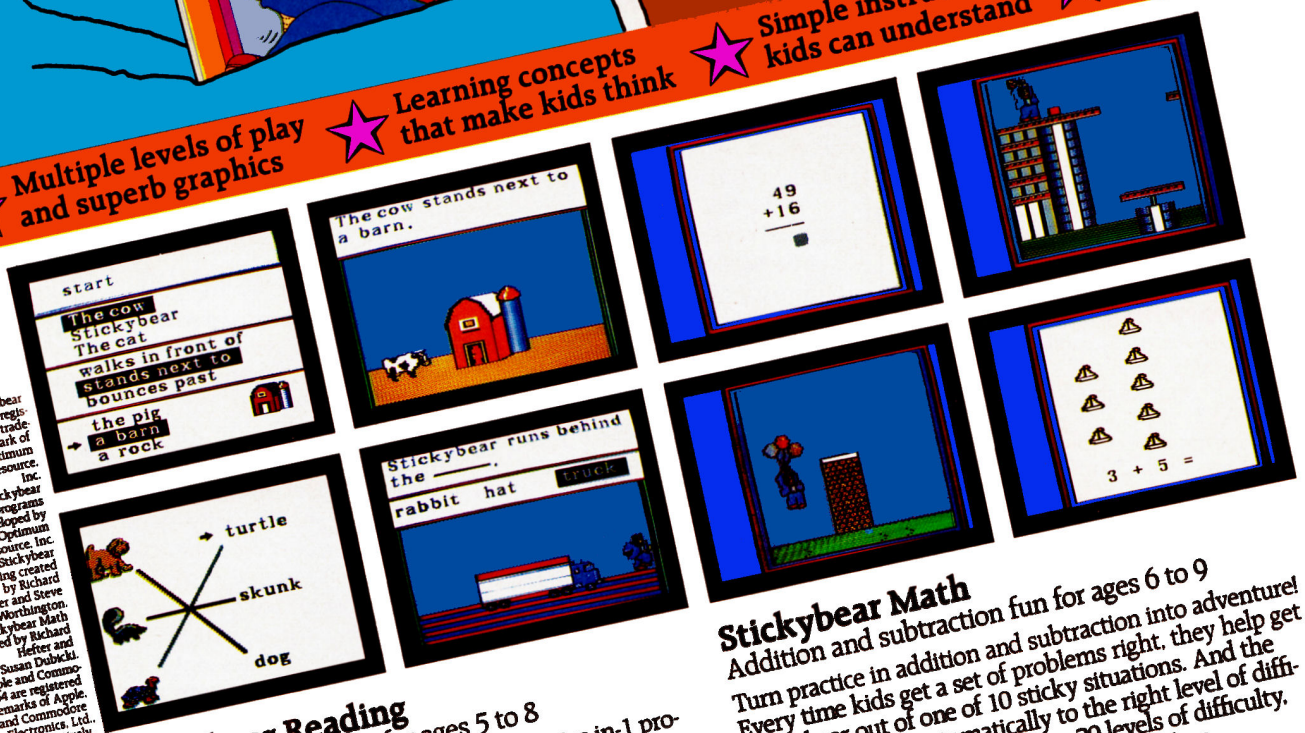

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LETTERS

reviews mentioned this, then perhaps the software publishers would make a small effort toward printer support.

How about it, *inCider*? Carry the challenge to them through your reviews and make a lot of Apple owners happier.

Michel Potheau
Box 175
Sherborn, MA 01770

Buyers, beware: It's a jungle in the printer world. Each printer and interface card combination has its own peculiarities. This is an acute problem for graphics programs, since they support only the printers and interfaces specified by the publisher.

For other software, always ask before you buy. The //c is a special case, since its serial port is different from the more common parallel port. We will try to be more specific in our reviews. Meanwhile, how about some industry-wide printer standards? —eds.

September Suggestions

Regarding your September 1984 issue:

In O'Brien's Journal, page 27, the author refers to "an inherent flicker of 60 Hz. . .[of fluorescent lighting]." While the polarity of the current alternates at 60 Hz, fluorescent lighting operating from that current will go on and off 120 times per second. On each cycle, the current will go above ground then below ground and reach ground potential (twice zero crossings). The light is off when the current is at ground, and on when it's either above or below ground.

"Garbage Clearing," page 92, is an unnecessary solution to a misunderstood problem. The author repeatedly states that DOS is somehow responsible for the build-up of disused strings in memory, whereas the problem is in the Applesoft BASIC interpreter. The only thing DOS does with strings during normal program operation is check for a control-D at the beginning of each input or output line; if it finds one, it attempts to execute the text following the control-D as a DOS command as in 100 PRINT CHR$(4);"RUN PROGRAM.

While Viktor Rubenfeld's solution to garbage accumulation is somewhat interesting, Applesoft has a built-in command that eliminates garbage automatically: 100 X= FRE(0). This sets variable X to the amount of remaining free memory and collects the garbage. The line 100 PRINT FRE(0) prints the amount of remaining free memory and collects the garbage.

If any line is placed in a program that is executed frequently when garbage is inclined to form, the garbage will seldom be a problem.

F. Kuechmann
8113 NE 25th Avenue
Vancouver, WA 98665

Integer Defender

As I was reading Ask *inCider* (July 1984, p. 99), I came across Bob Ryan's answer to Jeff Bruno concerning the "dead language" Integer BASIC.

Without doubt, the I-BASIC language is used less than the newer Applesoft, but it isn't dead. There are many good Integer programs around for several good reasons. One is that it's easier to program because it has fun commands like AUTO and POP. It's also a faster BASIC than Applesoft since it uses only integers and does a more complete, up-front parse step. Don't count out good old Integer yet.

As to information sources, here are two that I've seen in the book stores: *Apple Programmer's Handbook* by Paul Irwin and *Apple II User's Guide* by Lon Poole. Both books are about four years old and not too hard to find.

Good luck to Mr. Bruno and others who are interested in Integer.

Forrest Schwengels
14 Floye Avenue
Poquoson, VA 23662

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It's the best 300/1200 baud 212A telephone modem for your Apple® II, II+, and IIe. "Best" because it's the easiest to install and use, provides more useful modem features for your money, and lets you add software capabilities as your needs grow.

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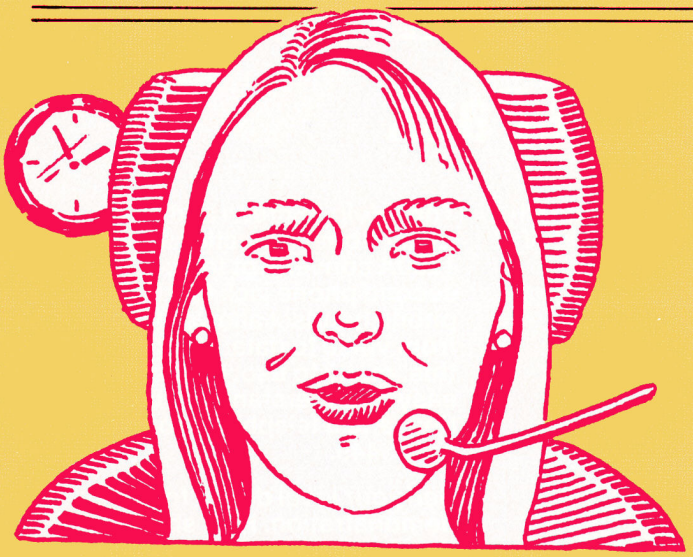

Open Wide

Flash those pearly whites. Preventive dentistry starts in Dr. Ellis J. Neiburger's office with the aid of four Apple computers—one II and three II Pluses. While the system helps organize the usual "drill-fill-bill" routine, Neiburger also uses an Apple to make his patients relax in the dental chair. His method: suggestive therapeutics—hypnosis to you and me.

Neiburger wrote a hypnosis program to make his patients feel more at ease. Fear, he says, is the main reason why people avoid checkups. And if he can promote a good experience in the dentist's office, so much the better.

The hypnosis program consists of designs on screen—flashing squares of alternating frequency. Since some people are more susceptible to hypnosis than others, Neiburger matches the patient's alpha brain wave pattern to a program frequency after assessing the patient's condition during the first visit.

Neiburger stresses that people are fully conscious and know what is happening while in a hypnotic state. "They're just comfortable," he says.

Hypnosis opens up a new area in dental treatment; it saves time and money. Because no anesthetic is used, a patient can be in and out of the dentist's office almost in the time it takes to say "Brush after every meal." Neiburger says a filling takes only eight minutes with hypnosis. Hypnosis actually lets the dentist charge less for his or her services because it reduces the time spent with each patient.

Another advantage lies in posthypnotic suggestion. Neiburger can suggest that a patient will stop bleeding within three minutes, experience reduced pain and swelling, or simply feel better. Neiburger says 78 percent of his patients have responded successfully to posthypnotic suggestion.

"No one has objected to this type of treatment," Neiburger states. "And the appointment book is always full."

Hold the Line

It's your dime—but that hasn't deterred people from accessing bulletin board systems across the country. Two new bulletin board systems on-line are The Sandhill Bandits' Board and the Helena Apple Bulletin Board.

Based in Southern Pines, North Carolina, The Sandhill Bandits' Board features electronic mail, games, hardware and software reviews, publication reviews, a BBS listing, merchandise section, and programming assistance. The system will include recipes, bit-copy parameters, and a download/upload section in the near future, according to Sandhill Bandit Thomas Blue. Call up the system at (919) 692-5536, 24 hours a day.

Another 24-hour BBS, the Helena Apple Bulletin Board, is devoted primarily to user group information and local advertisers in the Helena, Montana, region. People can post notice of nonprofit events and leave messages for business advertisers, too. The system runs on an Apple //e with a Hayes Micromodem //e (300 baud). Sysop Robert N. Clarkson invites Apple owners to call (406) 442-2046 and passes along the guest password, HAP007 .GUEST.

Let the Contest Begin



Attention Apple Computer Club members: Registration deadline for the 1985 Apple Computer Clubs' Competition is March 15, 1985. Club members can enter two categories: programming or community service. Advisors can compete in the advisor or lesson plans categories. Last year, more than $100,000 was awarded in prizes and travel. Write to Apple Computer Clubs, P.O. Box 948, Lowell, MA 01853, for registration information.

In response to the popularity of Apple computer clubs, Prentice-Hall has developed the Official Apple Computer Clubs Activity Book Series. Three handbooks start off the series: *The Apple Computer Clubs Activities Handbook*, *The Apple Computer Clubs Parents' Guide*, and *The Winning Programs*.

With almost 15,000 Apple computer clubs worldwide, Prentice-Hall selected the series to enhance members' computer skills, help parents and educators guide young computer users, and provide the clubs with various group projects and activities.

edited by Cynthia Carr

Sour Apples?

Listen closely and you'll here grumblings of discontent in the otherwise happy world of computing. Last January, Steven Stroum started Crabapple, Inc., an organization developed in response to high-pressured advertising linked to the home computer market.

When commercials became tinged with fear tactics, Stroum says he felt compelled to take action.

Some commercials implied that "if you don't buy a home computer for your children, you're sentencing them to a remedial life," Stroum explains. "This is a poor way to sell high technology."

Stroum owns up to the parody value in the name, Crabapple, but indicates that the organization is a serious one. Crabapple, Inc., publishes a newsletter, *Living and Computing*, which concentrates on how computers affect today's lifestyles. Among the topics covered are computers and socialization, the computer educational complex, and computers as tutors.

The group intends to challenge claims made by computer manufacturers and advertisers. "There is no legitimate need for home computers insofar as the masses are concerned," Stroum says. He explains that while personal computers are appropriate in higher education and the workplace, the average person doesn't need a home computer to balance a checkbook or store recipes. "After a while, the computer ends up sitting in the closet gathering dust," he states.

"Computers are marvelous tools, but...people should look, stop, and think before they buy," Stroum says. "Some of the purchasing has been fashionable, but ultimately the success or failure of the computer depends on its functionality."

Stroum points out that Crabapple sides with the human aspect of computing: "People are more important [in society] and the individual is more important than the computer."

For more information on Crabapple, Inc., or the *Living and Computing* newsletter, write to Stroum at P.O. Box 3236, Framingham, MA 01701.



Illustrations by Katherine Mahoney



A Helping Hand

Treatment for the mentally disturbed has advanced since the days depicted in *One Flew Over the Cuckoo's Nest.* Altro Health and Rehabilitation Services, Inc., has developed a treatment program for psychiatric patients that trains them to take productive places in the workforce.

The agency's program, COGITO, uses ten Macintosh computers in what the directors call "the first program of its kind."

"COGITO is specifically for the mentally ill," says Barbara Brizdle, a member of the board of directors. "Little research has been done in the area... and we look at it as the opportunity to bring microcomputer technology to meet the challenge in psychiatric treatment."

The program consists of a series of modules designed to test impulse control, concentration, and perception. These tasks, which look like computer games to the average person, vary parameters or skill levels. During an impulse control task, Brizdle explains, two bars, resembling thermometers, move up and down at different speeds. The patient must press the mouse when the bars are of equal length.

Brizdle says psychiatric patients find the computer intriguing and fun. COGITO uses that interest to help them develop flexibility in their thought and emotional patterns so they may rationally work problems through to conclusion without emotional outbursts.

Work on COGITO began in early 1984, and at press time was still in its beta test stages. Contact Altro Health and Rehabilitation Services, Inc., at 40 East 30th Street, New York, NY 10016, (212) 684-0600, for further details.

Are you making news in the world of Apple computing? Spread the word through The Cider Press, inCider, 80 Pine Street, Peterborough, NH 03458.

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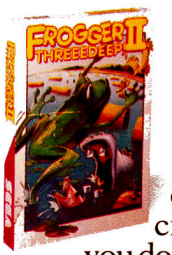

Frogger II Threeee-Deep, a three-screen nightmare. Starting with an undersea battle against deadly creatures and the cruel undercurrent. If you do make it to the surface, it just gets worse. The only hope is to leap into the sky where even more frog-eating monsters lurk.

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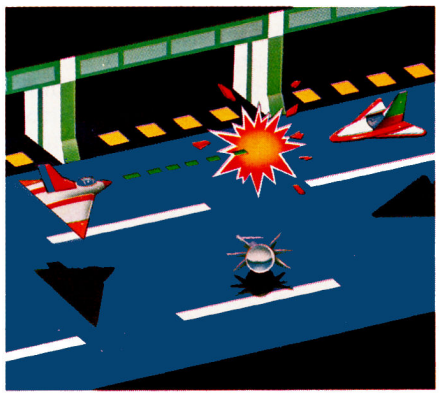
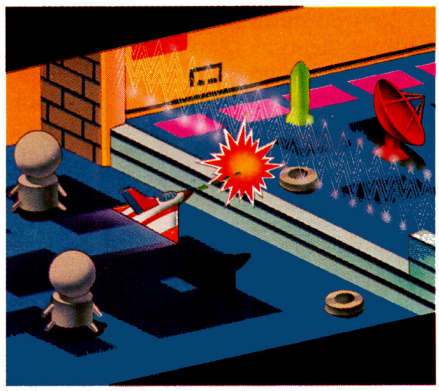
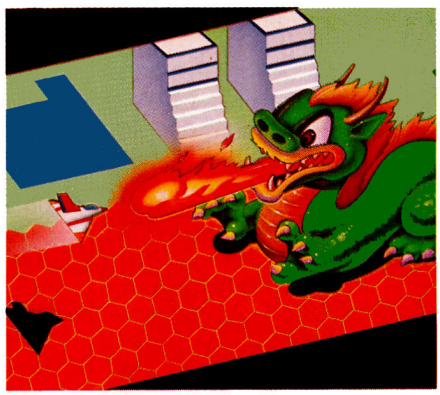
		✓ NEW	✓ NEW	✓ NEW	✓ NEW		✓ NEW	✓ NEW	SUPER ZAXXON







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INTRODUCING FROGGER II THREEEDEEP AND SUPER ZAXXON.

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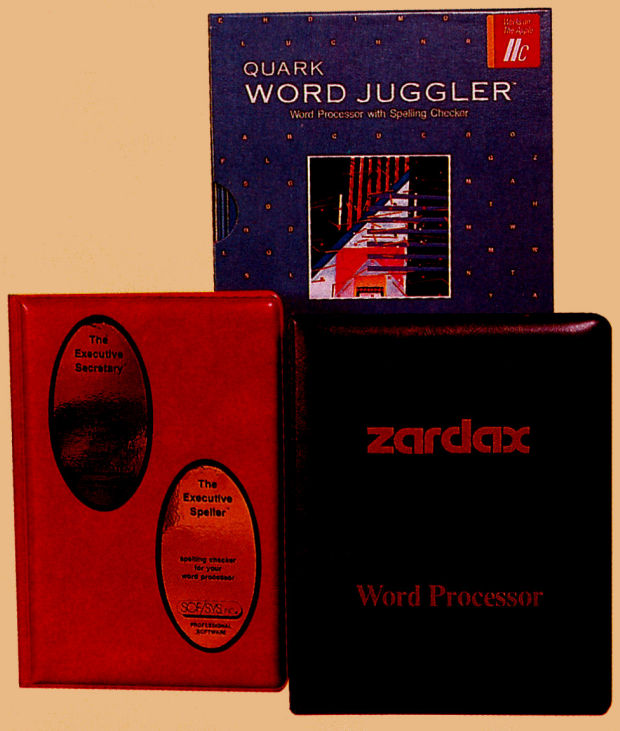

Photography: Torsheya Studio

Give your words the special treatment with a word processor that maneuvers screen text handily.

While *word processor* sounds like some imported food machine, the term is technically correct. The software *processes* words, or text, that you enter. It should be able to manipulate text by inserting sentences into the middle of paragraphs, justifying lines, moving blocks of text, and printing the final document the way you want it printed. The software should also let you move around inside your work to change things, and perform the process quickly and easily.

This month I'll examine three word processing programs: Executive Secretary, Word Juggler, and Zardax. All three are in a price category of $150 and up, and should give you much more power and flexibility than less expensive programs. All ask that you enter text as single-spaced lines (without worrying about line spacing or page breaks), and then format printed output using commands. You can't see what your final document looks like unless you use a screen-preview function or print the text.

Reading Up

While the Executive Secretary boasts that its new 102-page indexed manual was done entirely with the program—no typesetter—the original was larger and easier to read. The new manual serves as an unfortunate example of how poor documentation can cripple a decent program. A word processor/spelling checker program has no excuse for errors in its manual; I counted eight typos in Executive Secretary's before I stopped keeping track.

The spelling checker comes with a 15,000-word dictionary, to which you can add 10,000 more words. Unfortunately, the manual doesn't explain the process and devotes only a single page to the spelling checker—an obvious afterthought.

Quark's Word Juggler comes with a 132-page indexed manual and 19 key caps. You're expected to perform a bit of minor surgery on your Apple //e or //c to replace 19 of your old key caps with these new ones. To make the task easier, the package includes a key cap puller and good instructions on how to use it. The commands printed on the caps help you find the one you want

by Gregory R. Glau

faster, and thus make operation easier.

Word Juggler's program disk isn't copyable, but its spelling checker, Lexicheck, is. This system's 50,000-word dictionary lets you add words to the basic word list.

Zardax, the most flexible program, has the best documentation. Its 232-page indexed manual includes tutorial and reference sections ranging from the basics ("This is a disk. . .") to technical specifications for various printers.

The Executive Secretary allows about ten double-spaced pages in memory at one time; Word Juggler lets you have about 15, and Zardax allows about 25.

Writing with Executive Secretary

Executive Secretary can access and use an 80-column card, and it's easy to change your hardware configuration. The program is menu-driven for loading and saving documents. While you're entering and editing text, some commands appear on the screen in abbreviated form—(P)RNT for print and (S)RCH for search.

You can format your text on-screen or with embedded commands; both methods, however, clutter your display with command characters. Since there is no quick reference card, you need the program's on-line help to reference the 61 available commands.

There are a number of good features to this program. When you ask the Executive Secretary to insert text, it blanks out most of the screen but leaves one line at the bottom, so you can see the context you're working in. You learn through a step-by-step tutorial, and can delete (or move) by character, word, or line. The search function, while case-sensitive, starts at the cursor and goes to the end of your text. If it doesn't find a match, it goes to the beginning of the document and searches from there to your present position—a good approach. The Executive Secretary supports underlining, proportional spacing, and even soft hyphenation (telling the printer where to break apart a word at the end of a line). You're allowed as large a header as you need and a one-line footer.

The Executive Secretary comes with a built-in card file (up to 999 cards in each file) and form-letter function, so you can send letters to selected people on your list, or have the system ask for keyboard entry of the information. It even has a simplified terminal program to assist you in sending electronic mail. Text entry is fast and once you learn the program's commands, you can work rapidly with Executive Secretary.

"You can use the guess mode when you don't know the exact spelling of a word. The screen splits and displays similarly spelled words."

Using Word Juggler

Word Juggler's formatting commands, entered directly into your text, are displayed as inverse characters. This approach lets you change your document's format as you write—one section justified, another centered, and so on. There's a lot of flexibility—for example, you can delete by character, word, line, or paragraph—and you can move around the screen and through your document quickly. Character entry is accepted fast; I couldn't type ahead of the program. On-line help answers any questions you may have about some function, and you can stop a process (printing, looking at your screen preview) with the escape key.

You can use Word Juggler either in insert mode, which pushes ahead text in front of the cursor, or in type-over mode, where new characters erase old ones. Being able to switch from one mode to the other is a big advantage.

When you want to delete or move a block of text (about 60 lines maximum), the selected characters are painted as inverse, so you always see exactly what you're deleting or moving. You can instantly display any page and can scroll through your work. To move text with the Executive Secretary, mark the block you wish to move. This isn't quite as good as Word Juggler's method of showing the characters as inverse. Zardax's method lets you put a block of text onto disk and insert it elsewhere, or *pick up* a paragraph and visibly move it up or down through your document.

Word Juggler makes creating form letters easy and can automatically ask for keyboard data entry for names, addresses, and so on. The system also lets you add data from Quick File's and PFS: File's fields into your form letters. Special logic functions (IF. . .THEN. . . ELSE and a Range search) examine the information the program pulls from these data-base programs, so you can select exactly which records you send letters to. You can also access and load DOS text files, as well as text from other Word Juggler files, and insert them into your documents.

Once Word Juggler's spelling checker is loaded, you can use the guess mode when you don't know the exact spelling of a word. The screen splits and displays similarly spelled words; when you spot the one you want, you position the cursor over it and press the return key to enter it into your document.

Working with Zardax

To modify shift keys on older Apples to switch between upper- and lowercase characters, Zardax comes with a clip-on adapter. If your computer has 128K of memory and two disk drives, a print spooler provided with Zardax lets you continue working as you print a document. This system also can link files together for printing.

Zardax's tutorial helps you create a document storage disk on which you place files from the main disk. This isn't a bad idea, but you have to move all 12 files individually. You access Zardax's main system through two menus, and all menu selections are spelled out.

A glossary function lets you assign often-used words or phrases with specific command sequences. Each time you press a specific sequence of keys, the relevant character string appears in your text. Up to 26 glossary items can reside in memory at any one time,

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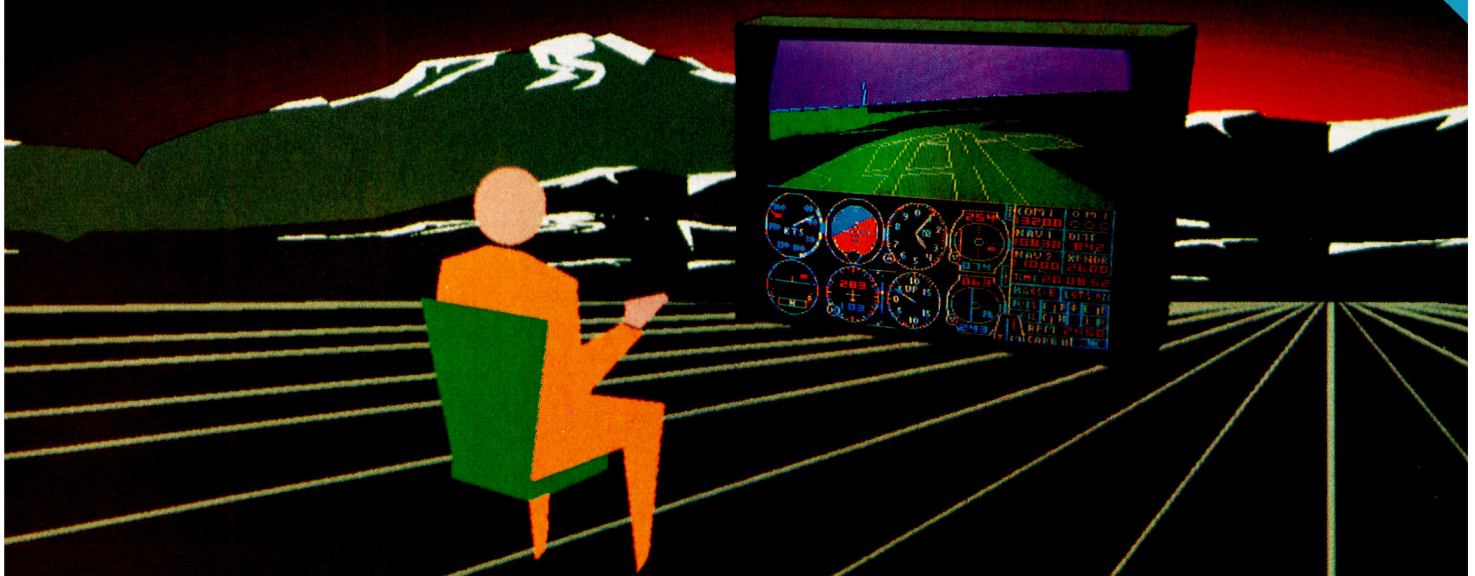

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and you're allowed as many glossary files as you need.

While Zardax isn't intended to function like a true data base, a simple mailing list created from it can send form letters to your customers. It's not as easy, though, as Executive Secretary, nor as powerful as Word Juggler.

The manual includes a quick reference card and separate chapter for Franklin Ace 1000 users. Print formatting commands can halt printing at a specific spot, letting you change a daisy wheel to get variety in your type styles. Zardax allows multiple lines in footers or headers.

It's easy and fast to move around inside of or go instantly to the start or end of a Zardax document. A screen preview function lets you see what your text will look like when you get a hard copy. The program provides a New Page command (start a new page after this line), as well as a Conditional Page instruction (if there isn't enough room to print this text on the current page, skip to the next one). Searches up to a 23-character string are performed from the cursor to the end of your document and needn't be case-sensitive.

If you have a modem, the program ZIPP-COMM puts Zardax into terminal mode so you can talk to other computer users, and send and receive documents. This program works at either 300 or 1200 baud and includes good advice on sending files to The Source through Telenet.

Weaknesses

The Executive Secretary's poor manual considerably damages its quality. Menus or command lines come in bits and pieces as you work through the examples, and quite often they aren't explained until much further along. It's almost as if this were the first draft, rather than the final documentation for the consumer.

The program's loading time isn't particularly fast, and a lot of disk access occurs when you change modes. The Executive Secretary does search rapidly, but you're allowed to look for only a 12-character search string.

Word Juggler's manual is generally complete, although some commands could be explained better. For example, the Need instruction checks the availability of lines on the current page needed to complete what you want to print there. If the number is insufficient, the program starts a new page. The concept is good, but the explanation appears at the back of the manual and then it's used as an example before the command is detailed.

The Word Juggler itself is reasonably idiot-proof, but consecutively pressing control-reset several times crashes the program and produces the "helpful" message "SYSTEM FAILURE." Also, when you load a file, your screen asks "PATHNAME?" but inadequately explains the term.

Word Juggler's Find and Replace search, although very fast, is case-sensitive: A lowercase search passes by a word or phrase at the beginning of a sentence. With either the Executive Secretary or Word Juggler, searching for the word "life" finds life, lifetime, lifeline, and so on, unless you leave a space at the end of your search word. However, neither system will then find your word if it's at the end of a sentence.

A true footnote or header function isn't available, but Word Juggler lets you specify the print location of up to ten lines in the margin area. With Lexicheck, you can create specialized dictionaries and use them with the main word list. However, the suggested file names (*.D1/MY.DICT, for example) are certainly not friendly. The word-list entries must also be in alphabetical order, a time-consuming task with a large dictionary.

Zardax doesn't come with a spelling-checker program, nor is one available from the manufacturer. The manual notes that "Many users. . .report good success with the Sensible Speller program. . ."

The program lacks a word-wrap function, which takes words that won't fit on the current line and moves them to the next one. Instead, Zardax breaks the words apart at the end of the line and places the remaining characters on the following line. I find this an amazing shortcoming to what is otherwise an excellent word processor.

The screen preview and printing modes do fix word breaks, but editing a document on screen is difficult. The screen preview procedure is normally very fast and straightforward; however, the program takes a considerable amount of time to show you just a sec-

Product Information

Executive Secretary
Sof/Sys, Inc.
4306 Upton Avenue South
Minneapolis, MN 55410
(612) 929-7104
64K Apple II Plus, with the shift-key modification and an 80-column card. The Executive Secretary will also work in a 40-character mode, but requires a lowercase adapter.
Apple //e or //c
One disk drive
$159.95
$189.95 including Executive Speller

Word Juggler
Quark
2525 West Evans, Suite 220
Denver, CO 80219
(800) 543-7711
(303) 934-2211
Apple //e or //c
One disk drive
$189 including the Lexicheck spelling checker program

Zardax
Action-Research Northwest
11442 Marine View Drive, S.W.
Seattle, WA 98146
(206) 241-1645
48K Apple II Plus
Apple //e or //c
One disk drive
$210
$80 additional for ZIPP-COMM

In a Nutshell

The Executive Secretary is a powerful word processor hampered by a poor manual. The Word Juggler, the easiest of these three programs to use, comes with key caps that show the system commands, so you don't have to remember them. Zardax is the most flexible and complete package and has the best manual—a hard combination to beat.□

tion of the text. When I asked it to display a nonexistent page, it thought for a time, then gave me a flashing cursor with no instructions to press the escape key to clear the screen.

Zardax's 43 print-formatting instructions and 23 editing/moving commands allow a lot of flexibility, but require time and effort to learn. Finally, loading a Zardax file brings you to the end of your text, assuming that you want to add more. In actual practice, I almost always start at the beginning of my work (to reread or edit), and would prefer the program to position me at the start of the document.

What to Buy

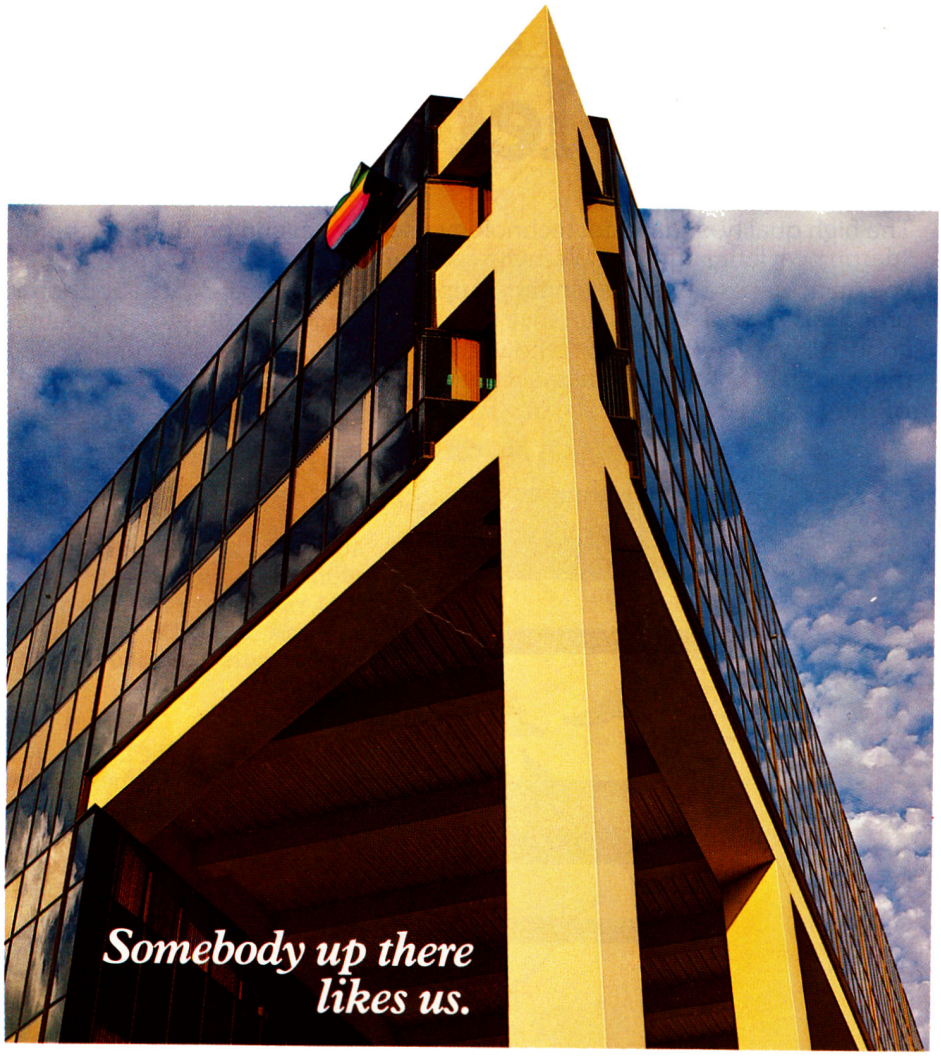
All three are good programs. It's unfortunate that the Executive Secretary suffers from a poor manual as the program itself is more than useful. If you buy it, you get the bonus of a built-in miniature file-handling system (1000 little cards per file) and a decent spelling checker. Know up front, though, that the documentation gives you less information and help than it should.

Of the other two, much depends on how complex a program you need. Word Juggler's replacement key caps make it simple and comfortable to use. Since it interfaces with PFS: File and Quick File, you can use data stored in their files. Even with its simplicity, Word Juggler is a powerful piece of software that won't disappoint you.

Zardax, the most sophisticated and flexible of these three programs, can do about anything your business needs. It does extract a cost in terms of learning all the system commands and how to use them effectively, but its manual is a great help in learning how to use Zardax. If you want to send your text files electronically, ZIPP-COMM is a useful, nearly built-in feature of the package.■

You can write to Greg Glau at P.O. Box 1627, Prescott, AZ 86302.





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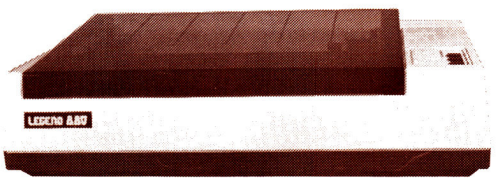

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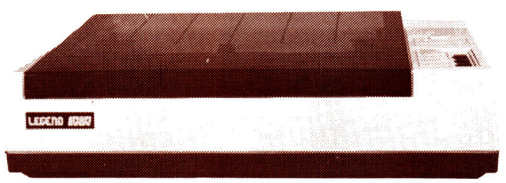

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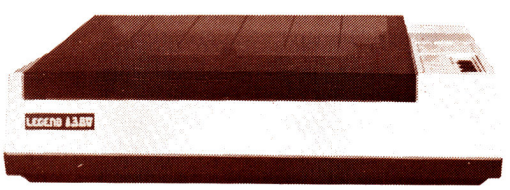

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Telling Tales



Illustration by Katherine Mahoney

Your child's stories live on in computer printouts.

Word processors and toddlers do mix, and with interesting results.

Of course, most young children can't use even the simplest word processor. Most can't read more than a few words, and many don't yet know the alphabet. Yet, beyond teaching them the alphabet or simple words, your word processor can show your children the power of written words used creatively.

The next time your toddler asks why you're playing with your computer again, invite him or her to tell you a story for you to type in. Suddenly, a child has the power to create a world of real or imagined people and animals. At the end of the tale, have the child title it, then add his or her name as author. Print the story for a keepsake, making extra copies for grandparents.

A few notes of warning: Load the word processor and have it ready *before* you ask your child to tell you the story. Young children have short attention spans and their stories are brief. They could easily finish telling a story before your word processor has finished loading. And they won't wait around for your old computer to get ready.

Don't worry if you aren't a fast typist. The story-telling will probably be marked by pauses. Transcribe as they talk and you can change a few details later.

Don't be surprised at their stories. They may not make much sense to you but don't change anything. And don't be surprised if a story is bloody,

by Michael Seeds

violent, or otherwise unacceptable to you. Children work out important ideas in their heads and many of those ideas are unconventional. You don't need to send *every* story to Grandma, but each story is important and the author's wishes deserve respect.

Don't force story-telling. If your tot doesn't want to tell a story, try again later. If the story is interrupted, save it and invite the author to continue it another day. If the author asks you to make revisions, help—but don't demand revisions. Children should find writing stories a happy experience.

"Toddlers see the computer is just a gizmo that does a job."

Here's a story my 3-year-old told:

An Elephant Story

An elephant went up the mean mountain. Some rats came up and the elephant ran away. The tree blew leaves on them. The bird tree flew birds out of them and jumped and jumped on the back of the elephant. Numbers came up and went up the hill with them but they could not follow.

That is the end of the story.

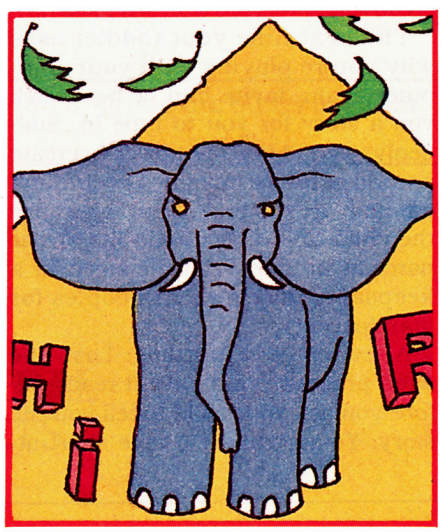
—Katie Seeds

What do such computer stories accomplish? First, toddlers see the computer is just a gizmo that does a job. Our children comprise the first generation to grow up with a computer in the house, and they should learn what it does early in their lives. Unlike many of their elders, they won't see the computer as a threatening monster.

More importantly, your putting their stories onto paper shows them words at work—not just any words, but *their* words. Controlling a part of their world through words is an experience many don't have until grade school, high school, or later.

Most important, their stories are their own creations. They are encouraged to be creative using paint and crayons, but, because they are not yet literate, small children aren't usually exposed to the creative world of language. Your word processor puts their stories directly onto paper, quickly, and without erasures, just like the print in books. They can hold their creations and be proud of them. You can, too.■

Address correspondence to Michael Seeds, Franklin and Marshall College, P.O. Box 3003, Lancaster, PA 17604.



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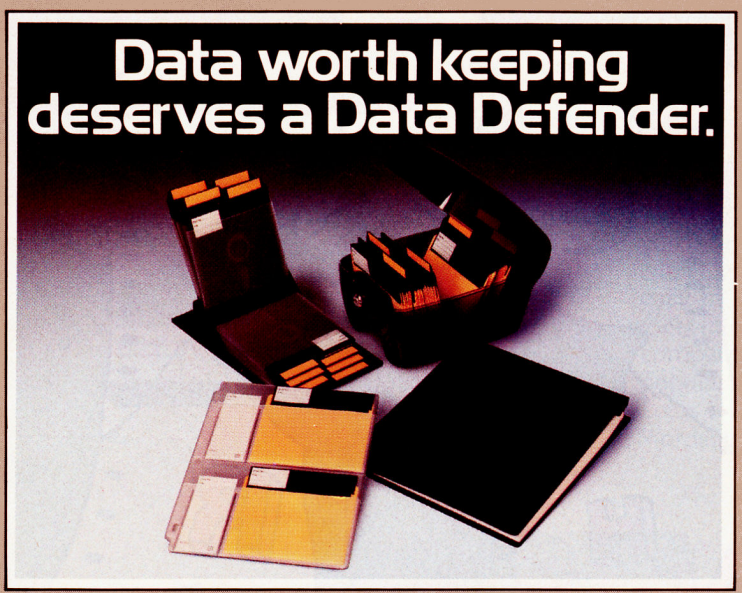

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Chimerical Chess And Other Pleasures



Illustration by Phil Geraci

Four challenging new games reward strategy over chance and luck.

with Warden Shiftky

At Warden University (Class of '71) I attended few classes. Instead, I sat around the student lounge developing a taste for Rhinobrau beer and for chess. Little did I know that I was laying the foundations of a career. Chess led to my unquestioned gaming expertise, and the Rhinobrau made hours of term-paper writing less painful.

One thing I noticed about chess: You're in no danger of being body-checked while making a move. This appealed to my craving for a totally nonviolent existence.

Of course chess is a game *about* violence. It simulates three aspects of war: the relative strength of various elements in the battle (expressed by their mobility), strategy, and surprise (all captures are automatic, thus simulating surprise).

Archon

Now imagine a chess game that incorporates a few unusual elements. What if we add magic, and a day/night cycle? Suppose that moving onto an enemy's square initiates combat with an uncertain outcome, rather than automatic capture. Suppose that the outcome of combat depended on your own physical skill, rather than on luck. Suppose, having lost your strongest piece, you could *will* it back to life. Imagine that you can nail down the other player's most powerful piece for several moves. And imagine that some of the pieces can fly, some can teleport, and all are magic. It makes for an interesting, if somewhat bloodthirsty, game of chess. In fact, what you've really got is a game called **Archon**.

When you get past the self-congratulation in the liner notes and read the manual, you find that Archon is a complete reprise of chess, with some interesting twists. As in chess, there are both light and dark sides (**Photo 1**). Yet the battle isn't to checkmate the king or kill off another piece, but to

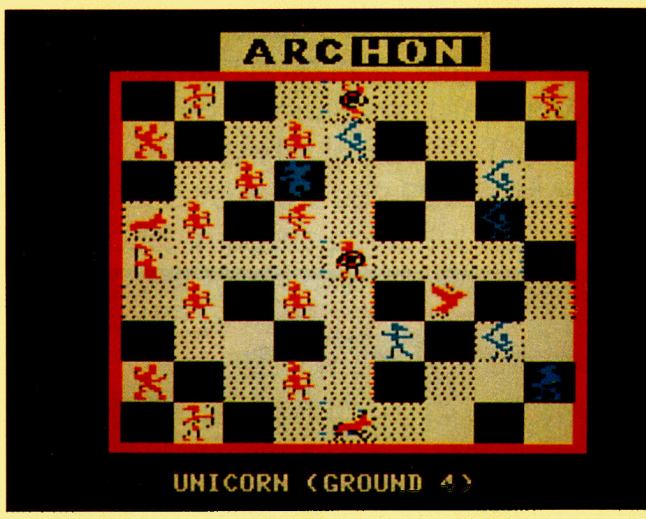

Photo 1. *Game board from Electronic Arts' Archon.*

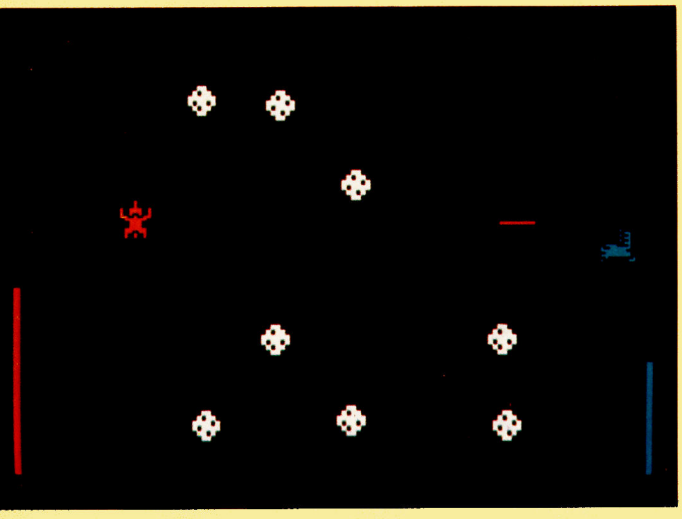

Photo 2. *Two Archon pieces in an arcade-style battle.*

capture five power points on the board. Once one side has occupied all five, the game is over. Theoretically, you can win with only five pieces.

Power points and 28 other squares are subject to gradual luminosity changes from dark to white. The darker half of the cycle benefits black pieces in combat, and the lighter side of the cycle, the light pieces. Clever use of the luminosity rule (and of permanently dark and light squares) can help make up the difference between a weaker piece (such as the knights for the light side and the dark side's goblins) and a stronger piece (like the dark side's banshees and the light side's golems).

The most important pieces on the board are the magic users (each side gets one). Each may cast seven spells during the game. For example, Teleport moves one piece to any non-magic square on the board—super if you want to land a dragon atop a faraway and vulnerable unicorn. An Exchange in that same situation would swap the unicorn for the dragon.

After combat, you can "revive" a critical piece. The light-side player should save the spell for the phoenix. The dark side should use it for the dragon or the shapeshifter. If a crucial piece is injured but not killed, you use the healing spell. Magic users can also summon an elemental spirit of water, fire, air, or earth. This piece will be on the board for one turn only, so select a good target! Another useful spell is Imprison, which locks up an enemy piece for a full luminosity cycle.

Combat is tricky, and requires good arcade skills and a steady hand on the joystick. You can play with keyboard commands, but you won't stand much of a chance in battle against the computer. While you're fumbling for the fire key and the direction key to hurl a missile or energy bolt at your foe (**Photo 2**), the other side will move and aim with computer swiftness. You won't have an edge with a joystick, but you will have at least a fighting chance.

Archon is one of the most relentlessly fascinating games to appear at the Game Reserve in a long time. The graphics are good, the sound effects only so-so, but the play value and challenge are super-high. This game will grab you and keep you for play after play—all this jaded chess player could ever ask for.

