

# inCider

Holiday  
Shopper's Guide

December 1984  
USA \$2.95/Canada \$3.50  
A CWC/I Publication

The Apple II Journal

## Wrap Up

### Your Gift List Fast

Inside: 70 Super Gifts  
for Apple Owners

10 Tips for Choosing  
Home Education  
Software

Forecast Your  
Bottom Line  
with Spreadsheets

### Free Program Listings:

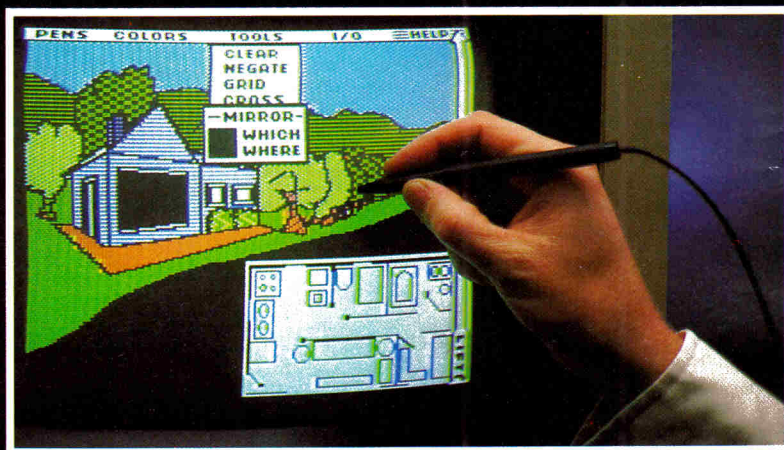
- A Simple  
Address Book
- Animal Bingo
- Trim an Apple Tree
- MousePaint  
Modification



DEC 5



# Now... Draw On Your Imagination



## Introducing The Gibson Light Pen System.™

The link between mind and machine has arrived. Suddenly you're free... free to translate your every thought into professional quality computer graphics... just by touching your screen.

The Gibson Light Pen System software features *icon* menus that offer easy access to powerful graphics tools such as symbol libraries, geometric shapes, mirror-imaging, magnification and complete color and pattern editing. Even if you're not a graphic artist, you can design, diagram and draw with precision at high-speed, in high-resolution, and in full-color... right on your screen.

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The Gibson Light Pen System comes complete with all you need to draw, paint, design, score music and learn animation.

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#### CREATE COMPUTERIZED ANIMATION WITH PENANIMATOR.™

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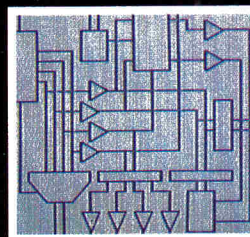
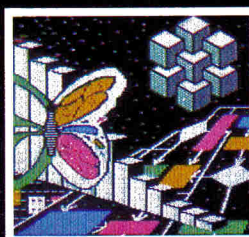
Score computerized melodies with incredible ease at the touch of your pen.

#### CREATE YOUR OWN LIGHT PEN APPLICATIONS WITH THE PENTRAK LANGUAGE SYSTEM.™

Take advantage of the software features, and customize your own light pen programs.

### NOW AVAILABLE FOR THE APPLE II® SERIES

Coming soon for the IBM PC™ and PCjr.™



Circle 315 on Reader Service card.

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# The Gibson Light Pen System

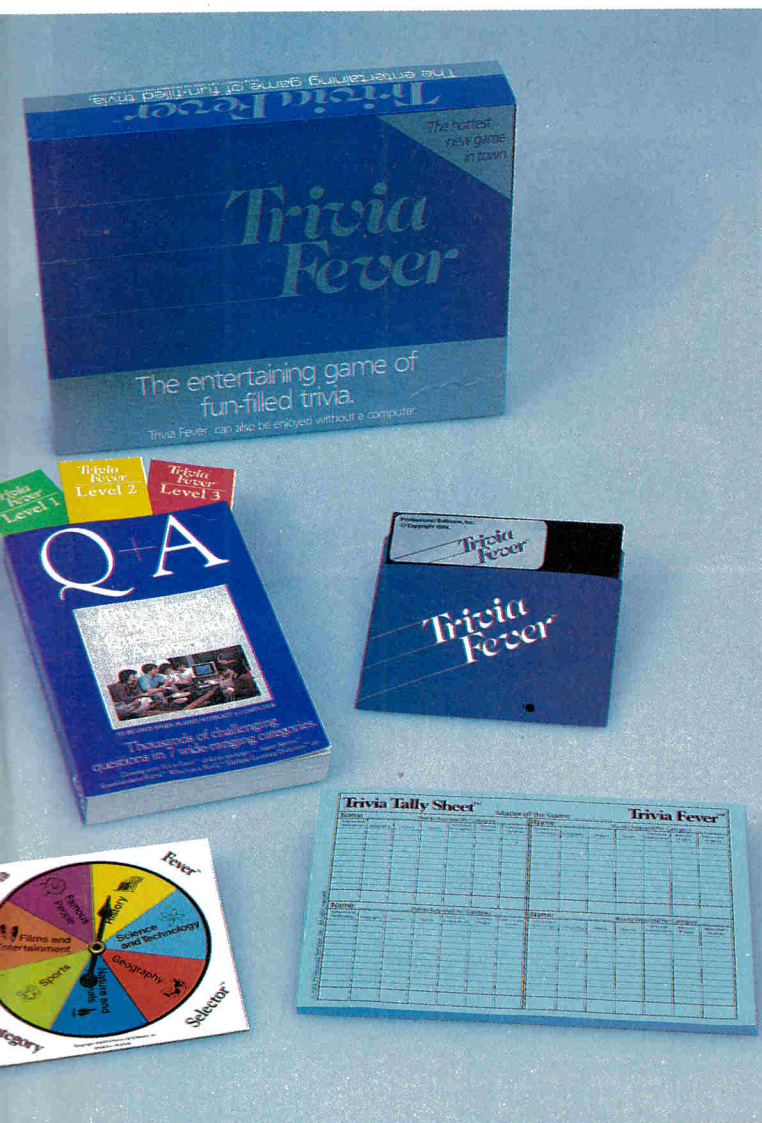
Touch the Magic of Light

# Catch

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# Trivia Fever™

## "The Hottest New Game In Town"



Trivia Fever is absolutely unique — it's the only software entertainment package that can be enjoyed **with** or **without** a home computer! When played on your home computer, Trivia Fever is a refreshing alternative to all those shoot 'em up games. An elected "Master of the Game" uses the computer to randomly select subject categories, handicap players, generate questions and answers, keep score automatically, and more! Instructive by its very nature, Trivia Fever can be enjoyed by up to 8 individuals or teams. And when played without a computer, Trivia Fever has all the best features of the "popular" trivia games plus more — all without the cumbersome board, cards, and little game pieces. You can play in a car, on vacation, anytime, anywhere! And Trivia Fever is by far the best Trivia game available anywhere. Here's why:

Trivia Fever offers thousands of challenging questions in 7 interesting categories, so there's something for everyone. Each category has questions with 3 levels of difficulty, which score comparable points. What's more, Trivia Fever allows players to HANDICAP all those so-called "trivia experts" three different ways, giving everyone a chance to win. And players can easily control the length of play from quick thirty minute games to multi-hour party marathons!



Trivia Fever is unique, entertaining, educational, and most of all FUN. And at \$39.95, Trivia Fever is destined to quickly become the best selling software entertainment package of all time. There's even a \$5 rebate available to any non-computer users who return the computer diskette.

Trivia Fever can be enjoyed on the Commodore 64, IBM PC & PCjr and compatibles, Apple II series, and others. So don't delay. Catch Trivia Fever at your favorite software retailer today!

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At \$39.95, Trivia Fever comes complete with Question and Answer Book, Category Selector, and Tally Sheets to be used when played without a computer.

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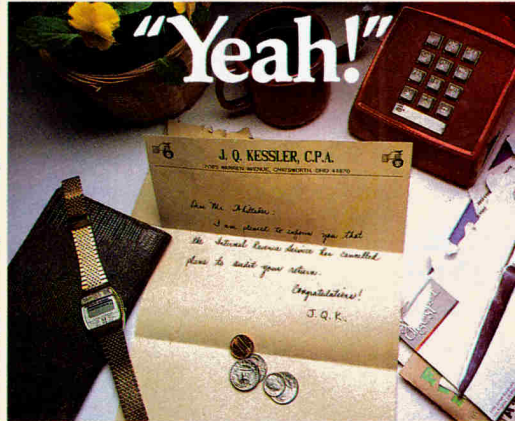
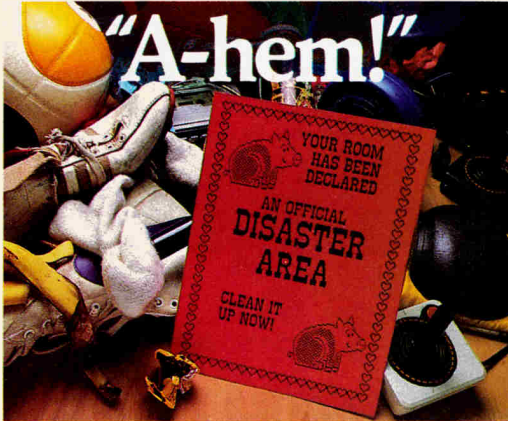
# Express Yourself!

A few minutes and a few keystrokes. That's all it takes to turn your personal computer into a personal print shop.

Everything you need is in the program: typefaces, border designs, background patterns, pictures, symbols and a starter kit of colored paper and matching envelopes. The Print Shop will also guide you along, step by step, even if you've never touched a computer before.

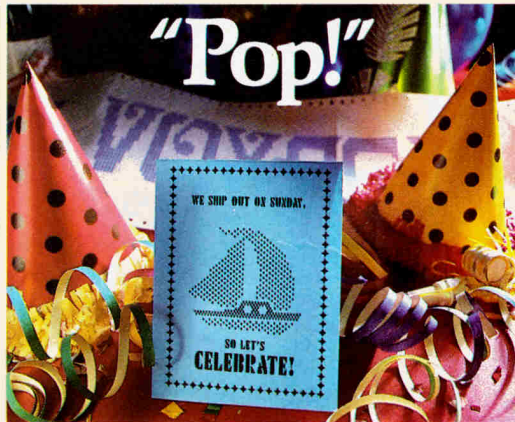
So think what you'd like to say, then put it in your own words with The Print Shop.

Make quite an impression with just five easy keystrokes.



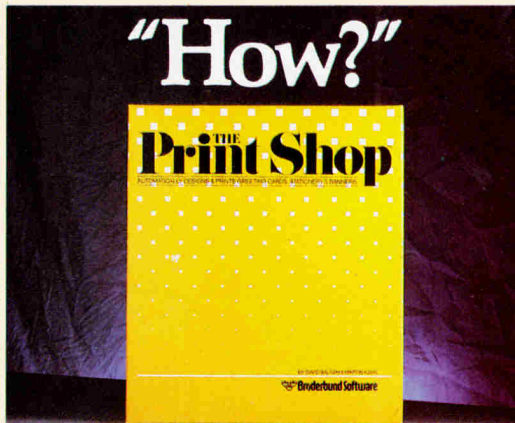
Everybody's creative with The Print Shop. You just can't help it!

Your originality shines through, so good news becomes even better.



Dozens of pictures and symbols to suit every purpose and occasion.

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Keep your creativity flowing... put it in your own words with The Print Shop.

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# REACH NEW HORIZONS with CH Products

## MACH II and MACH III JOYSTICKS

The second generation MACH II and MACH III Joysticks incorporate a **new slide-switch spring disconnect** feature that **requires no stick deflection** and **new rotary trims** which are **four times more precise**.

Additional features include: "spring centering" or positive true-positioning" modes of operation, electrical trims for each-axis, two fire buttons on the deck of the control and a stainless steel ball as the main pivot for added precision and durability. Our MACH III Joystick has an added fire button on the stick handle.

These highly accurate and reliable 360 degree microcomputer cursor controls used for games, business and graphics applications provide more features, greater durability, and longer life cycles. Plug in compatible with Apple II, IIE, IIC, IBM PC, PCjr and TRS-80 Color Computers.  
MACH II \$44.95/MACH III \$54.95

## PADDLESTICKS

PADDLESTICKS are a new and unique paddle control design that promises to return the fun and excitement back to paddletype games. They are faster, easier to operate and less fatiguing than conventional type paddles. The PADDLESTICKS operate as a single-axis joystick and are currently plug-in compatible with the Apple II, IIE and IIC personal computers. \$44.95 (pair)



## MICRO-TRAK TRACKBALL

The MICRO-TRAK TRACKBALL is the ultimate 360 degree cursor control that is engineered with the latest state-of-the-art technology. The MICRO-TRAK is controlled by two custom designed microprocessors and is 100% digital for higher reliability. The unit plugs into the standard game I/O and is 100% software compatible. It has four switch selectable modes of operation and requires no additional hardware or software. Both the "Positioning Mode" and "Velocity Mode" have a choice of two sensitivity levels. In addition the "Velocity Mode" has an "Auto-Center" feature that returns the cursor to the selected center position to emulate a self-centering joystick. There is also a "Rapid Fire" feature and dual switches for either left or right handed operation. Available November 1984 for Apple II, IIE and IIC personal computers. \$99.95

Manufactured in U.S.A.

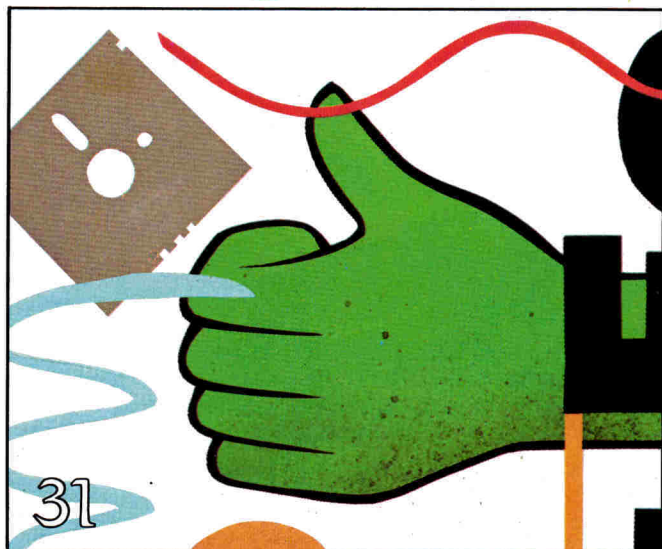


FORMERLY HAYES PRODUCTS

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San Marcos, California 92069  
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# inCider



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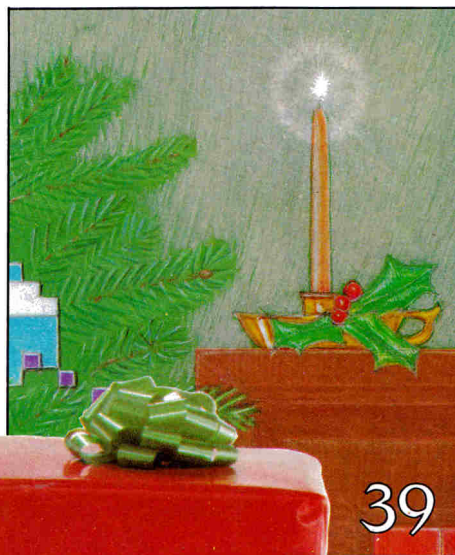
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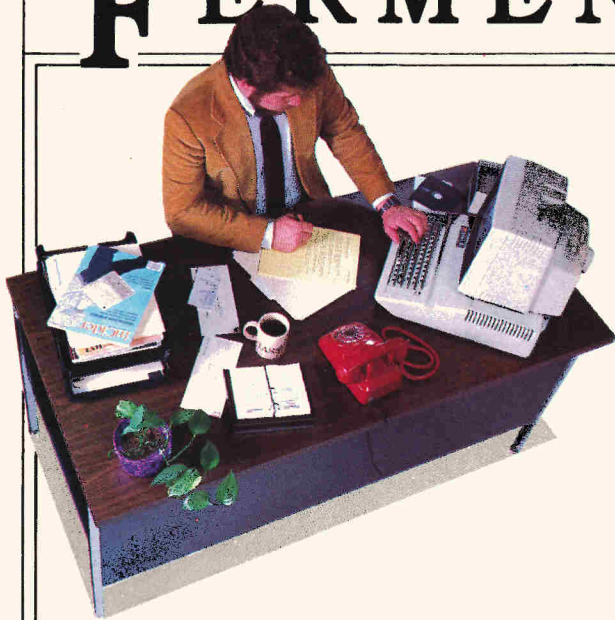
*inCider* (ISSN #0740-0101) is published monthly by CW Communications/Peterborough, Inc., 80 Pine Street, Peterborough, NH 03458. Phone: (603) 924-9471. Application to mail at second class postage rates is pending at Peterborough, NH, and additional mailing offices. Subscription rates in U.S. are \$24.97 for one year, \$38.00 for two years and \$53.00 for three years. In Canada and Mexico, \$27.97—one year only, U.S. funds drawn on a U.S. bank. Nationally distributed by International Circulation Distributors. Foreign subscriptions (surface mail), \$44.97—one year only, U.S. funds drawn on a U.S. bank. Foreign subscriptions (air mail), please inquire. All U.S. and Canadian subscription correspondence should be addressed to *inCider*, Subscription Department, P.O. Box 911, Farmingdale, NY 11737. Please include your address label with any correspondence. Postmaster: Send address changes to *inCider*, Subscription Services, P.O. Box 911, Farmingdale, NY 11737. Entire contents copyright 1984 by CW Communications/Peterborough, Inc.

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# FERMENTATIONS



## Eeny, Meeny, Miny, Mac?

**T**he following ad appeared in the *San Jose Mercury-News*:

*Apple //e System, \$995. . . comes with Monitor II, a disk drive and three hours of training. Or you could plunk down the same money and depart with a //c, no monitor, same training. Or you could dig down a thousand dollars deeper and take a Macintosh home for \$1995. So, assuming that you're in the market for a new Apple, what'll it be: Macintosh or an Apple II?*

### **The Mighty Mac**

Let's look at the Macintosh first. Technically, there's nothing else like it. The Mac's 68000 microprocessor needs little introduction and is simply one of the best chips on the market. Its 16-bit (or 32-bit, depending on who's counting) architecture allows for nimble operation. Its superior ROM paves the way for the integration of applications—witness the possibilities of cutting and pasting between text and graphics.

Durable 3½-inch mini-floppy disks are less prone to damage than the venerable 5¼-inch variety, and the machine itself is marvelously compact and sturdy. Some declare the bit-mapped display's resolution of 512 by 342 dots to be the sharpest screen display available in any

micro. It can even emulate an IBM 3278 terminal. And user-friendliness has been "Macsimized," making this computer the easiest ever to master. All for \$1995.

### **The Apple II Advantage**

Compare the Mac to the //e, Apple's Gunga Din. For \$1000 less you get color capability, something every Apple II owner is hopelessly spoiled about. You also get seven expansion slots (and an auxiliary slot)—the mother lode of peripheral capability.

The //e has cursor keys as humans have thumbs. The Mac has no thumbs, but it does have a mouse. Efficient as the mouse may be for drag-clicking through screen menus and manipulating MacPaint, it flaws the Mac's word-processing ability. To move from line to line, you must take your hand off the keyboard, grab the mouse, carefully move the cursor, and hustle back to the keyboard. "Making a mouse available," James Fallows said recently in *The Atlantic Monthly*, "is like offering your guests chopsticks in addition to silverware. Making it mandatory is like forcing them to use chopsticks even when you're serving soup."

We come now to the biggest sin-

gle advantage the Apple II enjoys over Macintosh: software. As of this writing, perhaps 90 programs are available for the Macintosh, tops. For the //e, there are more than 10,000 software packages. Need we say more? During a "slow" month, our new software folder bulges with 50 to 60 news releases announcing the latest software for the Apple II line. So while Macintosh third-party developers get their acts together, the Apple II community continues to flood the market with innovative, improved programming. Ditto for peripherals.

This stage of the Macintosh's development poses no match for the Apple II. Conventional design, the industry's largest software selection, and price keep the II on top.

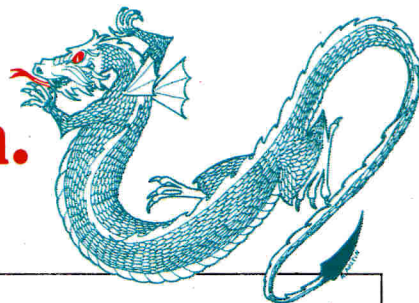
### **And the Envelope, Please. . .**

My guess is that prices on all three machines will steadily decrease. By the time you read this in mid-November—I'm speaking to you from a time warp—there may be an ad in the *Mercury-News* that is downright irresistible. Yes, the temptation will exist and the decision will be tough, but if you keep chanting, "Solutions, applications, solutions, applications," you'll know what to do. ■

*by Paul Quinn*



# Big Game Hunting? Try Baggin' Our Dragon.



It's the biggest game in town

**O**ur dragon, of course, is Wizardry—that unique series of computer recreation programs designed for Apple users who are seeking the ultimate “big game” challenge.

Since its debut, Wizardry has been the best-selling computer game of its kind.

For a very good reason:

Because Wizardry is more than just a game, more than a diabolically clever maze.

Wizardry is a complex world of variety and depth. A world of richness and pleasure.

Packed with suspense, full of surprises, Wizardry is enchanting—a compelling

diversion that turns your leisure time into prime time.

Wizardry is powerful and sophisticated. A simple command system, 3D maze displays and superb programming provide you with month after month of involvement and satisfaction.

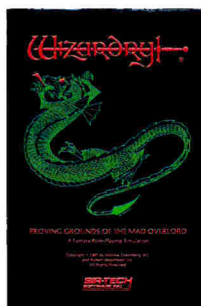
Four years old and still growing, the game is already recognized by critics and game lovers as a classic.

Simply stated, Wizardry is the finest fantasy role-playing computer game you can buy.

Set your sights on the best. Track down Wizardry—the biggest game in town.

## Enter the World of Wizardry®

A Classic Encounter

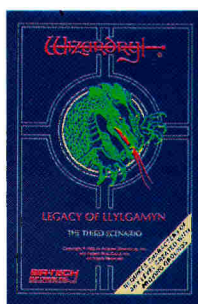


### Proving Grounds of the Mad Overlord

*The First Scenario*

Unlike any other game you have ever played. A fascinating 10-level maze full of monsters, sorcery, traps and treasures. As you gain skills, the characters you create grow stronger, richer, wiser and better able to survive. The final goal is elusive. Your experience... unforgettable.

Twice voted “All Time Most Popular Computer Program”  
—Softalk Readers

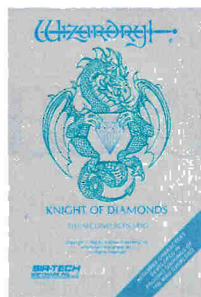


### Legacy of Llylgamyn

*The Third Scenario*

A spellbinder that advances the classic traditions of Wizardry. Find the great dragon Lkbreth and save the people of Llylgamyn. Includes full screen maze display and Windo-Wizardry, the revolutionary pop-up window graphics system. Requires brave adventurers of any level developed in PROVING GROUNDS.

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

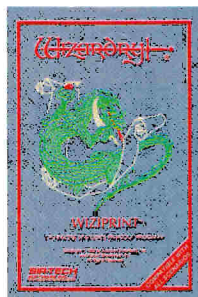


### Knight of Diamonds

*The Second Scenario*

This classic journey should only be attempted with those Wizardry heroes who have attained the 13th level of ability in PROVING GROUNDS. Their challenge—and yours—to adventure through a six-level maze and become the Knight of Diamonds. First-rate fantasy!

Awarded “Best Adventure Game for the Home Computer”  
—Game Mfrs. Association of America



### Wiziprint

*Character Statistics Printout*

A helpful utility program that prints the possessions, attributes and known spells of all your Wizardry characters. Quick, neat and easy-to-read. For use with 80-column printers. Compatible with all Wizardry scenarios. A real timesaver!

“Wiziprint is a very handy utility disk for ardent Wizardry players”  
—Roe R. Adams III, Softalk

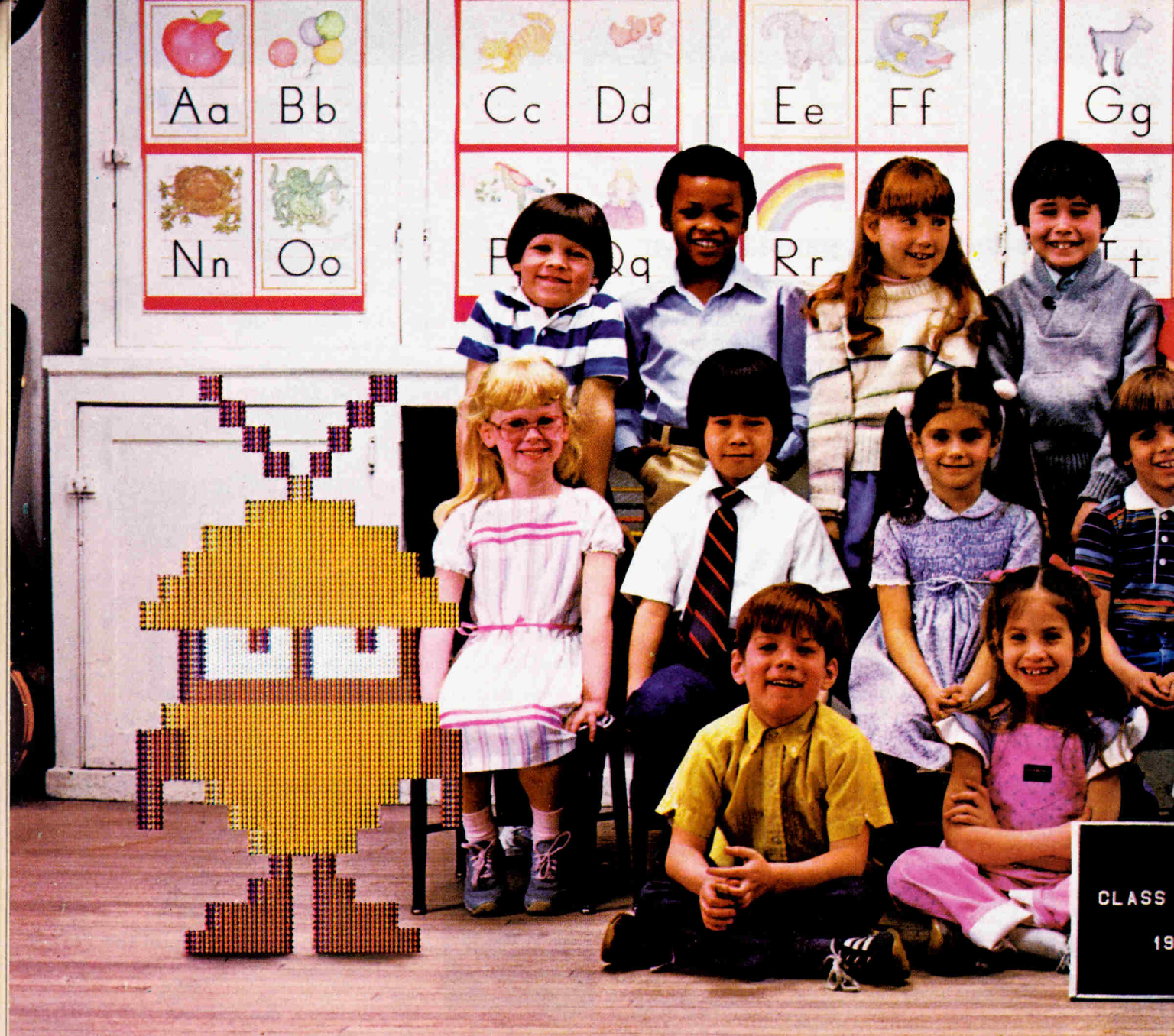
LOOK FOR THE DRAGON—  
SYMBOL OF WIZARDRY.  
PROMISE OF EXCELLENCE.

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All software available for Apple II series computer 48k  
Coming soon for the Macintosh  
Proving Grounds also available for IBM PC and PCjr 64k

**SIR-TECH**  
SOFTWARE INC.

6 MAIN STREET OGDENSBURG N.Y. 13369 (315) 393-6633 LEADERS IN COMPUTER FANTASY ROLE-PLAYING



# Modern times have create

We've cleverly disguised them as funny creatures from a computer game. But underneath the funny exterior is one of the most serious approaches to home education you've ever heard of.

INTRODUCING SPROUT™ SOFTWARE.  
GAMES THAT TEACH.

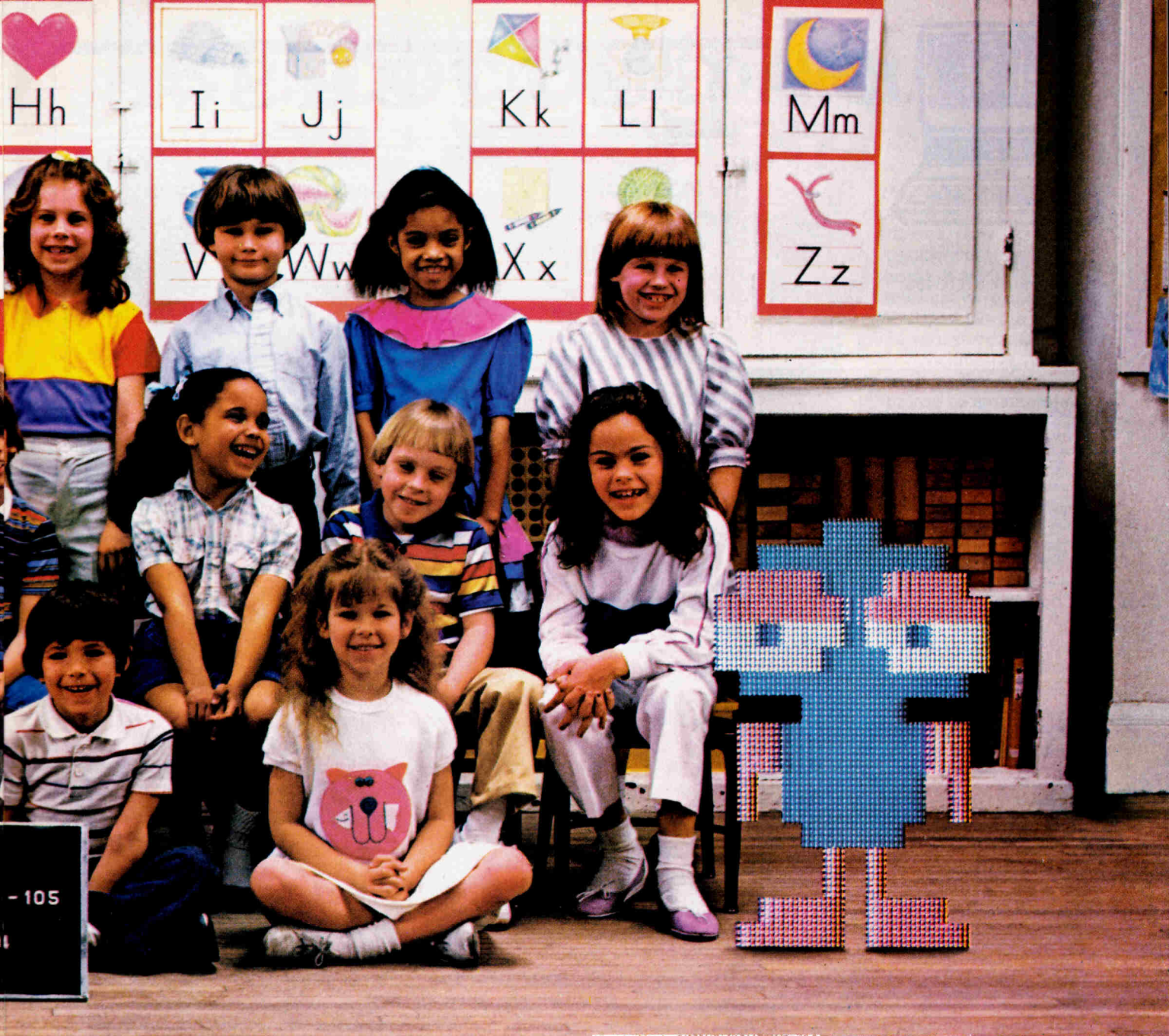
Your kid's new teachers are called Tink and Tonk. They come from Sprout. Software for kids 4 to 8.

The beauty of Sprout software is how

entertainment is balanced with a healthy dose of education.

While kids are having fun at home, they're actually reinforcing what they've learned at school. Things like the alphabet, spelling, vocabulary, counting, adding, and pattern recognition.

You'll also like how Sprout prevents boredom. Our games grow up, instead of wear out. As kids get older, the game adjusts and gets harder. Because there are many



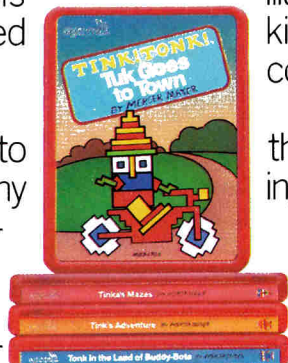
# d a new breed of teachers.

variations and many decisions to make.

Knowing how to do all this isn't something Sprout learned overnight.

You see, we've got a hundred years of experience to lean on. (Our parent company is SFN, the country's #1 textbook publisher for elementary and high schools.)

We've also got the expe-



Compatible with Atari\*, Commodore\*, Apple\*, and IBM.\*

rience of Mercer Mayer, who has written or illustrated 80 children's books. He dazzles kids with ideas and pictures that keep them coming back for more.

With TINK!TONKI!™ software, kids see that learning can be more fun than destroying space creatures.

sprout

Games that grow up. Instead of wear out.

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10 *inCider* December 1984

# LETTERS

## Professional Numbers Polished

I would like to thank all those who wrote to me about my "Professional Numbers" (July 1984, page 116). I enjoyed reading the letters and responding to them. I was especially impressed with several suggestions.

Dale Kirkland of Fort, Washington, added this line to avoid unwanted results given by a number larger than 999,999,999:

```
10005 IF ABS(N)>999999999 THEN  
  N$ = "###,###,###" : GOTO  
  10110
```

In other words, the program displays a field overflow as a FORTRAN program would.

Don Martindale of Redmond, Washington, pointed out that some people want to print a dollar sign only on the first item in a list and before a total. The following line prints a dollar sign at the head of a listing, or wherever you want it, when DF is set equal to 1. The variable DF will be reset to zero after printing one number with a dollar sign in front of it.

```
10100 IF DF = 1 THEN N$ = "$" + N$  
      :DF = 0
```

I hope these modifications will be useful. Thanks again to everyone who wrote—it really made my day!

**Damien Lindauer**  
P.O. Box 592  
Oroville, WA 98844

## Soliciting Word Games

I'm putting together a collection of word game programs that I intend to make generally available. *inCider* readers who would like to contribute to the collection, who like to play word games, or who want more information should send me an SASE, telling me what computer they own.

**Eric Balkan**  
14704 Seneca Castle Court  
Gaithersburg, MD 20878

## Penpals for Programs

I am a student and tutor in a computer education class at the Connecticut Correctional Institution. I would like to correspond with people who write programs for their Apple //e's. I've been working with the //e for two years and have been writing educational programs for lower grade level and special education students for a year.

**Ronald G. Proulx**  
P.O. Box 100, Q-1-59  
Somers, CT 06071

## Pickin' the Daisies

Robert Hart's article on low-cost daisy-wheel printers (June 1984, page 28) was informative, but incomplete. NEC, Diablo, Gume, and other manufacturers make daisies for less than \$1000. I wish Hart had included which printers have bi-directional tractors and how much their ribbons and print wheels cost. And what is a *Star Powertype*?

**Greg Hitchings**  
2623 West Artesia Boulevard  
Torrance, CA 90504

*Star Powertype* is a printer manufactured by *Star Micronics, Inc.*, Box 612186, Dallas/Fort Worth Airport, TX 75261. It retails for \$499.

—eds.

## Bar Code Banter

Hal Hancock's letter regarding bar codes (June 1984, page 10) is based on a limited view of typing program listings. As a parent of two children, ages 10 and 12, I've found the program listings to be of great educational value. Each month my children type in at least one listing in the magazine. This has resulted in excellent learning experiences, since we jointly dissect the programs to determine what is happening inside the "magic box."

While there may be people willing to spend \$100 for a monthly subscription to new bar code software (as Mr. Hancock suggests), a

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# LETTERS

marketing survey would prove that the reduction in readership (at a higher revenue per reader) would not make up the loss.

At its current subscription price, *inCider* is a bargain. I'm not certain I would be willing to give up the educational component.

**William D. Grant, Ed.D.**  
**University of Oklahoma**  
**P.O. Box 26901**  
**800 N.E. 15th Street, Room 201**  
**Oklahoma City, OK 73190**

I've noticed that a growing number of computer magazine readers would prefer not to type in program listings. I don't blame them. After attempting this feat a number of times myself, it becomes laborious and annoying trying to locate the inevitable typos.

Readers have written to support the bar code program listings option. Although perfectly feasible, I can't see myself paying several hundred dollars for a bar code reader.

I'd like to suggest another system. It's inexpensive to both the publisher, and the reader. The system is that relic of the past, the phonograph record. Since demonstration disks can be stamped into paper or thin, flexible plastic for inclusion in books and magazines, why not use this medium for data? Apples have cassette input jacks that could take input from a turntable or stereo system. The program listings could be stamped on one platter, each program listing as an individual cut. These platters are good for only a couple of passes, but all that's needed is one pass.

I can't locate anyone in Canada who is involved in the paper record process or anyone who could generate a "soft cut" record to prove my theory. It should work. I hope you'll give it some consideration.

**Phil Brunette**  
**R.R.#4**  
**Uxbridge, Ontario**  
**LOC 1K0**  
**Canada**

*inCider acknowledges the disgruntled readers who balk at typing program listings. That's why we set up our bulletin board system so readers could dump longer listings directly through their modems. Your solution, Phil, could possibly work with the II Plus or //e, but the //c doesn't have a cassette input jack. But, you know what, you've got a good idea and we'll look into it.* —eds.

**"Each month my children type in at least one listing in the magazine. This has resulted in excellent learning experiences."**

## Russian to Navajo

I found "Russian Word Processor" (July 1984, page 64) very interesting. The organization I work with is choosing a way of handling the Navajo language on our Apple II Plus. I have been reluctant to use Gutenberg because, in its sophistication, it does not seem particularly user-friendly.

The Gutenberg demo disk proves tremendous potential (including the print processor, which we could use), but a brief exposure to the actual program left me feeling overwhelmed with the multiplicity of commands needed; having to insert a command at the beginning and end of each paragraph, for example, seems a bit much.

We want this program to be usable by Navajos themselves, who may not have a lot of experience with word processing. I am interested in how and how much Mr. Svec was able to simplify the actual use of the program for the students. I have no question about Gutenberg's ability

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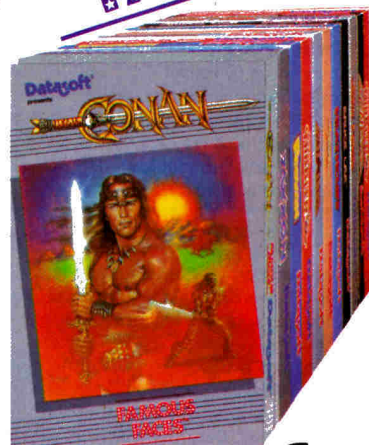
way through dark caves and dangerous dungeons. One false step and you'll be swallowed up in red-hot lava pits. And watch out for all those mysterious, supernatural creatures waiting to do you in.

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# LETTERS

to handle the extra characters required for Navajo. I would appreciate any advice on this problem.

**Glenn E. Marshall**  
P.O. Box 700  
Thoreau, NM 87323

## Consumer Alert

We have recently been informed that Micro Merchant, North 10th Street, or Box 1516, Colton, CA, has gone out of business. We have been unable to reach anyone for comment.

## Making Room

In his Hints 'n' Techniques ("Good-bye 80-Column Blues," August 1984, page 125), Jon Suttan set up his printer in the condensed mode to print a Quick File report with more information than would fit the standard 80-column printout. I offer an even simpler solution to this problem.

With Apple's Quick File for the //e, it's very easy to control the print mode from within the Quick File program. After formatting your report, use the right-arrow key to go to the right edge of the report. You'll see a statement with "len" and some numbers which indicate your report's column width. Make adjustments to the report until the len statement reads no more than 136. (You may have to omit certain columns of your report or make the columns narrower.)

After formatting your report not any wider than 136 columns, use the open-apple O command to display the printer options menu. Set the left (1) and right (3) margins at zero. Set the printer size (4) at 136. Now select Send Special Codes To Printer (9). Use the code applicable

for your printer—in the case of MX-80, control-O, and the Apple DMP, escape-Q, to specify the condensed mode. End the control string with a ^ (caret or shift 6).

Controlling your printer eliminates the time-consuming process of booting the System Master and typing the printer control characters. Also, you can transmit any print mode to your printer directly through Quick File using the Send Special Codes To Printer option. This will be saved as part of the report print specifications, making it possible to specify available print size and style that fits within a maximum of 136 columns for a printer using 8½-inch wide paper.

This technique also works with PFS: Report. Use the report options menu to enter the decimal form of your printer control code after the menu item, Printer Control Codes. You must use the decimal form because PFS programs recognize only that form of instruction. If you try to enter escape-Q, you'll be sent back to the main menu as soon as you enter escape.

**Winston Sayers**  
5421 Ivywood Lane  
Columbus, OH 43229

## Sorry, Wrong Number

The telephone company has been everyone's scapegoat in the past, but for once you can't blame them. Because of recent editorial changes, we published two telephone numbers for our bulletin board system. Unfortunately, the latest number is not being serviced. But, don't despair—we haven't let you down. Our new number is our old number, (603) 924-9801. Sorry if this caused any inconvenience. —eds.



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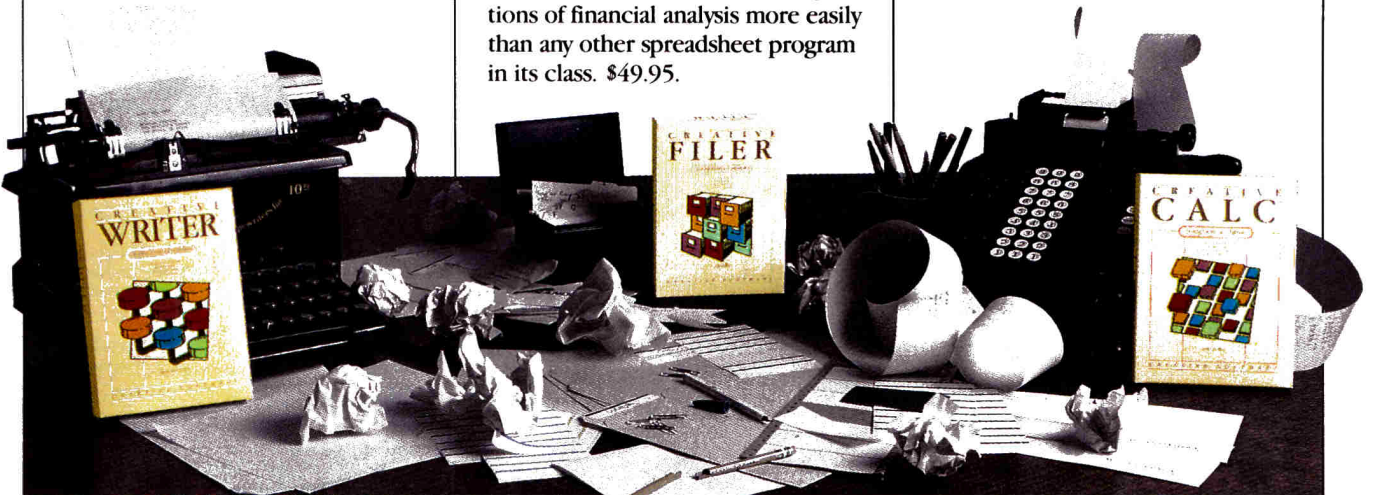
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## 20/20 VDT Vision

Looking at the world through rose-colored glasses may come to signify common sense rather than romanticism. *USA Today* (August 14, 1984) reported that American Optical Corporation has developed video glasses for people who experience eyestrain caused by using VDTs all day.



## Horse Sense

Apple is in the saddle at Sweet Briar College in Virginia. All it took was a little horse sense to set up a //e for the college's riding program, making Sweet Briar the first out of some 600 U.S. college riding programs to use computers in managing stables.

Paul Cronin, director of riding, explains that logging statistics for 60 horses and 125 students amounts to a massive record-keeping chore that includes keeping track of each horse's shots, shoes, and feed; its purchase price and competition performance level; as well as board, medical, and transportation fees.

Through the guidance and support of W. Ford Cramer, a member of

The rose-tinted glasses, which cost \$100 and come in designer styles, are sold by American Optical and selected optical retail stores.

According to *USA Today*, controversy blurs the video glasses' actual benefits. Some say they're the answer to a VDT worker's prayer; others quote a National Academy of Sciences' study that states VDTs don't cause "serious eye problems."

the college's board of directors and a former IBM executive, the riding program was groomed to enter the computer age.

"Other people look at it [the computer system] and wonder why it's here," Cronin says. "People in our field aren't really involved with computers."

According to Keedie Groanes, manager of the riding center and system operator, the stable relies primarily on three commercial programs: Applewriter, VisiCalc, and VisiFile.

Cronin and Groanes agree that the //e has saved hours of book-keeping time while managing the riding program's operations.

"The computer makes it run as efficiently as any other small business," Cronin says.

## White-Collar Computing

Just who uses personal computers, anyway? Not many top-level executives, according to a survey conducted by Forum/Nevison, a personal computer training firm.

The survey refutes the popular assumption that personal computers have infiltrated every level of the work force.

"It's not a surprise to us, but the results of the survey appear to contradict what the media is writing about the computer revolution," Forum/Nevison Chairman John Nevison says.

"In fact, the computer revolution has yet to attract top executives in significant numbers as active participants."

Only one in five of those polled indicated that within their companies there was "significant" use of personal computers by executives. The survey was distributed among executives in financial, industrial, human resources, and service companies as well as those in small-business management.

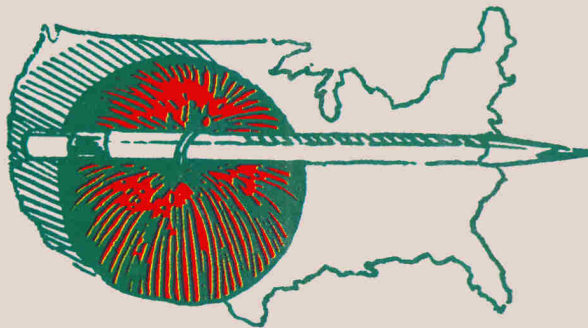
"Personal computers tend to be used to a far greater extent by lower management, accounting department staff, and secretaries than by anyone else," Nevison adds.

## It's Academic

Apples and education are symbiotic these days. In a survey of computer usage in the 50 largest school districts in the United States, Apple emerged the winner. Of the 38,211 computers placed in these schools, 16,992 are Apples. Six of the school districts—Detroit Public (Michigan), Broward County

(Florida), San Diego Unified (California), Jefferson County (Kentucky), Dekalb County (Georgia), and Boston (Massachusetts)—use Apples exclusively.

The report, conducted by Quality Education Data, Inc., is based on 1983-84 enrollment statistics. Broward County claimed the most Apples with 2000 in the district, but Jefferson County had more units per school with 13.03 Apple computers for each school.



edited by Cynthia Carr

## VOTERS' Rights

Thumbs up, thumbs down. You control the fate of computer products through VOTE—Voice of the End User. Formed by the Institute for Personal Computing, VOTE is a nonprofit educational organization aimed at distinguishing the good products from the bad for consumers.

Started in July, VOTE depends on the average consumer who uses a product day in and day out. According to Dr. Heinz Dinter, IPC president, consumers are the best judges of software and hardware.

Anyone interested in personal computing can join VOTE. The organization is recruiting volunteers.

"If they [computer users] have a message [about a product] to tell other people—whether positive or negative is not relevant—we would like to know about it," Dinter said.

IPC plans to spread the results of its studies through the media and its own publications.

"We're all very enthusiastic about VOTE," says Dr. Roger C. Schlobin, VOTE director. "I have a great interest in the personal computer, but I'm a non-technical end user, just like tens of thousands of others out there. This is a great opportunity for all of us to have a voice in the future development of personal computer products."

If you would like to become a VOTE volunteer, write to Dr. Schlobin at the Institute for Personal Computing, P.O. Box 8187, Vero Beach, FL 32963, or call (305) 231-6846.



Illustrations by Katherine...

## Adopt a Computer Waif

The picture isn't a pretty one: Cast aside for whatever reason, unloved, unused, and unwanted computers account for the fact that one out of every five sold this year will be orphaned within two years. What can you do for a homeless piece of hardware? Put it up for adoption. That's right. Give it a chance for a better life, courtesy of Brian Keenan, president of International Computer Orphanage.

Keenan developed the idea of a computer "orphanage" when he saw how many computers are abandoned because of new technology or their owner's lack of interest, and admits he selected the orphan theme for promotional purposes. The company acts as a brokerage house to locate and sell used computers.

International Computer Orphanage matches computers with prospective owners. People no longer interested in their computer can give it up for adoption while those looking for a computer can call up an

adoption center to see what's available, either on a temporary or permanent basis.

Giving up a used computer for adoption is a profitable alternative for the owner, who receives payment from International Computer Orphanage. Those looking for a computer can get one at a reduced price through a company-sponsored computer orphan agent.

Apple and IBM machines are the most favored, according to Keenan. The Commodore follows in popularity. People who "adopt" an IBM tend to be computer-literate or business-oriented, Keenan says, while those interested in an Apple are often first-time users.

The computer orphanage has two centers in operation with 95 requests for franchises in the United States. Keenan anticipates 1000 computer agents by the end of 1984.

"We are building a sub-industry within the computer industry," Keenan says. "We're dealing with a different breed when dealing with a used [computer] product. One out of ten existing stores cannot afford to deal in a used program."

To match the right owner with the right

computer orphan, Keenan's company entered the private market on The Source (an on-line information service) to store information on used computers.

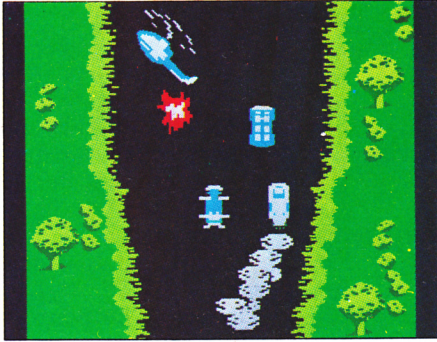
Through The Source, International Computer Orphanage is available to 66,000 members scattered in 53 countries.

Keenan's business has taken off within a matter of months. He developed the concept in January, and started advertising on The Source in June. ICO's biggest market, the education field, pulls in some 40 percent of the company's business.

"We present a new image to the public where computers are not intimidating," Keenan says. He points to the homey atmosphere characterizing his stores, decorated in a "bedroom" motif with nonmodular furniture and teddy-bear wallpaper. "The plan is to make this high-tech field a comfortable place to live in."

For more information on how to adopt a computer of your own, contact International Computer Orphanage, 6711 Mississauga Road, Suite 103, Mississauga, Ontario L5N 2W3, (416) 826-7955 in Canada, or (800) 387-8244.

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Do you have what it takes?



Bally Midway's Tapper would like to welcome you to the fastest game in the universe.

You're serving up drinks in some of the craziest places you've ever seen. And the service better be good, or else. You'll work your way through the wild Western Saloon to the Sports Bar. From there to the slam dancing Punk Bar and on into the Space Bar full of customers who are, literally, out of this world!

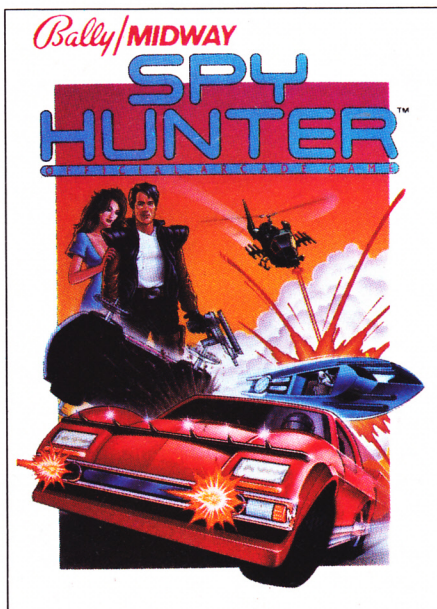
Are you fast enough to play Tapper? If you have to ask, you probably already know the answer.



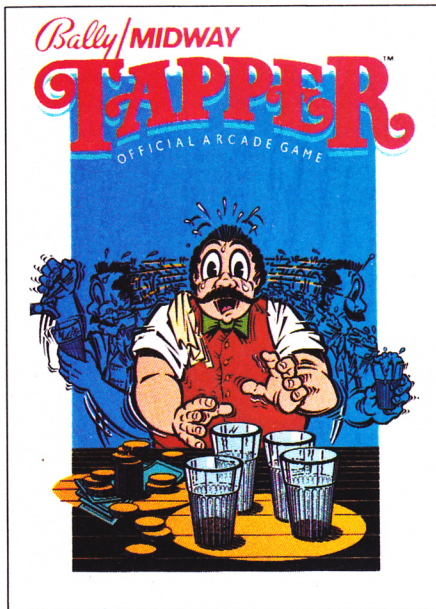
Bally Midway's Up 'N Down by Sega. In this game, a crash is no accident.

In fact, it's the whole object of the game. You'll race your baja bug over some of the worst roads south of any border. Leap dead ends, gaping canyons and oncoming traffic in a single bound. And if anyone gets in your way, crush 'em.

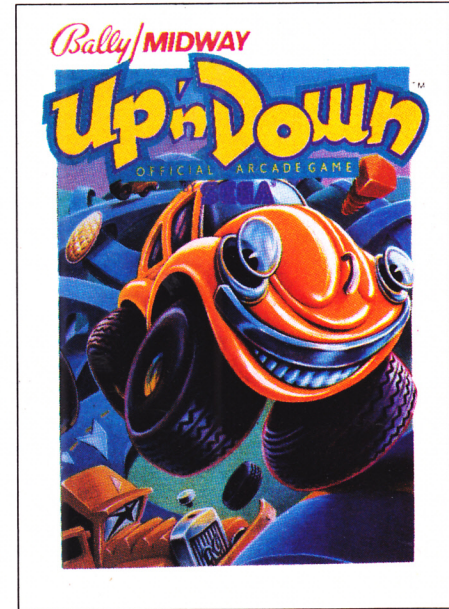
Crashing, bashing Up 'N Down. It's one smash hit that really is a smash.



The #1 Arcade Game of 1984.



Nominated as Most Innovative Coin-Op Game of 1984 by *Electronic Games* magazine.



#1 Arcade Hit, *Play Meter* Conversions Poll, 8/1/84.

# WERE SUCH BIG HITS, THEM HOME.

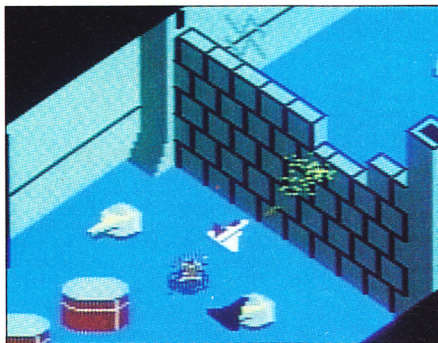
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Sega's Congo Bongo rocked the home game world when it shot up to Number 3 on the Billboard chart this spring.

And now it's available for even more home systems. So check the chart and get ready for jungle action. You'll pursue the mighty ape Congo up Monkey Mountain and across the Mighty River. Do battle with dangerous jungle creatures. Ride hippos, dodge charging rhinos and try to avoid becoming a snack for a man-eating fish.

Congo Bongo. It's fast and it's fun. But be careful. It's a jungle in there.



Sega's Zaxxon. If you haven't played Zaxxon, you must have been living on another planet for the past few years.

And now the ultimate space combat game is available for even more home systems. You'll pilot a space fighter through force fields and enemy fire on your way to do battle with the mighty Zaxxon robot. Countless others have gone before you in this Hall of Fame game. But this time your life is in your own hands.

Zaxxon killed them in the arcades. But compared to what it will do to you at home, that was child's play.



Arcade and Home Smash. Hit #3 on Billboard magazine's Top Video Games survey.



One of only ten games ever to make Electronic Games' Hall of Fame.

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Atari 5200 cartridge				✓	NEW
Atari Computers* cartridge	✓ NEW	✓ NEW	✓ NEW	✓	✓ NEW
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ColecoVision & ADAM cartridge	✓ NEW	✓ NEW	✓ NEW	✓ NEW	✓
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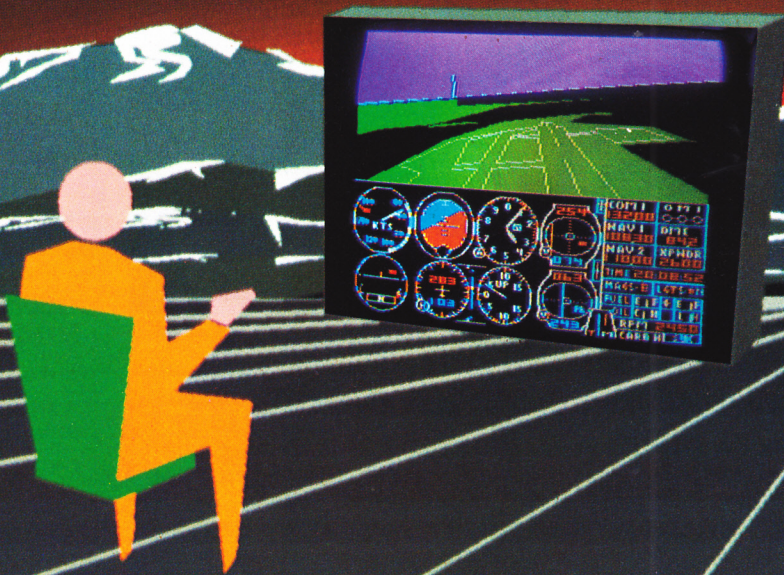
All new games are scheduled to be in your stores for Christmas. Check your local dealer.

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## Holiday Plans

**H**ow do you expect to spend Christmas? I plan to dress inadequately for winter, carry a frozen rifle through Russian snow drifts, and charge into the teeth of a fanatical foe.

Chestnuts won't be roasting on an open fire (though Jack Frost will be nipping at my nose)—in simulation, at least, when I refight World War II with **Objective: Kursk** and **War In Russia**, by Gary Grigsby.

Grigsby, one of my favorite war-game authors, thinks BIG (just like the Warden, whose Old Rhino toddies run to 16 ounces and up). His naval games take place on an oceanic scale, with hundreds of ships and planes.

I was surprised when Grigsby turned from naval games, at which he is the master, to monster-sized land games. Fortunately, he has the same flair for land-bound war games as for naval games. His two Eastern Front games, masterpieces of complexity and detail, are surprisingly simple to learn and play.

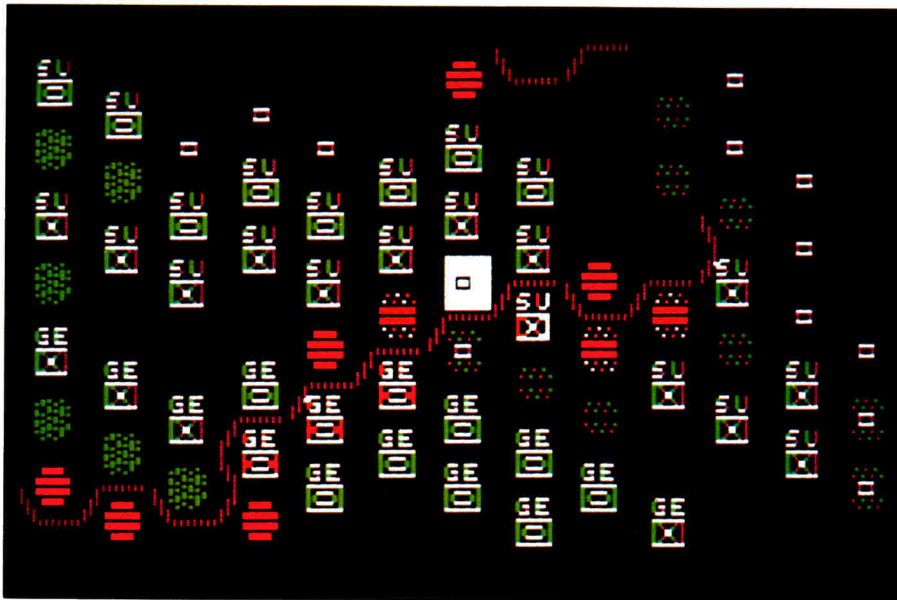


### **Objective: Kursk**

In **Objective: Kursk** the German player must capture the Soviet city of Kursk, situated at the top of a 31 by 32 hexagon map. Only a fraction of the map, about 11 by 12 hexagons, is on the screen at a time (see **Photo 1**). A scrolling simulation moves you to other parts of the display. There is no "strategic map" to let you see the entire display in miniature. The distance (simulated) between the Germans' starting line, in the lower left of the map, and their

**Spend Christmas deep in Russia, away at boot camp, or in the Olympics.**

*with Warden Shiftky*



**Photo 1.** Close-up battle map from *Objective Kursk*.

objective is 50 grueling miles. The Russian's objective is to stop the Germans.

Both players have large and complex forces at their command. At almost any point in the game you can inventory the units, called combat

groups (CGs for short). Each group is divided into smaller units of infantry, artillery, motorized troops, tanks, and so forth. Under each unit heading, you see the number of soldiers, guns, vehicles, and tanks in the

group as well as a morale estimate—an important indicator of the soldiers' willingness to fight. These statistics, which measure the overall effectiveness of the CG in combat, are crucial in planning successful attacks or defending a position.

You can divide a CG into two smaller groups. If you have two hexes to defend or attack and only one very strong CG, dividing the group can be a smart move. If the two smaller CGs surround an enemy unit, they invoke the game rule that a retreating enemy CG surrounded by your zones of control must be eliminated. That's when division is a very smart move.

Adding to the game's complexity is the sophisticated simulation of terrain. Geographic features include roads, fields, streams, gullies, minefields (that can reduce your force and your effectiveness on attack), and towns. All terrain features have important effects on combat results. CGs in towns and woods are twice as powerful on defense. Soviet units in minefields are also doubled on defense (presumably because the minefields are part of the Soviet strategy). Attacking out of a gully cuts your strength in half, while charging into a gully doubles your strength. Got it?

Supply rules require that both sides allocate supplies to their units during each move. Not being supplied on any particular turn means that the unit has only a limited time before it runs out of supplies. Once out of supplies, a CG can't move or participate in combat, except on the defensive and then only at half-strength.

### Heavy Casualties

Combat takes place when a CG attempts to move into a hex occupied by an enemy CG. The computer collects all the data on the relative combat strength and morale of the units, includes the disruptive effects of any air or artillery bombardments you have conducted, adds the effects of terrain and other factors, and comes up with a result. This result may be anything from a simple reduction in forces from casualties, to a retreat, or even the elimination of the enemy group.

It will be hard going for the Ger-

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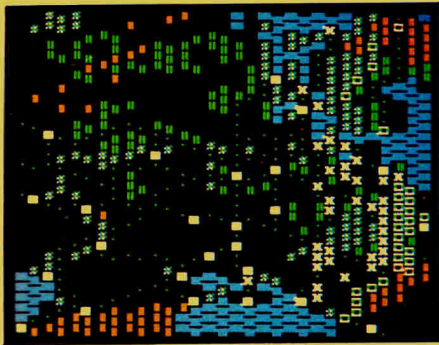
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man player to get even halfway to Kursk. The terrain and the minefields favor Soviet defense. The German side must attack to win, but has only half-strength time and again as it advances. In addition, the Soviets receive heavy reinforcement from six hexes along the right edge of the map.

All the Soviet player has to do is sit tight, roll with the punches, channel in the reserves, and fall back to lines of defense. Even if the first Soviet line falls, there are plenty of other places where you can re-form and punish the German side.

In solitaire, the German player has one advantage that the real-life German commanders lacked in their ill-fated offensive: The computer player can set the difficulty level to limit Soviet reinforcements. Aside from that though, it will take real military genius to avoid crushing defeat.



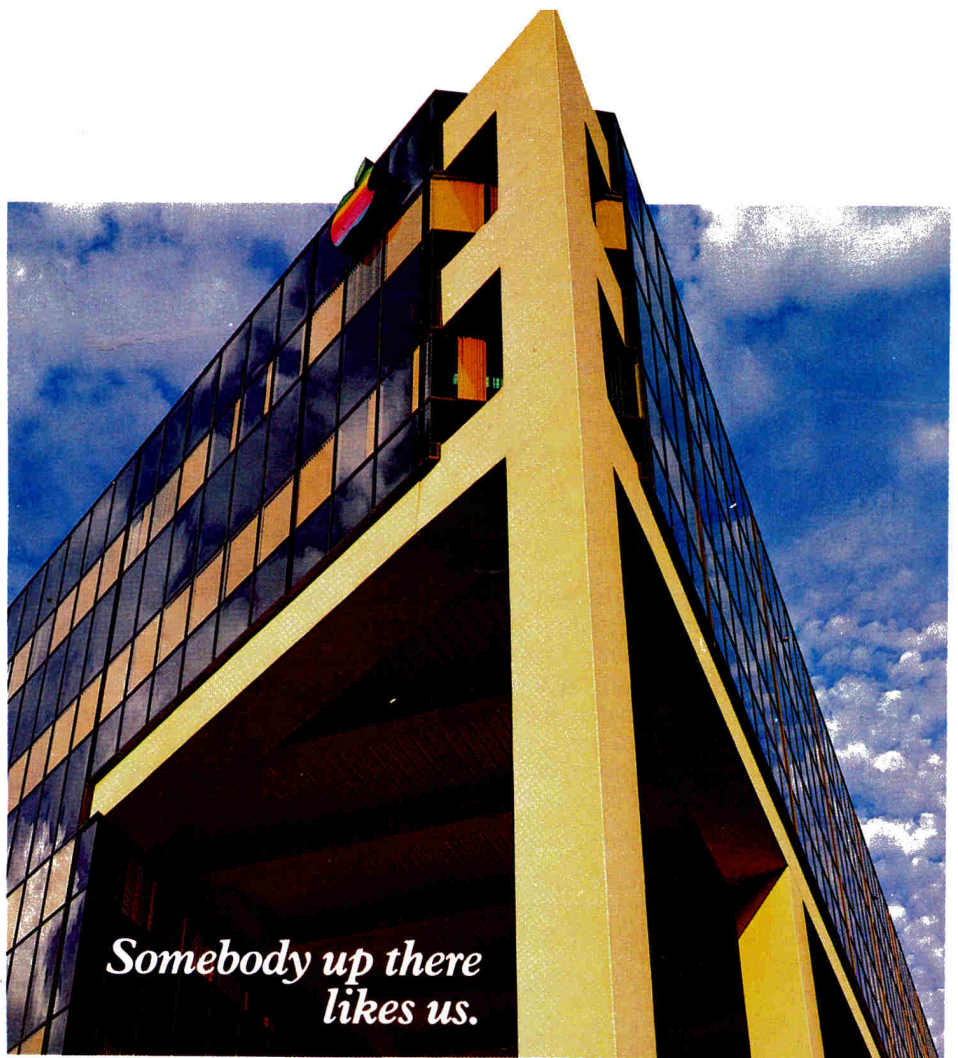
**Photo 2.** Strategic map gives an overview of War in Russia.

### War in Russia

Grigsby's other game, War in Russia, is a mammoth simulation of the entire Eastern Front from Murmansk above the Arctic Circle to Baku, just north of the Persian border (**Photo 2**). In this game the German units are divided into "corps" and the Russian forces into "armies," both about equivalent in size and force.

Both sides are challenged equally. The German player must capture cities, and the Russian player (or the computer in solitaire) must prevent the German side from doing so without expending all its forces before reinforcements arrive.

Supply and transportation are more of a factor here than in the Kursk game. The German player is faced with limited supply resources (in the form of depot units) which can be used either to resupply combat



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units or to extend rails from west to east. Supply range is limited but can be extended by rail movement. As German forces move east, rails must be extended eastward at the expense of supplying combat troops. A good commander recognizes the need to build these rails and rebuild Russian tracks for German trains.

The main scenario takes you from June 1941, the beginning of the German invasion of Russia, to December 1944, by which time the Nazis were doomed to defeat. Your best opportunity to beat the computer Russian commander comes in the first year and a half of the game, from June of 1941 to the end of 1942. After that, you win victory points just for staying in the game.

Let's face it: Invading Russia isn't easy, even in a computer game. The Swedes tried it, Napoleon tried it, and Hitler tried it. They all fell flat on their faces. Maybe you can do better. Defending Russia isn't any picnic either (what with the Swedes, the French, and the Germans constantly

invading you). In the last war around 22,000,000 Russians were killed. If you were in charge, could you cut those losses?

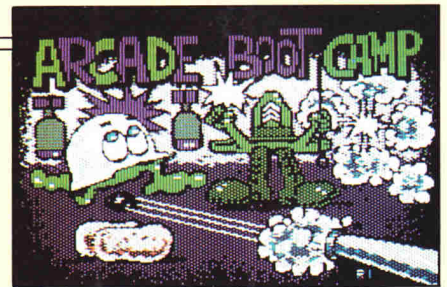
No matter which side you choose, be sure you can block around 100 hours of free time (the two secondary scenarios take only 20 hours each) and that you have lots of Old Rhino on hand. One hundred hours in the same chair is a long time—but it can be worth it.

That's the last war game that I'll review for the next few months. It seems fitting that we close out the year on a lighter note and look at some unusual arcade games.

### Arcade Boot Camp

You say you can't shoot down Galaxian's alien ships? Can't avoid the barrels in Donkey Kong or escape the ghosts in Pac-Man? Still stuck on the first level of Miner 2049er?? Can't get off the ground in Choplifter? You even poop out at Pong???

Well, just take a look at yourself. Your wrists are flabby, there's no



**Photo 3.** Sign up at the Arcade Boot Camp for gaming skills.

tone in your thumb muscles, and your eyes and hands are about as coordinated as the New Orleans Saints' backfield. It's gonna take the Army—the Arcade Army—to make a video-game player out of you. What you need, buddy, is a hitch in Penguin's **Arcade Boot Camp (Photo 3)**.

They'll shape up your arcade-game skills, sharpen your reflexes, and make you worthy of this most sophisticated pursuit. You come out ready to do combat with any and all game machines and computers.

The camp offers training in five basic areas: driver education, survival, helicopter piloting, obstacle course survival, and target practice.

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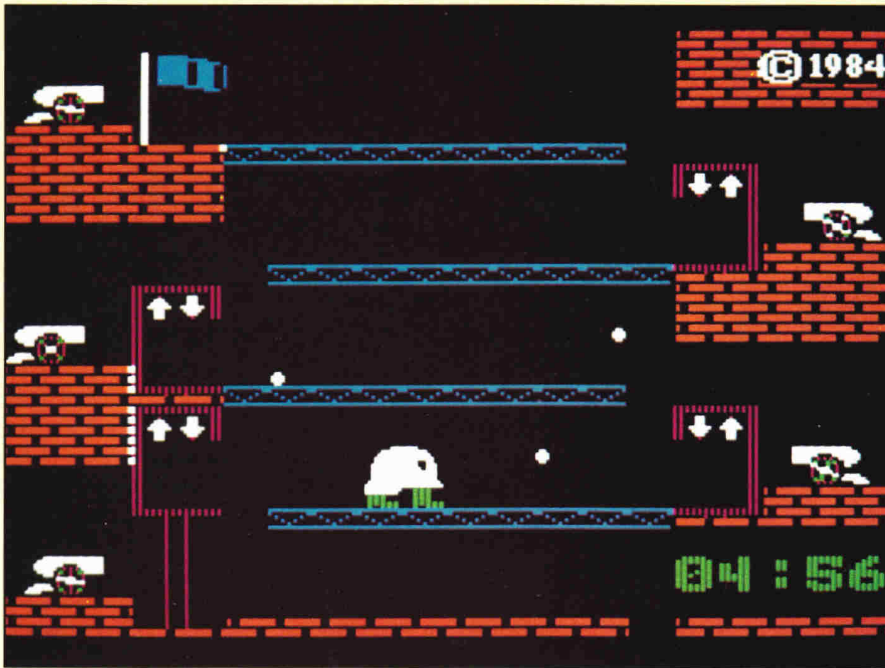


Photo 4. Boot Camp teaches helicopter skill under fire.

Each area is a separate video game, with various levels of difficulty that you reach only by mastering easier levels and winning promotions. For example, in target practice you start with stationary targets. Take those

out and you are offered pop-up targets, moving tanks, and birds.

In the survival course, you begin by dodging falling bombs. Survive that and you have to evade falling, bouncing, and rolling boulders. In

driver education, you first steer down a winding road. Then you tackle an icy road. In chopper piloting you learn to fly from point to point. Then you fly around barriers. Survive that and the barriers will be topped by cannons (Photo 4). Even K.P. is a challenge; the spuds chase you through a maze while you frantically search for a paring knife.

Arcade Boot Camp is fun and a little dizzy—what simulation of simulations wouldn't be? The game's major charm, the little Peewee character who is your alterego on screen, loses at video games and is kicked around by a sergeant until his skills (and yours) improve. If your skills improve drastically, who knows? Maybe you'll qualify for the 1984 Summer Games in Los Angeles.

### Summer Games

Okay, okay. I know that I've missed the games by about four months, but that's no reason why you can't participate anyway—through the magic of your Apple II, that is. Even the

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inCider		0 7 4 0 0 1 0 1	Sept. 18, 1984
3. FREQUENCY OF ISSUE		3A. NO. OF ISSUES PUBLISHED ANNUALLY	3B. ANNUAL SUBSCRIPTION PRICE
MONTHLY		12	\$24.97
4. COMPLETE MAILING ADDRESS OF KNOWN OFFICE OF PUBLICATION (Street, City, County, State and ZIP Code) (Not printer)			
80 Pine Street, Peterborough, N.H., Hillsborough County 03458			
5. COMPLETE MAILING ADDRESS OF THE HEADQUARTERS OF GENERAL BUSINESS OFFICES OF THE PUBLISHER (Not printer)			
80 Pine Street, Peterborough, N.H., Hillsborough County 03458			
6. FULL NAME AND COMPLETE MAILING ADDRESS OF PUBLISHER, EDITOR, AND MANAGING EDITOR (Do not use P.O. Box)			
PUBLISHER (Name and Complete Mailing Address): David Schissler, 80 Pine Street, Peterborough, N.H. 03458			
EDITOR (Name and Complete Mailing Address): Paul C. Quinn, 80 Pine Street, Peterborough, N.H. 03458			
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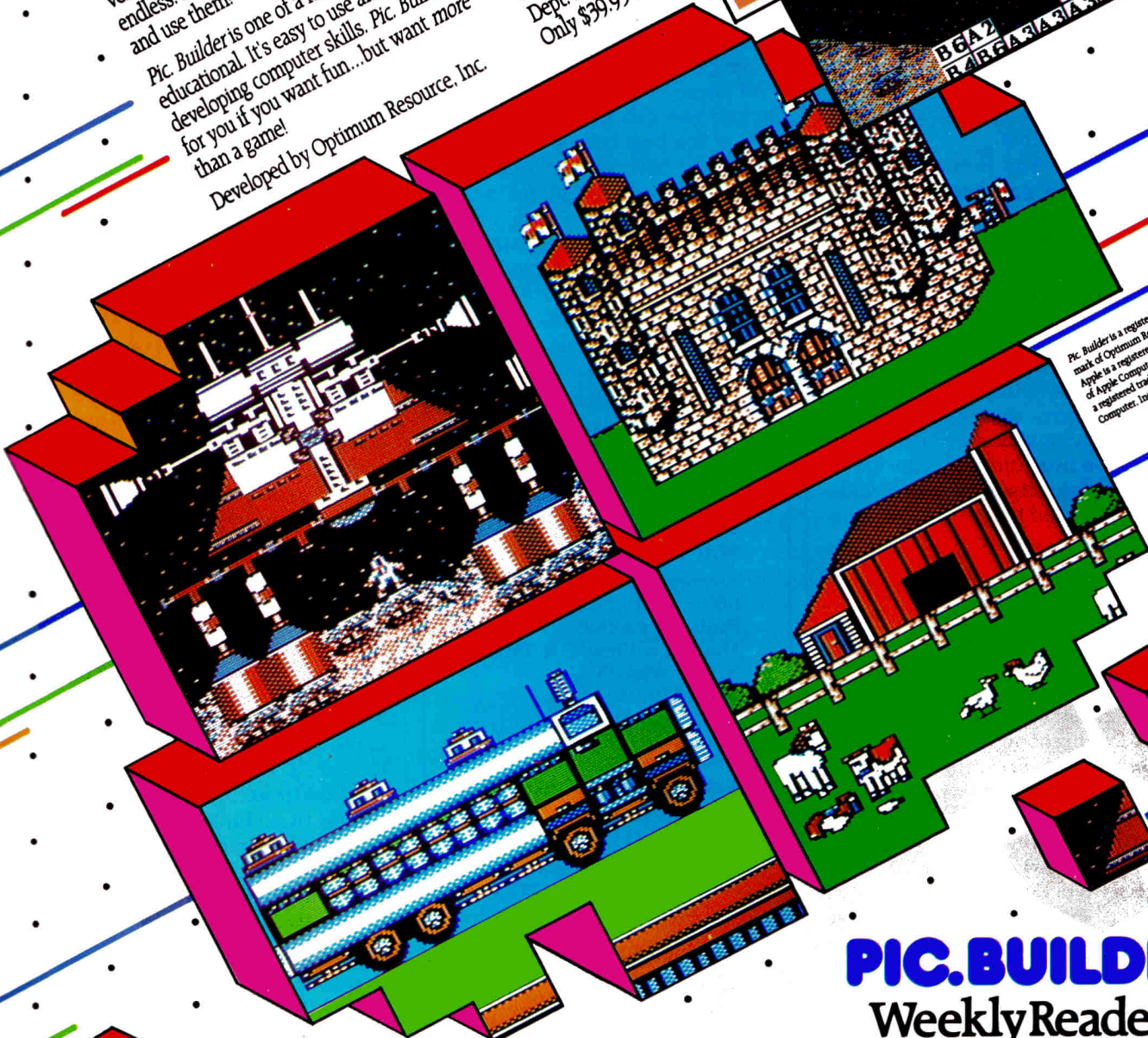
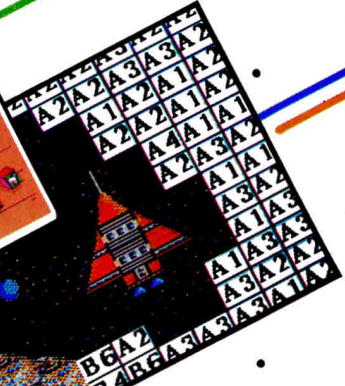
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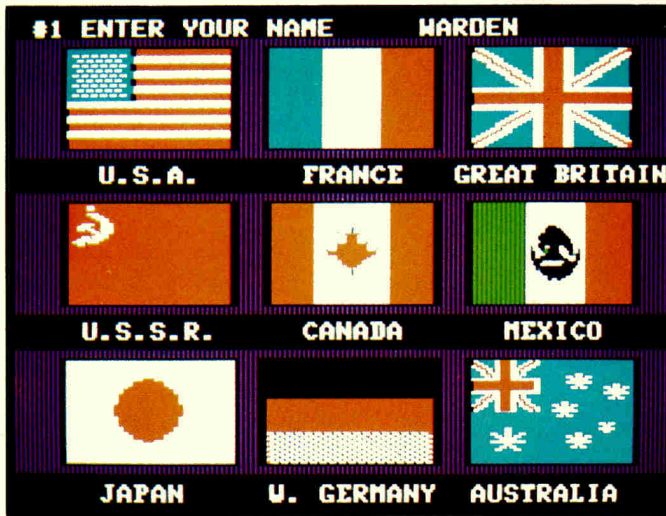
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**Photo 5.** Pick your country in the Summer Games.



**Photo 6.** The 100-meter dash pits you against the clock.

Russians have come to Epyx's **Summer Games** for the 100-meter free-style swim, swim relay, pole vaulting, gymnastics, the 400-meter relay, the 100-meter dash, platform diving, and skeet shooting.

If you think you needed sharp arcade skills to get through *Arcade Boot Camp*, you ain't seen nothin' yet. Your skills have to be, shall we say, of "Olympic" caliber to make the grade in this grueling series of events. Up to eight players of nine different "nationalities" may join in the games (**Photo 5**). Each event calls for quick reflexes, careful judgment, and great timing.

In the gymnastics event, for example, you must time a joystick-button press precisely to give your gymnast a good jump off the springboard. Then you maneuver your joystick to somersault off the vaulting horse and land on your feet. Similar skills are required in the platform diving event and in planting and releasing the pole in the pole-vaulting event. In the swimming competitions, you can increase your athletes' speed by pressing the joystick or mouse button—or hitting the space bar or the return key—whenever you see the swimmer's arm come out of the water. This is the way you achieve the "power stroke."

The spirit of Los Angeles lives on in the track events. In the 100-meter dash (**Photo 6**), your physical endurance is tested as you move your joystick as fast as you can to speed up your runner. In the relay race, you more or less set your speed and then

try to time relays and pace runners so they don't run out of steam before passing the baton.

All these events are competitions against the clock. The contestant posting the best time wins the gold. The skeet shoot, on the other hand, is a straightforward target game—the one who pops the most clay pigeons wins. In this contest, the players press the fire button to pull the skeet, then maneuver cross hairs to intercept the fast-moving target.

Summer Games, perfect for short-term nostalgia buffs, includes open-

ing ceremonies, record keeping (so you'll know when you've broken a world's record), and even the appropriate national anthems played for the winners. Only the ads are missing—we're spared the Official Snack Food, Official Tacos, Official Athlete's Foot Sprays. . . .

### Merry Christmas to All

All this talking about exercise certainly wears me out. There are a lot of games that have to be played for the new year waiting at the Game Reserve's computer station. I better face up to the task—and put it off until February. Instead, I'll dedicate at least part of my January column to the results of the Shiftky readers' poll. I'll also reveal the name of the first (and only) arcade player to be recognized as player of the month.

Meanwhile, remember that the poor old Warden enjoys getting your cards and letters. Address your comments and complaints about the gaming scene—and whatever news you care to send me—to Warden Shiftky, c/o *inCider*. Your letters make good reading for me and the Reserve's readers—and good kindling on those cold winter nights.

Until then, lift a cool one with me to the old year and accept my very best wishes for a healthy, happy new one. Mele Kalikimaka (Merry Christmas) and aloha. ■

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A computer can help your child learn, but the keyboard often gets in the way. It's a jumble of keys that's confusing and hard for little fingers to operate. And it's not much fun.

### Introducing Muppet Learning Keys™ from Koala Technologies™

It's the first computer keyboard made especially for young children. Unlike regular computer keyboards, all the letters and numbers are in order. So a child can find A-B-C and 1-2-3 without hunting all over the keyboard. And with Muppet Learning Keys software, learning letters and numbers becomes fun.

### From the Experts

Muppet Learning Keys was created by education specialists to make learning exciting for your child. It's the first computer keyboard with Kermit, Miss Piggy and the whole Muppet gang right on it, ready to introduce your children to the magic of letters, numbers and colors.



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### Kid Stuff

Muppet Learning Keys has things that every child knows and loves:

- A paint box with eight touchable colors
- A blackboard with the ABC's in order
- A ruler with the numbers where they're supposed to be
- And keys the right size for small fingers

Press any key and something always happens. Press K and Kermit flies his

kites. Press 6 and six kites appear. Touch a button on the paint box and leave a colorful impression.

Muppet Learning Keys—for a child's hands, a child's mind and a child's heart. Give your child Muppet Learning Keys and make computer learning child's play.

### Muppet Learning Keys. The Hands-on Keyboard for Kids.

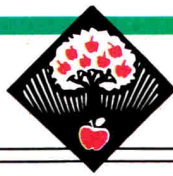


For the Apple® IIe and IIc, Atari®, and Commodore 64™ computers. In-Box software by Sunburst Communications. Muppet Learning Keys works with software that is designed or adapted for it.

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Circle 541 on Reader Service card.





## Ten Tips for Choosing Educational Software

**H**ow do you know that the software you are about to purchase will help your child?

Unfortunately, there is no foolproof way to determine that a package is educationally sound. It's best to view the software and even have your child use it before you buy it. But that's not always possible. If you follow my guidelines, though, your chances of purchasing worthwhile software will increase dramatically.

I'll start off with some of my biases. If a program responds with any sound to a wrong answer, I immediately reject it (with few exceptions). A child can be embarrassed when the computer announces to everyone in the room that he or she has chosen a wrong answer. Hearing a razzberry sound frequently can discourage a child from using the computer. On the other hand, if the noise pleases

them, children will sometimes hit wrong answers just to generate the sound. Likewise, if a wrong answer is followed by a lot of activity on the screen, the student may err deliberately just to see the clown cry or the bottle break, and so on.

What should happen when a wrong answer is chosen? Nothing—absolutely nothing.

I have other biases against sexist or racially stereotyped software, software that degrades or denigrates. I



*John Firman*

**When buying educational software for your child, first do your homework.**

**by Fred Huntington**

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**“If a wrong answer is followed by a lot of activity on the screen, the student may err deliberately just to see the clown cry or the bottle break.”**

dislike violence and can't condone children's shooting down aliens or killing monsters.

### **Individual Needs**

If you've read this column before, you may remember that I think Stickybear ABC is a fantastic program—but not for everyone. Before buying even a highly recommended educational package, you must first determine your child's particular needs. Enlist his or her teacher's help in charting your child's strengths and weaknesses. List as many qualities or traits as you can. You can list such things as “He is neat,” or “He has poor gross motor skills.” The profile of your child you create will be important when reviewing certain types of software. For example, slow-paced software may be perfect for a youngster who is methodical and exacting. Fast-paced software can better hold the attention of the child who is hyperactive or easily bored.

After determining your child's strengths and weaknesses, choose one or two subject areas to work on. Your child won't benefit from working on ten different packages every night. He or she will grow bored quickly, and you may be tempted to blame the “awful” software.

### **Ten Ways to Evaluate Software**

#### **1) Is the program easy to use?**

Can your child turn it on without your intervention? (Dale, my 2-year-old, turns on Stickybear ABC by himself and plays with it five to ten minutes at a time without any adult help.)

**2) Is the documentation easy to understand or, preferably, unnecessary?** The best software is so easy to use that you don't need more than the on-screen directions that are a part of the program. I try to use software that is not continu-

ously dependent on documentation because my daughter Melody tends to scatter computer instructions all over the house. (I'm looking for a program on how to help a 5-year-old want to be neater.)

**3) Does the program have sustaining power?** The only real way to answer this question is to put your child on the computer for an hour and see if it keeps his or her interest. You can guess at a program's sustaining power by evaluating its intellectual appeal. Is the task a simple one that is easily accomplished? Is it accomplished the same way each time or does it vary? For example, does the child complete the same maze repeatedly or does the computer randomly draw different mazes? Are there enough mazes to keep a child busy mastering them all?

**4) Is the program highly motivational?** This is where color, sound, and entertaining animation and art spark a youngster's interest in a program, though they don't guarantee that he or she will *stay* interested.

**5) Is the software accurate?** You might think this wouldn't be worth mentioning. But I have seen some otherwise good educational software that's riddled with atrocious spelling errors.

Sometimes a package contains factual errors; sometimes the information is so simplified that the meat is left out. And be aware that if you purchase a program to improve your child's algebra skills, for example, you are probably only going to get a fraction of what your child will cover over a semester in a high school course.

**6) Is the program educationally sound?** For example, a program that teaches reading by using all capital letters would confuse a primary student. (There were plenty of those programs in the old days, so beware.)

**7) Is the program outdated?** A bargain on a program that is no longer state-of-the-art may be no bargain at all. (Lack of graphics does not mean the program is out of date.) Is the program reasonably sophisticated?

**8) Is the computer used in a meaningful way?** One well-known educational company once put out a series of classics like *Black Beauty* and *20,000 Leagues Under the Sea* complete with cassette audio tape and a beautiful comic book. The computer was used simply to ask the student questions. The tape and the comic book were great, but it appeared that the disk itself was added as an afterthought; it did nothing to enhance the student's learning.

Unlike some educators, I'm not opposed to a program that doesn't fully use the computer. The most significant difference between a worksheet on paper and one displayed on screen is that the computerized version provides the child with immediate feedback and is more apt to be fun to complete.

**9) Is there a sense of excitement about the software?** Does the program evoke interest in your child or is working with the program a chore, comparable to dreaded school work?

**10) Does the program do a better job of teaching than a book or workbook could?** I've seen some programs that lecture a student by writing essays on the screen. This is boring and won't motivate a child. The novelty of the computer can't last forever. An animated character running across the bottom of the screen isn't enough to enliven a deadly lecture. Remember that the computer is most effective when it is used as an interactive tool, that is, when a dialogue is set up between the child and the computer.

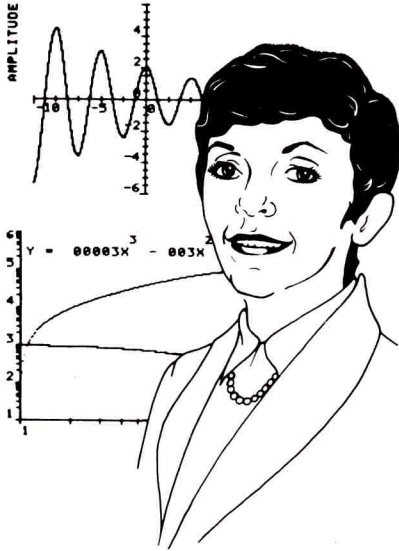
### **Some Last Thoughts**

I like programs that are easy to use, ones that require a single key-press to select an answer. I like to hit the Y key for yes and the N key for no (with no return key).

I like programs written in machine language because they run faster.

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—Virginia Lawrence, Ph.D.  
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Stay clear of any programs written in Integer BASIC, which involves an extra step in loading the program. Believe it or not, there are still some programs being sold in Integer BASIC (watch out for those bargain close-outs).

I like programs that are ready to use, straight out of the package—no data disks to configure, no setup required, and no long books to read first.

I don't take the recommended age-level printed on the outside of the package at face value. Too many educational software manufacturers know nothing about education and often misassign the age appropriate for their particular program.

A program should offer an easy exit when you hit the escape key and then an "Are you sure you want to quit now?" You should be able to skip lengthy titles, introductions, or instructions by hitting the escape key.

Be reasonable when you evaluate software. For example, if a program's sharp-edged packaging could be dangerous to youngsters, don't throw out the entire program. Just make sure an adult opens the package and then puts it away where a youngster can't get to it.

### Word Search Reviewed

Word Search by Hi Tech of Santa Cruz, a fantastic program written with the classroom teacher in mind, has as many applications at home as it does at school.

Hi Tech, a small company, produces four top-notch educational programs, all carrying the NEA (TM) teacher-certified seal. Owner and programmer David M. Summer is a part-time junior high school teacher devoting the remainder of his time to his computer business.

Word Search is the best of its type I've seen (and there are several such games on the market). As a principal, I've used it to get my teachers involved with the computer. Almost anyone can learn to use it effortlessly on the first try—even without reading the directions.

To start the program you boot the disk, tell the computer how large you want the puzzle, type in a word, and the computer will randomly place it on the grid. If you don't like

where the computer places the word, you can quickly and easily tell it to move that word, or any other word, to a new location. It even lets you decide in which direction you want the word to be placed.

The grid can be a 20 by 20 puzzle, or smaller, with up to 100 words. Save any puzzle you make for later use right on the Word Search disk.

When I was playing with the program, I used 27 words in my puzzle. I had fun hitting the R key, which rearranged all the words almost instantly, each time in a different way.

The printout was absolutely beautiful. Word Search first prints an answer key, and then the puzzle itself. It pauses between the puzzle and the key to give you time to insert new paper or to adjust your paper. It lets you put your name, the date, and a message at the top. It also prints out a list of words in the puzzle. I have used Word Search with equal success on daisy-wheel and dot-matrix printers.

This would be a great program for your child to use weekly on his or her spelling words. Children in the third grade and up will have fun generating their own puzzles, while the puzzles themselves could be used appropriately with students from first grade on.

Thanks for reading. ■

*Dr. Fred Huntington thrives on interaction. Write to him at 21721 Majorie Street, Apt. 223, Torrance, CA 90503.*

## Product Information

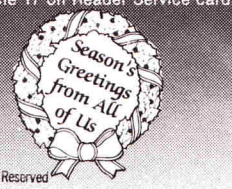
### Stickybear ABC

Weekly Reader Family Software  
245 Long Hill Road  
Middletown, CT 06457  
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### Word Search

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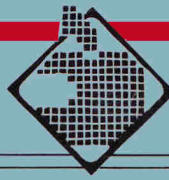
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## Animal Bingo

**T**his month I'm presenting another graphics game for your enjoyment—the second in a two-part series providing a bit of a diversion from this column's usual tutorial fare. The game is called Animal Bingo. Starting from traditional bingo, which involves very little but luck and staying awake, I have developed a game requiring nearly as much judgment and strategy as chess. The ability to think ahead is critical.

### How to Play

The object of the game is to get bingos by lining up five animals of the same kind in a horizontal or vertical row. (Diagonal doesn't count.) After three bingos, the game is over and you get a score and an evaluation.

The animals are of ten kinds: elephant, snake, lion, scorpion, rhinoceros, tapir, gorilla, giraffe, parrot, and monkey. To begin play, the computer places five of each type of animal, 50 in all, in random positions on the playing grid of 12 by 8 squares.

You're represented in the game by

the figure of a hunter, which you control with the first four key presses listed in the **Table**. When you want to move an animal you must first move the hunter one square north, south, east, or west of that animal, then pick it up with the appropriate key press from the **Table**. The animal then disappears from the screen to indicate that you are "carrying" it. When you've reached the desired location, drop it with the appropriate key press. Through all this, remember that if the hunter "steps on" an animal, the animal vanishes forever from the game.

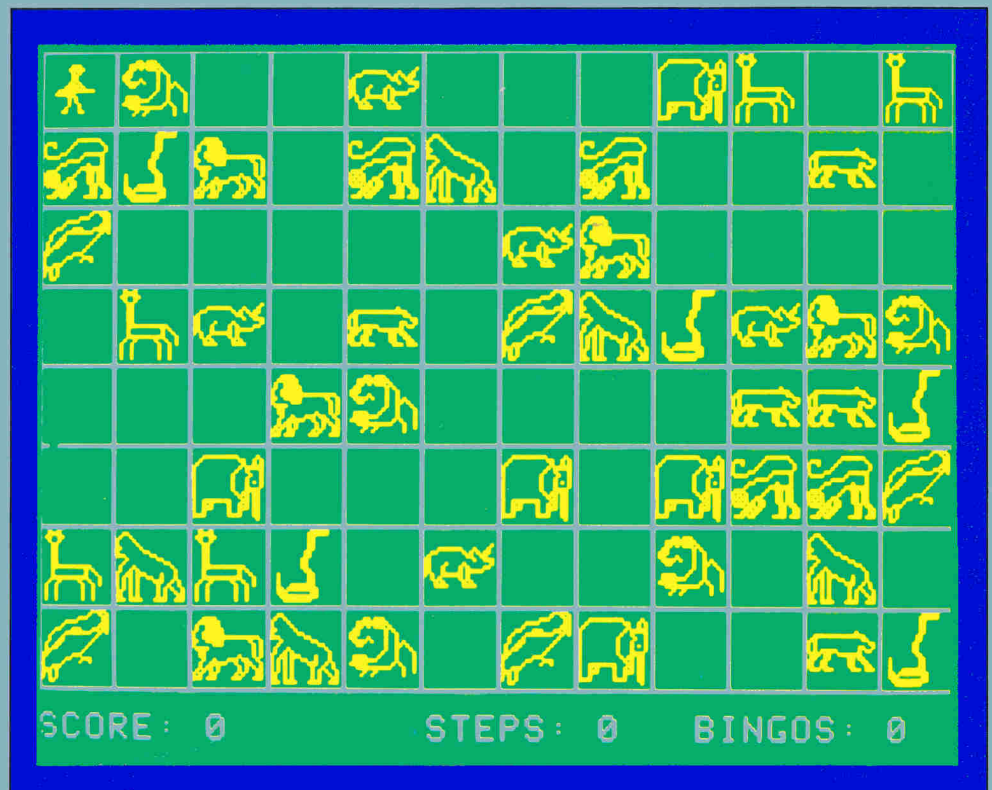
When you've lined up five identical animals, the screen fills with the

word BINGO, accompanied by sound effects. Then play resumes. If it's your third bingo, the game ends as previously described.

### Strategy

Whenever you need to move an animal to a square that is already occupied, you must temporarily drop it elsewhere, pick up the animal that's in the way, drop it in an out-of-the-way square, pick up the original animal, and drop it in the target square—the one that's part of your intended bingo.

Let's look at how this works. The following diagram represents a situation in which you, the hunter (H),



Animal drawings by Mary Carol Smith.

by Don Fudge

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# F U D G E I T !

are carrying a lion you intend to use to complete a bingo. There are already four lions (L) in the row where the bingo will be, plus a snake (S) and two elephants (E):

```
H
E S L L L L E
```

The hunter drops the lion to the west (DW):

```
L H
E S L L L L E
```

then picks up the snake to the south (PS):

```
L H
E L L L L E
```

and drops the snake to the east (DE):

```
L H S
E L L L L E
```

Finally, the hunter picks up the lion to the west (PW):

```
H S
E L L L L E
```



**Table.** Key-press commands.

Key	Function
N	Move hunter north.
S	Move hunter south.
E	Move hunter east.
W	Move hunter west.
PN	Pick up animal to the north.
PS	Pick up animal to the south.
PE	Pick up animal to the east.
PW	Pick up animal to the west.
DN	Drop up animal to the north.
DS	Drop up animal to the south.
DE	Drop up animal to the east.
DW	Drop up animal to the west.

drops the lion to the south (DS):

```
H S
E L L L L L E
```

and BINGO!

*Continued on page 120.*

**Listing 1.** Animal Bingo.

```
1 HIMEM: 36862:DS = CHR$(4)
2 DIM A(13,9): FOR I = 1 TO 12: FOR J = 1 TO 8:A(I,J) = INT(10 *
  RND(1)) + 5: NEXT : NEXT : GOSUB 15000: CLEAR : CALL 54915: GOSUB
  61000
3 DIM A(13,9),S(6),AN(4)
4 TEXT : HOME : VTAB 1
5 X = 11:Y = 12
6 DS = CHR$(4)
8 PRINT DS"BLOADALLCHAR"
10 PRINT DS"BLOADANIMALS"
15 POKE 232,255: POKE 233,143
18 HOME : HGR : POKE - 16302,0: HCOLOR= 3: ROT= 64: SCALE= 1
19 GOSUB 57200: DRAW 1 AT 11,12:A(1,1) = 1
20 GOSUB 57000: GOSUB 57100: GOTO 90
22 HA = PEEK(36) * 7:VA = PEEK(37) * 8
24 POKE 233,8: POKE 232,0
26 FOR L = 1 TO LEN(A$):A = ASC(MID$(A$,L,1))
27 REM IF A = 32 THEN HCOLOR= 0: DRAW 96 AT HA,VA:HA = HA
  + 7: GOTO 29
28 XDRAW A - 31 AT HA,VA:HA = HA + 7
29 NEXT
30 POKE 232,255: POKE 233,143: RETURN
90 HTAB 1: VTAB 24:A$ = "SCORE: STEPS: BINGOS: ": GOSUB
  22: HTAB 8: VTAB 24:A$ = STR$(SC): GOSUB 22: VTAB 24: HTAB 24
  :A$ = STR$(ST): GOSUB 22: HTAB 36: VTAB 24:A$ = STR$(BG): GOSUB
  22
100 PK = PEEK(- 16384): IF PK > 127 THEN SC = SC - 1:ST = ST + 1:
  POKE - 16368,0: GOSUB 1000: GOTO 110
105 GOTO 100
110 HCOLOR= 0: FOR K = 184 TO 190: HPLLOT 49,K TO 83,K: NEXT : FOR K
  = 184 TO 190: HPLLOT 161,K TO 181,K: NEXT : FOR K = 184 TO 190:
  HPLLOT 245,K TO 251,K: NEXT
120 HTAB 8: VTAB 24:A$ = STR$(SC): GOSUB 22: VTAB 24: HTAB 24:A$ =
  STR$(ST): GOSUB 22: HTAB 36: VTAB 24:A$ = STR$(BG): GOSUB 2
  2
199 HCOLOR= 3: GOTO 100
200 X = (I * 22) - 11:Y = (J * 22) - 10: DRAW A(I,J) AT X,Y: RETURN
1000 IF PK = 197 THEN I = I: IF X < 232 THEN GOSUB 57300:X = X + 2
  2: GOSUB 57310: DRAW 1 AT X,Y: GOSUB 2000: RETURN
1010 IF PK = 206 THEN I = I: IF Y > 33 THEN GOSUB 57300:Y = Y - 22
  : GOSUB 57310: DRAW 1 AT X,Y: GOSUB 2000: RETURN
1020 IF PK = 211 THEN I = I: IF Y < 145 THEN GOSUB 57300:Y = Y + 2
  2: GOSUB 57310: DRAW 1 AT X,Y: GOSUB 2000: RETURN
1030 IF PK = 215 THEN I = I: IF X > 32 THEN GOSUB 57300:X = X - 22
  : GOSUB 57310: DRAW 1 AT X,Y: GOSUB 2000: RETURN
1040 IF PK = 208 THEN SC = SC - 50: GOSUB 62500: GOSUB 9000: RETURN
1050 IF PK = 196 THEN FOR QW = 1 TO 6:PP = PEEK(- 16336):D = 5:
  P = 21: GOSUB 60000: NEXT : GOSUB 10000: RETURN
```

*Listing continued.*





## Trim an Apple Tree

**M**y earliest memory is decorating a Christmas tree with my parents. It was a real tree with fragile glass ornaments and a star at the top made of silver paper and red cellophane. While nothing can substitute for a real Christmas tree, my program, O CHRISTMAS TREE, gives children a chance to decorate their own—on the computer. Not only can they arrange the colored ornaments as they like, but also the more ornaments they hang, the more rewards (color graphics, sound, music, and an animated final scene) they will get.

This is a creative program and not a game. Children can't lose because there is no scoring.

### Trimming Your Tree

Use the I, J, K, and M keys to move the cursor over the tree, then press the space bar to hang an ornament. Don't try to hang ornaments in empty

space: They will fall and break. The tree trimmer gets a reward after every five ornaments, including a fascinating present with a red ribbon. After you've hung 25 ornaments, the present pops open to reveal a final surprise.

### Saving Your Tree

Once the present opens, you can interrupt the program display by pressing the escape key. To start over on a new tree, type RUN and hit the return key. If you press the reset key, but still



Illustration by Nancy Kaplan

**Deck the halls with hi-res color, seasonal sounds, and a Christmas surprise.**

*by Michael A. Seeds*

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want to see the tree you just decorated, type POKE 49239,0: POKE 49232,0 and hit the return key. With a screen-dump utility, you can print your Christmas tree then have little tree trimmers color the printout and add some glitter and ribbons.

If you escape from the program but still want to hear the Christmas carol, type GOSUB 740 and hit the return key. To restart the animation in the final scene, use the commands given above to display the tree, then type GOSUB 1050 and hit the return key.

Save decorated trees on disk by pressing the reset key then typing BSAVE TREE1,A,\$2000,L,\$2000 and pressing the return key. If you save more than one tree on a disk, be sure to assign different names to the files. To show a saved tree to visiting relatives, type HGR:POKE 49234,0, press the return key, then type BLOAD TREE1, using your own file name to reload the desired tree.

## Typing in the Listing

To enter the program, clear your Apple by typing NEW, hit the return key, then type in the program listing. Save the program to disk by typing SAVE

CHRISTMAS TREE and pressing the return key. Compare the typed-in program with the listing and look for typos. If you find any, correct them and resave the program.

Type in the data statements at the end carefully. They contain shape tables to draw ornaments and surprises, and a music routine to play the Christmas carol, and are POKEd into memory by lines 50 and 55. These lines also check the data for typos and will warn you if you have made an error. It's possible, though unlikely, to make two typos that cancel each other out. If the program runs and doesn't print the error messages in lines 50 or 55, you can be sure you typed the data statements correctly.

## Changing the Program

Since this program is written in structured BASIC, you can easily change it. Each task is isolated in a single subroutine. If, for instance, you want to make the five-pointed star a six-pointed star or an angel, change the subroutine in lines 300-390.

You might like to use the subroutine in line 900 in your own programs for

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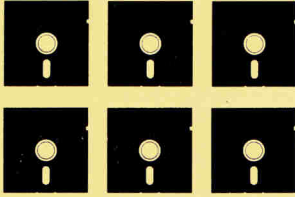
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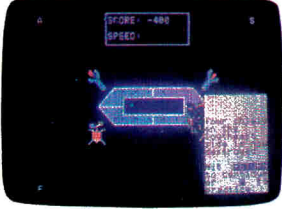

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<b>No</b>	Drill on weakest characters	<b>Yes!</b>	
<b>No</b>	Progress recorded	<b>Yes!</b>	

Studying with a computer program makes more sense than using a manual. But Harcourt's Computer SAT (\$79.95) gives you a fat manual and just 2 double-sided disks.

For \$89.95, Barron's Computer Study Program gives you an even fatter manual, plus 3 double-sided disks.

Why not buy a computer program that's a computer program?

Ours has 6 double-sided disks and a skinny manual. And costs just \$69.95.



Unlike Keyboard Cadet, Master Type doesn't show you the correct finger positions on the screen. So you might become a fast hunt-and-peck typist instead of a fast typist.

As long as you're learning how to type, why not learn how to type the right way? Keyboard Cadet, \$39.95.



## The Perfect Score and Keyboard Cadet from Mindscape

Mindscape, Inc., 3444 Dundee Road, Northbrook, IL 60062 For more information, call 1 800 221 9884 In Illinois 1 800 942 7315

Circle 539 on Reader Service card.

**Program listing. O Christmas Tree.**

```

30 HGR : POKE - 16302,0:SU = 0
40 FOR J = 1 TO 93: READ SH: POKE 16383 + J,SH:SU = SU + SH: NEXT J: IF S
  U < > 5449 THEN TEXT : PRINT "TYPO IN SHAPES DATA, LINES 10000-1000
  6": END
50 POKE 232,0: POKE 233,64:SU = 0: ROT= 0: SCALE= 1: GOSUB 800
60 FOR J = 1 TO 126: READ SH: POKE 770 + J,SH:SU = SU + SH: NEXT J: IF SU
  < > 8052 THEN TEXT : PRINT "TYPO IN MUSIC DATA, LINES 10010-10018"
  : END
90 GOTO 500
95 REM
100 REM ** DRAW BALL **
110 HCOLOR= 3: IF RND (1) > .5 THEN HCOLOR= 7
130 IF Y < 23 AND ABS (X - 140) < 4 THEN GOSUB 300: RETURN
135 IF Y > 170 THEN GOSUB 200: RETURN
140 IF ABS (X - 140) > (Y - 20) * (11 / 15) THEN GOSUB 200: RETURN
145 XDRAW 2 AT X,Y
150 NB = NB + 1: DRAW 1 AT X,Y
155 XDRAW 2 AT X,Y
160 IF NB = 10 THEN GOSUB 400
170 IF NB = 15 THEN GOSUB 300
180 IF NB = 5 THEN GOSUB 440
183 IF NB = 20 THEN GOSUB 740
185 IF NB = 25 THEN GOSUB 1000
190 RETURN
195 REM
200 REM ** DROP BALL **
210 VY = 1:YS = Y
220 XDRAW 1 AT X,Y:YN = Y + VY: IF YN < 190 THEN 230
223 XDRAW 1 AT X,Y:Y = 188: XDRAW 1 AT X,Y: GOSUB 700: XDRAW 1 AT X,Y:Y =
  YS: RETURN
230 VY = VY + 2: XDRAW 1 AT X,Y:Y = YN: GOTO 220
290 RETURN
295 REM
300 REM ** DRAW STAR **
310 HPLOT 140,10 TO 148,28 TO 131,17 TO 149,17 TO 132,28 TO 140,10
320 HPLOT 141,10 TO 149,28 TO 132,18 TO 150,18 TO 132,28 TO 141,10
390 RETURN
395 REM
  
```

*Listing continued.*

small children. It draws a dotted line from point X1,Y1 to point X2,Y2. (X1 must be less than X2.) If the two X's are even, then the line will be purple or blue depending on whether HCOLOR is set to 3 or 7. If the two X's are odd, then the line will be either green or orange. In this program, we need the dotted line subroutine to draw the green Christmas tree in line 820-840.

Line 570 lets you end the program by pressing the E key. This is handy while getting the program to run, but you may want to remove the line before turning the program over to a child. With line 570 deleted, only typing RESET can crash the program.

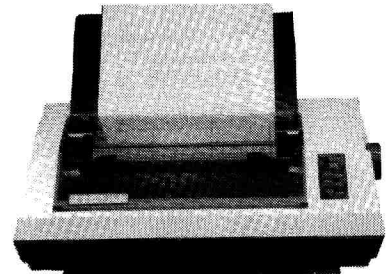
The most beautiful Christmas trees are first trees—the first we remember, the first in a new home, the first for the new baby. I hope you have a special tree this year, and I hope you and your family enjoy playing with the Christmas tree on your computer. ■

Mike Seeds can be reached at Franklin and Marshall College, P.O. Box 3003, Lancaster, PA 17604.

Circle 219 on Reader Service card.

# A Printer For All Reasons!

*The GP-550-AP is an extra high quality graphic printer that offers both standard Dot Matrix printing and Near Letter Quality printing all in a single unit.*



PRINTING MODE	DOT MATRIX (H x V) & SPACES	NUMBER OF COLUMNS	PRINT SPEED (CPS)	CHARACTER SPACING (CPI)	PASS
<b>DP Mode:</b>					
Pica	9 x 8 + 3	80	50	10	1
Elite	9 x 8 + 1	96	60	12	1
Condensed	5 x 8 + 2	136	86	17	1
<b>NLQ Mode:</b> NOTE: There is expanded (double-width) printing function in every character mode.					
Pica	9 x 16 + 3	80	25	10	2
Elite	9 x 16 + 1	96	30	12	2
Proportional	N x 16	—	—	—	2
Super/Subscript	5 x 8	136	43	17	2
Italic Cursive	12 x 16	80	25	10	2

**Line Spacing** 6, 8, 7½, 12, or N/120 (N = 0-99) lines per inch.  
**Paper Feed** Pin-feed and friction-feed (single sheet)  
**Paper Width** Adjustable from 4.5 to 10 inches (fanfold paper)  
**Paper Type** Fanfold or cutsheet paper  
**Ribbon** Single color, special self-inking cassette  
**Dimensions** 12" (D) x 16.5" (W) x 4.5" (H) (including paper separator)  
**Printing Method** Two-hammer  
**Printing Format** 9 x 8 (DP); 9 x 16 (NLQ)  
**Character Kinds** 96 ASCII + 44 characters and symbols  
**Graphics** Arbitrary combination of 8 dots or 16 dots.  
**Multiple Copies** 3 including original

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"... when many peripheral cards are plugged into the back of the Apple, inhibiting air flow and causing more heat output from the power supply ... expansion and contraction (results which) will eventually cause the components to malfunction. Fans ensure that your computer keeps cool and works smoothly."

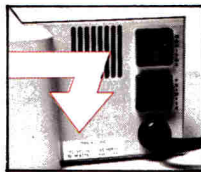
*InCider Magazine,  
July 1983, page 122*

# ALL RIGHT APPLE II and IIe OWNERS, Let's really take a look at cooling efficiency, versatility and flexibility!



Highly Efficient Ultra-Quiet Blower System  
**Independent control of system and peripherals.**

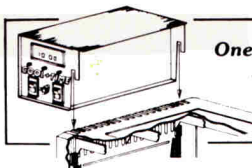
Illuminated switches separately control two rear outlets. This allows front panel control of your Apple and monitor, plus printer or other peripheral. This also provides a check on the system's on/off status.



**Heated air removed and exhausted at REAR, not across you and your workspace.**

**Line surge suppression at safe 130 volts RMS.**

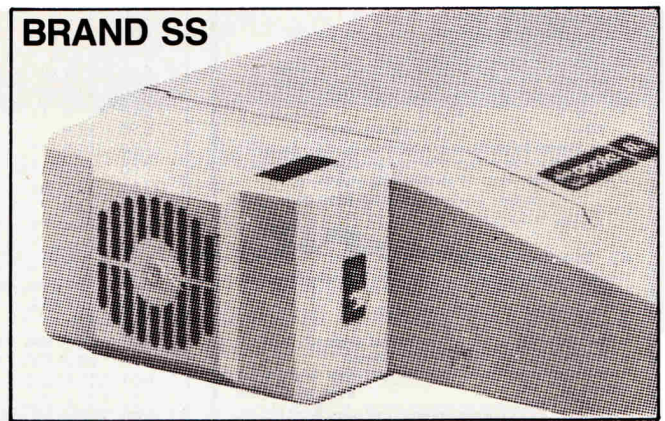
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Fan

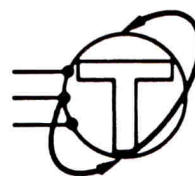
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Class 15	Jockey 15	Workouts 0
Condition 10	Trainer 5	Time of Year 0
Earnings 5	Post 10	Consistency 5
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Create program weight based on a particular track and fine tune it for maximum win percentage. This program is designed for "ease of use". The user needs no programming experience.  
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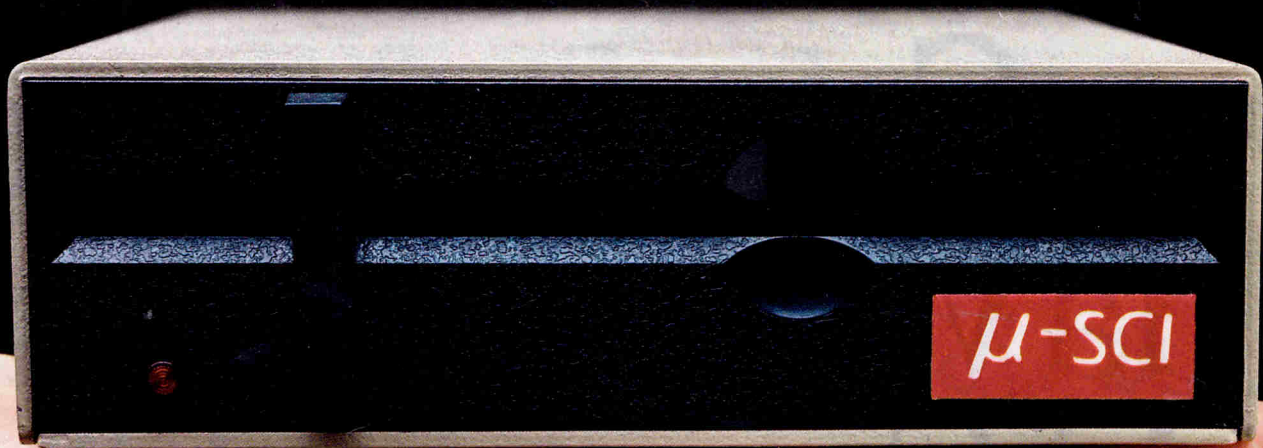
**IBM, APPLE, TRS-80,  
C-64 AND OTHERS**

**Listing continued.**

```

400 REM ** DRAW PRESENT **
410 HCOLOR= 3: FOR L = 180 TO 210: HPLOT L,175 TO L,191: NEXT L
420 HCOLOR= 0: FOR L = 191 TO 199 STEP 2: HPLOT L,175 TO L,191: NEXT L
430 RETURN
435 REM
440 REM ** DRAW GARLAND **
445 HCOLOR= 3: IF RND (1) > .5 THEN HCOLOR= 7
450 X1 = 112:Y1 = 60:X2 = 156:Y2 = 40: GOSUB 900
460 X2 = 186:Y2 = 82: GOSUB 900
470 X1 = 78:Y1 = 108: GOSUB 900
480 X2 = 220:Y2 = 128: GOSUB 900
490 X1 = 60:Y1 = 169: GOSUB 900
495 RETURN
499 REM
500 REM ** KEYBOARD LOOP **
505 DX = 1:DY = 1:XL = 140:YL = 50:X = XL:Y = YL: XDRAW 2 AT X,Y
510 GET A$: PRINT
520 IF A$ = "I" THEN Y = Y - DY
530 IF A$ = "J" THEN X = X - DX
540 IF A$ = "K" THEN X = X + DX
550 IF A$ = "M" THEN Y = Y + DY
560 IF A$ = " " THEN GOSUB 100
570 IF A$ = "E" THEN TEXT : END
580 IF X > 270 THEN X = 10
590 IF X < 10 THEN X = 270
600 IF Y > 191 THEN Y = 191
610 IF Y < 5 THEN Y = 5
620 XDRAW 2 AT XL,YL: REM ERASE
630 XDRAW 2 AT X,Y: REM DRAW
640 XL = X:YL = Y: GOTO 510
650 REM
700 REM ** POP **
710 POKE 06,114: POKE 07,3: CALL 786
720 RETURN
730 REM
740 REM ** PLAY SONG **
750 POKE 7,3: POKE 6,46: CALL 786: CALL 786
760 POKE 6,79: CALL 786
770 POKE 6,46: CALL 786
790 RETURN
795 REM
800 REM ** DRAW TREE **
805 HCOLOR= 3:TW = 110:XC = 141
810 X1 = XC - TW:Y1 = 170
820 X2 = XC:Y2 = 20: GOSUB 900
830 X2 = XC + TW:Y2 = 170: GOSUB 900
840 X1 = XC:Y1 = 20: GOSUB 900
850 FOR X = 137 TO 145 STEP 2
860 HCOLOR= 7: HPLOT X,171 TO X,191
870 NEXT X
880 RETURN
890 REM
900 REM ** DRAW DOTTED LINE **
920 SL = (Y2 - Y1) / (X2 - X1)
930 FOR J = X1 TO X2 STEP 2
940 HPLOT J,Y1 + SL * (J - X1)
950 NEXT J
960 RETURN
970 REM
1000 REM ** OPEN PRESENT **
1010 HCOLOR= 0: FOR XP = 180 TO 210: HPLOT XP,175 TO XP,191: NEXT XP
1020 X = 191
1030 XDRAW 3 AT X,190:XT = X
1035 IF PEEK (- 16384) = 155 THEN POKE - 16368,0: END
1040 X = X - 2: IF X < 1 THEN X = 279
1050 XDRAW 3 AT XT,190
1060 GOTO 1030
9000 REM
9100 REM
9999 REM SHAPES
10000 DATA 3,0,8,0,31,0,40,0,36,60,40,173,62,46,46
10001 DATA 32,21,54,254,48,254,36,151,35,36,36,252,18,54,54
10002 DATA 0,36,85,10,63,214,60,56,63,0,63,40,45,28,255
10003 DATA 154,27,63,40,45,28,255,26,36,39,37,37,44,54,45
10004 DATA 45,45,37,44,45,45,53,62,55,54,46,45,109,32,108
10005 DATA 54,23,46,108,32,36,36,45,54,54,118,46,36,36,13
10006 DATA 54,5,0
10008 REM
10009 REM MUSIC DATA
10010 DATA 173,1,3,32,168,252,173,48,192,206,0,3,208,242,96
10011 DATA 160,0,177,6,141,1,3,240,18,200,177,6,141,0,3
10012 DATA 200,32,3,3,169,128,32,168,252,76,20,3,96,43,60
10013 DATA 37,60,37,20,37,80,35,89,33,73,33,25,33,148,33
10014 DATA 49,35,44,33,49,32,105,38,76,35,89,37,80,174,1
10015 DATA 0,30,59,30,59,33,49,28,201,30,59,30,59,32,52
10016 DATA 32,158,32,52,32,52,35,44,30,177,32,52,32,52,33
10017 DATA 49,33,99,174,1,0,5,5,1,16,2,16,3,16,2
10018 DATA 5,1,5,2,16,0
    
```

**End of listing.**



Actual size: 1 1/8" H x 6" W x 8 1/2" D

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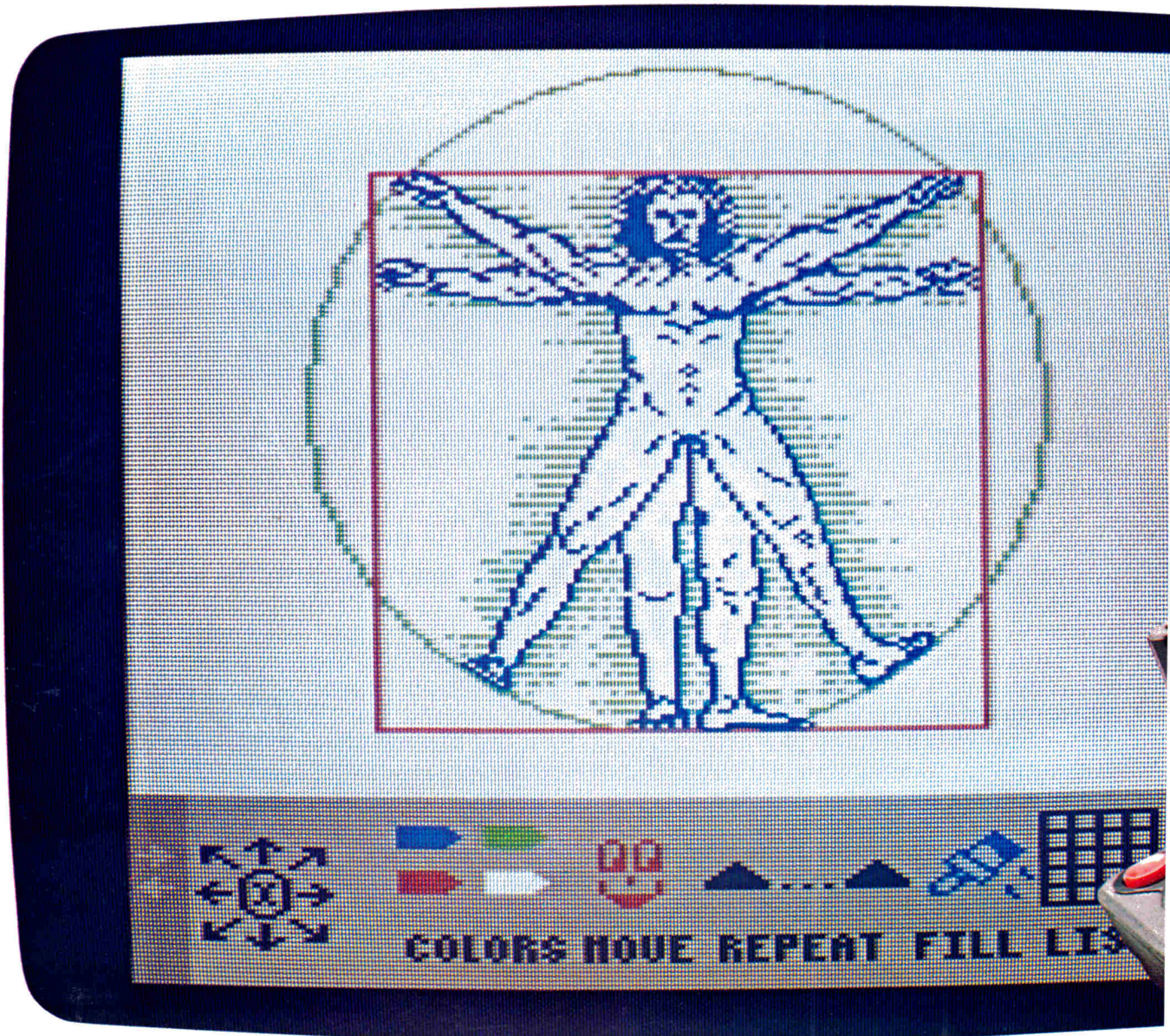
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Circle 371 on Reader Service card

# Computer program da Vinci, Shakespeare AI Capp would ha





# Programs for kids that are, Dickens and we loved.

If they were starting out today, this is what they could start with. Pixelwerks.