Skyfox

One of my favorite pastimes is flying a heavily armed jet plane to smash tanks and alien fighters. On the Game Reserve I get to do that quite a bit—in the comfort of the base lodge and never too far from my beloved Frigidaire. So you can imagine how grateful I was to get a crack at **Skyfox**, a real red-blooded arcade shoot-'em-up.

The setting is an asteroid under enemy attack. The only defense is the Skyfox, an advanced aircraft you pilot with a self-centering joystick. Your weapons are a laser cannon, and both heat-seeking and guided missiles. The enemy commands an unlimited supply of well-armed tanks, planes, and motherships (see **Photo 3**). Best of all, they are nearly impossible to beat.

Even the training scenarios are brutal. Mastering flight and navigation isn't hard, and you can superimpose a graphics window any time for a fix on both your and the enemy's locations. An autopilot takes you right to the action. The weapons are also easy to learn to use. You fire the laser cannon with the joystick button and press the G or H key to arm your missiles, which will hit any nearby target.

But there are so many nearby targets. F-15 pilots in Europe are told that if World War III breaks out, they will be in a "target-rich environment." That's another way of saying they'll be outnumbered. In Skyfox, you're always outnumbered: 20 to one, 30 to one, or even 60 to one. And all these "targets" can shoot back at you. The first few hits won't kill you, but they reduce the effectiveness of your shields. Keep an eye on your cockpit graphics to make sure your shields aren't about to collapse. And keep an eye on that fuel gauge (bear in mind you can land to refuel and rearm).

One of the biggest points in Skyfox's favor is its many scenarios. There are seven training levels, and I suggest you master ALL of them before you try the other games. Eight very challenging game levels feature motherships supplying unlimited enemies. Want to know how tough these scenarios are? Look at a few of the names: Alamo, Advancing Wall, Massive Onslaught, and Cornered. They sure sound tough. They sure ARE tough.

The graphics are superb. A cockpit radar screen is animated flawlessly; the superimposed window for "base

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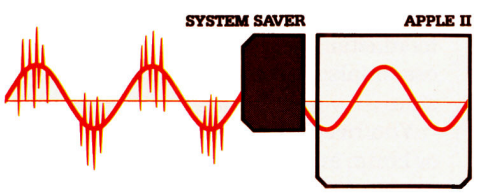

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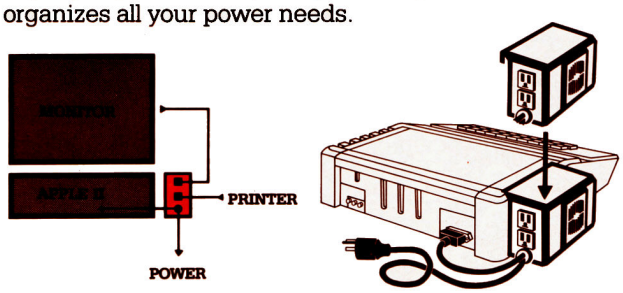

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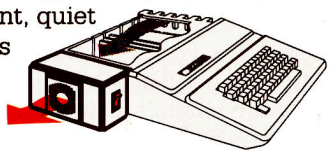

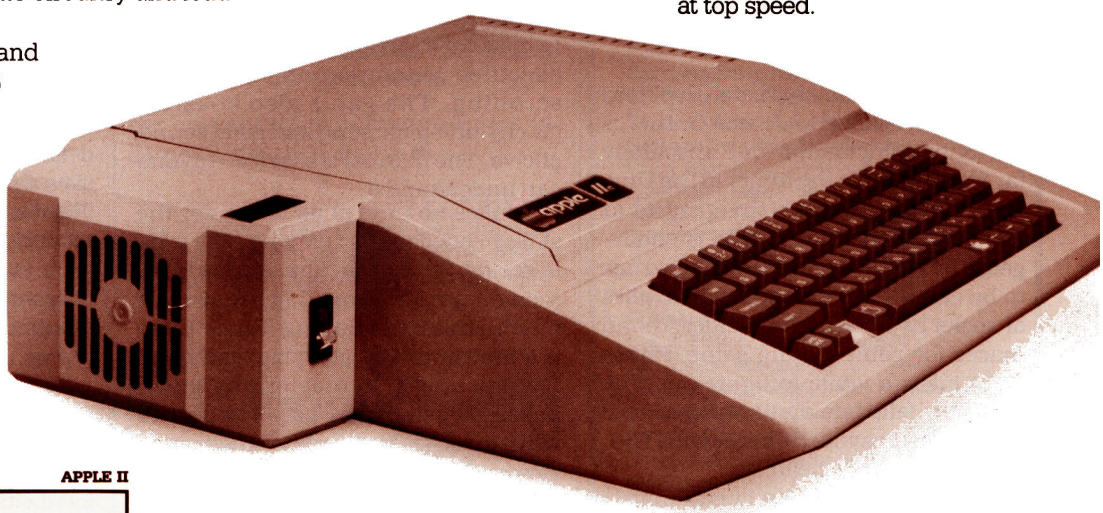

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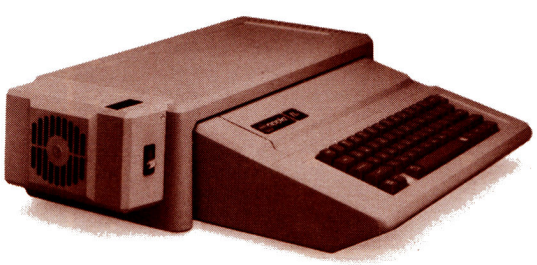

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computer" readouts is impressive (see **Photo 4**). The out-the-cockpit view is sophisticated and more realistic than you might expect. Terrain rushes beneath you at breathtaking speed. Enemy jets jig and slip to get out of your gunsights, and bursts of enemy fire are realistic. So will be your screams of frustration as you spend hours trying to master this game. Lotsa luck, flyboy!

Boulder Dash

Speaking of frustration—a good way to measure the level of challenge a game poses—have you seen **Bolder Dash** yet? I mentioned it in passing last month. Although I hadn't reviewed it, I'd heard good things about it. Well, a month later finds your Warden a complete slave of this insidiously clever, full-color arcade puzzler. Let me explain why.

You control the character Rockford (any resemblance to James Garner is not only coincidental but absolutely far-fetched). Like the miner in Dig Dug, you burrow through the ground at will. Unlike the miner, who is endangered by single boulders, Rockford has to be careful not to topple whole piles of rocks as he searches underground mazes for point-scoring gems (**Photo 5**). It takes a while to figure out why boulders fall, but don't worry: Once you've got it psyched out they'll STILL fall on Rockford's head.

Getting the jewels isn't just a matter of avoiding falling rocks. Boulder Dash offers 19 levels of mazes and graphics puzzles for you to solve. In each, you must grab the gems without being felled by rocks or gobbled up by subterranean monsters—fireflies and butterflies, for instance. You can do it, but it's not easy.

Sometimes the puzzles seem insoluble. Take Guards, where all the gems are guarded by fireflies. Even if you break into the chambers and grab the gems, there's nothing to stop the monsters from following you. There are hundreds of gems in Greed, but almost no way to get at them without starting a mammoth rock-slide. In Apocalypse, you have to dig a tunnel to connect the deadly butterflies with a green amoeba to turn the amoeba into gems. If it sounds complicated now, just wait until you start playing. This game will keep you guessing.

Boulder Dash's graphics are attractive, and are presented through well-executed animation and simulated scrolling. The game also boasts a catchy title-page song and good sound effects. The manual is a rarity: Anyone can understand it.

It takes no time at all to master the skills needed to start playing. The trick is seeing the big picture. I've seldom seen an arcade game that requires so much strategic thinking. Since there is a time limit for each play, you must try repeatedly to master any given puzzle. It's the rare player who can whiz through even one of these puzzles on the first try. This is a super-tough arcade game. That's why I think you'll like it.

Empire III: Armageddon

Finally, I turn to a role-playing adventure game from Peachtree Software's education catalog: **Empire III: Armageddon**. I won't presume to pass judgment on its educational values except to say that any good adventure game can teach problem-solving and other reasoning skills—and that this is such a game.



Photo 3. *Enemy mothership from the cockpit of Skyfox.*

In Armageddon, you create and control characters that go a-questing to destroy an evil empress who has enslaved the world. You explore a city (**Photo 6**) and a hostile countryside, gathering clues and magic objects, interacting with computer-controlled characters, and working steadily towards the goal of bringing down the tyrant.

There's a provision for saving the game (the Stasis command), and you'll need it. A first-time player will take from three hours to a whole afternoon to master the city and find the bare essentials for exploring the countryside.

You need food, water, tools, a torch or lamp, and, most importantly, weap-

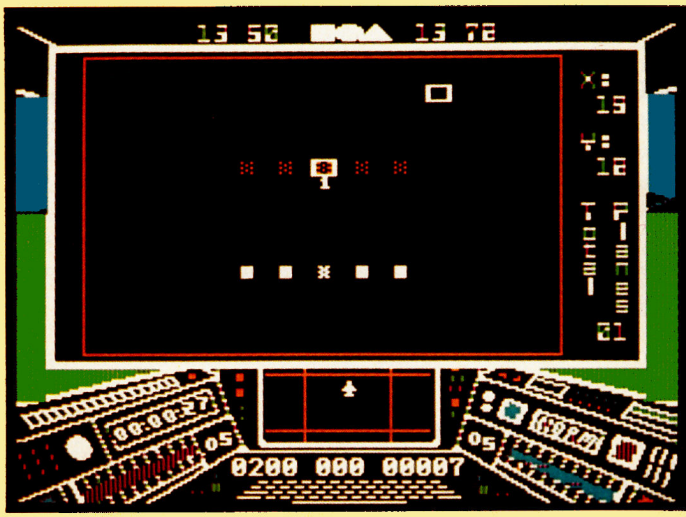

Photo 4. *Skyfox's battle computer gives you strategic help.*

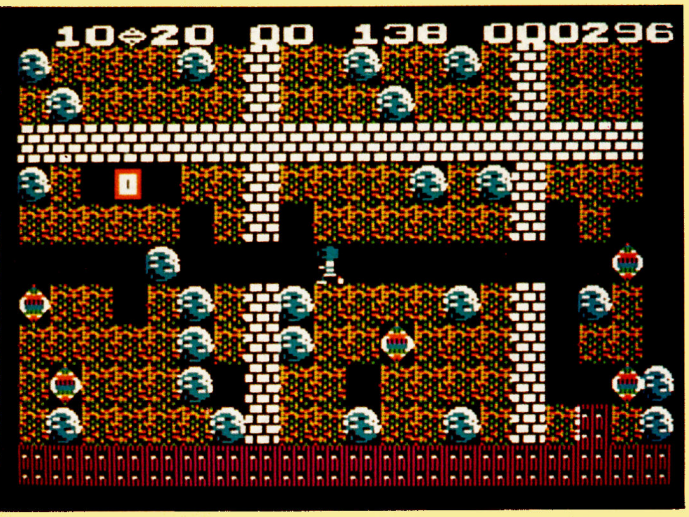

Photo 5. *Rockford seeks jewels and avoids falling boulders.*



Photo 6. *Screen from the illustrated adventure, Armageddon.*

ons. You start with a war chest of 100 gold pieces for purchases. If you have lots of charisma and lots of patience, and if you keep trying, you can talk down the merchants from list price to discount to wholesale to cost. You must bargain if you expect to buy all you need with the money you've got.

Discovery is most of the fun, so I'll resist telling more about what I've found, and the parts of the puzzle I've solved. I can safely say the most important action takes place in the countryside and it's a jungle out there. The forest is full of unfriendly animals to combat. You can spray them with acid or slash them with knives, but whether or not they'll swipe your head off anyway is largely a matter of luck.

Armageddon isn't at the cutting edge of adventure-game technology. The color graphics are as rudimentary as can be.

Syntax is limited strictly to verb/noun combinations like: USE COMPASS and GET MEDALLION. And hitting the space bar repeatedly to clear the command line becomes annoying after a while.

But let's not be picky. This is a tough game that will take you days, even weeks, to solve. Do yourself a favor: Read the manual carefully, especially the "Letters To My Son" section at the end. You just might find some clues and tips to help you.

Next month I'll engage in the momentous task of evaluating the best of the current flood of computer trivia games. Until then, aloha.■

The Warden wants to hear your thumbs-up/thumbs-down on games. Write to him at inCider, *80 Pine Street, Peterborough, NH 03458.*

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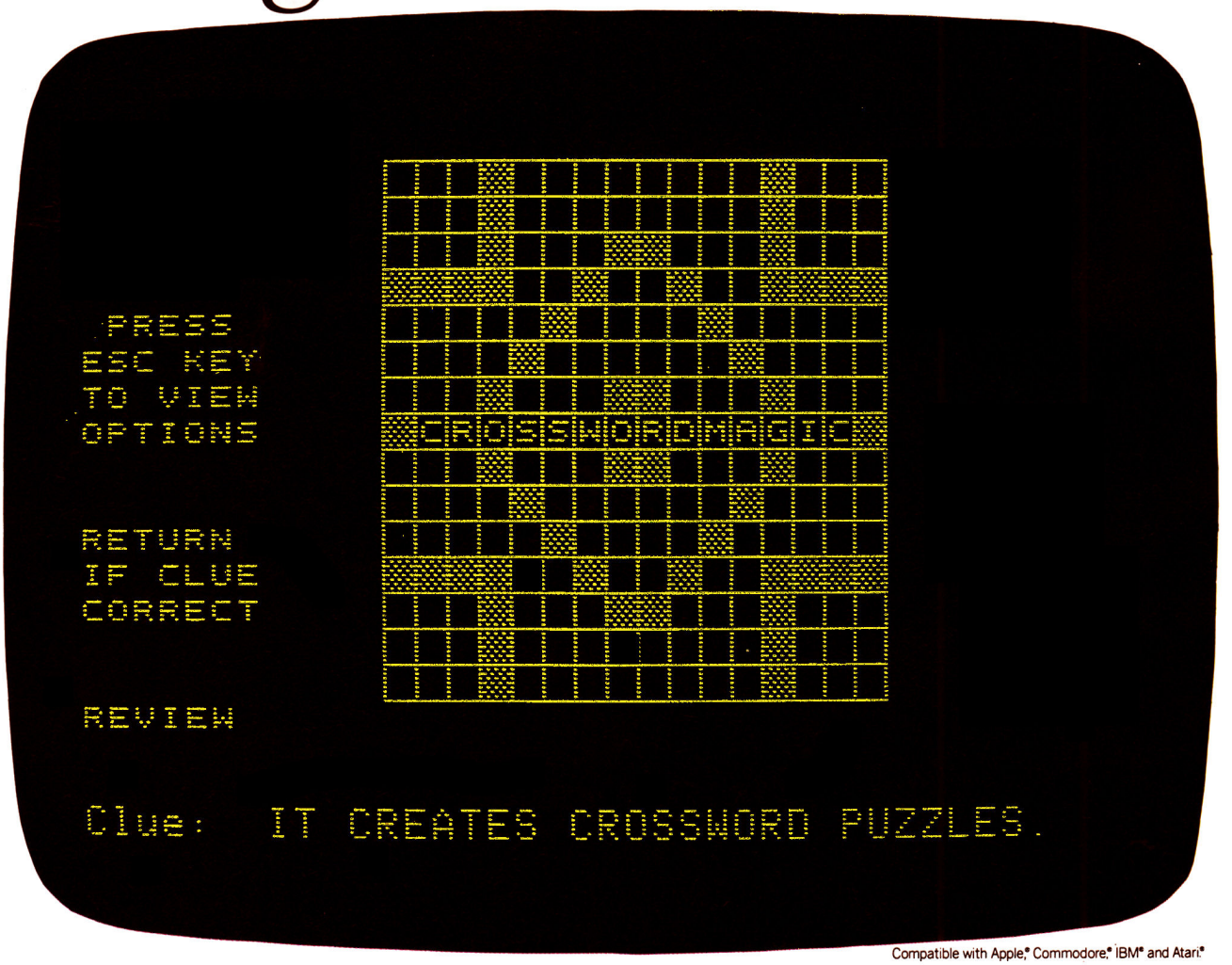

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Using ProDOS Part 1

The Multilayered DOS

The first in our six-part series on Apple's latest DOS focuses on its hierarchical file structure.

by Lee Swoboda

Last year Apple unveiled ProDOS (Professional Disk Operating System), the latest, greatest disk operating system for the venerable Apple II. Although similar to DOS 3.3 on the outside, and upwardly compatible with it, ProDOS represents a major redesign on the inside.

ProDOS is Apple's solution to the deficiencies of DOS 3.3. Among its distinct advantages, ProDOS is up to eight times faster than DOS, can be used with hard disks, and is compatible with SOS, the Apple /// operating system.

Those familiar with events in the Apple world may recognize similarities between the introductions of DOS 3.3 and ProDOS. But ProDOS is a much more radical departure from its predecessor than DOS 3.3 was from 3.2. ProDOS has replaced DOS 3.3 as the standard Apple II operating system and is included with all new Apple disk drives.

In a six-part series, I'll explain the wonders of ProDOS. The topics will include:

1) The ProDOS File Structure
2) Using ProDOS from the Built-in Menus
3) Improved ProDOS Commands
4) New ProDOS Commands
5) Using ProDOS from BASIC
6) Compatibility of ProDOS with DOS 3.3

The series is written for the novice who uses ProDOS as a first disk operating system, as well as for the experienced Apple II computer user who wants to upgrade DOS 3.3. It will stress hands-on instruction to understand how each ProDOS feature works. But first, whether you're a neophyte or an old hand, you'll need some background information.

Getting Down to Basics

ProDOS is a scaled-down version of the Apple /// Sophisticated Operating System (SOS). The SOS and ProDOS floppy disk formats are nearly identical, even to the point of generating exchangeable textfiles. (You cannot, however, swap BASIC programs, because Apple II's Applesoft and Apple ///'s Business BASIC are incompatible.)

When you buy a new Apple disk drive, you automatically get the ProDOS User's Kit, which includes the

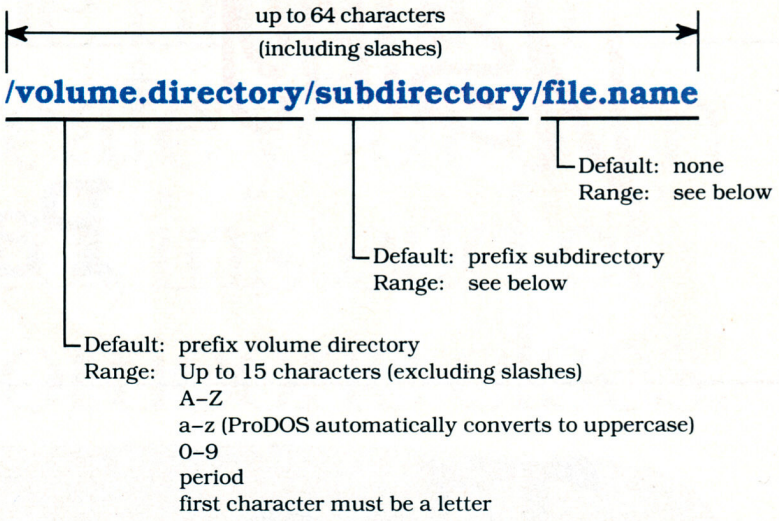
ProDOS User's Manual, the *ProDOS Supplement to the Apple //e Owner's Manual*, and the ProDOS User's Disk.

When you buy a //c, you get ProDOS on the System Utilities disk, and a System Utilities manual. If you already own a II Plus or //e, you can purchase the ProDOS User's Kit (Apple product A2D2010) separately for $40. Unlike the DOS 3.2 to DOS 3.3 conversion, which required changing two integrated circuits on the disk controller card, adding ProDOS to your Apple requires no hardware modifications.

ProDOS requires an Apple //e, a //c, or a 64K Apple II Plus (48K II Plus with a 16K "language" card). According to the *ProDOS Technical Reference Manual*, you may use ProDOS in a 48K Apple II Plus, but Apple doesn't recommend it. If you have a regular Apple II (with integer BASIC in ROM), you can't use ProDOS *even though you have a language card.*

Because ProDOS is a *disk* operating system, you must, of course, have at least one Apple-compatible disk drive. (Two are better.) Be cautious about compatibility, however. Apple's Disk II is a 35-track drive. If you have a "super" drive, which has more tracks, you may be unable to use ProDOS. Ask your dealer if your disk drive can handle ProDOS. If there's any doubt, test ProDOS on your system before you buy, and check the dealer's return policy.

Table 1. *Rules for defining a ProDOS pathname.*



Tree-Structured Files

The most dramatic difference between DOS 3.3 and ProDOS is the latter's tree-structured file system. **Figure 1** illustrates the typical DOS 3.3 file arrangement. Each file has equal status. To use a botanical analogy, all files "grow" like blades of grass out of the disk at ground level. When you catalog a disk, the computer simply lists the files in the order you created them (unless you deleted, then added, some).

ProDOS, however, organizes your files in a hierarchy. To continue our botanical analogy, imagine all the files on a ProDOS volume (floppy or hard disk) as apples on a tree. To pick an apple, you climb up the trunk and then inch out along progressively smaller branches until you reach the fruit. ProDOS follows this concept to organize files. **Figure 2** represents the simplest type of ProDOS directory, and **Figure 3** a more complex one.

The trunk of the tree is the *volume directory*. Just as branches radiate from the trunk, subdirectories and filenames on a disk volume "grow" from the volume directory. To reach a ProDOS file, you must follow a path "up" the volume directory and "along" any subdirectories to the file. This route is called the *pathname*, and consists of a volume directory name, any subdirectory names, and the filename. The entire pathname is analogous to DOS 3.3's filename. To define a file in ProDOS, you need to specify the entire pathname.

For example, you might assign the name PETS to a ProDOS disk that will store information about household animals. Under the categories DOGS and CATS, you could then store the respective information about those species. **Figure 4** shows how your disk would be arranged.

But suppose you wanted to store more detailed information, not just about dogs and cats, but about specific

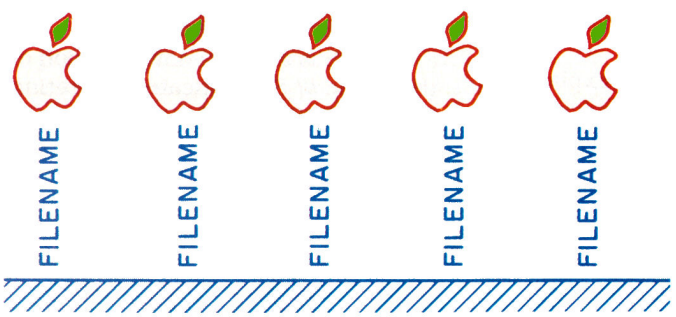


Figure 1. *DOS 3.3 directory.*

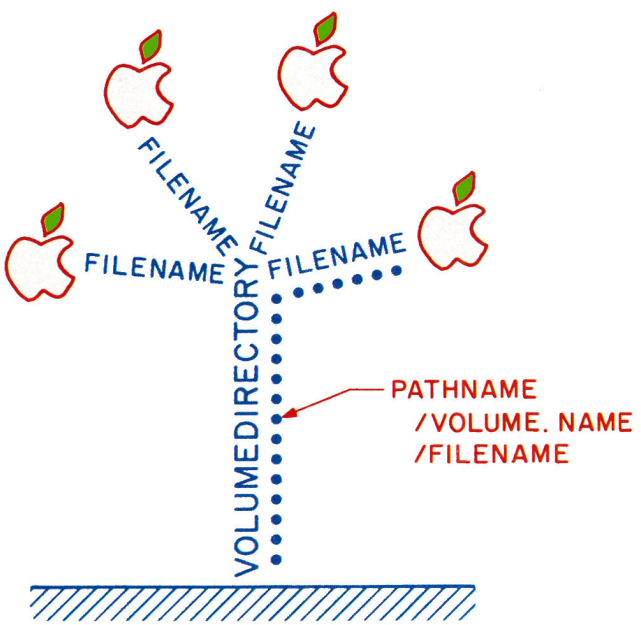


Figure 2. *The hierarchical structure of a ProDOS directory demonstrates how a volume is organized.*

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breeds? You could set up subdirectories named DOG and CAT, rather than just files by those names. Then, you could name files in those subdirectories for different breeds, as shown in **Figure 5**.

If you're *really* serious about pets, you might want to keep information about different varieties within each breed. One way to do this would be to name files that correspond to both the breeds and varieties (**Figure 6**). You could also set up a *second level* subdirectory for breeds, then name the files for the varieties (**Figure 7**).

ProDOS generously provides both these options. If you were dependent upon DOS 3.3 for this exercise, you'd have to lump dogs and cats together (a possibly precarious situation) into one group of files on the disk. (See **Figure 8**.) You could distinguish among dogs, cats, breeds, and varieties only by the filename, but compare **Figure 8** to **Figure 7**. See how much more logical ProDOS's tree-structured file arrangement is?

The Hard Disk Advantage

DOS 3.3's one-level file arrangement is adequate for the relatively small storage capacity of floppy disks. But ProDOS, with its tree-structured file arrangement, can handle the thousands of files stored on hard disks. When you tell ProDOS to set up a subdirectory, it reserves part of the hard disk large enough to store the files in that subdirectory. In effect, ProDOS turns a hard disk into a group of variable-size floppy disks, each of which can be located by naming its subdirectory.

Pathnames

As I mentioned, to define a file in ProDOS, you must name its volume directory, subdirectory(ies), and filename. This sequence of names is called the *pathname*. Just as DOS 3.3 has rules for naming files, ProDOS has rules for defining pathnames. Refer to **Table 1** as you read these rules:

- The pathname must contain all the elements that define the file's location: volume name, subdirectory name(s), and filename.
- These elements must be set off by slashes (/).
- The elements can't contain more than 15 characters each (excluding slashes).
- The first character of each element must be a letter.
- Remaining characters can be letters, numbers, or periods.
- You can use lowercase characters, but ProDOS will convert them to uppercase.

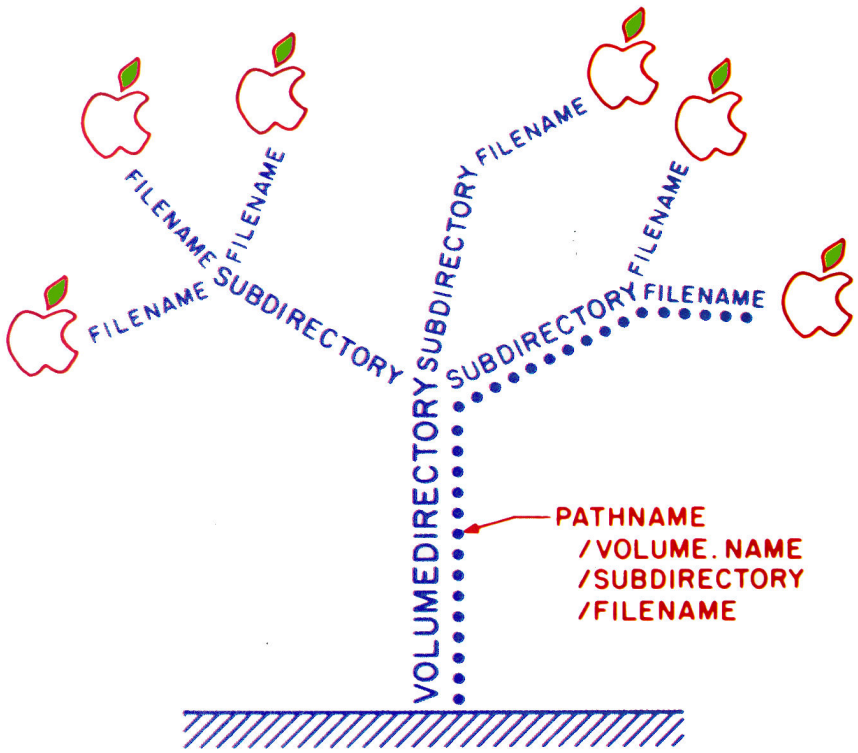

Figure 3. *ProDOS directory represented as a tree.*

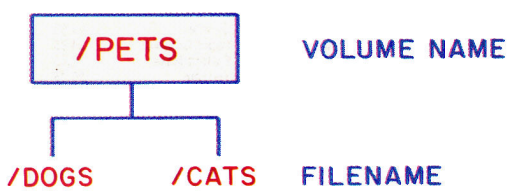

Figure 4. *One-level ProDOS directory.*

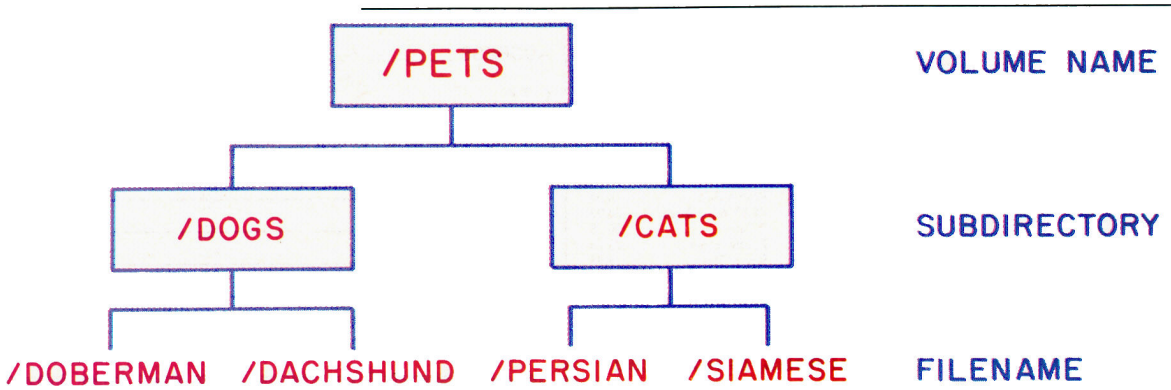

Figure 5. *Two-level ProDOS directory.*

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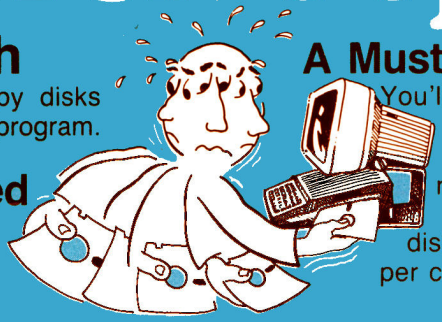

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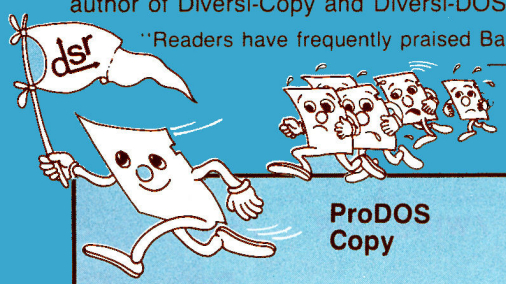

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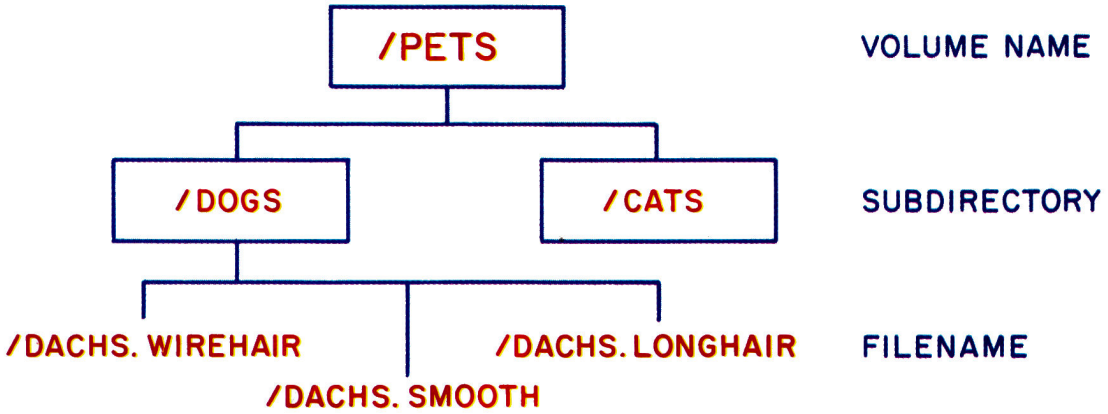

Figure 6. *Two-level ProDOS directory with expanded filenames.*

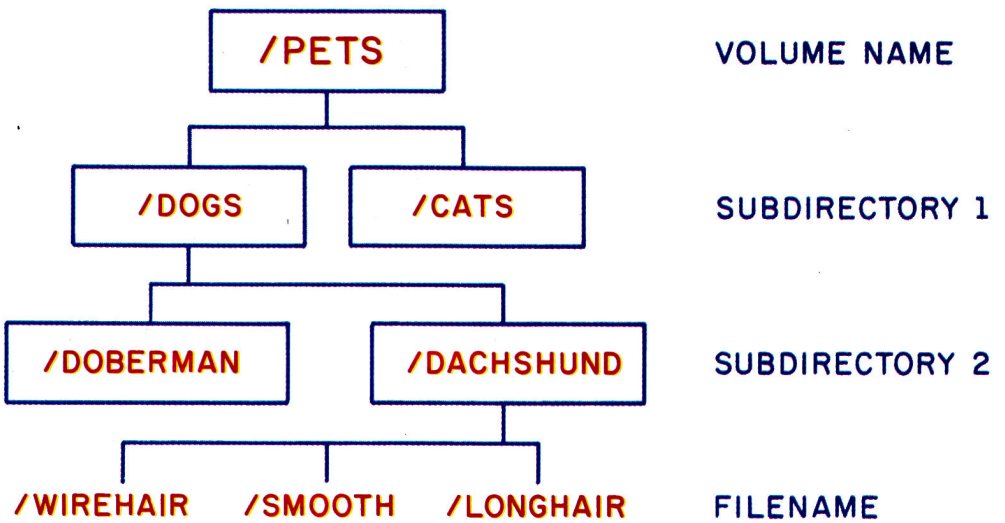

Figure 7. *Three-level ProDOS directory.*

Table 2. *Valid and invalid pathname examples.*

Valid Pathnames	Invalid Pathnames	Violated ProDOS Rule
/USERS.DISK	/APPLE'S.PRODOS	Only punctuation allowed is a period
/MY.OWN.DISK	/APPLE COMPUTER	Spaces not allowed
/LETTER.7.13.84	/3.BLIND.MICE	First character must be a letter
	/APPLE.MACINTOSH .COMPUTER	Fifteen characters maximum

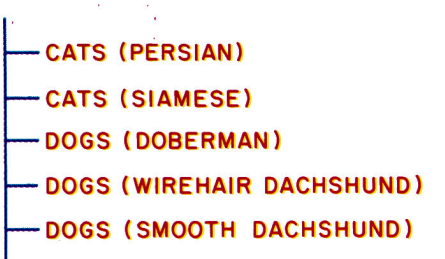

Figure 8. *DOS 3.3 directory.*

- The pathname can't contain more than 64 characters (including slashes).

Refer to **Table 2** for examples of valid and invalid pathnames. **Table 3** summarizes the differences between DOS 3.3 and ProDOS filenames.

If you had to define the entire pathname every time you accessed a file, you would soon tire of typing. To make it easier to use certain files repeatedly, ProDOS allows you to instruct the computer to temporarily remember a part of the pathname called a *prefix*. The computer attaches this prefix to all files you specify until you give it another prefix to remember. For example, if you instructed ProDOS to attach the prefix /PETS/DOGS to a filename, you could access the dog information in **Figure 7** by typing in the breed and variety of dog. If you typed /DACHSHUND/WIREHAIR, ProDOS would attach the prefix to yield the filename /PETS/DOGS/DACHSHUND/WIREHAIR. Or, if you set the prefix to PETS/DOGS/DACHSHUND, you could access the same file with the filename /WIREHAIR.

Table 3. *ProDOS and DOS 3.3 filenames comparison.*

ProDOS Filenames	DOS Filenames
Up to 15 characters	Up to 30 characters
Begin with a letter	Begin with a letter
Numbers, letters, periods only	Any character (including control characters)
No spaces allowed	Spaces allowed

Well, I've "put on the dog" enough for now. Understanding its file structure is the most important step toward understanding ProDOS. Next month, in Part 2, I'll discuss the techniques for using ProDOS from built-in menus. Join me then. ■

Address correspondence to Lee Swoboda c/o Padapple Computer Consulting, 1451 NE Paulson Road, Poulsbo, WA 98370. Representative questions will be answered in future articles in this series or in inCider's *Letters department.*

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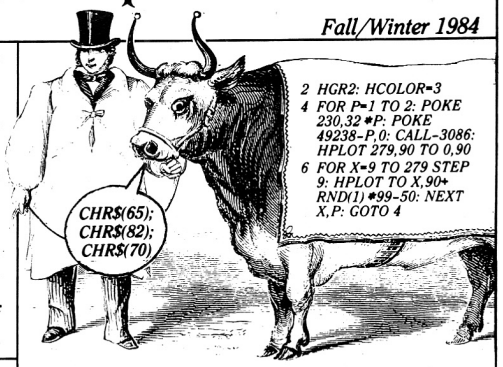

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```
5 INVERSE: PRINT SPC(7): A=A+1-3*(A=3)
8 POKE 2053,A+156: B=B+1: IF B<143 THEN 5
```

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```
10 POUR X=1 TO 3: ECRIVEZ "BONJOUR": ENSUITE
```

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```
A$="Dogfood"  ←VARIABLE-DISPLAY: prints
X=3.14159       all of a program's strings &
Y=255           variables with current values.