## THE OTHER WAY TO DRAW AND WRITE

Instead of a brush and canvas, a pen and paper, they'd create on a computer. Because Pixelwerks is the first medium that can keep up with their imaginations.

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With Mr. Pixel's Programming Paint Set, da Vinci (or any 8-year old) could do more than paint a picture. He could also enlarge it, repeat it, move it around, and change colors. Instantly.

And at the same time, he would be developing his programming skills. Painlessly.

## SHOW DIRECTOR

On the other hand, Shakespeare would love to play around with Show Director.

He'd use it to create plots and think up one scene after another, and he'd get a big cast of characters, lots of backgrounds, props, and musical sound effects to act them out.

## BANK STREET STORYBOOK

Dickens wouldn't be able to keep his hands off Bank Street StoryBook by George Brackett.

Not only could he write his own story, but he could also illustrate the scenes and characters he sees in his mind.

## MR. PIXEL'S CARTOON KIT

Maybe Al Capp wouldn't be satisfied with cartoons that just sit on the page after he tried Mr. Pixel's Cartoon Kit. Because he could make his cartoons come to life by animating them. His characters could move around, and even react to each other.

Every kid has a touch of creative genius buried inside. The job of Pixelwerks is to bring it out, with more features, more options and more flexibility than other programs.

In short, we supply the tools. Kids supply the imagination.



Circle 538 on Reader Service card.

# inCider's **Holiday** Shopping Guide



Photography: White/Packert Studio

'Tis the season for high-tech gift-giving and *inCider* is here to guide you through the holidays. Searching for just the right gift can be time-consuming and nerve-racking—especially considering the finicky preferences of the resident computer whiz. So, whether you're scouting presents for that Apple computer hobbyist or adding a few helpful hints to your own wish list, let us guide you.

We've got something for everyone—games, books, microprocessors, novelties, color printers—for every taste and every budget. And in keeping with the holiday spirit, we've separated the products for you into three price categories (under \$40, \$40 to \$100, and over \$100) and included each manufacturer's name and address for quick reference.

Get your red pencil handy for checking your shopping list. You won't need to check it twice with *inCider's* Christmas Gift Guide.

## gifts

under \$40

### **Charlie Brown's ABC's**

Snoopy, Woodstock, Lucy, and the rest of the Peanuts gang teach your child the alphabet in animated, musical sequences. Activity cards add to the fun.

\$39.95 from Random House Software, 201 East 50th Street, New York, NY 10022, (800) 331-5469.

### **Fact and Fiction Tool Kit**

Story Maker and Secret Filer programs challenge kids' imaginations and organizational skills as they create information banks and write and illustrate their own stories.

\$39.95 from Scholastic, 730 Broadway, New York, NY 10003, (212) 505-3000.

### **65C02 MPU**

Apple II, II Plus, and IIe owners, don't feel left out of the CMOS revolution. Hayden offers a 65C02 microprocessor just like the IIc's, and it's pin-compatible with your 6502. Give CMOS to someone you love.

\$15 from Hayden Software, 600 Suffolk Street, Lowell, MA 01854, (617) 937-0200.

### **Rocky's Boots (revised)**

Put the whiz in your whiz kids: they'll use logic gates and simulated electricity to build computers in this innovative game for ages 7 and above.

\$39.95 from The Learning Company, 545 Middlefield Road, Suite 170, Menlo Park, CA 94025, (415) 328-5410.

### **Work Force II**

An inexpensive and helpful set of financial utilities with routines to balance your checkbook and keep track of earned interest and service charges.

\$34.95 from Core Concepts, P.O. Box 24157, Tempe, AZ 85252, (602) 968-3756.

### Skyfox

Pilot the Mach-4 Skyfox fighter against invading tanks, planes, and mother-ships. This arcade game combines flight simulation with 3-D battle for edge-of-the-seat excitement. \$39.95 from Electronic Arts, 2755 Campus Drive, San Mateo, CA 94403, (415) 571-7171.

### Championship Lode Runner

For the Indiana Jones in you: Fifty of the most intricate and challenging rooms ever—loaded with gold and guards—lie before you in this sequel. \$34.95 from Broderbund Software, 17 Paul Drive, San Rafael, CA 94903, (415) 479-1170.

### Stickybear Series

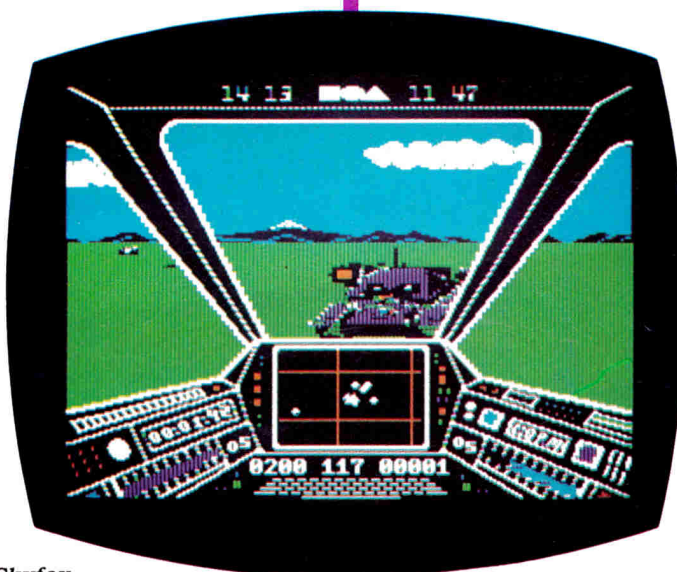
Colorful animated pictures teach children aged 3–6 their ABCs, counting, shape recognition, and other concepts. A hardcover book, a poster, and stickers accompany each package. \$39.95 each from Xerox Educational Publishing, 245 Long Hill Road, Middletown, CT 06457, (203) 347-7251.

### Learning with Fuzzywomp

Leave your prereaders alone with Fuzzywomp to learn pattern matching, counting, number sequencing, and creative play through four challenging games on a single disk. \$29.95 from Sierra On-Line, Sierra On-Line Building, Coarsegold, CA 93614, (209) 683-6858.

### Disk Chest

Made of native basswood, each chest has dovetailed joinery, hand-rubbed lacquer finish, and brass-finish hardware. Perfect disk accessory for the civilized executive. \$29.95 for 40-disk, \$34.95 for 60-disk, and \$39.95 for 80-disk sizes from Smith & Bellows, P.O. Box 668, Amherst, NH 03031, (603) 673-8482.



Skyfox

### Boulder Dash

Rockford needs help to explore 16 caves before time runs out. Scrolling graphics and music accompany your search for gems and points. \$39.95 from MicroLab, 2699 Skokie Valley Road, Highland Park, IL 60035, (312) 346-7886.

### The Elementary Apple

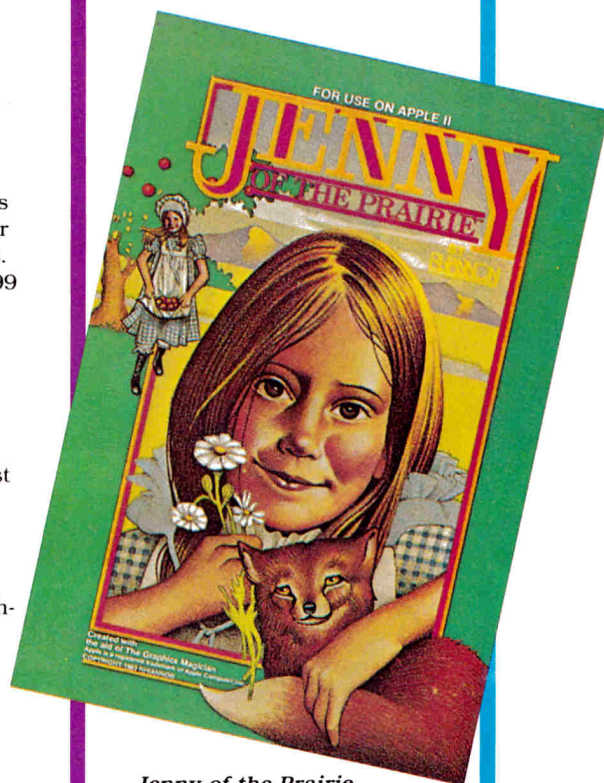
It's elementary that Bill Sanders' is perhaps the best book on BASIC programming. Good examples hold your interest while you learn. \$14.95 from Reston Publishing, 11480 Sunset Hills Drive, Reston, VA 22090, (703) 437-8900.

### Jenny of the Prairie

This pioneering adventure game features a girl-hero whose goal is to survive a harsh prairie winter through her own resources of skill and courage. \$39.95 from Addison-Wesley, Jacob Way, Reading, MA 01867, (617) 944-3700.

### Reading Skill Adventures with Tom Thumb

The adventurous Tom Thumb takes children (pre-school through grade one) on a reading-skills journey. \$29.95 from International Software Systems (ISS), P.O. Box 5427, Richmond, VA 23220, (804) 359-2211.



Jenny of the Prairie

### Microzine

Flipping pages is passé with a magazine on disk that's full of educational programs. \$39.95 from Scholastic, 730 Broadway, New York, NY 10003, (212) 505-3000.

### The Disk aRranger

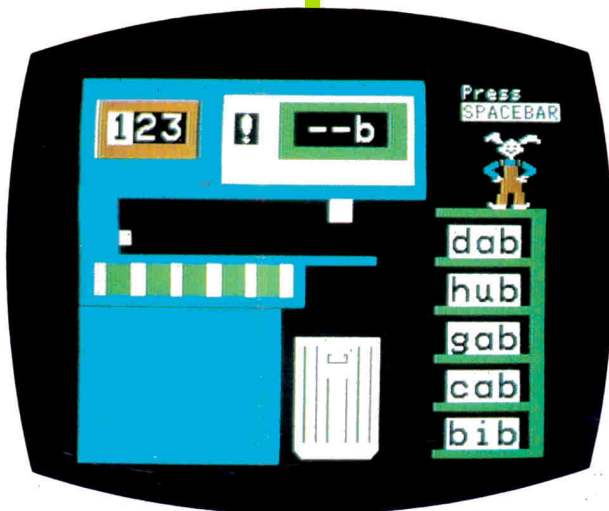
A useful collection of disk utilities that—among other things—arrange disk files alphabetically or by file type. \$29.95 from Penguin Software, 830 4th Avenue, P.O. Box 311, Geneva, IL 60134, (312) 232-1984.



*Inside the Personal Computer*



*Music Construction Kit*



*Reader Rabbit*

**Music Construction Set**

Budding composers learn musical notation, then create and play back their own kind of music.  
\$39.95 from Electronic Arts, 2755 Campus Drive, San Mateo, CA 94403. (415) 571-7171.

**Nibble Notch**

Double up! Make use of your disk's flip side with a tool that cuts a square notch right where you need it.  
\$14.95 from Nibble Notch Computer Products, 4211 N.W. 75th Terrace, Dept. 21, Lauderhill, FL 33319. (800) 642-2536.

**Inside the Personal Computer**

Pop goes the computer! No, it's not an I/O error but a pop-up book with three-dimensional disk drives, chips, and printers to illustrate the inner workings of the machine. Defines computer terminology clearly and simply.  
\$19.95 from Sweet Gum, 15490 N.W. 7th Avenue, North Miami, FL 33169, (305) 687-9338 in Florida; (800) 237-9338 elsewhere.

**Reader Rabbit**

Dancing rainbows, whirling windmills, and fluttering butterflies—these fanciful graphics help preschoolers comprehend spatial concepts as well as develop reading and math readiness skills.  
\$39.95 from The Learning Company, 545 Middlefield Road, Suite 170, Menlo Park, CA 94025, (415) 328-5410.

**The Return of Werdna**

The good, the bad, and the ugly return in Wizardry's fourth scenario. This time, join the bad guys in their battle through an underground maze. (You need the first scenario to create characters.)  
\$39.95 from Sir-Tech Software, 6 Main Street, Ogdensburg, NY 13669, (315) 393-6633.

**Cutthroats**

Avast, matey! A shipwreck loaded with sunken treasure lures you and a ragtag band of islanders in this text adventure. But be careful—there's a traitorous cutthroat among your crew.  
\$39.95 from Infocom, 55 Wheeler Street, Cambridge, MA 02138, (617) 492-1031.

**Beyond Castle Wolfenstein**

Hitler plans the final days of World War II. Your mission is to find your way to his bunker, activate a time bomb, and get out before it goes off. A worthy sequel to a best-seller.  
\$34.95 from Muse Software, 347 North Charles Street, Baltimore, MD 21201, (301) 659-7212.

### **Fishies**

Please don't feed the piranha. Turn your monitor into a simulated fish tank. Denizens of this hi-res, animated deep include fish, mermaid, diver, submarine, and other aquatic surprises. \$14.95 from Harper & Row, 10 East 53rd Street, New York, NY 10022, (212) 207-7655.

### **CompuServe Starter Kit**

Get on-line: from the world's most popular electronic information service, an easy way to get someone telecommunicating. Complete with password, user number, manual, and five free hours of connect time. \$39.95 from CompuServe Information, 500 Arlington Centre Boulevard, P.O. Box 20212, Columbus, OH 43220, (614) 457-8650.

### **Kindercomp**

Children's reading readiness and counting skills improve while this package familiarizes them with the computer keyboard. \$34.95 from Spinnaker Software, 1 Kendall Square, Cambridge, MA 02139, (617) 494-1200.

### **The Chocolate Chip**

Satisfy a high-tech sweet tooth with 54 grams of Belgian chocolate molded to resemble an integrated circuit. \$5.95 from The Computer Museum, 300 Congress Street, Boston, MA 02210, (617) 426-2800.

### **Early Games Series**

Colorful graphics and music teach math and reading in a series including Piece of Cake, Matchmaker, and Fraction Factory. \$29.95 from Springboard Software, 4005 West 65th Street, Minneapolis, MN 55435, (800) 328-1223.

### **In Search of the Most Amazing Thing**

Violence takes a back seat in this adventure game that helps children develop reasoning skills. \$39.95 from Spinnaker Software, 1 Kendall Square, Cambridge, MA 02139, (617) 494-1200.



*Fishies*

### **Discover 35**

A place for every disk and every disk in its place. A disk storage unit with rubber feet that prevent desktop damage and with room for 35 disks.

\$9.95 from Ring King Visibles, 2210 Second Avenue, Muscatine, IA 52761, (319) 263-8144.

### **Business Power for Your Apple**

Get more than one bottom line on 75 popular business programs as defined in this collection by various software reviewers.

\$32.95 from Van Nostrand Reinhold, 135 West 50th Street, New York, NY 10020, (212) 265-8700.

### **MasterType**

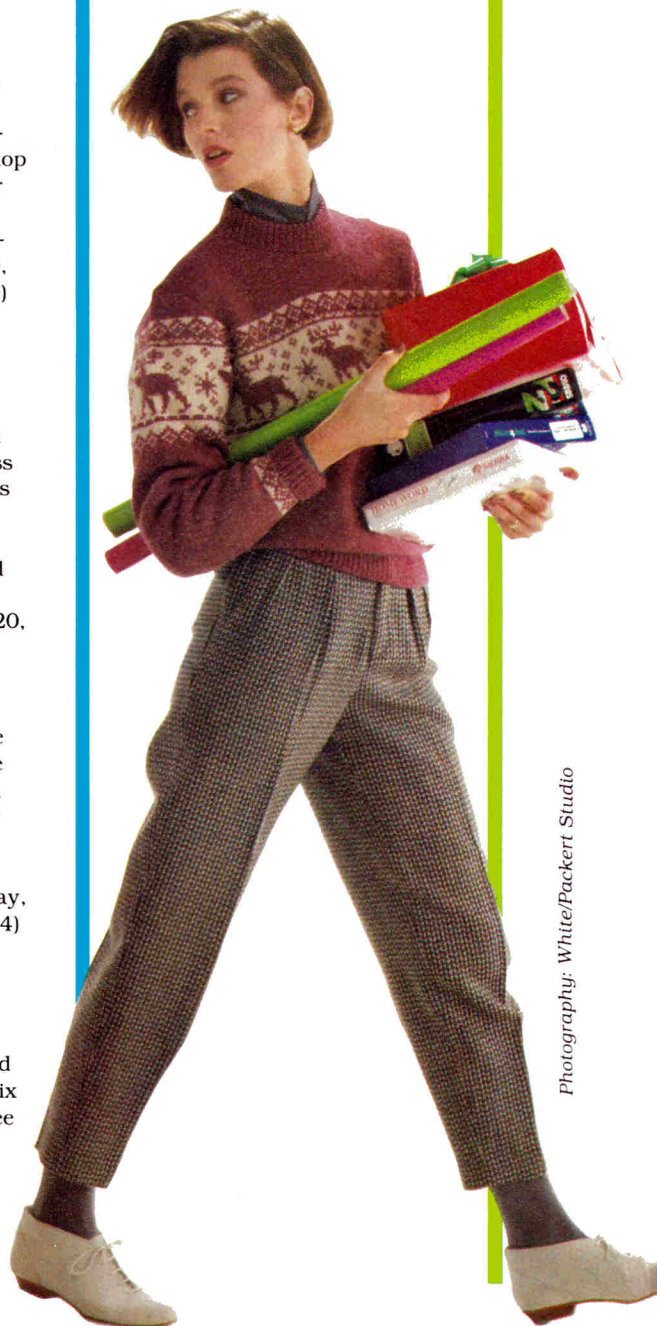
What's your WPM? Novice and advanced typists alike challenge homerow with a game designed to teach or improve typing skills.

\$39.95 from Scarborough System, 25 North Broadway, Tarrytown, NY 10591, (914) 332-4545.

### **Word Challenge**

Race the computer to find complete words from a grid of random letters. Twenty-six levels of difficulty and three grid sizes in this, the best word game for the Apple.

\$39.95 from Hayden Software, 600 Suffolk Street, Lowell, MA 01853, (617) 937-0200.



Photography: White/Packert Studio



# We've Provided Innovation And Excellence To 170,000 Apple® Users.



Three years ago Orange Micro set the standard for parallel printer interfaces with the Grappler +. Now a new standard has been set for Apple II's and the Imagewriter Printer. The new Serial Grappler brings all the power, features and compatibility of the Grappler + to Apple's innovative serial printer.

Over 30 built-in Grappler commands let you control screen printouts without software. The Serial Grappler will work with all programs written for the Grappler +.

The newest innovation in the Serial Grappler is the Bufferpak™ expansion module, a printer buffer that clips right onto the Serial Grappler. No extra slots, no boxes or cables. You just plug it on. Adding the power of buffering has never been so easy. Pick up a Serial Grappler today and see how far your Imagewriter can go.

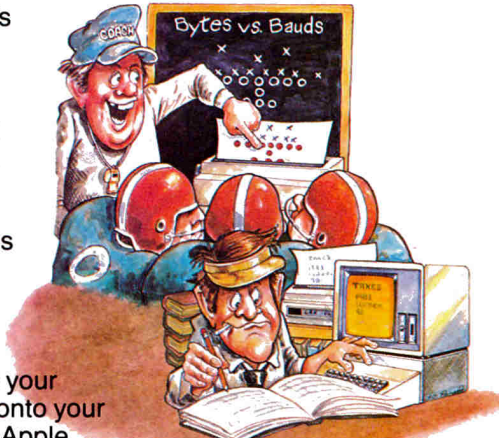
**SERIAL**  
**Grappler**™  
Printer Interface

The Bufferboard is the original buffer upgrade for parallel printer interfaces. Buffering saves you time by storing data being sent to your printer. That means that your computer is free to let you work, even while your printer prints.

The Bufferboard easily installs inside your Apple and "docks" onto your Grappler, Epson, or Apple parallel interface. Standard at 16K, it expands to either 32K or 64K. At capacity, the Bufferboard provides 20 pages of text memory.

Just plug the Bufferboard into any available slot, attach it to your printer interface, and you're set. No extra power supplies, no clumsy boxes and cables. The Bufferboard is the easiest and most economical way for you to add printer buffering.

**Bufferboard**™  
For Apples and Printers

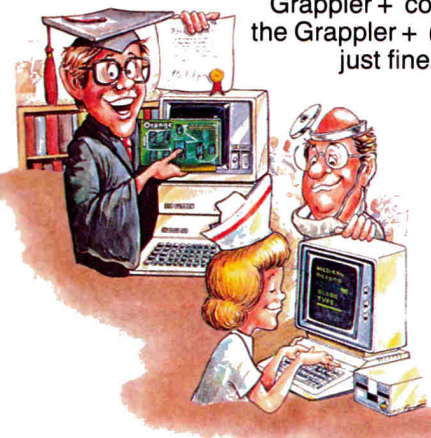


**Orange**™  
Printer Interface

If your focus is on accounting, word processing or other text-only applications, then the Orange Interface is for you.

The Orange Interface is a low priced, text specific interface. Sure, programs can send graphics through the card, but the 15 built-in commands are for text screen dumps and formatting. These features include a special screen dump for Apple's IIe 80 column screen.

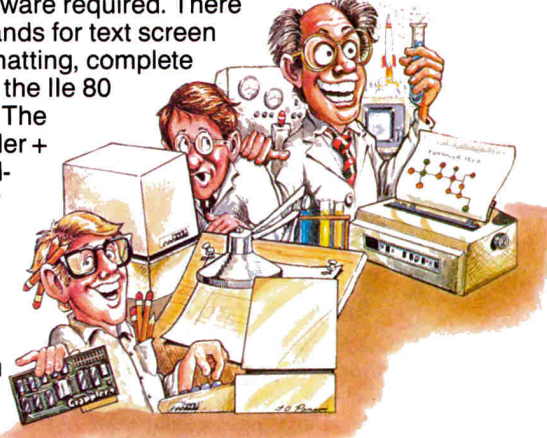
The Orange Interface is engineered to be Grappler + compatible, so software for the Grappler + (except graphics) will run just fine. The Orange Interface is compatible with most all parallel printers and comes complete with a cable and documentation. Its quality is assured by Orange Micro's 1-year warranty. Why settle for a "dumb" card when you can have an Orange Interface?



**Grappler +**™  
Printer Interface Series

When Apple owners talk about intelligent printer interfaces, they talk about the Grappler +. With over 150,000 units sold, the Grappler + series has become the most widely recognized product of its kind.

The parallel Grappler + comes with or without buffering, and offers a special version for Dataproducts color printers. With over 27 built-in commands, the Grappler + lets you print graphics with a wide array of options. No software required. There are also commands for text screen dumps and formatting, complete with support for the IIe 80 column screen. The Buffered Grappler + adds an expandable print buffer to save time while your printer prints. When you choose a Grappler +, you interface with intelligence.



 **Orange Micro**™  
inc.



**The Incredible Lab**

**Vis\Briidge/Sort**

Templates out of sorts? This VisiCalc utility sorts data according to your specifications.

\$89 from Solutions, Box 989, Montpelier, VT 05602, (802) 229-0368.

**Global Program Line Editor**

Debug listings, search and replace at warp speed, modify those long BASIC programs easily—a must for the serious Applesoft programmer.

\$49.95 from Beagle Bros, 3990 Old Town Avenue, Suite 102C, San Diego, CA 92110, (619) 296-6400.

**Homeword**

Worth a thousand words: Icon-driving makes this inexpensive word processor especially easy to use.

\$69.95 from Sierra, Sierra On-Line Building, Coarsegold, CA 93614, (209) 683-6858.

**Speed Reader II**

Evelyn Woods, watch out: Increased productivity is the goal of six challenging activities that replace poor reading habits with good ones.

\$69.95 from Davidson & Associates, 6069 Groveoak Place, #12, Rancho Palos Verdes, CA 90274, (213) 378-7826.

**Elementary Volume 6—Social Studies**

"You are there" when history comes alive in simulations children follow to trace the development of the United States.

\$49 from MECC, 3490 Lexington Avenue North, St. Paul, MN 55112, (612) 481-3500.

**The Incredible Laboratory**

Igor, fetch the beaker of blue goo. Kids form and test hypotheses and discover how chemical combinations create various monster configurations.

\$55 from Sunburst Communications, 39 Washington Avenue, Pleasantville, NY 10570, (914) 769-5030.

**Joystick**

A rugged, all-purpose joystick for the serious gamer.

\$59.95 from Personal Peripherals (P.P.I.), 301 East Whalley, Suite A, Longview, TX 75601, (214) 758-8874.

**GraForth**

Create fast-action graphics without assembly language through the extensions in this special implementation of Forth.

\$75 from Insoft, 7933 S.W. Cirrus Building, #23, Beaverton, OR 97005, (503) 641-5223.

**The Factory**

Figure it out for yourself with a program designed for fourth through ninth graders that teaches problem-solving skills.

\$55 from Sunburst Communications, 39 Washington Street, Pleasantville, NY 10570, (914) 769-5030.

**Robot Odyssey**

Boolean logic is fun when you build robots to solve this adventure. A sophisticated, hi-res way to learn about basic robotics and computer chips.

\$49.95 from The Learning Company, 545 Middlefield Road, Suite 170, Menlo Park, CA 94025, (415) 328-5410.

**War in Russia**

Can you alter the course of history? Reenact the German invasion of Russia (1941-44) in a simulation that includes both laminated paper and hi-res maps.

\$79.95 from Strategic Simulations, 883 Stierlin Road, Building A-200, Mountain View, CA 94043, (415) 964-1353.

**Math Maze**

Guide a spider through 40 mazes of basic math problems.

\$45 from DCH Software, 125 Spring Street, Lexington, MA 02173, (800) 428-8071.

**Apple Logo //**

Don't sit there like a turtle on a log: Introduce your family to this easy-to-learn programming language and take command of your computer.

\$100 from Apple Computer, 10260 Bandle Drive, Cupertino, CA 95014, (800) 538-9696.

**Survival Math**

Simulations in this package (Smart Shopper Marathon, Hot Dog Stand, Travel Agent Contest, and Foreman's Assistant) keep youngsters one step ahead of those who would separate them from their cash.

\$55 from Sunburst Communications, 39 Washington Avenue, Pleasantville, NY 10570, (914) 769-5030.



# What made over 100,000 Apple II owners fall in love with System Saver?

**It's the most versatile, most convenient, most useful peripheral ever made for the Apple.\***

**System Saver\* filters out damaging AC line noise and power surges.**

70-90% of all microcomputer malfunctions can be traced to power line problems\*. Problems your System Saver guards against.

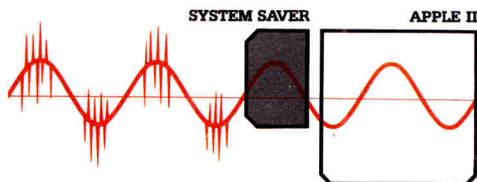
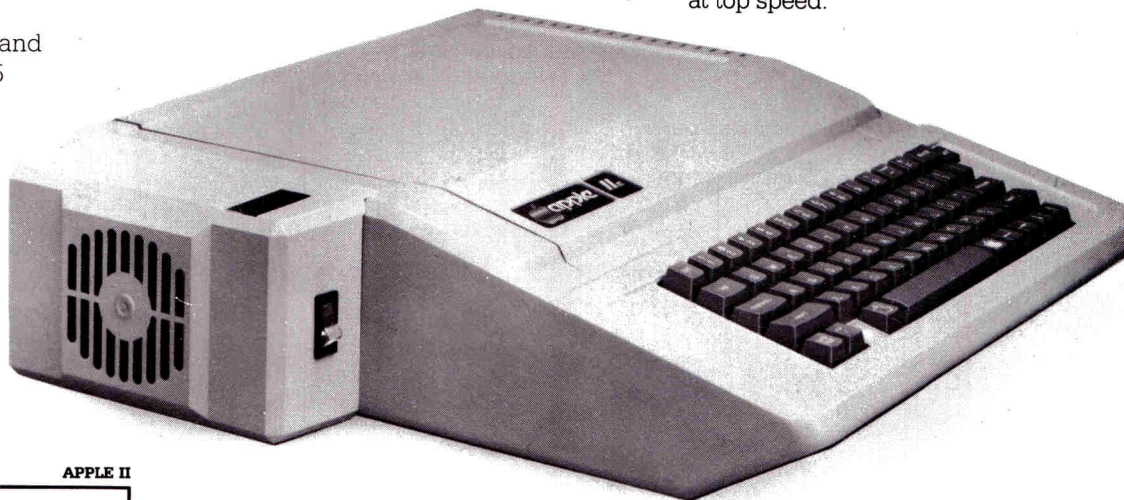
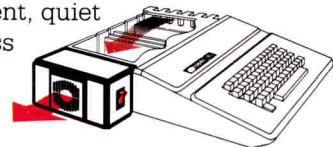
Power line noise can often be interpreted as data. This confuses your computer and produces system errors. Power surges and spikes can cause severe damage to your Apple's delicate circuitry and lead to costly servicing.

System Saver clips surges and spikes at a 130 Volts RMS/175 Volts dc level. A PI type filter attenuates common and transverse mode noise by a minimum of 30 dB from 600 kHz to 20 mHz with a maximum attenuation of 50 dB. You end up with an Apple that's more accurate, more efficient and more reliable.

**System Saver lets your Apple keep its cool.**

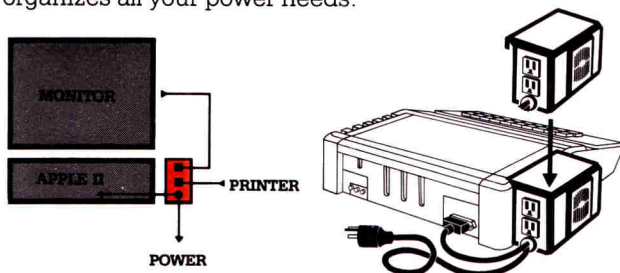
Today's advanced peripheral cards generate heat. In addition, the cards block any natural air flow through the Apple IIe creating high temperature conditions that shorten the life of the Apple and peripheral cards.

System Saver's efficient, quiet fan draws fresh air across the mother board, over the power supply and out the side ventilation slots. It leaves your Apple cool, calm and running at top speed.



**System Saver makes your Apple more convenient to use.**

No more reaching around to the back of your Apple to turn it on. No more fumbling for outlets and cords to plug in your monitor and printer. System Saver organizes all your power needs.



It functions as a multi-outlet power strip with two switched outlets. Plus System Saver offers the ultimate convenience; a front mounted power switch for fingertip control of your entire system.

So if you want to keep damaging heat, line noise and power surges out of your system for good, pick up the only peripheral that's in use every second your computer is in use. The System Saver. You'll soon come to think of it as the piece Apple forgot.

**Compatible with Apple stand**



**\$89.95 at Apple dealers everywhere.**

**K KENSINGTON MICROWARE**

251 Park Avenue South, New York, NY 10010  
(212) 475-5200 Telex: 467383 KML NY

\*PC Magazine: March 1983.

System Saver is UL Listed. System Saver's surge suppression circuitry conforms to IEEE specification 507 1980, Category A. Available in 220/240 Volts, 50/60 Hz.

Circle 86 on Reader Service card.

System Saver is a registered trademark of Kensington Microware Ltd. © 1984 Kensington Microware Ltd. System Saver is patent pending.

### **Arcademic Skill Builders in Language Arts/Math**

Teaching tools with arcade action: Alien Addition, Minus Mission, Meteor Multiplication, and Demolition Division teach fundamental math; Word Man, Word Invasion, Verb Viper, and others attack language-arts skills.

\$44 each from DLM, One DLM Park, Allen, TX 75002, (214) 248-6300.

### **ProDOS User's Kit**

The latest operating system for the Apple II is faster and more flexible than good old DOS. If you plan to keep your computer for the next few years, then you need ProDOS.

\$40 from Apple Computer, 20525 Mariani Avenue, Cupertino, CA 95014, (800) 538-9696.



*Binary Watch*

### **Bank Street Writer**

You and your children can bank on one of the easiest (and cheapest) word-processing programs available.

\$69.95 from Broderbund Software, 17 Paul Drive, San Rafael, CA 94903, (415) 479-1170.

### **Fontrix**

For highly detailed graphics work, this extends your monitor to the size of 16 hi-res screens you can send to a dot-matrix printer.

\$75 from Data Transforms, 616 Washington Street, Denver, CO 80203, (303) 832-1501.

### **Binary Watch**

Don't be late for your 1011 o'clock appointment. Check your quartz watch with hours marked in binary numbers. Men's and women's versions come with battery and leather strap.

\$49.95 from Sweet Gum, 15490 N.W. 7th Avenue, North Miami, FL 33169, (305) 687-9338 in Florida; (800) 237-9338 elsewhere.

### **Apple Tote Bags**

Make your getaway with designer tote bags sporting the Apple logo. Made of Caprolan nylon, these lightweight totes show your true colors.

\$45 for gear bag; \$32 for daypack; \$32 for zippered tote from Apple Computer, The Apple Collection, P.O. Box 306, Half Moon Bay, CA 94019, (800) 632-7979 in California; (800) 227-6703 elsewhere.



**gifts**  
over \$100

### **Gold Card**

Worth its weight in gold, DRI's entry into the Z-80 co-processor market is a value. And where better to buy a board that runs CP/M than from the makers of CP/M? \$350 from Digital Research, P.O. Box 579, Pacific Grove, CA 93950, (408) 646-6230.

### **TASC**

Compiled Applesoft programs run, on the average, three to seven times faster than interpreted Applesoft programs. Who needs to learn 6502 assembly language, anyway?

\$160 from Microsoft, 10700 Northup Way, Bellevue, WA 98004, (206) 828-8080.

### **Modem Starter Set**

If you can't afford \$400-\$500 for a modem and communications software, check out Zoom's products. With this package, all you'll need to get on-line is a telephone number.

\$129 from Zoom Telephonics, 207 South Street, Boston, MA 02111, (800) 631-3116.

### **VAX-11/780**

Complements your Apple system. Just boot your Apple with some VT52 or VT100 simulation software and take control of all those megabytes of RAM and gigabytes of direct access storage that come with your VAX. The perfect gift for a casual acquaintance.

\$184,000 (base price) from Digital Equipment, 146 Main Street, Maynard, MA 01754, (617) 897-5111.

### **Palette**

Turn hi-res graphics into sparkling slides and prints. The software lets you modify colors for best results using Polaroid instant or 35mm film.

\$1499 from Polaroid, 575 Technology Square, Cambridge, MA 02139, (617) 577-2012.

# Back-up Your Floppy with Diversi-Copy™

## A New Breakthrough

Diversi-Copy will copy unprotected floppy disks faster and more easily than any other copy program.

## Don't get burned by a bad disk!

Back-up your disks with Diversi-Copy.

## Verifies Every Byte

Diversi-Copy checks every byte written on the disk, so you know your copies are good.

## Shows Motor Speed

Diversi-Copy displays motor speed on each track while making a copy, eliminating a major source of disk errors.

## Formats Data Disks

You can use Diversi-Copy to format data disks for ProDOS, DOS 3.3, Pascal, or CP/M (18 seconds per disk).

## Mass Production

Diversi-Copy can mass produce 1 disk every 18-20 seconds, faster than most duplication machines (may require extra 128K card for full disks).

## A Must For The Apple //c

You'll be amazed how much easier it is to make back-ups on the new Apple //c. Diversi-Copy makes copies without all those annoying re-insertions of the disks. You'll save over 2 minutes per copy, and save your sanity too!

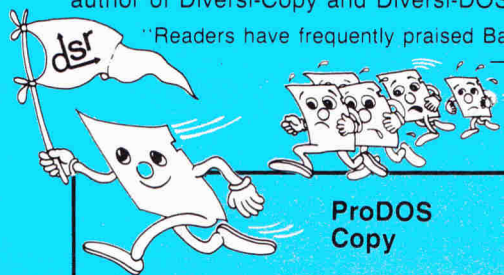
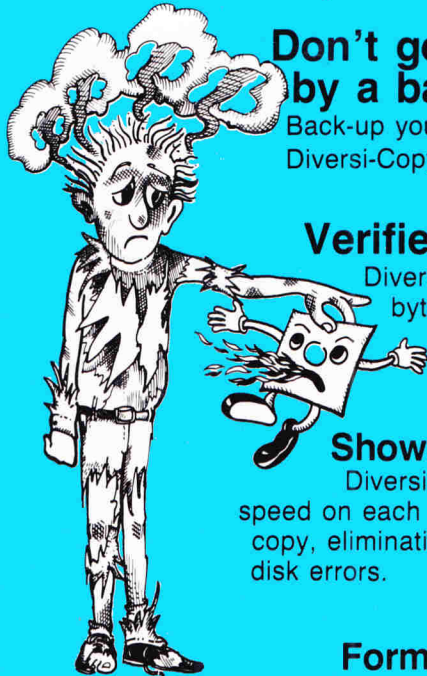
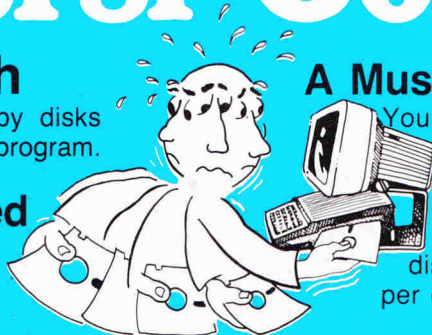
## For Unprotected Disks

Diversi-Copy will copy all unprotected Pascal, CP/M, DOS 3.3, and ProDOS disks. It can't copy protected program disks, but it usually will copy data disks produced by these programs. Works on Apple //c, //e or II+ compatible computers.

## We Back You Up Too

Mail and telephone support is available from Bill Basham, author of Diversi-Copy and Diversi-DOS.

"Readers have frequently praised Basham's support."  
—Softalk Magazine



	ProDOS Copy	Diversi-Copy*
1-Drive Copy (50% Full Disk)	172 sec. 18 insertions	36 sec. 2 insertions
1-Drive Copy (100% Full Disk)	172 sec. 18 insertions	44 sec. 4 insertions
2-Drive Copy	80 sec.	33 sec.

\* On 128K Apple //e or //c

## Also From DSR, Inc. Diversi-DOS™ Still The Best!

The top-rated DOS 3.3 enhancement program. Speeds up read/write of BASIC, Binary and Text files. DOS mover frees 10K additional memory. Includes new insert/delete mode, improved BASIC listings, keyboard MACROS, wildcard file-names, text file printer, keyboard/print buffers, and MORE! Works on Apple //c, //e, or 64K II+.

## RAM Disk Emulator Now Included

Use the extra 64K in the //c or //e extended 80-column card as a high-speed pseudo-disk drive. Also works with most 128K cards in any slot.

## 24-Hour Toll Free Ordering

800-835-2246 ext. 127 (orders only)  
For information, call 815-877-1343.  
Disks normally shipped within 24 hours.  
Sold by mail-order only.  
Price includes 1st class or foreign airmail.  
Return in 30 days for full refund if not totally satisfied!  
FREE: Dogfight II arcade game, by Bill Basham included on each disk.

## NEW: Diversi-DIAL™

Start your own CB-simulator on an Apple with 7 modems. Try our station at 815-877-9521 (300-baud modem).  
"More fun than humans should be allowed to have!"

Diversi-Copy ... \$30

Diversi-DOS ... \$30

**dsr**

Diversified Software Research, Inc.  
5848 Crampton Court  
Rockford, IL 61111

Name: \_\_\_\_\_

Address: \_\_\_\_\_

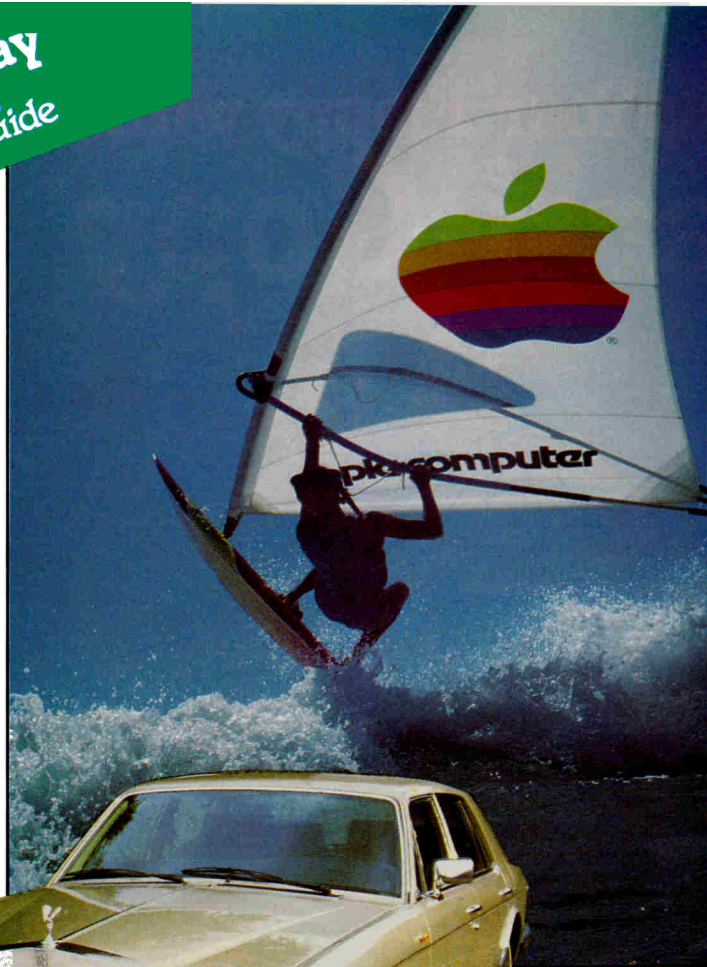
City: \_\_\_\_\_

State: \_\_\_\_\_ Zip Code: \_\_\_\_\_

Visa/MasterCard, C.O.D., or personal check accepted

Card #: \_\_\_\_\_

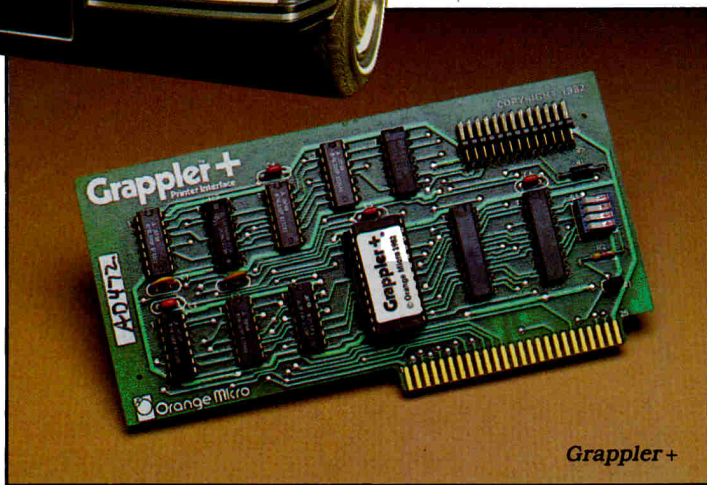
Expiration Date: \_\_\_\_\_



Apple Sailboard



//c Mobile  
Power Supply



Grappler+

### Apple Sailboard

Sail the seas on this polyethylene board for beginner and seasoned sailor alike. Emblazoned on one of its two Dacron sails—a 52-square footer—is a gigantic Apple logo.

\$899 from Apple Computer, The Apple Collection, P.O. Box 306, Half Moon Bay, CA 94019, (800) 632-7979 in California; (800) 227-6703 elsewhere.

### Micro-Ear

Knock, knock. Who's there? Connect this voice recognition system to your Apple via an RS-232 interface and it will recognize up to 256 words in anyone's voice. Demo software includes voice-controlled video games.

\$579 from Arctec Systems, 9104 Red Branch Road, Columbia, MD 21045, (301) 730-1237.

### //c Mobile Power Supply

The //c's most frustrating limitation is its dependence upon a clunky external power supply. This Christmas, consider the ultimate 12-volt mobile power supply: the Rolls Silver Spirit. Hook up your //c to the cigarette lighter and relish the pleasures of transportable computing in style.

\$98,500 (suggested USA retail price) from Rolls Royce, P.O. Box 476, Lyndhurst, NJ 07071, (212) 594-2586.

### Omnis 2

Pascal-based data base manager that can also create form letters.

\$195 from Organizational Software, 2655 Campus Drive, Suite 150, San Mateo, CA 94403, (415) 571-0222.

### Grappler +

Get the picture with this parallel printer interface card that makes it easy to print out hi-res graphics. \$175 from Orange Micro, 1400 North Lakeview Avenue, Anaheim, CA 92807, (714) 779-2772.

### Mockingboard //c

Listen to the mockingboard's arcade-level sound effects, synthesized speech, and stereo music.

\$195 from Sweet Micro Systems, 50 Freeway Drive, Cranston, RI 02920, (800) 341-8001.

### Hush 80 Printer

Weighing in at a mere 28 ounces, this 80-column, 80 cps thermal printer handles itself among the big guys. Battery-powered; parallel or serial model.

\$159 from Ergo Systems, 1360 Willow Road, Menlo Park, CA 94025, (415) 786-3746.

### JX-80 Color Printer

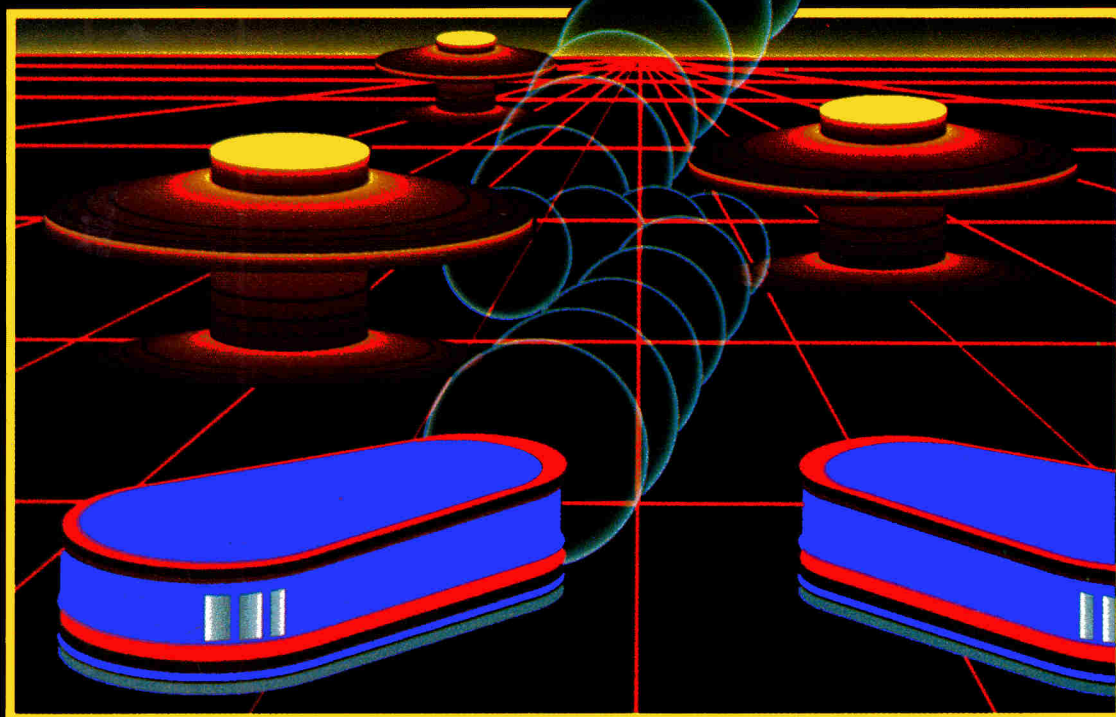
Color your world with a printer that features what you'd expect from dot matrix, and then some: front-panel control, programmable characters, and seven bold colors.

\$800 from Epson America, 3415 Kashiwa Street, Torrance, CA 90505, (213) 316-2557. ■

# TAKE A BREAK!

Circle 156 on Reader Service card.

For Apple II,  
Apple II+,  
and Apple IIe



## WITH NIGHT MISSION PINBALL

You deserve the best. You've earned it. Now reward yourself with a session of **Night Mission PINBALL**, the most realistic and challenging arcade simulation ever conceived! ■ Stunning graphics and dazzling sound effects put **Night Mission PINBALL** in a class by itself. Game features: multi-ball and multi-player capabilities, ten different professionally designed levels of play, and an editor that lets you create *your own* custom modes. ■ So take a break with **Night Mission PINBALL** from SubLOGIC. Winner of *Electronic Games* magazine's 1983 Arcade Award for Best Computer Audio/Visual Effects.



**See your dealer . . .**

or write or call for more information. For direct orders please add \$1.50 for shipping and specify UPS or first class mail delivery. Illinois residents add 5% sales tax. American Express, Diner's Club, MasterCard, and Visa accepted.

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**subLOGIC**  
Corporation  
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Champaign IL 61820  
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# Read 'Em and Weep



**C**an a computer play poker? Can an Apple computer hold its own in a challenge against the world's best poker players? Poker experts flatly refused to believe that a machine could even play the game. Computer experts thought it would be 20 years before a computer program could be designed to play on a world class level.

On May 13, 1984, the experts were proven wrong when an Apple computer programmed by renowned poker authority Mike Caro was a participant in the World's First Computer Poker Challenge, a media event scheduled as part of the Fifteenth Annual World Series of Poker at Binion's Horseshoe Hotel and Casino in Las Vegas.

Mike Caro is the editor-in-chief of *Poker Player* and the poker editor of *Gambling Times*. He has written several books about poker and gambling, including *Poker Without Cards*, *Poker for Women*, and *Caro on Computer*

*Gambling*. Considered by many as the best high draw poker player in the world, Caro is a world class poker player. His unorthodox playing style earned him the nickname, "The Mad Genius of Poker." Caro writes Pascal programs on his Apple II computer to produce the mathematics for the winning strategies described in his books and articles. He spent over a year perfecting his poker-playing program.

The World's First Computer Poker Challenge was scheduled for the day before the final event of the World Series. The game was no-limit Texas hold 'em, the same game that would

The first two to challenge the computer were reigning World Champion Tom "Grand Rapids" McEvoy, a former accountant who last year parlayed \$100 in a smaller "satellite tournament" into \$540,000, and two-time winner Doyle "Texas Dolly" Brunson, the first poker player to win more than \$1 million in tournament play alone.

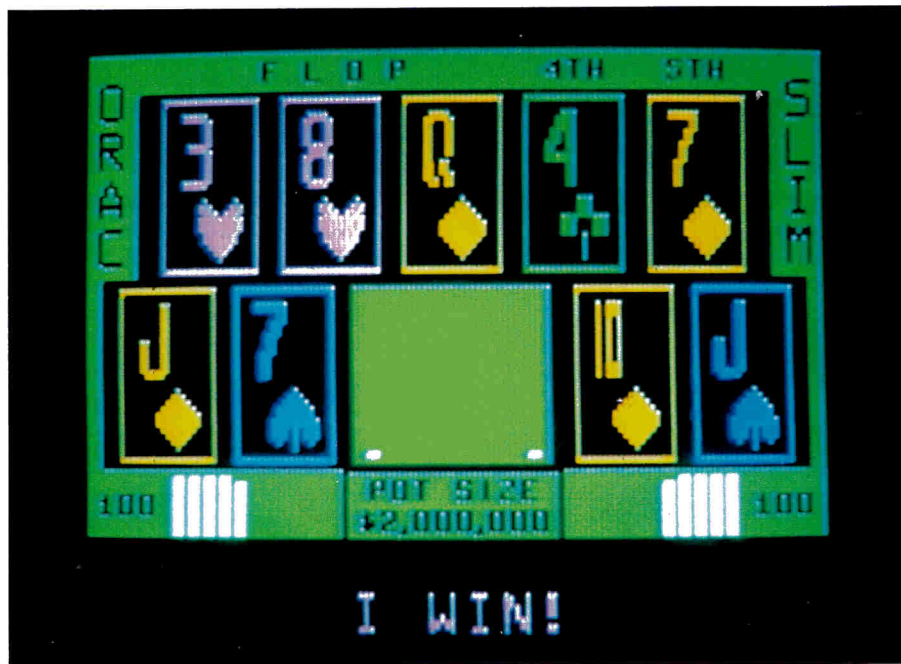
The computer poker challenge was structured similarly to all tournament games. Players start with the same number of chips and play until one person has all the chips. The computer and its challenger each started with 100 chips and the minimum bet was set at one chip. The deal alternated between computer and opponent.

Before the hole cards were dealt, both players made blind bets. At the start of each hand, the dealer put one

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*Don't try to bluff Michael Wiesenbergl at 420 Guinda Street, Palo Alto, CA 94301.*

# The Apple II took on the poker champs in the card game of the year. Would you play the odds?



chip into the pot and the nondealer, two. On the first round, the dealer was the first to act. He could either fold, call the one chip raise, or raise the bet (by any amount from one chip to all of his chips, or all of the opponent's if he had more than his opponent). On succeeding hands, the nondealer started the betting.

Commercial electronic poker games generate their own cards, but this method would never do for such a contest; poker players would not trust the computer to handle both sets of cards. They would be suspicious of the programmer's claim that the computer only knew its own hole cards and not its opponent's. So, just as in any tournament event, the hands were dealt by a professional dealer. Real cards were used, but slightly doctored to accommodate the non-human player. The Databar Corporation, of Eden Prairie, Minnesota, makers of optical scanners for home computers, supplied special decks with bar codes printed on the card faces. Databar's OSCAR (Optical SCANNing Reader) served as the computer's "eyes." For

each hand, the dealer dealt two cards face down to the opponent and two to the computer. A Databar representative slid the computer's hole cards, one at a time, up a short metal ramp. At the top of the ramp, each card slid over the reading tip of OSCAR, which transmitted the rank and suit directly to the computer. The computer's two hole cards remained face down on a solid platform just past the reading tip during the betting.

Two monitors were connected to the Apple. An NEC color monitor kept a running display of the play. Until the hole cards were shown, they were represented by their blank sides. As each face-up card was dealt, it appeared on the monitor, which also kept a running total of the bets. The other monitor, a Soroc black and white, was used for data input. As each face-up card appeared, Caro typed its value into the Soroc. Caro also entered the amount of the opponent's wager. The program generated its own bets, and displayed them on the NEC monitor.

The rest of the equipment consisted of three Apple disk drives and, for

by  
**Michael Wiesenberg**

speed, an Accelerator II board by Titan Technologies.

McEvoy played the computer first. He announced his bets verbally, and Caro entered them on the Soroc's keyboard. The computer displayed its own bets on the NEC screen. The two fenced cautiously for nearly an hour. At one point, the computer was ahead 140 chips to McEvoy's 60. Poker experts were impressed with the computer's aggressive style and its often tricky tactics. More than once the computer bet, McEvoy raised, the computer raised again, and McEvoy folded. Since McEvoy did not call those bets, the computer's cards were shuffled back into the deck and Caro never knew what the cards were.

Once, McEvoy had 66 chips and raised all his chips before the flop (when three cards are dealt face up and there is another betting round). The computer called. The computer held the ace and 4 of spades while McEvoy held the ace of diamonds and 8 of hearts. Although McEvoy started with the best, his bet was actually what poker experts call a semi-bluff.

More often than not, if he makes an all-in bet on these cards and the computer calls, he is beat. The community cards (10 of clubs, 4 of hearts, 8 of clubs, 7 of hearts, 10 of hearts) gave the computer 10's and 4's, and McEvoy 10's and 8's. The chips then stood at 138 for McEvoy, and 62 for the computer. That was a crucial hand. Had the computer won the hand, the match would have been over.

Soon, with the computer down to 43 chips, McEvoy bet all. The computer called. The computer started with the better hand, a very respectable ace and queen of diamonds. McEvoy had the ace and 9 of two dif-

**"Lady Luck was not with the computer this time."**

ferent suits. The flop was 9 of clubs, 8 of hearts, 2 of diamonds, 3 of clubs, 8 of clubs. McEvoy ended up with a pair of 9's, and the computer didn't help. The first match was over. Poker play-

ers call this going in with the best and getting drawn out on.

Two-time world champion Doyle Brunson, referred to as the best poker player in the world, next tested the computer's skill. In a surprise opening, Brunson bet all on the first hand, feeling that "there was no chance any computer would call." Caro, however, prepared the Apple for just such a possibility. The computer was instructed to call with even a medium strong hand in any all-in bet situation on the first hand.

This strategy did not work out as well as expected, though. The computer had the ace of diamonds and 7 of diamonds. Brunson had better—the ace and 9 of different suits. Lady Luck was not with the computer this time and did not "draw out on" the champ. Score one more for the humans.

Now trailing two matches to none, Caro accepted Brunson's offer of a rematch. Rather than play for the glory of the challenge, this time real money was wagered with Brunson laying the computer at 2 to 1. He later stated that at the time he would have been willing to lay odds at 10 to 1.

Poker then became serious. Brunson and the computer traded bluffs, bets, and check-raises for 50 minutes. When the match was suspended so that reporters could attend a press conference, the computer was ahead by 58 chips. Brunson expressed amazement at the machine's performance.

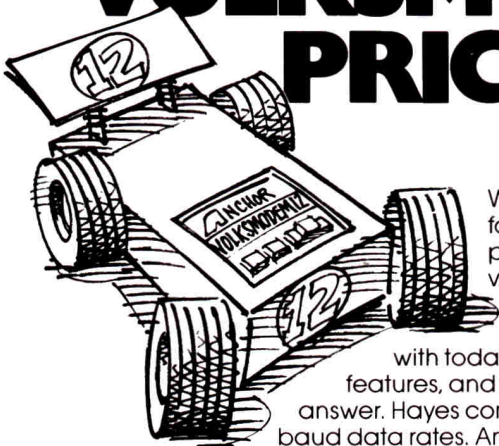
"I was very impressed with the computer. I'd like to take 2 to 1 and bet on the computer against anyone in the world," Brunson said. "I'm not sure it's the favorite against world class players, but if all seven matches [that had originally been scheduled] were played, it sure would have won some of them."

Score one draw for the computer.

Most experts agreed that the computer made no major errors in more than two hours of intense competition.

Caro plans on marketing a home version of his game with possible cash prizes for anyone who can beat the computer ten games in a row. Larger prizes would be awarded for more wins—perhaps as much as \$10,000 for 14 wins. Caro envisions his game as creating the same tensions that exist in an actual poker tournament. Someone winning ten games would have to decide whether to take the sure winner, or risk it all in an attempt to win more. How's your poker face? ■

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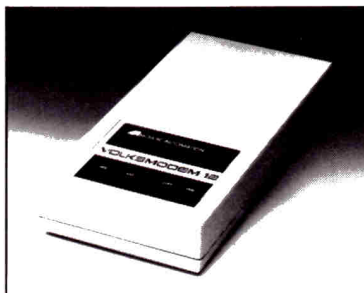
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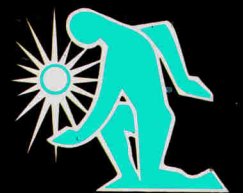
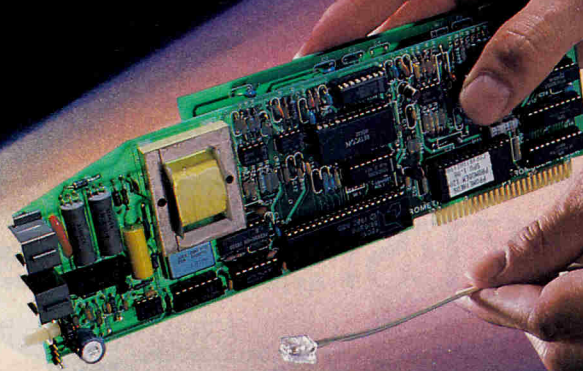
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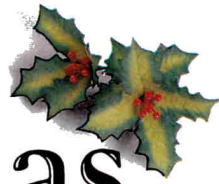
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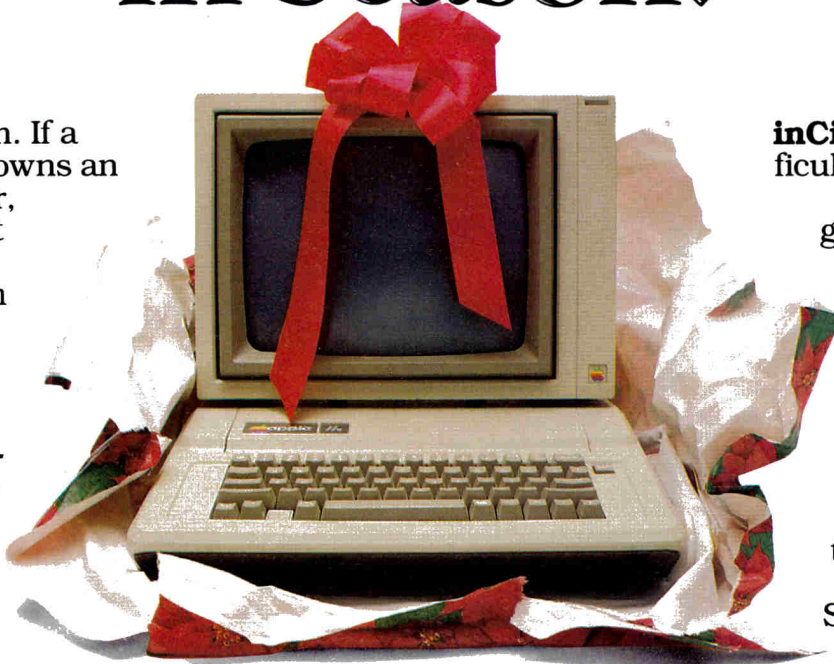
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# It's Christmas and Apples are in Season.



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# inCider's inSidious inSolubles

Okay, all you inSoluble fans, time to check the authenticity of your Apple II. Perform this inGenious test from a cold start. If you have the auto-start ROM, make sure your Hello program does absolutely nothing, or hit the reset key to stop Apple from booting DOS. Now type PRINT PEEK (230). What did Apple say? It should have been zero or 255. Anything else and the pedigree of your machine is suspect. Taiwan? Korea? inSidious, isn't it? No prizes here, just something that turned up from inside the 47th parallel and I thought you'd like to know.

Now back to our usual (unusual?) assortment of brainteasers, puzzles, and erroneous results. Remember, an inCider inSoluble is not a contest—at least, not one that produces prizes or trophies. It may challenge your BASIC programming abilities and provide a few hours of fun but, sorry, no monetary rewards for correct solutions (only for published submissions). If you're new to our inSidious programs and want some inSights, remember an inSoluble is an Applesoft BASIC program that has one or more problems, errors, mistakes, or some inTangible inAccuracy submerged within.

Most submissions are from readers whose programs developed the same problems their puzzles display. By submitting an inSoluble and having it published, you will receive \$20—an easy way to turn bugs into bucks.

Key in the listing, and type RUN, and hope for the best. If your typing is accurate you won't get a syntax error, but what you'll see is not what you'd expect. Or is it? Just follow the simple rules to solve or submit an inSoluble.

## Rules for inSidious inSolubles

1. An inSoluble must be a BASIC Applesoft program. Any POKED machine-language subroutines and CALLs to that subroutine must be correct.

2. The program must accomplish

something; when it's run it should produce some kind of result.

3. No error message should occur. If one does, check your typing.

4. A short explanation of the program's purpose is necessary and may contain clues to the problem.

5. The program may use common peripherals such as disk, printer, and modem. DOS 3.3 or ProDOS commands are acceptable.

6. More than one error may appear in the program.

When submitting your puzzles, remember to provide the solution, and please include an SASE if you'd like 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.

## The Rainbow

David Shields of Akron, Ohio, likes the serene beauty of a colorful rainbow spread over a quiet green meadow. His program, The Rainbow, produces just such a picture. Dave tells us that if you find something wrong, just remember that Roy G. Biv didn't do the programming. I think Dave must be kidding. What does he mean if we find something wrong? As Alice wanders around CompuLot, within these pages she *will* find things amiss. Rainbows, of course, are colorful things. Your Apple should have a color display.

### Listing 1. The Rainbow.

```
10 REM THE RAINBOW
20 FOR A = 1 TO 7: READ C(A): NEXT

30 TEXT : HOME : GR : FOR I = 1 TO
7: COLOR= C(I)
40 FOR A = 1.725 TO 4.475 STEP .
025
50 PLOT (20 + SIN (A) * (12 + I
)), (40 + COS (A) * (20 + I
))
60 NEXT A: NEXT I
70 COLOR= 4: HLIN 0,39 AT 36
80 DATA 1,9,13,12,7,6,3
```

## The Data Disk Maker

Our second inSoluble comes from Harvey David Heilbrun of Manorville, New York. Watch out for this one. Harvey wanted to initialize a data disk to store music records for his school. His solution was to write a program that initialized a disk and locked the Hello program on the disk. The Hello program would state that it was a data disk used only for storage. Harvey solved his problem nicely, and all went fine until some smart aleck boot-



by Art Ude

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ed Harvey's storage disk. Careful now!  
Dave and Harvey each receive \$20 for their inSoluble submissions. ■

Write to Art Ude c/o inCider, 80 Pine Street, Peterborough, NH 03458.

**Solutions on page 146.**

**Listing 2. The Data Disk Maker.**

```

100 REM DATA DISK MAKER
200 D$ = CHR$(13) + CHR$(4)
300 TEXT : HOME : VTAB 12: PRINT
   "INSERT BLANK DISK YOU WANT
   INITIALIZED": PRINT : PRINT
   "PRESS <SPACE BAR> TO BEGIN"
   ;
400 GET AK$: HOME : VTAB 12: PRINT
   : FLASH : PRINT "WARNING": NORMAL
   : PRINT "ANYTHING ON THIS DI
   SK WILL BE ERASED!"
500 PRINT : PRINT "PRESS <SPACE
   BAR> TO CONTINUE": GET AK$
600 HOME : FLASH : VTAB 12: PRINT
   "PLEASE WAIT WHILE I INITIAL
   IZE THE DISK": NORMAL
700 PRINT D$;"INIT HELLO,V0"
800 PRINT D$;"OPEN DISK"
900 PRINT D$;"WRITE DISK"
1000 PRINT "SAVE HELLO"
1100 PRINT "LOCK HELLO"
1200 PRINT "DELETE DISK"
1300 PRINT D$;"CLOSE DISK"
1400 PRINT D$;"EXEC DISK"
1500 REM ** STORAGE DISK **
1600 REM ** FROM INCIDER **
1700 REM ** BY HDH **
1800 HOME : VTAB 12: PRINT "THIS
   IS A STORAGE DISK ONLY"
1900 END
  
```

**Corrections**

In "The Compleat Text File Primer, Part 7" by Lee Swoboda, October '84, the end of the Visi-Data listing on page 99 is erroneously marked with a "Listing continued." Please disregard it.

The Product Information box in "Capturing Big Games," page 65 of the November '84 issue, contains an incorrect phone number. Thirdware Computer Products, manufacturers of FingerPrint, can be reached at (305) 592-7522.

"Recover a Protected File in MBASIC" by Michael Galler, a Hint 'n' Technique in the September '84 issue, contains an error. The list of commands at the top of the third column of page 91 is incomplete. The complete sequence of commands follows:

DDT  
M628F, last-byte, 101  
S100  
FF

control-C  
SAVE no-pages SECRET.BAS

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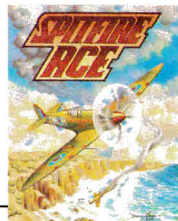
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# BUILD *a better* MOUSEPAINT

by Stephen Jones

*The graphics in this article were printed directly from MousePaint through the author's print routine.*

**W**ithout both an Apple printer and an Apple printer interface card, you can't print a picture directly from MousePaint. You must save it as a MousePaint disk file, exit MousePaint, and then use another program to dump this picture file to your printer. I didn't have such a program, so I wrote PIC.DUMP to integrate a print routine with MousePaint while providing print options not included in the MousePaint program.

#### Where There's a Will . . .

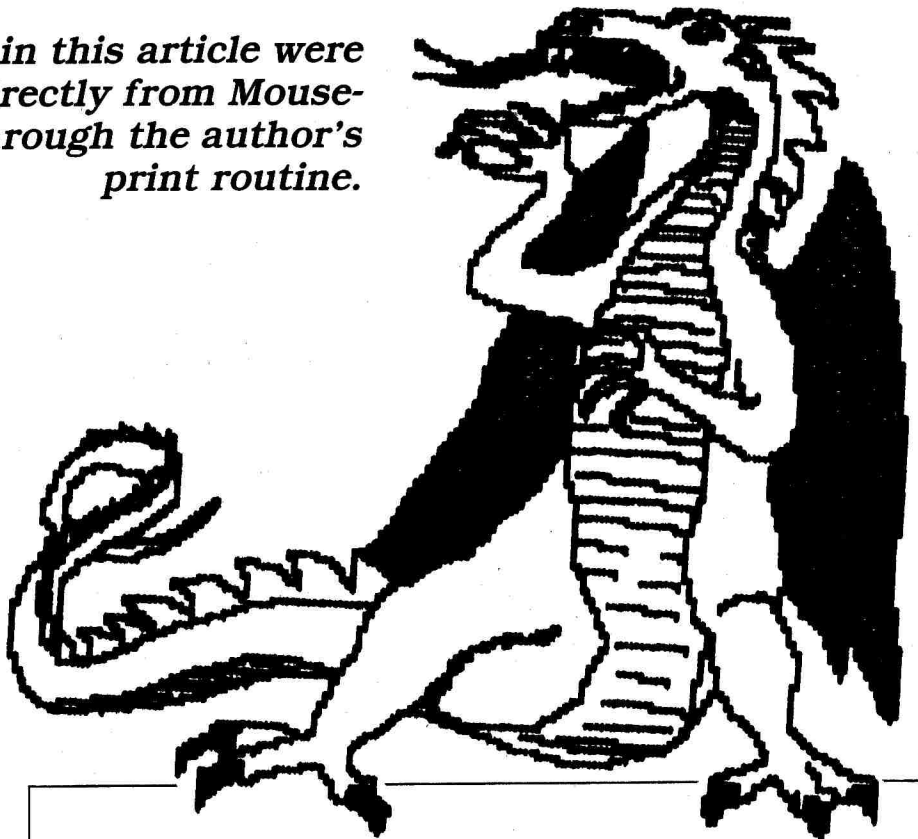
If you own an Apple II Plus, //e, AppleMouse II with MousePaint, and a printer interface card other than an Apple, then this article is for you. The PIC.DUMP program should work with most printer configurations after you change the print control codes that dump the picture (lines 500-550). Check your manual to see which codes work with your setup.

To implement the picture dump routine:

1) Change the STARTUP program on your back-up copy of MousePaint to the one in **Listing 1**. Type SAVE/MOUSEPAINT/STARTUP to save this revised STARTUP.

2) Type in PIC.DUMP (**Listing 2**) and save it to the MousePaint disk. Name it PIC.DUMP as in the STARTUP program. Type SAVE/MOUSEPAINT/PIC.DUMP to save it.

3) Boot the MousePaint disk. Select the menu option you need. The P op-



**Listing 1. STARTUP.**

```
10 REM
20 REM
30 REM
40 REM
50 REM
60 REM
70 REM
80 REM /MOUSEPAINT/STARTUP PGM
90 REM REVISED FOR PRINTING WITH
100 REM NON-APPLE CONFIGURATIONS
110 D$ = CHR$(4): REM CTRL-D
120 B$ = CHR$(7): REM CTRL-G, BELL
130 HOME : VTAB 5: PRINT "... MOUSEPAINT ..."
140 PRINT : PRINT "<I> INTRODUCTION TO MOUSEPAINT": PRINT "<M> GO DIRECTL
Y TO MOUSEPAINT": PRINT "<P> PRINT A MOUSEPAINT PICTURE FILE": PRINT
: PRINT "SELECT ONE -> ": GET S$: PRINT S$
150 IF S$ = "I" THEN PRINT D$;"/MOUSEPAINT/START.INTRO"
160 IF S$ = "M" THEN PRINT D$;"/MOUSEPAINT/INTRO/MOUSEPAINT"
170 IF S$ = "P" THEN PRINT D$;"/MOUSEPAINT/PIC.DUMP"
180 PRINT B$: GOTO 130
```

**Listing 2. PIC.DUMP.**



```

10 REM
20 REM
30 REM
40 REM
50 REM
60 REM
70 REM
80 D$ = CHR$(4): REM CTRL-D
90 I$ = CHR$(9): REM CTRL-I
100 B$ = CHR$(7): REM CTRL-G, BELL
110 REM OPENING MENU
120 TEXT : HOME : VTAB 5: INVERSE : PRINT "::::::::::::::::::
:::::::::::::::::: MOUSEPAINT PICTURE DUMP ::::::::::::::::::::
::::::::::::::::::": NORMAL
130 HTAB 19: PRINT "BY": PRINT : HTAB 13: PRINT "STEPHEN JONES"
140 VTAB 16: PRINT "- SET KEYBOARD CAPS LOCK.": PRINT "- PRESS <RTN> TO S
ELECT DEFAULT VALUES."
150 ONERR GOTO 160
160 VTAB 20: PRINT " ENTER PRINTER SLOT#": INVERSE : HTAB 5: PRINT "SLO
T# ->": NORMAL : CALL - 868: PRINT "1": HTAB 14: INPUT "": S$: IF
S$ = "" THEN S$ = "1": VTAB 21: HTAB 14: PRINT S$
170 S = VAL (S$): IF S < 1 OR S > 7 THEN PRINT B$: GOTO 160
180 REM MAIN MENU
190 ONERR GOTO 220
200 HOME : PRINT " <RTN> - SELECT DEFAULTS": PRINT " <CTRL-Q,R
TN> - QUIT PROGRAM"
210 VTAB 4: PRINT "1. ENTER THE NAME OF THE PICTURE FILE TO": PRINT "
PRINT, IN THE FORM: ": INVERSE : PRINT "/PREFIX/FILENAME": NORMAL : PRINT
"/PREFIX/' CATALOGS 'PREFIX' DISK)"
220 VTAB 7: HTAB 5: INVERSE : PRINT "FILE ->": NORMAL : CALL - 868: INPUT
": N$
230 IF N$ = "" THEN PRINT B$: GOTO 220
240 IF N$ = CHR$(17) THEN 560
250 IF RIGHT$(N$,1) = "/" THEN PRINT D$;"CAT";N$: PRINT "PRESS RETURN
TO CONTINUE": GET A$: GOTO 200
260 ONERR GOTO 290
270 VTAB 9: PRINT "2. ENTER PRINT OPTIONS, WITH NO COMMAS": PRINT " AND
NO SPACES.": PRINT : PRINT " D - DOUBLE SIZE": HTAB 25: PRINT "R
- ROTATED": PRINT " L - AT LEFT MARGIN": HTAB 25: PRINT "E - ENH
ANCED"
280 PRINT : PRINT " NOTE: PICTURES WILL AUTOMATICALLY BE PRINTED INVERS
E SINCE MOUSEPAINT DRAWS ON A WHITE BACKGROUND, WHICH WOULD NOR
MALLY BE PRINTED AS BLACK."
290 VTAB 19: HTAB 5: INVERSE : PRINT "OPTIONS ->": NORMAL : CALL - 868:
PRINT "NORMAL": HTAB 16: INPUT "": O$: IF O$ = "" THEN VTAB 19: HTAB
16: PRINT "NORMAL": GOTO 330
300 IF O$ = CHR$(17) THEN 560
310 FOR I = 1 TO LEN (O$): CH$ = MID$(O$,I,1): IF CH$ < > "D" AND CH$ <
> "R" AND CH$ < > "L" AND CH$ < > "E" THEN PRINT B$: GOTO 290
320 NEXT I
330 ONERR GOTO 340
340 VTAB 21: PRINT "3. ENTER NUMBER OF COPIES.": INVERSE : HTAB 5: PRINT
"COPIES ->": NORMAL : CALL - 868: PRINT "1": HTAB 15: INPUT "": C$
: IF C$ = "" THEN C$ = "1": VTAB 23: HTAB 15: PRINT C$
350 IF C$ = CHR$(17) THEN 560
360 FOR X = 1 TO LEN (C$): Y$ = MID$(C$,X,1): AY = ASC (Y$): IF AY < 48
OR AY > 57 THEN PRINT B$: GOTO 340
370 NEXT X
380 C = VAL (C$): IF C < 1 THEN PRINT B$: GOTO 340
390 HOME : GOTO 430
400 REM ERROR PROCESSING
410 PRINT B$: HOME : TEXT : VTAB 3: PRINT "THERE'S A PROBLEM FINDING FILE
": INVERSE : HTAB 7: PRINT N$: NORMAL : PRINT "BE SURE CORRECT DISK
IS INSERTED AND FILENAME IS CORRECT."
420 REM INSERT DISK INSTRUCTIONS
430 VTAB 10: PRINT "INSERT DISK WITH PICTURE FILE, POSITION PAPER IN PRIN
TER, THEN PRESS RETURN.": PRINT " (PRESS 'ESC' NOW TO CHANGE FILENAM
E)"
440 PRINT : PRINT "WHEN THE PICTURE IS DISPLAYED PRESS": PRINT " <RETURN
> - TO BEGIN PRINTING": PRINT " <ESC> - TO ABANDON PRINTING": GET
P$: IF P$ = CHR$(27) THEN GOTO 190
450 REM CLEAR HGR2 & LOAD PIC
460 HGR2
470 ONERR GOTO 410: REM DISK FILE ERROR
480 PRINT D$;"BLOAD";N$;"A$4000": REM BLOAD PIC INTO HIRES PAGE 2
490 GET A$: IF A$ = CHR$(27) THEN 560
500 REM PRINT PICTURE
510 PRINT D$;"PR#";S: REM TURN ON PRINTER
520 PRINT CHR$(27);">": REM PRINTER CTRL CODES FOR UNIDIRECTIONAL PRI
NTING
530 FOR I = 1 TO C: PRINT I$;"G2I";O$: PRINT CHR$(12): NEXT I: REM DUMP
HGR2 WITH OPTIONS
540 PRINT CHR$(27);"<": REM PRINTER CTRL CODES FOR BIDIRECTIONAL PRIN
TING
550 PRINT D$;"PR#0": REM TURN OFF PRINTER
560 REM CLOSING MENU
570 TEXT : HOME : VTAB 5: HTAB 5: PRINT "<P>PRINT ANOTHER PIC": HTAB 5: PRINT
"<M>MOUSEPAINT": HTAB 5: PRINT "<Q>QUIT": PRINT
580 VTAB 9: HTAB 10: PRINT "SELECTION ->": CALL - 868: INPUT "": SL$: IF
SL$ = "P" THEN 190
590 IF SL$ = "M" THEN NP$ = "/MOUSEPAINT/INTRO/MOUSEPAINT": GOTO 660
600 IF SL$ < > "Q" THEN PRINT B$: GOTO 580
610 HOME : VTAB 15: PRINT "ENTER /PREFIX/FILENAME OF NEXT PROGRAM": INPUT
"": NP$: IF NP$ = "" THEN HOME : VTAB 12: HTAB 17: PRINT "B Y E": VTAB
23: END
620 GOTO 660
630 REM ERROR PROCESSING
640 PRINT B$: HOME : VTAB 10: PRINT "THERE'S A PROBLEM FINDING FILE": HTAB
5: INVERSE : PRINT NP$: NORMAL : PRINT "CHECK THAT CORRECT DISK IS IN
SERTED AND PATHNAME IS CORRECT."
650 PRINT : PRINT "PRESS 'RETURN' TO CONTINUE, 'ESC' TO REENTER FILENA
ME.": GET ER$: IF ER$ = CHR$(27) THEN 610
660 ONERR GOTO 640
670 VTAB 22: PRINT "LOADING ";NP$: PRINT D$;"-":NP$

```

tion runs PIC.DUMP. Follow the instructions for a printed copy of the designated picture file with print options—something MousePaint doesn't have.

4) After printing, select an option to either print another picture, go to MousePaint, or run a different program.

5) To print a picture when in MousePaint, save the picture in a file using the ProDOS prefix and filename conventions described in the MousePaint manual. Select Exit MousePaint on the File pull-down menu. When the screen prompts you for a prefix, press return to choose the default of /MOUSEPAINT/ (the MousePaint disk). You will then be prompted for the path name of the next application. (It must be a SYS file type.)

6) Type MP.SYSTEM (MP for MousePaint and SYSTEM for SYS file), and the STARTUP menu (as in step 3) appears. Select P to run PIC.DUMP. Follow the instructions to print your picture.

A line description for the PIC.DUMP program appears in the **Table**. For lines 180-380, pressing the return key selects the displayed defaults.

You can leave PIC.DUMP any time during the main menu selections. When prompted for input to any of steps 1 through 3, press control-Q and the return key. The program will jump to the closing menu routines. In step 1, entering a filename, note that if you want to catalog a disk, the prefix entered must start and end with a slash (/). This is a good habit to acquire when working with ProDOS.

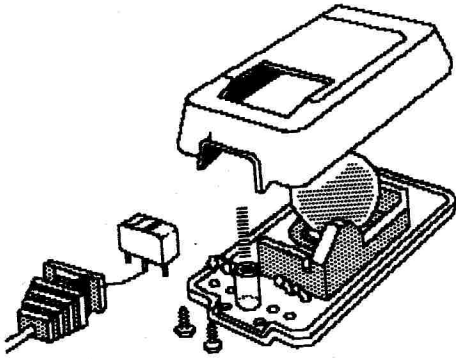
**ProDOS and Your Programs**

Since MousePaint uses Apple's ProDOS, STARTUP and PIC.DUMP must be saved to the MousePaint disk in a ProDOS-format file, too. If you have ProDOS on a disk other than MousePaint use it as a boot disk, enter the two programs, then save them to your MousePaint disk.

If you aren't fortunate enough to have ProDOS, you can still dump out of MousePaint to enter and save both STARTUP and PIC.DUMP. After booting MousePaint, the ProDOS file will load and the STARTUP welcome will appear while the disk drive loads other files. Hit reset to dump out of this BASIC STARTUP program.

Resetting later causes the disk to reboot. For a "boot on reset," add POKE 1010.0:POKE 1011.0 at or near the beginning of both programs. Wait until you are sure the program works before adding this line or you won't be able to reset in order to dump out of





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Lines	Description
80-100	Set control variables for ProDOS commands, printer card commands, and an error message.
110-170	Display the welcome, opening menu, and preliminary instructions. Error-trapping routines for invalid slot numbers are included.
180-380	Print picture files with printing option codes.
390-490	Display the printing instructions.
500-550	Input file name (or catalog disks), printing options, and number of copies.
560-670	Display the closing menu.

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the program and make corrections.

Before you enter the programs, catalog the disk, then load and list some BASIC files to make sure no error messages appear. If they do, press reset, or reboot and reset again. Then you can type in and save each program. If you don't have a separate ProDOS disk, have a friend or your computer store make a back-up copy of MousePaint for you so you don't damage the master by accident.

These routines don't represent the most efficient way to print a MousePaint picture, but until Apple comes out with software modifications for those without an Apple printer and Apple interface card, you can use them to get a hard copy of your latest masterpiece. ■

*Stephen Jones draws with his Apple Mouse II at 2937 Winter Garden #4, Lexington, KY 40502.*

# Nothing but Interruptions

by Bill Bynum

**W**hen you start a machine-language program on the //e, you have no control over it—it runs until completion. Thus, an error in a machine-language program, particularly one that locks up the computer, can be difficult to find. With this debugger, you can stop your program at any location, inspect and modify the contents of the registers and memory, and then resume or abort your program.

## Using the Debugger

The debugger is 208 bytes long and fits in the unused area of Apple DOS 3.3 from \$300 to \$3D0, beneath the vector jump table. The dollar sign [\$] indicates hexadecimal notation. To use the debugger, insert a JSR \$300 statement wherever you want to suspend program execution. When you run your program, each JSR \$300 passes control to the debugger, which lists the address of the next instruction, displays the current register contents, and flashes its prompt. The debugger commands do the following:

- display and modify memory or registers;
- disassemble 20 instructions at a chosen location;
- move memory from one location to another; or
- perform 1-byte hexadecimal addition or subtraction.

If you give the debugger a command it doesn't understand, it beeps and redisplay the prompt. To proceed, you may either continue or abort the program.

After locating and correcting the bugs, remove the JSR \$300 statements from your program and reassemble it. If you lack an assembler, replace each byte sequence 20 00 03 (the JSR \$300) in the object code with three NOP's (EA EA EA).

The program being debugged should not use the zero-page locations the debugger or monitor refer to—\$31-\$49 and \$F9-\$FD. You can't debug a copy of the monitor or the debugger itself. The program you intend to debug also can't use the debugger's location between \$300 and \$3D0.

## Debugger Commands

Except for the R (display registers), K (continue execution), and Q (abort execution) commands, the debugger commands are identical with the corresponding Apple monitor commands. However, because of the debugger's 208-byte space limitation it won't accept certain monitor commands, such as G or V. **Table 1** explains the syntax of the commands.

## How It Works

The **Program listing** tests a WRITE subroutine which writes the characters stored in a buffer to the

display screen. The WRITE subroutine assumes the buffer address will be stored at \$06 and \$07, with the least significant byte at \$06. The subroutine also assumes that the first byte contains the number of bytes of the buffer to be listed.

This example contains a deliberate error to illustrate how to use the debugger. In storing the address of the buffer at \$06 and \$07, the most significant byte and the least significant byte of the address were switched.

**Table 2** is the output listing. The program is started from the monitor with 800G. The first call to the debugger is at memory location \$820, so the next instruction on return from the debugger is indeed \$823, as the debugger announced. The 800L command given from the debugger disassembles the first 20 instructions of the program. This is a good way to find out where you are in your program if you don't have a listing handy.

The debugger corrects the address stored at \$06 and \$07. This error won't be repaired, however, until you return to the program source, switch lines 170 and 190, reassemble, and store the object file on disk. Just to illustrate how to use the MOVE command, move a copy of the program to \$900 and check it by listing memory locations \$900 to \$937.

At the next debugger break, the carriage return (the first character in

## With Breakpoint Debugger, start and stop programs at any point for any reason.

the buffer to be written) is listed by COUT. After the T in the buffer is listed, look at the contents of the stack. The current value of the stack pointer is \$F7, so list the contents of locations \$1F7-\$1FF (recall that the stack is located in page 1-\$100 to

\$1FF—and grows down from \$1FF). The 6502 differs from other processors, like the Z-80, in that the stack pointer indicates the next available byte on the stack to be filled rather than the byte of the most recently filled stack. Notice that the address

on the top of the stack is \$080A, pushed there by the JSR WRITE instruction at \$0808. The actual return address is \$080B, but RTS increases the address POPed from the stack.

Continue, and the O from the buffer is printed. Check the displacement

**Table 1. Debugger command syntax.**

Command	Description
)K	Continues execution of the program being debugged.
)Q	Aborts execution of the program being debugged and returns to the host program (the program from which you initiated testing).
)R	Displays registers and gives the location of the next instruction. You can modify the registers, except the stack pointer, at any prompt that follows the register contents display—the first prompt appearing when the debugger is called by your program or the prompt following the R command. The corresponding monitor command is control-E, but use R instead.
)800.80A	Lists the contents of memory locations \$800-\$80A, 8 bytes per line.
)900L	Disassembles the next 20 instructions, starting at \$900. If given an L without an address, the next 20 instructions starting at the memory address pointed to by \$3C and \$3D (A1L and A1H) are disassembled. This will be the next memory location if you used the L command with an address.
)906:AA BB CC	Stores bytes: \$AA in location \$906, \$BB in \$907, and \$CC in \$908.
)902 <800.808M	Moves memory contents from locations \$800-\$808 to the locations starting at \$902, namely, \$902-\$90A.
)CB + FF	Hexadecimal addition. Displays the answer = CA.
)CB - FF	Hexadecimal subtraction. Displays the answer = CC.

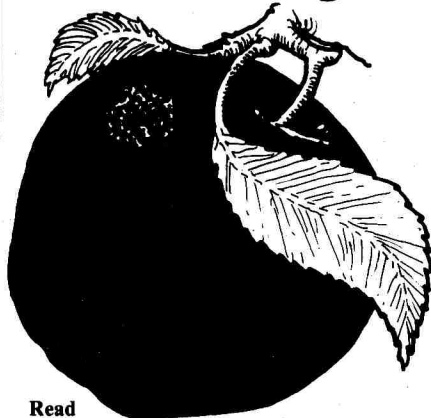
**Program listing. Breakpoint Debugger.**

```

0300- 20 4A FF E6 49 E6 49 E6
0308- 49 E6 49 A9 A9 85 33 68
0310- 85 FC 18 69 01 85 FA 68
0318- 85 FD 69 00 85 FB A0 00
0320- B9 AD 03 20 ED FD C8 C0
0328- 23 30 F5 A6 FA A5 FB 20
0330- 41 F9 A9 8D 20 D7 FA 20
0338- 67 FD 20 C7 FF 20 A7 FF
0340- 84 34 C9 C6 F0 3D C9 04
0348- F0 2F C9 EA F0 31 C9 EB
0350- F0 CC C9 95 F0 12 A0 07
0358- 88 30 31 D9 9F 03 D0 F8
0360- 20 92 03 A4 34 4C 3D 03
0368- A5 45 85 F9 20 99 03 20
0370- 20 FE A5 F9 85 45 4C 63
0378- 03 A5 FD 48 A5 FC 48 20
0380- 3F FF 60 20 99 03 20 00
0388- FE 4C 37 03 20 3A FF 4C
0390- 37 03 A9 FE 48 B9 A6 03
0398- 48 A5 31 20 C7 FF 60 A6
03A0- A4 06 05 93 A7 99 17 17
03A8- 2B 5D 17 17 03 8D C2 D2
03B0- C5 C1 CB D0 CF C9 CE D4
03B8- A0 C4 C5 C2 D5 C7 C7 C5
03C0- D2 8D CE C5 D8 D4 A0 D0
03C8- C7 CD A0 C1 C4 C4 D2 A0
03D0- 4C

```

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\$F2 in the BMI WTLOOP instruction in the subroutine at location \$0834. Add \$F2 and \$0836 to obtain \$28 (actually, \$0828—only 1-byte quantities can be added, and the \$08 is truncated), which seems correct since this is the value of the WTLOOP label.

Change the Y register to skip over a few characters in the buffer by displaying the registers and changing the contents of the Y register. Even though you don't want to change the A and X registers, you must type the values in them anyway because the destination of the bytes to be stored is determined by their positions (typing only \$09 would change the A

register instead of the Y register). Continue to one more break, abort the test program, and return to the monitor instead of continuing.

### Installing the Debugger

Store the object code in memory starting at \$0300. Then give the Apple DOS command BSAVE BREAK .OBJ,A\$300,L\$D0 to save the object file on disk under the name BREAK .OBJ. Afterward, when you want to bring the debugger into memory, type BLOAD BREAK.OBJ and the object file will be loaded into the proper place. ■

Write to Bill Bynum at 130 West Kingswood Drive, Williamsburg, VA 23185.

Table 2. Breakpoint Debugger program test output.

#### Hex Dump

```
*800G
BREAKPOINT DEBUGGER
NEXT PGM ADDR 0823
A=0C X=34 Y=00 P=32 S=F7
)800L
```

```
0800- A9 08 LDA #08
0802- 85 06 STA $06
0804- A9 0C LDA #0C
0806- 85 07 STA $07
0808- 20 1E 08 JSR $081E
080B- 60 RTS
080C- 11 89 ORA ($89),Y
080E- D4 ???
080F- CF ???
0810- A0 C5 LDY #C5
0812- D2 ???
0813- D2 ???
0814- A0 C9 LDY #C9
0816- D3 ???
0817- A0 C8 LDY #C8
0819- D5 CD CMP $CD,X
081B- C1 CE CMP ($CE,X)
081D- 89 ???
081E- A0 00 LDY #00
0820- 20 00 03 JSR $0300
)06.07
```

```
0006- 08 0C
)06:0C 08
)900 < 800.837M
)900.937
```

```
0900- A9 08 85 06 A9 0C 85 07
0908- 20 1E 08 60 11 89 D4 CF
0910- A0 C5 D2 D2 A0 C9 D3 A0
0918- C8 D5 CDC1 CE 89 A0 00
0920- 20 00 03 B1 06 8D 37 08
0928- C8 B1 06 20 EDFD 20 00
0930- 03 CC 37 08 30 F2 60 00
)K
```

#### Disassembly

The program to be debugged is at \$0800 (see the **Program listing**). Call it from the monitor.

Disassemble the first 20 program instructions.

Note that the LSB and MSB of the buffer address were switched.

This is the buffer to be written.

The start of the WRITE subroutine. The first call to the Debugger. Checks the locations where the buffer address is stored.

Switches the LSB and MSB of the address.

Saves a copy of the program being tested.

Checks that the program got there.

Continue

Table 2 continued.

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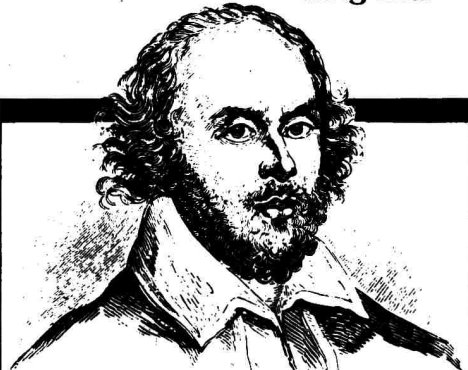
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 that in season grows  
 —King Lear



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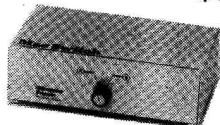
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**“If you give the debugger a command it doesn't understand, it beeps and redisplay the prompt.”**

Table 2 continued.

BREAKPOINT DEBUGGER NEXT PGM ADDR 0831 A = 89 X = 34 Y = 01 P = 71 S = F7 JK T	Carriage return written by WRITE.  Continue T written by WRITE.
BREAKPOINT DEBUGGER NEXT PGM ADDR 0831 A = D4 X = 34 Y = 02 P = 31 S = F7 )1F7.1FF	← Look at the stack.
01F7- 03 01F8- <span style="border: 1px solid black; padding: 0 2px;">0A08</span> 84 FF 3B 14 31 10 JK	← Note the top address on the stack is \$080A. Continue
O BREAKPOINT DEBUGGER NEXT PGM ADDR 0831 A = CF X = 34 Y = 03 P = 31 S = F7 )F2 + 0836  = 28 )R	O written by WRITE.  Checks the address to which the BMI WTLOOP refers (see the <b>Program listing</b> ). \$0828 is correct. Displays the registers.
BREAKPOINT DEBUGGER NEXT PGM ADDR 0831 A = CF X = 34 Y = 03 P = 31 S = F7 )CF 34 <span style="border: 1px solid black; padding: 0 2px;">09</span>	← Changes the Y register to skip several characters in the buffer.
JK S BREAKPOINT DEBUGGER NEXT PGM ADDR 0831 A = D3 X = 34 Y = 0A P = 31 S = F7 )Q	S written by WRITE.  Quit
*	Back in the monitor.

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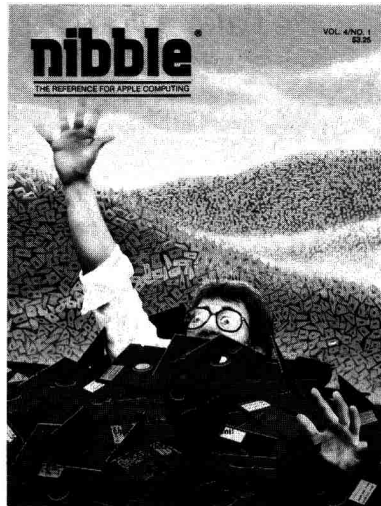
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# Polaroid Palette

by Chuck Doherty

*Take a look at this—state-of-the-art screen dumps to film, in any colors you want, with no distortion!*

**T**he Apple's graphics have made it the choice of business people for preparing charts and graphs. Many programs have been written to produce bar graphs, pie charts, and other business graphics, often in full color. While it is easy to display these graphics on a video monitor, it is difficult to produce high-quality hard copy of the results.

There are two common methods of putting screen displays on paper. One way is to "dump" the image to a printer. With most dot-matrix printers, different colors are represented by various shades of grey. Getting a full-color

image is more difficult, but possible with some printers. The quality of the results depends on the resolution of the printer and the flexibility of the dump routine, but the image always suffers degradation.

The second way of producing an image of a screen display is simply to photograph it. Here, many factors affect the outcome. The curvature of the screen can distort the image, causing the edge of the picture to appear warped. Any light which may be present in the room can be reflected in the screen and show up in the finished print. Also, what you see is what you

get: the photo is never better than the image on the monitor, and often quite inferior.

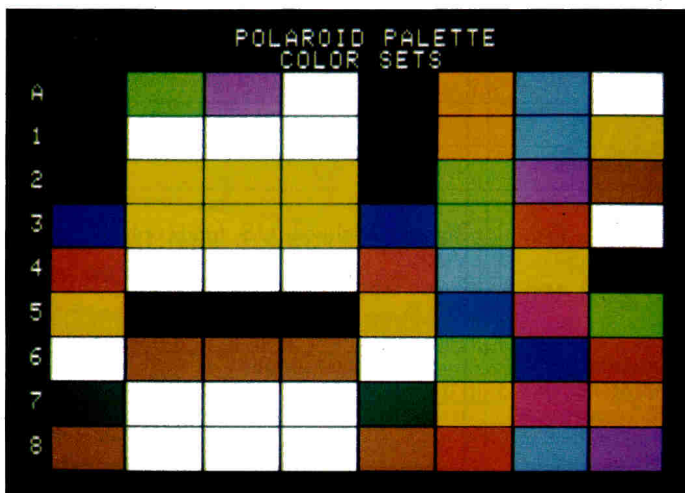
## A Better Way

The Polaroid Corporation of Cambridge, Massachusetts has long been a leader in optical and photographic techniques. Although best known for their instant film products, Polaroid's research has led them into many diverse fields. Recently, Polaroid intro-

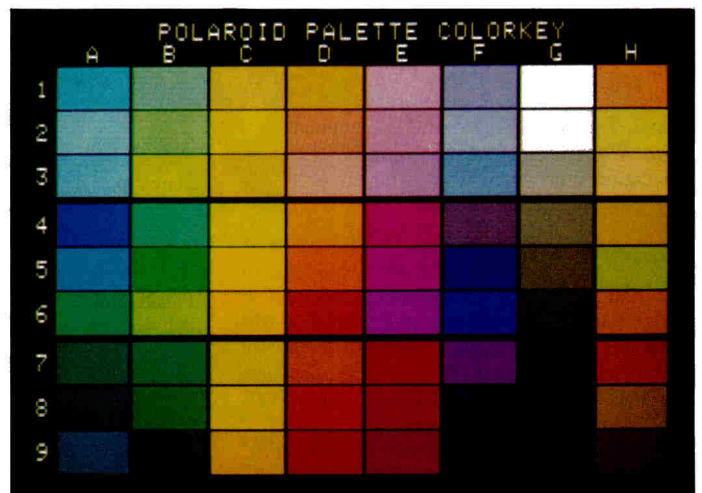
---

*Chuck Doherty lives at 32 Meadowood Drive, South Dartmouth, MA 02748.*

**Photo 2.** The nine color sets of eight colors each that are stored on the main program disk.



**Photo 3.** You can choose any eight of the 72 colors available for your picture, and you can edit the colors to get what you need.







**Photo 1.** The Polaroid Palette.

duced Palette (**Photo 1**), a product which converts screen images into distortion-free color slides and prints. In addition, Palette enhances the Apple's graphics image and gives full control over the selection of colors.

Palette was designed to record graphics with none of the problems found in other systems. Inside the unit, a four-inch high-resolution CRT supplies the actual photographic source. The screen is black and white, but a clever arrangement of filters converts the image to full color. These filters—red, green, and blue—are mounted on a motorized wheel which moves each

filter into place as needed. When the red filter is in position, for example, the internal screen will show only those parts of the image which contain red. The more red present in the image, the longer that section is exposed. By passing the image through the blue and the green filters as well, a complete color photo is produced.

Polaroid's system has several advantages. First, the resolution of the screen is greater than any color monitor, resulting in more detail. A Fill mode enhances solid-color portions of the image. This corrects the loss of

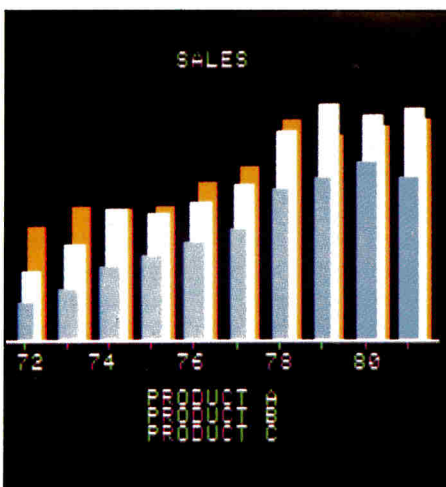
detail which results from space between scan lines on a video monitor.

**Fine-Tuning the Color**

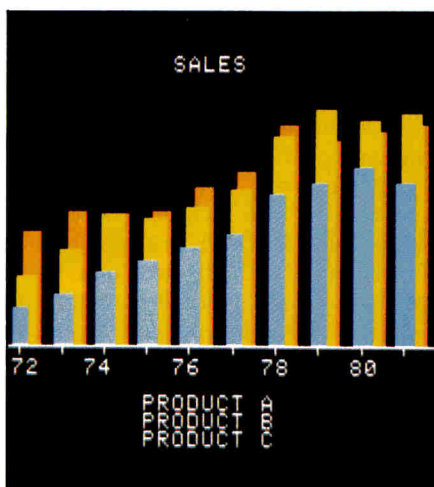
The most interesting part of Palette is the control it gives over the color. Since the system operates under software control, the image is not bound by hardware limitations. For example, you can change any of the original colors to give the photo an appearance that would be impossible on the video display.

Colors are not limited to the standard six-color set used by Apple, though the picture can be reproduced just as it ap-

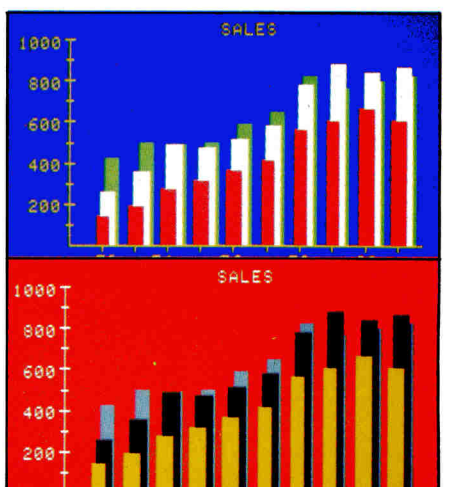
**Photo 4.** Text screen photographed without color correction.

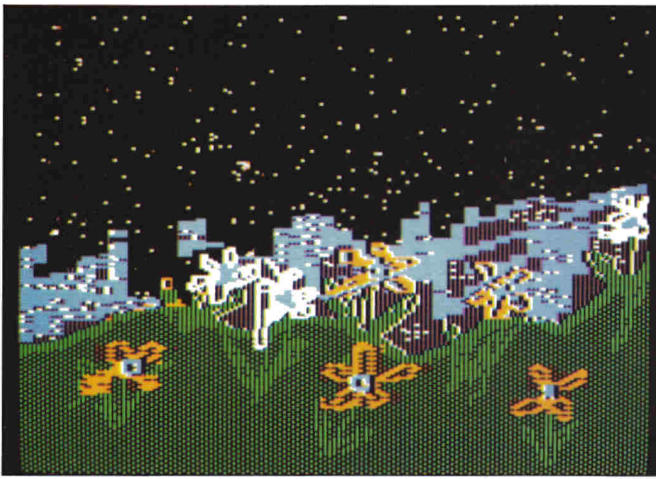


**Photo 5.** Text screen photographed with green and violet corrected to white.

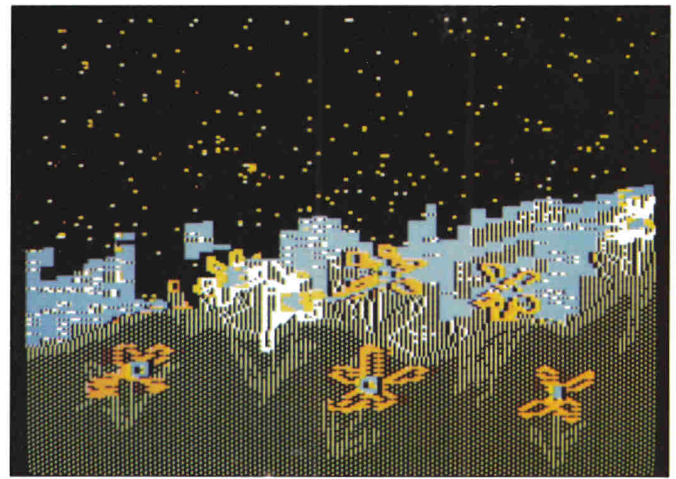


**Photos 6 and 7.** Choose alternate colors for more attractive graphs.





**Photo 8.** Original art from a KoalaPad.



**Photo 9.** Same original with a different color set.

pears on screen. The main program disk holds eight ready-to-run color sets of eight colors each, plus a set of Apple standard colors. (See **Photo 2.**) In all, Palette lets you choose up to eight colors per picture from the 72 available. (See **Photo 3.**) If that is not enough, you can even edit the colors themselves to get the exact shade you need.

Apple color graphics have always suffered poor text reproduction. On a color monitor, text appears as a mish-mash of white, green, and violet. As hard to read as it is on the screen, the problem is magnified when the screen is photographed without correction. (See **Photo 4.**) With this in mind, Polaroid designed a color set that improves screen readability while leaving most of the original colors intact. Color set 1 converts any pixel that would normally appear as green or violet to white. As a result, text is returned to a pure form that is much easier on the eyes. (See **Photo 5.**) Of course, this set also converts to white any part of the image that is supposed to be green or violet as well. By selecting a different color set you can change the background from black to another color, making many graphs much more attractive. (See **Photos 6** and **7.**)

### **Saving Your Image**

A graphics image must be in the form of a disk file before Palette can process it. Most business graphics programs, including Apple Business Graphics 1.0, VisiTrend, VisiPlot, and Graphmagic, have a feature that saves graphs as hi-res images. You can also process images from programs like the Koala Micro Illustrator (**Photos 8** and **9**) or Beagle Bros' Alpha Plot.

The Palette has no image-save routine—you must get the screen to disk.

It is difficult (sometimes impossible) to reproduce images from programs which lack a disk-save function. If, for example, you wished to photograph a display from a game, it is often necessary to reset the computer, load a utility program that can perform a disk save, and hope that the graphic image survived the process. More often than not, an image captured this way will be distorted or lost altogether.

### **Physical Appearance**

The heart of the Palette Computer Image Recording System is the recorder itself, a 13-by-5¼-by-7¾-inch device containing the CRT, color filters, and control electronics. The Palette is well constructed and finished in "Apple Beige" with a black faceplate. An on/off rocker switch on the side of the unit is the only control you will have to deal with on a regular basis.

The system comes with a Polaroid 3¼-by-4¼-inch film unit which accepts standard type 669 film to produce color prints in 60 seconds. This "camera" bolts onto the front of the recorder whenever an instant print is desired. There is no shutter on the camera. Instead, a metal slide is pulled from the front of the unit to expose the film when a photo is desired. The screen photographs used in this review were produced in this way.

An automatic 35mm Minolta camera body is also included for making color slides or 35mm prints. The camera shipped with my test unit was a Minolta XG-A, complete with auto-winder. This is a very nice camera for everyday use away from the Palette—add an inexpensive lens and you are ready to shoot. A bayonet-mount adaptor mates the body to the Palette when required.

You also receive a Polaroid instant color slide processor and slide mounter. With this system you can process a roll of Polaroid's new Polachrome 35mm slide film into 12 full-color slides in 60 seconds. Each Polachrome package comes complete with film and a pack of processing chemicals.

The Palette owner's manual is one of the finest pieces of documentation I have ever seen. This boxed, looseleaf book is indexed by chapter, printed on heavy glossy stock, and filled with illustrations and photographs. Every part of system assembly and operation is fully explained in a clear, thorough manner.

If you have difficulty with the system and are unable to find an answer in the manual, Polaroid provides a toll-free customer assistance telephone line to get you back on the right track. The Palette is a well supported product, built by a company dedicated to customer satisfaction.

### **Installation**

To operate the system you need an Apple IIe or II Plus with at least 64K of memory, an RS-232 adaptor such as Apple's Super Serial Card, one disk drive, and a monitor. A color monitor is not required.

The Palette connects to the serial port through a supplied cable, and is wired in-line with your monitor's video signal. The only other connection is its AC power cord.

When you first turn the Palette on, a quick set-up routine calibrates its internal CRT. The process involves looking into the unit and adjusting a brightness control on the rear panel until a test pattern is displayed properly. The

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entire procedure takes less than a minute.

### Operation

Many of the Palette's options are accessed from a system menu which appears when the program is first booted. From here, you can change the disk drive used for the program itself, the drive used for the images, and the slot number of the Palette's controller. Any of these selections can be saved to disk for a permanent record. The system menu also accesses the setup/test menu, where you adjust the threshold of the internal CRT.

When you are ready to continue, press escape and the main menu comes into view. Sub-menus handle color selections, exposures, and batch operations. At the bottom of the screen is a listing of the color set selected, plus the name of the image to be processed.

With both an image and a color set selected, proceed to the exposure menu and you are ready to take a picture. This routine keeps track of your film counter (photos remaining) and any special exposure settings. Photos are normally exposed at a neutral set-

**"I found the system extremely easy to operate, and I was impressed."**

ting, but you can manually lighten or darken the image by as much as a full stop (F stop) in either direction under software control.

The Expose command brings up the film menu. Since different films have different response characteristics, Palette needs to know the type used. The five standard selections are: Polaroid 669 (instant color prints), Polachrome 35mm (instant slides), Ektachrome 64, Agfachrome 100, and Fujichrome 100. A file of technical information on each film type is loaded during the exposure process.

With the film selected, Palette is

ready to go. A prompt instructs you to open the camera shutter (or pull the dark slide) and hit any key. During the actual exposure, the monitor shows the red, green, and blue sections of the image, in turn, as they are processed. These displays look a bit odd at first—they are both upside-down and backwards, exactly as the camera sees them. The entire process takes from one to two minutes, depending on film type, exposure settings, and complexity of the image.

If you have a number of images to be recorded, you can use Palette's Batch Exposure feature. Up to 16 images are processed automatically, with multiple copies of any image produced as well. To use the Batch mode, the 35mm camera body with auto-winder must be in place. As each image is loaded and exposed, the Palette triggers the camera to advance the film. This feature can be a tremendous time-saver. Since everything is done automatically, you could set up a batch before leaving for lunch and return to find the entire process completed.

### Summary

I found the system extremely easy to operate, and I was impressed with the results. Photos produced by Palette were crystal-clear—a noticeable improvement over standard Apple graphics. The only drawback as far as I can see is that there is no way to capture screen images unless they are stored on disk. It would be nice if the system could produce an image of any screen, any time, as do some printer control cards. Nonetheless, Palette is very good at what it does.

The Polaroid Palette is ideal for anyone who uses graphs and charts for presentations and reports. By using Polachrome 35mm instant slide film, you could prepare a complete slide presentation from computer-generated graphics in minutes. The Palette is also a useful device for software developers and teachers.

Considering the extent of the Palette system, and the amount of equipment included in the package, its \$1499 price seems well justified. This is not a product for the casual computer user, but it can be a valuable tool to many business people.

For more information, write to Polaroid Corporation, 575 Technology Square, Cambridge, MA 02139. Call their technical assistance hot-line at (800) 225-1618. ■

Circle 127 on Reader Service card.

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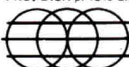
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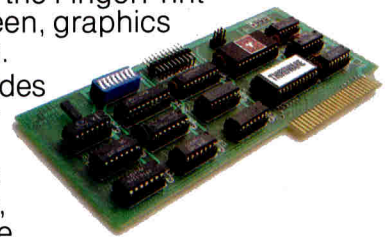
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# ACCOUNT FOR YOURSELF

**A**ssets, liabilities, expenses. . . stacks of paper strewn across your desk. Sound familiar? Then you need a complete picture of your financial standing compacted into one easy-to-read spreadsheet. Wundersheet provides the solution.

Using my formulas (see the **Table**) with any popular spreadsheet program, you can build Wundersheet, a flexible template of several schedules—portfolio worth, assets, taxable and nontaxable income, expenses, cash flow, liabilities, and total net worth—all on one manageable sheet of paper.

Creating your portfolio worth is the first step in building this template (see **Figure 1**). A portfolio can contain stocks, bonds, treasury bills, cash management accounts, Ginnie Maes, bank accounts, checking accounts, and ready assets accounts. You can tailor it to include any other item in your own portfolio. In the horizontal column, headers are the elements a basic portfolio report requires: security name, quantity owned, original cost per share, current price per share, current value of the portfolio, percent the individual security is of the total portfolio value, amount of gain or loss, and date of purchase to help you keep track of whether a gain is short or long.

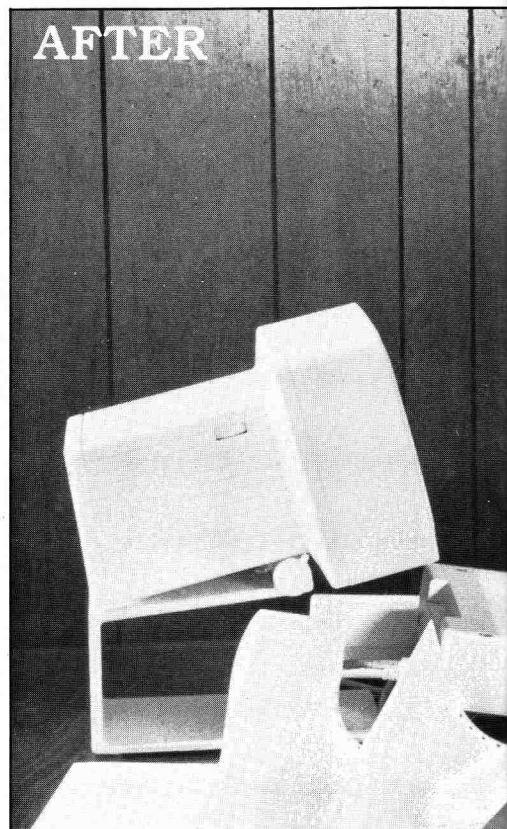
In the second step, you add to the

## Clear the desk with Wundersheet, a compact template for spreadsheet reckoning.

template a monthly schedule of income gained from the portfolio and other sources (see **Figure 2**). Also add gain and loss (both short and long term), salary, consulting income, and tax refund. Items are tallied individually on a yearly basis and in entirety on a monthly basis, with an additional monthly running cumulative total indicating your taxable income. You can also add nontaxable income like a tax efficient savings plan or an individual retirement account (IRA).

In step 3, you build in a schedule of expenses (see **Figure 3**). Expenses are grouped in much the same order in which they appear on a 1040 form (A and B), so this spreadsheet should be helpful at tax time.

A few other additions can make your expense sheet fancy. If you have a home mortgage, you can split



**Table.** The formulas that comprise the Wundersheet are listed starting with the lower-right cell and proceeding to the upper-left. Each line contains the cell identifier, the cell format (if any), and the formula or label associated with the cell. Global formats are found at the bottom of the listing.

```
>V77:@SUM(J77...U77)
>K77:+J77/J77
>H77:"PRINCIPLE
>V76:@SUM(J76...U76)
>K76:+J76/J77
>H76:"INTEREST
>H75:"MEMO
>F73:+F34-F67
>E73:"NET WORTH
>V72:+V71/V23
>U72:+U71/U23
>T72:+T71/T23
>S72:+S71/S23
>R72:+R71/R23
>Q72:+Q71/Q23
>P72:+P71/P23
>O72:+O71/O23
>N72:+N71/N23
>M72:+M71/M23
>L72:+L71/L23
>K72:+K71/K23
>J72:+J71/J23
>I72:"F TOTAL
>H72:"PERCENT O
>W71:+V71/V23
>V71:+V23-V67
>U71:+U23-U67
>T71:+T23-T67
>S71:+S23-S67
>R71:+R23-R67
>Q71:+Q23-Q67
>P71:+P23-P67
>O71:+O23-O67
>N71:+N23-N67
```

*Table continued.*



Photography: Torsheya Studio

**by Larry Conley**



**ORE**

**Figure 1. Portfolio portion of Wundersheet.**

INCOME SOURCE	QUANTITY	COST PER SHARE	PRICE PER SHARE	TOTAL VALUE	PERCENT OF HOLDINGS	GAIN OR LOSS	DATE OF PURCHASE
FORD STOCK				0		0	
AT & T STOCK				0		0	
CASH MGMT ACCOUNT				0		0	
READY ASSETS ACC				0		0	
BANK ACCOUNT				0		0	
CHECKING ACCOUNT				0		0	
TREASURY BILL 1/83				0		0	
TREASURY BOND 9%94				0		0	
ATT 8.75% BOND 00				0		0	
CAR 7.75% BOND 02				0		0	
GNMA				0		0	
G/L ST							
G/L LT							
SALARY							
CONSULTING INCOME							
TAX REFUND							
TOTAL				0			

**Table continued.**

>M71:+M23-M67  
 >L71:+L23-L67  
 >K71:+K23-K67  
 >J71:+J23-J67  
 >H71:"CASH FLOW  
 >W70:/FR"OF TOTAL  
 >AJ69:/FR"  
 >AI69:/FR"  
 >AH69:/FR"  
 >AG69:/FR"  
 >AF69:/FR"  
 >AE69:/FR"  
 >AD69:/FR"  
 >AC69:/FR"  
 >AB69:/FR"  
 >AA69:/FR"  
 >W69:/FR"PERCENT  
 >V69:/FR"TOTAL  
 >U69:/FR"DEC  
 >T69:/FR"NOV  
 >S69:/FR"OCT  
 >R69:/FR"SEP  
 >Q69:/FR"AUG  
 >P69:/FR"JUL  
 >O69:/FR"JUN  
 >N69:/FR"MAY  
 >M69:/FR"APR  
 >L69:/FR"MAR  
 >K69:/FR"FEB  
 >J69:/FR"JAN  
 >W68:/--  
 >V68:/--  
 >U68:/--  
 >T68:/--  
 >S68:/--  
 >R68:/--  
 >Q68:/--  
 >P68:/--  
 >O68:/--  
 >N68:/--  
 >M68:/--  
 >L68:/--  
 >K68:/--  
 >J68:/--  
 >I68:/--  
 >H68:/--  
 >G68:/--  
 >F68:/--  
 >E68:/--  
 >D68:/--  
 >C68:/--  
 >B68:/--  
 >A68:/--  
 >W67:+V67/V23  
 >V67:@SUM(V42...V66)  
 >U67:@SUM(U42...U66)  
 >T67:@SUM(T42...T66)  
 >S67:@SUM(S42...S66)  
 >R67:@SUM(R42...R66)  
 >Q67:@SUM(Q42...Q66)  
 >P67:@SUM(P42...P66)  
 >O67:@SUM(O42...O66)  
 >N67:@SUM(N42...N66)  
 >M67:@SUM(M42...M66)  
 >L67:@SUM(L42...L66)  
 >K67:@SUM(K42...K66)  
 >J67:@SUM(J42...J66)  
 >H67:"TOTAL  
 >G67:/FR"  
 >F67:@SUM(F42...F66)  
 >D67:"TOTAL  
 >W66:+V66/V23  
 >V66:@SUM(J66...U66)  
 >I66:"N  
 >H66:"RECREATIO  
 >G66:/FR"  
 >W65:+V65/V23  
 >V65:@SUM(J65...U65)  
 >H65:"TUITION  
 >G65:/FR"  
 >W64:+V64/V23  
 >V64:@SUM(J64...U64)  
 >H64:"CLOTHING  
 >G64:/FR"  
 >W63:+V63/V23  
 >V63:@SUM(J63...U63)  
 >I63:/FR"APPLIANC

**Table continued.**



your monthly payments into principal and interest. You can subtract the year-to-date contributions to principal from the mortgage liability and look at your current monthly mortgage rate.

Step 4 develops a cash flow to help keep you abreast of your financial picture. Merely subtract total expenses by month from total income by month and you have your cash flow.

In the final step, assign values to your major assets and liabilities to determine your personal net worth. (See **Figure 4** for a completed template reflecting calculations performed on assets and liabilities.) Now you are prepared to handle your finances in an orderly manner, and with little effort you can forecast what the next few months hold for you. ■

You can contact Larry Conley at 3797 Burning Tree, Bloomfield Hills, MI 48013.

**Table continued.**

>H63:"FURNITURE  
 >G63:/FR"  
 >W62:+V62/V23  
 >V62:@SUM(J62...U62)  
 >I62:"TENANCE  
 >H62:"HOME MAIN  
 >G62:/FR"  
 >W61:+V61/V23  
 >V61:@SUM(J61...U61)  
 >I61:"LECTRIC  
 >H61:"WATER & E  
 >G61:/FR"  
 >W60:+V60/V23  
 >V60:@SUM(J60...U60)  
 >I60:/FL"ENTS  
 >H60:/FR"CAR PAYM  
 >G60:/FR"  
 >D60:"CAR LOAN  
 >W59:+V59/V23  
 >V59:@SUM(J59...U59)  
 >I59:/FR"  
 >H59:/FR"GASOLINE  
 >G59:/FR"  
 >W58:+V58/V23  
 >V58:@SUM(J58...U58)  
 >I58:/FR"NCE COSTS  
 >H58:/FR"MAINTENA  
 >G58:/FR"  
 >W57:+V57/V23  
 >V57:@SUM(J57...U57)  
 >I57:"OSTS  
 >H57:"VEHICLE C  
 >G57:/FR"

**Figure 2. Income portion of Wundersheet.**

INCOME SOURCE	INTEREST OR DIVID ENDS FOR			1983 PERCENT	GAIN
	JAN	FEB	MAR		
FORD STOCK				0	0
AT & T STOCK				0	0
CASH MGMT ACCOUNT				0	0
READY ASSETS ACC				0	0
BANK ACCOUNT				0	0
CHECKING ACCOUNT				0	0
TREASURY BILL 1/83				0	0
TREASURY BOND 9 3/4				0	0
ATT 8.75% BOND 00				0	0
CAR 7.75% BOND 02				0	0
GNMA				0	0
G/L ST					
G/L LT					
SALARY					
CONSULTING INCOME					
TAX REFUND					
TOTAL	0	0	0	0	0
CUMULATIVE TOTAL	0	0	0	0	ERROR





Table continued.