A$: 5 10 150  ←CROSS-REFERENCE: Sorts
X: 10 20 3000   & displays line numbers of
Y: 5 40 55 60   each variable & string.
```

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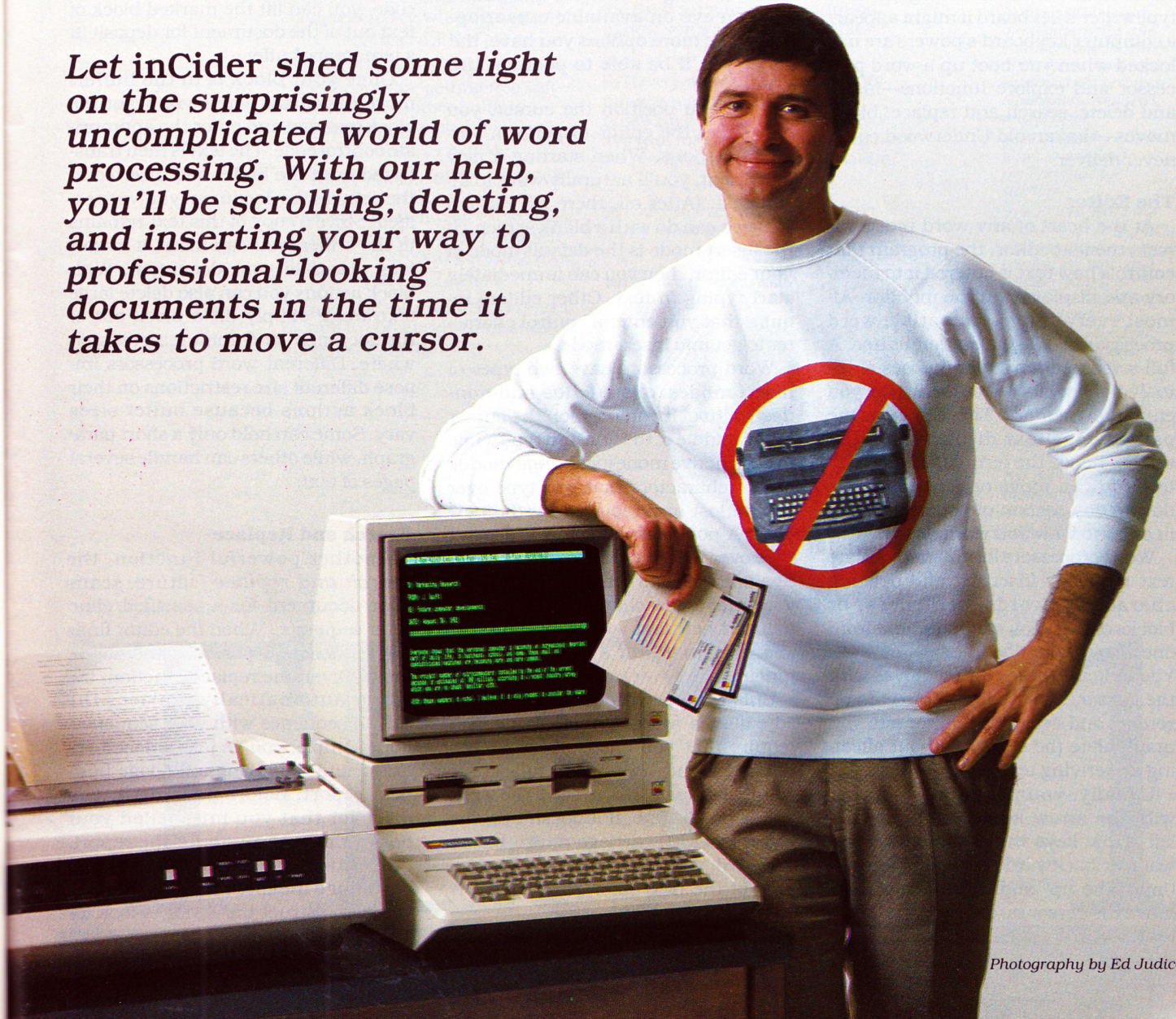
Word Processing Illuminated

by Bob Ryan, inCider staff

Let inCider shed some light on the surprisingly uncomplicated world of word processing. With our help, you'll be scrolling, deleting, and inserting your way to professional-looking documents in the time it takes to move a cursor.



Photography by Ed Judice

Two a.m. You've been typing for hours to meet a morning deadline. Your typewriter carriage is smeared with fossil-like traces of White-out and dusted with eraser crumbs. The room reeks of paper glue—you've been cutting and pasting, reorganizing paragraphs, rearranging sentences. Then, as you're proofreading, the old spelling-rule chant rises up in your brain: "I before E, except after C. . ." and you realize your document is full of "recieves," "acheives," "beleives," and "greives." You begin to *grieve*.

But isn't writing—whether it's a club newsletter, term paper, office memo, or State of the Union address—always fraught with such difficulty? Not necessarily, and especially not in this, the editing stage, when you compose on a word processor. If you've never used a word processor, or have just begun to work on one, you're in for a conversion experience. However analogous to a typewriter's keyboard it might appear, a computer keyboard's powers are unlocked when you boot up a word processor and explore functions—insert and delete, search and replace, block moves—that an old Underwood could never deliver.

"If you've never used a word processor, or have just begun to work on one, you're in for a conversion experience."

The Editor

At the heart of any word processor rests the text editor, the program that controls how text is entered into memory and displayed on the monitor. Almost every Apple-compatible word processor uses a *full-screen editor*. A full-screen editor superimposes a 16- to 24-line "window" onto the text you enter into memory. The window is the part of your text displayed on the screen, hence the term full-screen editor. You can move or *scroll* the window to any section of your document in order to view and work on text.

Word processors let you manipulate text easily by inserting and deleting characters, words, sentences, or blocks of text. You can move text from one area of your document to another. You indicate these editing moves with the *cursor*, a symbol that appears on screen, and every text editor lets you manipulate the cursor without affecting underlying text.

Usually, you position the cursor with the arrow keys. The right- and left-arrow keys move the cursor forward or backward one character at a time. The up- and down-arrow keys move the cursor up or down one line of text. (Word processors that support the Apple II and II Plus often use control keys instead of the up- and down-arrows on the //e and //c.) Most word processors let you move the cursor more than one character or line at a time; some move a word or a sentence at a time and set tabs; others move to the preceding or next window in the text. Many editors jump the cursor to the beginning or the end of the text. When looking for a word processor, keep an eye on available cursor options. The more options you have, the faster you'll be able to position the cursor.

Once you position the cursor, you can direct the editor to perform various functions. When starting a new document, you'll naturally want to insert text. (After all, there isn't much else you can do with a blank screen.) If the insert mode is the default mode of your editor, then you can immediately start typing in text. Other editors require that you enter a control character to get into insert mode.

Word processors have two types of insert modes: *destructive* and *nondestructive*. If you position the cursor in the middle of the text and type while in destructive mode (or *change mode*), all the characters that you type over will be lost and replaced by the new ones. A nondestructive insert doesn't type over text, but pushes the original text one space to the right every time you enter a new character. The ability to insert new text within existing text is one of an editor's most powerful functions.

Unlike a typewriter or a line-oriented editor, a full-screen editor doesn't require that you enter a carriage return at the end of a line. The full-screen editor always checks to see if the word will fit on the line. If it doesn't fit, the editor inserts a carriage return before the word, which forces it to the beginning of the next line. This feature is called *wrap-around*.

Besides providing easy ways to insert and change text, the editor can also delete unwanted text. With the delete function—the opposite of a nondestructive insert—you position the cursor on the character you want deleted and enter the delete command (usually a control code like control-D). The deleted character isn't replaced by a space, but by the character to its right. That is, the characters following the deletion point are shifted one space to the left. Most editors also provide the option to delete a single line or wipe out an entire document.

Block Actions

Editors usually carry out *block actions* to move sections of text. In the most common block action, a *block move*, you earmark the beginning of the block (usually with a control code), then move the cursor to the end of the text area and mark it with another control code. (The codes are different for each editor.) By entering a third code, you can lift the marked block of text out of the document for deposit in a temporary buffer.

Once your block is in the buffer, move the cursor where you want the block inserted and enter the appropriate control code. The text is then transferred from the buffer and inserted at the point in the document you've specified. Since a copy of this text remains in the buffer, you can insert it in various places in your document. With block actions you can also delete large text areas: simply lift a block out of the document and don't insert it anywhere. Different word processors impose different size restrictions on their block actions because buffer sizes vary. Some can hold only a short paragraph, while others can handle several pages of text.

Search and Replace

Another powerful function, the *search and replace* feature, scans your document for a specified character sequence. When the editor finds the sequence, it positions the cursor there. Given the replace function, the editor automatically replaces the search sequence with your sequence. For example, you've just finished entering and modifying a 20-page business report. Before printing it, you discover that you misspelled your boss's name throughout the report. Rather than make corrections as you go through the entire report manually, you can instruct the editor to look for the incorrect spelling and replace it

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with a correct sequence. The editor will make the appropriate changes throughout the document.

Size Limitations

Before you buy a word processor, consider the size of the documents you'll work with. Most inexpensive word processors are memory-limited; they can't produce documents containing more bytes than are left in the system—considering how much space is taken up by DOS and the word processor itself. Some word processors, however, aren't limited by memory. They use *virtual memory*, a technique to create documents larger than the system's available memory allows. This method stores documents on disk and brings into memory only the part of the document you're working on. When you scroll to part of a document that is not in memory, the word processor will scroll the necessary text from disk into memory, and then save the unused text to disk. So, if you want large documents, you need a word processor with virtual memory.

File Handling

All text editors are coupled with a filing system that lets you load, save, and delete documents from data disks. Without this feature, your word processor would be of limited value since you couldn't store and retrieve documents.

You should know how your word processor stores documents, specifically, in what format your files are saved to disk. Most Apple word processors save documents as DOS 3.3 text files. Others, however, save them as DOS 3.3 binary files or as Pascal text files. Of the newer word processors, some store documents as ProDOS text files while others use a proprietary operating system that renders data files unreadable by other programs.

Why is it important to know how a word processor stores documents? Compatibility. Perhaps you want to send a document across the country via your modem. If the document file is in a format your communications software can't read, then you're out of luck. Similarly, you should make sure that your spelling checker can read the type of files your word processor produces. If you intend to enter BASIC programs and text, you must check that the file can be EXECed (DOS or ProDOS text files). Before you buy, make certain the word processor produces files that will work with software you already own.

"Look for a word processor that lets you control your interface or printer directly."

The Format Program

Once you create a document, you need a way to print it out. This is the job of the *format program*, which takes your text and, based on selected commands, prints the document. You can give instructions to the format program through either the print menu or embedded commands.

The Print Menu

With most word processors a print menu helps you determine your hard copy's appearance by setting top, bottom, left, and right margins. It lets you define page length and spacing. Good word processors will also let you specify various justifications: A left-justified document begins lines at the left margin and has a ragged right margin; center justification centers every line; full justification inserts enough space into each line for even margins on both sides.

Print menus also control headers and footers, automatic pagination, and printing pause for inserting single sheets of stationery. More advanced programs handle form letters and printing multiple documents or copies of the same document.

Embedded Commands

Word processors must provide for embedded commands—a sequence of characters entered into the text but not printed out. They instruct the printer to perform a special function.

How does the format program differentiate between regular text and an embedded command? It depends on the word processor but, generally, the format program recognizes certain character sequences as commands. For instance, since a period never appears as the first character in a line, many word-processing programs use a period as a marker for the start of an embedded command in the first column. For example, if the first five characters in a line of Apple Writer text are .LM20, the print format program will move the left margin to column 20.

Embedded commands require the escape or control codes. Superscripts, subscripts, boldface, and underlining are also prompted by embedded commands. If you really want to get your money's worth, look for a word processor that lets you control your interface or printer directly. (See "The Docile Printer," p. 75.) Then, you can use all of your printer's special features, like compressed mode and different fonts. In any event, don't buy a word processor equipped with features your printer doesn't support. Don't pay for features you can't use.

Hardware Considerations

When you do buy a word processor, make sure it will work with your hardware, but there are no tried and true formulas to follow. If you own an Apple II or II Plus, find out if it prints lowercase by using a one-wire, shift-key modification or if the program will support hardware like the Videx Enhancer. Ensure that the program supports your 80-column board. Apple //e and //c owners should know if the word processor supports their machines' special features: 128K, the tab key, and the four arrow keys. Your dealer is your best information source. The second best is the manufacturer of the word-processing software. Make sure your word processor can drive your printer. Most word processors can drive most printers but don't let yours be the exception.

The One for You

For hard-core word processing on an Apple, check out some of the full-featured programs—Apple Writer (see "Cracking the Code," p. 50), Screenwriter, and Zardax. You might also consider a Z80 coprocessor to run WordStar, Peachtext, and a host of powerful CP/M word processors. (These programs work best with full upper/lowercase, 80-column displays, and two disk drives.)

If you don't need a professional word processing system, an inexpensive word processor may be more to your liking. Perfect for memos, letters, book reports, and term papers, these word processors are usually easier to operate than professional systems.

So talk to your friends, read reviews, refer to our buyer's guide (p. 46), and secure demonstrations from your dealer. Once you discover the ease of word processing, you'll never need White-out again.■

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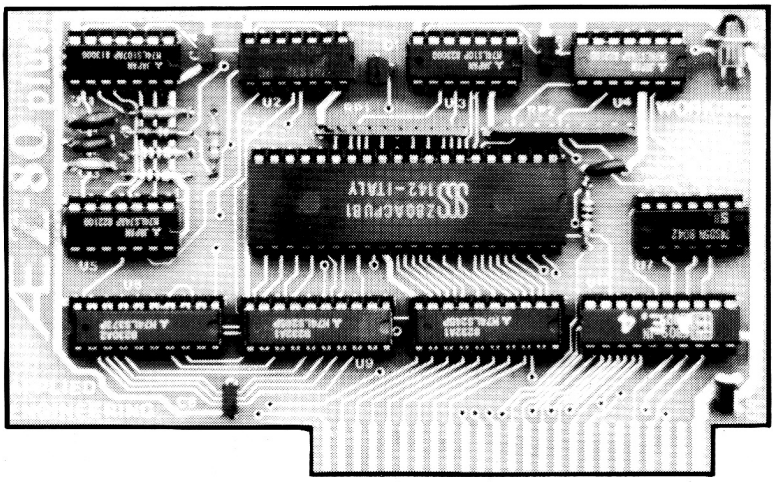

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The Write Choice	$44.95	48K	●	DOS 3.3 text DOS 3.3 binary	30K	●		●	●	●	30K
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●	●	80◇	●	●	●	●	●	●			●		●		Mail merge compatible with text.
	●	80						●		●	●	●	●	●	Margins in inches; AppleMouse.
●	●	80	●	●	●	●	●			●	●	●	●	●	Mailing list; AppleMouse.
●		80	●	●	●	●	●	●	●		●		●	●	Two alphabets; proportional print.
●	●	40	●	●	●	●	●	●	●	●	●		●	●	Icon driven; audio tutorial; automatic indent.
●	●	80	●	●	●	●	●	●	●	●	●		●		Large letters.
●		80	●	●	●	●	●	●			●	●	●	●	Mail merge.
●	●	40		●		●	●				●			●	
●	●	40◇	●	●	●	●	●	●			●			●	Utilities for editing Applesoft.
		70				●						●			Keyboard function strip; tutorial.
●	●	80◇	●	●	●	●	●	●			●	●	●	●	Built-in telecommunications program; text merge.
●	●	80	●	●	●	●	●	●	●		●	●			AppleMouse.
	●	40				●	●							●	Speech and large print.
●	●	80	●	●	●	●	●		●		●	●		●	Tutorial; word count; style manuals; AppleMouse.
●	●	70	●	●	●	●	●	●			●		●	●	Automatic save, indent; translates DOS wp files.
●	●	80	●	●	●	●	●	●	●		●		●		Tutorial.
●		80	●	●	●	●	●	●	●		●	●	●	●	

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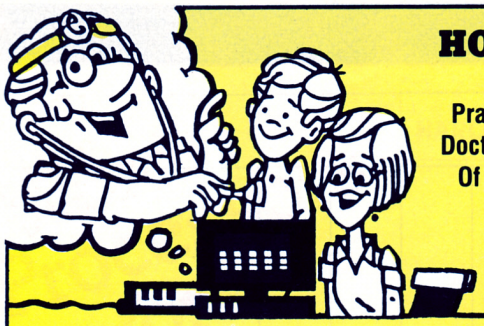

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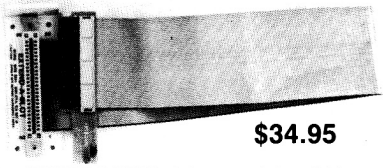

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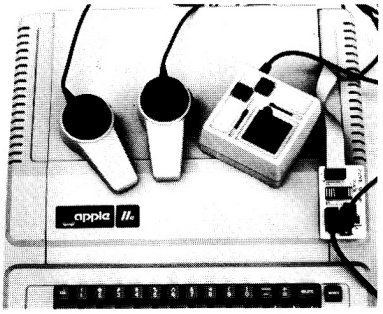

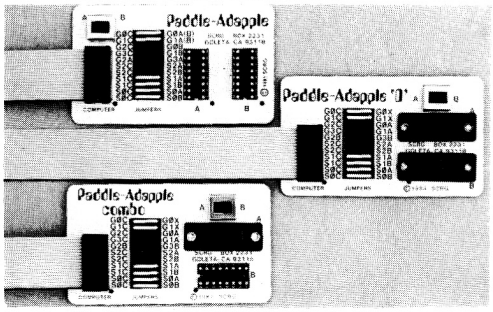

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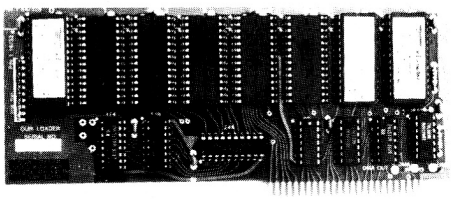
quikLoader™



FAST AND CONVENIENT

The quikLoader is the *fastest* way to load programs. **BAR NONE!** Programs can be loaded in fractions of a second. More importantly, DOS is instantly loaded every time the computer is turned on. Integer is even loaded in the language card. This process takes less than a second, saving valuable time. Frequently used programs are available *instantly* when you need them, without having to look for the disk, or hoping that the lengthy disk loading procedure goes smoothly.

To run a program from the quikLoader, bring up the quikLoader catalog (Q-reset), and the names of the programs will be displayed, along with an index letter. Pressing the index letter will instantly load and run the program.

Up to 23 programs on the quikLoader can be displayed on the screen at one time. If you have more programs, you may scroll through the catalog in either direction.

The quikLoader is **ideal** for applications requiring a dedicated computer. Your program can be automatically loaded and run at "power-up".

PROGRAMMING EPROMS

Putting your own programs on the quikLoader is easily done, using a separate EPROM programmer such as the **PROmGRAMER.** For APPLESOFT, INTEGER, or single machine language files, no programming knowledge is necessary. You **will** need experience if you want to save copy-protected or complex programs. The amount of experience necessary depends on the complexity of the program.

COMMERCIAL PROGRAMS

If you have a program that is valuable, it will become **more** valuable when it is instantly available to you. We are actively seeking licenses from software publishers to allow their popular programs to be made available for the quikLoader. Independent authors are encouraged to write programs suitable for the quikLoader. If the author wishes, we will market the program (with appropiate royalties), or the author can take care of all marketing. In either case, we will make known to our customers the availability of these programs.

We start your library of programs with the most popular utilities on the card, FID and COPYA. Now, if you have to copy a disk, you don't have to search for the master disk. You can start copying within 3 seconds after turning on the computer.

We are currently licensed to sell several very popular programs on EPROM. **DOUBLE—TAKE** by BEAGLE BROS., and **COPY][PLUS** by CENTRAL POINT SOFTWARE. The introductory price for DOUBLE—TAKE is $45.00. This includes the program exactly the same as you would buy it at your dealer for $34.95 (including disk and documentation), and a programmed 27128 EPROM (worth about $25.00). COPY][PLUS cost $65.00. This includes the original program (worth $39.95) and **two** programmed 27128's.

Other programs available directly from us or the publishers are, **BARKOVITCH I/O TRACER AND SINGLE STEP TRACE, MICRO/TYPOGRAPHER** from **TIDBIT SOFTWARE, ECHO** speech synthesizer software from **STREET ELECTRONICS,** and **MERLIN** assembler, from **ROGER WAGNER PUBLISHING.** More commercial programs are now in the works.

MEMORY CAPACITY

The quikLoader has eight sockets for EPROMs. These sockets can accommodate standard EPROMs from 2716 to 27512. These types can be freely intermixed. The memory capacity of the quikLoader depends on the EPROMS used. For example, the 2716 can hold 2K of programs, and the 27512 can hold 64K. (Frankly, the current costs of the 27512 is prohibitive,but should come down drastically in the next year.) At this writing, the least cost-per-bit is provided by the 2764, which can hold an 8K program. Using these "chips", the quikLoader becomes a 64K ROM. Using larger capacity EPROMs allows it to become a 128K, 256K, or even a 512K card. If more memory capacity is needed, the quikLoader operating system supports multiple quikLoaders.

INCREASED DISK CAPACITY

Since DOS is loaded from the quikLoader every time the computer is turned on, it is not necessary to take up valuable disk space with DOS. This will give you more than 5% additional space for programs and data on your disks.

ABOUT THE DESIGNER

The quikLoader was designed by Jim Sather, author of UNDERSTANDING THE APPLE][(forward by Steve Wozniak), published by QUALITY SOFTWARE (21601 Marilla Street, Chatsworth, CA 91311 (818) 709-1721).

SYSTEM REQUIREMENTS

The quikLoader plugs into any slot of the APPLE][+ or //e. If used in a][+, a slightly modified 16K memory card is required in slot 0. A disk drive is required to save data.

DOS, INTEGER BASIC, FID, and COPYA are copyrighted programs of APPLE COMPUTER, INC. licensed to Southern California Research Group to distribute for use only in combination with quikLoader.

$179.50

PROmGRAMER™

The **PROmGRAMER** will read or program any of the standard single-volt EPROMS from the 2708 to the 27512. Features include:

- Slot independent operation for the APPLE // family of computers.
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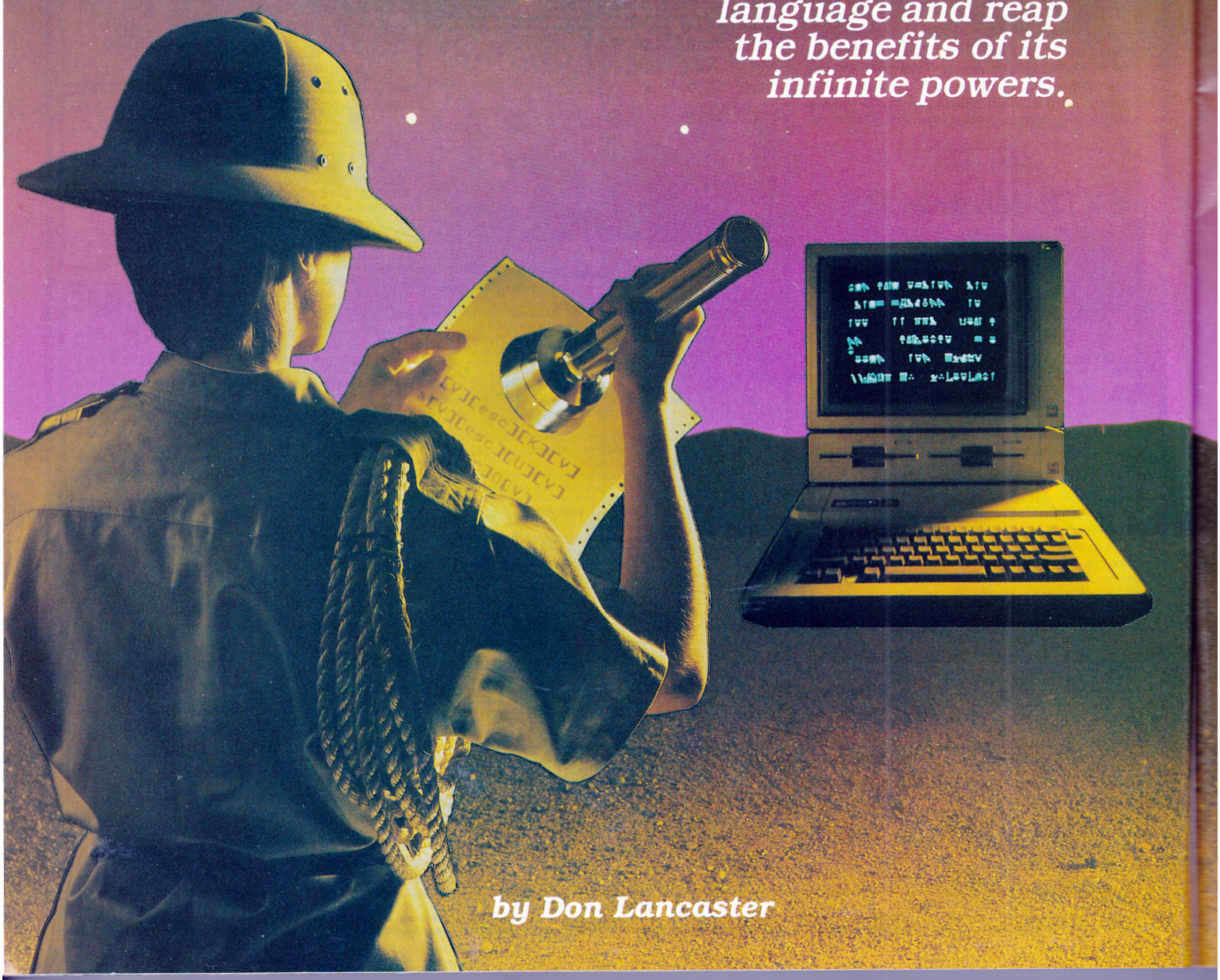
Cracking the Code

Unravel the mysteries of Apple Writer. Decipher this word-processing language and reap the benefits of its infinite powers.



by Don Lancaster

Photography: Torsheya Studio

Some think it's tricky to learn; others, that its code is arcane. So Apple Writer //e users often avoid tinkering with its WPL (word-processing language). But owning Apple Writer //e and not using WPL is as absurd as keeping a Porsche in the driveway just to listen to its FM radio.

A word-processing language program acts as an executive or supervisory controller. Like a gentleman's gentleman, it carries out detailed instructions methodically from a long list of tasks. Theoretically, since WPL is fully programmable, it makes Apple Writer "infinitely" extendable.

WPL manages everything from the obvious to the exotic—from form letters and mailing lists to a plotter with a photocell "pen" used as a scanning device. Little-known, yet powerful, WPL features can improve Apple Writer //e glossaries.

The Glossary

With a self-prompting glossary, a single keystroke quickly displays a help screen and lets you insert often-used phrases in text files. This beats memorizing obscure keystrokes or hunting for lost documentation. For example, you can enter complimentary closes for letters, and your own and your company's names, into a text file with one keystroke; just define a glossary entry with the needed information and the designated key. To enter the phrase, simply hold down the open-apple key and press the appropriate key.

Conveniently, the glossary treats a closed bracket] as a carriage return. You can have multi-line glossary entries by substituting a] for each carriage return. Separate glossary entries are allotted for uppercase characters, lowercase characters, numbers, control keys, and punctuation symbols except for the /, ?, and *. A glossary could give you over a hundred user-defined keys on-line at any time.

Each glossary is restricted to 2048 characters, but you'll rarely need more room. One amazing feature is that the Apple Writer //e glossary code can call *itself* up to eight times over. So, you can compact similar phrases by combining the words they share. This feature, *glossary nesting*, is analogous to a subroutine's shortening code when accessed from several different places in a program.

WPL creates glossaries one phrase at a time using the control-G command, or writes them all at once as an ordinary text file. You can load or store glossaries from a special glossary buffer through the control-Q E and control-Q F commands.

Figure. *The self-titling and self-prompting word-processing language glossary organizational structure.*

YOURGLOSS 1.0	
Title or Header	The header is a remark or comment, seen only by the programmer. Each line must begin with an *, /, or ?.
Main Glossary	This is the usual glossary, except that you can embed many immediate WPL commands.
Help Screen	A complete help screen, done exactly the way you want your message to appear to the user.
Help Screen Loader	The loader installs the help message to screen on open-apple z. It optionally copies itself to disk on open-apple Z. This loader must follow the help screen.

Table 1. *Apple Writer //e word-processing language commands.*

Command	Description
c[O]as6,d1	Catalogs drive 1 on lowercase c.
C[O]as6,d2	Catalogs drive 2 on uppercase C.
1[P]dowpl.camera ready]	Executes the WPL program, WPL.CAMERA READY on a numeric 1.
6[L]boilerplate 6.0,d2]	Inserts boilerplate module 6 on numeric 6.
7[L]fmod1] [L]fmod2] [L]fmod8	Inserts file modules 1,2,8 on numeric 7.
| [L]#] [L]#] [L]#] [L]#] [L]#] [L]#]	Makes 64 copies of a file on |.
@[P]?]tm0]bm0]lm0]rm255]pm0]pi66]pl66]tl]bl]]	Changes wide-open print constants on @.
#[P]?]tm4]bm4]lm7]rm70]pm6]pi66]pl62]tl]bl]]	Returns to stock print constants on #.
![F]<??????????????????????????????????<<A]	Clears to end of file on !.
/, ?, or *	Adds comment lines to glossary when punctuation begins line.
z[L]GLOSSNAME<startstring<endstring<\]	Provides the tutorial to screen only on lowercase z.
Z[Q]fEGLOSSNAME] [L]EGLOSSNAME<startstring<endstring<\]	Provides the tutorial to screen and a copy of the glossary to the active disk on uppercase Z.

Immediate WPL Execution

From the Apple Writer //e code, you can learn that the WPL and glossary share common routines. You can execute word-processing commands from the glossary just as you'd use a glossary to put a phrase into a text file (see **Table 1**).

Enter a glossary command by typing in a key letter, followed by the entry. For instance, a glossary entry of "zzorch" places "zorch" into your text file every time you press the open-apple and the lowercase z.

The glossary entry c[O]as6,d1] translates as "on lowercase c, catalog the disk in drive 1." Similarly, C[O]as6,d2] says "on uppercase C, catalog the disk in drive 2." The [O] means control-O or select the DOS commands menu.

Using brackets to show control commands is standard in Apple Writer //e and WPL. Throughout the rest of this article and in my tables, brackets indicate a control command. A closing single bracket represents a substitute glossary carriage return. Note that the final] in each command adds the last carriage return that carries out the intended operation. You use fake carriage returns because that glossary entry terminates on a real carriage re-

Continued on page 98.

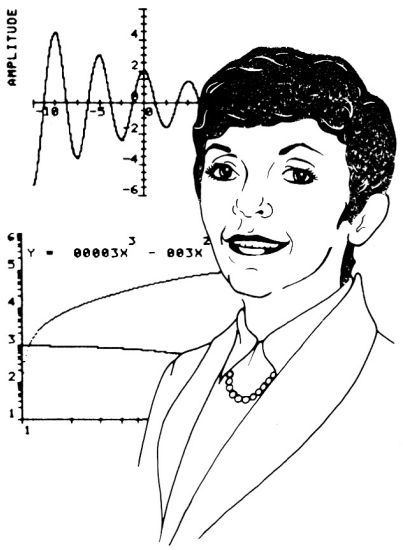
Table 2. *Apple Writer //e-Epson MX-80 formatting glossary with tutorial.*

Epson MX-80 Formatting Glossary	**Open-Apple Formatting Commands**
?	
?	
A[V] [esc]#[V]	(A) ASCII b8 as is
a[V] [esc]>[V]	(a) ASCII b8 one
B[V] [esc]G[V]	(B) bold print on
b[V] [esc]H[V]	(b) bold print off
C[V] [esc] [O] [V]	(C) compressed on
c[V] [esc] [S] [V]	(c) compressed off
D[V] [esc] [N] [V]	(D) doublewide on
d[V] [esc] [T] [V]	(d) doublewide off
E[V] [esc]E[V]	(E) emphasized on
e[V] [esc]F[V]	(e) emphasized off
F[V] [esc]C[V]	(F) fmlngth lines *
f[V] [esc]C[@] [V]	(f) fmlngth inches *
G[V] [esc]L[V]	(G) graphics 960
g[V] [esc]K[V]	(g) graphics 480 *
H[V] [esc]J[V]	(H) height custom *
h[V] [esc]2[V]	(h) height normal
I[V] [esc]4[V]	(I) italics on
i[V] [esc]5[V]	(i) italics off
J[V] [esc]N[V]	(J) jump perf on *
j[V] [esc]O[V]	(j) jump perf off
K[V] [V]	(K) (spare)
k[V] [V]	(k) (spare)
L[V] [esc] = [esc] [J] [V]	(L) linefeed w/rst
l[V] [esc]>[esc] [J] [V]	(l) linefeed only
M[V] [V]	(M) (spare)
m[V] [V]	(m) (spare)
N[V] [G] [V]	(N) noisy bell
n[V] [G] [V]	(n) noisy bell
O[V] [esc]U[@] [V]	(O) two-way print
o[V] [esc]U1[V]	(o) one-way print
P[V] [esc]9[V]	(P) paperout sense
p[V] [esc]8[V]	(p) paperout ignore
Q[V] [V]	(Q) (spare)
q[V] [V]	(q) (spare)
R[V] [esc] = [V]	(R) reset B8 = 1
r[V] [esc]>[V]	(r) reset B8 = 0
S[V] [esc]S[@] [V]	(S) superscript on
s[V] [esc]S1[V]	(s) subscript on
T[V]D[V]	(T) tab set *
t[V]D[V]	(t) tab set *
U[V] [esc] – 1[V]	(U) underline on
u[V] [esc] – [@] [V]	(u) underline off
V[V] [esc]1[V]	(V) very tight 7/72
v[V] [esc]0[V]	(v) very tight 1/8
W[V] [esc]Q[V]	(W) width column *
w[V] [esc]Q[V]	(w) width column *
X[V] [esc]@[V]	(X) off all modes
x[V] [esc]T[V]	(x) off sub/super
Y[V] [V]	(Y) your stuff on
y[V] [V]	(y) your stuff off
^[V] [L] [V]	(^) formfeed
<[V] [H] [V]	(<) backspace
Z[P]nd] [Q]FEGLOSS]	(Z) tutorial + save
[L]EGLOSS< > <ls.)> > <\] [P]yd]	
z[L]EGLOSS< > <ls.)> > <\]	(z) tutorial only

* follow with ASCII value(s). (Refer to Epson user's manual for details.)
Bracket pairs represent control commands. [esc] = escape, [Q] means control-Q.
The line preceding the tutorial screen must have four spaces. Z and z selections must not precede the tutorial or they will find themselves.
80-column tutorial text lines have been split. Entries (A), (H), (O), and (V) go on one line. The dot row is also one continuous line, as is the line starting with *-Follow.

'I like plotting equations with a computer, don't you?"

—Virginia Lawrence, Ph.D.
Chief Executive Officer



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Doing Windows

Prepare your programs for window displays that don't destroy underlying text.

by Brian J. Parry

You can do windows. On an Apple II, II Plus, or //e in 40-column mode and with a single disk drive, you can achieve the look of concurrency that Mac and Lisa owners take for granted. My assembly-language routine, PORTAL, produces scrolling window overlays up to three levels (stacks) high that let you move as easily among screen texts as you would shuffle papers on your desk.

After you place (PUSH) a window on the screen, text within that window's borders scrolls, while text beneath the window remains intact. When a window is removed (POPed) from the screen, the underlying text reappears. Adding and removing second and third windows yields the same results. **Tables 1** and **2** show the functions of the PUSH and POP routines.

Window dimensions range from three columns by three lines to 40 columns by 23 lines. (Normal screen text is 40 by 24.) Window borders occupy one space around the perimeter, reducing total window text area by two columns and two rows.

You can locate windows anywhere on the screen as long as you observe the following two rules:

- Window width plus the horizontal position where the window begins must be less than 41 columns.
- Window length plus the vertical position where the window begins must be less than 24 lines.

The PORTAL routine will trap any size or range value errors you may make by stopping your program and displaying an illegal quantity error for the line number the error occurred on. The routine also won't let you add or remove more than three windows. When PORTAL detects this type of error, it doesn't stop your program; instead, it bypasses the PUSH or POP command and prints "ERR" twice, rings the Apple's bell twice, and then continues executing your BASIC program. A size/range error halts your program because placing a window or window border outside the text screen ruins part of your program or creates an improper error code. A PUSH/POP error does no harm, and so continues execution to let you see if the rest of the program works.

Creating Windows

Apple II computers already have a built-in scroll window feature—the

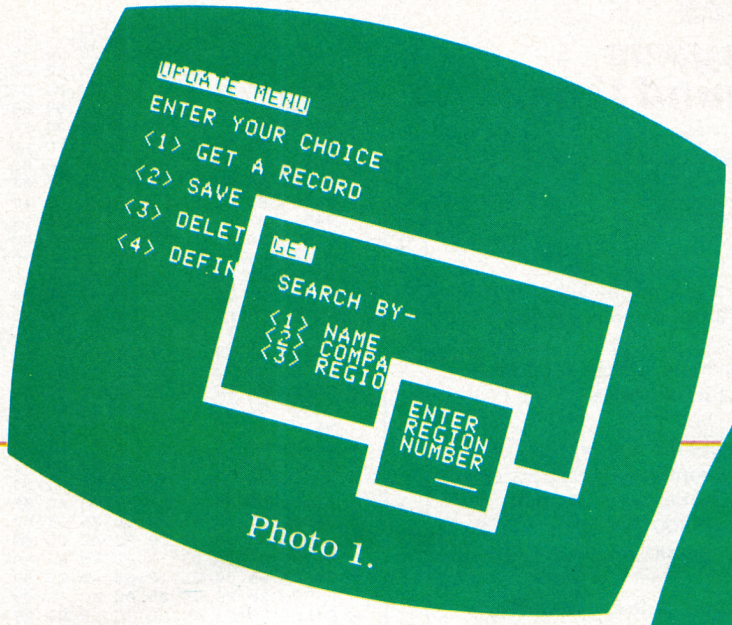

Photo 1.

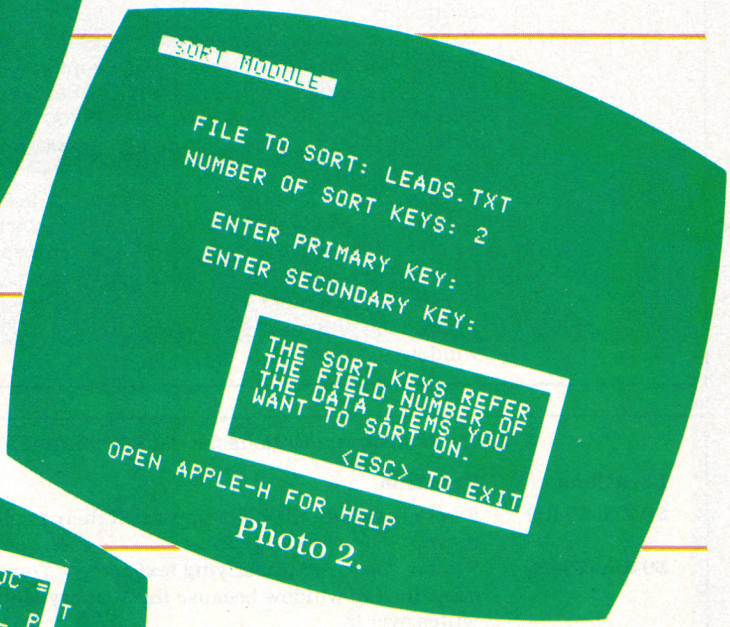

Photo 2.

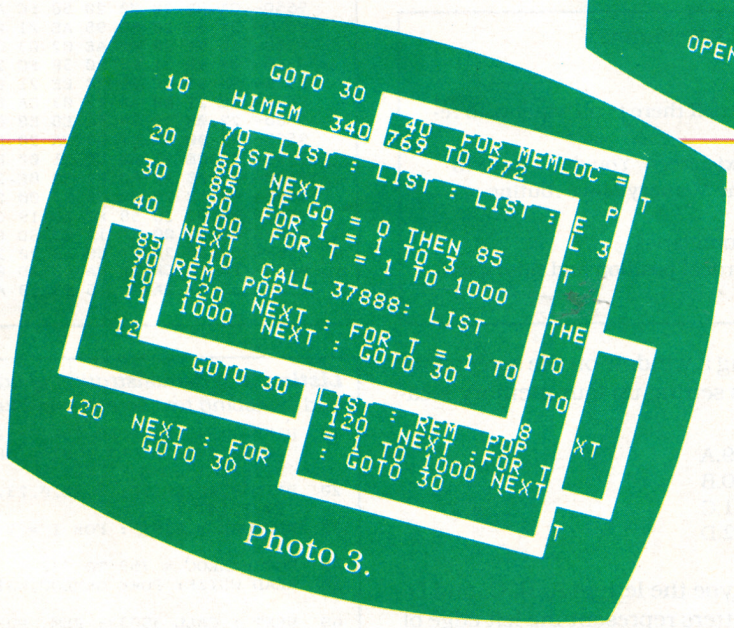

Photo 3.

Photo 1. *Portal creates nested menus like these to give your program a professional appearance. The underlying window contains the main menu and the overlaid window, a subordinate menu.*

Photo 2. *Help screens like these are an excellent supplement to programs. In this example, when you hit either the return or escape key, the help window disappears without destroying any underlying text.*

Photo 3. *The sample program accompanying this article creates three such windows in succession, scrolling the listing through all three. Then, erasing the windows in reverse order (top window first), the program demonstrates that all underlying material, including other windows, is undisturbed.*

entire text screen is a 40 by 24 scroll window. Four consecutive memory locations in the monitor specify the dimensions of the scroll area on the text screen—32, left edge; 33, right edge; 34, top edge; 35, bottom edge. (These are decimal values. A $ prefixes hexadecimal values.) PEEKing at these locations reveals that 32 equals zero, 33 equals 40, 34 equals zero, and 35 equals 24. Notice the similarity between these values and the text screen's row and column dimensions.

POKEing these memory locations with different values confines scrolling to a certain section of the screen. In the immediate mode, type:

```
POKE 33,20:POKE 32,10:POKE 34,5:
  POKE 35,20
```

Then press the return key. Next do a CATALOG or LOAD, and then LIST any program. All scrolling occurs within the specified POKE area.

If you decide to experiment with these locations, make the scroll window smaller than 40 by 24; a larger window can destroy part of a program in memory or confuse your disk drive.

"You'll find uses for window overlays as help screens and command lists."

Table 1. *Memory locations for the PUSH routine.*

Locations	Function
$9494–$94C0	Error-checking routine—windows cannot be smaller than three by three or larger than 40 by 23, and you cannot add or remove more than three windows.
$94C1–$94FE	Housekeeping chores—you must save the current window dimensions, cursor position, and print mode for use in the POP routine.
$94FF–$9524	Save the screen in high memory before the new window is drawn. The monitor's Memory Move routine is incorporated here. The destination memory address begins at location $8800. Screen 1 is saved at location $8800–$8C00, screen 2 at $8C00–$9000, screen 3 at $9000–$9400, and PORTAL at $9400–$9600.
$9525–$95A6	Draw the window borders and set scrolling inside them. Each window border is made by creating a one-by-length or width-by-one scroll area, and then printing inverse spaces inside these small areas. After the borders are drawn, the interior scroll area is set and cleared.
$95A7–$95BC	Restore the print mode you were using before you created a window.

Table 2. *Memory locations for the POP routine.*

Locations	Function
$9403–$9409	Error-checking—ERROR1 appears if there is no window to remove.
$940A–$9435	Restore the saved underlying text screen. You don't have to erase the top window because the Memory Move routine writes over it.
$9437–$9451	Restore the underlying screen boundaries.
$9452–$9465	Restore the cursor's previous vertical position and return execution to you.

None of the damage is permanent, however, and turning your computer off and then on again corrects the problem.

A TEXT command resets the screen to normal after you have POKEd in various values. Any text below the scroll window area was destroyed. PORTAL, however, saves underlying text so that it can be restored when you remove the windows. Furthermore, PORTAL lets you stack more than one window without disturbing any windows underneath.

Using PORTAL

Enter **Listing 1** and type the following:

```
BSAVE PORTAL OBJ,A$9400,L$1CF
```

Then type in your own BASIC program starting with the following line:

```
0 HIMEM:34815:POKE 768,0:PRINT
  CHR$(4);"BLOAD PORTAL OBJ"
```

Placing a window on the screen first involves setting up four memory locations:

```
POKE 769,A
POKE 770,B
POKE 771,C
POKE 772,D
```

Do not type the letters A, B, C, and D. These letters represent the left edge of the window, the window width, the top edge of the window, and the window length, respectively. Replace A with a number from zero to 37, B with a number from three to 40, C with a number from zero to 20, and D with a number from three to 23.

Type CALL 38033 to begin putting the window on the screen; type CALL 37888 to remove it from the screen. See **Listing 2** for a demonstration of adding and removing windows from the screen.

You'll find uses for window overlays as help screens and command lists that are easy to call up and remove from the screen. For further applications ideas, see the screen shots accompanying this article.■

Write to Brian J. Parry at 1115 West Sacramento Avenue #39, Chico, CA 95926.

Listing 1. *PORTAL assembly-language code.*

```
9400- 20 4A FF AD 00 03 C9 00
9408- F0 5C CE 00 03 20 C6 95
9410- A9 00 8D 3C 00 8D 42 00
9418- A9 CF 8D 3E 00 A9 04 8D
9420- 43 00 AD 16 03 18 69 88
9428- 8D 3D 00 18 69 03 8D 3F
9430- 00 A0 00 20 2C FE 18 AD
9438- 16 03 AA 69 04 8D 18 03
9440- A0 00 BD 09 03 99 20 00
9448- EC 18 03 F0 05 E8 C8 4C
9450- 42 94 AE 00 03 BD 05 03
9458- 8D 25 00 20 22 FC A9 00
9460- 85 24 20 3F FF 60 20 2D
9468- FF 20 2D FF 20 3F FF 60
9470- 20 39 FB A2 00 BD 88 94
9478- C9 AA F0 07 20 F0 FD E8
9480- 4C 75 94 A2 35 4C 12 D4
9488- D7 C9 CE C4 CF D7 BA AD
9490- AA 20 4A FF AD 00 03 C9
9498- 03 F0 CB 18 AD 01 03 6D
94A0- 02 03 E9 28 10 CA AD 02
94A8- 03 38 E9 03 30 C2 18 AD
94B0- 03 03 6D 04 03 E9 17 10
94B8- B7 AD 04 03 38 E9 03 30
94C0- AF 20 C6 95 18 AD 03 03
94C8- 6D 04 03 8D 17 03 AE 00
94D0- 03 AD 25 00 9D 05 03 AD
94D8- 32 00 8D 19 03 AD F3 00
94E0- 8D 1A 03 18 AD 16 03 AA
94E8- 69 04 8D 18 03 A0 00 B9
94F0- 20 00 9D 09 03 EC 18 03
94F8- F0 05 C8 E8 4C EF 94 A9
9500- 00 8D 3C 00 8D 42 00 A9
9508- CF 8D 3E 00 A9 04 8D 3D
9510- 00 18 69 03 8D 3F 00 AD
9518- 16 03 18 69 88 8D 43 00
9520- A0 00 20 2C FE 20 80 FE
9528- A9 01 8D 21 00 AD 01 03
9530- 8D 20 00 AD 03 03 8D 22
9538- 00 AD 17 03 8D 23 00 20
9540- 58 FC AE 04 03 20 BD 95
9548- 18 AD 01 03 6D 02 03 AA
9550- CA 8E 20 00 20 58 FC AE
9558- 04 03 20 BD 95 AE 01 03
9560- E8 8E 20 00 AE 02 03 CA
9568- CA 8E 21 00 20 58 FC 20
9570- BD 95 CE 20 00 EE 21 00
9578- EE 21 00 AE 17 03 CA 8E
9580- 22 00 20 58 FC E8 E8 8E
9588- 23 00 AE 02 03 CA 20 BD
9590- 95 CE 21 00 CE 21 00 EE
9598- 20 00 AE 03 03 E8 8E 22
95A0- 00 CE 23 00 CE 23 00 EE
95A8- 00 03 20 58 FC AD 19 03
95B0- 8D 32 00 AD 1A 03 8D F3
95B8- 00 20 3F FF 60 A9 20 20
95C0- F0 FD CA 10 FA 60 AD 00
95C8- 03 0A 0A 8D 16 03 60 AA
```

Listing 2. *A demonstration of adding and removing text screen windows.*

```
10  HIMEM: 34815: POKE 768,0: PRINT
      CHR$ (4);"BLOAD PORTAL OBJ"
    : TEXT : HOME : LIST
20  DATA 0,40,10,10,15,20,0,23,4,
    27,3,14
30  RESTORE : LIST : FOR I = 1 TO
    3
40  FOR MEMLOC = 769 TO 772
50  READ WSIZE: POKE MEMLOC,WSIZE

60  NEXT : CALL 38033: REM  PUSH
70  LIST : LIST : LIST : LIST
80  NEXT
90  FOR I = 1 TO 3
100  FOR T = 1 TO 1000: NEXT
110  CALL 37888: LIST : REM  POP
120  NEXT : FOR T = 1 TO 1000: NEXT
    : GOTO 30
```

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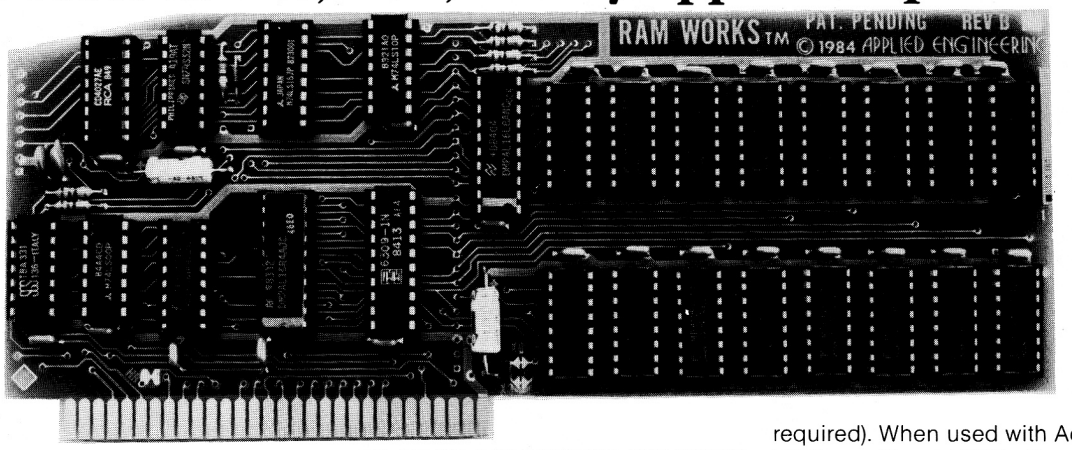

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Listing 1. *Raider.*