>P34:+P23+P25+P26  
 >O34:+O23+O25+O26  
 >N34:+N23+N25+N26  
 >M34:+M23+M25+M26  
 >L34:+L23+L25+L26  
 >K34:+K23+K25+K26  
 >J34:+J23+J25+J26  
 >H34:@SUM(H7...H33)  
 >F34:@SUM(F7...F17)+@SUM(F25...F33)  
 >B34:"AL  
 >A34:"GRAND TOT  
 >A33:"COINS  
 >A32:"ANTIQUES  
 >A31:"VEHICLE  
 >B30:"GS  
 >A30:"FURNISHIN  
 >A29:"HOME  
 >H28:+(E28\*C28)-(D28\*C28)  
 >F28:+C28\*E28  
 >B28:"OHAWK  
 >A28:"NIAGARA M  
 >F27:+V55  
 >B27:"T CONTRI  
 >A27:"RETIREMEN  
 >V26:@SUM(J26...U26)  
 >H26:+(E26\*C26)-(D26\*C26)  
 >F26:+C26\*E26  
 >A26:"IRA  
 >V25:@SUM(J25...U25)  
 >H25:+(E25\*C25)-(D25\*C25)  
 >B25:"IENT SAV  
 >A25:"TAX EFFIC  
 >U24:+T24+U23  
 >T24:+S24+T23  
 >S24:+R24+S23  
 >R24:+Q24+R23  
 >Q24:+Q23+P24  
 >P24:+O24+P23  
 >O24:+N24+O23  
 >N24:+M24+N23  
 >M24:+L24+M23  
 >L24:+K24+L23  
 >K24:+J23+K23  
 >J24:+J23  
 >B24:"E TOTAL  
 >A24:"CUMULATIV  
 >Y23:@SUM(Y7...Y22)  
 >W23:+V23/V23  
 >V23:@SUM(J23...U23)  
 >U23:@SUM(U7...U22)  
 >T23:@SUM(T7...T22)  
 >S23:@SUM(S7...S22)  
 >R23:@SUM(R7...R22)  
 >Q23:@SUM(Q7...Q22)  
 >P23:@SUM(P7...P22)  
 >O23:@SUM(O7...O22)  
 >N23:@SUM(N7...N22)  
 >M23:@SUM(M7...M22)  
 >L23:@SUM(L7...L22)  
 >K23:@SUM(K7...K22)  
 >J23:@SUM(J7...J22)  
 >G23:+F23/F23  
 >F23:@SUM(F7...F22)  
 >A23:"TOTAL  
 >Y22:+V22  
 >W22:+V22/V23  
 >V22:@SUM(J22...U22)  
 >G22:+F22/F23  
 >B22:"D  
 >A22:"TAX REFUN  
 >Y21:+V21  
 >W21:+V21/V23  
 >V21:@SUM(J21...U21)  
 >G21:+F21/F23  
 >B21:"G INCOME  
 >A21:"CONSULTIN  
 >Y20:+V20  
 >W20:+V20/V23  
 >V20:@SUM(J20...U20)  
 >G20:+F20/F23  
 >A20:"SALARY  
 >Y19:+V19

>W19:+V19/V23  
 >V19:@SUM(J19...U19)  
 >G19:+F19/F23  
 >A19:"G/L LT  
 >Y18:+V18  
 >W18:+V18/V23  
 >V18:@SUM(J18...U18)  
 >G18:+F18/F23  
 >A18:"G/L ST  
 >Y17:+V17  
 >X17:+V17/(C17\*D17)  
 >W17:+V17/V23  
 >V17:@SUM(J17...U17)  
 >H17:+(E17\*C17)-(D17\*C17)  
 >C17:+F17/F23  
 >F17:+C17\*E17  
 >A17:"GNMA  
 >Y16:+V16  
 >X16:+V16/(C16\*D16)  
 >W16:+V16/V23  
 >V16:@SUM(J16...U16)  
 >H16:+(E16\*C16)-(D16\*C16)  
 >G16:+F16/F23  
 >F16:+C16\*E16  
 >B16:/FR"BOND 02  
 >A16:"CAR 7.75% BON  
 >Y15:+V15  
 >X15:+V15/(C15\*D15)  
 >W15:+V15/V23  
 >V15:@SUM(J15...U15)  
 >H15:+(E15\*C15)-(D15\*C15)  
 >G15:+F15/F23  
 >F15:+C15\*E15  
 >B15:/FR"BOND 00  
 >A15:"ATT 3.75%  
 >Y14:+V14  
 >X14:+V14/(C14\*D14)  
 >W14:+V14/V23  
 >V14:@SUM(J14...U14)  
 >H14:+(E14\*C14)-(D14\*C14)  
 >G14:+F14/F23  
 >F14:+C14\*E14  
 >B14:"BOND 9%94  
 >A14:"TREASURY  
 >Y13:+V13  
 >X13:+V13\*4/(C13\*D13)  
 >W13:+V13/V23  
 >V13:@SUM(J13...U13)  
 >H13:+(E13\*C13)-(D13\*C13)

>G13:+F13/F23  
 >F13:+C13\*E13  
 >B13:"BILL 1/83  
 >A13:"TREASURY  
 >Y12:+V12  
 >X12:+V12/F12  
 >W12:+V12/V23  
 >V12:@SUM(J12...U12)  
 >H12:+(E12\*C12)-(D12\*C12)  
 >C12:+F12/F23  
 >F12:+C12\*E12  
 >B12:"ACCOUNT  
 >A12:"CHECKING  
 >Y11:+V11  
 >X11:+V11/F11  
 >W11:+V11/V23  
 >V11:@SUM(J11...U11)  
 >H11:+(E11\*C11)-(D11\*C11)  
 >G11:+F11/F23  
 >F11:+C11\*E11  
 >B11:"UNT  
 >A11:"BANK ACCO  
 >Y10:+V10  
 >X10:+V10/F10  
 >W10:+V10/V23  
 >V10:@SUM(J10...U10)  
 >H10:+(E10\*C10)-(D10\*C10)  
 >G10:+F10/F23  
 >F10:+C10\*E10  
 >B10:"ETS ACC  
 >A10:"READY ASS  
 >Y9:+V9  
 >X9:+V9/F9  
 >W9:+V9/V23  
 >V9:@SUM(J9...U9)  
 >H9:+(E9\*C9)-(D9\*C9)  
 >G9:+F9/F23  
 >F9:+C9\*E9  
 >B9:/FR"ACCOUNT  
 >A9:"CASH MGMT  
 >Y8:+V8  
 >X8:+V8/(C8\*D8)  
 >W8:+V8/V23  
 >V8:@SUM(J8...U8)  
 >H8:+(E8\*C8)-(D8\*C8)  
 >G8:+F8/F23  
 >F8:+C8\*E8  
 >B8:"OCK  
 >A8:"AT & T STO

Figure 3. Expenses and liabilities of Wundersheet.

EXPENSES AND LIABILITIES	JAN	FEB	MAR	APR	MAY
MEDICAL & DENTAL					
TAXES					
STATE INCOME TAX					
PROPERTY TAX					
MAJOR SALES TAX					
US INCOME TAX					
FICA TAX					
RENT OR MORTGAGE					
CONTRIBUTIONS					
INSURANCE					
LIFE INSURANCE					
ACCIDENT INSURANC					
CAR INSURANCE					
TELEPHONE					
VEHICLE COSTS					
MAINTENANCE COSTS					
GASOLINE					
CAR PAYMENTS					
WATER & ELECTRIC					
HOME MAINTENANCE					
FURNITURE APPLIANC					
CLOTHING					
TUITION					
RECREATION					
TOTAL	0	0	0	0	0



**Figure 4. The finished template with values assigned.**

FINANCIAL PICTURE, INCLUDING PORTFOLIO WORTH, INCOME, EXPENSE, CASH FLOW AND MINI NET WORTH										
INCOME SOURCE	QUANTITY	COST PER SHARE	PRICE PER SHARE	TOTAL VALUE	PERCENT OF HOLDINGS	GAIN OR LOSS	DATE OF PURCHASE	INTEREST OR DIVIDENDS FOR		
								JAN	FEB	MAR
FORD STOCK	100	90	102	10200	.2837274	1200		127		
AT & T STOCK	100	58	65	6500	.1808067	700				210
CASH MGMT ACCOUNT	1		1000	1000	.0278164	1000				
READY ASSETS ACC	1		3400	3400	.0945758	3400				
BANK ACCOUNT	1		1600	1600	.0445063	1600				
CHECKING ACCOUNT	1		350	350	.0097357	350				
TREASURY BILL 1/83	1		2000	2000	.0556328	2000				
TREASURY BOND 9894	1		10000	10000	.2781641	10000				
ATT 8.75% BOND 00	1		500	500	.0139082	500				
CAR 7.75% BOND 02	1		400	400	.0111266	400				
GNMA				0		0				
G/L ST						0				
G/L LT						0				
SALARY						0		3000	3000	3000
CONSULTING INCOME						0				
TAX REFUND						0				
TOTAL				35950	1			3127	3000	3210
CUMULATIVE TOTAL				160950				3127	6127	9337
TAX EFFICIENT SAV			0			0				
IRA			0	0		0				
RETIREMENT CONTRI			0	0		0				
NIAGARA MOHAWK			0	0		0				
HOME				110000						
FURNISHINGS				2600						
VEHICLE				9800						
ANTIQUES				2000						
COINS				600						
GRAND TOTAL				160950		21150		3127	3000	3210
EXPENSES AND LIABILITIES							EXPENSES			
	LIABILITY CATEGORY	LIABILITY		EXPENSE CATEGORY		JAN	FEB	MAR		
	TAX OWED			MEDICAL & DENTAL TAXES		200	100	150		
				STATE INCOME TAX						
				PROPERTY TAX						
				MAJOR SALES TAX						
				US INCOME TAX						
	MORTGAGE	50000		FICA TAX		230	230	230		
				RENT OR MORTGAGE CONTRIBUTIONS		345	345	345		
				INSURANCE						
				LIFE INSURANCE			450			
				ACCIDENT INSURANCE						
				CAR INSURANCE				140		
				RETIREMENT CONTRIB						
				TELEPHONE		60	60	60		
				VEHICLE COSTS						
				MAINTENANCE COSTS			100			
				GASOLINE		100	100	100		
	CAR LOAN			CAR PAYMENTS						
				WATER & ELECTRIC			45	120		
				HOME MAINTENANCE			300			
				FURNITURE APPLIANC				400		
				CLOTHING			100			
				TUITION						
				RECREATION		200	200	200		
	TOTAL	50000		TOTAL		1135	2030	1745		
						JAN	FEB	MAR		
				CASH FLOW		1992	970	1465		
				PERCENT OF TOTAL		.6370323	.3233333	.4563863		
	NET WORTH	110950								



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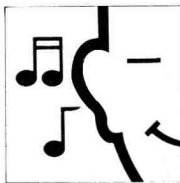
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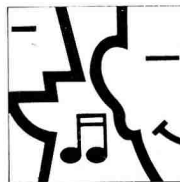
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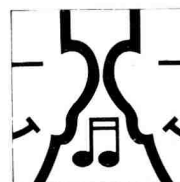
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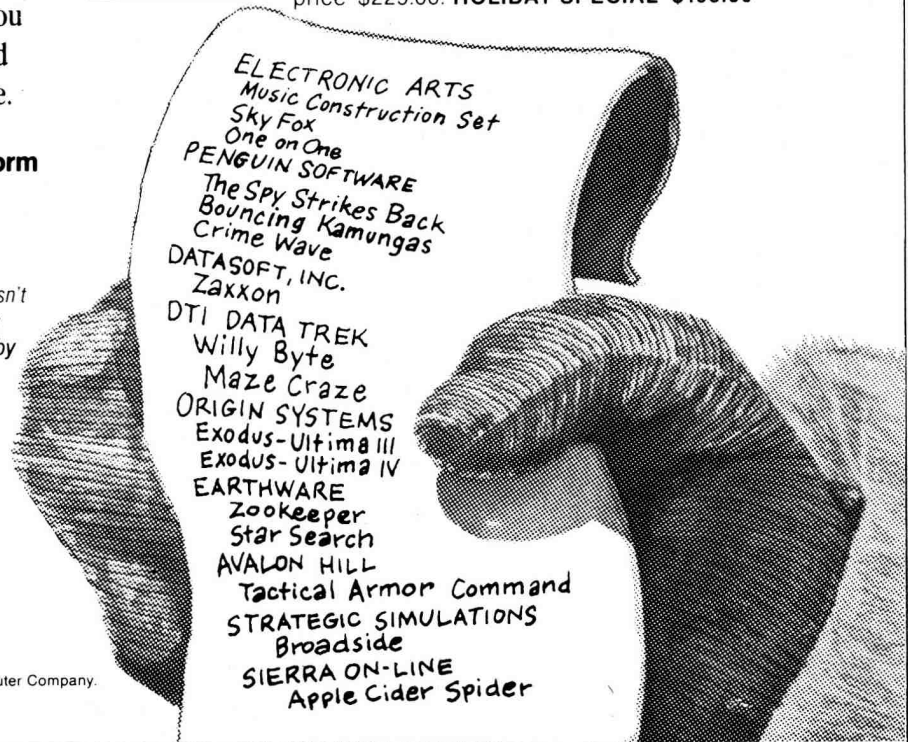
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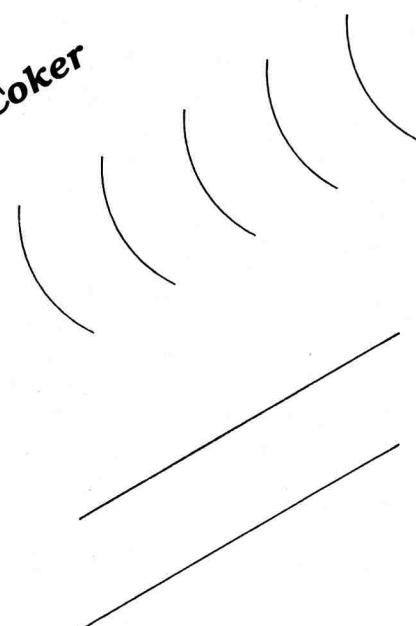
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# RANDOM MUSIC

Generate music with a special twist—just  
type in these four little listings.

by Frank Coker



**T**hanks to Jim Menick's article "Beepin' the Blues" (*inCider*, November 1983, page 149), I can wander the ivories without having to carry a piano home. However, as he explains, his Random Notes program doesn't produce the same three-octave chromatic scale that his Master Program does, but generates pitches with no musical relationship to one another. I wanted a program that would play music randomly within the chromatic scale.

The first part was easy. **Listing 1** produces random chromatic notes. Line 30 sets up Menick's machine-language sound generator. Line 40 fills the array PITCH(P) with the values needed to produce 37 notes over a three-octave range. Line 100 randomly selects one of these 37 pitches (P), while line 110 generates a random duration (D) from 1 to 255. Lines 210-230 POKE the pitch and duration values into the sound generator and then CALL it.

This was starting to sound like music, but the actual pattern of notes and durations was still too random. I solved the problem by adding moveable "windows" which would set the change boundaries. *(Continued)*

### Listing 1. Random chromatic notes.

```
10 HOME
20 DIM PITCH(39)
30 FOR Z = 770 TO 790: READ D: POKE Z,D: NEXT : DATA
  173,48,192,136,208,5,206,1,3,240,9,202,208,245,1
  74,0,3,76,2,3,96
40 FOR P = 1 TO 37: READ PITCH(P): NEXT : DATA 23,24
  ,26,27,29,31,33,35,37,40,42,45,47,50,54,57,60,64,
  68,72,76,81,86,91,96,102,108,115,122,129,136,144,
  153,161,171,180,192
100 P = INT ( RND (1) * 36) + 1
110 D = INT ( RND (1) * 255) + 1
210 POKE 768,PITCH(P)
220 POKE 769,D
230 CALL 770
290 GOTO 100
```

### Listing 2. Pitch and duration windows.

```
50 P = 18
60 PDIREC = 1
70 PJUMP = 4
80 DMAX = 125
90 DJUMP = 20
100 IF INT ( RND (1) * 2) = 1 THEN DJUMP = DJUMP * (
  - 1)
110 DMAX = DMAX + ( INT ( RND (1) * DJUMP) + 1)
120 IF DMAX < 5 THEN DMAX = 250
130 IF DMAX > 250 THEN DMAX = 5
140 D = INT ( RND (1) * DMAX) + 5
150 IF INT ( RND (1) * 2) = 1 THEN PDIREC = PDIREC *
  ( - 1)
160 PCHANGE = PDIREC * ( INT ( RND (1) * PJUMP) + 1)
170 P = P + PCHANGE
180 IF P < 1 THEN P = 37
190 IF P > 37 THEN P = 1
```

Adding the lines in **Listing 2** supplies two windows: one for pitch and one for duration. The pitch window randomly chooses the next pitch from all pitches within a given distance (PJUMP) from the present one. The duration window randomly chooses a duration between five (shortest note) and the maximum (DMAX). Then this maximum moves randomly to a new value within a given distance (DJUMP) from the present maximum. Choosing duration in this way gradually changes tempo (dictated by the moving duration maximum), while still allowing for individual short notes.

Line 50 sets the initial pitch (P). Line 60 sets the initial pitch change direction flag (PDIREC). A positive value moves up the scale. Line 70 sets the maximum pitch change (PJUMP), or pitch window size. Line 150 sets the new pitch change direction, line 160 sets the new pitch change, and line 170 figures the new pitch itself. Lines 180 and 190 check the pitch limits (1-37), and wrap around if the pitch has moved out of bounds.

Line 80 sets the initial duration maximum (DMAX), and line 90 sets the maximum change (DJUMP) in the duration maximum. Line 100 sets the direction of change for the duration maximum. Line 110 figures the new duration maximum. Lines 120 and 130 check the limits of the duration maximum (5-255), and wrap around the value if it has moved out of bounds. Line 140 then figures the present duration.

### Snake Dance

Once everything worked I wanted to "see" this random music on the screen. I used hi-res graphics to plot pitch along the Y-axis and the (duration\*5) along the X-axis. After watching the dot jump around the screen, I started connecting the new notes with the old notes and came up with a "dancing snake" whose three body parts express the relationship between the last four notes played.

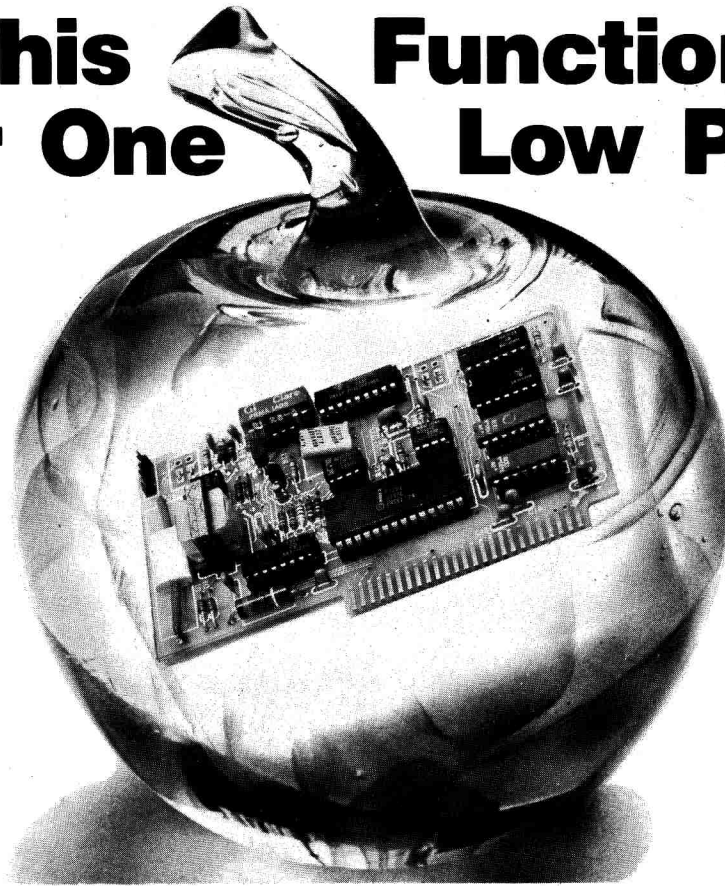
**Listing 3** gives the lines to be added for the snake. The plotting coordinate values of these four notes are held in the variable pairs: X3,Y3; X2,Y2; X1,Y1; D,P\*5. As it's played, each new note becomes the anterior end of the snake. The other variables are pushed down the body, with the oldest point (X3,Y3) being pushed off the end of the tail and lost.

The vertical distance between any two points represents their pitch difference. The horizontal distance represents difference in duration. To keep track of where the snake has been, the end of the tail leaves a dot at every point it touches.

In **Listing 3**, line 10 is changed to enter full page hi-res graphics. Line



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200 plots the snake's new head. Line 240 erases the old tail, and line 250 leaves a dot where the old tail ended. Lines 260-280 push the variables down the body.

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You can play around with the music by changing the window sizes. The larger the windows, the less structured the music will be. You can dispense with the wrap-around for either the pitch or the duration by changing the values which are given if the boundaries are crossed (lines 120, 130, 180, and 190) to the values of the boundaries themselves.

The supplied chromatic scale has a full complement of sharps and flats. Use the diatonic scale, which has no sharps or flats, to produce music with a much lighter feel. **Listing 4** gives the changes for a three-octave diatonic scale.

Create multiple snakes using other constantly changing variables (such as duration limit and pitch change), and have your own dance contest. ■

Write to Frank Coker at 2735 North Murray #5, Milwaukee, WI 53211.

### Listing 3. Dancing snake.

```

10 HGR : POKE - 16302,0
200 HCOLOR= 3: HPLLOT D,P * 5 TO X1,Y1
240 HCOLOR= 0: HPLLOT X2,Y2 TO X3,Y3
250 HCOLOR= 3: HPLLOT X3,Y3
260 X3 = X2:Y3 = Y2
270 X2 = X1:Y2 = Y1
280 X1 = D:Y1 = P * 5

```

### Listing 4. Random diatonic notes.

```

20 DIM PITCH(21)
40 FOR P = 1 TO 21: READ PITCH(P): NEXT : DATA 23,2
4,27,31,35,37,42,47,50,57,64,72,76,86,96,102,115,
129,144,153,171,192
180 IF P < 1 THEN P = 21
190 IF P > 21 THEN P = 1
200 HCOLOR= 3: HPLLOT D,P * 9 TO X1,Y1
280 X1 = D:Y1 = P * 9

```

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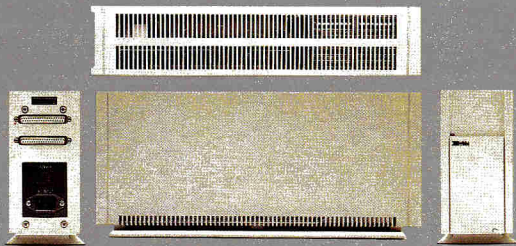


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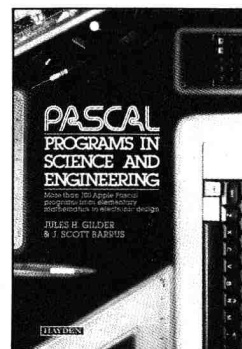
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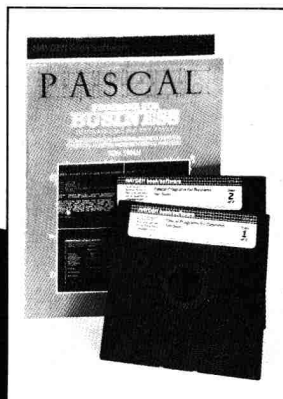
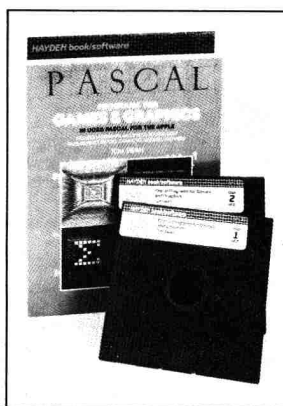
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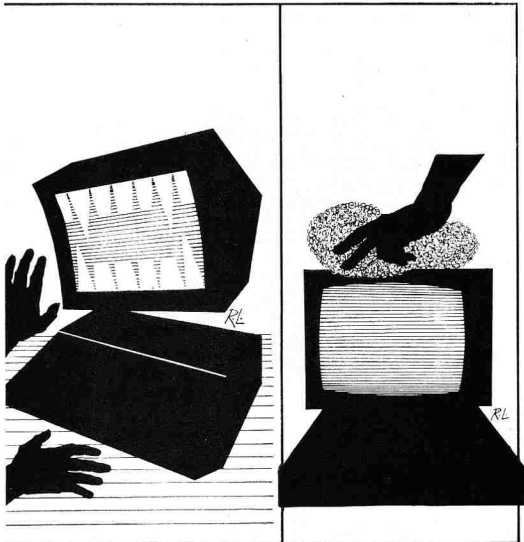
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# A New Glossary

by Robb Russon



**High-tech vocabulary  
has gotten so  
complex, even  
Merriam-Webster  
can't keep up with  
the lingo.**

**S**elect Committees have agonized over subtle differences in defining the myriad terms that abound in the ever evolving world of computing. Anthologies of such definitions are not lacking and most manuals worth their salt list glossaries of varying length and detail—perhaps as a last gasp at systematic thought in a sea of chaos.

The problem with these glossaries is not length—although they are often incomplete—nor is it the selection of which term deserves honor of explanation. The main problem is the total disregard of the subject's real-world implications. In order to bridge the gap between what is and what should be, the following short glossary is offered:

**ASCII.** The control code for all beginning programmers and those who would become computer literate. Etymologically, the term has come down as a contraction of the often-repeated phrase "ascii and you shall receive."

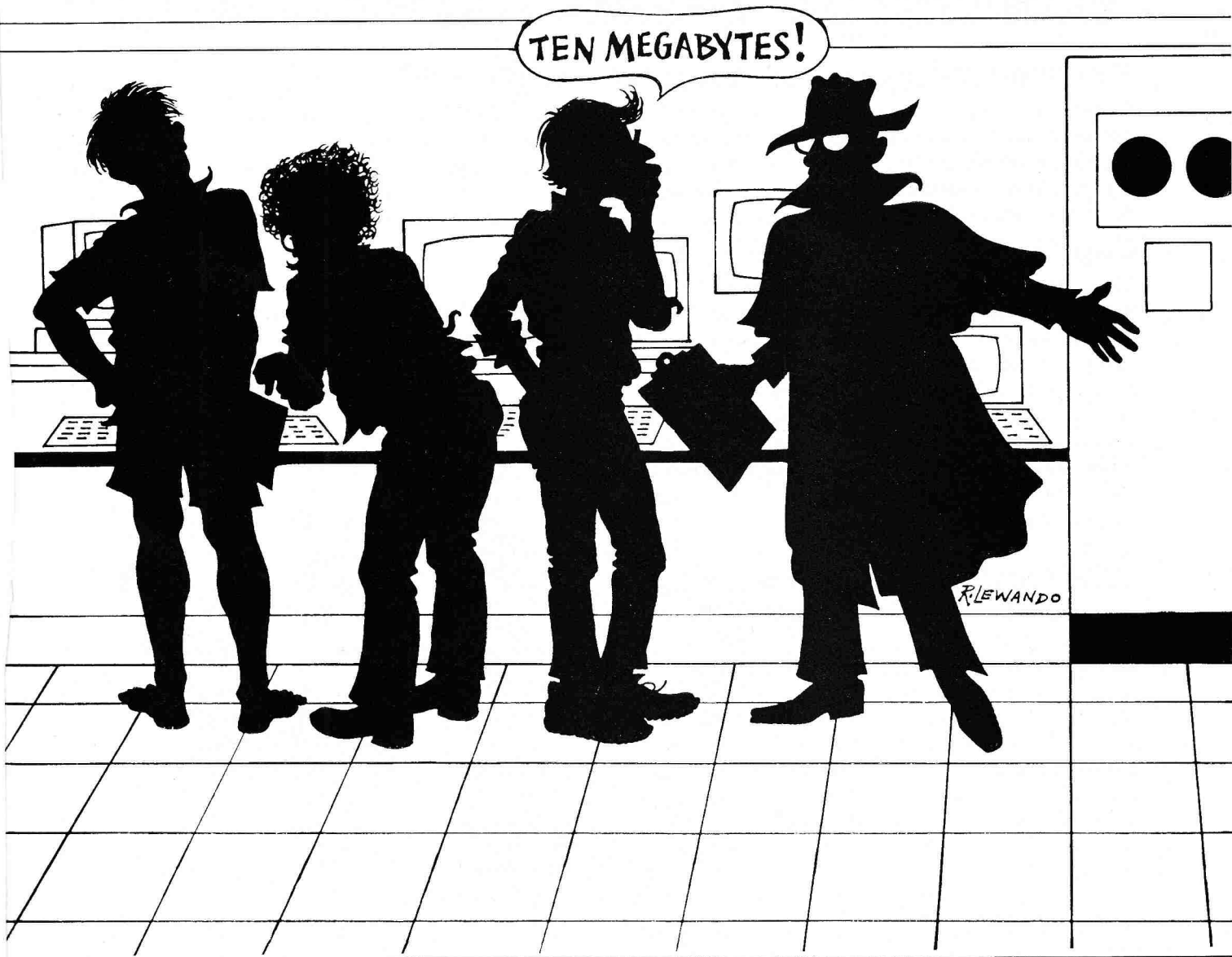
**Backing up.** The process of protecting what should never have been saved in the first place.

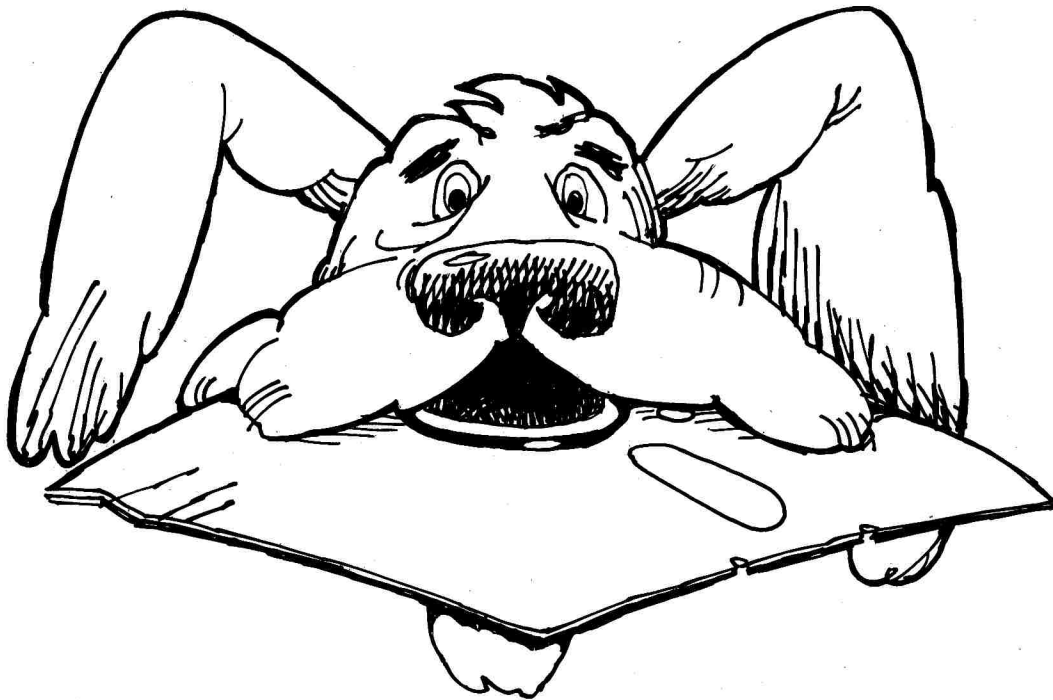
**BASIC.** An acronym that represents a universal programming language, but in reality was created as a joke among programmers. The letters stand for "Boy, this Algorithm Sure Is Complex!"

*Robb Russon ponders computer semantics at UMC 30, Utah State University, Logan, UT 84321.*



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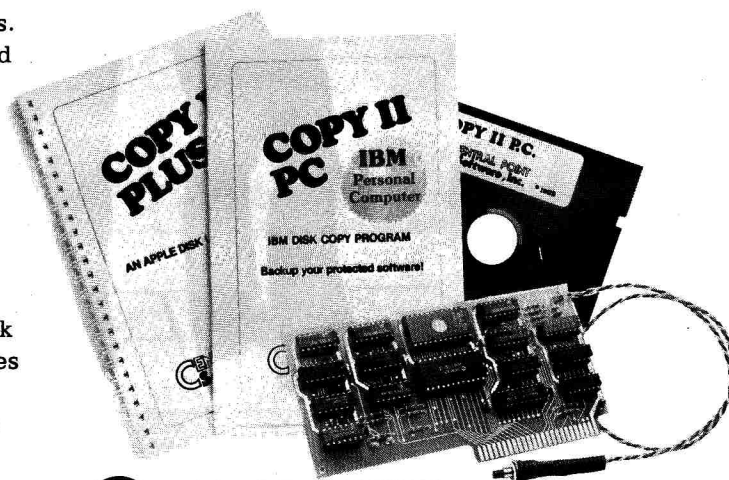
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**Boot.** Early computers were notoriously unreliable and often needed adjustment beyond the technical manual's guidance. To start these machines one often had to give it a "boot." Thus the term has come to mean the process of starting or running the machine.

**Buffer.** A derisive name for the proud new computer owner, who is always polishing or "buffing" his equipment.

**Character.** You see these people hanging around computer rooms and in computer stores. They usually wear thick glasses and they mumble phrases such as, "I got ten megabytes from the I/O phasing using the integrated verification data sequence."

**Code.** A secret string of symbols known only to those who have mastered the guild language. Makes equipment work and programs run.

**Computer.** The cause of it all.

**Control Character.** Those whom you ASCII. (See *Character*.)

**Cursor.** One whose program will not run.

**Default.** Usually the equipment or the recently-purchased software; never the owner.

**Disk Drive.** A street in Cupertino, California.

**Error Message.** What one gets when the instructions are scrupulously followed, routines checked, and bugs deleted.

**Expansion Slot.** A bottomless slit inside the computer into which large sums of money are poured in hopes of placating the great god Peripheral.

**Filename.** A created title with the unique amnesic property of becoming instantly forgotten as soon as it is written.

**High Level Language.** Communication between two programmers or computer engineers.

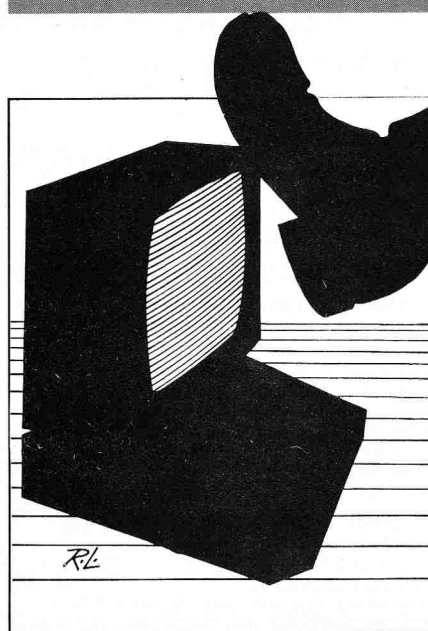
**Immediate Execution.** What happens when one messes around with computer innards with the power on.

**Interpreter.** An individual with the ability to understand and communicate to others the arcane mysteries of the computer. (See *High Level Language*.)

**Keyboard.** A set of closely placed switches or buttons that change function randomly from program to pro-



"They usually wear thick glasses and they mumble."



gram, and even during a program. With some operators, these switches are almost uncanny in their ability to place themselves under fingers at the wrong time, particularly the reset and escape keys.

**Kilobyte.** A slang term used by "old computer hands" when describing the beginner. It means, roughly, "He has bitten off more than he can chew."

**Loops.** See *Recursion*.

**Nibble.** Another slang term for the green, rank beginner. This person doesn't even measure up to a *kilobyte*.

**Peripheral.** The Great Spirit of computing whose omniscient presence dominates the hardware. Those who wish to placate this spirit must softly utter the words, "I/O, I/O, I/O."

**RAM.** The process used by the main memory to stuff all the meaningless information generated by the operator into unused cracks and crannies inside the lid.

**Recursion.** See *Loops*.

**Rigid Disk.** A floppy disk that has been left out overnight in the car on the coldest night of winter.

**ROM.** The eternal, unchanging god of memory.

**Save.** The process used to create file names. (See *Filename*.)

**Syntax.** Arbitrary rules, created by fiendish computer engineers, designed to confuse, perplex, befog, and baffle those who would rashly attempt to communicate with their computers using the rules painfully learned over many years of public schooling.

**Turnkey Program.** A good example of a typo that, with constant usage, remains intact in its original form. The term was first used as an expletive uttered by those who would try and debug their programs (@#\$%\*&!# TURKEY PROGRAM!!) but was changed to its current form by a typing mistake. (See *Keyboard*.) It means about the same thing, but has lost its punch.

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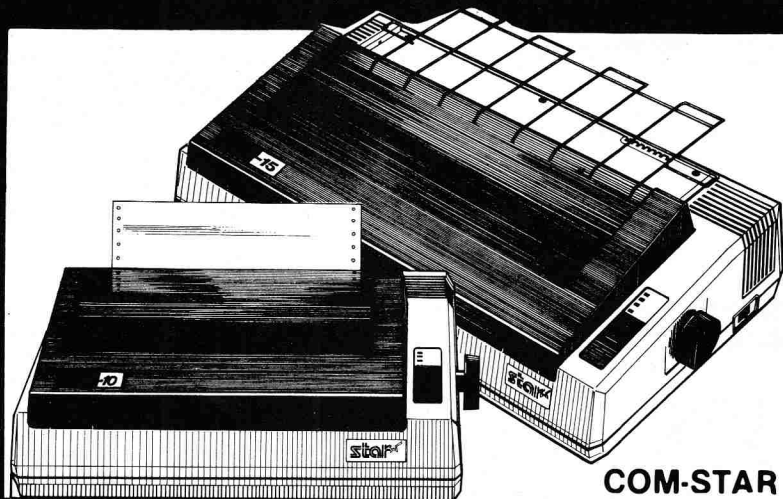
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# Reading Data and Linear Arrays

**T**he real power of the FOR...NEXT construction, as I suggested last month, lies in its control over arrays and subscript indexing. This month I'll show how a FOR...NEXT loop with a data array can simplify even the most elementary processes in your programs.

## Linear Arrays

An array, in its simplest form, is a list of data elements such as an alphabetized list of names or inventory items, or a numeric list of part numbers. The elements can be arranged either in a certain order or randomly.

Imagine a shopping list written on a narrow strip of paper with room for only one item on each line. This list is a collection of data elements arranged in a linear, or one-dimensional, array. Now number the lines of the list, 1 through 18. Each of the elements is different, yet all belong to the group of items to be purchased on your next shopping trip.

To represent this list as an array in a computer's memory you would select a single variable name, such as SL\$, to represent all of the elements in the group. Each individual element would also need a number in parentheses to distinguish it from the others. Thus, SL\$(1) would correspond to the first item in the list, SL\$(2) to the second, and SL\$(18) to the last.

The numbers in parentheses are called subscripts, and they are the

key to manipulating arrays. Every array variable must have a subscript. However, the subscript need not be a numeric constant such as 1, 2, or 18. It can also be a numeric variable or a mathematical expression with a numeric result, as long as the resulting value is a positive integer or zero.

Now we come to the connection between FOR...NEXT loops and arrays. Since subscripts are numeric, the counter values in a FOR...NEXT loop, which are also numeric, can serve as subscripts. For example, if the shopping list array were stored in your computer's memory, you could use the subroutine in **Listing 1** to display the list.

This sequence makes it unnecessary to deal with each item in a unique way. Lines 710-730 constitute a loop in which the loop counter, J, and hence the array subscript in line 720, changes with each cycle. The first time through, J's value is 1, and SL\$(1), the first item in the list, will be printed. Then, the second time through, J has a value of 2, and SL\$(2) is printed. In this way, only three lines of BASIC code are responsible for printing all 18 items.

For a second example, suppose a large number of inventory items, MX, is stored in the computer's memory in the array I\$(j), where j represents any value from zero to MX. The task at hand is to search for a specific item, represented by A\$, and to determine where in the list that item

can be found. That is, you must determine the subscript associated with the item that matches A\$. The subroutine in **Listing 2** would do the trick.

There are more efficient ways to handle such lists than this item-by-item comparison, but this technique is the simplest and at times may be the only way the task can be accomplished. The value of JF must be checked immediately after returning from the subroutine. If it is still zero, then a match for A\$ was not found in the inventory list, and an appropriate message or instruction sequence handles the event.

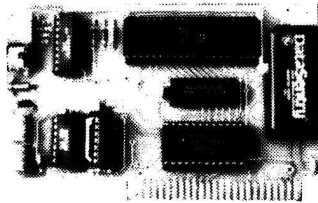
If a match was found, the value of JF on return from the subroutine corresponds to the subscript value of the item that matched. Thus I\$(JF) contains the element sought. Note that if a match is found, after JF is assigned the value of J, J itself is changed to MX so the FOR...NEXT loop will be terminated before returning to the main program. *Never use a GOTO command to jump out of a FOR...NEXT loop*, because the "stack" in memory that does the loop book-keeping will not get cleared and may fill up to the point that the program will crash.

BASIC requires that you adhere to one simple rule whenever you use arrays in a program: You must let the computer know in advance the maximum size of each array. This process is known as *dimensioning* an array, and the BASIC keyword you

by Dan Bishop

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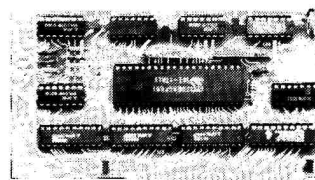
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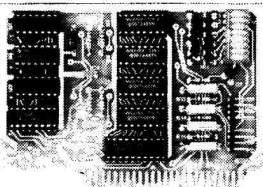
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use is DIM. Immediately after this word, you must list all of the array variables you plan to use in your program, with the maximum dimension for each indicated in parentheses. For example:

```
20 DIM SL$(18),I$(3500),RM(28),CC(F)
```

is a valid statement that dimensions four arrays. (Four separate DIM statements would have done as well.) The first array, SL\$(i), will contain string information, and will hold a maximum of 19 elements with subscript values from zero to 18. The second array, also string, will have room for 3501 elements. The third, RM(i), will hold numeric information to a maximum of 29 elements, and the fourth, CC(i), has a numeric variable for a dimensioning parameter. F must have been assigned a valid positive integer value earlier in the program for this line to execute, because without such an assignment, F will have a value of zero, and the array will hold only one element, CC(0).

Applesoft BASIC provides automatic dimensioning of small linear arrays containing 11 or fewer elements. This convenience is available at your option. But it's good programming practice to specifically establish all arrays with an appropriate DIM statement.

Dimensioning is usually done at the beginning of a program, although this is not a requirement. Remember that *an array must be dimensioned before any reference to any of its elements occurs*. Also, you cannot re-dimension an array. Any attempt to do so will result in a "redimensioned array" error.

### The READ/DATA Combo

Now that you know what a linear array is and how to manipulate its subscripts from within a FOR...NEXT loop, the next step is filling the array elements with data. You could use a procedure like the one following that will fill a 50-element string array with up to 50 names entered at the keyboard:

```
699 REM KEYBOARD ENTRY EXAMPLE
700 DIM NM$(50)
710 FOR I=1 TO 50
720 INPUT "ENTER A NAME (OR X)
...";NM$(I)
730 IF NM$(I)="X" THEN N=I:I=50
740 NEXT I
750 RETURN
```

**Listing 1.** A subroutine in which a FOR...NEXT loop prints the elements of an array.

```
699 REM *** DISPLAY LIST SUBROUTINE ***
700 PRINT "TODAY'S SHOPPING LIST"
710 FOR J=1 TO 18
720 PRINT SL$(J)
730 NEXT J
740 RETURN
```

**Listing 2.** A subroutine in which a FOR...NEXT loop searches an array for a specific element.

```
899 REM *** ARRAY SEARCH SUBROUTINE ***
900 JF=0
910 FOR J=1 TO MX
920 IF I$(J)=A$ THEN JF=J:J=MX
930 NEXT J
940 RETURN
```

**Listing 3.** A simple address book program. This program illustrates the use of DATA and READ statements to store input data within the program itself. Four linear arrays are filled with the data values by a simple FOR...NEXT loop (lines 100-150), and a sequential search for an assigned name is carried out by the subroutine at line 200.

```
1 REM ***** SIMPLE ADDRESS BOOK PROGRAM
2 REM FIRST DATA ELEMENT MUST BE NUMBER OF NAMES IN LIST
3 REM (READ AS N). EACH ENTRY MUST BE NAME (N$), STREET
4 REM ADDRESS (S$), CITY & STATE-NO COMMA- (C$), AND
5 REM PHONE NUMBER (P$).
6 REM ADDRESS BOOK CAN BE SEARCHED FOR A GIVEN NAME.
7 REM (ENTERED AS A$).
9 REM ***** MAIN PROGRAM *****
10 HOME : GOSUB 100: REM READ DATA INTO MEMORY
20 PRINT "WHO ARE YOU SEARCHING FOR?"
30 INPUT A$
40 GOSUB 200: REM SEARCH ARRAY FOR NAME MATCHING A$
50 IF JF = 0 THEN PRINT A$ " IS NOT ON YOUR LIST.": GOTO 70
60 GOSUB 300: REM DISPLAY NAME, ADDRESS & PHONE
70 END
99 REM ***** READ DATA SUBROUTINE *****
100 READ N
110 DIM N$(N),S$(N),C$(N),P$(N)
120 FOR I = 1 TO N
130 READ N$(I),S$(I),C$(I),P$(I)
140 NEXT I
150 RETURN
199 REM ***** ARRAY SEARCH SUBROUTINE
200 JF = 0
210 FOR J = 1 TO N
220 IF N$(J) = A$ THEN JF = J:J = N
230 NEXT J
240 RETURN
299 REM ***** DATA DISPLAY SUBROUTINE
300 HOME : PRINT : PRINT
310 PRINT "NAME"; TAB( 15);"ADDRESS"; TAB( 30);"PHONE"
320 PRINT : PRINT N$(JF); TAB( 15);S$(JF); TAB( 30);P$(JF)
330 PRINT TAB( 15);C$(JF)
340 RETURN
999 REM ***** DATA *****
1000 DATA 5
1010 DATA JON HARRISON, "8181 TROUT ST.",BILTON NJ, "218-6433"
1020 DATA MARY GALLOWAY,"212 OAK AVE", BUNION MN,"438-6438"
1030 DATA BO AXELTON, "1895 MAIN ST",GELLTOWN PA, "621-4121"
1040 DATA ALICE TASSLE, "16172 S. 8TH", HARDLUCK WY, "413-2188"
1050 DATA JERRY JERKY, ,SLUMVILLE CA, "218-4295"
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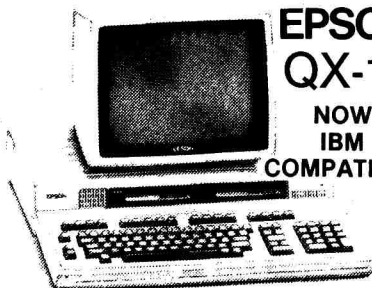
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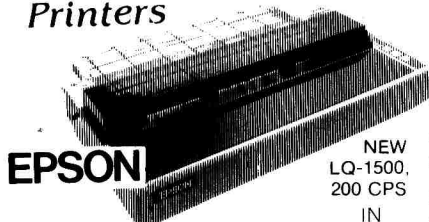
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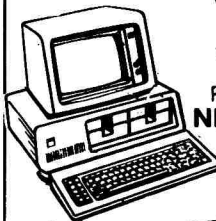


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Of course, with this subroutine every time you run the program you have to re-type all the names.

A more efficient approach is BASIC's built-in input command, READ, which incorporates data directly into the program from *DATA statements*. With this technique, data you enter into the computer becomes part of the program and is saved onto disk along with the instructional lines. Then, when you run the program the data automatically loads into memory. Thus, you benefit from disk storage while avoiding the fuss of separate data files, disk I/O, and so forth. Of course, the disadvantage is that you must actually change program lines (the *DATA statements*) whenever you need to change the information the program is to process, thus reducing the program's flexibility.

Through *READ statements* the program calls up (or "reads") data from *DATA statements* for processing. *READ statements* include the BASIC keyword READ, followed by a list of the variable names or array elements that are to be assigned the values being read. The statement:

```
250 READ A,R$, BF(6), J$, M
```

instructs the computer to read five data elements and assign those values to the five variables in the list. The first data element is assigned to A, the second to R\$, and so forth.

It is essential that the type of data being read match the type of the variable corresponding to it in the variable list. Thus, the first data element in the above example must be numeric, the second string, the third numeric, the fourth string, and the fifth numeric. A "type mismatch" error results when this rule is violated.

You have considerable flexibility in handling *DATA statements*. You can list as many values on a single line as you want, up to the character limit of 239. *DATA statements* may be located anywhere in the program, although traditionally they are placed as a block at the end.

Each value in a *DATA statement* is separated from its neighbors by a comma. String information need not lie between quotation marks unless it begins with a number, a plus or minus sign, a period, or a space. See **Figure 1** for some sample *DATA statements*. As you can see, a *DATA statement*

**Figure 1.** A sequence of *DATA statements* and an instruction sequence that would read values from them.

```
2000 DATA 6
2010 DATA 12, 28, 13.26, -45.219
2020 DATA SUN, MON, TUE, WED, THU, FRI, SAT
2030 DATA JOE SCHMOE, "12 OAK ST", 28, M, S

360 READ N
370 FOR I=1 TO 4
380   READ F(I)
390 NEXT I
400 FOR I=1 TO 7
410   READ DY$(I)
420 NEXT I
430 READ NM$, AD$, AG, SX$, MS$
```

may contain one or more values, and the type (string or numeric) may be mixed within the same statement.

If you used lines 2000–2030 in **Figure 1** in a program, then you might include the *READ statements* in the same figure to read the data.

The computer regards all of the values in all the *DATA statements* in a program as one long list. At the start of the program, the computer stores the memory location of the first data value. When it encounters the first *READ command*, the first data value is read, and the data pointer changes to the memory location of the second data value. When the second *READ command* is encountered, the second data value is read, and the data pointer changes to the memory location of the third data value. (*READ commands* with several variables, such as line 430 in **Figure 1**,

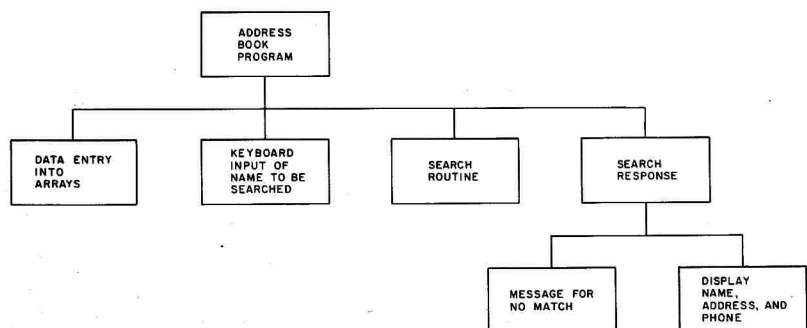
are treated just as though each separate variable had its own *READ command*.) In this way, the computer progresses through the data values, reading each one in succession.

If you have more data values than are used by the *READ commands*, those left over are not processed. On the other hand, if you try to continue reading data after all the values have been used, you will receive an "out of data" error message and the program will crash.

Occasionally you will need to reset the data pointer to the very first data value in the program. BASIC provides a one-word command to carry out the task: *RESTORE*. It starts the data-reading sequence all over again.

A common way to handle data values in a program is to treat each group of related values as a set with its own *DATA statement*. For exam-

**Figure 2.** A hierarchy diagram showing the functional parts of the address book program presented in Listing 3.



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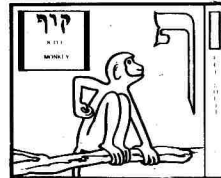
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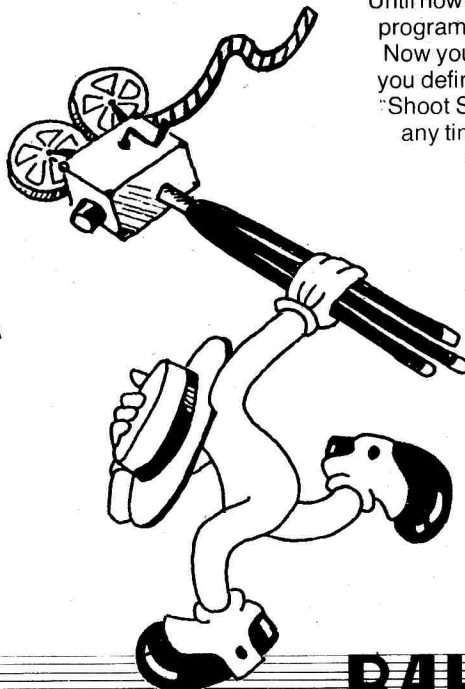
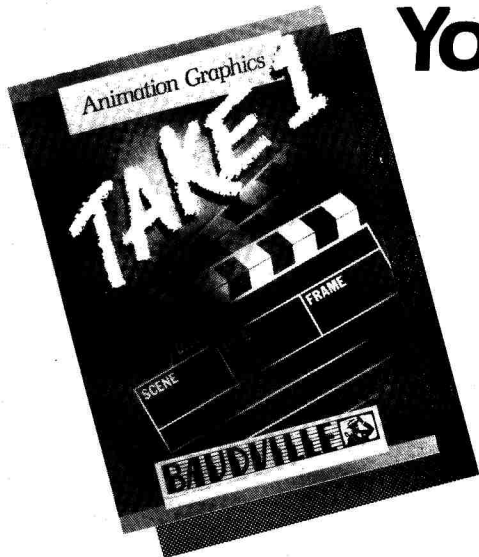
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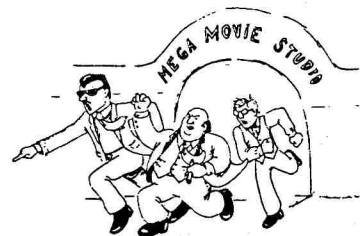
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ple, if you had a list of 50 names and phone numbers to be read into memory, you could write 50 DATA statements, each containing one name and its corresponding phone number. One such program line might look like this:

```
11030 DATA SAM JOHNSON, "(321)
123-0077"
```

This method makes it easy to alter or delete one name or phone number without affecting any of the other data sets in the program. It also makes it easier to design your READ command to match the order of the data being read.

Keep in mind that whenever the computer sees a comma in a DATA statement, it moves the data pointer ahead one notch after a READ command. This works to your advantage if you have a data set with missing information. For example, in:

```
820 DATA 18, 32, 4.611, , 12.821
```

the fourth value is empty, so when the fourth READ is executed, a zero or null is read. A fifth READ is required in order to pick up the 12.821. Unintentional commas in DATA statements can cause a great deal of trouble, however, and are very difficult errors to catch.

### A Simple Address Book

Listing 1 illustrates the simplest possible method for data-base filing. It employs only three functions and a set of data elements to set up an address book containing the name, street address, city and state, and phone number for each person in the data base. Figure 2 presents the hierarchy diagram for this program, while Figure 3 shows the three flowcharts for the program and its subroutines.

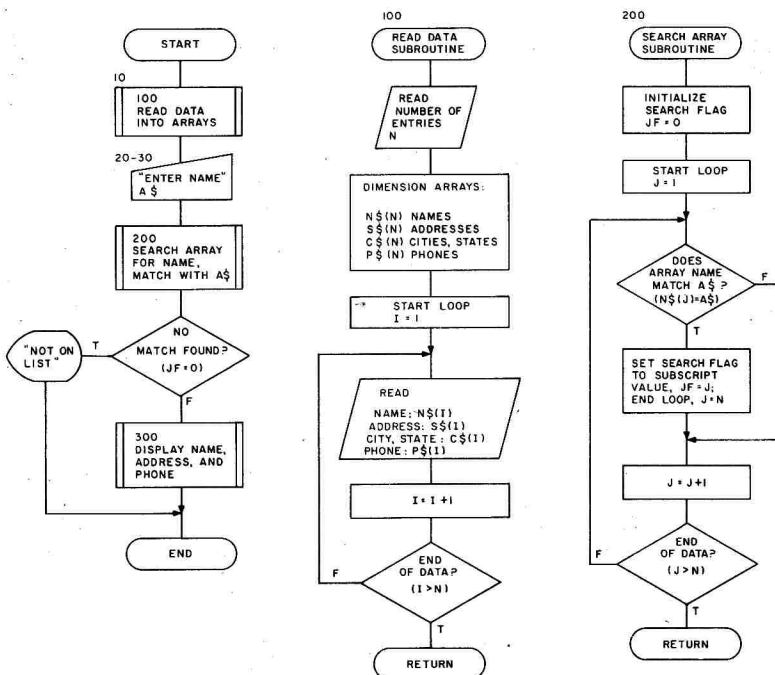
Four arrays to hold data in memory are dimensioned in line 110. But

since the number of records in the data base will change from time to time, the current number is provided to the computer as N by the first READ command in line 100. The first data element appears in line 1000. This value must correspond with the number of records that follow, and is the number used in line 110 to dimension the arrays. Each time you change the number of records in your list of DATA elements, you must also change the value in line 1000.

After reading the data elements (subroutine 100) into their respective arrays, the program asks the user to enter a name. It then searches the data sequentially to find an exact match (subroutine 200). If a match is made, the screen clears and that person's name, address, and phone number are displayed (subroutine 300).

Note that once the appropriate subscript value for a matching name has been found and assigned to the variable JF, that same value is applied to the other three arrays to bring out the corresponding address and phone number values (lines 320 and 330). Here is another advantage of using arrays: Related data elements in a set can be linked through the use of a common subscript.

Figure 3. Flowcharts for the address book program and subroutines presented in Listing 3.



### Conclusion

Linear arrays are important data structures in computer programming. This column has only scratched the surface to show how they can be used to organize and manipulate information in programs. Once you are familiar with their use, you'll find that you literally can't do without them.

Next month I'll continue discussing arrays and basic methods for managing the data they contain. In the meantime, try setting up a simple data-base program of your own, following the outline of the address book program in this column. You might add a subroutine that displays all the entries on the screen as though you were reading down a printed list, and incorporate an option into the main program for the user to search for a given name or see the complete list. ■

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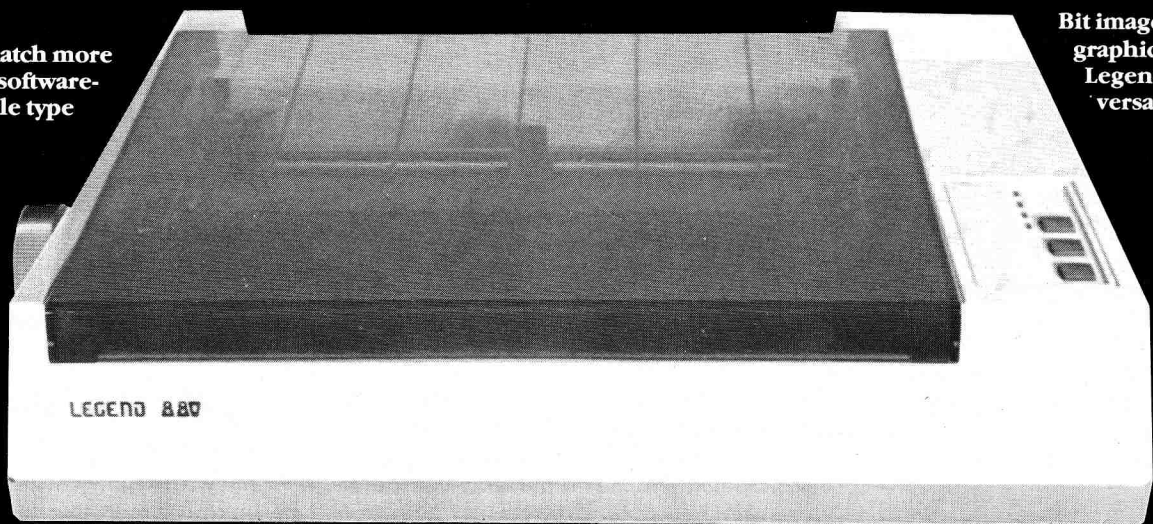
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## Your Best Baud

Dear inCider:

I own an Apple //e and I'm considering the purchase of a modem. In your August 1984 issue, John Granfield states in "Buying Your First Modem" (page 57) that "Home users don't need 1200 baud. . .300 baud is fast enough. . .and is the standard for all BBS's and information utility systems." Yet, in the same issue, Alexy and Zwemke, in the review "Apple's Talkative Pair" (page 74), say that "operation at 300 baud is a frustrating experience," and they recommend 1200 baud.

This leaves me confused and undecided. I want a modem so I can access bulletin boards and information services. I am not a business user. Where do I go from here?

Mark H. Conner  
Rt. 7, Box 310  
Morgantown, WV 26505

Dear Mark:

*I can understand your confusion, although the two articles are not as contradictory as they appear...I agree with Granfield: 300 baud is just fine for home users. I also agree with Alexy and Zwemke: 300 baud is too slow. How, then, do I reconcile these two opinions?*

*Whether you buy 300 or 1200 baud depends upon how you intend to use your modem. If you're going to spend most of your time connected to services that require a great deal of keyboard input from you—such as bulletin board systems and information services—then buy a 300-baud modem. In these instances, the slowest link in your telecommunications chain is*

*you, not your modem. On the other hand, if you intend to use your modem to send and receive many large files, then 1200 baud is for you. In this instance, the amount of time you spend at the keyboard is minimal when compared with your total hook-up time.*

*To reiterate, let me present Bob Ryan's Unofficial, Unscientific, Off-the-Wall, Don't-Quote-Me Law of Buying Baud: If you'll spend most of your connect time at the keyboard, buy 300 baud. Otherwise, buy 1200.*

*While on the subject of the August issue, I'd like to make one correction: The Micromodem //e does support touch-tone dialing. Thanks to Ray Lyon and others for pointing out our error.*

## More on the Model 100

Dear inCider:

In the September 1984 Ask inCider, you advised a reader on how to transfer files between a Radio Shack Model 100 portable computer and an Apple. I've recently acquired a commercial product that does the trick. It's called DISK+ and is available either as a ROM chip or on cassette tape from Portable Computer Support Group, 11035 Harry Hines Boulevard, #207, Dallas, TX 75229. DISK+ permits easy use of Apple disks as program and data storage directly from the Model 100.

Evans M. Harrell  
342 Sequoia Drive  
Marietta, GA 30060

Dear Evans:

*Since writing the September column, I have had the opportunity to use DISK+, and I agree that it's a very useful product. An Apple equipped with a Super Serial Card doesn't even need a null modem adapter. I recommend DISK+.*

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Jonathan Cohen  
15 Bechstein Drive  
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Dear Jonathan:

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## Happiness Is a Warm //e

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Joe McKeon  
RRI Box 323  
Milford, NJ 08848

Dear Joe:

*According to Apple, the //e is designed to operate in an environment that ranges from 30 to 115 degrees Fahrenheit, with a relative humidity range of 5-85 percent. You won't have to worry about summer temperatures, but be prepared to bring*

**by Bob Ryan, inCider staff**

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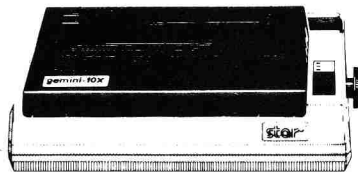
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## And the Winner is . . .

I was supposed to announce the winner of the "Two-Bit Game Contest" this month, but, due to the large number of entries, I've put off the announcement until the January issue. I think you'll be delighted with the great games readers have sent in.







# Spreadsheets: Forecasting Tools

**U**nder scrutiny this month are three spreadsheet packages: an updated version of the original king, VisiCalc, and two contenders to the throne, Magicalc and Multiplan. All three provide a worksheet of about 16,000 cells that relate to one another in many helpful ways. Each package comprises a powerful array of mathematical functions as well as the core of any spreadsheet program, the ability to calculate the bottom-line result as you forecast the future of your business.

Not all of their advertised capacity is actually available, though, even with a 64K machine. Magicalc, for example, will not accept any type of data you enter in the last cell (column BK, row 254) of its grid; instead, it tells you that you're out of memory. While Multiplan *will* take an entry at its furthest cell location, it takes about 20 seconds for you to regain keyboard control (and about the same length of time to blank out that test figure). All three packages are designed to function best with a 128K Apple IIe; Magicalc can even access and use up to 512K of memory.

VisiCalc now comes with two versions of the program in the package you buy. The basic version is comparable to the original VisiCalc, with two major changes: It now allows variable column widths and will access and use an 80-column card for a wider display area. The new advanced version of the package—the one I'll compare with Multiplan and Magicalc—requires two disk drives and includes even more features than the basic version.

If you are a new VisiCalc user and have only a single drive, since you get both versions in the package, you can start using the basic version of VisiCalc at once and, when you buy another drive, you can transfer your information to the advanced version. If you already have VisiCalc and two disk drives, you can move your present data to the advanced version's format immediately.

## Documentation

Magicalc's manual spans some 300 pages and provides a good tutorial and reference section. Each part even has its own index. An abbreviated spreadsheet example lets you use perhaps only half of Magicalc's functions, but the tutorial presents a good introduction.

Multiplan, a more complex and powerful package, comes with a longer (459 pages) manual, but, surprisingly, not a more difficult one. It leads you through a workable and real-world example that lets you use most of the spreadsheet's capabilities. You still should use its reference section, though, when you start to create your own worksheets.

VisiCalc literally wrote the book on spreadsheets, and includes a booklet and an on-line tutorial. Anyone, from beginner to experienced computer user, will feel quite comfortable with VisiCalc's approach to creating a spreadsheet. Even though Magicalc is perhaps a simpler program and Multiplan a slightly more powerful one, VisiCalc still shines because it contains an on-disk tutorial. It also comes with Don Beil's *The VisiCalc Book* (Reston Publishing), an out-

standing guide filled with helpful tips and good ideas.

## Using Magicalc

All three programs allow for variable column widths and will work in a 40- or 80-column display (if you have an 80-column card).

Magicalc is, simply put, a VisiCalc clone with some added attractions thrown in. Its biggest plus is its easy operation, and if your Apple doesn't have an 80-column card, the program's own character set provides you with a 70-character display. In addition, the letters and numbers in this mode are fairly easy to read, although not as clear as those produced by an 80-column card. You can switch modes easily within Magicalc—a good idea that lets you create a worksheet with the larger characters you're used to, and then expand the visible window when examining data.

Magicalc is partly menu-driven, an unusual approach in spreadsheets that lets the beginner use the program quickly and easily. The package uses a series of subsystems to file your information, print it, and so on. The program combines its menus with in-system commands that mimic VisiCalc's: You enter a slash (/) followed by a letter of the alphabet to indicate what you'd like to do (for example, /P lets you print and /S lets you save a file).

Magicalc lets you save all or part of your worksheet, and creates and reads data interchange format (DIF) files. Some of this flexibility, though, is confusing. When you choose an option to save a file, the screen dis-

**by Gregory R. Glau**

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plays a subsystem menu that has a place for column and row locations for the start and end of the worksheet you want to save. Your current cursor location is indicated as the starting point—suggesting that it will save the worksheet from that point on. It doesn't, unless you save your data as a DIF file; instead, Magicalc will save the entire worksheet.

The process for saving or loading a file in DIF format is explained adequately, but Magicalc offers little help beyond that. Instead, the manual suggests that you refer to other books that describe in greater detail the process you want to learn.

With Magicalc you can assign to particular cells, or a series of cells, attributes that protect a cell so data cannot be written into it; mark a cell to accept values or labels only; or even hide the contents of a cell from the user. VisiCalc and Multiplan also let you hide data in specific cells and protect a cell or group of cells from accidental data entry.

### Multiplan's Workings

Multiplan uses a command line noting each available command with one word. You either scroll the cursor over the word or type in its first letter; the screen then displays the next series of commands you can use. Since command names are fully spelled out, this approach is easier than those of the other two systems. In most cases, Multiplan suggests what it calls a proposed response, the entry or command that you'd usually use in a given set of circumstances.

When you insert or delete rows or columns, you can tell Multiplan the precise number you want to insert or delete, and exactly where to position added rows or columns. VisiCalc also lets you move or delete multiple rows or columns, while Magicalc can move or delete only a single row or column at a time.

Whereas both Magicalc and VisiCalc use letter and number combinations to indicate cell locations, Multiplan has its own system that's confusing to interpret. For example, if you add the data in two cells in the same column, your formula is:

$$=R[-2]C+R[-1]C$$

You're telling the program to go up

two rows from the current cell [-2] and add that amount to what's in the cell one row above [-1].

Multiplan, however, does provide two ways to avoid using this complex notation. In the first, you point to the cells you want to use in a formula by moving the cursor to those cells. The second lets you name a cell or series of cells and then use those names to construct your formulas. Herein is Multiplan's true power. Instead of being forced to work with a complex arrangement of rows and columns to create the formula you need, you enter a formula like the following:

$$\text{PROFIT} = \text{SALES} - \text{COSTS}$$

Multiplan goes even further and lets you link worksheets together and instruct one worksheet to pull data from another. For example, you might want to track your monthly electricity, gas, and telephone bills. A simple Multiplan worksheet can store and total them, but each month you may want to transfer this information to a more complex income statement that summarizes all of your expenses. Multiplan lets your utility worksheet send its data to your income statement worksheet automatically each time the income statement worksheet is loaded into memory. This function saves not only data-entry time but cuts down on mistakes, and it has numerous applications in the business world.

### Uses of VisiCalc

VisiCalc is almost completely command-driven, and each command is mnemonic (C clears the screen; D deletes a row or column), so commands are easy to learn and use. The latest version of the program offers full-word prompts that make it easier to understand what information the system is requesting.

VisiCalc also offers Keystroke Memory, a method that lets you assign several commands to one entry; when you want to use these instructions, you have to press only a single key. The system also includes print-formatting commands that let you send the codes to your printer to make presentation-quality reports.

VisiCalc is the only one of the three programs that comes with a disk tutorial, making it easier for the first-

**"Multiplan lets you link worksheets together."**

time user to get the package up and running. On-line help is *context-sensitive*—the help screen you see depends on what you're doing at that moment.

Finally, VisiCalc includes six worksheets on disk to help you with your personal finances, including an individual retirement account (IRA) analysis form, a checkbook-balancing program, and a home-finance template. You don't have to type these worksheets in—just enter your data and use them.

### A Touch of Weakness

Into every program a little rain must fall, and these three, like any other piece of software, deserve a bit of criticism. Magicalc, for example, doesn't prevent you from saving a new file over an old one with the same name. You might just be saving an updated version of that file, but the program should at least ask you to verify that you want to overwrite the old one, as Multiplan and VisiCalc do.

Magicalc lets you use windows (to examine different sections of your worksheet on the same screen) and titles (fixed in place so you always know what data should be entered where), but doesn't cover them in the tutorial section of the manual.

Another problem involves printing; Magicalc's screen doesn't clear at the time printing begins, and your printed data flashes by without any pauses.

With Multiplan, your printer can only be in slot 1—a limitation for some users. This system also cannot read DIF files from other programs. Although Multiplan can work with SYLK (SYmbolic LinK) files, and DIF files can be converted into SYLK format so Multiplan can use them, the process is tedious.

Multiplan is designed to work with the Apple IIe and takes advantage of its cursor command keys and other features. When you run the program

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## In a Nutshell

Magicalc is an easy-to-use spreadsheet that provides menus for many of its operations. It also will generate its own character set to give you a wide display without an 80-column card.

Multiplan is the most powerful package of the three, with the unique ability to link worksheets together so one can draw data from another.

VisiCalc now comes with two versions (in the same package) that let you start with a single disk drive and later on move to the more complex program that requires two drives. VisiCalc includes an on-disk tutorial to get you started fast, along with templates on disk for financial planning help. □

on an Apple II Plus, you often must use two keys to get the same effect. If you plan to use your spreadsheet on an older Apple, Magicalc's and VisiCalc's maneuverability are easier than Multiplan's. With a single-drive system, you must swap disks to load or save a file within Multiplan. The system disk must remain in drive 1 at all times, not only to provide on-screen help, but to perform certain functions.

With Multiplan, up to eight windows can be open for any worksheet, and you can even put borders around them. That sounds better than it actually is; a border takes up cell space, so once you add one, the bordered worksheet no longer lines up with its counterparts on your screen.

Although Multiplan's file-linking is terrific, its data transfer (one link at a time) has one limitation. When you have information on worksheet A that you send first to worksheet B and then to worksheet C, each worksheet must be saved and loaded sequentially. So if you store data on A and then load C, your information won't get transferred. You must enter it on A, and then save that worksheet. You then load B (which will

take the information from A), and then save it. Finally, after you load worksheet C, it's updated as it pulls the data from worksheet B.

VisiCalc, even with its new prompts, is still more cryptic in its operation than either of the other two packages.

### A Few Extras

Multiplan deals with a cell or series of cells as if the cells were an entire range of data. For example, if you want to add a series of numbers within Multiplan, you only have to name the specific row or column and ask the system to sum it (SUM SALES as an example). This procedure is much easier and faster than it is with VisiCalc or Magicalc. With those programs, you must mark the column and row locations from the beginning location all the way to the last cell and tell the program to sum the figures.

With Multiplan and Magicalc you can scroll a page at a time—a helpful device when you have a large worksheet to examine. Multiplan's sophisticated mathematics eliminates the forward reference problems worksheets sometimes contain, and the program includes extra functions like sorting.

I also like Multiplan's tutorial model, which works with a whole year's worth of information. In this kind of worksheet, the first month's figures usually contain a numerical entry and the following cells often include formulas. When you get to year-end, your totals are calculated differently than they are calculated in the rest of the worksheet. Multiplan helps with all of this.

VisiCalc's on-line tutorial is terrific for beginners—much more effective than a model you must both build and enter data into.

Magicalc's printed output is a strong feature. If a worksheet won't fit on one page, Magicalc will automatically format your printed copies so that the rows will line up from one sheet to the next. This makes it easy to tape the pages together to end up with a nice-looking and effective printout.

### What to Buy?

You won't go wrong with any of these packages. They're all bug-free

## Product Information

### Magicalc

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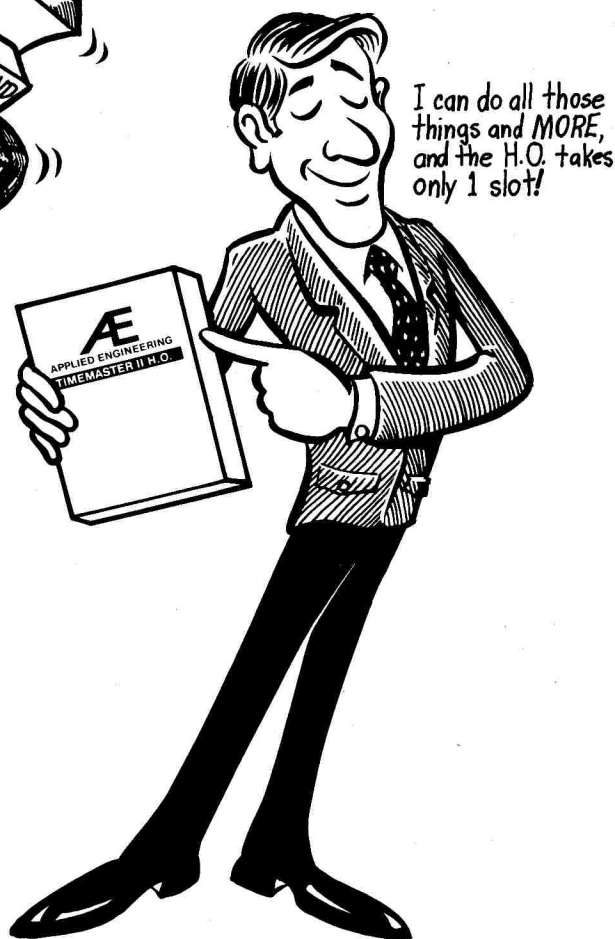
If you have only a single disk drive and want an easy-to-use program, Magicalc is the one to buy. If you have a dual-drive system, either Multiplan or VisiCalc will serve you well. Multiplan is slightly more powerful and is a good buy if you need to link worksheets together. Otherwise, buy VisiCalc; it's almost as powerful and is a bit more amiable than Multiplan. And at its new price, VisiCalc is a true bargain. ■

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\*Obviously, by ANY, we mean clock cards that are advertised and sold, not necessarily a clock card that your cousin Ralph built in his basement.

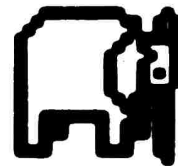
Listing continued.

```

1999 GOSUB 62000: RETURN
2000 D = 5:P = 24: GOSUB 60000:P = 16: GOSUB 60000:P = 8: GOSUB 6000
0: RETURN
4000 IF SC < 900 THEN 4101
4001 IF SC > = 900 AND SC < 1100 THEN 4102
4002 IF SC > = 1100 AND SC < 1300 THEN 4103
4003 IF SC > = 1300 AND SC < 1500 THEN 4104
4004 IF SC > = 1500 AND SC < 1700 THEN 4105
4005 IF SC > = 1700 AND SC < 1900 THEN 4106
4006 IF SC > = 1900 AND SC < 2100 THEN 4107
4007 IF SC > = 2100 AND SC < 2300 THEN 4108
4008 IF SC > = 2300 AND SC < 2500 THEN 4109
4009 IF SC > = 2500 AND SC < 2700 THEN 4110
4010 IF SC > = 2700 AND SC < 2900 THEN 4111
4011 IF SC > = 2900 THEN 4112
4101 PRINT "THIS SCORE MAKES YOU A NERD.": RETURN
4102 PRINT "THIS SCORE MAKES YOU A DORK.": RETURN
4103 PRINT "THIS SCORE MAKES YOU OUT-OF-IT.": RETURN
4104 PRINT "THIS SCORE MAKES YOU OUT-TO-LUNCH.": RETURN
4105 PRINT "THIS SCORE MAKES YOU A CRUM-BUM.": RETURN
4106 PRINT "THIS SCORE MAKES YOU SO-SO.": RETURN
4107 PRINT "THIS SCORE MAKES YOU FAIRLY GOOD.": RETURN
4108 PRINT "THIS SCORE MAKES YOU OKAY.": RETURN
4109 PRINT "THIS SCORE MAKES YOU GOOD.": RETURN
4110 PRINT "THIS SCORE MAKES YOU GREAT.": RETURN
4111 PRINT "THIS SCORE MAKES YOU SUPER.": RETURN
4112 PRINT "THIS SCORE MAKES YOU A WIZARD.": RETURN
5000 IF N = 5 THEN POP : GOTO 13000
5010 RETURN
9000 PK = PEEK ( - 16384): IF PK > 127 THEN POKE - 16368,0: GOTO
9010
9005 GOTO 9000
9010 IF PK = 197 THEN I = I: IF X < 232 THEN XX = X + 22:YY = Y:QW =
INT (XX / 22) + 1:WQ = INT (YY / 22) + 1:AN = A(QW,WQ):TX = X
:TY = Y:X = XX:A(QW,WQ) = 0:Y = YY: GOSUB 57300:X = TX:Y = TY: RETURN
9020 IF PK = 206 THEN I = I: IF Y > 33 THEN YY = Y - 22:XX = X:QW =
INT (XX / 22) + 1:WQ = INT (YY / 22) + 1:AN = A(QW,WQ):TX = X
:TY = Y:X = XX:A(QW,WQ) = 0:Y = YY: GOSUB 57300:X = TX:Y = TY: RETURN
9030 IF PK = 211 THEN I = I: IF Y < 145 THEN YY = Y + 22:XX = X:QW =
INT (XX / 22) + 1:WQ = INT (YY / 22) + 1:AN = A(QW,WQ):TX = X
:TY = Y:X = XX:A(QW,WQ) = 0:Y = YY: GOSUB 57300:X = TX:Y = TY: RETURN
9040 IF PK = 215 THEN I = I: IF X > 32 THEN XX = X - 22:YY = Y:QW =
INT (XX / 22) + 1:WQ = INT (YY / 22) + 1:AN = A(QW,WQ):TX = X
:TY = Y:X = XX:A(QW,WQ) = 0:Y = YY: GOSUB 57300:X = TX:Y = TY: RETURN
9999 RETURN
10000 PK = PEEK ( - 16384): IF PK > 127 THEN POKE - 16368,0: GOTO
10010
10005 GOTO 10000
10010 IF AN > 0 AND (PK = 197 AND X < 232) THEN XX = X + 22:YY = Y:
QW = INT (XX / 22) + 1:WQ = INT (YY / 22) + 1:NA = A(QW,WQ): IF
NA > 0 THEN RETURN
10011 IF PK = 197 AND (X < 232 AND AN > 0) THEN A(QW,WQ) = AN: DRAW
AN AT XX,YY: GOSUB 11000:AN = 0: RETURN
10020 IF AN > 0 AND (PK = 206 AND Y > 33) THEN YY = Y - 22:XX = X:Q
W = INT (XX / 22) + 1:WQ = INT (YY / 22) + 1:NA = A(QW,WQ): IF
NA > 0 THEN RETURN
10021 IF PK = 206 AND (Y > 33 AND AN > 0) THEN A(QW,WQ) = AN: DRAW
AN AT XX,YY: GOSUB 11000:AN = 0: RETURN
10030 IF AN > 0 AND (PK = 211 AND Y < 145) THEN YY = Y + 22:XX = X:
QW = INT (XX / 22) + 1:WQ = INT (YY / 22) + 1:NA = A(QW,WQ): IF
NA > 0 THEN RETURN
10031 IF PK = 211 AND (Y < 145 AND AN > 0) THEN A(QW,WQ) = AN: DRAW
AN AT XX,YY: GOSUB 11000:AN = 0: RETURN
10040 IF AN > 0 AND (PK = 215 AND X > 32) THEN XX = X - 22:YY = Y:Q
W = INT (XX / 22) + 1:WQ = INT (YY / 22) + 1:NA = A(QW,WQ): IF
NA > 0 THEN RETURN
10041 IF PK = 215 AND (X > 32 AND AN > 0) THEN A(QW,WQ) = AN: DRAW
AN AT XX,YY: GOSUB 11000:AN = 0: RETURN
10999 GOSUB 62000: GOSUB 62000: RETURN
11000 N = 1: GOTO 11100
11060 IF AN = A(QW - 4,WQ) THEN N = N + 1: GOTO 13000
11061 GOTO 12000
11070 IF AN = A(QW - 3,WQ) THEN N = N + 1: GOSUB 5000: GOTO 11060
11071 GOTO 12000
11080 IF AN = A(QW - 2,WQ) THEN N = N + 1: GOSUB 5000: GOTO 11070
11081 GOTO 12000
11090 IF AN = A(QW - 1,WQ) THEN N = N + 1: GOSUB 5000: GOTO 11080
11091 GOTO 12000
11100 IF AN = A(QW + 1,WQ) THEN N = N + 1: GOSUB 5000: GOTO 11110
11101 GOTO 11090
11110 IF AN = A(QW + 2,WQ) THEN N = N + 1: GOSUB 5000: GOTO 11120
11111 GOTO 11090
11120 IF AN = A(QW + 3,WQ) THEN N = N + 1: GOSUB 5000: GOTO 11130
11121 GOTO 11090
11130 IF AN = A(QW + 4,WQ) THEN N = N + 1: GOTO 13000
11131 GOTO 11090
12000 N = 1: GOTO 12100
12060 IF AN = A(QW,WQ - 4) THEN N = N + 1: GOTO 13000
12061 RETURN
12070 IF AN = A(QW,WQ - 3) THEN N = N + 1: GOSUB 5000: GOTO 12060
12071 RETURN
12080 IF AN = A(QW,WQ - 2) THEN N = N + 1: GOSUB 5000: GOTO 12070

```

Listing continued.



As I mentioned, should a hunter "step on" an animal, it's gone forever. But this is more than impolite; there are consequences. You lose 100 points for each animal you eliminate. What's more, if you wipe out at least one of the five animals in each of eight groups, you are doomed to play Animal Bingo for the rest of your life—because there'll be no way to end the game. This could happen when you've killed as few as eight animals. *The bottom line is to always make sure at least three animal groups remain intact.*

There are other penalties, as well. Every step the hunter takes costs a point, and it costs 50 points to pick up and drop an animal. So, the fewer moves—of both hunter and animals—the better.

To get the best score you often must choose between stepping on animals (at 100 points each) and moving animals (at 50 points per pick-up and drop). Moving is the obvious choice when only one animal is in the way. When you must relocate two animals, the choice will depend on the situation, since the point loss for moving or stepping-on will be the same. If three or more animals are in the way, stepping-on has the definite advantage.

**The Programs**

**Listing 1** is Animal Bingo, the main program. Type it in and SAVE it on your disk. **ALLCHAR**, **Listing 2**, is a hi-res character generator to use with it. (You may have ALLCHAR from one of my previous columns.) It contains 96 ASCII-character vector shapes, number 1 being the space.

To type in ALLCHAR, enter the monitor with CALL - 151, then type in the addresses and data. If a line reads 0800- 7E 00 FE 00 00 01 06 01, you should type 800:7E 00 FE 00 00 01 06 01 and hit the return key. Or type up to six lines of hex num-

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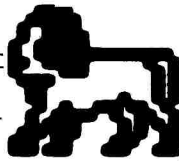
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Listing continued.

```

12081 RETURN
12090 IF AN = A(QW,WQ - 1) THEN N = N + 1: GOSUB 5000: GOTO 12080
12091 RETURN
12100 IF AN = A(QW,WQ + 1) THEN N = N + 1: GOSUB 5000: GOTO 12110
12101 GOTO 12090
12110 IF AN = A(QW,WQ + 2) THEN N = N + 1: GOSUB 5000: GOTO 12120
12111 GOTO 12090
12120 IF AN = A(QW,WQ + 3) THEN N = N + 1: GOSUB 5000: GOTO 12130
12121 GOTO 12090
12130 IF AN = A(QW,WQ + 4) THEN N = N + 1: GOTO 13000
12131 GOTO 12090
13000 IF AN(1) < > AN AND AN(2) < > AN THEN SC = SC + 1000:ST = 0
: TEXT : HOME : GOTO 13002
13001 RETURN
13002 FOR VV = 1 TO 24: HTAB 1: VTAB VV: PRINT "BINGO!BINGO!BINGO!B
INGO!BINGO!BINGO!1111!":PP = PEEK ( - 16336):PP = PEEK ( - 163
36):P = VV * 10:D = 5: GOSUB 60000
13003 NEXT : GOSUB 62500: POKE - 16304,0: POKE - 16297,0
13005 IF BG = 3 THEN GOSUB 62000: GOSUB 62500: FOR P = 250 TO 10 STEP
- 10:D = 5: GOSUB 60000: NEXT : GOTO 58000
13010 BG = BG + 1: IF BG = 3 THEN 13002
13015 AN(BG) = AN
13020 RETURN
15000 PRINT D$"BLOADANIMALS"
15001 POKE 232,255: POKE 233,143
15002 HOME : HGR : POKE - 16302,0: HCOLOR= 3: ROT= 64: SCALE= 1
15005 I = 2:J = 4: GOSUB 200:I = 3:J = 4: GOSUB 200:I = 4:J = 3: GOSUB
200:I = 4:J = 2: GOSUB 200:I = 3:J = 1: GOSUB 200:I = 2: GOSUB
200: FOR J = 1 TO 8:I = 1: GOSUB 200: NEXT :J = 8:I = 2: GOSUB
200:I = 3: GOSUB 200
15010 I = 4:J = 7: GOSUB 200:J = 6: GOSUB 200:I = 3:J = 5: GOSUB 200
:I = 2: GOSUB 200: FOR J = 1 TO 8:I = 6: GOSUB 200: NEXT : FOR
J = 8 TO 1 STEP - 1:I = 8: GOSUB 200: NEXT :I = 9:J = 2: GOSUB
200:J = 3: GOSUB 200
15020 I = 10:J = 4: GOSUB 200:J = 5: GOSUB 200:I = 11:J = 6: GOSUB 2
00:J = 7: GOSUB 200: FOR J = 8 TO 1 STEP - 1:I = 12: GOSUB 200
: NEXT : FOR QW = 1 TO 1900: NEXT : CALL 62450:I = 3:J = 5: GOSUB
200:I = 4: GOSUB 200:I = 4:J = 6: GOSUB 200
15030 J = 7: GOSUB 200:I = 3:J = 8: GOSUB 200:I = 2: GOSUB 200: FOR
J = 7 TO 2 STEP - 1:I = 1: GOSUB 200: NEXT :I = 2:J = 1: GOSUB
200:I = 3: GOSUB 200:I = 4:J = 2: GOSUB 200:I = 7:J = 1: GOSUB
200:I = 8: GOSUB 200
15040 FOR J = 2 TO 7:I = 9: GOSUB 200: NEXT :I = 8:J = 8: GOSUB 200
:I = 7: GOSUB 200: FOR J = 7 TO 2 STEP - 1:I = 6: GOSUB 200: NEXT
:I = 11:J = 8: GOSUB 200: FOR J = 6 TO 1 STEP - 1:I = 11: GOSUB
200: NEXT : FOR QW = 1 TO 1900: NEXT : RETURN
57000 FOR DR = 5 TO 14: FOR QW = 1 TO 5
57010 RN = INT (12 * RND (1)) + 1:RD = INT (8 * RND (1)) + 1: IF
A(RN,RD) = 0 THEN A(RN,RD) = DR: NEXT : NEXT : RETURN
57020 GOTO 57010
57100 FOR QW = 1 TO 12: FOR WQ = 1 TO 8
57105 IF A(QW,WQ) = 0 THEN 57120
57110 ROT= 64: SCALE= 1: DRAW A(QW,WQ) AT (QW * 22) - 11,(WQ * 22) -
10
57120 NEXT : NEXT : RETURN
57200 FOR VV = 1 TO 177 STEP 22: HPLLOT 1,VV TO 265,VV: NEXT : FOR V
V = 1 TO 265 STEP 22: HPLLOT VV,1 TO VV,177: NEXT
57210 RETURN
57300 HCOLOR= 0: FOR QW = Y - 10 TO Y + 10: HPLLOT X - 9,QW TO X + 1
1,QW: NEXT : HCOLOR= 3:QW = INT (X / 22) + 1:WQ = INT (Y / 22
) + 1:A(QW,WQ) = 0: RETURN
57310 HCOLOR= 0: FOR QW = Y - 10 TO Y + 10: HPLLOT X - 9,QW TO X + 1
1,QW: NEXT : HCOLOR= 3:QW = INT (X / 22) + 1:WQ = INT (Y / 22
) + 1: IF A(QW,WQ) > 3 THEN SC = SC - 100: GOSUB 62500: FOR QQ =
9 TO 33 STEP 4:D = 5:P = QQ: GOSUB 60000: NEXT
57320 A(QW,WQ) = 0: RETURN
58000 PR# 0: TEXT : HOME : IN# 0: CALL 1002: VTAB 1: PRINT "THE GAM
E IS OVER.": PRINT : PRINT "SCORE: "SC: PRINT
58002 PRINT "BINGOS: "BG: PRINT
58004 PRINT
58005 GOSUB 4000
58006 PRINT
58010 PRINT "WOULD YOU LIKE TO PLAY AGAIN, GO TO ANOTHER PROGRA
M, OR QUIT & GO TO BED?": PRINT
58020 PRINT "(1)PLAY AGAIN (2)GO TO ANOTH
ER PROGRAM (3)QUIT & GO TO BED": PRINT
58030 INPUT "(TYPE 1,2, OR 3):";RR
58040 IF RR = 3 THEN HOME : INVERSE : PRINT "GOOD NIGHT!!!": END
58050 IF RR = 2 THEN END
58055 IF RR = 1 THEN CLEAR : CALL 54915: GOTO 1
58060 GOTO 58010
60000 POKE 768,P: POKE 769,D: CALL 770: RETURN
61000 FOR I = 770 TO 790: READ D: POKE I,D: NEXT : RESTORE : RETURN
61010 DATA 173,48,192,136,208,5,206,1,3,240,9,202,208,245,174,0,3
,76,2,3,96
62000 FOR QW = 1 TO 80:V = PEEK ( - 16336): NEXT : RETURN
62500 FOR QQ = 1 TO 13:PP = PEEK ( - 16336): NEXT :P = 29:D = 10: GOSUB
60000: RETURN
63000 PRINT : PRINT "(HIT ANY KEY TO CONTINUE)": PRINT
63010 PP = PEEK ( - 16384): IF PP > 127 THEN POKE - 16368,0: RETURN
63020 GOTO 63010
    
```

End of listing.

bers before hitting the return key. With the latter method it is best to type in a quantity of hex numbers that is divisible by eight. Then, after hitting the return key, you'll be ready to use one of the memory addresses given to begin your next input. When you're done keying in ALLCHAR, type BSAVE ALLCHAR, A\$800, L1272 and hit return.

If you've already saved ALLCHAR from one of my previous columns, it probably starts at a different address from that required for Animal Bingo—namely \$800. To change the address that ALLCHAR is loaded into, type BLOAD ALLCHAR,A\$800 <return>. This overrides the default starting address you specified when you first BSAVED it. Now change the default loading address by typing BSAVE ALLCHAR,A\$800,L1272 <return>. This will ensure that ALLCHAR resides where Animal Bingo expects to find it.

As with so many games, your //e or //c's caps-lock key should be down when you are giving keyboard commands. Not that ALLCHAR doesn't have both upper- and lowercase—it does. But I've linked the commands to the capital letters to accommodate II Plus owners.

Another vector shape table you'll need for playing Animal Bingo is Animals, Listing 3. (It, too, has appeared before in my column, so you may already have it.) Key it in exactly the same way you did ALLCHAR. (For 8FFF-16, type 8FFF:16 <return>.) Then save Animals with BSAVE ANIMALS, A\$8FFF, L1102 <return>.

One final program, Listing 4, is the Hello program needed to keep Animal Bingo from conflicting with the graphics pages and shape tables in memory. If you'd rather use a menu program of your own devising, make sure POKE 104,64 and POKE 16384,0 are executed just prior to running Animal Bingo.

Let me or inCider know how you feel about my recent Fudge It! columns. We'd like to know if they're meeting your needs. See you next time! ■

You can write to Don Fudge at Avant-Garde, P.O. Box 30160, Eugene, OR 97403.



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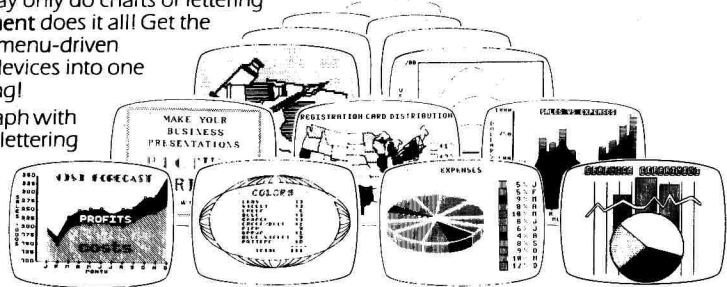
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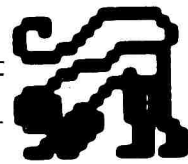
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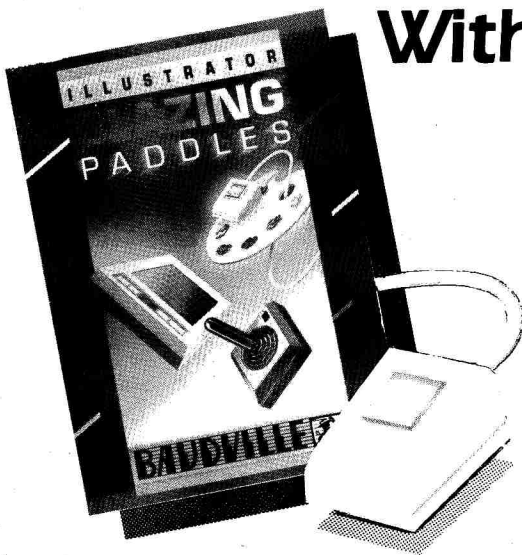
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Listing 2. ALLCHAR,A\$800,L1272.

0800-	7E 00 FE 00 00 01 06 01	0940-	24 20 04 00 49 36 06 00	0A80-	2D B5 1A 3F 04 18 36 36	0BC0-	0E 2D 2D 00 49 09 36 36
0808-	0C 01 1D 01 2B 01 37 01	0948-	49 1E 1E 36 0E 0E 05 00	0A88-	36 00 09 2D F5 DB 36 36	0BC8-	36 1C 1E E7 24 0C 75 06
0810-	44 01 48 01 50 01 58 01	0950-	49 0E 0E 36 1E 1E 1E 00	0A90-	0E 2D 25 3C 07 00 31 36	0BD0-	00 91 29 75 3E 3F 1C 36
0818-	66 01 6E 01 75 01 7A 01	0958-	49 36 36 36 0D E0 04 60	0A98-	36 6E 09 24 3C 3F 4C 21	0BD8-	0E 2D 05 00 49 75 DF F6
0820-	7F 01 87 01 96 01 9E 01	0960-	DF 73 16 1E 1E 00 49 32	0AA0-	24 00 09 2D 1E 36 36 0E	0BE0-	2D 1E 36 06 00 91 29 0D
0828-	A9 01 B4 01 C1 01 CE 01	0968-	36 2E 40 FF 3F 00 49 92	0AA8-	3F 07 00 49 09 36 36 F6	0BE8-	1E F5 35 F6 3F 04 08 E7
0830-	DB 01 E4 01 F2 01 00 02	0970-	12 F6 06 00 2D 91 2A 2D	0AB0-	3F 1C 04 00 31 36 36 6E	0BF0-	24 00 31 36 36 2E 80 80
0838-	05 02 0C 02 15 02 1D 02	0978-	2D 00 49 92 92 06 00 91	0AB8-	09 1C 1C 1C 0C 0C 0C 0C	0BF8-	60 75 36 36 00 49 16 77
0840-	26 02 2F 02 3D 02 4C 02	0980-	92 0C 0C 0C 0C 05 00 09	0AC0-	00 31 36 36 2E 2D 2D 00	0C00-	36 1E 2D 05 00 49 16 77
0848-	5A 02 66 02 72 02 7F 02	0988-	2D 0E 36 36 1E 3F 1C 24	0AC8-	31 36 36 6E 09 24 24 24	0C08-	36 F6 1C 04 00 31 36 36
0850-	8A 02 96 02 A2 02 AB 02	0990-	24 4E F1 1E 06 00 49 1E	0AD0-	1E 1E 1C 04 00 31 36 36	0C10-	6E E1 1C 0C 0C 04 00 09
0858-	B4 02 C1 02 C8 02 D5 02	0998-	35 36 76 3F 07 00 11 0C	0ADB-	6E 09 24 24 24 9F 13 0E	0C18-	35 36 36 1E 2D 05 00 91
0860-	E3 02 EF 02 FB 02 08 03	09A0-	2D 0E F6 F7 1E 2E 2D 2D	0AE0-	0E 06 00 09 2D 0E 36 36	0C20-	36 36 0D 24 E4 0D 0E 36
0868-	17 03 24 03 2C 03 36 03	09A8-	00 29 2D 35 1E 1E 75 F6	0AE8-	1E 3F 1C 24 24 04 00 31	0C28-	36 00 91 36 36 0D 18 80
0870-	40 03 4C 03 58 03 64 03	09B0-	3F 1C 04 00 49 31 36 0E	0AF0-	36 36 2E 80 80 28 65 E4	0C30-	80 0C 75 36 36 00 91 29
0878-	6F 03 7C 03 83 03 90 03	09B8-	37 3E 80 80 3F 64 0C 04	0AF8-	3F 04 00 09 2D 0E 36 FE	0C38-	75 36 1E 3F 1C 24 04 00
0880-	98 03 9F 03 A4 03 AF 03	09C0-	00 29 2D B5 3B 3F B4 49	0BB0-	0E 0E 1F E7 24 24 04 00	0C40-	91 36 36 2E 80 80 2D 0C
0888-	BA 03 C4 03 D1 03 DC 03	09C8-	31 F6 3F 1C 04 00 49 09	0B00-	29 2D 0E F6 3F 04 18 36	0C48-	E4 3F 07 00 91 29 35 26
0890-	E5 03 F2 03 FD 03 05 04	09D0-	3F 1E 1E 36 76 2D 0C E4	0B10-	36 6E 09 1C 1C 05 00 09	0C50-	36 F5 03 80 80 38 1C 24
0898-	0D 04 17 04 1F 04 2A 04	09D8-	3F 07 00 29 2D 35 1E 1E	0B18-	2D 0E DF 33 0E 2D 0E F6	0C58-	00 91 36 36 0D 18 80 80
08A0-	36 04 40 04 4C 04 59 04	09E0-	1E 36 06 00 09 2D 0E F6	0B20-	3F 1C 04 00 29 2D F5 33	0C60-	0C 75 06 00 49 89 3A 3F
08A8-	64 04 70 04 77 04 7F 04	09E8-	3F 1E 76 2D 0C 24 D8 1B	0B28-	36 36 06 00 31 36 36 0E	0C68-	1E 0E 2D 0E 1E 3F 3F 00
08B0-	88 04 92 04 9D 04 A9 04	09F0-	24 00 09 2D 0E 36 F6 1E	0B30-	2D 0C 24 24 24 00 31 36	0C70-	49 F6 2D 1E 36 36 00 91
08B8-	B4 04 BF 04 C8 04 D2 04	09F8-	3F 04 40 2D DC 23 04 00	0B38-	76 0E 0C 0C 24 24 04 00	0C78-	36 76 2D 0C 24 24 00 91
08C0-	D9 04 2D 25 2D 25 2D 2D	0A00-	49 12 16 06 00 49 92 16	0B40-	31 36 36 66 0C AC 72 24	0C80-	36 0E 0E 0C 0C 24 04 00
08C8-	14 65 2B 27 FD 0E 22 E7	0A08-	F6 06 00 49 49 F1 1E 1E	0B48-	24 24 04 00 31 0E 16 1E	0C88-	91 36 76 0C 24 95 62 24
08D0-	24 1E ED 1E 2A 75 12 1C	0A10-	0E 0E 0E 05 00 91 2D 2D	0B50-	6E 09 E4 1C 0C 0C 24 00	0C90-	24 00 91 0E 16 1E 4D E1
08D8-	6D 0E 6B 0E 6E E6 12 E7	0A18-	16 3F 3F 07 00 09 0E 0E	0B58-	31 0E 0E 36 2E 80 80 80	0C98-	1C 0C 0C 0C 00 91 36 0E
08E0-	24 3F 22 66 6B 65 45 1C	0A20-	0E 1E 1E 1E 07 00 11 0C	0B60-	80 0C 24 00 29 2D 35 1E	0CA0-	2D 25 24 95 D2 1E 3F 07
08E8-	24 1E 2A 0C 12 2E 12 0E	0A28-	2D 0E 1E 1E B6 06 00 09	0B68-	1E 1E 1E 2E 2D 2D 00 31	0CA8-	00 91 2D 2D 1E 1E 1E 1E
08F0-	14 E7 24 1E 24 1E 24 1E	0A30-	2D 0E 36 96 3F E7 24 24	0B70-	36 36 2E 2D E5 1B 24 24	0CB0-	2D 2D 05 00 49 2D DE 73
08F8-	6A 1C 07 75 0A 00 01 00	0A38-	8D 36 25 04 00 91 36 36	0B78-	2C 2D 05 00 11 0E 0E 0E	0CB8-	1E 77 F1 0E 2D 05 00 09
0900-	49 36 36 16 06 00 09 36	0A40-	4D 21 3C 3F 04 80 80 0C	0B80-	0E 05 00 29 2D 35 36 36	0CC0-	0E 0E 0E 1E 1E 1E 1E 00
0908-	0D 24 04 00 09 36 36 36	0A48-	0E 0E 36 00 29 2D 0E F6	0B88-	3E 3F 67 09 24 24 07 00	0CC8-	29 75 1E 0E F5 73 1E 3F
0910-	0D 24 24 24 8D 13 16 1F	0A50-	3F 04 18 36 36 2E 2D 0C	0B90-	91 12 0C 0C 0E 0E 05 00	0CD0-	07 00 11 0C 0E 0E 0C 05
0918-	04 F8 16 06 00 49 2E B5	0A58-	24 00 49 89 1C 3F 1E 36	0B98-	91 92 12 2D 2D 05 00 09	0CD8-	00 29 2D 2D 35 3F 3F 3F
0920-	F2 37 1C 67 61 3F 1C 0C	0A60-	36 0E 2D 0C 04 00 29 2D	0BA0-	0E 0E 06 00 91 29 35 36	0CE0-	2E 2D 2D 35 3F 3F 2E
0928-	0E 05 00 31 25 4D F2 1E	0A68-	0E 36 36 1E 3F 27 24 24	0BA8-	2E DE 38 1C 0C 2D 00 31	0CE8-	2D 2D 35 3F 3F 2E 2D
0930-	1E 1E 4E 29 3C 07 00 09	0A70-	04 00 29 2D B5 1A 3F 04	0BB0-	36 36 2E 70 65 24 1C F7	0CF0-	2D 35 3F 3F 3F 07 00 00
0938-	0E F6 0E 0D 1E 0E 1F E7	0A78-	18 36 36 2E 2D 2D 00 29	0BB8-	06 00 91 49 39 3F 1E 36		

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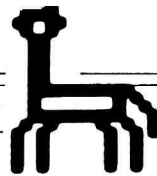
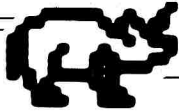
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Listing 3. Animals,A\$8FFF,L1102.

Table with columns of alphanumeric codes (e.g., 8FFF-16, 9000-00) and corresponding data values.

Listing 4. The Hello program.

258 POKE 103,1: POKE 104,64: POKE 16384,0
260 D\$ = CHR\$(4)
1000 PRINT D\$;"RUNANIMAL BINGO"

Circle 35 on Reader Service card.

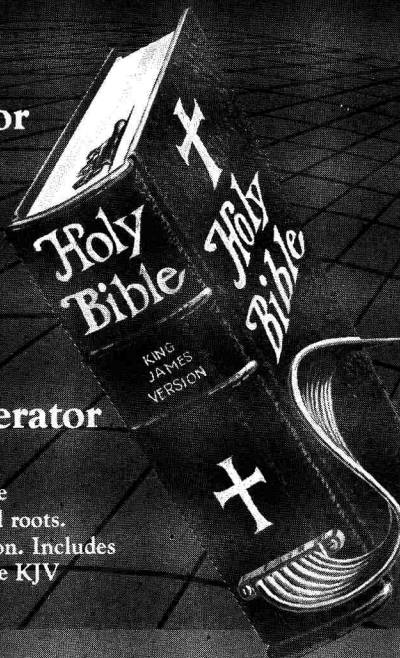
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## Maintenance Made Easy

by Paul Pagel

Sometimes a common-sense, do-it-yourself approach to computer housekeeping tasks works best. So here are some maintenance hints for Apple owners to help with sound control, keyboard contamination, screen glare, and radio frequency interference (RFI).

### Sound Off

If beeping computers annoy you, install an on/off switch in your speaker as I did in my Apple IIe.

Inside the computer, the speaker is mounted facedown against the louvres on the bottom, left-hand side. Two twisted wires run from the speaker to a connector on the motherboard. The proximity of the wires to the louvres makes any of those ready-made holes a convenient spot for mounting an on/off switch. The minimal clearance space between the bottom of the computer and the desk doesn't leave enough room for the bat handle of a toggle switch, but my parts supply yielded a miniature DPDT slide switch (one pole is unused) that fits perfectly in one of the louvres. You can find similar slide switches at Radio Shack stores and electronic-supply houses.

I mounted the switch, cut one of the speaker wires (it doesn't matter which one you use), and connected the wires to the switch as shown in the **Figure**. The speaker wires carry 5V dc, so make certain there are no shorts to ground or to other components to avoid power-supply and other damage. I used small pieces of heat-shrink tubing over the wire/switch terminal connections to avoid inadvertent shorts.

Now I can silence my Apple any time. Raising the front of the computer slightly to reach the switch is a small inconvenience considering the

results: easy installation of an inconspicuous switch.

### Keyboard Cover

Your computer keyboard is exposed to many hazards: accumulated dust, wayward staples and paper clips, coffee spills—to name a few. A commercial cover works fine when the computer isn't on; however, when you are away from an operating computer, you can't use this cover to protect the monitor and keyboard because of heat build-up. My solution is to use a plastic bag—not any old plastic bag, but a genuine Apple ("The Personal Computer") shopping bag.

I cut the bag in half, folded over about 4 inches at the top, and taped it to the bottom (formerly the inside) of the bag half. This provides me with a colorful cover that I secure over the keyboard by placing a large rubber band around the computer case just above the keyboard in the

slot that normally stores pens or pencils. When I leave the computer unattended, I slide the top portion of the cover under the rubber band, and dress the cover over the keyboard. This provides inexpensive keyboard insurance and avoids heat build-up. It's quick and easy to use, and the price is right.

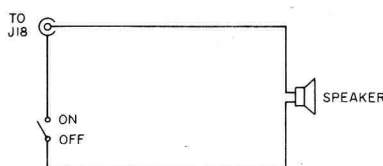
### Screen Glare

Despite the anti-reflective screen covering on some video monitors, a major source of eyestrain and headaches is screen glare caused by overhead lighting. Changing the position of the monitor or the computer station or using a different lighting scheme is a relatively obvious, though not always practical, means of correcting the problem. A simpler solution is placing a light shield on top of the monitor (a manila file folder taped to the monitor cabinet will do) so that it extends a few inches in front of the screen to prevent glare from above.

### Cable Shielding

Amidon Associates offers a line of ferrite products that help eliminate RFI to and from computers. These devices come in various shapes (donuts, flat bars, cylinders) and sizes to fit practically every requirement. The relatively new flat ferrite bars are ideal for use with disk drive, printer, and other flat cables. Each bar, comprising two U-shaped sections of ferrite, can be placed on either side of a cable and held together with rubber bands, tape, or nylon ties. Write to Amidon Associates, 12033 Otsego Street, North Hollywood, CA 91607, for more information. ■

**Figure.** Although the circuit requires only a single-pole, single-throw (SPST) switch, chances are a single-pole, double-throw (SPDT) or double-pole, double-throw (DPDT) switch is easier to obtain. Break one of the speaker leads and insert the switch in series with it. Insulate the connections with heat-shrink or spaghetti tubing to avoid accidental shorts.



Contact Paul K. Pagel at 4 Roberts Road, Enfield, CT 06082.

# Now You See It; Now You Don't

by P. Kenneth Morse

Cleaning house can pose unforeseen difficulties. While working on a set of Turbo Pascal procedures, I decided to clear the .BAK files but ended up erasing the .PAS files as well. In Apple DOS, I would have used an appropriate utility to recover the files, but until I discovered Turbo Pascal, I rarely used CP/M so I had no such utility.

With three weeks' work lost and no back-up disk, I needed to recover the files. Before panicking, I reasoned that perhaps a DOS zap program could correct the damage if I located the CP/M directory and discovered what CP/M changed to erase a file from the directory.

First I located the directory by taking a newly formatted CP/M disk and

PIPing one file to it. Track 17 was blank (CP/M has \$E5 in each byte of an unused sector), but track 3 sector 0 showed a 32-byte directory entry. I wrote down the 32 bytes in hex and then read track 3 sector 0 on my erased disk. Directory entries were found beginning at bytes \$00, \$20, \$40, \$60, \$80, \$A0, \$C0, and \$E0.

The first byte of each erased entry was \$E5, while the first byte of the good entry on the test disk was \$00. It seemed almost too simple, but I zapped \$00 into bytes \$00, 20, 40, 60, 80, A0, C0 and E0, booted CP/M, and eight files appeared on the directory. I typed them (all were text files) to verify their recovery.

Since the original disk had more than 40 files, I rebooted DOS and re-

loaded my zap program to search for the other entries. Sectors 1 and 2 on track 3 contained program text, but sector 3 had eight more entries. Directory entries also appeared on sectors 6, 9, 12, and 15. After zapping \$00 into the first byte of these entries, I recovered my disk.

DOS changes the bit map when you delete a file to free up the occupied sectors, and CP/M replicates the procedure. I PIPed the recovered files to the test disk, and then used Copy to transfer the files back to the original disk. This ensured that CP/M would not write over the files when I added a new file to the disk. ■

Write to P. Kenneth Morse at P.O. Box 3367, Augusta, GA 30904.

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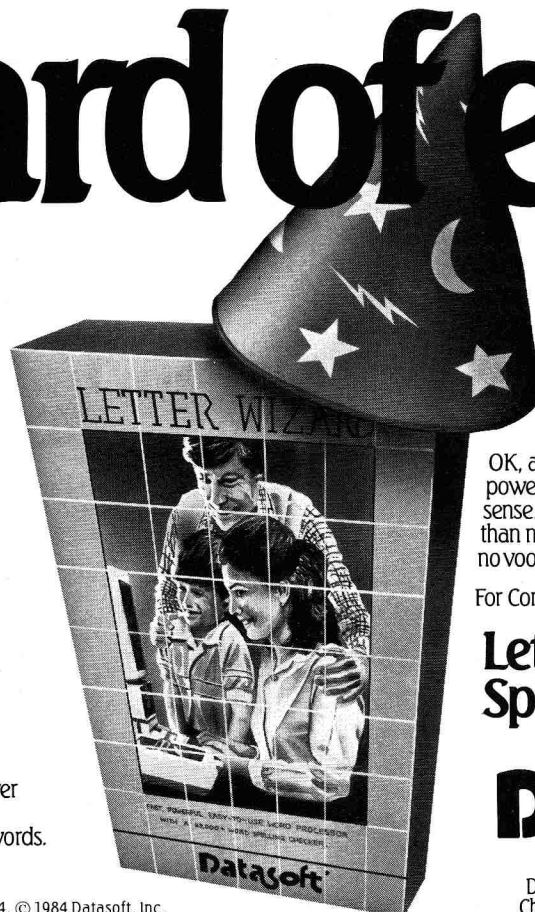
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edited by Joan Witham

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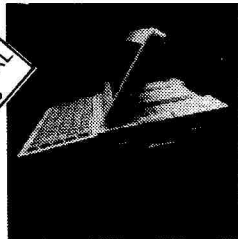
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★★★★	Superlative
★★★	Above average
★★	Good
★	Not recommended
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## Software

### Access II

★★★★  
Apple Computer, Inc., 20525 Mariani Avenue, Cupertino, CA 95014  
Communications, August '84.  
A sophisticated yet easy to use terminal package. Pro-DOS based. \$75.

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★★★★  
BPI Systems, 3423 Guadalupe, Austin, TX 78705  
Business, June '84.  
Get a handle on your business. This package does what an AR package should. \$395.

### Alphabet Beasts and Company

★★  
Reader's Digest Software, Microcomputer Software Division, Pleasantville, NY 10570  
Education, July '84.  
Beautiful graphics help youngsters learn how to draw numbers, letters, and strange creatures. \$34.95.

### Apple Logo II

★★★★  
Apple Computer, Inc., 20525 Mariani Avenue, Cupertino, CA 95014  
Language, September '84.  
More powerful and complete than its predecessor. Requires a //c or a 128K //e. \$100.

### AppleWorks

★★★★  
Apple Computer, Inc., 20525 Mariani Avenue, Cupertino, CA 95014  
Business, July '84.  
A superb integrated package featuring a word processor, a spreadsheet, and a data base manager. An excellent value. \$249.

### BASIC Tutor

★★  
Supersoft, Inc., 1713 S. Neil Street, Champaign, IL 61820  
Education, August '84.  
A solid instructional package for people interested in learning Applesoft BASIC. Schools can take advantage of a multiple copy policy. \$99.95.

### 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.

### Break the Bank Blackjack

★★  
Gentry Software, 9411 Winnetka Avenue, Chatsworth, CA 91311  
Entertainment, July '84.  
This program teaches you how to count cards when playing blackjack. \$24.95.

### Carrier Force

★★★  
Strategic Simulations, Inc., 883 Stierlin Road, Building A-200, Mountain View, CA 94043  
Strategy game, August '84.  
A war game that simulates a number of famous air-sea battles of the Pacific Theater in World War II. A super challenge. \$59.95.

### Caverns of Callisto

★★  
Origin Systems, Inc., P.O. Box 58009, Houston, TX 77258  
Arcade game, June '84.  
It's a long walk (400 million miles) back to Earth if you don't find the parts stolen from your spaceship. \$34.95.

### Certified Personal Accountant

★★  
Sundex Software, 3000 Pearl Street, Boulder, CO 80301  
Home accounting, October '84.  
CPA tracks your personal financial information in an easy and understandable way. \$99.95.

### Chivalry

★★★  
Weekly Reader Software, 245 Long Hill Road, Middletown, CT 06457  
Arcade game, June '84.  
Beautiful graphics enhance this game set in days of yore. A great game for kids. \$49.95.

### CodeWriter

★★★  
CodeWriter Corp., 7847 North Caldwell Avenue, Niles, IL 60648  
Utility, October '84.  
CodeWriter is a data-base generation program that lets you create tailor-made data bases. \$199.

### The Coveted Mirror

★★  
Penguin Software, P.O. Box 311, Geneva, IL 60134  
Adventure game, August '84.  
An adventure game with some arcade features included. Be careful—King Voar is watching! \$34.95.

### Create-A-Test

★★  
Create-A-Test Company, 80 Tilley Drive, Scarborough, Ontario, Canada M1C 2G4  
Education, September '84.  
Teachers can save a lot of time with this test authoring system. Question disks are also available. \$89.95.

### 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.

### Disk Quick

★★★  
Beagle Bros, Inc., 4315 Sierra Vista, San Diego, CA 92103  
Utility, June '84.  
Turn the extended 80-column card in your //e into a RAM disk. \$29.50.

### 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.

### Dow Jones Spreadsheet Link

★★★  
Dow Jones & Company, Inc., P.O. Box 300, Princeton, NJ 08540  
Communications, October '84.  
This package automatically dials up the Dow Jones data base, downloads information on selected stocks, and writes the data to a file which can be read by your spreadsheet program. \$249.

### The Eating Machine

★★★  
Muse Software, 347 North Charles Street, Baltimore, MD 21201  
Home, July '84.  
A cut above the average self-improvement program. The Eating Machine helps you plan a healthy diet. \$49.95.

**Edu-Ware Fractions**

★★★

Edu-Ware Services, Inc., P.O. Box 22222, Agoura Hills, CA 91301

Education, September '84. Everything you always wanted to know about fractions and decimals. \$49.

**Electronic Playground**

★★

Software Entertainment Company, 537 Willamette Street, Eugene, OR 97401

Education, August '84. Games for three- to eight-year-olds, including a kaleidoscope, a matching game, and a drawing program. \$24.95.

**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.

**The Factory**

★★★

Sunburst Communications, Inc., 39 Washington Avenue, Pleasantville, NY 10570

Education, July '84. Designed for fourth through ninth graders, The Factory teaches real problem solving skills in a challenging way. \$55.

**Fraction Factory**

★★★★

Counterpoint Software, 7807 Creekridge Circle, Minneapolis, MN 55435

Education, September '84. An excellent introduction to fractions for young learners. \$29.95.

**Fraction Fever**

★

Spinnaker Software, 1 Kendall Square, Cambridge, MA 02139

Education, September '84. An arcade game that teaches fraction equivalents. Poor documentation limits the usefulness of the software. \$34.95.

**Fractions**

★★★★★

Quality Educational Designs, P.O. Box 12486, Portland, OR 97212

Education, September '84. A package containing six disks that makes learning about fractions fun. An excellent buy for schools. \$175.

**The Graphics Magician**

★★★★

Penguin Software, P.O. Box 311, Geneva, IL 60134

Graphics, June '84. A great graphics utility for the Apple. No wonder so many professional game designers use it. \$59.95.

**Gruds in Space**

★★★

Sirius Software, Inc., 10364 Rockingham Drive, Sacramento, CA 95827

Adventure game, June '84. Saving the universe can be a chore. A game where all is not what it seems. \$39.95.

**Gutenberg Jr.**

★★★

Micromation Limited, 1 Yorkdale Road, STE 406, Toronto, Ontario, Canada M6A 3A1

Word processor, June '84. A powerful and inexpensive program for combining text and graphics. Limited in the hardware it supports. \$85.

**The Heist**

★★★★

Micro Lab, 2699 Skokie Valley Road, Highland Park, IL 60035

Arcade game, October '84. Great animation is the high point of this game in the vein of Miner 2049'er and Donkey Kong. \$40.

**Homeword**

★★★

Sierra On-Line, 36575 Mudge Range Road, Coarsegold, CA 93614

Word processor, July '84. The use of icons makes this inexpensive package easy for beginners to understand. \$69.95.

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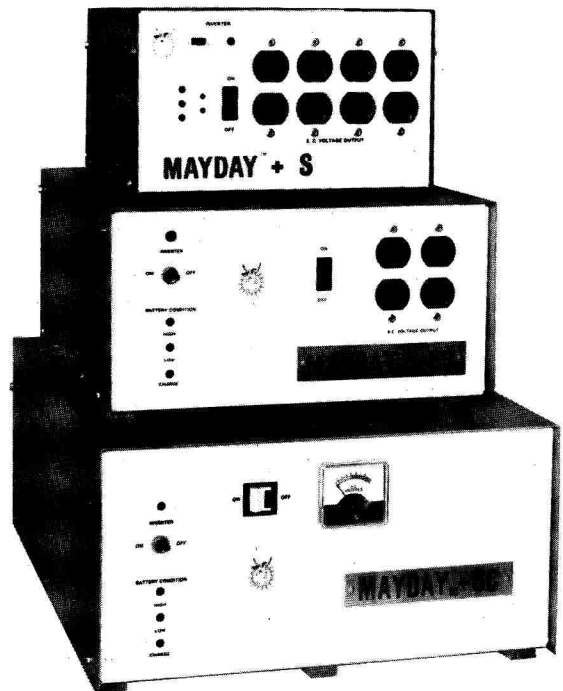
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**In Search of the Most Amazing Thing**  
★ ★ ★

Spinnaker Software, 1 Kendall Square, Cambridge, MA 02139

Education, June '84.  
An adventure game for children that helps develop reasoning skills and deemphasizes violence. \$39.95.

**In-The-Mail**  
★ ★

el Dorado Software, 350 7th Avenue, Suite 324, San Francisco, CA 94118 Business, July '84.

In-The-Mail gives you 99 different letters for all those times when you can't think of what to write. From sympathy notes to letters of resignation, this package has them all. \$60.

**Jeepers Creatures**  
★ ★

Kangaroo, Inc., 332 S. Michigan Avenue, Suite 700, Chicago, IL 60604  
Education, July '84.  
A program for preschoolers

that lets kids be creative while practicing word recognition and association. \$34.95.

**Jenny of the Prairie**  
★ ★

Addison-Wesley Publishing Company, Jacob Way, Reading, MA 01867  
Adventure game, August '84.  
You take the part of the "plucky pioneer girl" and try to survive the harsh prairie winter. \$39.95.

**Kids on Keys**  
★ ★

Spinnaker Software, 1 Kendall Square, Cambridge, MA 02139  
Education, September '84.  
A game for young children that teaches how to use the Apple keyboard. \$29.95.

**Kidwriter**  
★ ★ ★

Spinnaker Software, 1 Kendall Square, Cambridge, MA 02139  
Education, July '84.  
A good reason why Spin-

naker has a reputation for excellence. This program lets young kids create pictures and then write short stories to accompany them. \$34.95.

**Kinder Koncepts**  
★ ★

Midwest Software, Box 214, Farmington, MI 48024  
Education, September '84.  
Six disks containing 30 programs that teach math and reading skills to young children. \$175 or \$39.50 per disk.

**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.

**Letters and Words**  
★ ★

Learning Well/Methods and Solutions, Inc., 200 South

Service Road, Roslyn Heights, NY 11577  
Education, July '84.  
Games for preschoolers that teach alphabet sequencing, upper/lowercase association, and word/object association. \$49.95.

**Magicalc**  
★ ★ ★

Artsci, Inc., 5547 Satsuma Avenue, North Hollywood, CA 91601  
Spreadsheet, September '84.  
Powerful, flexible, and economical, this spreadsheet is the answer to a VisiCalc user's dreams. \$149.

**Magic Memory**  
★ ★

Artsci, Inc., 5547 Satsuma Avenue, North Hollywood, CA 91601  
Data base, June '84.  
Put your address book on your computer with this easy to use package. Although not very powerful, it does its job well. \$99.95.

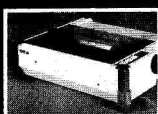
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## Masquerade

★ ★ ★

Phoenix Software, Inc., 64 Lake Zurich Drive, Lake Zurich, IL 60047

Adventure game, July '84. This hi-res game features a wonderful collection of characters and a bewildering array of puzzles that you must solve before you can unmask that arch-criminal, Mr. Topp. \$34.95.

## Mastering the SAT

★ ★

CBS Software, One Fawcett Place, Greenwich, CT 06836 Education, September '84.

A good preparation for the Scholastic Aptitude Test. \$150.

## Microzine

★ ★

Scholastic Wizware, 730 Broadway, New York, NY 10003

Education, June '84. A disk magazine from the publishers of *Scholastic*. More fun than flipping pages. \$39.95.

## Murder by the Dozen

★ ★ ★

CBS Software, One Fawcett Place, Greenwich, CT 06836 Strategy game, August '84.

A great game for Agatha Christie fans and anyone else who likes a tough problem to crack. \$34.95.

## Number Commander

★ ★

ComputerEase, Inc., 1312 West Cedar Street, Appleton, WI 54914 Statistics, August '84.

A good package for those who store and manipulate a lot of numeric data. \$125.

## One-on-One

★ ★ ★

Electronic Arts, 2755 Campus Drive, San Mateo, CA 94403

Game, July '84. The best sports game available for the Apple. When Larry Bird and Julius Erving go one-on-one, it's almost as much fun as a Celtics-Sixers playoff game at the Garden. If only they had included a parquet floor. \$40.

## Paper Graphics

★ ★ ★

Penguin Software, P.O. Box 311, Geneva, IL 60134 Graphics, July '84.

This package lets you print the contents of the Apple hires screens. As an added bonus, you can edit the pictures before you print them. \$49.95.

## 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.

## Planetfall

★ ★

Infocom, Inc., 55 Wheeler Street, Cambridge, MA 02138

Adventure game, August '84. With Floyd as your boon companion, you'll set out to unravel the mysteries of the lost civilization. Success depends upon your wits and imagination. \$49.95.

## Plato Fractions

★ ★

Control Data Publishing, 4455 Eastgate Mall, San Diego, CA 92121 Education, September '84. A dart game with a difference. This one teaches youngsters about fractions. \$49.95.

## Plato Whole Numbers

★ ★

Control Data Publishing, 4455 Eastgate Mall, San Diego, CA 92121 Education, September '84. An arithmetic drill that takes the form of a pinball game. \$49.95.

**Practicalc II**

★★★  
PractiCorp, 44 Oak Street,  
Newton Upper Falls, MA  
02164  
Spreadsheet, October '84.  
Practicalc offers the features  
of spreadsheets costing more  
than twice as much. As a  
bonus, it also has limited  
data-handling and text-  
handling capabilities. \$69.

**The Print Shop**

★★★  
Broderbund Software, 17  
Paul Drive, San Rafael, CA  
94903  
Graphics, September '84.  
The Print Shop lets you com-  
bine graphics and text and  
print the results on a dot-ma-  
trix printer. An excellent pro-  
gram and a lot of fun.  
\$49.95.

**Report Card**

★★★  
Sensible Software, Inc.,  
24011 Seneca, Oak Park, MI  
48237  
Education, October '84.  
For teachers only. Report  
Card eliminates the tedium  
of calculating student  
grades. \$59.95.

**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.

**Sargon III**

★★★  
Hayden Software, 600 Suf-  
folk Street, Lowell, MA  
01853  
Strategy game, August '84.  
A worthy successor to Sar-  
gon II. Its enhanced features  
make it a great buy. \$49.95.

**Simply Perfect**

★★★  
LJK, Inc., 7852 Big Bend  
Boulevard, St. Louis, MO  
63119  
Business, October '84.  
An integrated package that  
features a word processor, a

spelling checker, and a data  
manager. Requires a 128K  
Apple II. \$189.95.

**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.

**Speed Reader II**

★★★  
Davidson & Associates, 6069  
Groveoak Place, #12, Rancho  
Palos Verdes, CA 90274  
Education, June '84.  
Increased productivity is the  
goal of this software. A good  
alternative to expensive speed-  
reading courses. \$69.95.

**Stickybear Opposites**

★★★  
Weekly Reader Family Soft-  
ware, 245 Long Hill Road,  
Middletown, CT 06457  
Education, August '84.  
Colorful graphics teach kids  
word opposites. For 3- to  
6-year-olds. \$39.95.

**Stock-Folio**

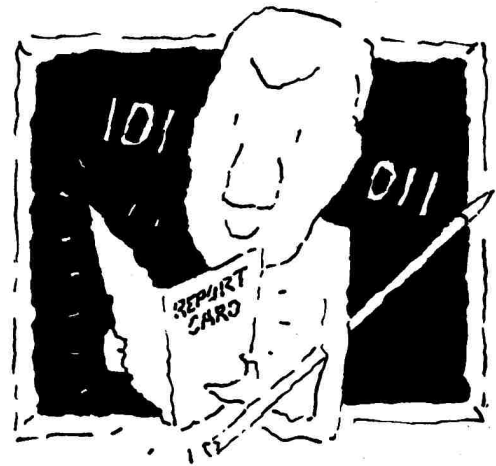
★★★  
Micro Program Designs, 5440  
Crestline Road, Wilmington,  
DE 19808  
Investment analysis, October  
'84.  
With Stock-Folio, you can  
plot the activities of different  
stocks. It doesn't support  
downloading data from Dow  
Jones. \$79.50.

**Term Exec 1.2**

★★★  
Exec Software, 201 Waltham  
Street, Lexington, MA 02173  
Communications, June '84.  
A sophisticated yet low-cost  
communications package for  
the Apple. Sometimes hard  
to use, but worth the bother.  
\$79.95.

**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.



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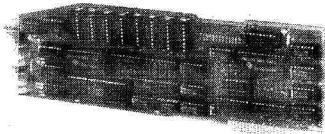
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### Tournament Golf

★ ★ ★

Microcomputer Games, Inc., 4517 Harford Road, Baltimore, MD 21214  
Simulation game, August '84. An excellent sports simulation. Have fun making chip shots with your computer! \$30.

### VODAC—The Alpine Encounter

★ ★

Ibidinc, 179 Allyn Street, Suite 607, Hartford, CT 06103  
Adventure game, July '84. A hi-res game of intrigue set in the Swiss Alps. Robert Ludlum would love this game. \$39.95.

### Winning on Wall Street

★ ★ ★ ★

Summa Software, P.O. Box 2046, Beaverton, OR 97075  
Investment analysis, October '84.

A decision support system for stock traders and investors. Winning on Wall Street consists of three separate packages. \$700.

### Word Blaster

★ ★

Random House, 201 East 50th Street, New York, NY 10022

Education, July '84. Students in grades two through six will enjoy this reading and comprehension program. You don't have to tell them they can learn from it. \$150.

### 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.

### Work Force II

★ ★

Core Concepts, P.O. Box 24157, Tempe, AZ 85282  
Home, June '84.

Six programs that help you manage your budget. Includes a checkbook program, a loan analyzer, and a savings analyzer. \$29.95.

### The Writer

★ ★

Hayden Software, 600 Suffolk Street, Lowell, MA 01853

Word processor, July '84. A solid, low-cost word processor. The Writer is a scaled-down version of the popular Pie Writer by Hayden. \$49.95.

### Hardware

#### AppleModem 300/1200

★ ★ ★

Apple Computer, Inc., 20525 Mariani Avenue, Cupertino, CA 95014

Modem, August '84. An external modem that provides 300- and 1200-baud operation. Lots of nice features. \$49.95.

#### 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.

#### CP/M Gold Card

★ ★ ★ ★

Digital Research, P.O. Box 579, Pacific Grove, CA 93950  
Coprocessor, October '84.

The makers of CP/M have developed an excellent Z-80 board to run their industry-standard, eight-bit operating system. \$350.

#### Drum-Key

★ ★ ★

PVI, 1 Great Valley Parkway East, Malvern, PA 19335  
Sound synthesizer, October '84.

You can create some impressive percussion lines with this peripheral card from PVI. An external amplifier and speakers are required. \$139.95.

#### EXP 500

★ ★

Silver-Reed America, Inc., 19600 South Vermont Avenue, Torrance, CA 90502

Printer, June '84. A daisy-wheel printer with 12 cps and a low price. Free yourself from dot-matrix. \$599.

**FingerPrint**

★★★ ★  
Precision Software, Inc.,  
4747 N.W. 72nd Avenue,  
Miami, FL 33166  
Printer interface, October  
'84.  
This intelligent interface  
card can dump both the text  
and graphics screens to your  
printer. It works with a wide  
variety of printers. \$149.

**Gibson Light Pen**

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

**Graphics Tablet**

★★ ★  
Apple Computer, Inc., 20525  
Mariani Avenue, Cupertino,  
CA 95014  
Graphics, September '84.  
A sophisticated input device  
for producing high-quality  
graphics on the Apple II. Not  
for the casual user. \$795.

**Juki 6100**

★★★ ★  
Juki Industries of America,  
Inc., 299 Market Street, Sad-  
dle Brook, NJ 07662  
Printer, June '84.  
A low-cost daisy-wheel print-  
er that features 18 cps oper-  
ation. \$699.

**L-1000**

★★ ★  
Smith-Corona Consumer  
Products, 65 Locust Street,  
New Canaan, CT 06840  
Printer, June '84.  
Letter quality can be within  
your budget. This inexpen-  
sive daisy-wheel printer fea-  
tures 12 cps operation. \$595.

**Password Modem**

★★★ ★  
U.S. Robotics, Inc., 1123  
West Washington Boulevard,  
Chicago, IL 60607  
Modem, August '84.  
A 300/1200 baud external  
modem that is suited espe-  
cially for advanced home and  
business communications.  
\$449.

**PowerPad and  
Leonardo's Library**

★★ ★  
Chalkboard, Inc., 3772  
Pleasantdale Road, Atlanta,  
GA 30340  
Education, September '84.  
A hardware-software prod-  
uct that eliminates the need  
for keyboard input. Ideal for  
children. Pad—\$149.95;  
software—\$39.95 each.

**Pro 100 Keyboard**

★★ ★  
Amkey, 220 Ballardvale  
Street, Wilmington, MA  
01887  
Keyboard, November '84.  
A replacement keyboard for  
the Apple II and II Plus. In-  
cludes function keys and a  
numeric keypad. \$295.

**RP1200N**

★★★ ★  
Ricoh of America, Inc., 5  
Dedrick Place, West  
Caldwell, NJ 07006  
Printer, October '84.  
At 18-20 cps and a mid-  
range price, the RP1200N is  
a good value. \$895.

**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. \$119.95.

**Voice-Based  
Learning System**

★★ ★  
Scott Instruments Corpora-  
tion, 1111 Willow Springs  
Drive, Denton, TX 76205  
Education, June '84.  
A hardware-software pack-  
age. It lets you create inter-  
active tutorials that recog-  
nize speech input. A system  
with a lot of potential. \$895.

**Voice Box III**

★★ ★  
The Alien Group, 27 West  
23rd Street, New York, NY  
10010  
Speech synthesizer,  
November '84.  
This is a very good speech  
synthesizer, but hampered  
by poor documentation. \$129.

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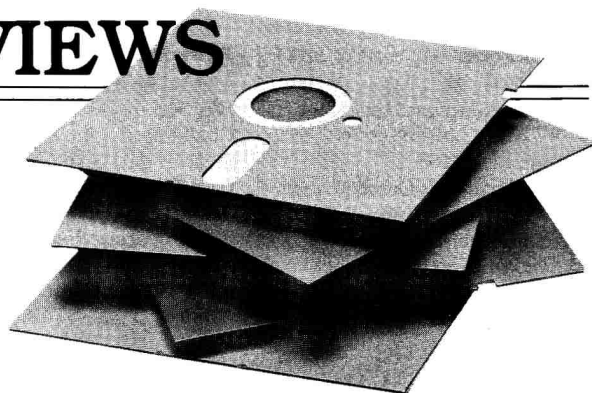
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# SOFTWARE REVIEWS



## inCider's Ratings

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

## Financial Cookbook

### Electronic Arts

2755 Campus Drive  
San Mateo, CA 94403

Home finance  
\$50

★★★

**F**inancial Cookbook answers home finance questions through a worksheet that makes it more than just a programmed calculator. This program is useful if you lack a spreadsheet program or are uncomfortable constructing spreadsheets using financial formulas for future and present values, interest rates, and so on.

Financial Cookbook provides 32 "recipes"—related to savings, interest rates, investments, IRA's, and mortgages—with fill-in blanks. The Leasing Your Car recipe, for example, has blanks for initial and monthly payments, tax credit, interest rate earned, and five other amounts.

After you fill in the numbers, press a sequence of keys (or point and click the mouse), and the program computes and displays the results. The results for car leasing include monthly and total