```
10  REM         >>> RAIDER <<<
20  REM          BY TIM WILEY
30  REM         APRIL 15, 1984
40  LOMEM: 17056
50  HGR : TEXT : HOME : POKE 232,0: POKE 233,64: PRINT  CHR$ (4)"BLOAD RAI
    DER SHAPES,A16384"
60  GOTO 430
70 LY = 0:LX = (TA * 3.11) + 139: IF LX > 279 THEN LY = LX - 279:LX = 279:
     GOTO 110
80 F = 2
90  IF LX < 0 THEN LY =  ABS (LX):LX = 0
100  SCALE= 3
110  HCOLOR= 0: ROT= FR: DRAW 1 AT FX,FY: HCOLOR= 3: HPLOT 139,184 TO LX,L
    Y: DRAW 1 AT FX,FY
120 H = 1: IF (FR = 120) OR (FR = 130) OR (FR >  = 134 AND FR < 137) THEN
     H = 2
130  HCOLOR= 0: HPLOT 139,184 TO LX,LY: IF  PEEK (234) < H THEN  DRAW 1 AT
    FX,FY: SCALE= 1: HCOLOR= 3: ROT= 0: RETURN
140 X = FX + 8: IF X > 279 THEN X = 279
150  DRAW 1 AT FX,FY: HCOLOR= 3: SCALE= 1: ROT= 0: XDRAW 15 AT X,FY + 9
160 NH = NH + 1: IF NH < 3 THEN HM = HM / 3:T =  INT (( RND (1) * .5 + .75
    ) * (3 + (NH * 2))): XDRAW 15 AT X,FY + 9: RETURN
170 T = 100:HM = HM / 4: XDRAW 15 AT X,FY + 9: RETURN
180  IF FA < 1 THEN LX = 15:LY = 0: GOTO 210
190 X = FA - 45: IF X < 0 THEN LY = 15 + (X * (15 / 45)):LX = 15: GOTO 210
200 LX = 15 - (X * (15 / 45)):LY = 15
210 X = FX:Y = FY + 3: IF X > 279 OR Y > 191 THEN  RETURN
220  IF X + LX > 279 OR Y + LY > 190 THEN  RETURN
230 X = X + LX:Y = Y + LY: DRAW 3 AT X,Y: IF  PEEK (234) = 0 THEN  XDRAW 3
     AT X,Y: GOTO 220
240  HCOLOR= 0: DRAW 3 AT X,Y: HCOLOR= 3
250  FOR XX = 1 TO 6: IF X >  = P(XX) - 4 AND X <  = P(XX) + 19 THEN 280
260  NEXT : RETURN
270  IF EX THEN  HCOLOR= 0: DRAW EX AT ZX,ZY: HCOLOR= 3:EX = 0
280 D(XX,3 - PP) = D(XX,3 - PP) - 1
290  IF D(XX,3 - PP) = 0 THEN  IF EX THEN  HCOLOR= 0: DRAW EX AT ZX,ZY: DRAW
    SH(XX,3 - PP) AT P(XX),190:EX = 10:ZX = P(XX) + 5:ZY = 190: HCOLOR= 3
    : DRAW 10 AT ZX,ZY:S(PP) = S(PP) + SC(XX,3 - PP): RETURN
300  IF D(XX,3 - PP) = 0 THEN  HCOLOR= 0: DRAW SH(XX,3 - PP) AT P(XX),190:
    EX = 10:ZX = P(XX) + 5:ZY = 190: HCOLOR= 3: DRAW 10 AT ZX,ZY:S(PP) =
    S(PP) + SC(XX,3 - PP): RETURN
310  RETURN
320  IF B = 0 THEN  RETURN
330 B = B - 1:BD = 1:BX = FX + 1:BY = FY + 4:BV = 1
340 BV = BV * 1.7: IF BY + BV < 190 THEN 410
350 BD = 0: IF EX THEN  HCOLOR= 0: DRAW EX AT ZX,ZY: HCOLOR= 3:EX = 0
360 BX = BX + (191 - BY) / (BV / 8)
370  IF BX > 279 THEN BX = 279
380 EX = 10:ZX = BX:ZY = 190: DRAW EX AT ZX,ZY
390  FOR XX = 1 TO 6: IF ZX <  = P(XX) - 3 OR ZX >  = P(XX) + 19 THEN  NEXT
    XX: RETURN
400  HCOLOR= 0: DRAW SH(XX,3 - PP) AT P(XX),190: HCOLOR= 3:S(PP) = S(PP) +
    SC(XX,3 - PP):D(XX,3 - PP) = 0: RETURN
410 BX = BX + 8: IF BX > 279 THEN BD = 0: RETURN
420 BY = BY + BV: DRAW 4 AT BX,BY: RETURN
430  GOSUB 920
440  HOME : IF L1 =  INT (L1) THEN A$ = ">> READY PLAYER ONE <<": VTAB 12:
     GOSUB 910: FOR D = 1 TO 1000: NEXT : GOTO 460
450 A$ = ">> READY PLAYER TWO <<": VTAB 12: GOSUB 910: FOR D = 1 TO 1000: NEXT
460  HGR : POKE  - 16302,0: HCOLOR= 3: HPLOT 0,191 TO 279,191
470  HCOLOR= 3: ROT= 0: SCALE= 3: DRAW 2 AT 139,184: SCALE= 1
480  FOR X = 1 TO 6: SCALE= 1: ROT= 0: DRAW SH(X,3 - PP) AT P(X),190: NEXT
    X
490  IF  PEEK ( - 16286) > 127 AND BD = 0 THEN  GOSUB 320
500  IF  PEEK ( - 16287) > 127 THEN  GOSUB 180
510 FA = FR - 121:FA = FA * 6.17647059:FA = FA - 45
520  IF S THEN V1 = 1.5: GOTO 620
530  IF T THEN 620
540  IF  PDL (1) < 105 THEN V1 = 1: GOTO 620
550  IF  PDL (1) < 65 THEN V1 = 2: GOTO 620
560  IF  PDL (1) < 30 THEN V1 = 3: GOTO 620
570  IF  PDL (1) < 5 THEN V1 = 5: GOTO 620
580  IF  PDL (1) > 170 THEN V1 =  - 1: GOTO 620
590  IF  PDL (1) > 220 THEN V1 =  - 2: GOTO 620
600  IF  PDL (1) > 250 THEN V1 =  - 4: GOTO 620
610 V1 = 0
620  IF T THEN V1 = 2
630 VM = VM + V1: IF VM > 20 THEN VM = 20
640  IF VM <  - 15 THEN VM =  - 15
650 S = 0
660  IF  PDL (0) / ( PDL (1) + 1) < .4 THEN S = 1:HM = 0
670  IF S = 0 AND T = 0 THEN HM = 1 +  PDL (0) / 17: IF HM < 5 THEN VM = V
    M + (5 - HM)
680  SCALE= 3: ROT= FR: HCOLOR= 0: DRAW 1 AT FX,FY: HCOLOR= 3:FX = FX + HM
    :FY = FY + VM: IF F THEN F = F - 1
690  IF FX > 279 THEN FX = FX - 279
700  IF FY < 6 THEN FY = 6
710  IF FY > 187 THEN 1260
720 FR = (VM + 13) / 2 + 121:FR =  INT (FR):H = 0: IF (FR = 120) OR (FR =
    130) OR (FR >  = 134 AND FR < 137) THEN H = 1
730  ROT= FR: DRAW 1 AT FX,FY: SCALE= 1: ROT= 0: IF  PEEK (234) > H AND FY
     > 165 THEN 1260
740  IF BD = 1 THEN  HCOLOR= 0: DRAW 4 AT BX,BY: HCOLOR= 3: GOSUB 340
750  IF T THEN T = T - 1
760 KY =  PEEK ( - 16384): POKE  - 16368,0
770  IF KY <  > 160 AND KY <  > 136 AND KY <  > 149 THEN 880
780  HCOLOR= 0: SCALE= 3: ROT= TR: DRAW 2 AT 139,184: HCOLOR= 3: IF KY = 1
    60 AND F = 0 THEN  GOSUB 70: SCALE= 3: ROT= TR: DRAW 2 AT 139,184: GOTO
    880
790  IF KY = 136 THEN 850
800  IF KY = 160 AND F THEN  DRAW 2 AT 139,184: GOTO 880
810 TA = TA + 10: IF TA > 90 THEN TA = 90
```

Listing continued.

you. Then, you must set up your military base (beginning at position 1 on the left of the screen and continuing to position 6 on the right) with several targets—radar, interplanetary missile (IPM), fuel tank, munitions dump, and two buildings. Set the caps-lock key and press the first letter of your choice for each position. Your opponent then sets up another military base following the same procedure.

The targets vary in both importance and damage resistance. The radar, hardest to destroy and therefore worth the most, is vital because it can detect the approach of a large assault force that could destroy the entire base. The next most important target is the missile, which, if destroyed, renders the base harmless. One blast from your fighter's laser cannon destroys the fuel and munitions targets, the least valuable because they are easily replaced and not in demand at this point in the conflict. Buildings, although not worth any points if destroyed, block laser fire and destroy the fighter if it crashes into them.

A final structure, an indestructible, high-power, particle-accelerator defense turret, is always located between positions 2 and 3, and is the only means of defense. The space bar fires the turret, and the left- and right-arrow keys rotate it. The fighter loses altitude each time it is hit, and crashes after three hits. A low-flying fighter crashes sooner, so pull up your craft quickly when hit.

The Battle Rages

After constructing both bases, determine the length of the skirmish, the number of times you can attack each other—between one and 15 rounds (sorties). Three rounds is a quick raid, while ten to 15 rounds is an all-out battle. I prefer about five rounds, allowing barely enough slack to come back from a bad sortie. Press the return key to begin the game. Player 1, who set up his or her base first, controls the fighter, and attacks player 2's base.

Your fighter's armament consists of a Supermax IV laser cannon and three chemical reaction bombs. Button zero fires your laser and button 1 releases one bomb. Lasers are most effective against munition dumps and fuel tanks, although radars and missiles, if hit often enough, can be destroyed by laser fire. Buildings are especially resistant to lasers, but they can still be destroyed by them. One bomb, if it hits, will wipe out any structure.

Paddle 1 controls the fighter's altitude. The fighter climbs with a clockwise rotation, and dives in a counterclockwise motion. Pushing the joystick away from you makes the plane dive; pulling it toward you makes it climb. You must also take momentum into account when diving, since the computer updates the vertical motion instead of just changing it according to the paddle position. After a steep dive, you may find yourself unable to pull up before you crash.

Paddle zero controls the fighter's speed. Rotating it to the right (or moving the joystick to the right) accelerates the fighter. A slow ascent causes the plane to stall. To rectify this, either increase the speed or drop the nose. After a few sorties, mastering the controls becomes easier.

Once your fighter has crashed or is

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"You must take momentum into account when diving. After a steep dive, you may find yourself unable to pull up before you crash."

Listing continued.

```
820 X = (TA + 90) / 8.181818 + 53: IF X > 64 THEN X = X - 64
830 TR = X: ROT= TR: DRAW 2 AT 139,184
840  ROT= 0: SCALE= 1: GOTO 880
850 TA = TA - 10: IF TA <  - 90 THEN TA =  - 90
860 X = (TA + 90) / 8.181818 + 53: IF X > 64 THEN X = X - 64
870 TR = X: ROT= TR: DRAW 2 AT 139,184
880  IF EX THEN  HCOLOR= 0: SCALE= 1: ROT= 0: DRAW EX AT ZX,ZY: HCOLOR= 3:
     EX = EX + 1: IF EX > 15 THEN EX = 0: GOTO 900
890  IF EX THEN  DRAW EX AT ZX,ZY
900 KY = 0: SCALE= 1: ROT= 0: GOTO 490
910 H = (20 - ( LEN (A$) / 2)): HTAB H: PRINT A$: RETURN
920  TEXT : HOME : PRINT :A$ = "WELCOME, CAPTAIN.": GOSUB 910: PRINT : PRINT
     "YOU ARE ON A SECRET MISSION,": PRINT "AND A VERY DANGEROUS ONE."
930  PRINT : PRINT "WE HAVE CHOSEN YOU BECAUSE YOU ARE": PRINT "ENLISTED I
     N THE MOST DEMANDING BRANCH": PRINT "OF ALL THE ARMED FORCES..."
940  PRINT :A$ = "YOU ARE A": GOSUB 910: PRINT : PRINT :A$ = ">>> RAIDER <
     <": GOSUB 910
950  FOR D = 1 TO 1000: NEXT : PRINT : PRINT : PRINT "NOW THEN, I ASSUME Y
     OU HAVE READ THE": PRINT "MISSION BRIEFING AND YOU ARE READY TO": PRINT
     "GLORIFY THE EMPIRE THROUGH YOUR SERVICE."
960  PRINT "FIRST, THOUGH, A FEW DETAILS MUST BE": PRINT "TAKEN CARE OF.
      GOOD LUCK.": PRINT
970 A$ = "(PRESS ANY KEY TO START)": GOSUB 910: POKE  - 16368,0
980  IF  PEEK ( - 16384) < 128 THEN 980
990  POKE  - 16368,0
1000 C$ = "RIFMB"
1010  SCALE= 1: HCOLOR= 3: ROT= 0: DIM S(2),D(6,2),SH(6,2),SC(6,2),P(6),OD
     (6,2): FOR P = 1 TO 2
1020 R = 1:I = 1:F = 1:M = 1:B = 2
1030  HOME : FLASH : PRINT "PLAYER "P":": NORMAL : PRINT
1040  PRINT "YOU MUST POSITION 4 STRUCTURES AND": PRINT "2 BUILDINGS ON YO
     UR MILITARY BASE WHICH": PRINT "PLAYER "(3 - P)" WILL ATTACK.": PRINT
1050  PRINT "THE LEFTMOST POSITION IS #1,THE RIGHT #6LOCATE YOUR INSTALLAT
     IONS NOW...": PRINT : PRINT
1060  PRINT "RADAR, IPM, FUEL, MUNITIONS, BUILDING"
1070  PRINT : FOR X = 1 TO 6: PRINT "POSITION #"X": ";
1080  GET A$
1090  FOR XX = 1 TO 5: IF  MID$ (C$,XX,1) = A$ THEN 1110
1100  NEXT XX: GOTO 1080
1110  ON XX GOTO 1120,1140,1160,1180,1200
1120  IF R THEN R = 0:D(X,P) = 4:SC(X,P) = 5:SH(X,P) = 5: PRINT "RADAR": NEXT
     X: NEXT P: GOTO 1220
1130  GOTO 1080
1140  IF I THEN I = 0:D(X,P) = 3:SC(X,P) = 4:SH(X,P) = 6: PRINT "INTERPLAN
     ETARY MISSILE": NEXT X: NEXT P: GOTO 1220
1150  GOTO 1080
1160  IF F THEN F = 0:D(X,P) = 1:SC(X,P) = 2:SH(X,P) = 7: PRINT "FUEL": NEXT
     X: NEXT P: GOTO 1220
1170  GOTO 1080
1180  IF M THEN M = 0:D(X,P) = 1:SC(X,P) = 1:SH(X,P) = 8: PRINT "MUNITIONS
     ": NEXT X: NEXT P: GOTO 1220
1190  GOTO 1080
1200  IF B THEN B = B - 1:D(X,P) = 5:SC(X,P) = 0:SH(X,P) = 9: PRINT "BUILD
     ING": NEXT X: NEXT P: GOTO 1220
1210  GOTO 1080
1220 S(1) = 0:S(2) = 0:B = 3:FX = 1:FY = 20:P(1) = 52:P(2) = 90:P(3) = 164
     :P(4) = 196:P(5) = 228:P(6) = 259
1230  FOR P = 1 TO 2: FOR X = 1 TO 6:O(X,P) = D(X,P): NEXT X: NEXT P
1240  HOME : INPUT "HOW LONG DO YOU WISH THE SKIRMISH TO BE?(# OF TIMES TH
     AT EACH PLAYER CAN ATTACK)";L:L =  INT (L): IF L < 1 THEN 1240
1250 PP = 1: RETURN
1260  SCALE= 1: HCOLOR= 3: HPLOT 0,191 TO 279,191
1270  ROT= 0
1280  FOR X = 10 TO 15: DRAW X AT FX,190: FOR D = 1 TO 65: NEXT D: XDRAW X
      AT FX,190: NEXT X
1290 L1 = L1 + .5: IF L1 < L THEN B = 3:FX = 1:FY = 15: HCOLOR= 0: FOR X =
     1 TO 6: DRAW SH(X,PP) AT P(X),190: NEXT X:PP = 3 - PP: GOTO 1390
1300  TEXT : HOME : PRINT : PRINT "THE SKIRMISH IS OVER.  DESTRUCTION": PRINT
     "COVERS BOTH PLANETS, AND NONE ESCAPED": PRINT "THE HAVOC.": PRINT
1310  PRINT "HOWEVER, ";: IF S(1) > S(2) THEN  PRINT "PLAYER ONE WAS MORE
     EFFICIENT. PLAYER ONE WINS!": GOTO 1340
1320  IF S(2) > S(1) THEN  PRINT "PLAYER TWO WAS MORE EFFICIENT. PLAYER TW
     O WINS!": GOTO 1340
1330  PRINT "BOTH PLAYERS ARE EQUALS": PRINT "AND WILL BE REMEMBERED..."
1340  VTAB 13: PRINT "PLAYER ONE: "S(1);: PRINT  TAB( 20)"PLAYER TWO: "S(2
     )
1350  VTAB 20:A$ = "(PRESS ANY KEY TO CONTINUE)": GOSUB 910
1360  POKE  - 16368,0
1370  IF  PEEK ( - 16384) < 128 THEN 1370
1380  POKE  - 16368,0: CLEAR : GOSUB 1000: GOTO 440
1390  TEXT : HOME : VTAB 11:A$ = ">> SWITCH CONTROLS <<": GOSUB 910: FOR D
      = 1 TO 3000: NEXT :S = 0:T = 0:VM = 0:FR = 0:TR = 0:TA = 0:FA = 0
1400 EX = 0:NH = 0: FOR X = 1 TO 6:D(X,PP) = O(X,PP): NEXT : POKE  - 16368
     ,0:BD = 0: GOTO 440
```

End of listing.

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Table. *Line-by-line description of Raider.*

Lines	Function
70–170	Defensive fire sequence
180–260	Laser fire sequence
270–310	Possible explosion and score adjustment
320–370	Bomb-dropping sequence
380–420	Explosion and possible score adjustment
460–480	Screen setup
490–500	Paddle button check
510	Fighter angle determination
520–530	Check if fighter is stalling or was hit by laser fire
540–600	Paddle readings and vertical velocity adjustment
610–670	Check if fighter will stall
680–730	Move fighter, adjust rotation
740	Check if a bomb is falling
750	Check if fighter was hit, reduce timer
760–870	Turret rotation
880–890	Erase, update, and redraw explosion
900	Repeat loop
910	Print centering function
920–990	Introduction to Raider
1000–1250	Game setup
1260–1280	Crash and explosion sequence
1290	End player's turn, check for end of game
1300–1380	Score analysis and end of game
1390–1400	Initialization sequence

shot down, you and your antagonist switch controls. You now are on the defensive and control the turret, and your opponent attacks your base. After each sortie both bases are repaired, and when the skirmish is over, the computer displays both scores and acknowledges the winner.

Typing in the Program

The body of Raider is in **Listing 1**. I followed as many of Gareth Tucker's commandments (Letters, November 1983, p. 12) as I could for easy entry, but speed and efficiency held top priority. The **Table** contains a line-by-line program description.

Listing 2, the shape table for Raider, contains the fighter, turret, laser, bomb, structures, and six different explosions to create a realistic explosion sequence. To prepare the computer to enter the shape table into the system monitor, type CALL – 151. Then type 4000: and enter about five lines of data and press the return key. Then type a colon, enter another five lines, and press the return key until all the code is typed in. You can check your work by typing 4000.4299 and comparing it with **Listing 2**. When you're done typing it in and checking it, type

BSAVE RAIDER SHAPES,A16384,L666

to save the program. Then run Raider and have fun. ■

Contact Tim Wiley at 7 Dewey Road, Lexington, MA 02173.

Listing 2. *Shape table.*

```
4000- 0F 00 20 00 24 00 2A 00
4008- 2F 00 35 00 62 00 AB 00
4010- E3 00 16 01 52 01 67 01
4018- 85 01 A4 01 F6 01 4A 02
4020- 2E 2E 05 00 34 3F 2D 2D
4028- 07 00 2D 2D 2D 05 00 3F
4030- 3F 0C 16 05 00 2D 2D 2D
4038- 2D 2D 2D 3C 3F 3F 3F 3F
4040- 3F 0C 29 2D 2D 2D 2D 1C
4048- 3F 3F 3F 3F 3F 27 21 21
4050- 21 25 3D 23 2D 25 21 21
4058- 31 36 36 17 36 3D 23 17
4060- 05 00 24 24 24 24 24 24
4068- 24 24 2D 35 36 36 36 36
4070- 36 36 36 3E 27 05 20 20
4078- 23 28 20 38 20 28 20 18
4080- 08 2C 2D 2D 35 25 15 1E
4088- 3A 3A 32 2D 2D 3E 3F 37
4090- 36 36 2E 2D 35 3F 3F 36
4098- 2E 2E 2C 2E 20 24 18 08
40A0- 24 3F 2F 09 20 04 18 08
40A8- 1C 04 00 2D 29 2D 29 24
40B0- 24 24 24 24 24 1C 1C 1C
40B8- 3F 17 17 17 36 36 36 36
40C0- 36 2E 21 23 24 21 21 35
40C8- 25 0C 0C 24 1C 1C 27 17
40D0- 17 17 36 0E 0C 25 33 12
40D8- 12 09 29 32 3E 3A 03 38
40E0- 24 00 12 24 24 24 2C 2D
40E8- 2D 2D 2D 2D 2D 2D 2D 35
40F0- 36 36 36 3F 3F 3F 3F 3F
40F8- 3F 3F 3F 27 01 20 24 2D
4100- 3E 2A 2E 21 24 15 0C 36
4108- 2E 21 24 15 0C 36 2E 29
4110- 25 24 3F 36 06 00 24 24
4118- 24 24 24 24 24 2D 2D 2D
4120- 2D 2D 36 36 36 36 36 36
4128- 36 3F 3F 3F 3F 27 08 2D
4130- 24 3F 26 18 08 2D 24 3F
4138- 26 18 08 2D 24 3F 2E 09
4140- 31 2D 24 3F 16 12 36 2D
4148- 24 37 12 3A 36 2E 21 24
4150- 07 00 3F 07 38 20 25 2D
4158- 2C 2D 2E 35 35 37 37 3F
4160- 1C 23 28 2A 29 00 08 3F
4168- 2C 20 23 23 27 0C 2D 28
4170- 2D 2A 15 37 35 3B 32 0E
4178- 3E 3F 18 08 08 24 38 13
4180- 2E 12 2A 05 00 2F 29 1C
4188- 27 27 3F 27 27 2F 28 25
4190- 2D 2D 2D 35 2D 2E 17 37
4198- 3F 37 27 3C 1C 2F 01 08
41A0- 2D 2A 00 1F 3D 2B 18 08
41A8- 28 25 29 05 28 24 21 07
41B0- 38 38 07 38 07 38 3F 3A
41B8- 3A 17 17 36 15 15 2D 2A
41C0- 15 2A 18 08 18 08 25 29
41C8- 0C 3C 33 33 03 38 2B 16
41D0- 3F 1C 0F 18 08 05 08 05
41D8- 18 08 16 0A 29 18 08 18
41E0- 08 2B 16 01 28 15 1E 1B
41E8- 1B 18 08 08 38 3F 0B 1A
41F0- 17 3F 3A 2A 00 1C 3D 2B
41F8- 18 08 18 07 20 29 2A 28
4200- 2D 20 21 3B 17 17 07 18
4208- 28 28 28 05 20 3B 3F 17
4210- 17 37 1A 30 02 28 2A 2D
4218- 09 09 09 12 2A 0D 20 18
4220- 08 23 01 20 39 1B 24 1B
4228- 1C 1F 23 1C 1B 36 1B 16
4230- 1E 33 32 3A 32 2B 09 1A
4238- 0C 0E 04 18 08 08 28 29
4240- 18 08 31 2B 11 12 09 3E
4248- 00 1B 04 18 08 0C 21 18
4250- 38 1B 3B 12 09 04 18 08
4258- 09 16 2A 09 20 38 18 1C
4260- 3B 13 17 1A 16 19 0E 15
4268- 39 18 08 18 08 18 08 18
4270- 08 18 08 1F 1B 32 13 32
4278- 09 09 09 09 09 09 09 04
4280- 18 08 23 03 18 08 17 13
4288- 15 12 12 12 0A 11 1F 1B
4290- 1B 1B 1B 1B 1B 18 08 2B
4298- 00 12
```

Apple Ecology: Part II

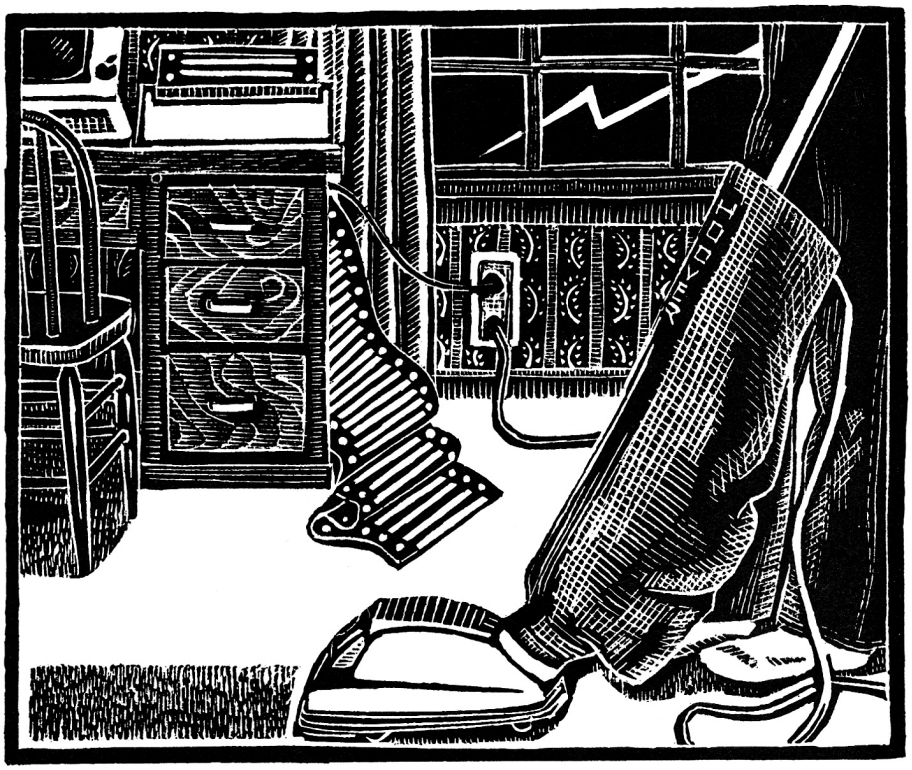

Illustration by Beth Krommes

How will your Apple fare when the lights go out?

Electricity, a cornerstone of our civilization, is, perhaps, second only to fire in importance. Yet, while we take precautions against the unsupervised and uncontrolled uses of fire, we don't give much thought to their counterparts in the electrical world. Last month, I looked at the source of your power woes. This month, let's delve a little deeper and get a perspective on what aids are available to help you guard your Apple from potential disasters that electrical failures and malfunctions can precipitate.

Wasted Days and Wasted Nights

"Bill, the hard disk won't come online. We've tried a few times but it's always the same. It just sits there."

"Can you reformat and restore the old data?"

"No, can't get it to recognize that there's a hard disk there at all. We were in the middle of posting our receivables when the lights browned out for a few seconds. Somewhere in there, as far as the computer's concerned, the hard disk disappeared. Can you come over and check it out?"

"No problem, but get the box ready. It sounds like it's going on a trip to the repair shop. Did you ever get the power accessories we talked about?"

"No, we couldn't get the money approved by purchasing. The office needed a copy machine."

What happens when your computer or hard disk takes a nose dive? Obviously, you must contend with the repair costs. Beyond that, you've lost information and time. If you've backed up the data correctly, it may take only a few hours to reinstall and check it. If you don't, you can be faced with days, possibly weeks, of data entry.

Even if you've checked every power outlet in your home and office with last month's column in one hand and a VOM (volt ohm milliammeter) in the other, you shouldn't feel safe. Electrical conditions can be as unpredictable as the weather.

Spikes, Surges, and Noise

Picture this: You've spent a few hours entering information into your

by Bill O'Brien

Circle 49 on Reader Service card.

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computer. Now it's time to print out the results. You turn the printer on, swivel back to the computer, and wham! Either the screen has been filled with nonsense, or the keyboard won't respond.

Here's the same situation, but you've already turned all the equipment on, and in the proper order: You hear a far-off peal of thunder. A few seconds later, your printer stops, your computer stops, and everything grinds to a halt.

The third scenario should hit closer to home for many of you. Just before you start printing, you decide your pencil is a little blunt. You jab it into the electric sharpener, bring up a good point, turn back to the computer—and nothing works.

All three situations start off harmlessly enough. Printers, distant thunder, and pencil sharpeners may seem innocuous and unrelated. They're not. In its own way, each can affect electrical voltage.

Thunder follows lightning. When lightning—electricity in natural form—strikes a power line, it can multiply your line voltage 100-fold. Just the static charge from a lightning bolt nearby can place the same spike of electricity in your line.

When first turned on, a printer uses electricity rapidly. At the end of its power-on cycle, the "extra" electricity is pushed back into the power line, a situation analogous to smacking your hand down into a tub of water: The initial wave is large. Its echoes, as the water bounces off the walls of the tub, return to the spot you slapped. These same ripples, or surges, from your typewriter, air conditioner, or any heavy-duty electrical implement play havoc with your wall outlet.

Then the pencil sharpener grinds endlessly away. Its small motor pumps your electrical line full of "noise." These small pulses of power travel right back to the wall outlet and enter anything plugged into it.

A line conditioner (see last month's column), protects your equipment from the ravages of these electrical variations. But as I noted last time, they're expensive, and if you don't need the voltage-regulating characteristics of a line conditioner, you can get the same protection for under $100.

One unit in particular, Curtis Manufacturing's Ruby, can exemplify features you should look for. It dissipates 585,000 watts of power for 100 seconds and offers protection against up to 340 volts of electricity in a breathtaking 1 nanosecond. The fastest memory chips are rated at 100 nanoseconds and typical Apple devices function in the 400-nanosecond range. That's fast protection.

You're covered against spikes of up to 3000 volts and protected against surges of up to 1440 amperes that occur for less than 1/120 of a second (not an unreasonably short period of time).

If electrical noise from pencil sharpeners, vacuums, and the like is the problem, this particular unit will attenuate power-line radio frequency (RFI) or electromotive interference (EMI) between 150 kilohertz (kHz) and 30 megahertz (MHz). CB transmitters tend to peak out at 28 MHz, so even they are kept out of your computer.

This particular unit (Curtis has different models) is advertised at $89.95. Prices for others with more or less the same specifications vary depending on the amount and type of protection they give you. (See the list of suppliers at the end of the column.)

Static

Those small bolts of personal lightning that zap you unexpectedly aren't hazardous. They're manifestations of static, a slight jolt of electricity that can amount to several thousand volts but is rated at low power levels. The power behind a static discharge is rated in thousandths of an amp.

Unfortunately, your Apple works with small voltages at these same low power levels. Suffice it to say that introducing voltage at any point in an electronic circuit other than where it's expected can be hazardous. When that voltage is 500 times larger than the circuit was designed to accept, it's disastrous.

What causes static? Many factors are involved, not the least of which is the weather. Static is most likely to occur on dry days. Your clothing rubbing together as you walk, your feet on a rug, even the contact between you and the cloth chair-cover can turn you into a static storage battery.

As you saw last month, electricity needs a path to ground for a complete circuit. Only when you reach some grounded spot does the static drain off.

All too often the ground connection is your Apple.

Static Prevention

A static problem is obvious, and you can remove it before it removes your computer through the use of a humidifier, anti-static spray, or anti-static mats.

In a normally (comfortably) humid environment, everything, even the air, is conductive and an excellent path to ground. Under such conditions, static has no opportunity to build up; it's constantly drained to ground.

Humidifiers can successfully combat severe static, but they can create their own problems. Mechanical devices, they require a maintenance schedule. Then there's the water: Some models have their own holding tank and must be refilled periodically. Others require their own pipeline. If you've priced a plumber lately, you already know that this may not be a practical approach, especially if your static problem is localized.

On the other end of the cost spectrum are anti-static sprays—chemical combinations in a water medium propelled from an environmentally safe pump sprayer. You douse the general area, including all rugs and chairs.

The drawback to this process is that the cure becomes chronic. One treatment stops static for a while; then you must repeat the procedure. If you happen to sit in a chair before the spray has dried you'll discover that, while it isn't harmful, it *is* uncomfortable.

The more popular solution is an anti-static mat. Available in various sizes, these mats come in two types: The first looks like an ordinary mat. It's composed of an anti-static material, and is the cheaper of the two. As you walk over it, the mat material absorbs any static charge. The other has embedded conductive meshing and a wire that exits the mat and is connected to a suitable source of ground, like the center screw of your wall outlet.

I've found this latter type of mat to be more effective, though you *must* connect the ground wire. In the installations I've done where static problems have persisted, either someone kicked free the ground wire or it was disconnected to move the mat and never reconnected.

Vanishing Voltage

Though you take all of the precautions I've discussed, you can't sit back and savor your well-protected Apple. You must still contend with those insidious disruptions of electrical energy—blackouts.

If your Apple system includes a hard-disk drive and the power fails, the cushion of air used to suspend the read/write head over the disk medium is stopped. When that happens, the head makes a one-point landing on the disk and destroys it. Both disk and all data stored there enter oblivion.

If you're working on some information in memory and the power fails, the data vanishes as well. Without power, you can't exit a software application correctly, and in some cases that may cost you several hours (or weeks) of work.

Most urban computer installations will never know the frenzy of a power failure. The closest they'll usually come is a brownout. But even these dips in the voltage level can fall below what a line conditioner can handle and your system can suffer damage.

The solution to either a no-power condition or an extended brownout is an Uninterruptible Power Supply (UPS). Again, there are two types providing the same results but functioning differently.

Both use a battery as the back-up power source and transform and invert the lower DC voltage into a usable AC output. How they provide the back-up is where they diverge.

One type is a standby system. Your Apple is fed wall power unless or until the UPS notices there isn't any. A switch is automatically thrown inside the unit and the battery becomes the power source.

Switching times are usually about a few thousandths of a second and, for most installations, won't be noticeable. However, unless specifically stated, this type of UPS may not provide surge, spike, and RFI/EMI protection.

The other type is an on-line system. It constantly inverts and transforms the wall power into suitable voltage to keep the battery charged. The battery voltage is then inverted and trans-

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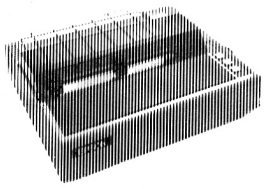

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formed into AC for the computer. The battery is the primary source of electrical power. No switching is needed. So you're guaranteed relatively clean and stable voltage. But the double conversion (wall AC to battery to AC) usually makes these units more expensive. A 1KVA (1000 watts) standby UPS might cost $1400; an equivalent on-line system, four times as much.

Neither one is meant to keep your Apple running indefinitely during a blackout. What they do is provide a bail-out period during which you can stop what you're doing and exit the system correctly. After that, shut everything off and wait for the power to return.

Operating times can vary from 20 minutes to an hour, depending on the UPS's power rating and the amount of current your system draws. An Apple with a hard disk will require a 250–300-watt UPS. Keeping your printer on a UPS is also a wise—and often overlooked—practice. If you're printing when the power fails, your computer can lock up. Although you've assured it of power, when the printer stops in the middle of its work, your Apple may not let it do anything. If your data is all in memory, the UPS on the Apple is useless. You'll have to reset the computer to recover. Of course, depending on the printer, that can boost the UPS's power requirement into the 500–700-watt range.

Recap

None of the equipment that I've discussed in these last two columns is necessarily a solution. Rather, they represent preventive steps you can take to treat the results of a problem. If your problem is severe, then, like putting a Band-Aid on a wound that won't heal, you're only fooling yourself. And before your Apple disappears in a puff of smoke, you should contact an expert—whether that's your local power company representative (yes, they can be helpful) or a licensed electrician (the adjective is the key word). You must deal with electrical problems at their cause. And since the voltage in your wall outlet can be lethal, let people who know what they're doing handle it.

IN THE NEWS

As you read this, Sorcim/IUS should be announcing a new product for the Apple //c. The IUS (as in EasyWriter) part of the name should be familiar to you, though the significance of the Sorcim name may be mysterious. They manufacture Supercalc electronic spreadsheet software for CP/M and MS/PC-DOS computers. Or at least that *was* the limit of the program's utility.

Its introduction on the Apple //c adds a new dimension both to the Apple and to businesses using Supercalc. The person on the go no longer needs to spend $2000–$3000 for a transportable computer that will also run the product.

A one-drive Apple //c with a monitor will do the job fine. When you bring work back to the office, download the spreadsheet data to the CP/M or MS/PC-DOS computer with any communications program that supports MODE (8-bit) data transfer. Of course, you can just swap disks if you're using a //c in the office as well.

The beta version here at Futility Base is one step before a final, release copy, so some of the features could still be modified. Some things shouldn't change. It requires the 80-column and extended-memory features of the //c, as well as the 65C02 processor—not currently available on the Apple //e, which uses the standard 6502 (non-CMOS) version of the chip.

The working size of the spreadsheet (as opposed to the number of physical columns and rows) is 64K. That's larger than most 8-bit, but not as large as many 16-bit machines, can handle. From the looks of the version I have, it's a Supercalc 2 variant. There are no graphing abilities, as are available in the later Supercalc 3 release. Utilities are provided to import VisiCalc and AppleWorks files into Supercalc.

And it runs under ProDOS with formatting capabilities and full subdirectory support. That means the single-drive Apple //c is more than adequate to handle the insert/reinsert process for the correct ProDOS data and program volumes.

The version I have is *not* copy-protected. If it remains that way through its final release (all of the other versions are unprotected) then it will be a boon to QC-10 and other hard disk owners. I'll keep my fingers crossed on that one.

Before the //e owners in the audience become depressed, there is good news. There's nothing, in theory anyway, that says you can't put a 65C02 in your computer. There are some other considerations, though—like screen handling—that must be accounted for, but stay tuned for a full review and better details.

/RAM

Brace the doors and clamp down the shutters: There's a storm of controversy arising over an all-too-easily uttered quote from my November column. The offending verbiage was to the effect that Apple has abandoned the /RAM virtual disk area in ProDOS 1.02. Well, rest easy. It's still there, but it's not exactly the same.

Let's take a moment to recap. When Apple upgraded its Apple II series to the //e, added ProDOS as its primary operating system and gave it 128K memory capacity, several things happened. You no longer needed a language card, since the main logic board had a full 64K of RAM. You had an additional 64K of memory available with an add-on card. And, because the 8-bit 6502 processor can only address a maximum of 64K at one time, if you had the extra memory you really could do nothing with it. At that time, Apple offered no programs that could take advantage of the added RAM.

There was no sense having the memory if you couldn't use it, so Apple added a virtual disk facility to ProDOS 1.00. If you booted the ProDOS disk and went through the Volume utilities, you could see that, no matter how many disk drives you really had, the utilities reported that you had one more—/RAM. Apple took the auxiliary RAM area and converted it into a high-speed electronic disk drive.

This was excellent. Even though the /RAM area was only 120 blocks large (512 bytes per block), it was a great place from which to run programs or handle data. Everything moved *fast*. The only hitch was that if you didn't create data files or programs in the /RAM area, you had to use the ProDOS File utilities to transfer them there. (The File utilities are a breeze to use, so that was no problem.)

At the same time, Apple was working on the //c. When it was finally re-

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leased, they shipped it with ProDOS 1.02, a version change over the current 1.01 ProDOS being used on the Apple //e.

Something very surprising happened. When you booted the new ProDOS utilities, there was no /RAM any more. It was gone. "What's that occupying my /RAM area?" some Apple owners now asked. "ProDOS Utilities!" was the reply.

Starting with version 1.02, ProDOS's utilities now loaded into the auxiliary RAM area, effectively blocking the creation of /RAM. After all, the virtual disk and the programs couldn't occupy the same space. But when you exited the utilities and entered ProDOS BASIC (a new name for a slightly enhanced Applesoft), /RAM was automatically created. In fact, if you type CAT /RAM you are shown an empty area with available space.

ProDOS Paradox

That's where the paradox comes in. One of the few ways to get programs and data into /RAM is with ProDOS's File utilities. But you can't run the utilities because they overwrite /RAM—a Catch-22. Add to that Apple's double hi-res graphics destroying a portion of /RAM, and you have the basis for my humble statement about Apple abandoning its /RAM offspring.

All isn't lost. There are several ways to get around this apparent problem and still have a functioning virtual disk. However, most of the solutions rely on the good nature and graces of programmers. In the long run, it's they who will decide if it lives or dies. While they're trying to work things out on their own, there are a few ways you can get over the RAM hump. I owe a deep debt of gratitude to Ken Kashmarek for working out the details.

Apple is supporting anyone who wants to develop a /RAM application as part of his or her software. In fact, they have issued ProDOS Technical Note #8 (for developers) that explains a new convention for maintaining /RAM with even greater than 64K space—if the hardware is installed in the system.

From Applesoft, you can LOAD or BLOAD files and then SAVE or BSAVE them into the /RAM area. You can also create a small Applesoft program to transfer Text files. All of this can be neatly wrapped up in an EXEC file for automatic execution when you first boot the disk.

The other side of the auxiliary RAM spectrum is the way most programs are now handling it. Rather than try to preserve /RAM, they use the additional memory for work space. If you caught the note at the beginning about the 6502's memory limitations, you might wonder how they do that.

Programs like AppleWorks or Magicalc swap memory segments from the auxiliary area in and out of the allotted 64K as they need them. They do all of that without your noticing it (hopefully) and without creating any other problems. Considering the limited space available in a 60K /RAM (about 44K if the double hi-res area is in use), that seems the sanest approach to take.

That doesn't mean you can't add your own version of a virtual disk. Several companies, like Synetix, Applied Engineering, and Legend Industries (which was one of the first suppliers of additional RAM technology for the Apple II Plus), sell and support extended memory cards. Legend's board will handle up to one megabyte of memory. They incorporate this memory into the Apple by using DOS or ProDOS modifications that change the way the operating system looks at the additional memory.

But this method isn't without its own problems. A reader recently wrote in about a problem he was having with a MicroSci larger capacity disk drive and a C language compiler. In order to recognize the extended capacity of the disk drive, MicroSci makes some alterations (called "hooks") to the operating system. Unfortunately, so did the C compiler. Even worse was the fact that they both used the same area in memory to make those changes. Every time the reader ran the compiler, it disconnected his drive.

That's another reason I find it difficult to accept /RAM as a practical offering. Even if you've augmented it with additional memory, there is literally no way to tell (if the documentation doesn't announce it) whether or not some other hook will dislocate it *and* dislocate all of the work you've kept in it at the same time.

At this point, there are just too many variables to make a virtual disk on the Apple a viable item. Considering that most of the software developers have opted to ignore it as well and make better use of the memory, I think that's a reasonable conclusion.

So, for all of you who wrote in saying that /RAM was still alive and living in both the Apple //e and //c, I say yes, it is. But then, they still sell 8-track stereo tape players and, if you look hard enough, quadraphonic stereo systems. The underlying question is one of usefulness.

I'll leave you an option. If you're using a virtual disk, you have an opportunity to change my mind. Tell me who makes the RAM card (if it's not an Apple product), which operating system (DOS, ProDOS, CP/M) you're using it with, what you have to do to initialize it, how you transfer information into and out of it, and why you do (or don't) like it. Likewise, if you've stretched your Apple's memory beyond the boundaries of 6502 competence, tell me about it.

Mashed Bits

Thanks again to Ken Kashmarek for also pointing out that Apple has been offering free updates to Apple //e owners with REV. A main logic boards. Your dealer will swap the new REV. B boards into your older REV. A machine at no charge.

Keep in mind that if you're an Apple //c owner with an early machine and you've been having difficulty with serial communication, there's also a free update in your future. Apparently there were problems with some of the early //c serial circuits on its main logic board. Contact your dealer for details. ■

Write to Bill O'Brien at P.O. Box 1010A, Fort Lee, NJ 07024. Or call him up on CompuServe. His user ID is 74216,1215.

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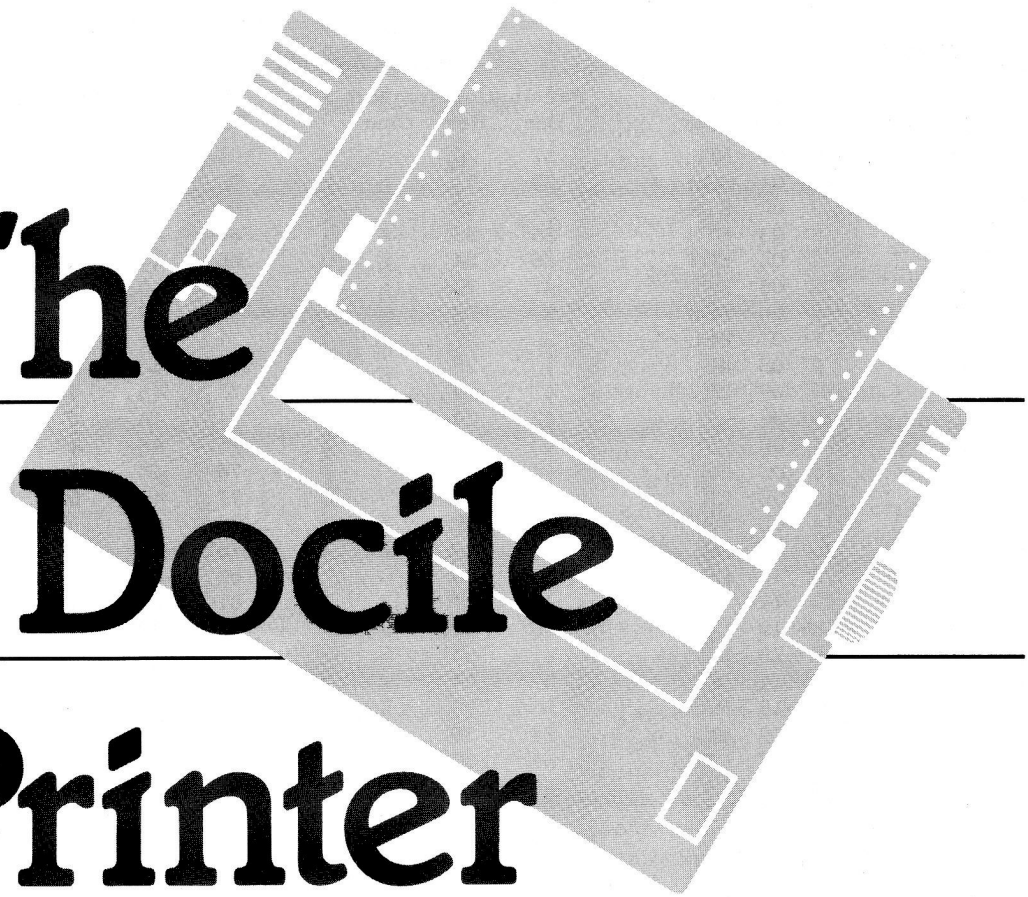

Discover your printer's secrets. Make it obey all your commands.

by James B. Munro

Today's full-feature printers are technical marvels. Yet their manuals' explanations of anything beyond the default condition range from mediocre to awful. It may take you months of diligent effort to understand a printer's special features when its manual assumes you have a broad technical background.

This article explains how printers work and how you can use features like print styles and margin controls. Then, a short, fundamental BASIC program illustrates the correct methodology and syntax for writing a printer-control program for your Apple.

Table 1. *Illustration of a few ASCII commands.*

		ASCII Commands		
Feature	**Decimal**	**Control**	**Character**	**Hexadecimal**
Compressed	15	O	SI	0F
Expanded on	27 87 1	-	ESC W 1	1B 57 01
Right margin	27 81 n	-	ESC Q n	1B 51 ??

HOW PRINTERS WORK

Learning *how* a printer works is the first step in gaining control of your printer. ROM (read-only memory) chips in the printer contain permanent programs that control the printer and establish the following default features: character width (pitch), print style (font), print quality, special features, paper feed (spacing), form format (margins), paper-movement controls, and graphics. (Graphics, however, are beyond the scope of this article.) These programs also provide ways to change the default features either by changing inaccessible DIP (dual in-line package) switches or through software control.

The printer's RAM (random access memory) stores specific commands the computer sends to the printer. Unlike the permanent information stored in ROM, a new instruction in RAM disappears when you turn off the power to the printer (not the computer) or when the printer receives another command that specifically cancels it. The original default features are reestablished every time you turn on the printer; commands configure the printer to use your selected combination of features (plus any default fea-

Table 2. *Table of ASCII codes.*

ASCII Character Set

Ctrl	Control Codes Dec	Hex	Char	Punctuation/Numbers Dec	Hex	Char	Capital Letters Dec	Hex	Char	Lowercase Letters Dec	Hex	Char
@	0	00	NUL	32	20	space	64	40	@	96	60	
A	1	01	SOH	33	21	!	65	41	A	97	61	a
B	2	02	STX	34	22	"	66	42	B	98	62	b
C	3	03	ETX	35	23	#	67	43	C	99	63	c
D	4	04	EOT	36	24	$	68	44	D	100	64	d
E	5	05	ENQ	37	25	%	69	45	E	101	65	e
F	6	06	ACK	38	26	&	70	46	F	102	66	f
G	7	07	BEL	39	27	'	71	47	G	103	67	g
H	8	08	BS	40	28	(	72	48	H	104	68	h
I	9	09	HT	41	29	)	73	49	I	105	69	i
J	10	0A	LF	42	2A	*	74	4A	J	106	6A	j
K	11	0B	VT	43	2B	+	75	4B	K	107	6B	k
L	12	0C	FF	44	2C	,	76	4C	L	108	6C	l
M	13	0D	CR	45	2D	-	77	4D	M	109	6D	m
N	14	0E	SO	46	2E	.	78	4E	N	110	6E	n
O	15	0F	SI	47	2F	/	79	4F	O	111	6F	o
P	16	10	DLE	48	30	0	80	50	P	112	70	p
Q	17	11	DC1	49	31	1	81	51	Q	113	71	q
R	18	12	DC2	50	32	2	82	52	R	114	72	r
S	19	13	DC3	51	33	3	83	53	S	115	73	s
T	20	14	DC4	52	34	4	84	54	T	116	74	t
U	21	15	NAK	53	35	5	85	55	U	117	75	u
V	22	16	SYN	54	36	6	86	56	V	118	76	v
W	23	17	ETB	55	37	7	87	57	W	119	77	w
X	24	18	CAN	56	38	8	88	58	X	120	78	x
Y	25	19	EM	57	39	9	89	59	Y	121	79	y
Z	26	1A	SUB	58	3A	:	90	5A	Z	122	7A	z
ESC	27	1B	ESC	59	3B	;	91	5B	[	123	7B	{
\	28	1C	FS	60	3C	<	92	5C	\	124	7C	|
shift-M	29	1D	GS	61	3D	=	93	5D	]	125	7D	}
shift-N	30	1E	RS	62	3E	>	94	5E	^	126	7E	~
shift-hyphen	31	1F	US	63	3F	?	95	5F	_	127	7F	DEL

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Table 3. *Printer feature ASCII command chart. Create your own chart using your printer's features.*

Character Pitch	Decimal	Character	Control	Hexadecimal
Letter quality on	27 120 1	ESC x 1	-	1B 58 01
Draft quality on	27 120 0	ESC x 0	-	1B 58 00
Pica 10 cpi	27 80	ESC P	-	1B 50
Elite 12 cpi*	27 77	ESC M	-	1B 4D
Emphasized on	27 69	ESC E	-	1B 45
Emphasized off	27 70	ESC F	-	1B 46
Proportional on*	27 112 1	ESC p 1	-	1B 70 01
Proportional off*	27 112 0	ESC p 0	-	1B 70 00
Compressed 16.9 on	15	SI	O	0F
Compressed 16.9 off	18	DC2	R	12
Expanded cpi/2 on	27 87 1	ESC W 1	-	1B 57 01
Expanded cpi/2 off	27 87 0	ESC W 0	-	1B 57 00
Expanded 1 line on	14	SO	N	0E
Expanded I line off	20	DC4	T	14
Print Style				
Italics on	27 52	ESC 4	-	1B 34
Italics off	27 53	ESC 5	-	1B 35
Superscript on	27 83 0	ESC S 0	-	1B 53 00
Subscript on	27 83 1	ESC S 1	-	1B 53 01
Both scripts off	27 84 27 72	ESC T ESC H	-	1B 54 1B 47
Print Quality				
Double strike on	27 71	ESC G	-	1B 47
Double strike off	27 72	ESC H	-	1B 48
Unidirectional on	27 85 1	ESC U 1	-	1B 55 01
Bidirectional on	27 85 0	ESC U 0	-	1B 55 00
Underlined on	27 45 1	ESC - 1	-	1B 2D 01
Underlined off	27 45 0	ESC - 0	-	1B 2D 00
Paper Feed				
Lines/inch 6	27 50	ESC 2	-	1B 32
Lines/inch 8	27 48	ESC 0	-	1B 30
Lines/inch 10 (7/72)	27 49	ESC 1	-	1B 31
Lines/inch n/72	27 65 n	ESC A n	-	1B 41 ??
Lines/inch n/216	27 51 n	ESC 3 n	-	1B 33 ??
Form Formats				
Form length—inches	27 67 0 n	ESC C 0 n	-	1B 43 00 ??
Form length—lines	27 67 n	ESC C n	-	1B 43 ??
Skip perforation on	27 78 n	ESC N n	-	1B 4E ??
Skip perforation off	27 79	ESC O	-	1B 4F
Right margin	27 81 n	ESC Q n	-	1B 51 ??
Left margin*	27 108 n	ESC l n	-	1B 6C ??
Vertical tabs*	27 66 n..n 0	ESC B n..n NUL	-	1B 42 ?? 00
Horizontal tabs	27 68 n..n 0	ESC D n..n NUL	-	1B 44 ?? 00
Paper Movement Controls				
Form feed	12	FF	L	0C
Line feed	10	LF	J	0A
Carriage return	13	CR	M	0D
Back space	8	BS	H	08
Horizontal tab	9	HT	I	09
Vertical tab	11	VT	K	0B
Ignore paper out	27 56	ESC 8	-	1B 38
Enable paper out	27 57	ESC 9	-	1B 39

*Available on models FX-80/100; letter/draft on LQ-1500 only

tures not specifically changed) only until the printer receives a new command sequence.

Printer Command Signals

To select printer features other than the default values, you must know their command signals and how to send them. The computer sending the signal through your software program, the interface card, and the printer's ROM must work harmoniously with these command signals for the printer to perform as expected.

Although the industry has no set standards for which command represents which feature, all printer manufacturers have agreed to use command signals based on ASCII (American Standard Code for Information Interchange) codes. The purpose of ASCII is to make sure that every computer, printer, interface, or modem uses the same electronic signal to represent the same character or key. Each device can then communicate with the others, and you can communicate with the machines through the keyboard.

At least five types of ASCII notation are commonly used to describe those signals: words, ASCII character symbols, decimal symbols, control-code symbols, and hexadecimal symbols. Hex symbols are the numbers zero through 255 written in base 16 notation, a form used in machine-language and assembly-language programs.

Most of the commands used to select printer features consist of one, two, or three ASCII signals sent sequentially in a string. Some printers use up to six parts per command. See **Table 1** for an illustration of some commands.

Table 2 presents an ASCII character set more clearly than tables found in many user's manuals. To conserve keyboard space, some keys perform more than one function. ASCII standards actually provide for 255 distinct signals, but Apple computers can only send values of zero through 127.

Control codes (CTRL) exist only for decimal values zero through 31. They are an especially useful form of printer command since you can send them directly from the keyboard by holding down the control key while also pressing another key. From within programs, they are sent using a decimal form, for example, PRINT CHR$(15) for compressed pitch.

Control codes don't usually print anything on the screen or on paper; instead, they activate switches in the printer to perform printer functions like setting margins or choosing fonts or pitches. Escape codes are handled differently. The escape key, CHR$(27), regards any key-press signal following it as a command.

Every key or combination of keys is assigned a command it will send or a character it will display or print. Each key press sends out a specific electronic signal. If the output is directed to the screen, the corresponding character symbol is displayed there. If the output is directed to the printer slot or port, the character is printed on the paper or the printer obeys the specified control or escape code.

By enclosing ASCII character symbols other than control codes within quotation marks—PRINT CHR$(27) "W1"—you can use them in a BASIC program. (ESC must be handled as

Program listing. *TYPE (Tame Your Printer Easily).*