```

1: Saving Money with IRAs
Compares growth of IRA deposit with
regular savings deposit
    
```

```

Amount of deposit $ 2000
Years to analyze 4
Interest rate earned % 10
Compounding periods 365
Marginal tax rate % 30
    
```

```

Ending savings balance .... $ 1860
Ending IRA balance ..... $ 2984
    
```

YR	-----NON IRA-----			IRA	
	INTEREST	TAXDUE	BALANCE	BALANCE	
NOW	\$ 0	\$ 600	\$ 1400	\$ 2000	
1	\$ 147	\$ 44	\$ 1503	\$ 2210	
2	\$ 158	\$ 47	\$ 1614	\$ 2443	
3	\$ 170	\$ 51	\$ 1732	\$ 2700	
4	\$ 182	\$ 55	\$ 1860	\$ 2984	
TOT	\$ 657	\$ 797	\$ 1860	\$ 2984	

```

■ COMPUTE ■ INDEX ■ PRINT ■ SAVE ■ BALANCE
Arrows select command, RETURN does it
    
```

Recipe for an IRA from the Financial Cookbook.

values for cash payment, tax savings, net expense, and the current value of total leasing costs.

Once the results are computed, you can ask "what-if" questions or change some numbers to see how the financial situation changes. You can also retrieve previously saved worksheets, print them, or rework them. Functions include the ability to back up, delete, and rename files.

I do have one complaint. Worksheets can be saved only on document disks initialized from within the program, but these disks aren't compatible with standard DOS, and you can't access saved worksheets from other programs. The Financial Cookbook's

stored worksheets can't even be used by its publisher's word processor, Cut and Paste.

The Cookbook's excellent 32-page manual glosses financial jargon for you. It begins with a program introduction, a discussion of financial terms, and a short tutorial. Recipe explanations are next, followed by a glossary and an index.

The Financial Cookbook is slightly flawed by one minor undocumented feature. Sometimes when you print a worksheet and then review the results on the screen, the program goes out to lunch. This happens with only the last six recipes, and if it does, you have no choice but to reboot the disk and lose





Infocom's *Seastalker* for underwater adventure.

the worksheet. You still have the print-out; without it, ironically, the bug doesn't seem to surface in the first place.

Overall, *Financial Cookbook* is well done. It's easy to use and comes with an excellent manual. A nonstandard disk format and a minor bug account for the only distractions. Of course, it can't compete with a full-blown spreadsheet program, but if the included recipes meet your needs, *Financial Cookbook* might be the selection for you. ■

**Jon Voskuil**  
Milford, NH

## Seastalker

### Infocom

55 Wheeler Street  
Cambridge, MA 02138

Text adventure  
\$39.95

★★★★

In the depths of the sea lie strange and wonderful creatures. You'll fight the most deadly ones in *Seastalker*, an Infocom text adventure for ages nine and up with enough action and challenge for any beginning adventurer.

You're a member of the Discovery Squad in command of the submarine *Scimitar*, designed to take two men on voyages of deep-sea exploration. One day, while working in the laboratory/headquarters of the Discovery Squad, you get a message from the

*Aquadome*, a permanent underwater research station: A gigantic sea monster is attacking the base.

You must go to the rescue, but technical foul-ups make the job difficult. In addition, one of your most trusted aides is bent on sabotaging the entire operation. You must power up the *Scimitar* and navigate it submerged through the treacherous waters of Frobton Bay and far out to sea to the *Aquadome* station. Once there, you will have to contend with equipment failure, morale problems, more treachery, and, of course, the monster's attacks, which are weakening the dome to the danger point.

Since this is an Infocom game, you can devise complex commands to make the program do what you want. This is in vivid contrast to other companies' adventures, which usually require simple commands like "GET WRENCH" or "CLIMB ROPE." Typically sophisticated commands from *Seastalker* are "TAKE THE BLACK BOX, OXYGEN GEAR AND UNIVERSAL TOOL," and "MARV, GO TO THE LAB THEN FIX THE SUBMARINE." The game's capacity to understand English sentences increases the sense of realism. You feel as if you're talking to people, not machines.

The game comes with various aids and goodies: a full-color chart of the bay, blueprints of the lab, the sub, and the *Aquadome*, character sketches of all the principal characters in the game, stickers, and a game manual.

*Seastalker* has plenty of clues you can use when the going gets tough. If

you appear to be trapped or if you don't perform certain actions in a certain sequence and number of turns, hint messages appear on screen. These messages steer you to a collection of hint cards you can read via a decoding device packaged with the game.

My own hints are: Don't trust many of the people you meet in the *Aquadome*; find the catalyst capsule quickly and use it where it belongs in the sub, and read a magazine during the long boring part of the trip out to the dome. If you can't get started, go into the corridor and look at the panel. One last hint: Close the hatch!

Infocom couldn't have designed a better game to introduce new players to their text-only adventures. *Seastalker* has lots of action, intrigue, and surprises. It's a great stimulus to the imagination, an ideal puzzle for the beginner, and a wonderful pastime for your nine-year-old to share with Mom or Dad.

*Seastalker* will run on any Apple II with at least 32K (if you have 64K the program will execute faster) and on the Apple III in Apple II emulation mode. You'll need a scratch disk to save games. ■

**Brian J. Murphy**  
Fairfield, CT

## MathMaze

### DesignWare

185 Berry Street  
San Francisco, CA 94107

Basic math skills  
\$39.95

★★★

Learning can be fun and DesignWare's *MathMaze* proves it for the four basic mathematical operations of addition, subtraction, multiplication, and division.

*MathMaze* begins with an all-encompassing demonstration. The high-resolution graphics entice any child to play without giving any hint that he or she is using skills learned at school.

First, the child chooses one of the four operations and the difficulty level. Then the child solves ten math problems by moving a fly through a maze to the correct answer. The problem is pictured at the bottom left of the screen and the score is at the bottom

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## SOFTWARE REVIEWS



right. (Movement of the fly is controlled by the I, J, K, M keys.) The program guide includes provision for using a joystick.

Correct answers receive bonus points, but these points decrease for every few seconds taken to solve the problem. Each problem begins with 100 bonus points, so the most points are won by maneuvering the fly through the maze in a direct path. The quickest motion is rewarded, thereby strengthening eye-to-hand coordination.

MathMaze has been carefully planned and coordinated with the educational process. The child begins slowly. In the additional games, the child learns to add to ten, then to 20, and so on. In multiplication, the times tables are learned just like in school. With MathMaze, the mathematical instruction of basic operations is coordinated between school and home. Active participation between parents and teachers is possible.

For the more skilled math student, MathMaze offers challenging options. The student may choose from 40 mazes and four skill levels. He or she may also design mazes, which can be stored on a data disk.

The four difficulty levels are carefully structured. The first level is directed toward the young math student. The second level introduces an enemy—a spider who likes flies—who provides an interesting twist to the math game. In the third level, all the walls of the maze disappear. The fourth level combines all of the above: math skills, the enemy, and invisible walls.

The strongest point for this program is the link between home and school. Now parents have a vehicle, the computer, to take an active part in the education of their children while having fun at the same time. ■

**Bonnie Fox  
Merrimack, NH**

## Music Construction Set

**Electronic Arts**  
2755 Campus Drive  
San Mateo, CA 94403

Music composer  
\$40

★★★★

“It was something that needed to be done.” So says Will Harvey on the package of his software, Will Harvey’s Music Construction Set. Not too far from this quote is a photo of Will’s beaming face; the look he gives of healthy enthusiasm prompts you to believe that not only is he a man you can trust, but this program is going to be fun, too. Right from the start, the Music Construction Set struck me as one of the slickest, most professionally designed programs ever to come down the pike. It did not fall short with regards to fun either.

The Music Construction Set was designed to make learning about music easy and enjoyable. Your video display is the musical staff, your computer the orchestra, and you the composer. Music created with Music Construction Set can be extremely complex or very simple. In fact, very few things can be done with written music that can’t be done here. Some of the demonstration material included on the program disk is amazing.

To make music, you simply place notes on either of the two musical staves, much as you would with pen and paper. You can also pick up and move notes once they are on the staff, to change the tune. The notes themselves are taken from locations near the bottom of the screen by pointing to them with the hand-shaped cursor, to be moved wherever they are needed. Music Construction Set lets you choose the way these notes are moved.

One method is with the keyboard; using the four arrow keys or two arrow keys plus A and Z, you select the note, accidental, rest, or other sign that you want, and drag it across the screen until it is in the proper place. Another mode is with the joystick. The third and most effective method is with a KoalaPad. This was by far the easiest and fastest way of operating the program.

All of the commands to the program are given through icons, small pictures on the screen corresponding to desired functions. For example, moving the cursor to the picture of a disk would select disk operations, either for saving or loading files. Once you get used to operating a program this way, you may never want to go back to your keyboard again.

After your music is written or loaded from disk, it can be played through the system. If you have a no-frills Apple, Music Construction Set plays through the tiny speaker in the cabinet. Needless to say, this little speaker is not the last word in fidelity. Music Construction Set also supports the Mockingboard, from Sweet Micro Systems. Using any of the Mockingboards raises the level of performance in several ways; not only is the sound greatly improved, but the stereo reproduction of the Mockingboard allows you to create much more in-

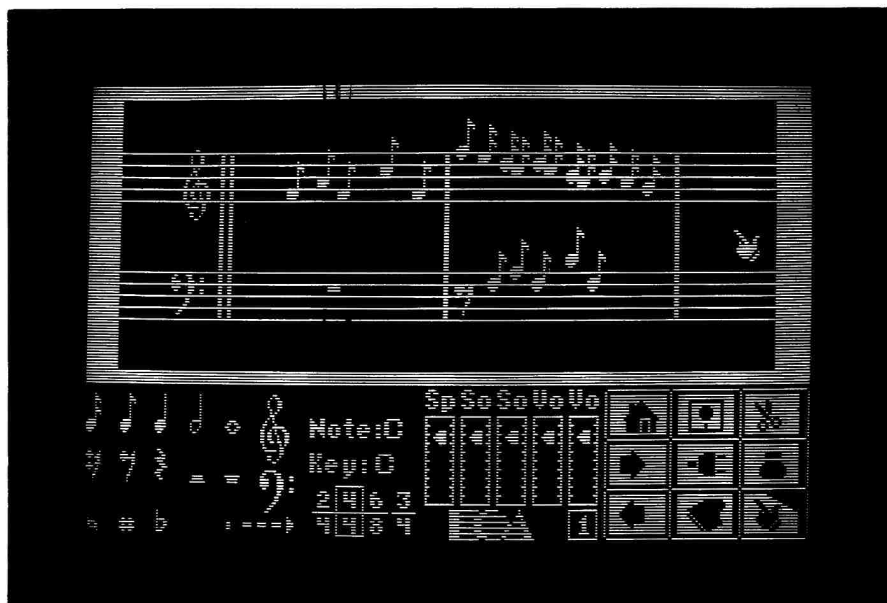
cluded musical pieces. Further, since the Mockingboard does not busy the processor in producing the sound, the Music Construction Set is able to scroll the music past while it is being played. This gives you a graphic display of the piece while you hear it, with the moving notes synchronized to the music.

Your printer can provide hard copy of your music genius. The two musical staves are printed exactly as you created them. You can print the entire piece or just a small section.

If there were one part of the system that could have been improved, it would have to be the documentation for the print routine. It is quite difficult to follow the printer set-up procedures as described in the manual.

The Music Construction Set impressed me in many ways, from its excellent documentation to the superb graphics. Will Harvey released this program at the ripe age of 16, so don't be surprised to see some more examples of this young man's talent in the future. This is a very well designed and documented program, and I feel that it is a superb value at its \$40 retail price. In fact, I would go so far to say that the Music Construction Set might just be the greatest bargain in recreational software available today. ■

**W. Charles Doherty**  
South Dartmouth, MA



Worksheet from Music Construction Set by Electronic Arts.

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# SOFTWARE REVIEWS

## Bank Street Speller

**Broderbund Software**  
17 Paul Drive  
San Rafael, CA 94903

Spelling checker  
\$69.95

★ ★

According to recent statistics, Bank Street Writer is the most popular word processing program available. It follows then that many people must be curious about Bank Street's new companion program, Bank Street Speller.

Bank Street Speller does what its name implies—it checks the spelling of any text written on the Bank Street Writer. With double disk drive, you simply boot up the Bank Street Speller program then insert the disk containing the Speller's dictionary and the disk with the text you want checked. For single drive users the process is the same but because of the obvious limitations, it involves switching disks more often.

The Bank Street Speller serves as a motivational tool for student writers. After text is written on the Bank Street Writer, the Speller can comb through and flag unfamiliar or misspelled words. The student can now concentrate on the text. Spelling won't become a thing of the past with this program, but those using the Bank Street Writer/Speller combination will have an easier time.

A 30,000-entry word list accompanies Bank Street Speller. Using special wild-card characters, the Speller will list all words beginning with a selected letter combination or words beginning and ending with designated letters. The 30,000-word dictionary may seem limiting (the typical classroom dictionary contains about 95,000 words), but double disk drive users may create expanded dictionaries by adding words or creating a new dictionary. (Single disk drive users can't utilize this feature.)

If you could master Bank Street Writer, then Bank Street Speller should be a snap. The formats are the same, and an in-depth user's manual comes with the package.

The program's scope is limited be-

cause it doesn't check punctuation or grammar. For example: *give, them those there things?* would sail through the speller as a correct sentence. Single disk users won't be as enamoured with the Speller's features as double disk users because of the constant disk swapping and the inability to create new dictionaries with the single drive. ■

**Gerry Gontarz**  
North Hampton, NH

## Multigraph

**Micro Lab**  
2699 Skokie Valley Road  
Highland Park, IL 60035

Business graphics  
\$150

★ ★ ★

Any graphics system should create a snapshot of the moment that represents a piece of your financial picture. Multigraph is a business tool that produces line, bar, and scatter graphs based on the numbers you enter into the program and store in its files. The package can interface with the data-base program, The Data Factory, to access its information. The program disk is copyable, and Multigraph also operates with a hard disk.

The 123-page indexed manual presents a thorough tutorial that covers all aspects of creating a graphic image. Each function is detailed with sample data for you to practice with. You use abbreviated commands to operate the system; the program is fast and accepts or changes information easily.

You initially configure the package to work with your hardware. While Multigraph will function with one disk drive, it's faster with two—one to hold the program disk and another to store data. Each line or scatter graph can plot up to six data sets; bar graphs can display up to four. You can create different graph patterns that overlay one another. Once information is entered into Multigraph, the system will print and store it for future use. With one of four printer interface cards, Multigraph will print the pictures you create. You can always exit any section of the program.

Multigraph lets you construct a data set relative to one already in memory. If you have costs, for example, that run 65 percent of sales, you can instruct the system to create a new file in which each item is 65 percent of the corresponding value in your existing sales file.

The program also draws (and saves) its graphs in two sizes. The RUN command pulls the chart data from disk and recreates a graph, letting you save the information the picture is based on in less disk space than a normal high-resolution image requires. This system is the only one I know of that allows a logarithmic scale for its graphs, which is often more effective because it shows the percent of change rather than just the raw data of your numbers. Unfortunately, the package doesn't explain what this kind of graph is or how it should be used. On-screen help is available for each of Multigraph's commands.

There are limitations in the way Multigraph operates that may or may not be important to you. For starters, there is no provision for a pie chart. If you hit the return key when the program expects data, it usually defaults to the start of that particular section, which forces you to re-enter your information.

Multigraph is overburdened with commands. It isn't that there are too many (33 in all), but rather that you must select each part of your image, and then enter the associated range of values. In other words, if you want

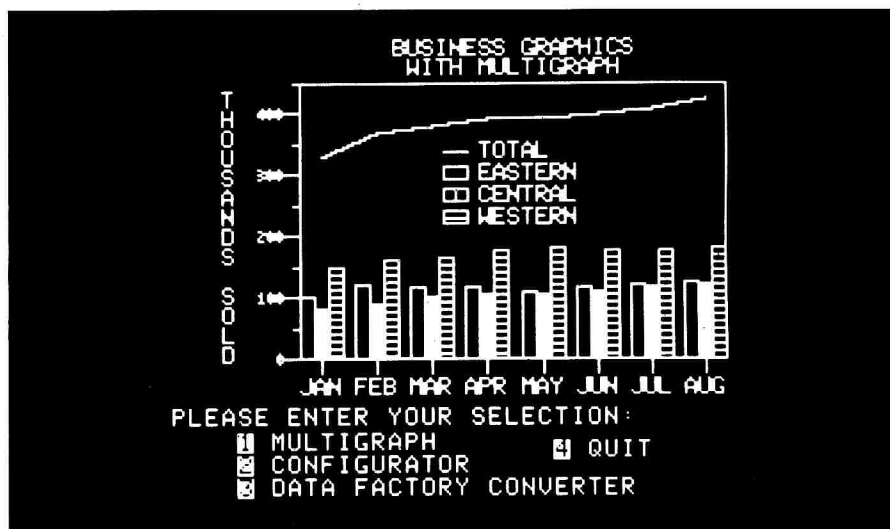
tick marks along the side or across the bottom of your chart, you not only have to indicate that to the system but you also must tell it how many you'd like, what increment they should be drawn in, and so on. This is also true for horizontal and vertical grid lines.

You locate legends, which explain each aspect of the graph, by screen coordinate numbers. A confusing and difficult approach, this method requires some trial and error to check that the legends don't overlay part of your graph. If you have a single drive system, there are no prompts to insert your data disk when you issue a SAVE command. RESET halts program execution and erases what data you have in memory.

Multigraph is a useful business tool, and is especially appealing if you already have records stored in Data Factory files that you'd like to chart. It can also graph non-standard files. The system works well and is fast, but is a burden because of the number of things to specify. The process becomes time consuming and tiring. You must be X-axis and Y-axis oriented; duties that could be handled by your Apple simply aren't by Multigraph.

That isn't to say that Multigraph might not be right for you. If you don't mind a bit of extra work and want control over every aspect of your pictures, Multigraph is a functional package. ■

**Gregory R. Glau  
Prescott, AZ**



Title page from Multigraph shows sample figure.

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## M-ss-ng L-nks

### Sunburst Communications

39 Washington Avenue  
Pleasantville, NY 10570

Language skills  
\$39.95

★★★

Children's literature comes to the microcomputer with M-ss-ng L-nks, a game for one or two players, ages nine to adult. The game involves filling in blank parts of words excerpted in phrases from such stories as *Charlie and the Chocolate Factory* and *The Lion, the Witch, and the Wardrobe*. Filling in blanks may not seem like a big deal, but deciding which letter goes in a particular blank involves digging into the player's unconscious understanding of language.

This game goes in nines: There are nine passages from each of nine stories and nine different formats of blanks for the players to make educated guesses. The easiest format

leaves out all the vowels, as in f-tch-d d-w-n - dr-ss-ng g-w-n -nd- sl-pp-rs, from *The Wind in the Willows*. The next easiest leaves out every other letter: B-t -n -l- h-s -o-r-e-s -h-o-g- t-e -r-a-e-t, from *The Cricket in Times Square*. The other formats provide only the first letter, every other word, vowels only, last letter of each word, first word of each sentence, complete blanks, and then not even blanks but the title and author of the passage followed by an empty screen with the cursor flashing at the upper left.

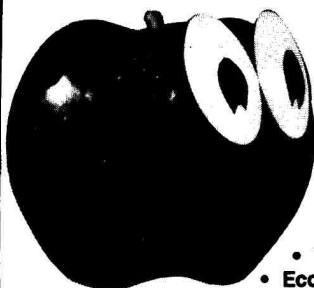
The educational philosophy behind M-ss-ng L-nks is consistent with Piagetian humanistic and behavioristic principles. Players see results immediately. They can move the cursor to any blank and try any letter that suits their fancy; players can examine their scores at any time by pressing return and abandon a passage by pressing the escape key. Players have a choice of the number of guesses per blank and per turn. (Adults can take control by setting up a game with less player choice.)

M-ss-ng L-nks does not emphasize right and wrong answers. Wrong choices activate a not too unpleasant beep, and the chosen letter appears in a rectangle at the bottom of the screen while the cursor remains on the blank being guessed. Correct choices meet with the same beep, but the cursor jumps to the next blank. When a player uses all the guesses on a blank, the program supplies the letter with a more melodious beep. When the players complete a passage, the program plays a fanfare and invites the players to look at their scores by pressing the return key.

The score display shows the number of blanks in the passage, the number of guesses made by each player, the number and percent of correct guesses, the number and percent of wrong guesses, and the number and percent of letters supplied by the program. An overall score is recorded on a scale from one to 100.

M-ss-ng L-nks comes with a 14-page program guide of adequate, though rudimentary, instructions.

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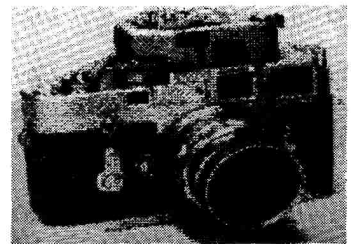
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The version marketed to schools has a 30-page documentation manual with detailed information about the program's educational aspects. Purchasers interested in knowing what is behind M-ss-ng L-nks should locate a school version (\$55).

Also available on the school market is a program called English Editor (\$65), a device for creating new files for M-ss-ng L-nks. It could be a valuable companion, since once you've gone through most of the 81 passages in the original package there isn't much interest left.

Great care has gone into designing and producing M-ss-ng L-nks. Fresh material would liven things up after the newness wears off, so M-ss-ng L-nks and the English Editor make a good team to create passages for the children using it. Write stories about them. Have them write stories about each other. This software combination could encourage interaction between younger and older players. ■

**Tony and Rachel Stavely  
Keene, NH**

## The Write Stuff

**Harper & Row Publishers**  
10 East 53rd Street  
New York, NY 10022

Word processor  
\$59.95

★★

**T**here is no lack of new, low-cost word processors for the Apple //e. The Write Stuff is aimed at the same market that products such as Pen-Pal, Homeword, and Bank Street Writer are trying to capture. Besides low cost, its virtues are ease of use, 80-column capability, on-screen help menus to remind you of the available options and required keystrokes, and a virtual memory that permits larger documents than RAM-limited systems.

The 83-page Write Stuff manual contains all that you need to learn to use the package. The back cover lists the most important control commands for handy reference. On-screen menus

identify options available at any time, and a description of each control command can be called with a control-key-stroke.

Overall, I found the Write Stuff easy to use. Entry and edit of text became fairly natural once I picked up the essentials. One handy feature included in the Write Stuff is an Undo command for correcting the last operation. Another nice option is the choice of deleting characters to either the left or right of the cursor, as well as the ability to delete whole words. And, if you aren't sure which disk file you want, you can examine the first line without having to load the whole thing into memory!

My greatest complaint about the package is the slow response to most requests when in the view mode. Text entry is slow, and some command requests require several seconds to be performed.

In the view mode, the Write Stuff has many of the features of a "what you see is what you get" word processor system except right justification and

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headers. When you select control-V, for "view," you see the text as it will be formatted within the established column margins. Control codes for boldfacing or underlining, which appear on the edit screen, are no longer visible. However, you will see boldfaced or underlined text.

I have not been able to get the bold-face or underline option to work properly with my NEC 8023A printer. The Write Stuff includes a utility program to let you modify format codes sent to the printer; however, I found the manual too brief and unclear on how to do this.

The Write Stuff has some of the more common formatting features. These include changing line spacing, inserting page breaks, pausing during the printout to let the operator change a single sheet of paper, and varying line width for different margin settings. In addition to left-justification, text can be centered or right-justified. You can print up to 125 characters per line and 125 lines per page (assuming your printer holds forms large enough to handle these).

A nice feature is the inclusion of up to nine different user-defined formatting specifications. Each option (initially named F1 through F9) can be identified with an easier-to-remember two-character label, such as QU for quote. You can use these to establish margins, line spacing, and other format choices that might vary within your text.

The idea of a virtual memory is indeed a good one for a word processor. Memory-limited word processing programs usually give you no more than 25 to 35K of space for text (at most ten pages, single-spaced). Having worked with several other "virtual" systems, I was interested to see how smoothly the Write Stuff performed. I must report that it is no better than others, perhaps a bit slower. The drawback of the virtual approach is that the disk drive will interrupt your typing at unpredictable times. Of course, the type-ahead buffer saves almost all that has been typed in during disk saving, but the process proves to be a distracting interruption.

I had no trouble learning how to use the Write Stuff, although packages that use icons or interactive tutorials are far easier to learn. The documentation is brief and well-written. The pro-



Knoware's tutorial on Applesoft graphics.

gram's ability to use an 80-column board is a valuable feature, but delays will occur in the view mode. The Write Stuff is one of the few virtual memory systems in the low-price category.

Having worked with word processors that I prefer over this one, and with others that lack its stronger features, I consider the Write Stuff somewhere in the middle of the low-cost programs. ■

**David Morganstein**  
Germantown, MD

## People Management

**CBS Software**  
One Fawcett Place  
Greenwich, CT 06386  
Management training  
\$79.95



**P**eople Management, part of the Managing for Success series, is the disk equivalent of *The One-Minute Manager*. A self-paced instructional program that stresses leadership skills you need in dealing with subordinates, People Management was developed in cooperation with Thoughtware, Inc., a group of specialists in business administration, psychology, training, and computer programming. The program attempts to teach managerial skills through instruction and case studies, but de-

votes too much time to course outlines and summaries, and not enough to content.

People Management is a four-disk set packaged within a sturdy plastic binder, and comes with a wirebound, 20-page program guide. The disks deal with leadership, team-building, motivation, and communication, and each subject is broken down into two or three subunits.

One problem with the product was immediately obvious to me: The programs don't employ ordinary Apple character-generation but instead use larger-sized, hi-res shape-table characters, forcing the program to read every screen from disk. Screens requiring 10 to 15 seconds to read need an additional 10 to 25 seconds to load, severely damaging the effectiveness of the training.

Another problem is irritating, flickering horizontal lines on the display as the screens are loaded. (Color is only used incidentally; a monochrome monitor is adequate for this program.)

Not only did I find the waiting tedious and the display distracting, but also my intelligence was substantially underestimated by a series of management homilies, simplistic case studies (where the situation is straightforward and the solution obvious), and basic levels of instruction. One unit describes a leader as one who gives continuous feedback and who gets results by influencing behavior, but lists only a few relevant examples.



Your responses to a series of questions customize the program. Then People Management summarizes the results of your replies. For example, the program produces a list of management skills you use and of those you don't use. It doesn't analyze information or give any specific advice that might improve your management performance. You can get a printout of this list, but its usefulness isn't apparent.

People Management was obviously developed by serious people with good intentions who missed the mark. They didn't exploit the medium well. A computer can be an exciting, interactive educational tool. Management case studies could be written as adventure games are, thrusting you into a situation that changes according to your answers. This package, on the other hand, is more akin to a short paperback brought to the screen of the computer. ■

**Daniel Umberger  
Reynoldsberg, OH**

## Knoware

### Knoware

301 Vassar Street  
Cambridge, MA 02139

Business software tutorial  
\$95



**D**o you need a simple, hands-on introduction to personal computers? Do you yearn for money, prestige, and power? Knoware may fulfill your desires. This three-disk set introduces the major types of applications software and their uses in the guise of a game.

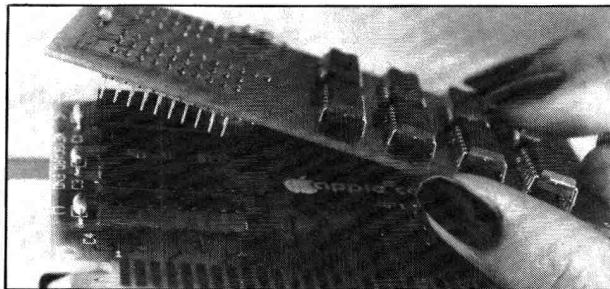
While Knoware does a reasonable job of introducing applications concepts, its usefulness ends there since you must purchase other software if you want to use your computer seriously.

The major components are Knowcalc, a spreadsheet; Knoword, a text processor; and Knowdata, a data-file manager. These are supported by a bar and pie chart generator, a perpetual calendar routine, programs for financial calculations, and a metric

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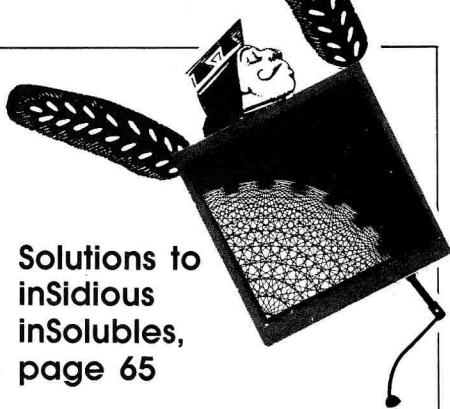
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## Solutions to insidious insolubles, page 65

### *Solution to The Rainbow:*

You might remember Roy G. Biv's name from your junior high science class. No, he's not a famous astronomer and he didn't buy the first Apple. The letters of his name represent the seven different colors of the rainbow in their correct order: red, orange, yellow, green, blue, indigo, and violet. Since indigo and violet are not among Apple's best known lo-res colors, we substituted medium blue and purple. If you were able to fix that, you really are a wiz.

At any rate, the problem seems to be that the colors in our rainbow are in reverse order. The red should be on the outside and the violet on the inside. To fix this, simply reverse the values found in the data statement in line 80 to read:

```
80 DATA 3,6,7,12,13,9,1
```

Now you have a rainbow that would make old Roy's heart glad.

### *Solution to The Data Disk Maker:*

The program will initialize the disk perfectly, execute the EXEC file, and delete the EXEC file. The disk was perfect to store and retrieve data, as long as you didn't boot up the disk itself. Booting the disk initializes it (thus wiping the disk out) or creates another blank disk if you aren't careful.

Adding line 950 below deletes all of the earlier steps of the program on the new data disk, so if it's accidentally booted, all you'll see is the statement THIS IS A STORAGE DISK.