```
2  REM  TYPE - TAME YOUR PRINTER EASILY (APPLESOFT BASIC VERSION)
5  REM   WRITTEN BY JAMES B. MUNRO BOX 205 YOUNGSTOWN NY 14174
10  TEXT : HOME : REM  CLEAR SCREEN (IBM= CLS)
20 D$ =  CHR$ (4): REM  CTRL D THE DOS COMMAND (IBM OMIT LINE)
30 S = 1: REM  S = SLOT # FOR PRINTER INTERFACE (IBM OMIT)
2000  REM  BUILD A SCREEN MENU OF PRINTER FEATURES
2005  HOME : REM  (IBM= CLS)
2009  REM  IBM EXAMPLE = LOC 5,1 : PRINT " 3": LOC 5,4 : PRINT "CO
    MPRESSED ON";
2010  VTAB 1: HTAB 8: PRINT "TAME YOUR PRINTER PROGRAM";
2035  VTAB 5: HTAB 1: INVERSE : PRINT " 3";: NORMAL : HTAB 4: PRINT
    "COMPRESSED ON";
2040  VTAB 6: HTAB 1: INVERSE : PRINT " 4";: NORMAL : HTAB 4: PRINT
    "EXPANDED ON";
2045  VTAB 6: HTAB 20: INVERSE : PRINT "43";: NORMAL : HTAB 23: PRINT
    "RIGHT MARGIN";
2325  VTAB 21: HTAB 1: INVERSE : PRINT "99";: NORMAL : HTAB 4: PRINT
    "PRINT TEST";
2330  VTAB 21: HTAB 17: INVERSE : PRINT "50";: NORMAL : HTAB 20: PRINT
    "EXIT TO BASIC";
2375  VTAB 22: HTAB 1: INVERSE : INPUT "MAKE SELECTION..TYPE  #  <
    RETURN>";B: NORMAL
2400  REM  PRINTER COMMAND DRIVER SECTION
2405  PRINT D$;"PR#";S: REM  DIRECT OUTPUT TO THE PRINTER (IBM OMI
    T)
2415  REM  IBM USES LPRINT AS IN IF B = 3 THEN LPRINT CHR$(15)
2420  IF B = 3 THEN  PRINT  CHR$ (15): REM  COMPRESSED COMMAND IN
    DECIMAL NOTATION
2425  IF B = 4 THEN  PRINT  CHR$ (27) CHR$ (87) CHR$ (1): REM  EXP
    ANDED COMMAND
2545  IF B = 43 THEN 2700: REM  GOTO RIGHT MARGIN ROUTINE
2560  IF B = 50 THEN  PRINT D$;"PR#0": HOME : END : REM  DIRECT OU
    TPUT TO SCREEN END
2565  IF B = 99 THEN 40000: REM  GOTO LINE 40000 FOR PRINT TEST
2570  PRINT D$;"PR#0": REM  REDIRECT OUTPUT TO THE SCREEN :REM IBM
     OMIT LINE
2575  GOTO 2000: REM  RETURN FOR MORE FEATURE SELECTIONS
2700  REM  RIGHT MARGIN SIDE ROUTINE
2705  GOSUB 4000: VTAB 16: HTAB 20: PRINT "SET RIGHT MARGIN";
2710  VTAB 17: HTAB 20: PRINT "AT COLUMN NUMBER ?";
2715  VTAB 18: HTAB 20: PRINT "PICA=2-80 ELITE=3-96";
2720  VTAB 19: HTAB 20: PRINT "COMPRESS=4-137";
2725  VTAB 20: HTAB 35: INPUT CC
2730  PRINT D$;"PR#";S: REM  DIRECT OUTPUT TO PRINTER (IBM OMIT)
2735  PRINT  CHR$ (27) CHR$ (81) CHR$ (CC): REM  RIGHT MARGIN COMM
    AND (IBM LPRINT)
2740  GOTO 2570: REM  RETURN TO MAIN PROGRAM
4000  REM  SUB ROUTINE FOR REPEATED USE IN SIDE ROUTINES
4005  PRINT D$;"PR#0": REM  DIRECT OUTPUT TO THE SCREEN (IBM OMIT)
4010  VTAB 12: HTAB 24: INVERSE : PRINT "MAKE CHOICE";
4015  VTAB 20: HTAB 23: PRINT "TYPE  #  -->";: NORMAL : RETURN
40000  REM  PRINT TEST SECTION
40010  PRINT D$;"PR#";S: REM  DIRECT OUTPUT TO PRINTER (IBM OMIT)
40015  REM  IBM SUBSTITUTE LPRINT for PRINT
40020  PRINT "IF BUILDERS BUILT BUILDINGS"
40025  PRINT "THE WAY PROGRAMMERS WROTE PROGRAMS
40030  PRINT "THEN THE FIRST WOODPECKER"
40035  PRINT "WOULD DESTROY CIVILIZATION"
40040  PRINT D$;"PR#0": REM  DIRECT OUTPUT TO SCREEN (IBM OMIT)
40050  GOTO 2000: REM  RETURN FOR MORE FEATURE SELECTIONSSAVE TYPE
     PROGRAM
```

CHR$(27).) Decimal symbols are used in BASIC programs by writing them as CHR$(27)CHR$(87)CHR$(1).

If your computer uses standard BASIC commands, type PRINT CHR$(65) and then press the return key. You should see the letter A on the screen. Replace 65 with any decimal number from 33 to 127 and see what happens. Now type PRINT ASC ("A"). The screen should display 65. Get the idea?

Before you can begin to make full use of your printer's features, you have to know its commands. I suggest that you rule a large sheet of paper into five columns and list the printer features down the left column, grouping them according to categories. (See **Table 3** for an example using Epson printers.) Note that many features have both ON and OFF commands. Label the remaining columns decimal, control, character, and hexadecimal.

Now, look up each printer feature in the user's manual and write the commands in the correct column. Some manuals give all four notations. If yours doesn't, use **Table 2** to retrieve the missing information.

Caution: Sometimes notations in descriptions such as ESC 87 1 mix decimal and ASCII values. ESC is decimal 27, 87 is a decimal number, and 1 could be decimal 1 or ASCII 1 (decimal 49). You can always determine the intent by double checking the decimal or hexadecimal version. Watch for important punctuation marks in printer codes (quotation marks, for example).

Some sophisticated interface cards also use printer-control commands. When conflicts arise between the printer and the interface values, the interface always wins. So for future reference you may want to add interface commands at the bottom of your printer command chart.

Word Processors and Spreadsheets

Most spreadsheet programs let you send printer commands as part of the Print option, and good word processors let you embed print commands within the text you're writing. Most word processors even let you create a glossary or disk file of these print commands for recall later.

The correct ASCII notation to use with these programs may be obscure or poorly explained in the manuals, but setting up a command chart and then experimenting with it should help. The following examples show how to embed printer commands in some popular programs:

- VisiCalc lets you select features through its Setup string (/PP"). For example, to print your spreadsheet in expanded mode type in ^H followed by the hexadecimal notation for the command being sent—^H1B5701 for ESC W 1, as **Table 3** indicates. You can send only one command at a time, but you can send commands as often as you like. Entering the lower-right coordinate finishes the sequence.
- Peachtext 5000 lets you embed DEC commands by typing BACKSLASH OUT27,87,1 for ESC W 1. (Peachtext 5000 requires CP/M to run on Apples.)
- AppleWriter II embeds ESC W 1 with: control-V, escape key twice, W, control-A, and control-V. Unfamiliar symbols appear on your screen, but the printer accepts the input.

APPLYING PRINTER CONCEPTS

My Applesoft BASIC **Program listing**, TYPE (Tame Your Printer Easily), illustrates how to write a program that quickly configures your printer with chosen features you select. The BASICs used with the IBM/XT and the Commodore 64 use the same principles; program remarks indicate any differences for the IBM version.

Substituting your printer's commands, type in the program and save it. Then, turn on the printer and run the program to display the available printer selection features. Typing 99 and pressing the return key makes your printer print its default features. The sequence 3 99 4 99 50, pressing the return key after each number, prints samples illustrating default, compressed, and expanded compressed.

Table 4. Line descriptions for TYPE program.

Lines	Description
10	Sets text mode and clears screen.
20	Assigns D$ the value of CHR$(4)—control-D, the Apple DOS command.
30	Assigns the variable S the number of the slot containing printer interface card (usually slot 1).
2000–2330	Create a menu of features (using VTAB and HTAB commands for neatness' sake).
2375	Prompts you to type in the number for the feature you want, then assigns it to variable B.
2405	Directs output from Apple to printer by interface card in slot S.
2420–2565	Send printer commands after output has been directed to proper slot number.
2570	Redirects output to screen (counterpart to line 2405).
2575	Returns to screen menu for additional printer feature selections.
40000–40050	Print out a sample then return to screen menu.

Turn the printer's power switch off, then on, and run the program again, this time selecting expanded mode. After making another print test, you get a fourth print sample—expanded default character width.

Type 50 and press the return key to exit the program. You can now boot any program you want, but don't turn your printer's power off. If you do, the features you selected will disappear. Also, if the printer is not selected, or if the interface card is not in slot S, then the program will hang up. (In commercial programs, error-trapping subroutines are built in to prevent this.)

Program Notes

Starting at line 2050 in the **Listing** and using the printer feature command chart you created (refer to my sample in **Table 3**), you can easily design a screen listing all the features you want to use. (For program line descriptions, see **Table 4**.)

Note that line 2405 illustrates one of the more foolproof ways of directing output from your Apple to the printer: via the interface card located in slot S. If your printer interface is always in slot 1, you can type PR#1 or omit the DOS command D$ and just use 2405 PR#1. However, these two alternatives eventually present problems (for example, when using a Get command).

Lines 2420 and 2425 illustrate the correct syntax for sending printer commands after output has been directed to the proper slot number. PRINT CHR$(27)"ESC W 1" using ASCII form of notation is equally correct syntax for line 2425. (It isn't necessary to use semicolons between commands as some user's manuals suggest.)

Look at your printer feature command chart for the correct code to activate your printer's features. Using decimal notation, substitute these values for the ones shown in the **Listing**. Continue adding lines of code starting at line 2430. The value of B for each code is the same number assigned to it in the screen menu. Line 2575 simply sends the program back to the screen menu so you can make additional printer feature selections.

To avoid multiple keystrokes, you can put a series of frequently used feature commands into a string. For example, if your setup is compressed, unidirection, doublestrike on, skip perforations six lines, then define the screen menu as SPREADSHEET ## and establish a single printer driver command that contains each of the commands in sequence, with no spaces between them.

Lines 40000–40040 print out a sample on your printer and then return you to the screen menu. The print test is reached when you type 99 as your selection in line 2375.

Many printer features require that you define exactly what you want. Lines 2700–2740 illustrate how to handle this using the right margin as an example. I suggest you adapt this format and syntax for this type of feature starting at line numbers 2800, 2900, and so on, until you have covered each feature you want to use. Lines 4000–4015 can be used as a subroutine.

Summary

This configuration program can save you time and a lot of frustration when you want an entire document printed with the same set of feature selections. You can incorporate these principles into any BASIC program to obtain the print results you want. ■

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Holding Your Own

In six simple steps, build this convenient copyholder and type in listings with ease.

By *John Uzzolino*

Building your own copyholder to use when writing letters or keying in other documents on your word processor can represent your first step toward an ergonomically designed work station. You'll avoid eye- and neck-strain and save substantially over the cost of an electric copyholder ($175).

My 17-year-old son, Frank, designed this portable stand from mat board left over from a school project.

You probably have most of the following materials in your home. Chances are the mat board is the minimum size sold in your local art store, so use the remainder to make another copyholder. Extra copyholders make great gifts for friends or relatives who own microcomputers.

Here is what you need: a 32-by-40-by-1/16-inch mat board, a roll of clear tape, a hobby knife or sharp cutting tool, a ruler, and a pencil.

The copyholder's design and construction are simple; in just six easy steps, you'll build your own in no time.

1) Draw a 9-inch-by-20-inch rectangle on the mat board. Cut out this rectangle with a hobby knife or sharp cutting tool.

2) Measure 7½ inches along the rectangle's 9-inch edge. Score the face side with your knife. Measure 1 inch from the opposite 9-inch edge and score the back side.

3) Bend the 7½-inch side down and the 1-inch edge up.

4) From the mat board, cut out a 1-inch-by-10½-inch strip. From the 1-inch side, measure 3/8 inch and notch out two 1/8-by-1/4-inch slots.

5) On the 7½-inch-by-9-inch rectangle, opposite the bent edge, cut out a slot (see the **Figure**) 3/4 inch in from the 7½-inch side.

6) Slip the shape in step 5 into the slot on the 7½-inch side. Tape the other end at the bottom near the 1-inch bend.

And there you have it, your own copyholder as it appears in the **Photo**. No need to have a cluttered desk again. You'll wonder why you didn't think of it sooner. ■

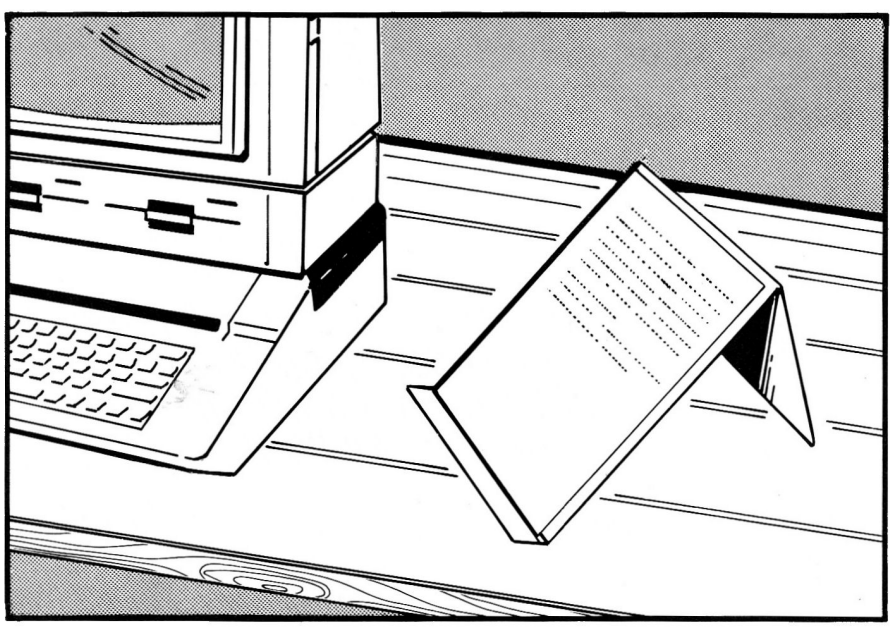
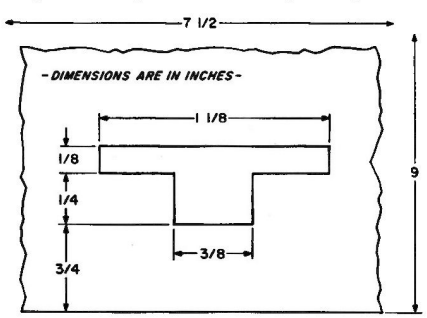


Photo. *The finished copyholder.*

Figure. *Shape dimensions for step 5.*



John and Frank Uzzolino live at 2237 New York Avenue, Westfield, NJ 07090.

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Don't get steamed over the office paper chase. Let business boilerplates do the work for you.

by Gregory R. Glau

From a business perspective, word processors save time, improve the look of letters and contracts (say goodbye to typos), and perhaps best of all, eliminate the usual drudgery of the paper shuffle.

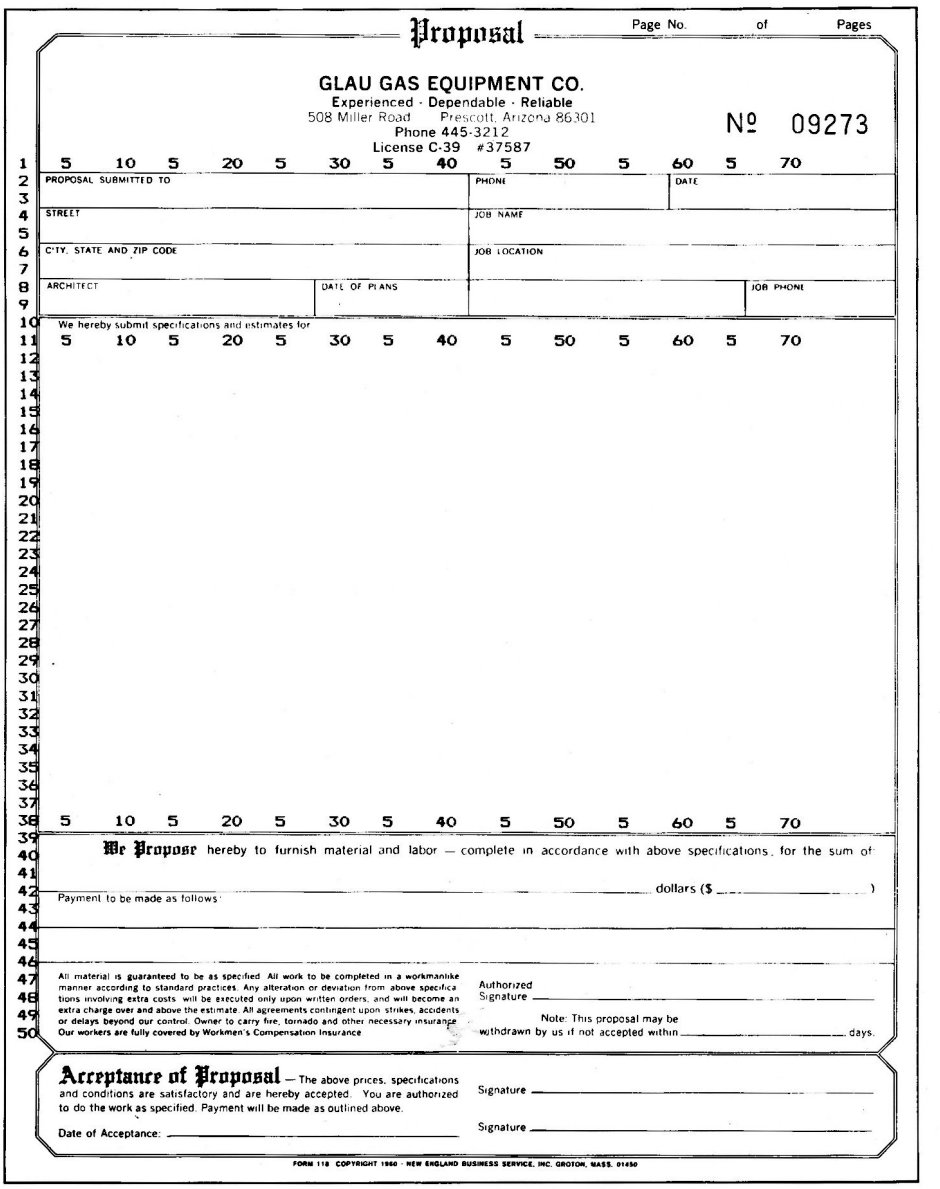
Part of the secret is that you can keep templates of business forms on disk: blank letterhead, bid forms, specification sheets, contracts, sales letters.

When we started, I liked the idea of boilerplate paragraphs—just save the paragraphs and insert them into documents as required. While that's fine for long documents, for single-page formats it's more effective (and much easier) to save the entire document and then change the names and prices that correspond to a specific job.

If you decide to use a template, determine where you want printed items (like your customer's name, address, and job cost) to appear. Put a copy of the form into your printer and use your word processor to print row and column designations directly on the form. This makes it easy to see where everything should go.

I can align the top of any of our many forms with a specific spot on the printer. For each form, we printed out where the rows and columns appeared. (See the **Figure** for an exam-

Figure. *Business proposal with printed row and column designations.*



Proposal Page No. of Pages

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№ 09273

1 5 10 5 20 5 30 5 40 5 50 5 60 5 70
2 PROPOSAL SUBMITTED TO | PHONE | DATE
3
4 STREET | JOB NAME
5
6 CITY, STATE AND ZIP CODE | JOB LOCATION
7
8 ARCHITECT | DATE OF PLANS | JOB PHONE
9
10 We hereby submit specifications and estimates for
11 5 10 5 20 5 30 5 40 5 50 5 60 5 70
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24
25
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38 5 10 5 20 5 30 5 40 5 50 5 60 5 70
39
40 We Propose hereby to furnish material and labor — complete in accordance with above specifications, for the sum of:
41
42 _____ dollars ($ _____)
43 Payment to be made as follows:
44
45
46
47 All material is guaranteed to be as specified. All work to be completed in a workmanlike manner according to standard practices. Any alteration or deviation from above specifications involving extra costs will be executed only upon written orders, and will become an extra charge over and above the estimate. All agreements contingent upon strikes, accidents or delays beyond our control. Owner to carry fire, tornado and other necessary insurance. Our workers are fully covered by Workmen's Compensation Insurance.
48 Authorized Signature _____
49 Note: This proposal may be withdrawn by us if not accepted within _____ days.
50

Acceptance of Proposal — The above prices, specifications and conditions are satisfactory and are hereby accepted. You are authorized to do the work as specified. Payment will be made as outlined above.

Signature _____

Date of Acceptance: _____

Signature _____

FORM 118 COPYRIGHT 1980 - NEW ENGLAND BUSINESS SERVICE, INC. GROTON, MASS. 01450

ple of our proposal form, imprinted with row and column designations.)

It's easy to determine where the customer's name should be printed, where the main text should start, and so on. On the form in the **Figure**, for example, the customer's name should start at row 3, column 15 and his phone number at row 3, column 45.

Our standardized proposal details what work we'll include in the bid. We sell furnaces, so we have one boilerplate bid form that says we'll install X furnace at Y size along with ductwork, registers, grills, and thermostat. Ninety percent of the bid remains constant from job to job; the only variables are the prospect's name, address, phone, date, price, and perhaps the brand name and furnace size.

Once you have a template for each business operation stored on disk, it's fast and easy to put the form on screen and change information to reflect the specific job you're working on. Then just print out the "customized" form for a prospective client.■

For more information on business templates, see "Account For Yourself," December 1984, p. 84. —eds.

Write to Gregory R. Glau at P.O. Box 1627, 508 Miller Road, Prescott, AZ 86302.

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inCider's inSidious inSolubles

In the infamous world of Alice in CompuLot, an inSoluble is a simple BASIC program that seems to be correct, though submerged within are oddities that even Alice has never encountered. If you're new to our column just type in the listing, follow the simple rules, type RUN, and hope for the best. If your typing was accurate you won't see SYNTAX ERR, but what you will see isn't what you'd expect. If you'd like to submit an inSoluble of your own creation, you'll find *inCider* pays $20 when your puzzle is published.

Rules for inSidious inSolubles

1. An inSoluble is a BASIC Applesoft program. Any POKEd machine-language subroutines and CALLs to that subroutine are correct.
2. The program must accomplish something. In other words, when it's run it should produce some kind of a result.
3. The program should not generate an error message. If it does, check your typing.
4. A short explanation describes what the program is supposed to do and may contain clues to the problem.
5. The program can use common peripherals such as disk, printer, or modem. DOS 3.3 or ProDOS commands are acceptable.
6. More than one error can appear in the program.

When submitting your puzzles, remember to provide the solution, and please include an SASE if you want a reply to your entry before it appears within these pages. The shorter the inSoluble, the better—but we like programs that do something useful.

An Applesoft Bug

Now that you've carefully read the rules, you'll find that the first problem for Alice, An Applesoft Bug, disregards the third rule. "But," you say, "the error is trapped by the ONERR command of line 100." Yes, it's supposed to work that way but, alas, things are seldom what they seem. This problem from James Kudebeh of Kirksville, Missouri, uses the VERIFY command to check for files on your disk. It's straightforward, simple, and should pose no problems. Logically and syntactically nothing is wrong with this program, however.... One hint: Get out the books.

Listing 1. *An Applesoft Bug.*

```
10  REM AN APPLESOFT BUG
20  TEXT : HOME :D$ =  CHR$ (4)
30  INPUT "ENTER FILE NAME ";F$
40  IF F$ = "END" THEN  END
50  GOSUB 100
60  PRINT : GOTO 30
100  ONERR  GOTO 140
110  PRINT D$;"VERIFY";F$
120  PRINT F$;" IS PRESENT ON THI
     S DISK"
130  GOTO 150
140  PRINT F$;" IS NOT PRESENT ON
      THIS DISK"
150  POKE 216,0
160  RETURN
```

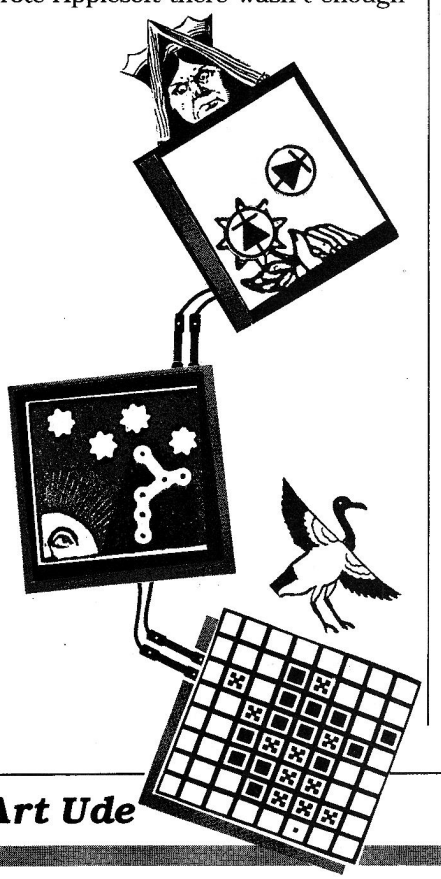
Print Using

The way I heard it, when whiz kids wrote Applesoft there wasn't enough memory available on the chips to add all the graphics commands and still retain all the usual BASIC statements. Something had to go. Least missed, so the designers thought, would be IF...THEN...ELSE and PRINT USING. Thus, a multitude of fixes and short routines substitute for these commands, the PRINT USING routines being the most numerous.

Alice's second inSoluble combines ideas from Michael Phillips of Clearwater, Florida, and Don Smith of Kelowna, British Columbia. The program Print Using right justifies numbers and fills in the decimal portion of the column of figures with zeros for dollar formatting. The format is set to accept ten digits, including the decimal point and the cents. This is controlled by the variable L in line 20 and can be changed to meet your needs. I think you'll like this routine, but first try it with various figures (for example, 23.45, 2.45, .45, and 1.1). ■

Send your inSolubles to Art Ude c/o inCider, *80 Pine Street, Peterborough, NH 03458.*

Solutions on page 97.



Listing 2. *Print Using.*

```
10  REM  PRINT USING
20  HOME : PRINT  TAB( 12)"X TO E
    XIT": PRINT :L = 10: ONERR  GOTO
    130
30  INPUT "AMOUNT: ";AMT:ZE$ = ""
    : POKE 37, PEEK (37) - 1: CALL
     - 958
40 AMT = AMT * 100
50 DM = AMT -  INT (AMT)
60  IF DM =  > .5 THEN AMT = AMT +
    1
70  IF  LEN ( STR$ (AMT)) > L THEN
     FOR I = 1 TO 3: PRINT  CHR$
    (7);: NEXT : GOTO 30
80 AMT =  INT (AMT) / 100
90 DM = AMT -  INT (AMT): IF DM =
    0 THEN ZE$ = ".00": GOTO 110

100 DM = DM * 10:DM = DM -  INT (
    DM): IF DM = 0 THEN ZE$ = "0
    "
110  FOR I = 0 TO L -  LEN ( STR$
    (AMT)) -  LEN (ZE$): PRINT "
     ";: NEXT
120  PRINT AMT;ZE$: GOTO 30
130  END
```

by Art Ude

Circle 17 on Reader Service card.

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Strings 'n' Things

Computer graphics have been among the major attractions of microcomputers since their first appearance. They enhance most games and many business and educational programs. Yet all too often enhanced display techniques for text are completely overlooked.

BASIC provides numerous string functions you can use to manipulate text in intriguing ways. This month I will describe these string functions and present some short algorithms and sample programs for making your text screens "come alive."

Dividing Strings

Applesoft BASIC provides three functions that divide a string into blocks of characters: LEFT$( ), RIGHT$( ), and MID$( ). As with most BASIC functions, the parentheses enclose one or more variables or constants, called arguments, that identify the string the function is to work on.

LEFT$( ) copies a specified number of characters from the left end of the object string. For example, the following program will copy the first eight characters from the beginning of the object string, A$, assign those characters to B$, and display GEORGE W on the screen:

```
10 A$ = "GEORGE WASHINGTON
   CARVER"
20 B$ = LEFT$( A$, 8)
30 PRINT B$
```

Line 20 demonstrates the syntax for the LEFT$( ) function. Note the two arguments, separated by a comma. The first argument, which must be a string variable or constant, identifies the string to be operated on. The second argument—a number, numeric variable, or expression that evaluates to a numeric result—tells just how many characters to copy out, starting at the left. You could read line 20 as, "Copy the leftmost eight characters from A$ and assign them to B$."

The RIGHT$( ) function works the same way, but at the opposite end of the object string. It also requires two

Listing 1. *String Search Subroutine. Lines 5500–5530 in this program illustrate the use of the string search subroutine. The subroutine requires that the object string be assigned to ZZ$ and the substring to Z$. The subroutine returns J, the character count from the start of the object string to the first character of the substring.*

```
1  REM  A DEMONSTRATION OF THE
2  REM  SUBSTRING SEARCH ROUTINE
10  HOME :CT = 0:J = 0
20  INPUT "ENTER ANY STRING OF CHARACTERS.....";A
    $
30  PRINT : PRINT "NOW ENTER THE SUBSTRING THAT YOU WI
    SH"
40  INPUT "TO SEARCH FOR...";B$
50 ZZ$ = A$:Z$ = B$
60  GOSUB 5500
70  IF Z = 0 AND CT = 0 THEN  PRINT B$" IS NOT IN ": PRINT
    A$".": GOTO 190
80  IF Z = 0 THEN 190
90 CT = CT + 1:J = J + Z
100  PRINT "OCCURRENCE # "CT" OF "B$" IN"
110  PRINT "    "A$
120  PRINT "    BEGINS AT CHARACTER "J".": PRINT
130  IF ( LEN (ZZ$) - Z) <  LEN (Z$) THEN 190
140  INPUT "PRESS <RETURN> TO CONTINUE...";X$: PRINT
150 ZZ$ =  RIGHT$ (ZZ$, LEN (ZZ$) - Z)
160  GOTO 60
190  END
5491  REM  **********************
5492  REM   SUBSTRING SEARCH
5493  REM      ROUTINE; REQUIRES
5494  REM      OBJECT STRING ZZ$
5495  REM       SEARCH STRING Z$
5496  REM       USES I INTERNALLY
5497  REM       RETURNS Z, THE
5498  REM       LOCATION OF Z$
5499  REM       IN ZZ$.
5500 Z = 0: IF  LEN (Z$) = 0 THEN Z$ = " "
5510  FOR I = 1 TO  LEN (ZZ$)
5520  IF  MID$ (ZZ$,I, LEN (Z$)) = Z$ THEN Z = I:I =  LEN
    (ZZ$)
5530  NEXT I: RETURN
```

by Dan Bishop

arguments, the string being operated on and the number of characters to be copied. The character count begins at the far right. Add the following lines to the three you already have and rerun the program:

```
40 C$ = RIGHT$( A$, 8)
50 PRINT C$
60 PRINT A$
```

Line 50 will display N CARVER. Note that blank spaces within the string are included in the character count. Line 40 could be read, "Copy the eight rightmost characters from A$ and assign them to C$." I included line 60 to demonstrate that the value of A$ is still intact, even after the two copying operations.

By now you have probably guessed that the MID$( ) function copies characters from the middle of a string. MID$( ) requires three arguments, a string and two numeric expressions, all separated by commas. The first number tells the computer where to begin copying characters (counting from the left), and the second number specifies the number of characters to be copied. So if you add:

```
70 D$ = MID$( A$, 8, 4)
80 PRINT D$
```

to the previous program lines, line 80 will display WASH.

Searching for Substrings

MID$( ) enables you to search through a given string for a specific character or group of characters, or substring. Some BASICs have a special function, INSTR( ), for this, but Applesoft does not. You can, however, duplicate INSTR( ) by using MID$( ) within a loop if you know the lengths of the object string and search string.

This is possible because Applesoft does include the BASIC LEN( ) function that determines the length of a string. Only one argument is needed with LEN( ), the string whose length you wish to determine. Add lines 90 and 100 to your developing program:

```
90 L = LEN(A$)
100 PRINT L
```

When you run the program now, the number 24, the total number of characters (including spaces) in A$, will appear on the screen.

Listing 1 demonstrates the algorithm needed to duplicate the INSTR( ) function of other BASICs. Lines 5500 to 5530 search for the first occurrence of the given character or substring in the object string and return a number, Z, that corresponds to the character count from the beginning of the object string to the first character of the substring. If a matching character is not found, Z returns a value of zero.

To use the string search subroutine, you must assign the object string to ZZ$ and the substring to Z$. Then type GOSUB 5500. Line 5500 tests to see if Z$ has a value. If not, it is automatically assigned a single blank space, and the subroutine returns the location of the first blank space in the object string.

Listing 1 uses the subroutine again after each find in order to search for further occurrences of the substring. To make this possible, each time through, the RIGHT$( ) function in line 120 assigns the unsearched portion of the object string to ZZ$. All the while, CT maintains a count of the number of times the substring is found in the object string.

Listing 2 is a simple subroutine that uses these functions to reverse

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the order of words in a string. The string, N$, must contain two words separated by a blank space (such as a first and last name). The subroutine loops through the string from right to left to locate the blank space before the last word. It then assigns the two separate words to AN$ and BN$ and recombines them into NM$. They end up in reverse order, separated by a comma. Because most applications that involve sorting records by name work by last name, transposing N$ into NM$ can be a useful operation.

Listing 3 takes a string, assigned to ZZ$, and displays it on the screen as a horizontally scrolling message. The message appears at the right edge of the screen and scrolls across on a single line. The effect is similar to a news marquee on a city building.

Positioning Text

Applesoft BASIC gives you complete control over where a text display appears on the screen. As you know, HOME places the cursor in the upper-left corner of the screen. A PRINT command displays text and produces an automatic line feed. If the printed text is already on the bottom line of the screen, the whole display scrolls up, with the top line disappearing from view.

Sometimes you may not want an automatic line feed. In those cases, if you make the last character in the PRINT statement a semicolon, Applesoft will not issue a line feed and the next PRINT statement will begin printing on the same line.

You can use the HTAB and VTAB functions to pinpoint a position on the screen for printing to begin. Imagine the screen as a grid of 40 columns and 24 rows. To center the phrase HI THERE by beginning it at row 12, column 16, you could use the following command:

```
HTAB 16: VTAB 12: PRINT "HI THERE";
```

Not only will the phrase appear in the middle, but any other text already in row 12 will remain unchanged.

You can use the VTAB function as a one-line subroutine to erase a row of text on the screen. Set V equal to the line number (from 1 to 24) you want erased and issue a GOSUB command to a line containing the following:

```
VTAB V:HTAB 1:PRINT SPC(40);:
  RETURN
```

"Windowing capability has been designed into your Apple."

A variation on this subroutine appears in **Listing 3**, which will blank out any block on the screen, leaving text surrounding the block untouched. Your program must assign values to four variables before using the subroutine. RS and RN are the starting row and number of rows for the block to be cleared, while CS and CN are the starting column and number of columns to be cleared.

The subroutine checks to be sure that the HTAB and VTAB values assigned by the subroutine are allowed values. VTAB may range from 1 to 24, HTAB from 0 to 255 (with 0 interpreted as 266). However, for meaningful application only values between 1 and 40 are acceptable.

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Listing 2. *Name Reversal. This program accepts a "first-name last-name" string combination as N$ and produces NM$ for the reverse, "last-name, first-name", format. It also produces AN$ and BN$, containing only the first name and the last name from N$, respectively.*

```
1  REM  A USEFUL APPLICATION
2  REM  OF STRING FUNCTIONS
3  REM  TO SEPARATE FIRST &
4  REM  LAST NAME INPUT N$
5  REM  INTO FIRST NAME AN$
6  REM  LAST NAME BN$,
7  REM  AND REVERSE ORDER NM$
10  HOME
20  PRINT "PLEASE ENTER YOUR FIRST AND LAST NAME:"
30  INPUT "AND PRESS <RETURN>. ";N$
40  GOSUB 2000
50  PRINT
60  PRINT "I'M HAPPY TO MEET YOU, "AN$"!"
70  PRINT "I KNEW A "BN$" IN CHICAGO ONCE."
80  PRINT
90  PRINT "YOUR NAME IS BEING FILED UNDER "
100  PRINT "     "NM$" ."
110  END
2000 J = 0: FOR I =  LEN (N$) TO 1 STEP  - 1
2010  IF  MID$ (N$,I,1) = " " THEN J =  LEN (N$) - I +
     1:I = 1
2020  NEXT I
2030  IF J = 0 THEN AN$ = N$:BN$ = N$:NM$ = N$: GOTO 2
     070
2040 AN$ =  LEFT$ (N$, LEN (N$) - J)
2050 BN$ =  RIGHT$ (N$,J - 1)
2060 NM$ = BN$ + ", " + AN$
2070  RETURN
```

Listing 3. *Horizontal Scrolling Line Display. The subroutine in this program accepts any message line as ZZ$ and displays the line in a horizontal scrolling format, running right to left across the screen.*

```
1  REM  HORIZONTAL SCROLLING
2  REM  LINE DISPLAY
10  HOME
20  PRINT "ENTER YOUR MESSAGE LINE..."
30  INPUT A$
40  PRINT
50  PRINT "WHAT DISPLAY LINE DO YOU WISH TO USE?"
60  INPUT "(1 - 24)...";Z
70  HOME :ZZ$ = A$: GOSUB 5600
80  END
5591  REM  SCROLLING MESSAGE
5592  REM  SUBROUTINE.  DISPLAYS
5593  REM  ZZ$ ON LINE Z
5594  REM  AS A MESSAGE STRIP
5595  REM  SCROLLING FROM RIGHT
5596  REM  TO LEFT AND OFF.
5600 H = 1: VTAB Z
5610 ZZ$ = ZZ$ + "
          ": REM  40 BLANKS ADDED
5620  FOR J = 1 TO  LEN (ZZ$)
5630  HTAB 40 - H
5640  PRINT  MID$ (ZZ$,J - H + 1,H);
5650 H = H + 1: IF H > 39 THEN H = 39
5660  HTAB 1
5670  FOR I = 1 TO 100: NEXT I
5680  NEXT J
5690  RETURN
```

There are times when you will need to move the cursor (and thus the next print position) a certain number of columns or rows from its present position. If you know, as you are writing the program, what the point of origin will be, just specify an HTAB and VTAB to the desired location. If the cursor's position is not known beforehand, you can incorporate PEEK commands into your program to determine its position. The command CR = PEEK(37) + 1 will determine the row number, and CC = PEEK(36) + 1 will determine the column number, because RAM locations 36 and 37 contain the cursor's row and column locations, respectively. (The 1 is added since the values in memory reference a 0–39 column and 0–23 row screen.) Now, to move down three rows and left 10 columns, you could use the following line in your program:

```
VTAB CR + 3: HTAB CC - 10
```

Be sure that the numeric expressions will evaluate to allowed values for the VTAB and HTAB functions.

Text Windows

There is currently much enthusiasm about "windows," the superimposition of portions of screens on each other. Some degree of windowing capability, accessible through Applesoft, has been designed into your Apple, though it isn't often referred to or used.

The window is the "active" area of the display. When you first turn your computer on, the window is identical with the full screen, having a left margin of 0, display width of 40, top margin of 0, and bottom margin of 23. These values are stored in the computer's memory at locations 32, 33, 34, and 35, respectively. These values can be changed by POKEing acceptable alternatives into the memory locations.

Use care to assign only acceptable values to these locations. For example, the left margin should be no larger than 39, the bottom margin shouldn't exceed 23, the top margin should always be less than the bottom, the width should lie between 1 and 40, and the sum of the left margin value plus the print width should not exceed 40.

When you set a window, HOME drives the cursor to the upper-left corner of the window and clears the area specified, leaving the rest of the screen unchanged. PRINT commands dis-

play, wrap, and scroll information only within the window.

HTAB also functions only within the window. If you set a left margin of six screen columns, screen column 7 becomes column 1 in the window.

VTAB, however, always uses the full screen for reference. If you use POKE 34, 12 and POKE 35, 18 to set top and bottom margins to rows 13 and 19, respectively, then be sure to keep VTAB commands between 14 and 18 to stay within the defined window.

You can make a title print down the left edge of the screen by defining a text window with a left margin of 0 and a width of 1. Then type HOME and print your title. The window width will allow only a single character on each line, so automatic wraparound will print your title in a vertical bar. Then set the left margin to 3 and print width to 38 to create a new window for printing text. **Listing 4** contains an example of this technique.

Special Effects

Your Apple has two built-in switches, accessible through Applesoft, for displaying text in modes other than the normal green on black. One is triggered by typing FLASH, and blinks every character on and off. To cancel the flashing, type either NORMAL or INVERSE.

The other switch, triggered by typing INVERSE, displays every character in black on a green background. To cancel the inverse mode, type NORMAL or FLASH. Although some people like to work with entire displays in inverse mode (usually referred to as "reverse video"), I feel the increased glare makes eye fatigue more of a problem.

These special effects can be used in imaginative ways to heighten the appearance of any display. For example, suppose a line in a program menu read:

```
A  ADD NEW CLIENT TO FILE
```

where A is the key to be pressed to make that selection. Now suppose you want A to flash, ADD to be inversed, and the remainder of the line to be normal. The following lines would do the trick:

```
FLASH:PRINT"A";
INVERSE:PRINT" ADD";
NORMAL:PRINT" NEW CLIENT
   TO FILE."
```

For frequent use, you could define a subroutine that would automatically set up the flashing, inverse, and normal pattern. Such a subroutine would look like this:

```
5599 REM MENU DISPLAY SUBROUTINE
5600 FLASH:PRINT LEFT$(MD$,1);
5610 INVERSE:PRINT MID$(MD$,2,MD);
5620 NORMAL:PRINT MID$(MD$,MD + 2)
5630 RETURN
```

The string value is assigned to MD$, and the number of characters at the beginning of the string to be inversed is assigned to MD. A GOSUB 5600 in the program will display the line as specified. Note that the MID$( ) function in line 5620 uses only one numeric argument. In such cases the computer automatically displays all the rest of the string.

With the INVERSE function, you can draw horizontal lines and vertical bars on your screen by merely printing blank spaces in reverse video. For example:

```
VTAB 10:INVERSE:PRINT SPC(40);:
   NORMAL
```

will display a horizontal bar across the screen at row 10.

Conclusion

The functions described in this column represent only a few examples of the Applesoft text display techniques available to you. Experiment to discover the variety of possibilities and to learn how to use them effectively in your programs. ■

Write to Dan Bishop at Custom Comp, P.O. Box 429, Buena Vista, CO 81211.



Listing 4. *Displaying a Vertical Message. The title line in this short program is displayed vertically by PRINTing it in a one-column window. The text is then displayed in a new window that leaves the title line in the margin.*

```
1  REM  USE OF WIDOWS TO SETUP
2  REM  A VERTICAL PRINT BAR
10  HOME
20  POKE 32,0: POKE 33,1
25  INVERSE
30  PRINT "THE GETTYSBURG ADDRESS"
40  POKE 32,39
50  PRINT "  BY ABRAHAM LINCOLN"
60  POKE 32,3: POKE 33,36
65  HOME : NORMAL
70  FOR I = 1 TO 23
80  PRINT "FOUR SCORE AND SEVEN YEARS AGO, OUR"
90  NEXT I
100  POKE 34,8: POKE 35,16
110  HOME : INVERSE
120  FOR I = 1 TO 8
130  PRINT " OUR FATHERS BROUGHT FORTH ON THIS "
140  NEXT I
200  POKE 34,10: POKE 35,13
210  HOME : FLASH
220  FOR I = 1 TO 3
230  PRINT "       CONTINENT A NEW NATION       "
240  NEXT I
250  NORMAL
260  POKE 32,0: POKE 33,40
270  POKE 34,0: POKE 35,23
280  GOTO 280
```

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AMPERGRAPH

AMPERGRAPH is a powerful, easy-to-use relocatable graphics utility for the Apple II +/e/c. AMPERGRAPH adds twenty-two Applesoft commands that allow effortless generation of professional-looking plots of scientific or financial data. All of the necessary scaling and screen formatting is accomplished with just a few, simple Applesoft lines.

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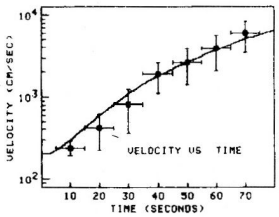
SAMPLE AMPERGRAPH PROGRAM LISTING:

```
10 &SCALE, 0, 80, 80, 13000
15 LX$ = "TIME (SECONDS)":LY$ = "VELOCITY
   (CM/SEC)"
20 &LOG Y: &LABEL AXES, 10, 10
25 LABEL$ = "VELOCITY VS. TIME":&LABEL, 30,
   200
30 FOR T = 0 TO 80:&DRAW, T, 150 + T12:NEXT T
35 FOR T = 10 TO 70 STEP 10
40 &CLOSED SQUARE, T,
   (150 + T12)*(.8 + .4*RND(3) )
45 &ERROR BARS, 5, T12/2
50 NEXT T:&DUMP
```



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AMPERDUMP is a high-resolution graphics dump utility which can be used either in menu-driven mode, or directly from your Applesoft program, with, or without AMPERGRAPH. The following printers will work with AMPERDUMP: Apple Dot Matrix, Imagewriter; Epson; Gemini; NEC PC-8023A-C; C. Itoh 1550, 8510A/B, 8600; Toshiba 1340, 1350. AMPERDUMP offers many features which are not available in other graphics dump routines:

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AMPERGRAPH and AMPERDUMP are available from your dealer or order direct. Include $2.00 for shipping and handling; Wisconsin residents add 5% sales tax.

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Corrections

In "Build a Better MousePaint" (December 1984), the line descriptions for lines 180–380 and lines 500–550 of the Table on page 71 were reversed.

The final sequence of line 200 in the "Grape Gobbler" (August 1984) Program listing on page 70 should read (KY% = 218 AND HP% = 135 AND VP = 144).

In "The Compleat Text File Primer, Part 7," the Program listing beginning on page 82 is missing two embedded control-D commands. Lines 2050 and 12740 should read:

```
2050 PRINT CHR$(4)"MAXFILES 1"
12740 PRINT CHR$(1) CHR$(13)
        D$"CLOSE"
```

Michael Seeds has some changes for people who want to run a couple of his Child's Play programs with ProDOS instead of DOS 3.3. For "Kidword" (October 1984) modify the statements that transfer output to and from the printer. To do this, add the following lines to the Program listing on page 32:

```
40049 S = 1
40179 S = 0
```

and change the following lines:

```
40050 PRINT CHR$(4)"PR#";S
40180 PRINT CHR$(4)"PR#";S
```

"Dino Math" (November 1984) also requires modification to run under ProDOS. In the article, you're advised to save the shape table under SHAPE:DINO. While this is fine for DOS 3.3, it's an illegal filename under ProDOS which doesn't permit a colon in the pathname. With ProDOS, save the shape table on page 34 as SHAPE.DINO and change line 550 in the Applesoft listing on page 33 to:

```
550 PRINT CHR$(4);"BLOAD
      SHAPE.DINO"
```

Because of ProDOS' increasing popularity, we've directed our authors to make sure their programs run under both DOS and ProDOS.

It has been brought to our attention that an article in our October 1984 issue and two articles in our November 1984 issue made improper reference to the trademark DUNGEONS & DRAGONS. Please note that DUNGEONS & DRAGONS is a federally registered trademark owned by TSR, Inc.

"A Bug in AppleWorks" (November 1984, p. 109) contains an error in the last paragraph. The terms "escape, control-A" and "escape, control-@" are incorrect and should read "escape – control-A" and "escape – control-@." Hit the escape key, followed by the minus sign. Then hold down the control key and press the A or @ key.

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ASK INCIDER

Send your questions about Apples or Apple computing to Ask inCider, *80 Pine Street, Peterborough, NH 03458.*

Sounds of Silence

Dear *inCider*:

I bought an Apple //c last month and I've been trying to do some programming. I've hit only one snag—sounds. I've looked in all kinds of books and magazines on how to make sounds with the Apple, but I've come up empty. Can you help me out?

Shawn Keith
3919 Colbrook Road
Anderson, IN 46011

Dear Shawn:

Your Apple can only make one sound. To hear it, run the program:

```
10 X = PEEK(-16336)
```

That little click you hear isn't much to listen to, but it's the basis of all Apple sounds. Other sounds on the Apple, except those created with add-on synthesizer boards, are generated by clicking the speaker at different rates and durations. To hear how a sound is built from the basic click, add this line to your program:

```
20 GOTO 10
```

This isn't much, but it demonstrates what you can do with the basic click. We've published sound generating programs in inCider. *Check Fudge It! (September 1984, p. 109) for some wild sounds you can use in your own programs.* inCider *also ran music generation programs in February, July, and December 1984. You can learn a lot from seeing how other people generate sounds on the Apple.*

Don't give up on programming books. Most contain at least a short section on producing Apple sounds.

Dynabook

Dear *inCider*:

A while ago, I read that computers like my Apple //e could possibly retrieve information from an encyclopedia found on a disk. Can you tell me how I can take advantage of this?

Nelson Chou
16549 Sioux Lane
Gaithersburg, MD 20878

Dear Nelson:

The technology you describe involves using a laser disk that can store gigabytes (billions of bytes) of memory on a single platter. These disks can store volumes of information and make it available quickly. Don't look for this technology in the near future, but when it comes, it'll revolutionize personal computing.

Rounding Runaround

Dear *inCider*:

I write interactive programs for my chemistry classes and have come across an interesting problem with Applesoft. Let me illustrate with the following program:

```
 5 HOME
10 INPUT "A = ";A
20 INPUT "B = ";B
30 INPUT "C = ";C
40 IF C = A - B THEN GOTO 70
50 PRINT "A = ";A,"B = ";B,"C = ";C
60 PRINT "A - B <>";A - B: GOTO 80
70 PRINT "A - B = C"
80 END
```

If I enter A = 4, B = 2, and C = 2, the statement at line 40 sends control to line 70, as it should. The problem comes with some decimal values. When I enter A = .56, B = .45, and C = .11, the program doesn't jump to line 70. Instead, it executes lines 50 and 60 and prints a value of .11 for the expression A - B!

I get around this problem by using line 40:

```
40 IF ABS (C - A + B) < .0001 THEN
   GOTO 70
```

My fix works, but could you tell me what is there in the Apple II series that causes this violation of logic?

William Simonsen
2304 Barrington Woods Road
Palatine, IL 60074

Dear William:

The problem you describe isn't specific to Apple computers but is endemic to computing. Computers work in base 2, while humans work in base 10. When you enter a base 10 number, the computer translates it into the base 2 equivalent. The problem is that there isn't always an equivalence between base 10 and base 2. Some rational base 10 numbers don't have a rational base 2 counterpart, so the computer translates the number into a base 2 value that approximates the original base 10 value.

In your example, one of the decimal values didn't translate directly into a base 2 equivalent. Consequently, the statement in line 40 detected that .11 wasn't exactly equivalent to the base 2 difference between .56 and .45 and didn't jump to line 70. The reason that .11 was printed in line 60 is that the Apple works with greater precision internally than with its output. In effect, Applesoft rounded off the answer to .11 when it output A - B. Internally, the number is slightly different from .11.

Your fix is a common one. The number of decimal places you use in your fudge factor (.0001) determines the precision of your result.

In Search Of. . .

Dear *inCider*:

I saw a program called Disk Library that keeps track of disks. It was copyrighted in 1981 by Modular Media. I can't find a distributor for this program or the address of Modular Media. Can you help me?

Joe M. Norwood
3044 Kushton Drive
Windsor, Ontario
Canada N8K 1M4

Dear Joe:

Sorry, Joe, but I came up empty. If any reader knows the whereabouts of Modular Media, please drop me a line.

by Bob Ryan, inCider staff

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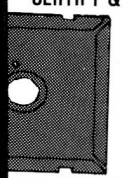

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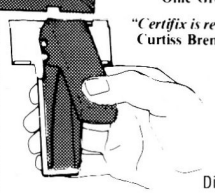

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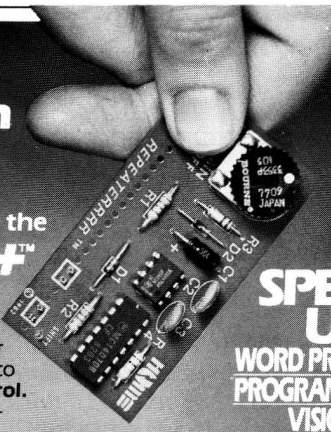

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In the Driver's Seat

If you're a Visiplot devotee who needs plots of different sizes, this printer driver is the one for you. MENU VP.DRIVER works with any smart graphics interface card that uses control-I G sequence to initiate a graphics dump. A menu within Visiplot selects printer options. The program was tested with the Grappler, Microbuffer, and Graphitti interface cards.

Follow these steps to install MENU VP.DRIVER and see the Visiplot manual's appendix for renaming instructions:

1) Rename VISIPLOT.DRIVER using the DOS rename command so you can keep your current printer driver.
2) Put a copy of MENU VP.DRIVER on the Visiplot program disk using the System Master FID program.
3) Use the DOS rename command to rename MENU VP.DRIVER to VISIPLOT.DRIVER, as in step 1.

Visiplot runs as usual until you're ready to print a plot. After you enter the printer slot, the driver menu will replace Visiplot's normal menu. Refer to the **Table** for a list of the available options.

Once the plot has been printed, the printer driver returns to the Visiplot menu. With this menu driver, you can select different printer options and never leave Visiplot to install a new driver. Note that not all printer-interface card combinations will print an emphasized plot. If you have the Graphitti card, you must press the escape key twice after printing concludes to return to the Visiplot menu.

The menu driver automatically issues a form feed when you select a double-sized plot. You can print up to three normal-sized, non-rotated plots on a single sheet of paper. Issue a manual form feed when printing in any of the normal-sized modes.

Modifications

Don't hesitate to try other options, such as inverse, in place of my selections. A word of caution: Keep the length of any printer driver to a minimum. The longest driver supplied with the Visiplot program was 487 bytes. ■

Write to Michael Salzman at Route 5, Box 582, Shreveport, LA 71107.

Program listing. *BSAVE MENU VP. DRIVER,A$98C3,L$147.*

```
98C3- 00 0D 02 D8 98
98C8- 00 00 00 04 07 00 00 00
98D0- 00 00 00 00 00 A9 14 85
98D8- 25 20 22 FC A2 00 BD E9
98E0- 98 F0 76 20 F0 FD E8 D0
98E8- F5 BC B1 BE A0 CE CF D2
98F0- CD C1 CC A0 A0 BC B2 BE
98F8- A0 CE C5 A0 A0 BC B3 BE
9900- A0 CE D2 A0 A0 BC B4 BE
9908- A0 CE D2 C5 A0 A0 A0 A0
9910- A0 BC B5 BE A0 C4 CF D5
9918- C2 CC C5 A0 A0 BC B6 BE
9920- A0 C4 C5 A0 A0 BC B7 BE
9928- A0 C4 D2 A0 A0 BC B8 BE
9930- A0 C4 D2 C5 A0 A0 A0 A0
9938- A0 BC B9 BE A0 CE CF CE
9940- C5 A0 A0 AD AD A0 A0 D7
9948- C8 C9 C3 C8 BF A0 A0 A0
9950- A0 A0 A0 A0 A0 A0 A0 8D
9958- 00 A9 14 85 24 A9 16 85
9960- 25 20 22 FC 20 0C FD AA
9968- C9 BA B0 04 C9 B1 B0 05
9970- 20 DD FB 50 E4 C9 B9 F0
9978- 4B C9 B5 90 13 A9 14 85
9980- 25 A9 8A 20 ED FD A9 8A
9988- 20 ED FD A9 8A 20 ED FD
9990- A9 14 85 25 A9 8A 20 ED
9998- FD A9 89 20 ED FD A9 C7
99A0- 20 ED FD 8A C9 B1 F0 2F
99A8- C9 B2 F0 26 C9 B3 F0 16
99B0- C9 B4 F0 19 C9 B5 F0 37
99B8- C9 B6 F0 2E C9 B7 F0 1E
99C0- C9 B8 F0 21 F0 38 A9 D2
99C8- 20 ED FD 50 0A A9 D2 20
99D0- ED FD A9 C5 20 ED FD A9
99D8- 8D 20 ED FD 50 20 A9 D2
99E0- 20 ED FD 50 0A A9 D2 20
99E8- ED FD A9 C5 20 ED FD A9
99F0- C4 20 ED FD A9 8D 20 ED
99F8- FD A9 8C 20 ED FD A9 F0
9A00- 85 36 A9 FD 85 37 20 EA
9A08- 03 60
```

Table. *MENU VP.DRIVER's available options.*

Option	Description
Normal	Normal sized plot
NE	Normal, emphasized plot
NR	Normal, rotated plot
NRE	Normal, rotated, emphasized plot
Double	Double sized plot
DE	Double, emphasized plot
DR	Double, rotated plot
DRE	Double, rotated, emphasized plot
NONE	Return to Visiplot's menu

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by Michael Salzman

Editing in // Style

by W.M. Miller, Jr.

All Apples are *not* created equal. Try editing in BASIC on the II Plus and then on the //e. The procedures aren't the same—a fact not mentioned in the owner's manual.

Editing in BASIC on Apple II computers, awkward at best, accounts for the success of many enhanced editing utility programs. New Apple users seek outside references to learn anything substantial about BASIC. If the guide is //e-specific, the odds are in their favor, but II Plus veterans may have problems.

Essential to editing on the Apple II series are pure cursor moves—moves that change only the cursor's position. Activate these cursor moves with the escape key. For pure cursor moves on any Apple, use A for right, B for left, C for down, and D for up, but press the escape key before each cursor move.

The //e follows this procedure without a hitch, but a far more convenient method is available on the II Plus. After you press the escape key, press K for right, J for left, M for down, or I for up. The computer stays in escape mode until you press a key other than one of these four. While fine for the II Plus, this method causes problems on the //e.

Editing on the II Plus

For example, assume you have the following line of BASIC to edit:

```
210 A$(X) = STR$ (A(X))
```

Once this line is in the program, you realize A$(X) should have been T$(X) and A(X) should have been T(X). Type LIST 210 to list the line, then press the escape key. Using the I, J, K, and M keys, place the cursor over the 2 in the line number. Continue to press the right-arrow key until the cursor is on the first A. (Note: You must hit the right-arrow key two times before the cursor moves.) Press T and then the right-arrow key until the cursor is on the second A. Press T again. Tap the right-arrow key until the cursor passes the last character in the line and hit the return key. List the line again, and you'll see the corrected line; the two A's changed to T's.

The //e Version

If you follow the same procedure on the //e, the line may *appear* edited, but when you list the line you'll see that the original line didn't change. With the //e, you'll have to hit the first letter to be changed two times before it takes. Now try the II Plus editing procedure to change the two X's to Y's. This time, when you press the return key the message SYNTAX ERROR appears. Listing the line shows that, once again, the editing didn't work. On the //e, pure cursor moves can also be controlled by the four arrow keys, but you'll get the same results: The editing doesn't work and sometimes you'll receive a syntax error message.

What's the Problem?

The arrow keys on the //e can be used as pure cursor moving keys and that accounts for the editing problem. The solution is in knowing when you're in escape mode and when you're not. On the II Plus, you remain in escape mode after you press the escape key *and* continue to use the I, J, K, and M keys. To cancel escape mode, press a different key.

The right-arrow key on the II Plus *isn't* a pure cursor moving key, so if you press it while in escape mode the computer will negate escape mode. Characters are copied into memory as the cursor passes over them. On the //e, the right-arrow key *is* a pure cursor moving key. Thus, pressing it while in the escape mode only moves the cursor to the right.

Now you can see what happened when we tried to use II Plus editing methods on the //e. In changing the A's to T's (after placing the cursor on the 2 of the line number with pure cursor moves), the right-arrow key operated as a pure cursor moving key to position the cursor past the line number *without* copying it into memory. Pressing the T took the computer out of escape mode. From this point, editing occurred normally. The computer saw the statement:

```
T$(X) = STR$(T(X))
```

The syntax is correct, so you didn't get an error message, but your editing inadvertently eliminated the line number, so line 210 was not changed. Consider the second alteration (changing the X's to Y's) where the first character registered in the computer was the Y typed to replace the X. The rest of the statement registered correctly, and the computer saw the line:

```
Y) = STR$(A(Y))
```

Naturally, the SYNTAX ERROR message appeared.

For proper editing with the //e, leave the escape mode at the right time:

1) Press the escape key.
2) Use either the I, J, K, M keys, or the arrow keys to place the cursor over the first digit of the line number (the 2 in the example).
3) At this point (and here is the difference) get out of escape mode before you press the right-arrow key. Use the space bar to get out of escape mode, then press the right-arrow key to advance to the point you need to edit.
4) Type the correction and continue to the end of the line.
5) Press return, and the statement appears in its correctly edited form.

The same principle works for more complex editing, like inserting text. Just follow the general rule. Stay in escape mode while you move the cursor without taking other action, and leave the escape mode by pressing the space bar before you move the right-arrow key to copy characters into memory. ■

Address correspondence to W.M. Miller, Jr., at 6744 Ransome Drive, Baltimore, MD 21207.

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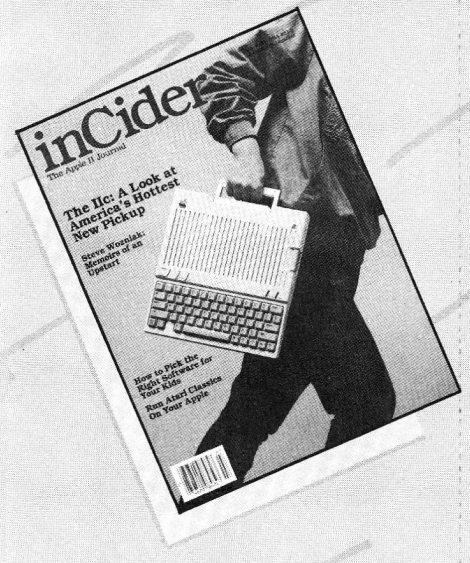

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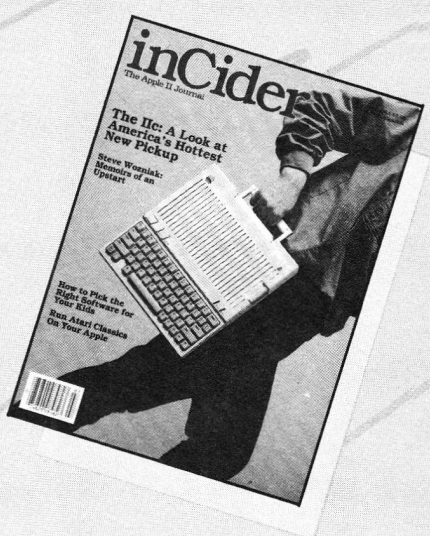

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From page 84.

Solutions to inSidious inSolubles

Solution to An Applesoft Bug

This program runs correctly upon execution as long as the programs being verified are on the disk. If the file being verified is not on the disk, a RETURN WITHOUT GOSUB error occurs on line 160. It seems that DOS loses its stack pointer when an error occurs, and so forgets it was executing a GOSUB command. The solution: Keep ONERR commands out of GOSUB routines or use a short machine-language program that is called whenever an error occurs. This program restores the stack pointer and can be found in the *Applesoft BASIC Programming Reference Manual* for the II Plus on page 136.

Add the following lines to the program:

```
15  GOSUB 200
145 CALL ER
200 ER = 768
210 FOR L = ER TO ER + 9
220 READ I
230 POKE L,I
240 NEXT
250 RETURN
260 DATA 104,168,104,166,223,154,
    72,152,72,96
```

Solution to Print Using

The Applesoft Floating Point software is the culprit here. Line 100 takes the decimal portion of AMT, multiplies it by ten, and subtracts the integer portion from it. If the least significant digit of AMT is in the tenth's place, the result should be zero and ZE$ should be defined as zero. However, when the integer of DM is subtracted from DM, Applesoft comes up with a strange result. Put a PRINT DM just before the last instruction in line 100 and run it to see the problem. The solution is to treat AMT as a string.

Change line 100 to:

```
100 IF MID$ ( STR$ (AMT), LEN ( STR$
    (AMT)) - 1,1) = "." THEN ZE$ =
    "0"
```

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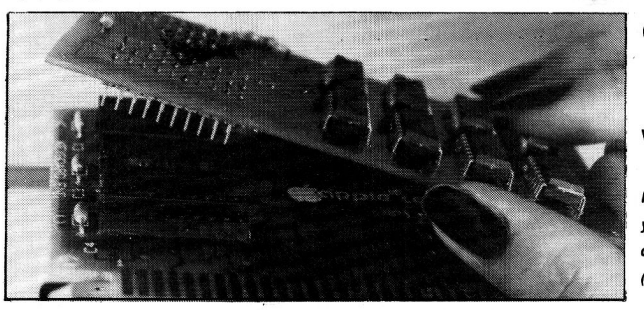

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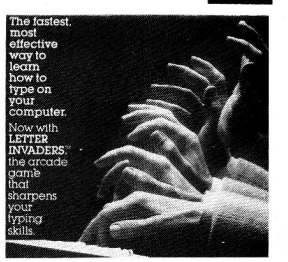

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Continued from page 52.

turn. Fake carriage returns force multi-line glossary entries.

You can execute a single WPL program with one keystroke. The glossary entry of 1[P]dowpl.camera ready] says "on numeric 1, execute the WPL program WPL.CAMERA READY." You can't, however, execute a series of WPL programs on a single glossary command. The reason: [P]do only loads a WPL program and sets a flag. It doesn't actually run the WPL routine. The WPL program won't begin until the glossary is finished.

So something like a[P]doWPL.1] [P]doWPL.2] will load the program WPL.1 and set the WPL activity flag. Then, it will load the program WPL.2, and will overwrite WPL.1. Finally, when the glossary is finished, control will transfer to WPL.2. Only the second program runs in this instance, since WPL can't start until the glossary is done.

Cloning Files

One of my favorite Apple Writer //e tricks appears in **Table 1**. With one keystroke, you can transform a single file into 64 identical files. You use the control-L# load from file command to copy the file to itself six times, doubling its length each time—especially handy when printing disk labels, return addresses, and the like.

Table 1 also shows how to insert a lengthy boilerplate into your text files. A single glossary keystroke loads as many individual files as you like. This table also explains how to change print constants with a single keystroke. You'll need to reset them, particularly if the printer fouled up the works in the middle of a document.

Apple Writer //e's .pd8 print-to-disk option affords you many tricks. After writing to disk, you don't want additional margin padding, since you're in a "what you see is what you get" mode. To print a formatted file, use a set of "wide-open" print constants. The disk image then goes to your printer, modem, or phototypesetter.

The last example in **Table 1** lets you clear to the end of your document. Be sure your data direction is set to > before using this command.

Glossary Restrictions

Keep the following guidelines in mind to distinguish whether a glossary entry goes directly into the text file, executes immediately, or embeds a command:

1) If the glossary entry has no control commands, the phrase goes directly into the text file. An L goes into the text file as an uppercase letter.

2) Stand-alone control characters direct the glossary to perform an immediate WPL action. So, [L] attempts an immediate load.

3) Control commands preceded and followed by the verbatim control-V will be embedded directly into the text file. The sequence [V][L][V], therefore, embeds a control-L into the text file.

4) The glossary doesn't recognize WPL variables. Thus, an (x) prints as exactly that, rather than substituting the numeric value for the WPL x variable. The same rule holds for strings $A–$D.

5) While the glossary can't substitute WPL variables in the text file, it can change, set, or define them. WPL behaves in just the opposite manner. WPL will, of course, substitute numerics on its own (x), (y), and (z) variables as well as strings on its $A, $B, $C, and $D strings, but it only recognizes the] as a closing bracket.

6) The [P]do command doesn't execute a WPL program. It merely loads the program and sets the WPL activity flag. One glossary entry can run only one WPL program. If you try to run several WPL programs with one glossary key, only the *last* WPL routine will be executed after overwriting the previous ones.

Titling and Self-Prompting

Use these "immediate" WPL execution tricks to build titled and self-prompting glossaries. (See the **Figure**.) To start, carefully organize your glossary. A titled, self-prompting glossary comprises four parts: title, main glossary, help screen, and help-screen loader.

A glossary key of ? or * is filtered as a glossary *define* or *purge* command. Typing in <open-apple>-/ retrieves the main help menu, rather than a / (slash) glossary entry. So, any glossary line that starts with ?, /, or * will never be accessed but can be used as a comment or remark line. **Table 1** summarizes this rule: To add comments to your glossary, start each comment line with ?, /, or *.

You already know how to use the main glossary when you don't require titling or self-prompting. Now you know you can add powerful new features to your glossaries by using immediate WPL commands; simply mix phrases and commands.

One obvious route toward creating a self-prompting glossary is to use glos-

Table 3. *Apple Writer //e-Diablo 630 formatting glossary with tutorial.*

Diablo 630 Formatting Glossary	Open-Apple Formatting Commands
?	
?	
A[V] [esc] [K] [V]	(A) absolute VTAB*
a[V] [esc] [U] [V]	(a) absolute HTAB*
B[V] [esc]O[V]	(B) bold print on
b[V] [esc]&[V]	(b) bold print off
C[V] [esc] = [V]	(C) centering on
c[V] [esc]X[V]	(c) centering off
D[V] [esc]$[V]	(D) dash hyphen on
d[V] [esc]X[V]	(d) dash hyphen off
E[V] [esc]0[V]	(E) west margin set
e[V] [esc]9[V]	(e) east margin set
F[V] [esc]A[V]	(F) funny ribbon on
f[V] [esc]B[V]	(f) black ribbon on
G[V] [esc]3[V]	(G) graphics on
g[V] [esc]4[V]	(g) graphics off
H[V] [K] [V]	(H) vertical tab
h[V] [tab] [V]	(h) horizontal tab
I[V] [esc]%[V]	(I) improve quality
i[V] [esc]N[V]	(i) normal quality
J[V] [esc]M[V]	(J) justify on
j[V] [esc]X[V]	(j) justify off
K[V] [esc] [Q] [V]	(K) kerning set *
k[V] [esc]X[V]	(k) kill v margin
L[V] [esc] [L] [V]	(L) lines/page set *
l[V] [esc] [H] [V]	(l) little backspace
M[V] [esc]^[V]	(M) motion VMI **
m[V] [esc]_[V]	(m) motion HMI **
N[V] [esc]T[V]	(N) north margin
n[V] [esc]S[V]	(n) south margin
O[V] [esc]D[V]	(O) offset hl up
o[V] [esc]U[V]	(o) offset hl down
P[V] [esc]P[V]	(P) proportional on
p[V] [esc]Q[V]	(p) proportional off
Q[V] [esc]7[V]	(Q) quit printing
q[V] [esc]X[V]	(q) quit wp modes
R[V] [esc]/[V]	(R) reverse <-on
r[V] [esc]\[V]	(r) reverse <-off
S[V] [esc]W[V]	(S) shadow on
s[V] [esc]&[V]	(s) shadow off
T[V] [esc] – [V]	(T) tab vertical set
t[V] [esc]1[V]	(t) tab horizontal set
U[V] [esc]E[V]	(U) underline on
u[V] [esc]R[V]	(u) underline off
V[V] [esc] [J] [V]	(V) vertical up
v[V] [J] [V]	(v) vertical down
W[V] [esc]Z[V]	(W) wheel spoke $7F
w[V] [esc]Y[V]	(w) wheel spoke $20
X[V] [esc]2[V]	(X) clear tabs
x[V] [esc]S[V]	(x) clear HMI
Y[V] [V]	(Y) your stuff on
y[V] [V]	(y) your stuff off
^[V] [L] [V]	(^) formfeed
<[V] [H] [V]	(<) backspace
.[V] [esc]Q[esc]1[H] [tab] [V]	(.) dots start
.[V] [esc]P[V]	(.) dots end
Z[P]nd] [Q]FDGLOSS]	(Z) tutorial + copy
[L]DGLOSS< > < – 1)> > <\] [P]yd]	
z[L]DGLOSS< > < – 1)> > <\]	(z) tutorial only

* follow with ASCII value

** follow with ASCII value – 1

Bracket pairs represent control commands. [esc] = escape, [Q] means control-Q. The line preceding the tutorial screen must have four spaces. Z and z selections must not precede the tutorial or they will find themselves.

80-column tutorial text lines have been split. Entries (A), (H), (O), and (V) go on one line. The dot row is also one continuous line.

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sary commands to enter a long help screen. But this has serious disadvantages: Entering a full screen from the glossary can take as long as 30 seconds; while placing the screen, you alter your text file; when you finish with the help screen, you somehow have to undo it to change text files back to their original form.

Instead, let's get sneaky.

A glossary is a text file so it's likely to be on disk. Why not load the glossary directly to the screen, put down a help message at the end, and let the rest scroll by? Better yet, tack a help screen onto the end of your glossary. Then load the help screen directly out of the glossary text file, and key on delimiters at the beginning and end of the help screen. This takes only three seconds, doesn't disturb your working text file, and exits instantly on a carriage return.

Although the help screen is displayed exactly as you want it to appear, it may gobble up a thousand characters or so from your glossary. Usually, the space is available. If not, you can shorten your help screen.

The Help Screen Loader

The upgraded glossary has two loaders, keying on lowercase and uppercase Z. The lowercase z loader loads your glossary text file directly to screen, with a *start string* at the beginning of the screen image and an *end string* at the end of the screen image.

You'll use the lowercase z loader more often; it's the faster of the two. Unfortunately, it works only if you have a copy of the current glossary in your active drive.

If you just switched disks or drives, you may not have a copy of the glossary in the active drive. This is where the uppercase Z loader comes in. By pressing Z, a copy of the current glossary is saved to the active drive and this new glossary image is then loaded to the screen.

The help screen loader must *follow* the help screen. If not, the help screen loader will find its own delimiters instead of those in the help screen. A little advice: Use Z for a new disk but z all other times: z takes three seconds; Z, nearly ten.

Minor restrictions limit your tutorial help screen. All glossary entries, except the loaders, must precede the help screen. The help screen's length must comprise no more than 23 lines. No screen line can start with z or Z as its first character.

Clumsy typing could enter any first character on a screen line not previously defined as a "real" glossary entry into your text file.

With most longer glossaries, this screen-line-as-glossary-entry problem never shows up. If it bothers you, put a box of stars around the help screen or start each help screen line with a space and define the space as an often-used glossary entry or as an immediate return.

Titling Glossaries

Titling a glossary makes life easier for you, the programmer, because you can identify each glossary version, thereby avoiding changes made to the wrong glossary. Self-prompting a glossary makes it easier on you or the viewer, because of a one-key tutorial help screen. It means never looking up the magic keystrokes on a lost sheet of paper, never memorizing seldom-used glossary commands, and never using dozens of keystrokes when one will do.

Two examples of titled and self-prompting glossaries are shown in **Tables 2** and **3** along with their respective open-apple formatting commands. These glossaries let you tap the fancy commands of an intelligent printer, like the Epson MX-80 or the Diablo 630.

The first glossary (**Table 2**) is for an Epson MX-80. Note how each control character to be embedded in your text file is bracketed by a pair of control-Vs. Also, notice how the loader follows the help screen. The glossary name is EGLOSS. The start string is a carriage return followed by five spaces, and the end string is ls.) followed by a carriage return. The reverse slash says to load to screen only.

EGLOSS works best on a third backup copy of Apple Writer //e, patched to embed null characters and to prevent justified "shortlines." (Contact the author for free patches.)

Table 3 shows a self-prompting

glossary for the Diablo 630 capable of micro-justification and proportional spacing.

This time, the glossary file name is DGLOSS, but the start string and end string remain the same. Each glossary action is keyed to a letter that is easy to remember. Uppercase letters give directions like on, up, more, above, or right. For example, S turns shadow printing on, while s shuts it back down. J starts micro-justification; j turns it off.

Once again, a z from the glossary calls the full help screen, while Z gives a tutorial help screen and saves a new glossary copy to the active drive.

Dot Commands

Printing part of a line in full micro-justification, switching out for a group of dots or spaces, and then switching back in for aligned columns of micro-justified text is a delicate maneuver you often need for bills or statements. The *dots start* command exits you from micro-justification, begins letter spacing, and carefully eliminates any extraneous spacing, so the dots or spaces are aligned vertically. The *dots end* command resumes full micro-justification, aligning dots in vertical columns.

After you use these dot commands, some columns may be out of line by whole letter-spaced characters. Simply add or remove dots or spaces to bring any offenders in line.

You can match the glossary to your needs. For example, I also use the numeric keys to format micro-justification and proportional spacing, handle a camera-ready double-whapping trick, and much more. Although specific to my needs, they're available separately.

Other printers will need their own glossaries. While EGLOSS is a good starting point for most dot-matrix printers, DGLOSS is better for daisy wheels. You'll have to change individual commands and features after studying the printer's manuals.

An AGLOSS for the Apple daisy-wheel printer and an IGLOSS for the Imagewriter printer are also available from the author. ■

For help with Apple Writer //e, you can write to Don Lancaster at Synergetics, 746 First Street, Box 809, Thatcher, AZ 85552. Or call him at (602) 428-4073 between 8 a.m. and 5 p.m. Mountain Standard Time. This is a free service offered by Don Lancaster and the Gila Valley Apple Growers Association.



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Grappler+RS232	89.95	Quadram 128k Fazer p/p	274.95
PRINTERS DOT MATRIX			
Apple Imagewriter	499.95	Epson FX 100	599.95
Apple Scribe	239.95	Epson JX 80 Color	599.95
Citizen MSP 10 160	**359.95**	Gemini 10X	279.95
Citizen MSP 15 160	**549.95**	Gemini Delta 10	369.95
Citizen MSP 20 200	**549.95**	Gemini Delta 15	479.95
Citizen MSP 20 200	**689.95**	Okidata Color	**Call**
C.ITOH 8510	349.95	Okidata 182	**Call**
Epson LQ 1500	1039.95	Okidata 92	399.95
Epson RX 80	229.95	Okidata 92 Image	469.95
Epson RX 80 F/T	319.95	Okidata 93	599.95
Epson RX 100	419.95	Okidata 84	699.95
Epson FX 80	419.95	Toshiba P1340	729.95
PRINTERS LETTER QUALITY			
DW 2000 33cps 48k	829.95	Silver Reed 400 12cps	299.95
Dynax DX 15XL 21cps	399.95	Silver Reed 500 14cps	359.95
Dynax DX 25 23cps	639.95	Silver Reed 550 17cps	429.95
NEC 2010/2030	699.95	PowerType 17cps	359.95

SOFTWARE FOR IIe & IIc

Word Processing		Bruce Lee	**29.95**
Bank Street Writer	49.95	Cat Graphics	**24.95**
Bank Street Speller	49.95	Champ Lode Runner	29.95
Bank Street Filer	**49.95**	Choplifter	29.95
Bank Street Mailer	**49.95**	Comp. Graphic Sys.	**59.95**
Dictionary	**69.95**	Conan	**Call**
Format II Enh.	**99.95**	Crosswork Magic	39.95
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Habatemplates	**19.95**	Data Capture	45.95
Homeword	49.95	Dazzle Draw	35.95
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Megawriter	**69.95**	Epyx Baseball	**Call**
Megaspell	**42.95**	Exp. Amazon	24.95
PFS:Write	79.95	Exodux Ultima III	45.95
Sensible Speller IV	79.95	Facemaker	**24.95**

SOFTWARE FOR IIe & IIc

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The Write Stuff	**39.95**	Gertrudes Secret	**29.95**
Business & Personal		Graphics Magician	42.95
Appleworks	219.95	Hitchhikers Guide	**27.95**
Arrays		Kindercomp	**22.95**
GL, AR, AP, PR (ea)	**159.95**	Kings Quest	34.95
ASCII Exp. Pro	94.95	Koala M Keys	**49.95**
Beagle		Magic Paintbrush	**24.95**
Mechanic	**20.95**	Master Type	29.95
GPLE	**30.95**	Math Blaster	39.95
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Triple Dump	**30.95**	Microsoft T Tutor 2	19.95
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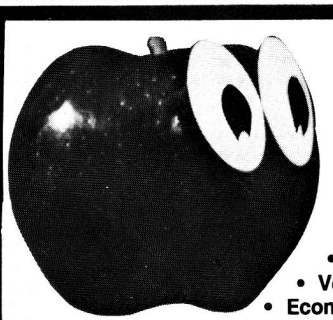

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The DS-65 Digisector® opens up a whole new world for your Apple II. Your computer can now be a part of the action, taking pictures to amuse your friends, watching your house while you're away, taking computer portraits . . . the applications abound! The DS-65 is a random access video digitizer. It converts a TV camera's output into digital information your computer can process. The DS-65 features:

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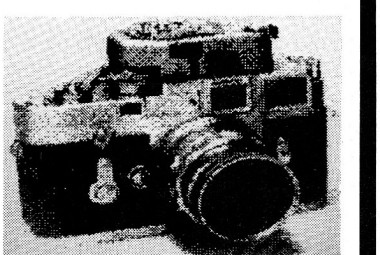

HI-RES PICTURE USING THE DS-65 AND PICTURE SCANNER SOFTWARE

The DS-65 is an intelligent peripheral card with on-board software in 2708 EPROM. Check these software features:

- Full screen scans directly to Apple Hi-Res screen
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- Utility functions for clearing and copying the Hi-Res screen

Use the DS-65 for precision security systems; computer portraiture; robotics; fast to slow scan conversion; moving target indicators; reading UPC codes, musical scores and paper tape and more! **GIVE YOUR APPLE THE GIFT OF SIGHT!** DS-65 Price: $349.95
RCA 1500 Series Camera w/6:1 zoom lens Price: $399.90/Combination Price: $729.95

ADDITIONAL SOFTWARE FOR THE DS-65

— Picture Scanner: An applications tool for processing video images for display on the Hi-Res screen. A variety of dithering algorithms are provided, for compressing the digitized image into the Hi-Res screen and simulating grey scales. Price: $39.95

— Superscan: Enables you to enhance the DS-65's Hi-Res pictures with colors! Choose from 21 different colors and assign them to grey scale values, modify pictures, zoom, enhance contrast, etc. Includes print routines for Anadex 9500 or 9501; Epson MX-80GFT and MX-100; and IDS 460 Paper Tiger*. Written for The Micro Works by Magna Soft. Price: $79.95

*Paper Tiger is a trademark of Integral Data Systems, Inc.

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APPLE EXTRACT

A reprise of the reviews that have appeared in inCider *in the last three months. Prices subject to change without notice.*

★★★★	Superlative
★★★	Above average
★★	Good
★	Not recommended
	Stay away

Software

Bank Street Speller
★★
Broderbund Software, 17 Paul Drive, San Rafael, CA 94903
Spelling checker, December '84.
A companion to Bank Street Writer, this program provides a 30,000-word dictionary that checks the spelling in your word-processed documents. $69.95.

Beyond Castle Wolfenstein
★★★
Muse Software, 347 North Charles Street, Baltimore, MD 21201
Arcade, November '84.
In this absorbing arcade-adventure game, you must penetrate the Fuehrerbunker and eliminate the archenemy of democracy. A winner. $34.95.

Counters
★★★
Sunburst Communications, 39 Washington Avenue, Pleasantville, NY 10570
Education, December '84.
A package for preschoolers that introduces rudimentary math skills. $55.

Data Spectrum
★★★
Advanced Business Computing, 1580 North Northwest Highway, Park Ridge, IL 60068
Data base, November '84.
An easy-to-learn data-base manager that is an excellent choice for small- and medium-sized businesses. $239.

Documax
★★★
Signum Microsystems, 120 Mountain Avenue, Bloomfield, CT 06002
File Manager, November '84.
Documax is a valuable tool for examining and organizing text files created by a word-processing system. $99.95.

El-Ixir
★★★★
Isoft, P.O. Box 10762, Stanford, CA 94305
Strategy game, November '84.
One of the best games to come out for the Apple this year. As easy to learn as it is fun to play. $29.95.

Financial Cookbook
★★★
Electronic Arts, 2755 Campus Drive, San Mateo, CA 94403
Home finance, December '84.
The worksheets included in this package let you answer "what if" questions on your personal finances. $50.

FlashCalc
★★★
Paladin Software Corp. (formerly VisiCorp), 2895 Zanker Road, San Jose, CA 95134
Spreadsheet, January '85.
Although it has a slightly smaller worksheet than VisiCalc, this ProDOS-based program is faster and more versatile than its venerable predecessor. $99.

The Graphics Department
★★★
Sensible Software, 24011 Seneca, Oak Park, MI 48237
Business graphics, January '85.
With data entered via the keyboard or a DIF file, this program will create the charts and graphs you need to complete a professional presentation. $124.95.

How About a Nice Game of Chess?
★★
Odesta, 3186 Doolittle Drive, Northbrook, IL 60062
Chess simulation, December '84.
Not only a program that plays chess, but one that teaches the game. Not the strongest chess playing program on the market, but a good choice for beginners. $34.95.

How to Operate the Apple //e
★★
FlipTrack Learning Systems, 999 Main Street, Glen Ellyn, IL 60137
Training, January '85.
This six-hour, cassette-based training course introduces the fundamentals of Apple computing. $57 for DOS 3.3 version, $39.95 for ProDOS.

Knoware
★
Knoware, 301 Vassar Street, Cambridge, MA 02139
Training, December '84.
A series of games that introduces you to various types of applications software. $95.

Learning with Fuzzywomp
★★
Sierra On-Line, 36575 Mudge Range Road, Coarsegold, CA 93614
Education, November '84.
Four different games teach 3- to 6-year-olds the rudiments of counting and number recognition. $29.95.

MathMaze
★★★
DesignWare, 185 Berry Street, San Francisco, CA 94107
Education, December '84.
Fun games help youngsters master the four basic arithmetic operations. $39.95.

Multigraph
★★★
Micro Lab, 2699 Skokie Valley Road, Highland Park, IL 60035
Business graphics, December '84.
A useful tool for creating line, bar, and scatter graphs with your Apple. $150.

Music Construction Set
★★★★
Electronic Arts, 2755 Campus Drive, San Mateo, CA 94403
Music, December '84.
A great program that lets you compose and play music on your Apple computer. Can also be used with a Mockingboard. $40.

M-ss-ng L-nks
★★★
Sunburst Communications, 39 Washington Avenue, Pleasantville, NY 10570
Educational game, December '84.
Fill in the blank letters in passages from children's literature. A fun exercise in language skills. $39.95.

Number Farm
★★★
DLM, 1 DLM Park, Allen, TX 75002
Education, December '84.
Old McDonald helps preschool youngsters learn to count. $29.95.

Omnis 2
★ ★ ★
Organizational Software Corp., 2655 Campus Drive, Suite 150, San Mateo, CA 94403
Data base, January '85.
A mid-range data-base manager that has some powerful search, form-letter, and report capabilities. $195.

Pascal Utility Pack
★ ★ ★
Mach 2 Software, 106 Fairfax Building, 43rd and Locust Streets, Philadelphia, PA 19104
Utility, January '85.
This package of utilities for UCSD Pascal gives you access to lo-res graphics, special I/O functions, and many other functions normally beyond the reach of Apple Pascal programmers. $24.95.

People Management
★
CBS Software, 1 Fawcett Place, Greenwich, CT 06386
Training, December '84.
This package helps you develop the skills you need to manage people. $79.95.

Person-to-Person
★ ★ ★
Trutec Software, 1700 Solano Avenue, Berkeley, CA 94707
Communications, November '84.
A quick and easy communications software package. It includes an address and phone number data base. $69.95.

Picture Writer
★ ★
Scarborough Systems, 25 North Broadway, Tarrytown, NY 10591
Graphics, November '84.
A drawing program for youngsters aged 4 to 14. Requires a joystick or a KoalaPad. $39.95.

The Return of Heracles
★ ★ ★
Quality Software, 21601 Marilla Street, Chatsworth, CA 91311
Adventure, November '84.
You assume the identity of an ancient Greek hero in this new fantasy role-playing adventure. Succeed, and you too can become a hero of song and story. $32.95.

Seastalker
★ ★ ★ ★
Infocom, 55 Wheeler Street, Cambridge, MA 02138
Adventure game, December '84.
Another winner from Infocom, this aquatic adventure is a great introduction to the world of text adventures. $39.95.

Songwriter
★ ★ ★
Scarborough Systems, 25 North Broadway, Tarrytown, NY 10591
Music, November '84.
Songwriter lets children and adults compose their own melodies and play them on the Apple. $39.95.

Story Maker
★ ★ ★
Scholastic Software, 730 Broadway, New York, NY 10003
Education, January '85.
This program lets you write and edit a story, and illustrate it with pictures provided on disk. Designed for young authors aged 8 and up. $39.95.

Sweet Shoppe
★ ★ ★
Eric Software Publishing, 1713 Tulare, Fresno, CA 93721
Education, January '85.
By using a joystick for all input, this basic number-skills package is designed for children who have yet to master the computer keyboard. $39.95.

Time Tunnels
★ ★ ★
Reston Publishing Company, 11480 Sunset Hills Road, Reston, VA 22090
Arcade, November '84.
It's you against the mutants in this fast-action, hi-res arcade game. Joystick required. $25.

Word Challenge
★ ★ ★
Hayden Software, 600 Suffolk Street, Lowell, MA 01853
Game, November '84.
The best word game available for the Apple. This game provides hours of challenging fun. $39.95.

The Write Stuff
★ ★
Harper & Row Publishers, 10 East 53rd Street, New York, NY 10022
Word processor, December '84.
A word processor that uses virtual memory to create larger documents than you can with some of its low-cost cousins. $59.95.

Xyphus
★ ★
Penguin Software, P.O. Box 311, Geneva, IL 60134
Adventure game, January '85.
A good introduction to the fantasy/role-playing genre. If you're befuddled by Wizardry, try Xyphus first. $34.95.

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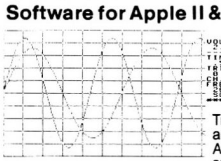

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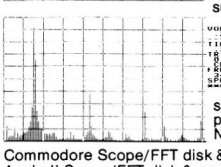

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ALF AD8088 Processor Card
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ALF Products, 1315-F Nelson Street, Denver, CO 80215
Coprocessor, December '84.
Speed up math functions on the Apple and develop software for MS-DOS machines with this 8088 coprocessor card. A companion card in the works will permit you to read MS-DOS disks. $345.

Centronics H80
★★
Centronics Data Computer, 1 Wall Street, Hudson, NH 03051
Printer, November '84.
The company that set the standard in parallel printer interfaces has produced a quality dot-matrix printer of its own. $699.

Cricket
★★★
Street Electronics, 1140 Mark Avenue, Carpinteria, CA 93013
Speech synthesizer, December '84.
A ProDOS-based speech/music generator for the //c. It also includes a clock, and can work with 128K //e computers that have a Super Serial Card. $179.95.

DuoDisk
★★★
Apple Computer, Inc., 20525 Mariani Avenue, Cupertino, CA 95014
Disk drive, December '84.
The DuoDisk consists of two low-profile disk drives in a single, integrated package. Works with DOS and ProDOS on the Apple II, II Plus, and //e. $729.

Era 2
★★★
Microcom, 1400A Providence Highway, Norwood, MA 02062
Modem, December '84.
A modem and software combination that supports 110-, 300-, and 1200-baud communications. A powerful package. $499.

Gibson Light Pen
★★
Koala Technologies, 3100 Patrick Henry Drive, Santa Clara, CA 95050
Graphics, November '84.
A complete graphics system that includes painting, drawing, animation, and music, using a light pen. $249.

JX-80
★★★
Epson America, 3415 Kashiwa Street, Torrance, CA 90505
Printer, January '85.
The JX-80 is a dot-matrix printer that provides 160 cps (characters per second) speed, programmable characters, proportional spacing, and seven colors (with 80 different shades). $800.

McMill 68000
★★
Stellation Two, P.O. Box 2342, Santa Barbara, CA 93120
Coprocessor, January '85.
If you want to learn how to program the MC68000 microprocessor, the McMill 68000 board will provide you with the tools you need. $229 ($299 with assembler).

Pro 100 Keyboard
★★
Amkey, 220 Ballardvale Street, Wilmington, MA 01887
Keyboard, November '84.
A replacement keyboard for Apple II and II Plus computers. Includes function keys and a numeric keypad. $295.

RGB Interface
★★★
Video-7, 12340 Saratoga Sunnyvale Road, Saratoga, CA 95070
Monitor interface, December '84.
With this device, you can hook your Apple //c to an RGB monitor. Includes a nifty demonstration/utility disk. $199.95.

Soundmaster II
★★
Kearsarge Industries, 12310 Pinecrest Road, Reston, VA 22091
Sound synthesizer, November '84.
A very good product for enhancing the sound capabilities of your Apple. It isn't yet supported by third-party software vendors. $119.95.

Voice Box III
★★
The Alien Group, 27 West 23rd Street, New York, NY 10010
Speech synthesizer, January '85.
This is a very good speech synthesizer, but hampered by poorly produced documentation. $129.



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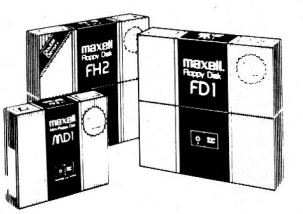

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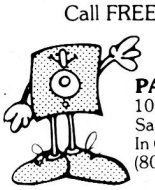

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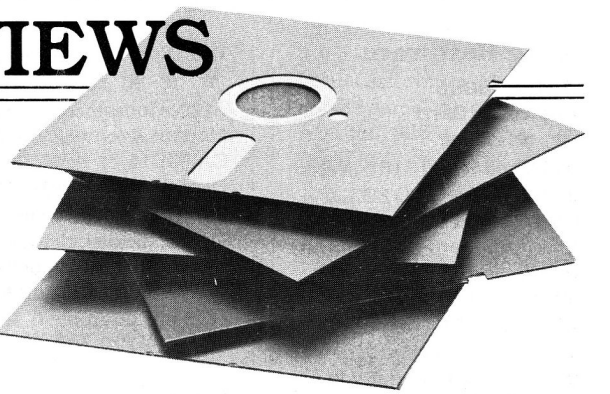
SOFTWARE REVIEWS



inCider's Ratings

★★★★ Superlative
★★★ Above average
★★ Good
★ Not recommended
Stay away

Spell It!

Davidson & Associates
6069 Groveoak Place
Rancho Palos Verdes, CA 90274

Spelling games
$49.95

★★★

Spell It!, much like the traditional spelling bee, injects excitement into the tedious task of memorizing lists of vocabulary words. Students from the elementary grades to high schoolers studying for college-entrance exams can benefit from the program, which combines four individual modules: See It!, Practice It!, Unscramble It!, and Spelling Frog.

The Spell It! package contains program and data disks and a 65-page manual, the last 40 pages of which duplicate the words on the data disk. The first 25 pages, however, are thorough and helpful in explaining program options and how to use the editor to create word lists.

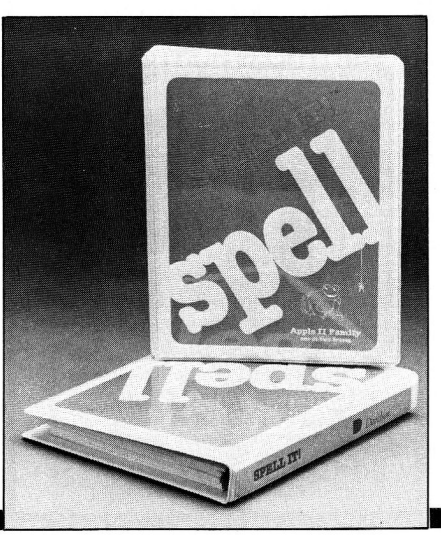
The program begins by asking the student to make several choices regarding presentation. He or she may choose regular or bold print, whether or not to use the sound effects, and the word list difficulty level (novice, intermediate, advanced, champion, or grand master).

The documentation advises students, when working with a new word list, to begin with See It!, which is really the core module of the whole program. See It! displays a correctly spelled word at the top of the screen. (If the word contains more than one syllable, it is broken into syllables on a subsequent line). Then the student must fill in the vacant space in a context sentence using the new word.

In the Practice It! activity, a word flashes on the screen, and the student must type it as it appeared. The student controls the length of time a word is displayed, from a quarter-second (very fast) to five seconds (an eternity).

In both the See It! and Practice It! modules, the student receives a score based on the number of words spelled correctly on the first try, and then can retake the missed words. (This is the extent of Spell It!'s scoring and tracking capabilities, which limits its usefulness in a classroom.)

Unscramble It! is a challenging game for one or two players. The screen is divided into nine boxes, A through I. When you choose a box, it fills with color, and the computer presents a scrambled word to decipher. As the student types, letters from the scrambled word at the top of the screen are inserted into the box. If the student types the word correctly, the box flashes and points are awarded. Bonus points can be earned depending on the pattern of correct answers, so some strategy is involved.



The Spelling Frog module is an arcade-like finale that reinforces learning from the other modules. With direction from the student, the animated amphibian leaps to gobble up correctly spelled words from among choices that include similar, but misspelled, words.

Though Spell It! comes with a data disk of "the 1000 most frequently misspelled words," it also features a simple-to-use, yet powerful, screen editor that allows the teacher or parent to create new word lists or change the old ones. Lists of five to 20 words can be created.

By providing four very different learning activities, Spell It! attempts to accommodate varying learning styles. It puts the student in control, allowing him or her to choose the most attractive activity. Hitting the escape key enables the user to leave an activity at any time and pick another activity or word list, without rebooting the program. These features, combined with provision for creating and editing word lists, makes Spell It! a valuable program for teachers and parents to aid and motivate individual students. ■

Paul DiBara
Rockland, MA

Management Diagnostic Series

Thoughtware
2699 South Bayshore Drive
Coconut Grove, FL 33133

Management training series
Ten volumes for any Apple II
$350–$450 each

★

George Steinbrenner isn't the only one searching for the perfect manager. Corporate leaders everywhere are constantly on the lookout for people who can use time effectively, set goals, manage stress, motivate others, delegate responsibility, conduct productive meetings, and, in general, get the job done.

The breed, however, is rare, a fact that keeps corporate headhunters in business and the Yankees in the headlines. Occasionally, though, individuals possessing these characteristics are already within the fold, needing only to be discovered, enlightened, and motivated as to the specific techniques and strategies that make for effective management.

With this in mind, Thoughtware of Coconut Grove, Florida, has created the Management Diagnostic and Management Training Series, a ten-volume set of computer-based evaluation and training programs designed to assess and improve one's knowledge and application of management methods. Three of the ten volumes cover management diagnostics, and the remaining seven, management training. System requirements are any Apple II, monitor, and one disk drive; a printer is optional.

The first volume in the series is "Assessing Personal Management Skills. Version 2.0" (although the disk labels read Version 1), which consists of three disks and a manual bristling with worksheets, follow-up exercises, and recommended readings. Each disk contains a separate unit: "Managing People to Achieve Results," "Applying Management Methods," and "Increasing Your Own Effectiveness."

After booting, you enter your name and step into the shade of the "Thoughtree" (pronounced *thought tree*), something the manufacturer defines as a ". . .graphic approach to understanding and accessing the contents of the program," but which the rest of us call an organizational chart, that is, interconnected boxes with numbers in them. Call it what you will, it gets you into the program. Your choices are Instructions and Program Description, the Unit itself, or Exit. The first choice, or unit one, consists of subunits assessing Leadership, Motivation, Teamwork, and Feedback. Under Leadership, two sub-subunits, Style and Strategy, are offered; the subunit Motivation breaks down into Motivational Factors and Motivating Subordinates.



Thoughtware's Management and Training Diagnostics series.

You make your choice, and the assessment begins with a discussion of basic management principles. Effective management, for example, requires you to be a competent leader, a motivator, a team builder, and feedback provider. Next, you are presented with a series of statements and asked for your response. Following this, you receive a brief on-screen evaluation: "Genghis, you have a high concern for task and a low concern for people. The most effective leader is one who combines concern for task with concern for people. It seems you would benefit from further work on increasing your concern for people."

This discussion-response-evaluation method does not vary greatly throughout the rest of the volume. Along the way you sit in on meetings, assess strategies, and compare your responses to a national sampling of managers and subordinates. Occasionally, you encounter genuinely thought-provoking questions: "In surveys conducted nationwide. . .managers typically rate themselves higher than their subordinates rate them. How do you think your subordinates would rate your performance as a leader? Why do you think managers rate themselves higher?" I wouldn't want to be anywhere near the water cooler when that one comes up!

The program's strength lies in its versatility. Well-designed and easy to operate, it can be used at various levels of an organization, either by itself or as a supplement to existing management-training programs. Another plus is that material learned at the keyboard is immediately applied to the individual's specific job situation. Follow-up exercises and action plans for improvement also contribute to the program's long-term usefulness.

Graphics quality is inconsistent, however, ranging from full-screen hires images of talking heads, to the kind of silhouette figures and three-dimensional bar graphs often seen in annual reports and sales meeting slide shows.

My main criticism concerns the program's speed: it's painfully slow. After you enter your name and press the return key, it takes more than 25 seconds for the screen to change. Screen wipes occur at a snail's pace, and the program returns to disk almost every time you press a key—unacceptable for a program costing $350.

Another problem is the length of time required to print your results. The display on screen-page 54 says it takes approximately ten minutes to print the results of unit one's seven brief assessments. I assume that's for a dot-matrix printer, as it took a full 13 minutes with my letter-quality Transtar 120. That's a serious flaw, for it's likely to inhibit one from exercising this valuable option. ■

Wayne J. Sassano
Wethersfield, CT

Jane

Arktronics
113 South Fourth Avenue
Ann Arbor, MI 48104

Word processor, spreadsheet, and list manager
Any Apple II, 64K
$179
$295 with a custom mouse for the //e

★★

Jane is dubbed an (here's that magic word) *integrated* program, but the fact is, Jane is very plain. It combines word-processing, spreadsheet, and mailing-label functions, but unfortunately some limitations built into each section handicap Jane's performance in the real world.

Like the Macintosh computer, Jane's functions are directed by selecting icons, such as a typewriter icon to choose word processing. To use Jane then, you need a mouse, a joystick, or a KoalaPad.

Jane's 236-page manual is easy to understand and includes many helpful illustrations. A 59-page tutorial details each of Jane's three major applications. The program comes with three color-coded disks: its main program disk, a sample data disk, and a help disk.

Jane lets you use "windows" (up to four at any time); you can enlarge or reduce the windows and move them around on your screen. You can cut (with a scissors icon) or copy (a camera icon) information from one application and then put the information (a paste jar icon) into another application. The icons make it easy to move things from one spot to another in the same document, too.

A stop sign icon is always on your screen, and when selected, the stop function closes all the windows and saves your current file. Disk functions (to lock or rename a file, for instance) are also all completed through the use of icons.



Jane processes words, lists, and spreadsheets.

Janewrite

Jane's word processor is a bit better than average. It boasts that it prints what you see on the screen, and to some degree that's correct. The system can handle up to 25 pages of text in memory at one time, and the icons make it easy to set margins and other page information. Text editing and insertion are simple.

The major drawback of Jane's word-processing function is its use of Apple's hi-res graphics for text characters. They are not as clear as those produced by word processors that use an 80-column card. If you type in data in standard-sized characters, you can't see the entire text on the screen. When you reach the right edge of your text, the program hesitates and rewrites your screen display. This distracting delay slows text entry and can cause character loss. You can avoid this by switching to smaller characters that are, nonetheless, hard on the old eyes.

Once you reach the bottom of your working area, Jane rewrites the screen as you finish each line. The visual chaos confuses the mind as well as the eye. On a better note, the program lets you search and replace and justify your text. It also shows on-screen underlining, boldface, and sub- or superscripts.

Janecalc

Janecalc is a miniature spreadsheet: only 19 columns wide by 24 rows high for a total of 456 cells. (A standard spreadsheet like VisiCalc provides more than *16,000* cells.)

Usually a spreadsheet takes on new dimensions with a mouse, but with Janecalc I learned that a mouse isn't necessarily helpful. When you reach a boundary on your worksheet, this program rewrites the screen to match your new location. Any speed you gained with the mouse is lost. Another problem is that Janecalc doesn't highlight your current cell, so it's difficult to determine exactly at what you're pointing. I also tried the program with a joystick and found it an exercise in frustration. If you buy Jane, use a mouse.

Jane's spreadsheet includes only a few functions: sum, average, count, minimum, and maximum. Data or text can spill into following cells—useful for labels and other text information. You can't vary the column widths or adjust the formats of your numbers.

One of the more powerful spreadsheet functions missing from Jane is *replication*, which lets you enter a formula in one cell and then replicate (or copy) it into a range of cells. With Janecalc, you must construct your worksheets one cell at a time.

Janelist

The mailing-list program comes with two preset formats: one for business records and another that duplicates a personal address book. You can create your own designs for your filing "cards," too. Each card can have up to 250 characters of information; an in-

dividual field can hold up to 25.

Janelist is below average as a mailing-label generator, because you can't select the labels you want to print, such as all labels from one state. When you ask for hard copies, it prints every label.

Janelist does allow a screen search. Its search function isn't case-sensitive and lets you use two different types of wild cards to find partial matches. Each search pattern is an AND search: you can search on more than one field, but all criteria must match for Janelist to find the data. Once it finds a match, it displays the card. Janelist must figure that once it finds one card, that's the only card you'll want to locate, since, to continue the search, you must retype your criteria and ask the program to continue looking.

Changing or editing your information is easy, and Janelist can sort its cards on any field you select.

If you try to enter more information into a field than the program expects, it won't accept the extra data (good) but doesn't beep to let you know (bad).

Worth Buying?

Jane is integrated in the sense that data can be transferred from one part of the system to another. In most cases, you'll send information *from* the spreadsheet or mailing-list program *to* the word processor. (It's unlikely that you'd enter much text into your spreadsheet or send a letter to your address book.) I suppose you might write a letter and want to save the name and address in the filing system, but by the time you select the text that you want to move, "take a photo" of it, load Janelist, and "paste" in the data, you could have done it by hand—perhaps twice.

Because the spreadsheet and mailing-list sections of the program hold most of the data that you'll want to move, those functions should be powerful. And that's precisely where Jane runs into problems: The spreadsheet is only marginally more functional than a hand calculator, and by the time you ask the mailing-label application to search for and find an address and send it along to the word processor, it would have been faster (and almost as easy) to flip through a card file. This is an example of the kind of task a computer can perform, but not necessarily better than you could do by hand or on paper.

Jane is worthwhile for home use, where you may want to transfer some calculations into a letter or if you'd like to have an electronic address list. But there simply isn't enough power in the system for any business applications that require true integrated strength. ■

Gregory R. Glau
Prescott, AZ

Investor's Workshop

Dow Jones & Company
P.O. Box 300
Princeton, NJ 08540

Investment manager
Modem recommended
$149

★★★

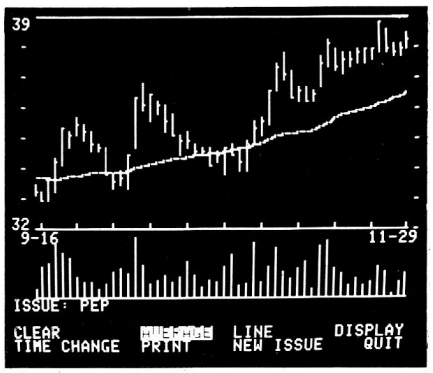
Investor's Workshop, a new release from Dow Jones and recognized by Apple Computer as a featured product for the //c, is impressive software that performs three relevant tasks for investors: portfolio management, stock charting, and terminal program emulation. The program also works perfectly with the Apple II Plus and Apple //e computers, with either one or two drives.

Basically the Investor's Workshop updates the value of your portfolio automatically (from Dow Jones News/Retrieval or your own information), generates reports of profits and losses, charts stocks for analysis, and accesses Dow Jones News/Retrieval for business news and general information.

In keeping with the Apple //c theory of simplicity, the Investor's Workshop manual is designed to help you master the program as quickly as possible; it consists of six concise sections.

Suggested hardware includes one or two disk drives, modem, and printer. An Apple Modem or Hayes Smartmodem are the only ones that can be dialed automatically by the program. You need an Apple Imagewriter to print stock charts with an Apple //c, but any printer with an intelligent interface will print charts with an Apple II Plus or //e.

The package comes with only one program disk, the Investor's Workshop System Master Disk. The disk



Workshop's chart of stock volume, price, and average.

isn't copy-protected—a rarity for Dow Jones software—so backups aren't a problem. You must supply two blank disks for use as a "portfolio" disk and a "text" disk.

All portfolio transactions are recorded in a master list on your portfolio disk. The disk holds (1) up to 80 transactions and (2) data for charting up to 25 stocks for a total of up to 80 symbols.

The "new transaction" menu option lets you enter new purchases, short sales, or non-security assets. All new transactions are considered "open," until they are closed with an offsetting transaction.

When entering a new transaction, you are prompted for the symbol, type of security, buy or short sale, number of shares, date of purchase, total cost, commissions, dividends, and the expiration date if you are dealing with a bond or option. A single-character I.D. can be entered to name the portfolio.

"Low price," one of two optional entries, lets you set a target *below* the current price that will be indicated in a report when the security falls below this level. This is helpful for setting stop-loss orders. The "high price" option does the same thing with a target price *above* the current price.

The Charting mode lets you construct high, low, close, and volume bar charts with stock data collected from Dow Jones News/Retrieval or data you enter yourself. The portfolio disk is used when charting stocks. Once a chart is constructed, you can plot moving averages and trend lines for further analysis.

The Investor's Workshop is compatible with the Dow Jones Market Analyzer, a popular stock-charting program.

The Market Analyzer disk, however, must never have held more than 25 stock histories. If your Market Analyzer data disks meet this requirement, it will save you the time and expense of setting up a new stock data base. Also, the Investor's Workshop plots charts much faster than the Market Analyzer, although it isn't capable of performing such complex technical analysis.

The EZ Terminal mode lets you access all the data bases at Dow Jones News/Retrieval. The data received is called "text" and can be saved to disk for future viewing and printing. This helps to keep access charges to a minimum. Data that comes from Dow Jones in 40 columns can be reformatted if your Apple has an 80-column display. The "text" disk is used in the EZ Terminal mode.

The Investor's Workshop offers great value for $149, which is less than half the price of an average Dow Jones software package. If the bottom line is "buy" or "sell," then buy.■

Richard Fuccillo
Groton, MA

Gelfling Adventure

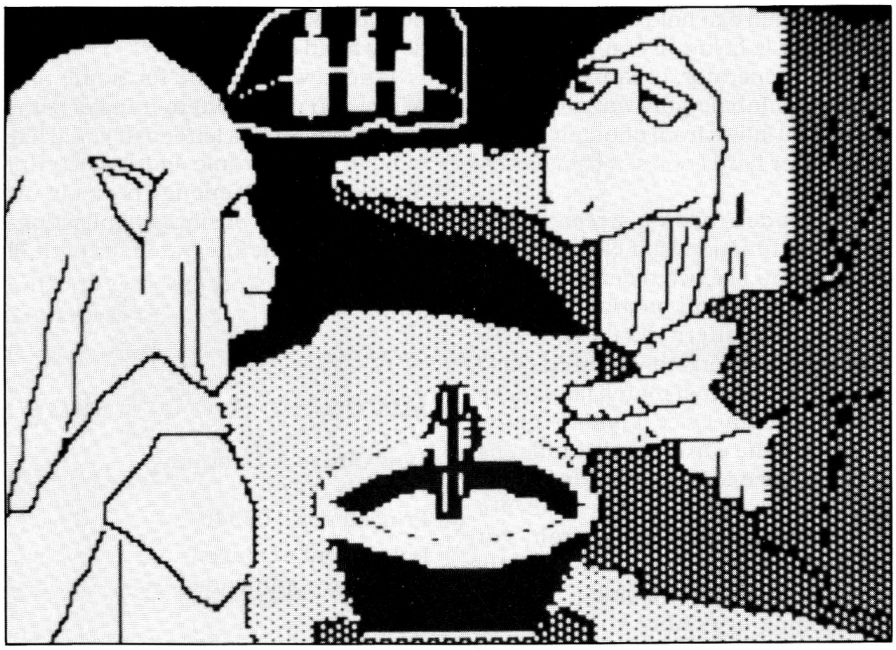
Sierra On-Line
P.O. Box 485
Coarsegold, CA 93614

Illustrated adventure
$50

★★

Perhaps you're familiar with the world of the Dark Crystal from its appearance in movie theaters and as a computer game a year or so ago. Gelfling Adventure is a less complex version of the game for young players. The child takes the role of the hero Jen, whose task it is to locate a missing shard of crystal rock stolen long ago by the captors of his people, and by restoring the shard to free his people from domination.

One of the big differences between Gelfling Adventure and Dark Crystal is that in the junior version it's not necessary to type in commands. All the player must do is press the space bar to move the flashing cursor to choose an option, then press return. There are also fewer objects to find in Gelfling Adventure. Sounds simple enough, you say? Simple, yes—but educational, too.



Follow Jen in Gelfling Adventure.

Gelfling Adventure furthers children's reading skills and encourages them to remember details, such as whom and what to avoid, whom to trust, and whom to turn to for help. Also, the technique of making choices to issue commands encourages youngsters to ask themselves, "I wonder what would happen if. . .?" and to draw conclusions.

Sierra understands that some children find map-making difficult, so they've included an illustrated map of the world of the Dark Crystal. A compass decal the parent or teacher can stick on the monitor near the screen complements the map.

Also included in the package is a Gelfling Glossary that describes the various creatures and objects Jen and the young player will find along the way. It comes in handy as a preview or when the child can't remember whether the creature that has just appeared is good or evil.

Gelfling Adventure does have a couple of drawbacks. One is that you can't save a game to resume it later. Also, sometimes if you move in the wrong direction, you are immediately captured by hidden guards and the game ends abruptly. Then rebooting and starting all over again is the only recourse. If this happens once, it's no problem, but after four or five times it gets annoying. Of course, the trick is to remember where the guards lurk, but it takes time for a youngster to get the hang of that.

Aside from these two shortcomings, Gelfling Adventure is an enjoyable as well as educational game. I would recommend it for the 9–12 age range. Younger children are not likely to have the thinking skills required, and older ones will want more challenge.■

Linda Beaulieu
Ansonia, CT

ProfitTaker

Investment Growth Corporation
Suite 4
1430 West Busch Boulevard
Tampa, FL 33612

Commodities trading
$795

★★★

Unless you understand the commercial significance of pork bellies, the Japanese yen, or sugar #11, you may want to skip this review. ProfitTaker is a highly sophisticated, tightly planned software package for the serious commodities trader. It is a fair investment in itself, but the value of incorporating the experience of Louis B. Mendelsohn into your system can-

not be overestimated—he is a widely respected expert in the use of computers for trading in financial markets, with a definite skew toward the arcane art of commodities trading.

Investment Growth Corporation has approached the subject by providing, in fact, two programs. The first, ProfitTaker, can be purchased alone (Apple hard-disk version $895, floppy $795), or the second package adds a program called ProfitAnalyst (hard-disk version $1795, floppy $1495).

Since access to an on-line data base is always useful for any stock market trading, the publishers recommend use of Commodity Systems (Boca Raton, Florida), a supplier of commodity performance data. While CSI's data can be ordered and received by mail, it also has an on-line service for microcomputer owners, accessed by using the communications program Quicktrieve, which CSI also supplies. ProfitTaker and ProfitAnalyst don't support direct communications, but are designed to look for data disks created under Quicktrieve. (Manual entry is, of course, also possible.)

The base program, ProfitTaker, has a comprehensive tutorial that explains how the program will be used—but if you don't understand commodities trading, don't expect this tutorial to teach it. Unlike some programs (admittedly in less complex areas), ProfitTaker assumes that you know the business. By page 6 of the tutorial you are presented with such jargon as "oscillators of short and long term directional indicators" and "momentum timing filter." This is not a criticism, but a warning to newcomers: Get your education on the art of commodities trading elsewhere, and then ProfitTaker will be able to help you.

With ProfitTaker, you can introduce into the analysis your own particular trading style, a factor missing from the so-called "black box" software, which in effect says "buy" or "sell" but excludes you from the underlying theories and principles involved.

But that is not the important reason for the personalization possible in ProfitTaker. One of the critical factors in commodity trading is one's "intestinal fortitude." Each trader's ability to handle risk, pressure, *and* financial losses is different, and any program with parameters set for one style and attitude could not possibly suit everyone. Mendelsohn has recognized this, and as the manual warns, some of the technical indicators in the program must be modified to suit the individual, as they may "involve trading performance that might be unacceptable to you."

"Access to an on-line data base is always useful for any stock market trading."

The way to test (or perhaps even establish) your own trading style, by actually experiencing the possible results, is to use ProfitAnalyst, the other program offered by Investment Growth Corporation. It gives you the opportunity to test suppositions, theories, and even hunches on actual historical data. It can test and compare your particular trading system with the real world.

These programs are excellent, and they certainly come from an organization that has all the credentials for at least presenting the right tools for an investor. Yet for software of this importance and price, there is no excuse for a dot-matrix, mimeographed manual full of errors in spelling and grammar. The program is copy-protected with a hardware chip that goes in the paddle port of the Apple, and the publisher has been kind enough to allow the futures investor/game-freak to branch the port so that the paddles or joystick can coexist with the coded chip.

Until someone introduces a category of commodities called "rare chips" or "data bases," this reviewer probably won't attempt futures trading. But I do find comfort—borne out by discussions with people who do trade futures—in the fact that the Investment Growth Corporation packages can be of great help in managing and planning for investments in this volatile market. ■

Archie Mason
Stamford, CT

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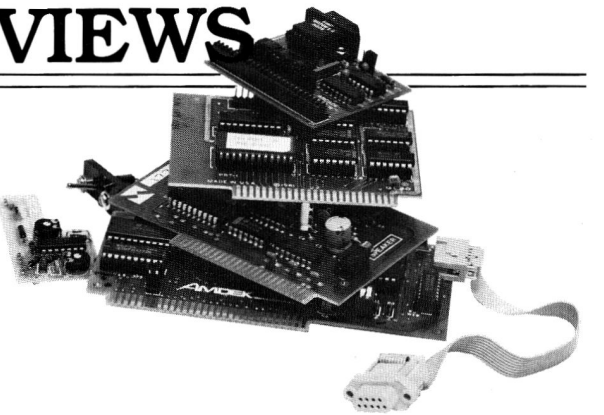
HARDWARE REVIEWS



inCider's Ratings

★★★★ Superlative
★★★ Above average
★★ Good
★ Not recommended
Stay away

Personal Speech System

Votrax
500 Stephenson Highway
Troy, MI 48084

Speech synthesizer
$395

★★

You don't have to wait for the 21st century to take advantage of speech synthesis. Votrax has designed Personal Speech System, a better, more powerful device than its earlier release, Type 'n' Talk. But the Personal Speech System doesn't come with software. You must write your own or run commercial programs that output to a printer.

An Apple II, or any computer with RS-232 serial or Centronics-type parallel ports, can easily hook up to the system. Just choose the right cable and you're in business.

Standard features include a parallel and a serial interface card, a 3500-character buffer, and an internal speaker. The rear panel sports an external speaker jack, a 5-pin DIN power connector, an on/off button, and eight configuration DIP switches. The Personal Speech System measures 12¼ inches by 5¼ inches and weighs a mere 2½ pounds. It's actually portable!

The Personal Speech System operates according to the *synthesis-by-rule* method, which offers greater flexibility than other speech synthesis techniques because of its unlimited vocabulary. The only drawback is that synthesis-by-rule often produces less understandable speech output than other methods.

The Spoken Word

For speech data, the Personal Speech System accepts text or phonetic input. Inflection, amplitude, and rate of verbalization can be controlled independently. Non-speech functions include music, sound effects (white noise is possible), customized alarms, and a programmable clock.

For the Personal Speech System to speak, it requires text programmed like output to a printer:

```
10 PR#1
20 PRINT "Votrax does it right."
30 PRINT "It took him two hours to write
   this program."
```

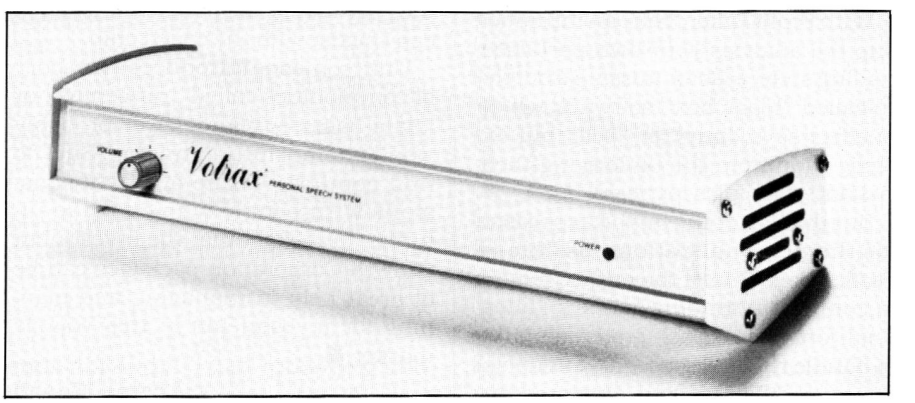
The Personal Speech System also "verbalizes" games such as Pirate Adventure and Voodoo Castle for a new dimension to adventuring.

The SC-01 synthesis chip can generate 64 phonemes, the building blocks of language. Input the phonetic sequences as standard ASCII characters. Approximately 1400 English words and their phonetic equivalents reside in the speech dictionary. Couple this with the phoneme-ASCII table and you're set. Phonemes permit crisper speech and (usually) faster response than straight ASCII text, since the data doesn't have to be translated prior to output.

Non-alphabetic, printable ASCII characters, such as the tilde, question mark, and exclamation point, serve as command and control characters. The system treats others ($, &, %) as spoken punctuation marks.

Skilled use of the inflection, rate, and amplitude commands fine tunes the verbal output. All it takes is a little practice.

Other commands in the voice and in the music generator change the data transmission rate (in predetermined



The Personal Speech System improves your Apple's vocabulary.

steps) from 75 to 9600 baud, create an amplitude envelope for non-speech generation, and alter filter settings to generate various sound and voice effects. You can define the attack and decay rates, as well as the sustain and release levels of the three channels, independently with the envelope feature. There's even an attack delay option.

With only a few keystrokes, you can load and execute the exception word table. Prompts (toned-down alarms), noise generation, and tempo are other easy-to-master features made more flexible by the wait (delay execution) command.

The Personal Speech System is a misleading moniker because it can generate musical tones, too. Far superior to the Apple's meager bleeps and blips, the Personal Speech System chimes in with 96 notes from three independent sound channels.

Documentation

A vinyl, three-ring manual contains system particulars, operating commands, and instructions. A separate quick reference card and Phonetic Speech Dictionary are also included. The manual, though generally well-organized and informative, does, however, offer pitfalls to first-time users. The non-speech output examples are listed with creating speech by programming in BASIC, but nowhere is this stated. You must remember to include PRINT commands and both sets of quotes whenever you want audible output.

The manual also doesn't specify which serial and parallel cards the system interfaces with. According to Votrax, the unit won't work with all cards, even after you adjust the DIP switches. The best thing to do is ask the dealer to demonstrate the system (with the same card you use) before purchase. (Good news: The standard Apple parallel printer card works just fine.)

Informative appendices include adjusted spelling examples (elocution exceptions), a phoneme conversion chart, error code listings, a musical note chart, cable wiring diagrams, DIP switch settings, and BASIC programming examples. Default settings, Z-80 memory and input/output maps, and a hex-to-decimal conversion listing comprise the remaining tables.

Other hardware devices can create more lifelike speech than the Personal Speech System, but they cost ten times as much. Considering affordability and performance, the Personal Speech System is unbeatable. ■

Ted Salamone
Bridgeport, CT

The Digital Paintbrush

Computer Colorworks
3030 Bridgeway
Sausalito, CA 94965

Graphics package
$299

★★★

The Digital Paintbrush is an innovative and easy-to-use graphics design package based around a unique hardware interface. Powerful enough for software developers and business people, the system is also affordable enough to appeal to hobbyists.

An alternative to complex graphing commands, the special electronic "pen" lets you draw graphics freehand, displaying the image on the screen. Two nylon cords connect the pen to the 8-by-11½-inch Digital Paintbrush module. The other end of each cord attaches to an internal, spring-loaded wheel, keeping the tension on the cord light at all times. Sensors inside the module monitor the position of the pen as it moves across the drawing area in front of the main unit, and then pass this information along to the computer.

A single cable, fed through the back panel of the computer and attached to an internal joystick/paddle port, connects the Digital Paintbrush to the Apple. Unfortunately, the cable's connector is too large to fit through the joystick openings on the back of some //e's and must be routed through the opposite end of the case.

The Digital Paintbrush includes utility programs dedicated to the production, storage, and display of graphics images. The heart of the system is the graphics design program itself, which liberally uses selection menus and icons. In its simplest form, the program lets you draw as you would with pencil and paper. Pressing the pen down activates a small internal switch and initializes drawing. A second switch mounted on the side of the pen brings the command menu into and out of view as desired.

When you want to get a bit fancier, menu selections let you change the size and shape of your electronic "brush," or choose a drawing color from solid colors or mixed color patterns. Going further, you can produce rectangles and circles of almost any size, and fill the finished shape with any of the available colors or patterns. Additional features produce a straight line between two points, generate curves from a series of points (especially helpful in constructing graphs and charts), and display an on-screen grid size while creating a picture to help keep proportions correct.

Though easy to learn and use, the system nevertheless has several limitations. For example, you can trace a drawing by placing the original under a clip and following the edges with the pen, but this technique is far from precise. Small details on a drawing are almost impossible to follow accurately. Part of the problem stems from the cords being mounted about ¼ inch above the tip of the pen; any change in the pen's angle can cause distortion in the drawing.

In addition, the excessive downward pressure required to activate the pen tears thin paper. I found it easier and more precise to follow a drawing's on-screen progress rather than rely on the pen's physical position.

Special Features

Perhaps the most unique part of the Digital Paintbrush system is its telephone graphics program. By using two Apple computers equipped with modems and connected through telephone lines, interactive drawing is possible: Changes made on one end of the line are reflected on the other end as well, a useful application particularly in field engineering, where changes in design can be discussed and graphically depicted over the telephone. Another application, a real-time record of the drawing process, re-creates the exact steps used in making or modifying a drawing.

The Digital Paintbrush package includes utility programs on disk. One routine determines the area of an en-

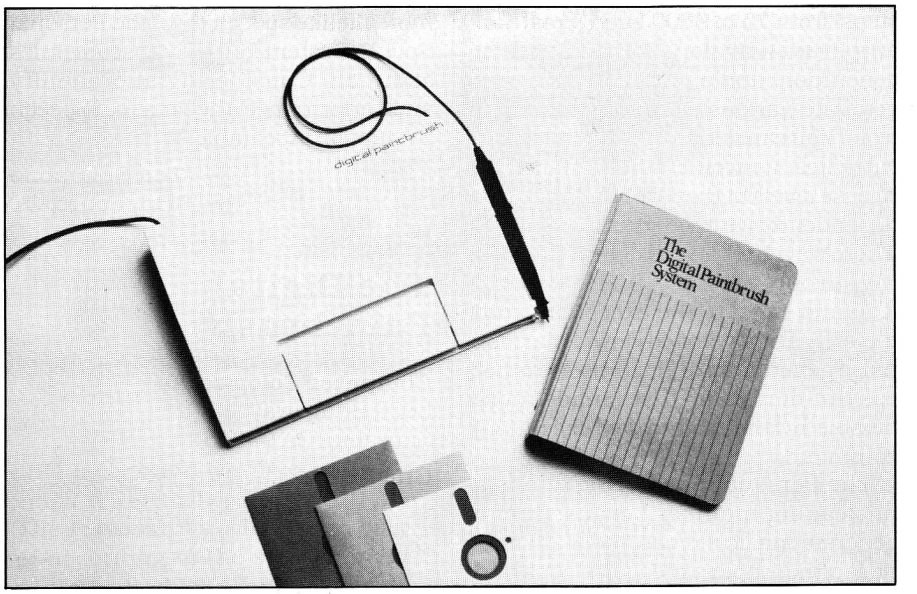
closed shape calculated in a unit of measurement you specify. This is useful in job estimation and statistical analysis. A second routine, the Graph Grabber, lets the Digital Paintbrush load and process illustrations created by PFS:Graph.

The Digital Paintbrush system supports 35 of the most popular printers, over 25 different interface cards, and includes a print utility program that can print your finished graph as hard copy even with a standard printer interface. It also displays images one after another, individually or sequentially, like a slide show, with each image staying on screen from three to 99 seconds.

The system also features a selection of font styles for use within the graphics design program, including a complete set of icons. Finally, the package includes several files of ready-to-use images that can be used in graphics designs.

The documentation included with this system is quite thorough and professionally produced. Serving as an instruction and reference manual, the 8-by-9-inch binder is informative and easy to follow. It contains chapters devoted to each part of the system and a very helpful section about designing effective business presentations. ■

W. Charles Doherty
South Dartmouth, MA



The Digital Paintbrush combines graphics with telecommunications.

Calmpute

HesWare
150 North Hill Drive
Brisbane, CA 94005

Biofeedback monitor
Apple II Plus, //e, //c
$99.95

★★★

Personal computers have never been more personal. Calmpute, a hardware/software biofeedback program, claims you can learn how to reduce tension by monitoring your own stress levels and following the program's suggested exercises. In essence, you can be privy to the methods behind that so-called "art" of relaxing.

The Calmpute package contains the user manual, program disk, and an external GSR (galvanic skin response) monitor. The only additional items you'll need are a 9-volt battery to power the sensor, your Apple, and, of course, yourself.

The manual presents an overview of biofeedback and the melding of computer technology with this science. It clearly and concisely explains how the body's nervous system works and responds to stress. In addition, it fully explains all of the programs contained on the disk, how to implement them, some useful tips on getting the most out of your sessions, and other pertinent information.

The key to the package is the GSR monitor. This intriguing little piece of hardware is a palm-sized plastic unit with two indented metal strips on which you place your fingers (a piece of elastic keeps the unit comfortably positioned on your hand). The 9-volt transistor battery goes inside the monitor. A cable, which runs from the unit to the Apple's joystick socket, transmits the fingers' "responses" to the computer. The human body commonly reacts to stress by variations in sweat-gland activity and pore size. These variations change the electrical resistance characteristics of the skin, and this is exactly what the GSR monitors. The computer measures and evaluates the fluctuations and levels of resistance, processes the information, and displays the results on the screen.

If the GSR is Calmpute's heart, then the eight selections from the main menu are its soul: instructions, introduction to biofeedback, physical stress test, psychological stress test, relaxation/stress management, calm-scope, calm-bar, and calm-prix.

The on-screen instructions refresh your memory and negate the need for constantly referring to the manual. At the title page of each program segment you can opt to view or bypass relevant instructions. (I really must give this program an A + for user-friendliness.)

The physical stress test provides you with a good idea of how muscular tension, physical performance, and relaxation ability affect your overall stress level. This test's activities include image relaxation, muscle flex and breathing, post-stress relaxation, and relaxation reaction time. The physical stress test should be taken in sequence without interruptions for the most accurate evaluation of your performance, and you should refrain from trying to interpret the results while actually taking the test. At its completion, a graph displays your results.

The psychological stress test illustrates how mental factors can affect your GSR arousal level, as well as indicating psychological conditioning or automatic reactions that will affect you. Besides providing meaningful insight into your psychological stress makeup, it can be fun if taken in a lighter vein. The word association section, for example, that measures emotional reactions to certain words, sug-

gests distinct possibilities as a party game, as well as giving you an oft-times-surprising look at your own psychological profile.

The stress management program provides a thorough outline of strategies that enable you to relax deeply and rapidly. Several techniques are offered, and as everyone's emotional composition is different, you're encouraged to experiment to find out which is the most effective for you.

Both the calm-scope and calm-bar segments of the program are visual plotting aids that let you see a hi-res representation of your stress levels. Several controls are provided for adjusting the sensitivity of the GSR sensor: toggling the audio on or off, centering the image, and toggling verbal relaxation instructions on or off.

The calm-scope produces a graph of your stress/relaxation levels instantaneously and shows your immediate response to persons, things, and events around you.

The calm-bar is represented by a rising and falling column that is proportionate to your stress/relaxation levels over a period of time. You can select this period to be five minutes or more.

The calm-prix is a novel segment of the program that takes on the scenario of an arcade-style auto race. The objective is to complete the course without hitting the potholes or going off the road, and this is one game where it's truly a case of mind over matter. One hand controls the cursor keys, which affect the direction of your surrogate race car, while the other hand is hooked up to the GSR sensor, which controls the *speed* of the car. It works like this: when you are calm, the car goes faster; the faster the car goes, the more difficult it is to stay on the course; the more difficult it is to stay on the course, the more tense you become; and so on. It's a vicious cycle, but it is fun.

Virtually every medical professional cites stress and hypertension as leading causes of health problems. Calmpute may not be the solution to all of your stress problems, but it certainly won't add to them—and just the joy of using a program that doesn't require lightning-fast reflexes or heavy-duty thinking is quite therapeutic in itself. ■

Tom Benford
Bricktown, NJ

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***Warning:** EDD is sold for the sole purpose of making archival copies ONLY.*

$79.95 Ask for EDD at your local computer store, or, *to order direct;* send **$79.95** plus $2 shipping ($5 foreign). Mastercard/Visa accepted. *Prepayment required.*

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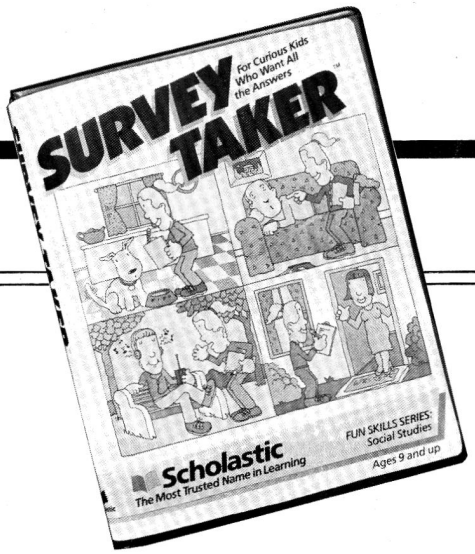


Children plan and poll with Survey Taker.

New Software for Kids

Children plan and interpret surveys using **Survey Taker** ($24.95). Your only clues are vowels to decipher **Mystery Sentences** ($39.95), a game of analysis and logic. Team up with **Kids at Work** ($24.95), an animated graphics program, to draw city and country scenes. These new products work with any Apple II and come from Scholastic, 730 Broadway, New York, NY 10003. Reader Service number is 456.

Critical Planning

Plan, organize, schedule, and monitor any project like an expert with **Project Planner**. Using Critical Path Analysis, Planner organizes your data and generates schedules and flowcharts. The program works on any 64K Apple II, needs two disk drives, and costs $150. An enhanced 128K version is also available. Contact Applitech Software, 381 Harvard Street, Cambridge, MA 02138. Mark Reader Service number 454.

Product descriptions contained in this section are based on information supplied to us by the respective manufacturers. These announcements are provided solely as a service to our readers and do not constitute endorsement by inCider *of any given product.*

Behind the Mask

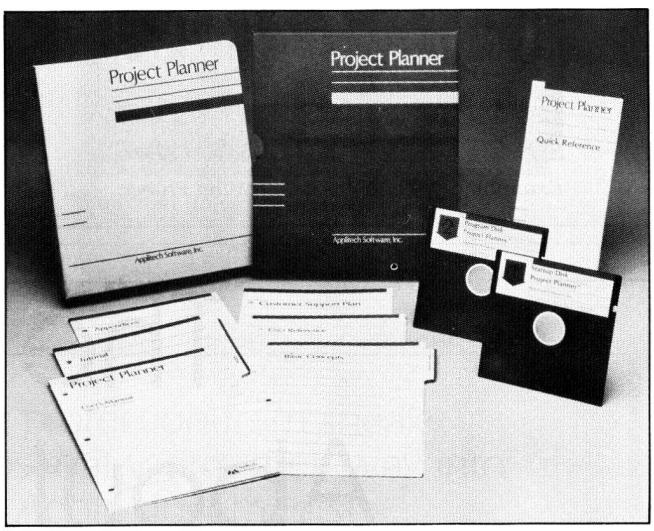
Kids use their family Apple and **Mask Parade** ($39.95) to design masks, jewelry, hats, badges, and accessories. Icon-style menus help children create a costume that can be printed and colored. This double-sided disk is from Springboard Software, 7807 Creekridge Circle, Minneapolis, MN 55435, or check off number 463 on the Reader Service card.

Braille Translator

Now anyone can generate braille with an Apple and a braille printer. **Braille-Talk** will translate any text file into the proper form for braille printers. The program supports many voice synthesizers, so the menu and input can be spoken. This product costs $95, and is published by Computer Aids, 4929 South Lafayette Street, Fort Wayne, IN 46806. Use Reader Service number 466.

Karate on Computer

You are the star in your own karate movie called **Karateka**. This arcade-style game features a series of screens and villains as the plot progresses. The game runs on any Apple II, requires a joystick, and is priced at $34.95. For gripping details, contact Broderbund Software, 17 Paul Drive, San Rafael, CA 94903. Reader Service card is 462.



Project Planner combines ideas with critical schedules.

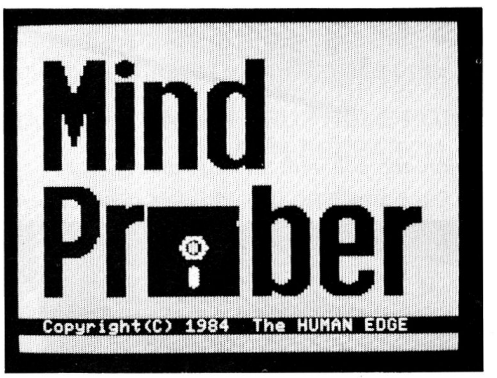


With Mask Parade, kids make their own costumes.

edited by Kerry J. Lanz



Solve a mystery aboard the Zinderneuf.



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King's Quest taps all the potential of your new Apple. This illustrated adventure requires an Apple //c or //e with 128K. It features fully animated, three-dimensional, double hi-res graphics. Commands are complete sentences, directional control is by joystick, and puzzles have several solutions. For $49.95, you get two disks, manual, and card of commands. Quest is from Sierra On-Line, Coarsegold, CA 93614. Reader Service number is 470.

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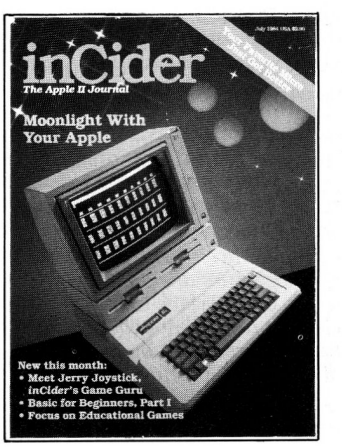

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Add footnotes, index, and table of contents to any document with **Executive Footnoter** ($69.95). The program works on files created by many common word processors and adds the formatting required for formal papers. For details, contact Sof/Sys, 4306 Upton Avenue South, Minneapolis, MN 55410, or check off number 468 on the Reader Service card.

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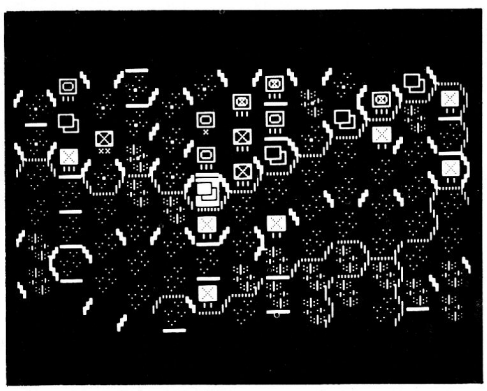
Compuzzler challenges crossword buffs.



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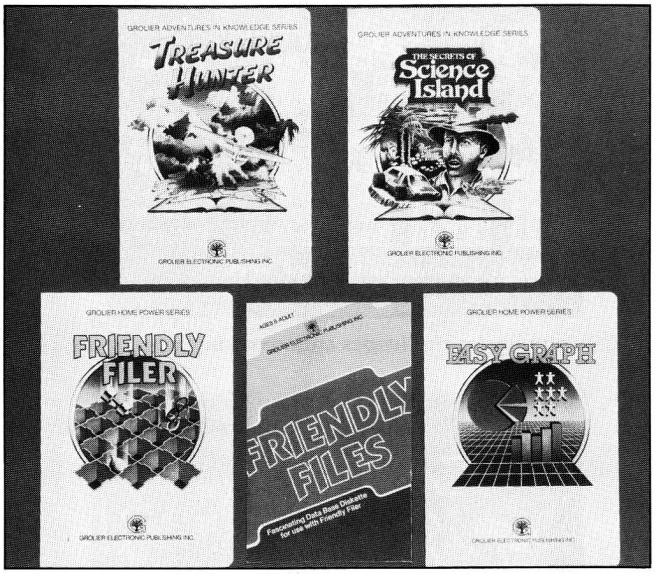

Grolier introduces productivity tools and adventure games.

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The Accountant boasts fast and easy figures. Able to store over 4000 transactions on a single disk, this system balances accounts, monitors checks and deposits, and prints reports. For $120, you get the manual and a disk that runs on the entire Apple II family. This information is from Schmidt Enterprises, 15841 Leadwell Street, Van Nuys, CA 91406. Circle Reader Service number 457.

Work and Play from Grolier

Children gain computer experience with the **Friendly Filer** data-base manager, and the **Easy Graph** graphing program. Two challenging adventures combine software with a paperback book in **Secrets of Science Island** and **Treasure Hunter**. Each program runs on any Apple II with 64K, costs $39.95, and is published by Grolier Electronic Publishing, 95 Madison Avenue, New York, NY 10016. Reader Service number is 452.

Nutritious Bytes

Try these new software titles for better living through computers. **Heartware** ($50) compares your favorite recipes with any dietary restrictions you have and suggests alternate ingredients. There are two versions of **Balancing Act** ($65 and $299) to help you design a personalized weight-loss program. For information, write to Soft Bite, P.O. Box 1484, East Lansing, MI 48823. Reader Service number is 464.

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Halloween is perfect for mischief and for Infocom's new mystery, **Suspect**. The costume ball you're covering for your newspaper becomes the scene for murder. As prime suspect, you have to clear yourself, solve the crime, and get the story back to your chief. This advanced-level text adventure ($44.95) works on any Apple II. The culprit is Infocom, 55 Wheeler Street, Cambridge, MA 02138. Circle number 451 on the Reader Service card.

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Your Apple and **Discover Your Child** can help with child-rearing by evaluating skills and behavior. Two versions are available, Birth to Two Years and Two Through Five Years, for $69.95 each. They also organize records and memories of your child's early years. Compatible with any Apple II, they come from The BHT Group, 883 Stierlin Road, Building B-200, Mountain View, CA 94043. Use number 453 on the Reader Service card.

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With **MegaWorks**, you combine word-processing and spreadsheet files created by AppleWorks and merge them with a mailing list. It also examines the files with a 40,000-word spelling checker. MegaWorks costs $125, runs on the Apple //c and //e, and requires AppleWorks. Contact Megahaus Corporation, 5703 Oberlin Drive, San Diego, CA 92121. The Reader Service number is 459.

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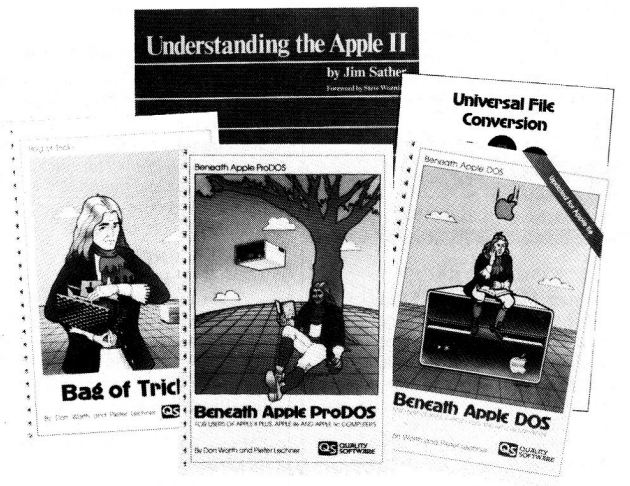

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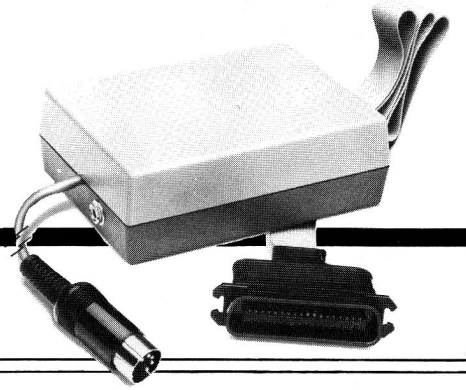

Kameleon joins parallel printers to your Apple //c.

Parallel //c Port

With the **Kameleon** interface ($99.95), your //c can run parallel printers. One end plugs into your Apple's serial port, the other goes to a Centronics-style plug. The interface comes with **K-graphics**, a screen dump for MousePaint and many dot-matrix printers. Get more details from Intronics, 2520 East 125th Street, Kansas City, MO 64146. Check off number 479 on the Reader Service card.

Kodak Enters Disk Field

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Product descriptions contained in this section are based on information supplied to us by the respective manufacturers. These announcements are provided solely as a service to our readers and do not constitute endorsement by inCider *of any given product.*

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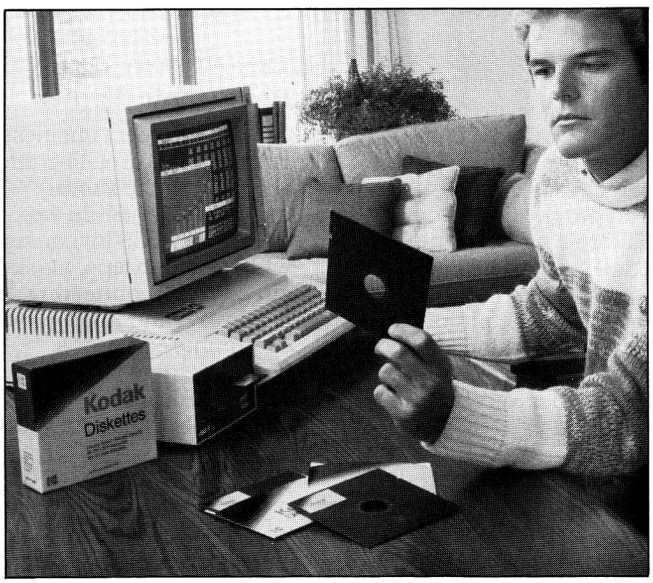

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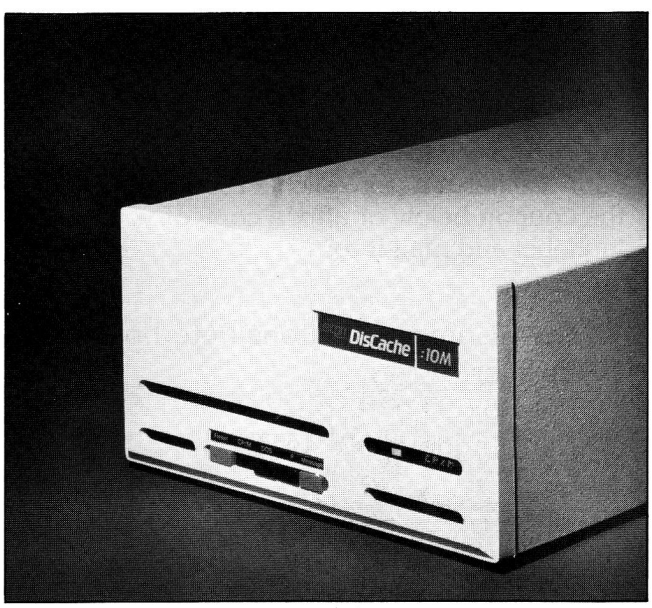
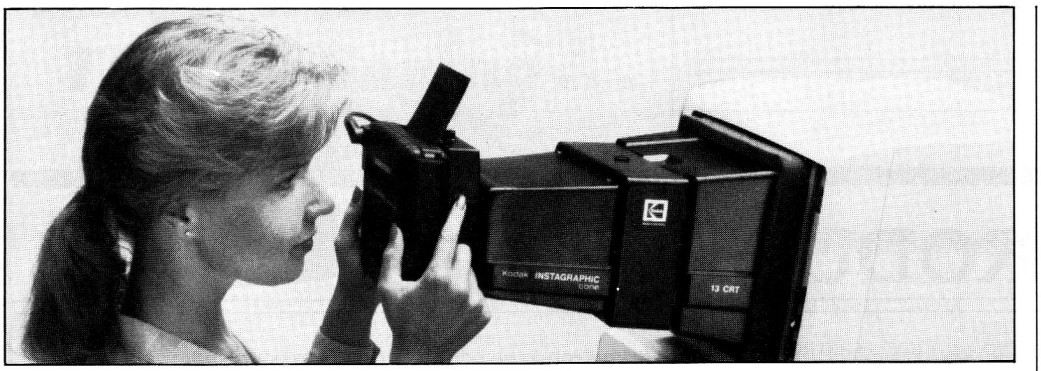


DisCache 10-Mbyte hard disk offers fast memory.

edited by Kerry J. Lanz



Kodak's Instagraphic system for computer photos.

temperature and time data to regulate the heat all week. The PFC includes two temperature sensors, clock, manual, and programming guide. The cost for one zone is $349, and $399 for two zones. For more details on this product contact Future Projects, P.O. Box 11, Hawleyville, CT 06440, or use Reader Service number 480.

Photogenic Apples

Save your best business graphics and arcade-game scores with the **Instagraphic CRT Slide Imager**. The $339 kit comes with: close-up lens, blackout cone, all connecting hardware, and Kodak Instagraphic camera. A 35mm camera can also be used for slides and prints. Get details from Eastman Kodak, 343 State Street, Rochester, NY 14650. Use number 472 on the Reader Service card.

Accurate Modem and Software

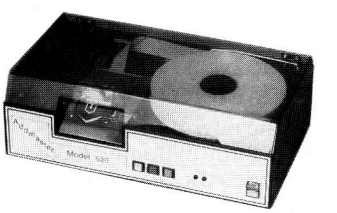
Perfect transmission of data, especially over poor phone lines, is the boast of the **General DataComm 1200** modem ($699). This 300/1200-baud modem uses an RS-232 interface to connect with your Apple. A 300-baud version costs $289. Both modems will support General DataComm Communications Software ($199), which can be updated by modem. Get the full story from General DataComm, Middlebury, CT 06762. Use number 484 on the Reader Service card.

New Life for Old Drives

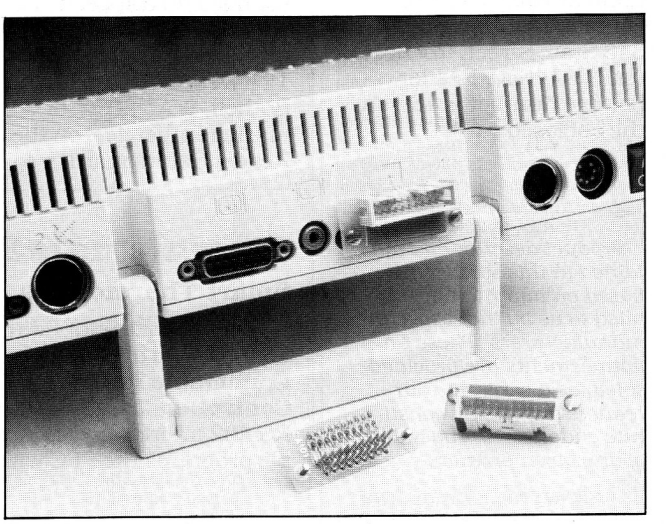
You can use a disk drive from an Apple II Plus or //e as an external drive for your //c with **Adapt-A-Disc**. This coupler costs $29.95 and installs in seconds. Just plug it in and teach an old drive new tricks. Get full information from Computer Accents, P.O. Box 5307, Kingwood, TX 77325. Reader Service card number is 471.

Punch Your Own

Write Telex messages on your Apple with a **Model 520 Punch**. You can make a paper tape at 50 cps in the Baudot code used for a Telex. For other control applications, you can make a tape in hexadecimal, ASCII, or EIA code. This is from Addmaster, P.O. Box 387, San Gabriel, CA 91778. Circle number 489 on the Reader Service card.



Addmaster paper punch for Telex applications.



Old disk drives work with //c and Adapt-A-Disc.

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Two new dot-matrix printers from Datasouth.

Datasouth's New Printers

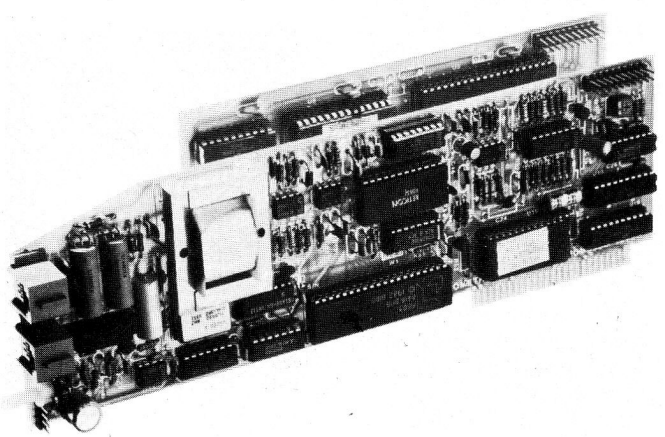
Two new dot-matrix printers operate at 160 cps in draft mode and 27 cps in letter-quality mode. They include a 2K buffer, alternate character sets, and graphics ability. The **Personal Printer I** ($695) features a 10-inch carriage, and **Personal Printer II** has a 17-inch carriage for $895. Learn more from Datasouth Computer, 4216 Stuart Andrew Boulevard, Charlotte, NC 28210. The Reader Service number is 481.

Complete Modem Card

Simply plug the **ProModem 1200A** into a slot on your Apple II Plus or //e and enter the field of telecommunications. This 300/1200-baud modem ($449) offers auto-dial and auto-answer, help commands, and a built-in terminal program. For complete information, write to Prometheus Products, 45277 Fremont Boulevard, Fremont, CA 94538. Mark number 475 on the Reader Service card.

Single-Outlet Surge Control

The handy, single-outlet **Kiwi** ($19.95) protects your computer from the vagaries of power-line flux. It plugs into any electrical outlet and suppresses surges before they can disrupt data in memory. This is produced by Electronic Protection Devices, 217 Bear Hill Road, Waltham, MA 02254. Use number 488 on our Reader Service card.



Full-featured ProModem 1200A from Prometheus.

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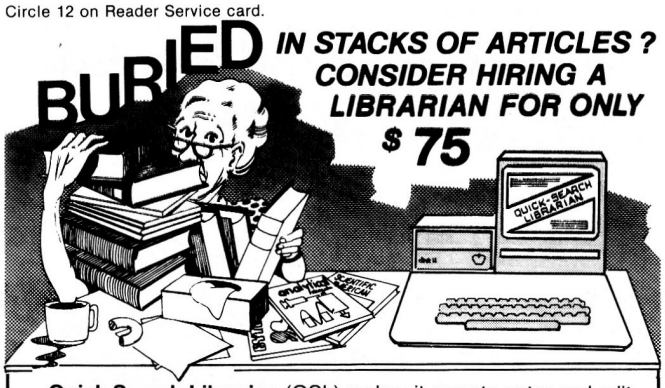

Quick Search Librarian (QSL) makes it easy to enter and edit your journal references, search for articles, and print or sort a list of articles using the APPLE* II+/IIe computer. Important QSL features include:

- Two keystrokes select any one of 255 keywords or any one of 255 journal titles.
- Four lines available for listing authors, title and/or comments.
- Powerful data base screen editing, copying and merging features.
- Average search speed is 50 articles/second with multiple criteria; average sorting speed is 40 articles/second when sorting on 3 fields.
- Typically, 1000 articles can be stored on a single disk.
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VISA or Mastercard orders accepted. QSL manual available separately for $5. (Price of manual deductible later with purchase of QSL software.) Add $2.50 for shipments made in U.S.A.
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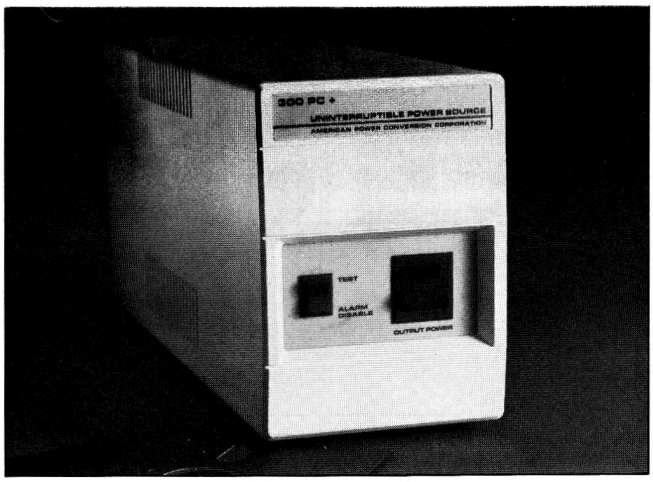
NEW PRODUCTS



The 300PC+ assures your power supply.

Power Guarantee

When your system must work all the time, try the **300PC+** for steady power. During normal operation, it filters all power-line surges, spikes, and interference. In brownouts or blackouts, it provides time for you to save files and protect data until service is restored. Priced at $495, this is produced by American Power Conversion, 89 Cambridge Street, Burlington, MA 01803. Reader Service number is 474.

Color Your Files

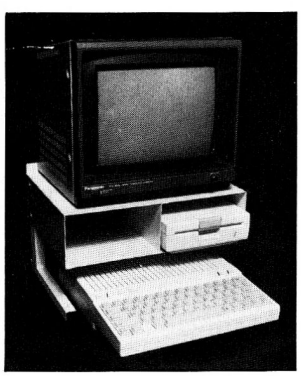
A **Prism Pack** of color disks can help you organize your data and records. The pack ($28 for single side, single density) features ten disks, each with its own hue. You can also get a pack of ten disks of the same color. For full information, contact Sentinel Technologies, One Sentinel Plaza, Hyannis, MA 02601. Reader Service number is 490.

Slim-Line Disk Drive

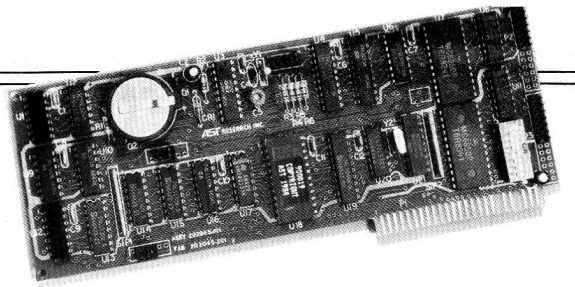
New half-height disk drives are fully compatible with Apple II Plus, //e, and //c computers. Priced at $269, the **A.5** connects to your II Plus or //e controller card and runs all Apple II software. The **A.5c** ($299) gives your //c a second disk drive. Contact Microsci, 2158 South Hathaway Street, Santa Ana, CA 92705, or circle number 473 on the Reader Service card.

System Organizer

Organize your work area with the **Apple //c Stand** ($59.95), which supports a monitor, external disk drive, and modem over your //c. Built of vinyl-coated steel, the stand matches the //c's color and slim lines. Get more information from Care Distributors, 490 Wrightwood, Elmhurst, IL 60126. Use number 482 on the Reader Service card.



The Apple //c Stand organizes your equipment.



Two ports and a clock on one Multi I/O.

Multi-Function Interfacing

Multi I/O puts three popular interfaces on one card for the Apple //e. For $235, you get a printer serial-port, a modem or terminal serial-port, and a ProDOS-compatible clock/calendar with battery back-up. A disk of utilities comes with it to show off its abilities. This card comes from AST Research, 2121 Alton Avenue, Irvine, CA 92714. Use Reader Service number 485.

Clock Your Programs

Bring your system up to date with the **TimeStamp Module** ($65). This clock and calendar card, with battery back-up, fits a slot in your Apple II Plus or //e and is easily accessed from BASIC. The documentation tells how to modify DOS 3.3 to date and time-stamp your files and listings. This product is from Mi-ChRon, 311 Quebec Avenue, Longmont, CO 80501. Use number 477 on the Reader Service card.

Optical Mouse

Give your //c the **A+ Mouse**, an optical mouse with no moving parts. It plugs directly into your //c, or into an Apple II Plus or //e Mouse Card, and works with all AppleMouse-compatible software. The mouse costs $150, but for $239.95 you get it bundled with Dollars and Sense and Bank Street Writer. The big cheese behind this mouse is Mouse Systems, 2336 H Walsh Avenue, Santa Clara, CA 95051. Use Reader Service card number 483.

Phone and Modem Combo

ModemPhone provides you with a 300-baud modem and a re-dial telephone in one desktop unit ($119) connected to your Apple through an RS-232 interface. Find out more about this product by writing to Theall Engineering, P.O. Box 336, Oxford, PA 19363, or by checking off number 487 on the Reader Service card.



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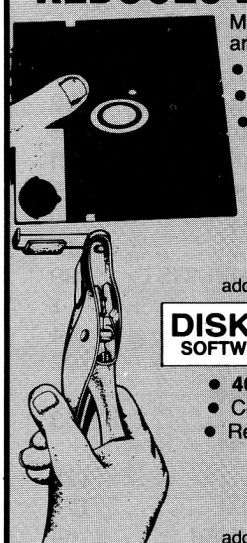

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*This advertiser prefers to be contacted directly.

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Paul Boule, Sales Manager; Barbara Alvarez

Reader Service

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My vote for the best advertisement in this issue goes to _____whose Reader Service number is _____.

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- ☐ 2. Computer store
- ☐ 3. Newsstand
- ☐ 4. Bookstore
- ☐ 5. At work
- ☐ 6. Library
- ☐ 7. Friend/Colleague
- ☐ 8. Other

B. How many of each issue's program listings do you actually type in?
- ☐ 1. 0
- ☐ 2. 1
- ☐ 3. 2
- ☐ 4. 3
- ☐ 5. 4
- ☐ 6. 5 or more

C. Are you interested in reading more about the Macintosh or Lisa in *inCider*?
- ☐ 1. Yes, on the Macintosh
- ☐ 2. Yes, on Lisa
- ☐ 3. Yes, on both
- ☐ 4. No

D. Which of the following microcomputers do you own or use?
- ☐ 1. Apple II or II+
- ☐ 2. Apple IIe
- ☐ 3. Apple IIc
- ☐ 4. Apple III
- ☐ 5. Macintosh
- ☐ 6. Apple compatible
- ☐ 7. Other
- ☐ 8. Don't own or use one

E. What is your annual household income?
- ☐ 1. Under $20,000
- ☐ 2. $20,000 - $40,000
- ☐ 3. $40,000 - $60,000
- ☐ 4. $60,000 - $80,000
- ☐ 5. $80,000 - $100,000
- ☐ 6. Over $100,000

F. How much have you spent on computer hardware during the last 12 months?
- ☐ 1. Nothing
- ☐ 2. Under $1,000
- ☐ 3. $1,000 - $2,000
- ☐ 4. $2,000 - $3,000
- ☐ 5. $3,000 - $4,000
- ☐ 6. $4,000 - $5,000
- ☐ 7. Over $5,000

G. How much do you plan to spend on computer hardware during the next 12 months?
- ☐ 1. Nothing
- ☐ 2. Under $1,000
- ☐ 3. $1,000 - $2,000
- ☐ 4. $2,000 - $3,000
- ☐ 5. $3,000 - $4,000
- ☐ 6. $4,000 - $5,000
- ☐ 7. Over $5,000

H. How much have you spent on software during the last 12 months?
- ☐ 1. Nothing
- ☐ 2. Less than $100
- ☐ 3. $100 - $250
- ☐ 4. $250 - $500
- ☐ 5. $500 - $1,000
- ☐ 6. Over $1,000

I. What is your specific interest in the items circled at right?
- ☐ 1. Immediate purchase
- ☐ 2. Purchase within 6 months
- ☐ 3. Brand comparisons
- ☐ 4. Reference
- ☐ 5. Other

J. Do you influence computer purchases within your company?
- ☐ 1. Yes
- ☐ 2. No
- ☐ 3. Doesn't apply

K. On a scale of 1 (no interest) to 5 (great interest), please rate your interest in the following *inCider* columns:
- ___ 1. Fermentations
- ___ 2. The Game Reserve
- ___ 3. The Glau Report
- ___ 4. O'Brien's Journal
- ___ 5. The Learning Machine
- ___ 6. Child's Play
- ___ 7. The Applesoft Adviser
- ___ 8. The Cider Press
- ___ 9. Fudge It!
- ___ 10. Ask inCider
- ___ 11. The Apple Clinic
- ___ 12. Apple Extract

L. If you are not a subscriber, please circle 500.

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80	85	90	95	100	230	235	240	245	250	380	385	390	395	400	530	535	540	545	550
101	106	111	116	121	251	256	261	266	271	401	406	411	416	421	551	556	561	566	571
102	107	112	117	122	252	257	262	267	272	402	407	412	417	422	552	557	562	567	572
103	108	113	118	123	253	258	263	268	273	403	408	413	418	423	553	558	563	568	573
104	109	114	119	124	254	259	264	269	274	404	409	414	419	424	554	559	564	569	574
105	110	115	120	125	255	260	265	270	275	405	410	415	420	425	555	560	565	570	575
126	131	136	141	146	276	281	286	291	296	426	431	436	441	446	576	581	586	591	596
127	132	137	142	147	277	282	287	292	297	427	432	437	442	447	577	582	587	592	597
128	133	138	143	148	278	283	288	293	298	428	433	438	443	448	578	583	588	593	598
129	134	139	144	149	279	284	289	294	299	429	434	439	444	449	579	584	589	594	599
130	135	140	145	150	280	285	290	295	300	430	435	440	445	450	580	585	590	595	600

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This card valid until March 31, 1985

My vote for the best advertisement in this issue goes to _____whose Reader Service number is _____.

A. Where did you get this copy of *inCider*?
- ☐ 1. Personal subscription
- ☐ 2. Computer store
- ☐ 3. Newsstand
- ☐ 4. Bookstore
- ☐ 5. At work
- ☐ 6. Library
- ☐ 7. Friend/Colleague
- ☐ 8. Other

B. How many of each issue's program listings do you actually type in?
- ☐ 1. 0
- ☐ 2. 1
- ☐ 3. 2
- ☐ 4. 3
- ☐ 5. 4
- ☐ 6. 5 or more

C. Are you interested in reading more about the Macintosh or Lisa in *inCider*?
- ☐ 1. Yes, on the Macintosh
- ☐ 2. Yes, on Lisa
- ☐ 3. Yes, on both
- ☐ 4. No

D. Which of the following microcomputers do you own or use?
- ☐ 1. Apple II or II+
- ☐ 2. Apple IIe
- ☐ 3. Apple IIc
- ☐ 4. Apple III
- ☐ 5. Macintosh
- ☐ 6. Apple compatible
- ☐ 7. Other
- ☐ 8. Don't own or use one

E. What is your annual household income?
- ☐ 1. Under $20,000
- ☐ 2. $20,000 - $40,000
- ☐ 3. $40,000 - $60,000
- ☐ 4. $60,000 - $80,000
- ☐ 5. $80,000 - $100,000
- ☐ 6. Over $100,000

F. How much have you spent on computer hardware during the last 12 months?
- ☐ 1. Nothing
- ☐ 2. Under $1,000
- ☐ 3. $1,000 - $2,000
- ☐ 4. $2,000 - $3,000
- ☐ 5. $3,000 - $4,000
- ☐ 6. $4,000 - $5,000
- ☐ 7. Over $5,000

G. How much do you plan to spend on computer hardware during the next 12 months?
- ☐ 1. Nothing
- ☐ 2. Under $1,000
- ☐ 3. $1,000 - $2,000
- ☐ 4. $2,000 - $3,000
- ☐ 5. $3,000 - $4,000
- ☐ 6. $4,000 - $5,000
- ☐ 7. Over $5,000

H. How much have you spent on software during the last 12 months?
- ☐ 1. Nothing
- ☐ 2. Less than $100
- ☐ 3. $100 - $250
- ☐ 4. $250 - $500
- ☐ 5. $500 - $1,000
- ☐ 6. Over $1,000

I. What is your specific interest in the items circled at right?
- ☐ 1. Immediate purchase
- ☐ 2. Purchase within 6 months
- ☐ 3. Brand comparisons
- ☐ 4. Reference
- ☐ 5. Other

J. Do you influence computer purchases within your company?
- ☐ 1. Yes
- ☐ 2. No
- ☐ 3. Doesn't apply

K. On a scale of 1 (no interest) to 5 (great interest), please rate your interest in the following *inCider* columns:
- ___ 1. Fermentations
- ___ 2. The Game Reserve
- ___ 3. The Glau Report
- ___ 4. O'Brien's Journal
- ___ 5. The Learning Machine
- ___ 6. Child's Play
- ___ 7. The Applesoft Adviser
- ___ 8. The Cider Press
- ___ 9. Fudge It!
- ___ 10. Ask inCider
- ___ 11. The Apple Clinic
- ___ 12. Apple Extract

L. If you are not a subscriber, please circle 500.

Reader Service: Return this card to receive full information on the products advertised in this issue. Refer to the ad. You will find numbers near the logo of each advertiser. Each represents the advertiser's Individual Reader Service Number. Circle the corresponding numbers on the card on this page. include your name, address, zip, & stamp, and drop in a mailbox. In 4-6 weeks you'll hear from the advertiser directly.

1	6	11	16	21	151	156	161	166	171	301	306	311	316	321	451	456	461	466	471
2	7	12	17	22	152	157	162	167	172	302	307	312	317	322	452	457	462	467	472
3	8	13	18	23	153	158	163	168	173	303	308	313	318	323	453	458	463	468	473
4	9	14	19	24	154	159	164	169	174	304	309	314	319	324	454	459	464	469	474
5	10	15	20	25	155	160	165	170	175	305	310	315	320	325	455	460	465	470	475
26	31	36	41	46	176	181	186	191	196	326	331	336	341	346	476	481	486	491	496
27	32	37	42	47	177	182	187	192	197	327	332	337	342	347	477	482	487	492	497
28	33	38	43	48	178	183	188	193	198	328	333	338	343	348	478	483	488	493	498
29	34	39	44	49	179	184	189	194	199	329	334	339	344	349	479	484	489	494	499
30	35	40	45	50	180	185	190	195	200	330	335	340	345	350	480	485	490	495	500
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52	57	62	67	72	202	207	212	217	222	352	357	362	367	372	502	507	512	517	522
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54	59	64	69	74	204	209	214	219	224	354	359	364	369	374	504	509	514	519	524
55	60	65	70	75	205	210	215	220	225	355	360	365	370	375	505	510	515	520	525
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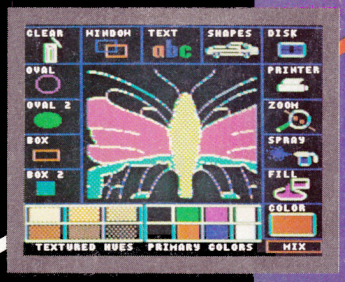

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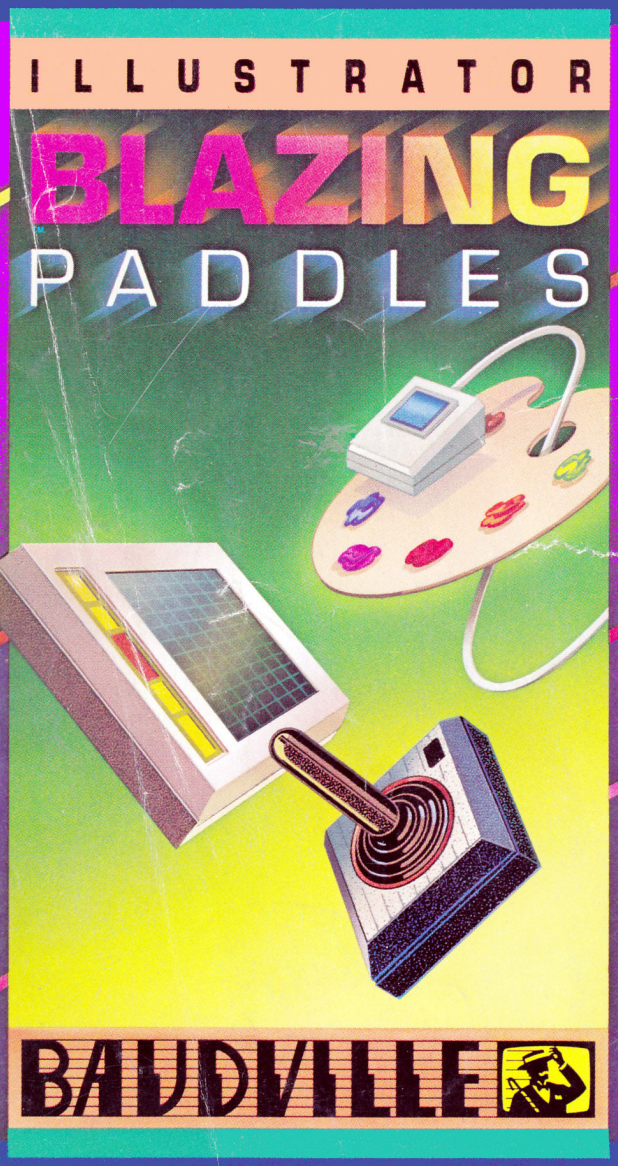

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