```
950 PRINT "DEL 100, 1400"
```

Fooling around with DEL, INIT, and EXEC commands can be dangerous to your programs' health. I hope you remembered to save your programs before running them and used disks without valuable information on them. I told you to be careful.

converter. The only printed documentation is a small illustrated leaflet that shows you how to turn the computer on and insert the first disk. The package is tied together by the game narrative, with some low-key recreational material thrown in: at times you will be advised to take a break from your strenuous career to check your biorhythms or attend the mouse races.

You begin Knoware as a lowly mail clerk with \$500 to your name. Your first assignment is to trap a thief, using HPLOT to build a barricade between him and the mailroom shelves. This scenario introduces you to Cartesian coordinates and screen graphics. Your bonus depends on how quickly you complete the task. You then have the option of accepting a promotion to the next job level or remaining in the mailroom to earn extra bonuses.

In your next job as an accountant, use Knoware's compound interest program to help the company achieve a specific investment objective. Use this routine to manage your own investments, too. After each promotion and after completing certain tasks you can buy or sell securities to amass a fortune.

From accountant you advance to EDP Manager and modify the BASIC investment program to include brokerage fees. Next comes the job of Director of Public Relations and a chance to update the company's data base of birth dates and birthplaces. As Director of Personnel, you use a simple word processor to produce a holiday bonus announcement, and as Vice President of Marketing you examine your own savings plan to see if you'll have enough cash to purchase a boat in six months.

As President, you must use all the previous programs and a few more to carry out tasks assigned by the Board of Directors. At the completion of each task you can advance to Chairman of the Board, but you don't win the game unless your investments yield one million dollars.

Despite a few rough spots at the highest levels (prompts that don't seem to lead where they should), Knoware plays fairly well. However, although the vendor claims that the various components can be used independently after you've mastered the

game, the programs are too rudimentary to do very much.

Knoware runs on the Apple II Plus or //e with 64K and one disk drive. ■

**Scott L. Norman**  
Framingham, MA

*At press time, Knoware announced an enhanced version of this product at the same price. They report that the new version makes it possible to use individual components outside of the tutorial setting.* —eds.

## Counters

### **Sunburst Communications**

39 Washington Avenue  
Pleasantville, NY 10570

Preschool counting  
\$55

★★★

## Number Farm

### **DLM**

One DLM Park  
Allen, TX 75002

Preschool counting

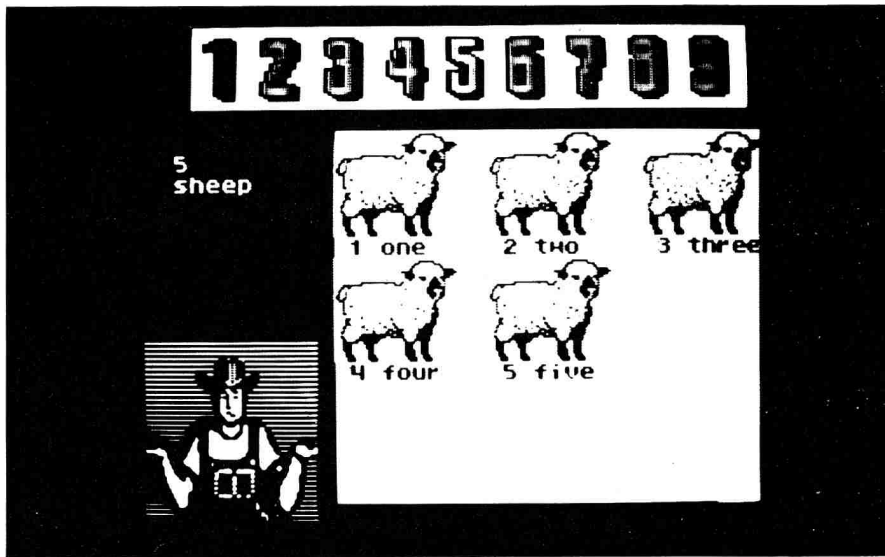
★★★

When they practice math skills early, children find later learning experiences in the classroom that much easier. Both Counters and Number Farm, designed for ages 4-6, help to teach counting and other principles of preschool math.

Counters is based on the premise that a child is really counting only when he or she can correctly answer the question "How many?" When given a collection of things—marbles or fingers or people. Real counting is not the rote naming of number words that many preschool children can do.

Counters has three parts: Counting, Addition, and Subtraction. In Counting, children press a key or paddle button to show correspondence between the count of objects on top of the screen and the objects or numeral on the bottom of the screen.

Counting has five levels. Level 1 introduces a correspondence between two collections of objects, such as bears, cars, or helicopters. A musical



Number Farm helps youngsters learn to count.

message is the reward when the child presses any key to stop the flow of objects and match the top. At level 5, objects are randomly arranged on top of the screen, and children must match a numeral with the count on top. As children work through the counting levels, they become adept at the *concept* of counting. The Addition (five levels) and Subtraction (two levels) sections are similar in construction to Counting.

The program handles incorrect responses constructively. If a child presses a key too early or too late, the problem is worked out on the screen. If the child makes no response, the object to be counted crosses the screen again. Incorrect responses automatically set the program back so that the next problem is easier.

The colorful boats, bears, and cars are attractive, and the numerals are easy to read. But the 4-year-olds who tried the program found that it occasionally moved too fast. They pointed to the screen to count, taking more time than the programs allow.

Number Farm is a more entertaining and lively approach to counting. Billed as "six fascinating games to help children up to 7 years learn their numbers," the program teaches the concept of number, numerical order, and recognition of numerals and number words.

Number Farm, the first game, introduces the child to the numbers 1 through 9 and to the farm animals

used throughout the program. As the child presses a number, pictures of farm animals appear, depicting the number the child chooses.

Old McDonald plays the familiar tune, but stops at the phrase "and on his farm he had ? pigs (ducks, and so on)." The child counts the number of animals on the screen so that the song can continue. In all the activities, the farmer prompts children to try again when they answer incorrectly.

In Crop Count, the child counts as many crops as he or she can before the sun goes down. Children enjoy this, but are frustrated by the short time limit. Other games include Hen House, a guessing game that teaches the concepts "less" and "more," and Horseshoes, which reinforces number recognition and counting skills.

The favorite game of every child who tried Number Farm was Animal Quackers. Here the child counts the number of times an animal makes its sound. It is quite exciting for children to hear the computer bark, oink, and meow.

While Number Farm's special effects keep children glued to the computer, the noise level could be disruptive in a classroom where children are busy with other projects. Number Farm might be better used in a home setting. Counters is a quieter, gentler program. It would work in a classroom where the exercises could reinforce any early math curriculum.

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WESTLAKE VILLAGE, CA 91359

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ing Counters explains the principles of math education that underlie the design of the program. In contrast, the Number Farm booklet, while adequate to run the program, doesn't delve into the principles of teaching math. Both packages suggest how to enhance and reinforce the skills used in each activity.

If you need a replacement or a backup for Number Farm, the cost is \$15 per copy. Counters has a lifetime guarantee: The publisher will send a new disk at any time if yours is damaged. ■

**Margaret Lurie  
Evanston, IL**

## How About a Nice Game of Chess?

**Odesa**

3186 Doolittle Drive  
Northbrook, IL 60062

Chess simulator  
\$34.95

★★

A modified version of Larry Atkin's Chess 7.0 for micros, How About a Nice Game of Chess?, not only plays chess but also aims to teach the basics of the game. Any novice player who wants to understand the intricacies of chess, though, will need a bit more theory than the program manual provides.

Chess suggests moves, shows positions susceptible to attack, displays strategic offensive positions, and limits the novice to moving pieces to permissible squares. You can't adjourn a game at any point and save it to disk for later recall, but you can watch Chess think, ask its advice for your move, or have it play against itself.

Make your moves with the keyboard, the paddles, or the mouse. If you have a mouse, point to the piece and click the button, then point to where you want your piece placed and, click the button a second time. (Chess will light up, showing you the squares for legal moves.) If you don't have a mouse, use the keyboard or paddle to move the cursor through a sequence that identifies each piece. Mouse control is very

natural—almost like picking up a piece and positioning it. The paddle or keyboard approach is somewhat awkward. Chess doesn't include the option to enter the algebraic notation designating the move.

In the manual's 53-page tutorial, six chapters contain several teaching aids that demonstrate chess techniques. Each chapter is accompanied by a "movie" on the disk. You should first read the section and then watch the movie. While the idea is clever and well done, I have one concern about the presentation: You can't change the speed of the movie (although you can halt it temporarily). While the quick learner may pick up the point immediately, others may require more time to understand what just happened. There is no fast-forward or instant-replay feature, but you can re-run the entire lesson. The section on "How the Pieces Move" gives you the opportunity to practice moving the pieces and reviewing their characteristics.

The well-written manual, complete with table of contents and index, provides tutorials for the pieces, the mate, openings, special moves, the middle game, and the end game. Unfortunately, the manual doesn't list references to any books on learning chess.

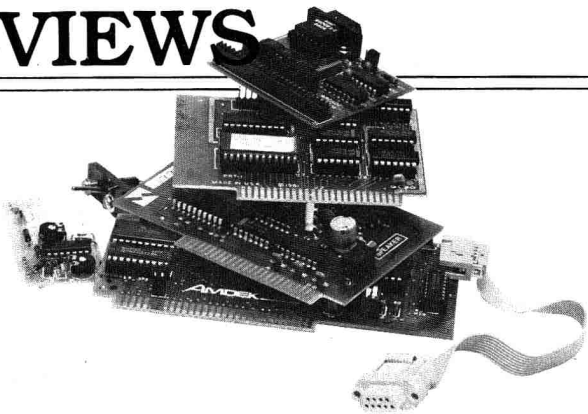
You can select from any of nine play levels, which are timed from one second per move (level 0) to two to six minutes per move (level 9). Although newer chess programs think while you think, the manual doesn't specify if Chess can do so. Chess does give an "opening book" of 7000 positions. If you remain in the book, Chess will move automatically without thinking.

I have few criticisms of the package or manual, but a nice option would have been to print the game moves or a given position. Chess does provide a listing of the most recent 40 moves, and with the "take-back-a-move" feature you can review earlier moves. If you're a beginner, Chess is a good instructor, but more advanced players should consider a stronger opponent like Chess 7.0 or Sargon III. ■

**David Morganstein  
Germantown, MD**



# HARDWARE REVIEWS



## inCider's Ratings

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

## DuoDisk

### Apple Computer

20525 Mariani Avenue  
Cupertino, CA 95014

Two disk drives in one  
\$729

★★★

A sleek addition to the Apple II line, DuoDisk, a dual disk drive, consists of two low-profile disk drives set side by side as a single unit.

Like many other Apple accessories, DuoDisk complements the computer. Color and overall design match the Apple, giving it an integrated look. I found the low-profile drives functional and cosmetic: The low, 2¾ inches high, drive unit is an ideal height for eye-level viewing.

Packed with DuoDisk are a controller card and a shielded round cable with D-connectors on either end. Installation is simple: Plug the controller card into slot 6, fasten the card D-plug to the back of the Apple, and use the shielded cable to connect the drive.

Using the cable and plugs reduces RFI (radio frequency interference).

Also the use of D-connectors facilitates quick detachment of the drive, should you want to transport the computer.

Insertion and removal of floppy disks have been improved over the older Disk II drives. Push down the access door lever to insert a disk. Push the lever in and the disk is automatically ejected, with the edge extending about 2 inches from the drive.

DuoDisk's operation is extremely quiet, a definite plus. Another technical improvement is more precise head positioning, resulting in more reliable access of half tracks. Naturally,

each drive (#1 on the left, #2 on the right) has the usual "in-use" light to indicate when it is running.

DuoDisk uses DOS 3.3 and ProDOS. Therefore, it runs all current Apple II software. It can be hooked up to an Apple II, II Plus, or IIe.

What about the practical considerations? Do you really need two disk drives?

Those of you who already have one drive face a sticky problem. If you are a software developer—say with a graphics utility in one drive, a work disk in another, and an assembler in a



third (allowing you to switch between the utility and assembly language)—then maybe the three drives will come in handy. But let's face it, a three-drive system is hardly *de rigueur*. You are probably better off buying an inexpensive add-on drive, if needed.

On the other hand, if you make a lot of backup copies, maybe the expense is worthwhile. And if you use dual-disk programs—software that requires one drive for a utility or applications disk, and a second drive for your work disk—then you should certainly consider two drives.

For those of you who have not yet purchased an Apple, or who are considering a second system, the decision is easy. Assuming you need a second drive, ask your dealer to price a system with the DuoDisk in place of the single drive that comes with the typical package. You should certainly do better than purchasing the DuoDisk as a separate item.

The \$729 price tag may seem high, but it actually compares favorably with the \$940 list price of two Disk II's and a controller card.

In short, this product is not just two drives mounted together in a plastic case. It is visually appealing, quiet and efficient in operation, and reasonably priced. If you have a need for two drives, I recommend it. ■

**Charles Englesher**  
Loudonville, NY

## RGB Interface

### Video-7

12340 Saratoga Sunnyvale Road  
Saratoga, CA 95070

Interface for Apple //c  
\$199.95

★★★★

You haven't seen color on an Apple II until you've seen it on an RGB (red-green-blue) monitor. The dull and muted tones of a composite color display pale before the vibrant, rich hues available with RGB output. Because the //c has no internal expansion slots, however, there is no place to install a conventional RGB interface card. So, in response to the portable's design, Video-7 has produced an external RGB interface for the //c.

The device is as portable as the computer. It's twice as thick but not much larger than a pack of cigarettes. You connect it to the video expansion port via a short integral cable with a 15-pin male connector at one end.

An additional 15-pin female connector is built into the other side of the small box. Here the signals that duplicate the digital video environment on the majority of quality RGB monitors can be found. Video-7 reproduces the output-signal standard Apple introduced on the Apple III resulting in most cases in direct plug-to-plug compatibility.

Just beneath the case of the interface, accessible through slots in the cover, is a small DIP-switch pack with two switches. Using these, you can create a variety of colored text displays. With the inherent resolution of RGB displays, you can produce 40- or 80-column text in green, blue, amber, or white on a black background. Even the white mode has none of the color fringing that typically appears when a composite NTSC monitor is used.

Graphics are incredible. The interface supports standard Apple graphics, and overlapping colors aren't subject to the "bleed" common on composite NTSC displays. Video-7 supplies Apple-compatible driver routines for the double-density mode which can produce, among others, two color 560-by-192 and 16 color 140-by-192 modes. Unlike the standard Apple colors, none of these 16 is repeated within the list.

The old-line Apple programmer can implement hi-res color and screen handling commands with the ampersand (&) character, although the commands may not be familiar. For example, using & COL = n, where n is a number between zero and 15, you can describe the drawing pen in terms of one of the available colors.

&GPRNT relocates the Apple printing hooks so that all text output is routed to the screen, eliminating the need to download a separate graphics character set. You can download a font stored on disk: Use &NCHARS F\$ (where F\$ is the name of the font). Use &SCHARS to restore the system font.

Before you run out and get the RGB Interface for your //c, remember that RGB monitors, inherently more expensive than their NTSC cousins,

come in two varieties: digital and analog. Almost all of the current RGB interface cards for the Apple II series, and the Video-7 interface, support the digital variety. The other common RGB monitors use analog signals.

Video-7 markets the \$50 Mapper Interface that mates the Apple //c RGB interface with a nine-pin connector to provide all of the proper analog signals at the correct levels. A simple solution is to purchase a monitor designed to work with the interface. Most of the Electrohome series will, as will monitors from manufacturers who supply RGB cards for the Apple II series. ■

**Bill O'Brien**  
Fort Lee, NJ

## ALF AD8088 Processor Card

### ALF Products

1315-F Nelson Street  
Denver, CO 80215

8088 processor card  
\$345

★★★★

The AD8088 card is an Apple compatible version of the 8088 microprocessor. It offers two major enhancements for the Apple II: a substantial speed-up in program operations that involve large amounts of arithmetic operations, and the possibility of developing programs for 8088-based computers including the IBM PC and IBM-compatible machines.

Using the Formula Transfer Link (FTL) that is on the disk included with the card, a number of mathematical functions are transferred from the relatively slow 8-bit 6502 processor in the Apple to the faster 16-bit 8088 processor on the card. These functions include multiplication, division, exponentiation, SQR, LOG, EXP, and trigonometric functions.

The differences are substantial; a rather attractive Applesoft ellipse-plotting program was reduced from 66.4 seconds in the normal Apple to 18.6 seconds with the 8088 card installed and incorporated into the Apple system by a simple RUN FTL command. (Instructions for installing and activat-



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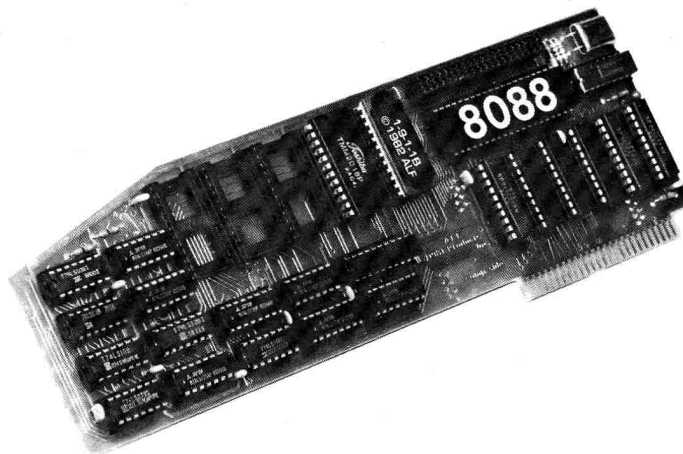
This Ad Prepared September, 1984

ing the card are clear and easy to follow.) For a similar speed increase of Pascal programs, you must purchase MicroMagic's Pascal Patch disk (\$49.95). For example, ALF's numerical integration demo program was reduced from 42.6 seconds to 10.5 seconds, just as stated in the ALF literature. I wrote a test program for 2000 multiplications and divisions, and execution time was reduced from 13.6 to 6.5 seconds with the 8088 card.

That is a large percentage difference, but consider one point before you spend \$345 for the faster processor. If a program involves many keyboard entries, disk I/O, printing, or other non-computational activities, the arithmetic speed-up might not make much difference in the program's total execution time. Review your program to ensure enough time is spent doing computations so the 8088 card will make a difference in running time. For example, one of my lab Pascal programs calculates means, standard errors, and p values (sums of squares, square roots, and other mathematical computations) on seven sets of data while it prints the results. The delay that occurs during computation is about equal to the time required to print *one* character at 40 cps. Obviously, the speed-up resulting from the 8088 card is not significant in that program.

Additional software extends the AD8088 card's usefulness. Clone Software Corporation offers a version of CP/M-86 designed for the AD8088 card for \$100 through ALF. With this system, the Apple uses the 6502 only for input/output functions. Everything else is done by the 8088. This opens your Apple to a wide variety of software, particularly in the business area. Programs such as Digital Research's Manager Set, MicroPro's Star Series, Ashton-Tate's dBaseII and Financial Planner, all use CP/M-86; many are available on Apple-formatted disks.

MS-DOS (PC-DOS on the IBM PC) will be available from Clone Software through ALF. Check actual availability of this system before buying the card if your major interest is IBM compatibility. Of course, programs developed on the Apple-AD8088 must be re-typed or transferred to an IBM through the serial ports, but ALF is developing an Apple Disk Controller Card that will read



double-sided, double-density IBM disks. Then, we'll have complete compatibility except for programs that use graphics or the IBM special function keys.

Some of the IBM and CP/M-86 programs require more than 64K of memory. ALF sells an expansion card that allows many of these programs to be run on the Apple II. The ALF systems make it possible to develop IBM programs from an Apple for less money than it takes to buy an IBM computer. Such programs would be adaptable to other 8088 computers such as the DEC Rainbow and Professional, the Zenith Z-100, and the TI Professional computer.

The AD8088 Processor Card also provides, at no extra charge, a handy program for program developers. It uses the 8088 microprocessor to time programs running on the 6502. Simply put appropriate POKE statements before and after the program portion to be timed, and the MET (Multiple Event Timer) READ program will read the durations for each specified event. The programmer can find out which parts of the program are most time consuming and then concentrate on speeding up those sections. This makes program optimization more organized, and is useful in the later stages of program development. According to ALF, this procedure can be accomplished in any language that can write a byte to a specified memory location. So, it could be used in BASIC, Pascal, or assembly language.

The MET program also can log data in laboratory work. A number to be

logged (0 to 255) is written to a particular memory location. The MET program stores both the number and the time since it was logged previously. Resolution is to 50 microseconds in the fastest mode. Events more than an hour apart can be logged with this system in the slowest mode (100 milliseconds). These program uses are documented in the AD8088 manual; I suspect that this device's usefulness is limited only by the user's imagination.

The ALF Processor Card offers a neat solution to the backup versus copy-protection question. Each card has a serial number in ROM, and it is possible for an Applesoft program developer to have his program automatically run the FTL program and check the card's serial number. This would add \$345 (the price of the card) to the cost of the program for any purchaser who didn't already have the 8088 card, but complex programs requiring the faster calculation speeds of the 8088 might include the ALF card as part of the program package. With this system, you could make unlimited backups but they would run *only* on the machine containing the "correct" AD8088 card.

ALF's AD8088 Processor Card is very good at what it does. Although not for the casual Apple user who does mostly game playing, word processing, and simple programming, AD8088 is for professionals and advanced amateurs who need processor speed, special features, or partial compatibility of an Apple //e with an IBM PC. ■

**James R. Florini**  
Syracuse, NY



# SCRG PRODUCTS FOR THE APPLE COMPUTER

## SWITCH-A-SLOT



\$179.50

The **SWITCH-A-SLOT** is an expansion chassis, which allows the user to plug in up to four peripheral cards at one time. One of these cards is selected for use, and only that card draws power.

This product is especially useful where the software requires the printer to be in a particular slot, and the user wishes to choose between two or more printers.

- Allows up to four peripheral cards to be plugged into one peripheral slot.
- User selects desired card by front panel rotary switch.
- Only selected card draws power.
- Plugs into any peripheral slot.
- Saves wear and tear on delicate connectors.
- 18" cable connects Switch-a-slot to computer.

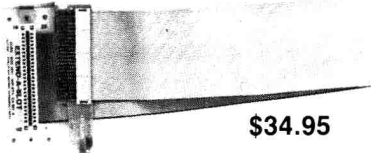
**New—resistive terminations for better response**



**SWITCH-A-SLOT** and **EXTEND-A-SLOT** work well with all slow to medium speed cards, such as Modems, Printers, Clock, 80 Column, Music, etc. They are not recommended for high speed data transfer devices such as disk drive controllers, alternate processor, and memory cards. These products may be incompatible with some alternate processor cards.



## EXTEND-A-SLOT



\$34.95

The **EXTEND-A-SLOT** brings a slot outside your APPLE™, allowing an easy change of cards. The 18" flex cable is long enough to allow placement of the card in a convenient location. The high quality connectors are gold plated for reliability.

The perfect accessory for:

Owners of large numbers of I/O expansion cards—keep your frequently used cards installed. Use the **EXTEND-A-SLOT** for the others.

Technicians—easy access to test points on accessory cards under actual operating conditions.

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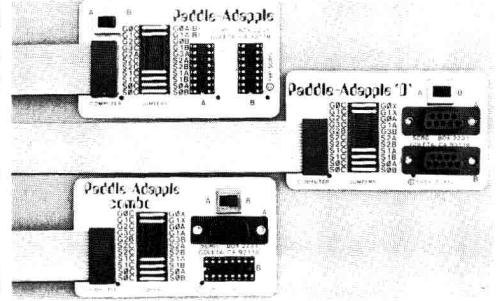
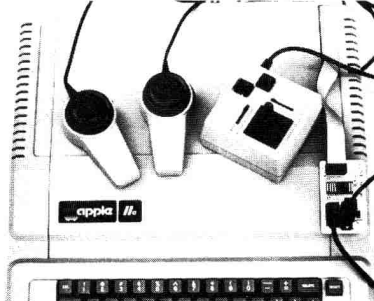
**EASY TO USE**—just plug it in as you would any expansion card, then plug your card in. When you want to change cards, do it easily outside the computer, without the wear and tear on the computer expansion slot.

### OTHER PRODUCTS

**D Manual controller.** Gives complete control over the \$C000 through \$COFF range in hardware. Can be switched while program is running. \$89.50.

**MAGIC KEYBOARD** (for ][ or ][+ only). Re-encodes the keyboard to give alternate keyboards, such as DVORAK, ASK, 10-KEY, HEXDECIMAL KEYPAD, etc. \$49.50.

## Paddle-Adapple GAME I/O ADAPTER AND EXTENDER



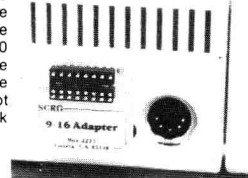
- Works with all Apple compatible joysticks, paddles and other I/O devices.
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- Use 4 paddles simultaneously.
- Unique "Jumpers" socket allows you to configure to meet your needs.
- BPI™ users can have BPI™ device and paddles plugged in simultaneously. (**Paddle-Adapple** and **Paddle-Adapple Combo** only).
- Gives you four push-button inputs.
- Supports shift key modification.
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- Small and compact — adheres to computer with supplied foam tape.
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- Supplied with 18" cable.

\$29.95

## NEW 9-16 Adapter

For Apple //e and //c

This product permits the use of most 16-pin I/O devices with the APPLE //c or //e. By plugging this adapter into the sub-miniature 'D' connector, you can plug in a 16-pin device, such as the Paddle-Adapple, paddles, joystick, KOALA PAD™, etc. The only limitations are those devices that use the annunciators or the C040 strobe, such as the POWER PAD™. Please note that the //c does not support four joystick inputs.



\$14.95

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 ELECTRONICS, **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 O. 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

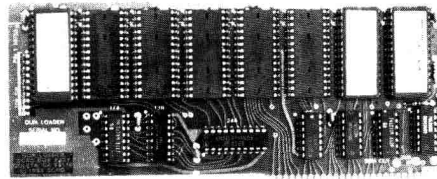
### PROmGRAMER™

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.
- Zero insertion force sockets accepts 24 or 28 pin devices.
- Disk based software allows easy customization of software.
- Complete instructions for loading software into quikLoader.

\$149.50

## 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 appropriate 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.

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## Cricket

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Speech, music, and clock.  
Requires ProDOS, Apple //c, or //e  
with 128K and serial card.  
\$179.95

★ ★ ★

**C**ricket, a speech synthesizer, music generator, and clock, is aimed primarily at the //c owner, but can be adapted by //e owners if they incorporate extended memory in their machines.

Cricket produces three types of speech output: *limited*, from a built-in vocabulary; *unlimited*, using normal English words entered at the keyboard; and *phonemic*, created from letters and symbols representing component speech values. This latter process is as far from the English language as is calculus.

In the limited mode, using Cricket's Word Editor, you create word files from a predefined, 750-word vocabulary. From this list, the file can borrow as many as 116 words for your Apple to pronounce in a relatively intelligible female voice. While you achieve clearer, easier to understand output, you're limited to those words that

Street Electronics has selected. You can, however, append the prefixes dis-, re-, ex-, and un- or the suffixes -s, -t, and -d to any of the words in your list.

Limited mode is closer to the typical synthesizer output you'd expect: A metallic robot voice articulates your chosen words. The advantage here is that you can use any word you want, although you'll have to make either some concessions for the unit's pronunciation (robot pronounced rahbot) or spelling adjustments (rowbot) if you want dialogue spoken accurately. You'll need to listen carefully in this mode to understand what's being said.

Phonemic mode lets you create words from their sound components or phonemes. A simple expression like Apple Computer is translated into A3P'L KUIIMP%T'R for proper pronunciation. The manual also uses terms such as "schwa" and "fricative," so this mode should be left to the more industrious speech programmer.

All speech modes let you adjust the speed and pitch of the spoken words. For the first two modes, speed is a matter of fast or normal output, while in phonemic mode you have a greater control of speed, pitch, and inflection. Speed and pitch can vary in either direction, and unless you compensate with inflection, you'll lose clarity.

Many synthesizers don't discrimi-

nate between "sounds" and "music." Cricket breaks this pattern: You can program up to 31 different sounds with its Sound Editor software and play them from either of two sound generators. Connecting the correct cable to the stereo mini-plug jack produces true stereo sound from your amplifier.

Music is handled through a two-voice (instrument sound), eight-octave music generator. Although more complex scores require an optional Music Editor, simple tunes can be played from Applesoft. Without the editor, you're limited to one-note melodies throughout the eight-octave range, but you can include three-note chord accompaniment. In Applesoft, only one voice can be used at a time.

The Apple //c is definitely not a candidate for a clock card since it has no slots. However, if you have a ProDOS application that requires clock input, there is a solution. You can access Cricket's clock features either by running the binary program included on the disk, thus modifying ProDOS in memory, or by transferring Cricket's altered ProDOS file to your disk. Then any Thunderclock features ProDOS or your ProDOS application supports will be available from Cricket. In addition, you can program a built-in alarm to chime at a preset time each day.

Cricket software works only under ProDOS. If you're DOS-bound, you might look at Street's Echo II Synthesizer instead.

Nor does it work automatically with pre-existing software. A significant amount of programming is involved since it has its own command set, and all these commands must be prefixed with an ampersand (&). For all of its features, this is an experimenter's or development tool, not a finished application.

From a hardware standpoint, it is well done. Many features are packaged into a small (3-inch by 4-inch by 1-inch) case. A wall transformer provides external power to Cricket, whether or not it is connected to your Apple, and maintains power to the clock circuit. Cricket has a volume control but no off switch.

You might be tempted to place the tiny Cricket on top of the //c. Don't. It will block the //c's ventilation slots. Also, the unit I tested, which looked



# Beagle Bros Apple Software Report

Ad Number 182

"All the News That Fits"

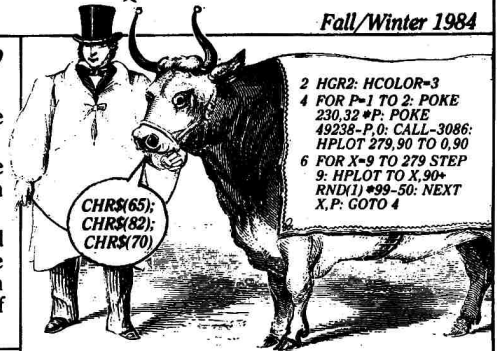
Fall/Winter 1984

## "How can I make my Apple do that?"

The nice thing is you *can* make your Apple do anything you can think of, with just a little help—Beagle Bros software helps make your Apple a more powerful machine, and *you* a better programmer.

**BEAGLE BROS, THE UTILITY LEADERS:** Beagle Bros' low-priced unprotected disks dominate the Apple Utility bestseller lists. And Beagle disks were recently voted to FOUR of the TOP-24 spots in *Softalk's* "Most Popular" poll—that's against *all* Apple software publishers in *all* categories.

**APPLE SECRETS REVEALED:** Since 1980, our authors have been on the lookout for tips and techniques that can be shared with our customers. From our inspectable programs to our informative instructions and Apple Tip Books, you will learn from the experts. Here's a tip you probably won't find in any of Apple's manuals—To reveal the hi-res screen without erasing it, simply type **CALL-3100** instead of the awkward "POKE-16297,0: POKE-16304,0: POKE-16300,0". A secret technique? Not any more.



## The Beagle Bros Catalog

### GRAPHICS

- ALPHA PLOT** (II+, IIe, IIc, DOS 3.3) . . . . . \$39.50  
Normal hi-res (6 colors, 280x192 pixels) drawing and typing on both hi-res pages. Compress pictures to 1/3 disk space.
- APPLE MECHANIC** (II+, IIe, IIc, DOS 3.3) . . . . . 29.50  
Create hi-res shapes for animation with Applesoft's DRAW & XDRAW commands. Put fancy hi-res type in your programs. List & learn demo programs teach you hi-res programming.
- APPLE MECHANIC TYPEFACES** . . . . . 20.00  
26 new editable fonts to be used with Apple Mechanic.
- BEAGLE GRAPHICS** (IIe or 128K IIc, 3.3/Pro) 59.95  
Double hi-res drawing (16 colors, 560x192 pixels) and typing in many typestyles (all editable). Color fill, cut & paste, 200+ color mixes. 33 new commands for using double-res in your programs. Compress picture data to 1/3 disk space...
- FLEX TYPE** (II+, IIe, IIc, DOS 3.3) . . . . . 29.50  
Variable-width text (wide/normal/condensed) controllable with normal Applesoft commands. No 80-column card reqd.
- FRAME-UP** (II+, IIe, IIc, DOS 3.3) . . . . . 29.50  
Make Apple "slide shows". Keyboard controlled or unattended, using your existing hi-res, lo-res and text screens.
- TRIPLE-DUMP** (II+, IIe, IIc, 3.3/Pro) . . . . . 39.95  
Transfer any image including double hi-res to your dot matrix printer. Make Giant (8" high characters) Banners too.

### ALL-PURPOSE

- DISKQUIK** (described in this ad) . . . . . 29.50
- FATCAT** (II+, IIe, IIc) . . . . . 34.95  
Reads all of your DOS 3.3 and ProDOS file names into one or more Master Catalogs for sorting, searching and printing. Alphabetize file names on disks. Compare any two files.
- PRONTO-DOS** (II+, IIe, IIc, DOS 3.3) . . . . . 29.50  
Triples the speed of loading and saving. New TYPE command displays text file contents. Move DOS for extra 10K.

### PROGRAMMING

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DiskQuik has many uses. For example, load often-used files into memory when you boot up, so they are always available when you need them.



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

## BEAGLE BASIC™

### APPLESOFT ENHANCER

\$34.95 (DOS 3.3, compatible with Apple IIe or 64K II+)

Beagle Basic loads Applesoft into RAM and enhances it by replacing unused cassette commands (Shload, etc.) with *new commands* like ELSE—IF X=2 THEN PRINT "YES": ELSE PRINT "NO"

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GOTO and GOSUB may precede variables, as in "GOSUB FIX" or "GOTO 10+X". Replace awkward graphics screen pokes with one-word commands, change your ctrl-G Beep to any tone you want...

Rename Applesoft commands & error messages to anything. For clarification, encryption-protection or even foreign translation. For example: 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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suspiciously like a prototype, became uncomfortably warm after a few hours of operation. The combined heat of the Apple and Cricket doesn't benefit either.

Cricket comes with one of the best manuals I've seen. It takes you step by step through programming the device in sound, speech, music, and clock modes. The appendices are well done, including an Apple //c 5-pin DIN connector to standard DB-25 (Apple //e, Super Serial Card) cross-reference for the serial interface. In fact, the only thing that's missing is an index. ■

**Bill O'Brien**  
Fort Lee, NJ

*According to Street Electronics, the heating problem in the prototypes has been solved for production models. They report that many programs supporting other synthesizers will soon support Cricket.* —eds.

## Era 2

### Microcom

1400A Providence Highway  
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Modem and software  
\$499

★★★

Easy to learn and use, the Era 2 communications program represents a good compromise between the slow, menu-oriented structure and the faster, but more difficult, command-driven structure. Documentation, both written and on-line, is very good.

Among its more powerful features is the terminal set-up arrangement. Communications settings can be customized for almost any remote system. With the user function module's flexibility, you can create a series of complex actions that can be invoked with a two-key command, and turn the Apple into a communications robot. Era 2 has predefined terminal setups, facilities for communicating with certain DEC and IBM computers directly, and a four-layer communications network protocol (MNP) for error-free transmission.

The Era 2 system includes the mo-

**Table. Era 2's main menu options.**

Option	Description
Enter Interactive Mode	The business end of the program: a command-oriented module backed up by a help menu and driven, single-key control codes (open-apple plus letter code on the //e).
Load Terminal Setup	A set of customized functions you load to communicate with a given data base or remote terminal.
Display/Change Terminal Setup	For editing set of functions currently in memory.
Save Terminal Setup	Use meaningful names here, such as DOW JONES SETUP.
File Maintenance	For routine disk access—cataloging or locking files, for example.
Display Change Configuration	For reconfiguring the program to system needs when necessary.

dem board itself, communications software on a 5¼-inch disk, spiral-bound and index-tabbed documentation, a quick reference card, a warranty card, and cabling for direct connection to a modular phone jack. In addition, you get a free hour of Dow Jones News/Retrieval Service; this includes the initial sign-up fee (\$75 when you subscribe separately).

The modem operates at 300 baud,

typical of many personal computer modems, as well as at 110 and 1200 baud. The board itself is a piggy-backed double board that operates in almost any Apple expansion slot. You need only plug in the board, connect it to a modular jack, and close the lid.

The first time you boot up Era 2, you configure the program to your system's needs. Specify the slot number the Microcom card resides in, dial-

*The Era 2 communications program operates in almost any Apple expansion slot.*



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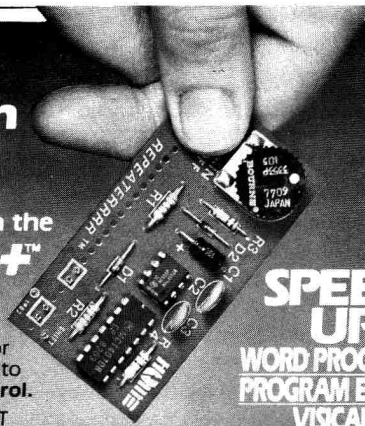
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## HARDWARE REVIEWS

ing system (pulse or tone), location of printer and clock cards, if any, and the number and location of your disk drives. Select the desired option with the arrow keys, and then the parameter with the space bar. This method neatly avoids illegal inputs.

The main menu has six options (see the **Table**). Powerful user functions let you automate your communications tasks. Microcom's documentation includes two chapters detailing applications of these user functions.

Microcom has also provided terminal set-up files on disk for four of the more common data-base services: Dow Jones, CompuServe, The Source, and MCI Mail. The documentation gives a thorough description of each element in these files, along with suggestions for customizing them to your needs.

Unfortunately, Era 2 supports only two printer cards: Apple Super Serial and Apple Parallel. (You can always download files to disk, retrieve them later using your word processor, and then print them.) The company plans support for other cards sometime in the near future. Another drawback is that you can't look at the catalog of disk files from anywhere but the file maintenance mode. And creating and saving terminal set-up files is a four-step process involving considerable disk access.

Era 2's strengths, though, compensate for its weaknesses. It provides terminal emulation for the DEC VT 100, VT 52, and IBM 3101 computers, when you have a //e with an 80-column display. You can communicate with other personal computers and set up a bulletin board with the auto-answer mode and programmed user functions.

For error-free transmission, Era 2 uses a four-layer network protocol called the MNP (Microcom Network Protocol) reliable link. This protocol assures correct transfer of both files and interactive communication, essential if you need a perfect facsimile at the other end, or if transmission lines are noisy.

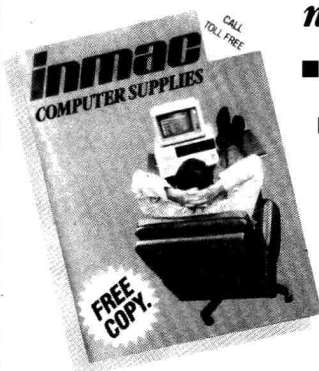
Except for the lack of printer card support, the Era 2 modem is an excellent product. I recommend it to anyone interested in buying a modem. ■

**Charles Engelsher**  
Schenectady, NY

497108

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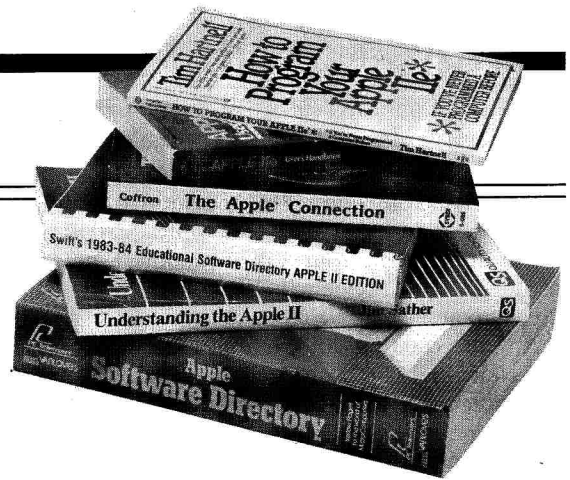
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# BOOK REVIEWS



## An Apple for Kids

by Sharon Boren

dilithium Press  
P.O. Box 606  
Beaverton, OR 97075  
Softcover, \$7.95

**A**n *Apple for Kids*, a well-written and educationally sound tutorial, teaches children how to program in BASIC on an Apple microcomputer. It is the first and principal book of a three-book series; the other two books are an activities workbook (\$5.95) and a teacher's guide (\$14.95).

The book is divided into eight components of approximately eight chapters each. Each lesson—or chapter—is presented in a straightforward, fun-to-read style geared to a fourth-grade reading level. Boldfaced type highlights important terms and most lessons are reinforced through reviews and practice sessions.

### Overview

The early chapters familiarize the student with the Apple keyboard and system operation. Later chapters teach the language and skills necessary to write programs in BASIC. All programming techniques included in the book can be understood by the average sixth grade student. After completing the book the child should be able to write game programs, simple graphics, teaching programs, and programs that solve problems.

Component One introduces the child to the Apple with a tour of the keyboard (Apple II, II Plus, and IIe are all treated), including the special keys, such as the escape, control, reset, return keys, and the space bar. Correcting typing errors and moving the cursor are both covered here through clear examples.

The first component also explains the inner workings of the computer and points out some of the circuitry visible when the Apple's cover is removed. Terms such as RAM, byte, kilobyte, ALU, and CPU are also explained. A discussion of peripherals and the proper operation of the disk drive close out the first component.

### On to Programming

Component Two explains several arithmetic capabilities of the micro, including order of operations, while Components Three and Four start your child writing simple programs with graphics and loops. At this point the technique and benefits of flowcharts are presented.

Components Five through Seven continue to develop the BASIC commands necessary for simple programming. Variables, FOR...NEXT loops, timers, counters, and the different ways to input data are just a few examples.

The last six chapters in Component Eight explore animation and random

numbers, and how to include them in game programs.

The book ends with five different appendices and a glossary of the many terms used in the book.

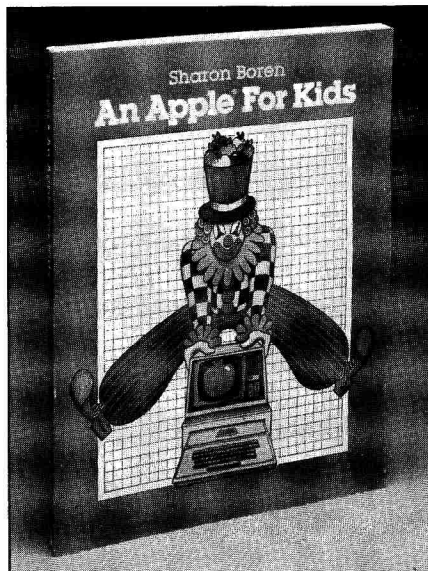
### Summing Up

For the most part, Boren has succeeded at writing a textbook to teach programming to third through eighth graders. Differences in aptitude, reading skill levels, and ability to relate to or understand technical information across this age group make that a difficult assignment at best.

Her book can be used by a child alone or with the assistance of a parent. (Certainly, with the available teacher's guide, it could be used by classroom teachers.)

*An Apple for Kids* might be over the heads of some third graders; at times the terms and math used are appropriate only for the very top of the stated age range. On the other hand, eighth graders might find early examples a little simple. But this is a book that can sit by the home computer, to be read over and over again, always offering its reader another idea, another term from its wealth of information. ■

**Ken Silverstein**  
Salem, NH



## Inside Apple's ProDOS

by John Campbell

Reston Publishing Company  
11480 Sunset Hills Road  
Reston, VA 22090  
Softcover, \$16.95

**I**nside Apple's ProDOS is a well-written companion to the manuals that Apple supplies with the Professional Operating System (ProDOS).

Each chapter begins with an overview, followed by several sections and subsections addressing related topics. A summary section and a questions section for quick review then conclude the chapter.

An introduction to the main features and boot-up technique is given in chapter one, along with some comments on the differences between DOS 3.3 and ProDOS, and the methods of program interconversion.

Chapter two, ProDOS Files and Commands, explains the structure of ProDOS, and its BASIC commands (RUN, LOAD, SAVE). The use of volumes, files, pathnames, and directories is also covered. Chapter three, Housekeeping Commands, continues with an explanation of other commands, including Lock, Unlock, Rename, Chain, Prefix, Store, and Restore.

Chapters four and five cover sequential-access and random-access files, respectively. Chapter six discusses binary files, and chapter seven covers executive files. Chapter eight explains some additional commands and utility programs, including the Filer, the Tutor, various file display and manipulation facilities, and the Convert utility for converting DOS 3.3 programs to ProDOS format.

Chapter nine, The Machine Language Interface, for the machine-language literate among you, includes the ProDOS loading sequence, mem-

ory maps, and integration of machine-language routines with ProDOS. This chapter also discusses system programs that fit in between an applications program and the operating system to permit more efficient use of ProDOS. Campbell addresses the subject of writing such routines with specific examples.

### Learn by Doing

In the final chapter, chapter ten, Campbell presents the use of ProDOS with a Christmas card mailing list, a modest but educational project. This chapter gives a painless and fairly thorough introduction to structured programming in BASIC. It also reviews all the things you've been told about ProDOS earlier in the book. ProDOS commands are presented in a hands-on manner, so that you are left with a better understanding of their use in an actual case. The use of ProDOS's hierarchical file structure is also covered in this program, to the same advantage. Topics in chapter ten include: the skeleton program, screen routines, record read/write routines, system configuration and set-up routines, and clock card usage—all with emphasis on this particular program. Finally, the program is described on a line-by-line basis.

Nine appendices cover such things as a comparison of DOS 3.3 and ProDOS, the ProDOS memory map and command summary, hard-disk stor-

age, details on selected ProDOS utility programs, and so on. The bibliography is comprehensive and current.

*Inside Apple's ProDOS* is well-conceived, well-executed, clear, and complete. And for those of you who anticipate converting to ProDOS, what better recommendation for a practical handbook do you need? ■

**Charles Engelsler**  
Schenectady, NY

## Writing with a Word Processor

by **William Zinsser**

Harper and Row Publishers  
10 East 53rd Street  
New York, NY 10022  
Softcover, \$12.95

## Writing in the Computer Age

by **Andrew Fluegelman and Jeremy Joan Hewes**

Anchor Press/Doubleday  
245 Park Avenue  
New York, NY 10167  
Softcover, \$10.95

**T**hese two books are aimed at the writer who is considering taking the technological plunge. Both try to give a general introduction to word processing in clear and simple lan-

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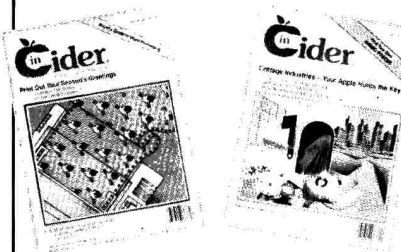
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guage. They talk about hardware and software in non-technical terms, and show how computerization can simplify the writing process. They also demonstrate that the new technology can benefit the writer both stylistically and creatively. The books differ mainly in the point of view and in intention.

### Writing with a Word Processor

Zinsser's book is primarily an account of his own experience in adapting to the writer's newest tool. A professional writer for more than 20 years, Zinsser has a clear view of the future of writing and the courage to confront it despite his self-confessed techno-phobia. He recounts his emotional and intellectual responses to an IBM word processor with warmth, wit, and good humor, painlessly incorporating a clear and concise introduction to the basics of word processing.

The entire book is a textbook example of clear, simple, and excellent writing. Much of what he says can benefit even the experienced writer. But the foremost concern of the book is to look at the growth of a particular man-machine relationship from the human perspective. Zinsser shows writers looking to the future that the technology can be mastered and put at their service.

### Writing in the Computer Age

If Zinsser tries to provide emotional

support and reassurance to word-processing novices, Fluegelman and Hewes attempt to teach them everything they might need to know about the subject. Their in-depth book covers all the major features of word processing on microcomputer systems. Fluegelman and Hewes consider each feature individually, giving a thorough explanation with a minimum of jargon. Numerous diagrams and examples help to clarify their explanations.

Both books begin with basics, assuming that the reader knows nothing about word processing beyond its existence. After covering all the beginner needs to know, Fluegelman and Hewes examine the more advanced features of some word processors and look at changes in the publishing business brought about by microprocessors. Beginners could easily be overwhelmed by the amount of information and detail, but all of it is thoroughly explained.

The two books complement each other and together provide a thorough introduction to the writing technology of the future. Zinsser's book should be read first for the reassurance that anyone can learn to live with and utilize a word processor. Fluegelman and Hewes provide the information needed to make an intelligent choice from all the word-processing hardware and software available. Both give invaluable insight and direction for us-

ing technology to improve the words, sentences, and paragraphs that are the writer's output. ■

**Karen McCullough  
Greensboro, NC**

### VisiCalc Extensions for the Apple II and Apple IIe

by Jack Grushcow

Reston Publishing Company  
11480 Sunset Hills Road  
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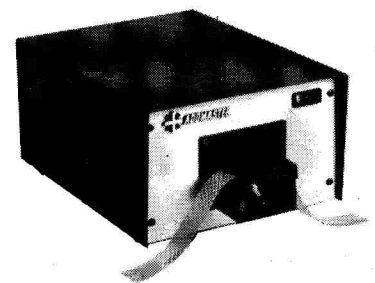
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programs, I recommend that you purchase the disk and enjoy the considerable enhancements offered.

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A word of caution: The Print, Sort, and Transfer programs make extensive use of DIF files. Be sure that you have Apple II version 202 (or later) and not version 193 of VisiCalc, which might erase an entire disk if you try to use it with DIF files.

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mulas and data that lie behind spreadsheets, as well as the visible format and labels in their template locations, instead of in a single listing with cell references. This feature provides an invaluable debugging and verifying tool for both template designer and user.

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prints selected columns instead of an entire block. A wrap-around feature determines how many rows and columns fit on a page. If a template exceeds that number, a form feed continues output to additional pages that are numbered automatically. And finally, the program prints templates with superimposed VisiCalc row numbers and column letters, enabling you to find specific cell locations quickly on a printout—an invaluable aid when editing template entries.

With the Sort program you can select and sort up to three different levels of rows or columns. You can designate protected as well as sorting areas, thereby precluding erroneous inputs to formulas outside of the sort range.

The powerful Transfer program creates linked VisiCalc systems that let you move or consolidate data between spreadsheets. Or you can modify the value of cells in all or part of a spreadsheet by using simple commands. For example, you can split up a large VisiCalc problem or template into a series of related templates, complete each individual template separately, then consolidate the results in a final spreadsheet. Thus, the program lets you apply structured problem-solving techniques to VisiCalc operations. The Show Calculations (SC) feature verifies that correct data has been transferred to the correct cell, providing a perfect audit trail.

The Connect program takes data from external sources (for example, accounting, stock analysis) and loads it into your own spreadsheets, without using the complex DIF format. It uses its own interchange system, GIF (Grushcow's Interchange Format). GIF files are simply sequential files with any set of delimiters (characters used to separate one record in a sequential file from its neighbor). The program also converts standard DIF files into GIF files, making it easier for your external systems to process them.

Whether you buy the book and create your own disk, or buy the VisiCalc Extensions disk itself, the cost is well worth the enhanced VisiCalc results that these powerful programs provide. ■

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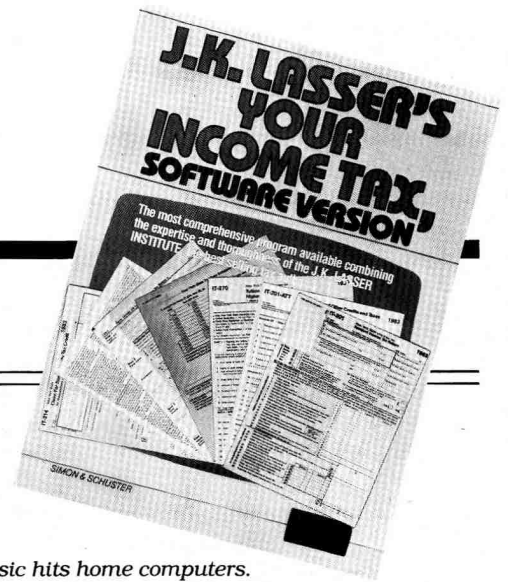
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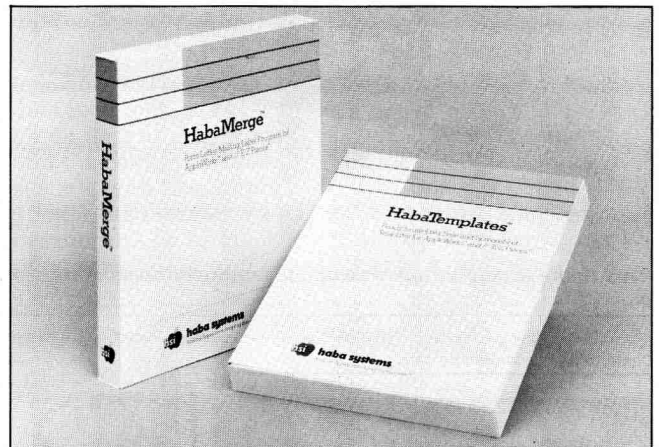
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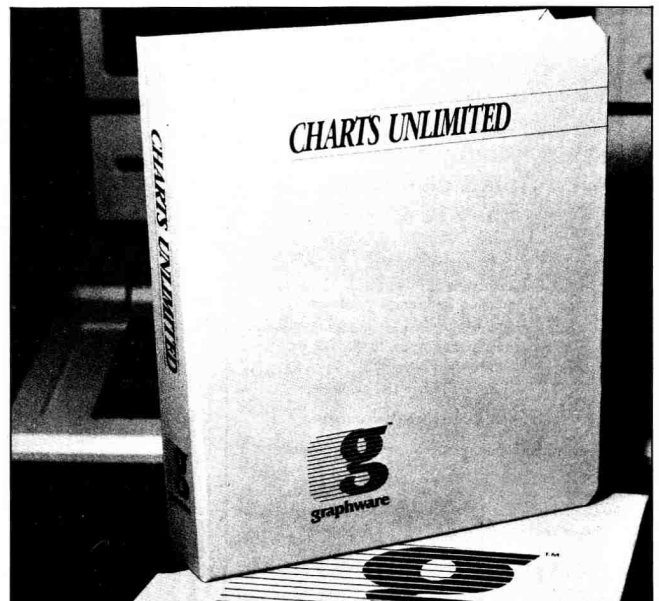
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edited by Kerry J. Lanz



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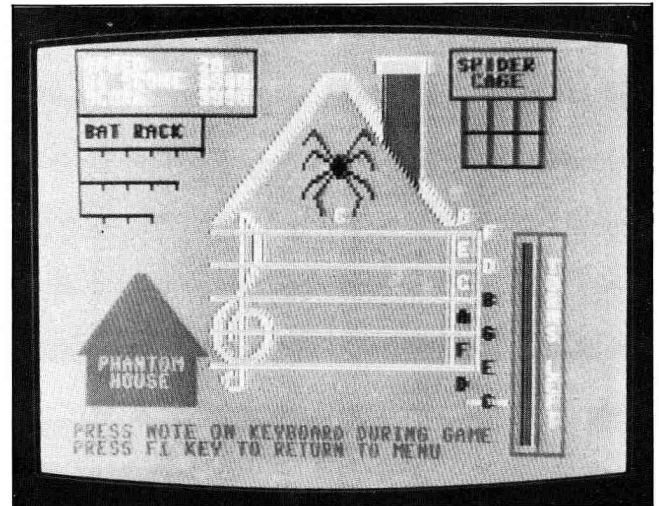
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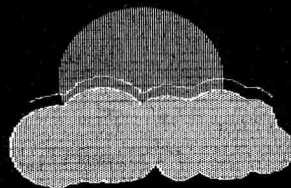
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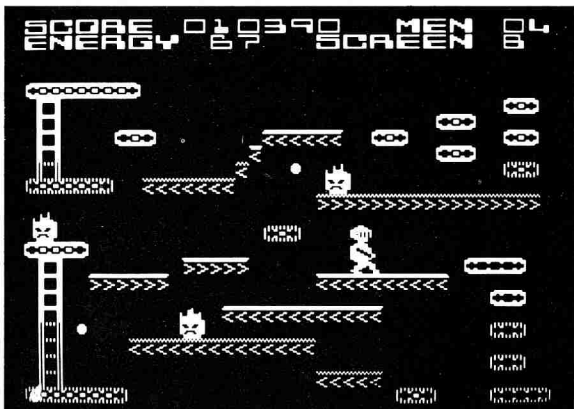
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### Role-Playing from Penguin

**Xyphus**, a fantasy role-playing game, allows independent movement of four characters. It combines six different scenarios into one grand adventure. The game is played on a full-screen map of Arroya where characters use both weapons and magic in pursuit of the demon lord. You can join the fantasy for \$34.95 at Penguin Software, P.O. Box 311, Geneva, IL 60134. Use Reader Service number 473.

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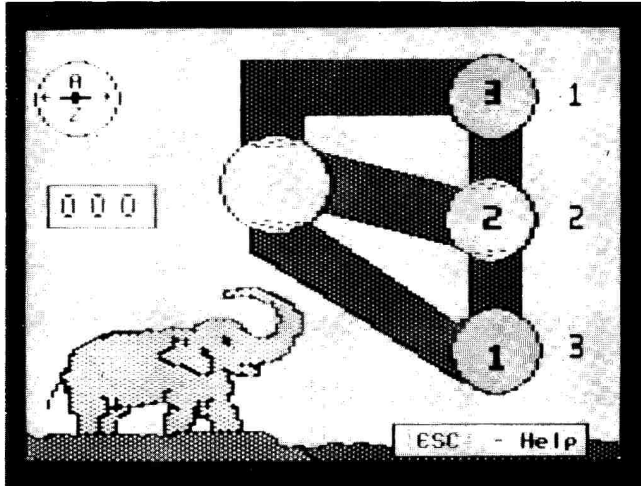
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# NEW SOFTWARE



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## Stock and Commodity Analysis

**High-Tech** performs 30 different types of technical analysis on daily or weekly data for stocks and commodities. It can update its data by modem and costs \$395. **Master Forecaster** costs \$139 and its forecasts include closing prices of stocks and bonds, money supply figures, and consumer price index. Both programs work on any Apple II and are from Microvest, P.O. Box 272, Macomb, IL 61455. Use Reader Service card number 485.

## Freddie Needs Logical Help

Designed for children ages 7-12, **Freddie's Puzzling Adventures** stimulates problem-solving and logical thinking. Children try to unscramble letters and numbers in the fewest moves. There are six adventures of varying difficulty, with sound and hi-res graphics. Freddie needs \$29.95 to adventure with DLM, One DLM Park, Allen, TX 75002. Use number 476 on Reader Service card.

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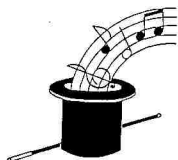
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# NEW PUBLICATIONS

## **Bulletin Board Directory**

*The National CBBS Directory* (\$2) contains over 1000 computer bulletin board telephone numbers in numeric sequence, identifying the BBS type, its baud rate, operating hours, and other pertinent facts. For further information, contact Thomas Wnorowski, 3352 Chelsea Circle, Ann Arbor, MI 48104.

## **Dentists' Software Catalog**

Over 30 applications packages for the dental profession are listed in a free catalog from CMA Micro Computer, 55722 Santa Fe Trail, Yucca Valley, CA 92284. These applications include billing and claim form preparation, appointment scheduling, patient recall, and general ledger. Also available are several specialized data base and word processing applications specifically designed for dentists.

## **Where's that Review?**

*The Computer Software/Hardware Index* is a monthly loose-leaf index to software reviews, hardware reviews, book reviews, and printed programs. Reviews and programs are indexed from 35 computer publications. The index is priced at \$60 a year, and includes a binder, 12 monthly issues, and an annual cumulation. Contact the publisher, Robert M. Bottorff, P.O. Box 7991, Haledon, NJ 07538, for further information.

## **Educational Microcomputer Catalog**

The 1984 Hammett Microcomputer Division catalog has 80 pages of hardware, peripherals, furniture, supplies, and more than 500 programs selected for their educational value. Contact the Microcomputer Division, J. L. Hammett Co., Box 545, Braintree, MA 02184, to obtain this free catalog.

## **Game Maps and Hints from Infocom**

Players in need of help in the Infocom series of adventures (Zork, Planetfall, Deadline, etc.) can look to a series of InvisiClues hint books and game maps. They are available for \$7.95 for each game from Infocom, P.O. Box 855, Garden City, NY 11530.

## **TAPIT on TAP**

*TAPIT* (The Apple Periodical Information The-saurus) is a data base created by AV Systems, P.O. Box 49210, Los Angeles, CA 90049. You can find concepts and instructions in the published list of books. Retail price is \$39.95.

## **Want a Widget?**

*Widget World* offers the nuts and bolts of the computer world to you—adapters, converters, data cables, switches, spoolers, tools, test sets, and much more. Write Micom Systems, Inc., 20151 Nordhoff Street, Chatsworth, CA 91311, to receive the free *Widget World* catalog.

## **Anecdote to Dullness**

Directories don't have to be dull. Anecdotes liven up the *PC Telemart/VANLOVES Apple Directory* with 3500 descriptions of Apple software programs. Applications range from agriculture to word processing, and the business category includes more than 700 programs. Contact PC Telemart, Inc., 11781 Lee Jackson Highway, Fairfax, VA 22033, for further information. The directory sells for \$24.95.

## **Let Your Fingers Use the Yellow Pages**

*The Complete Software Marketplace: 1984-1985* is a comprehensive, authoritative, and current guide that teaches personal computer users how to turn ideas into programs and how to sell these programs—either through software companies or directly to the public. This resource guide is available for \$17.95 from Warner Software/Warner Books, 666 Fifth Avenue, New York, NY 10103.

## **Problem Solver**

A free 40-page catalog from Electronic Specialists presents products designed to eliminate problems most often blamed on software. Protective devices for smooth software performance include equipment isolators, AC power line filter/suppressors, AC line voltage regulators and modem protectors. Ask for catalog 831 from Electronic Specialists, Inc., 171 South Main Street, Natick, MA 01760.

## **Computer News for Educators**

The charter issue of *Computers in the Schools*, a quarterly journal for the professional educator, covers the issues of educational computing in a friendly, literary style. It discusses issues and concerns, and reports re-search findings in non-technical language. For further information, contact *Computers in the Schools*, The Haworth Press, Inc., 28 East 22nd Street, New York, NY 10010.

## **Computer News by Tape**

*Computer News Audio Digest* (\$195), an edited and recorded twice-monthly digest of current computer news from key computer journals, can keep executives up to date on computer news while driving to work or opening their morning mail. For further information on this digest, contact Computer News Audio Digest, P.O. Box 10266, Stamford, CT 06904.

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## Magazine on Disk

*Softyme*, a monthly disk publication for Apple computers, features home productivity programs such as a check-book balancer, utilities, and games. Outside submissions are welcome.

*Softyme* is published by Viking Data Based Technologies, Inc. at 174 Bellevue Avenue, P.O. Box 299, Newport, RI 02840. A one-year subscription is \$48 for 12 issues.

## LAMP Offers Light on Micros

*LAMP* (Literature Analysis of Microcomputer Publications) is a bimonthly journal that indexes 130 periodicals dealing with microcomputers in the areas of business, education, the arts, and the social and physical sciences. *The Annual Cumulative Editor* for 1983, printed in two volumes, is available for \$69.95 (\$39.95 for subscribers) from *LAMP/Soft Images*, Brochure Department, 200 Route 17, Mahwah, NJ 07430.

## Good Software for Grades K-12

*The 1984 Educational Software Preview Guide* is a list of favorably reviewed software for K-12 classroom use. Available for \$5, this booklet helps locate software for a particular curriculum area, grade level or machine, and identifies undeveloped marketing areas for software developers. Contact The International Council for Computers in Education (ICCE), University of Oregon, 1787 Agate Street, Eugene, OR 97403, for further information.

## Freeware

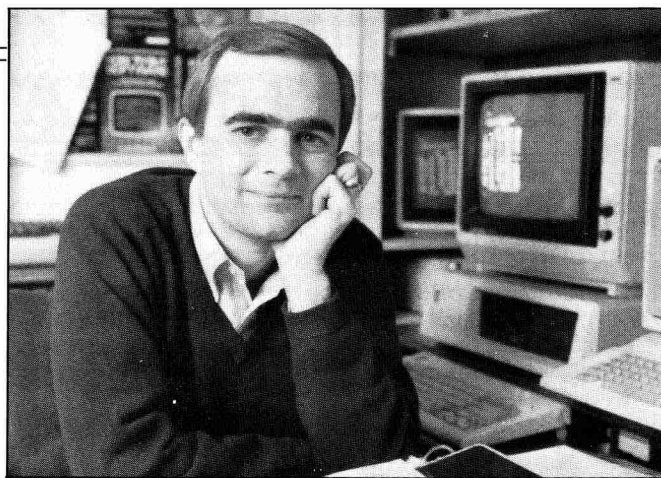
*How to Get Free Software* (\$14.95) by Alfred Glossbrenner offers a range of free or low-cost programs from word processing, spreadsheets, communications, database management and filing programs, to free music, graphics, education, and game programs of every description. User groups, bulletin boards, and software librarians and other sources are all listed here. For further information, contact St. Martin's Press, Inc., 175 Fifth Avenue, New York, NY 10010.

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Hayden Book Company announces *The Microcomputer User's Guide to Information Online*, an up-to-date collection of more than 100 on-line data bases for home use, business, news, education, and document delivery. This reference covers start-up, data-base costs, and vendor publications. Also included is a complete examination of how to perform a search and download data programs, as well as step-by-step instructions for sending mail, talking to others, programming, and forming special-interest groups. This handy guide is available for \$18.95 from Hayden Book Company, 10 Mulholland Drive, Hasbrouck Heights, NJ 07604.

## SuperCalc Primer

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## Avon's Data Sources

*The Computer Data and Database Source Book* is a complete encyclopedia of commercial and public sources of information on any computer. This reference tool (\$9.95) contains thousands of listings from commercial data bases to the names, addresses, and telephone numbers of data sources. For further information, contact Avon Books, 1790 Broadway, New York, NY 10019.

## Industry Surveyor

Associated Technology has completed an industry survey, *Software Locator Survey*, that identifies over fifty major services, cites over 350,000 software packages, and represents over 9000 software companies. Survey results are available for \$18.50 from ATC Software, Route 2, Box 448, Estill Springs, TN 37330.

## Computer Investors Journal

In-depth articles and reviews of investment software and books as well as member software discounts are available in the *AAMI (American Association of Microcomputer Investors, Inc.) Journal*. For a sample issue, send \$3.00 to the AAMI, P.O. Box 1384, Princeton, NJ 08542.

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## Trivial Controllers

**PQ—The Party Quiz Game** adds hand-held controllers to trivia questions. Four controllers connect to any Apple II by 6-foot cords and are used to answer questions and select game options. For \$74.95 you get four controllers, interface, all cables, and the 2700-question General Edition of the game. Other editions are available. Contact Suncom, 260 Holbrook Drive, Wheeling, IL 60090. Reader Service number is 458.

## Searching for Software?

.Menu maintains a data base of over 50,000 software titles for all com-

puters. Its **SoftReport** custom search lists programs that meet your criteria and costs \$25 for the first ten listings, \$1 each up to 50 listings, and 25 cents after that. Information is from .Menu, 1520 South College Avenue, Fort Collins, CO 80524. Call 1-800-THE-MENU or mark Reader Service number 468.

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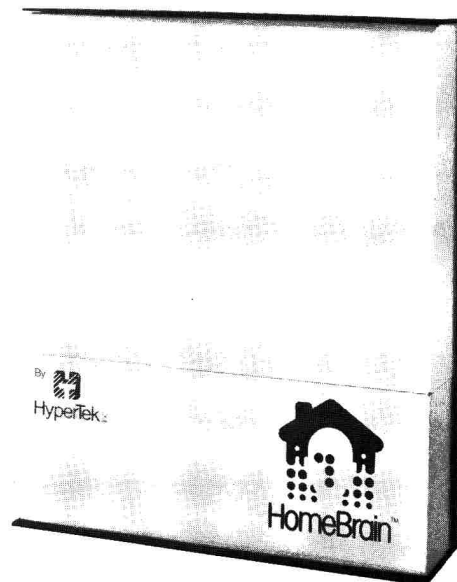
**HomeBrain** home-management system combines security with automation. Your Apple programs Brain's processor through an RS-232 interface. Then the Brain takes over, freeing your Apple for other work. Brain monitors temperature, moisture, or security, and controls thermostats, sprinklers, and alarms. The central unit costs \$1499, or \$2149 with sensors. Contact Hypertek, P.O. Box 137, Whitehouse, NJ 08888 or circle 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 an endorsement by inCider of any given product.*

*Quick commands from Keyfax.*

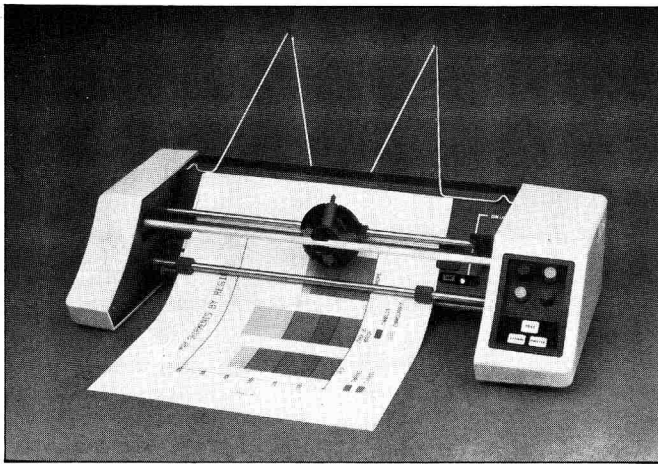


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**edited by Kerry J. Lanz**



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on paper up to 11 by 17 inches. Hook your Apple to the PC Plotter through an RS-232C interface and start plotting better graphs. Contact Houston Instrument, P.O. Box 15720, Austin, TX 78761. Reader Service number is 452.

## Share and Share Alike

Connect two peripherals to one computer with **MacSwitch**, priced at \$99. You can also connect two computers to the same peripheral. Be sure to specify parallel Centronics style or serial RS-232. For full information, write Computer Friends, 6415 SW Canyon Court, Portland, OR 97225. Or you could check off number 469 on the Reader Service card.

noise, alignment, write/read, and hysteresis. The disk works on any Apple II and comes from Dymek, 1851 Zanker Road, San Jose, CA 95112. Use Reader Service number 463.

## Color-Coded Memories

Keep your blue moods away from your red-letter days with **Rainbow Memories**. Each sturdy plastic box of ten 5¼-inch colored disks contains two each of silver, red, blue, yellow, and green. You can get single-sided (\$34.95) or double-sided (\$39.95) disks. This information is from Rainbow Memories, 710 Wooten Road, Colorado Springs, CO 80915. Reader Service number is 462.

## Get RID of Head Pains

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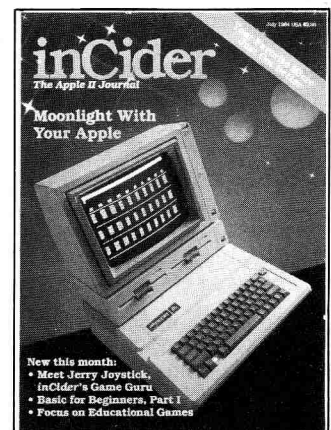
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## Jewels of Protection

Four new surge protectors for your home computer system, some with interference filtering, are **Diamond, Ruby, Emerald, and Sapphire**. They are priced from \$49.95 to \$89.95 by Curtis Manufacturing, 305 Union Street, Peterborough, NH 03458. Reader Service number is 456.

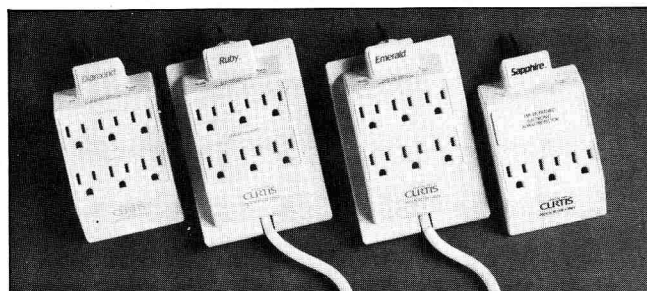
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Reliability and low cost combine in Alphacom's first daisy-wheel printer. **Alphapro** (\$399) prints at 18 cps and offers proportional spacing, double strike, superscripts and subscripts, and reverse line-feed. Interface cable (\$49.95) connects Alpha-

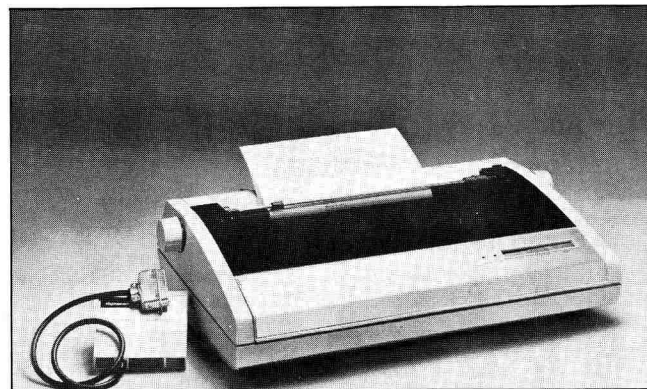
pro to your Apple through parallel or serial ports. For more information write Alphacom, 2323 South Bascom Avenue, Campbell, CA 95008, or mark number 450 on the Reader Service card.

## Next Series of Grappler

Drive Apple's Image-writer printer or any serial printer with the **Serial Grappler** (\$119) for Apple II, II Plus, and //e. This interface card includes firmware commands to dump text or graphics screens, even double hi-res. It can accept a Bufferpak for up to 64K printer memory. For more information contact Orange Micro, 1400 North Lakeview Avenue, Anaheim, CA 92807, or mark number 465 on the Reader Service card.



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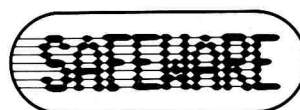
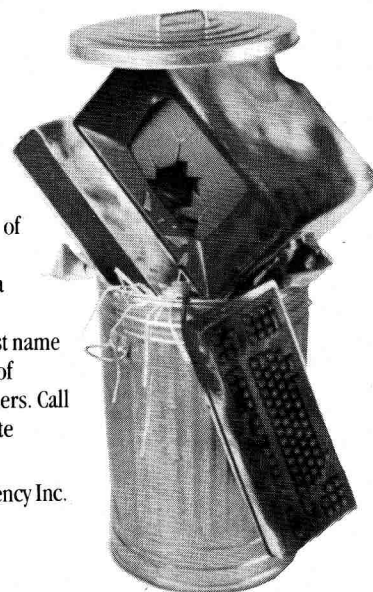
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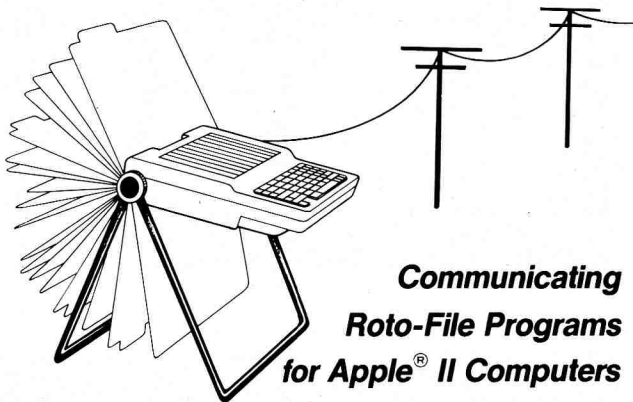
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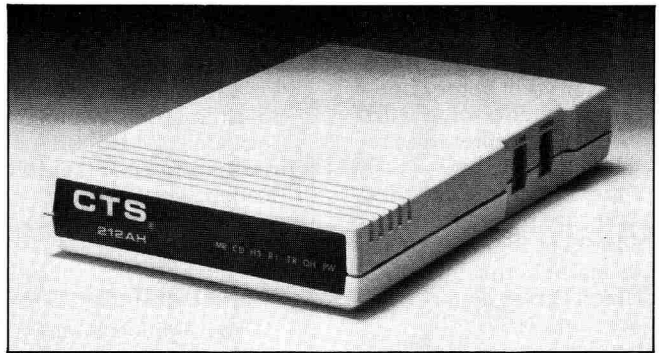
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## NEW PRODUCTS



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The **CTS-212AH** modem offers full features at 300 and 1200 baud. Connected to your Apple by RS-232 interface, it is fully Hayes-compatible. For \$445, you get full duplex, auto dial/auto answer, and pulse or tone dialing. For details, contact CTS Corporation, Datacomm Division, 131 West Street, Danbury, CT 06810. Use Reader Service card number 459.

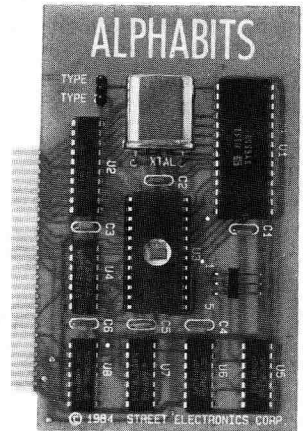
### New from the Street

**Extracard** provides 80-columns and 64K memory for an Apple //e. Priced at \$189.95, it is bundled with software that adds hi-res commands to BASIC. **AlphaBits** serial interface card (\$119.95) lets your Apple II, II Plus, or //e imitate the serial port of the //c and control peripherals designed for the //c. It comes with **GraphicBits**, a powerful graphics program. Write: Street Electronics, 1140 Mark Avenue, Carpinteria, CA 93013. Reader Service number is 467.

### Epson Interface for Apple //c

Your serial Apple //c can now drive the parallel Epson RX and FX printers with a **cPrint Interface**. For \$59.95, you get

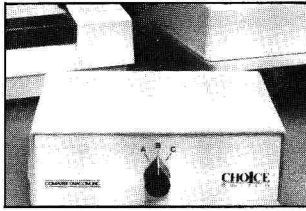
interface, cables, and plugs for both the Apple and Epson. This product comes from Dresselhaus Computer Products, 837 East Alosta Avenue, Glendora, CA 91740. Mark number 460 on the Reader Service card.



Connect II or //e peripherals to your //c with AlphaBits.

### Disk Drive Care Kit

Omnium's **Head Cleaning Kit** features software that controls the disk drive during cleaning. The program positions the head on an unused track of the cleaning disk and reminds you when to use a new disk. For \$49.95 you get software, cleaning disks, and cleaning spray. Software is sold separately for \$29.95. This information is from Omnium, 201 North Second Street, Stillwater, MN 55082. Use number 451 on the Reader Service card.



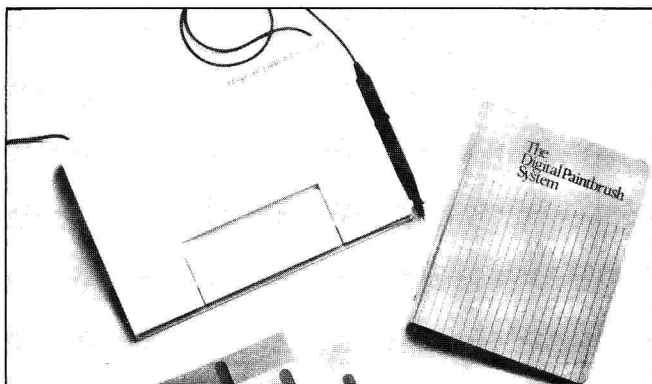
Share data among several peripherals with Choice.

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Eliminate the bother of constantly changing plugs among printers, modems, and computers with **Choice** switches. Six models, beginning at \$99, connect your computer to two or three other devices or connect one device to two or three computers. For full information on all the Choices, write: Computer Datacom, 1821 McGaw Avenue, Irvine, CA 92714. Circle Reader Service number 457.

### Power Line Monitor

**Power Monitor** keeps a 24-hour watch on your electric power. The monitor (\$99.95) is a plug-in device that gives an accurate and constant reading of your power supply, important for safe use of your computer system. There is a built-in alarm to warn of power surge or loss. Write Ultima Electronics, 21 Central Drive, Farmingdale, NY 11735, or circle Reader Service number 461.



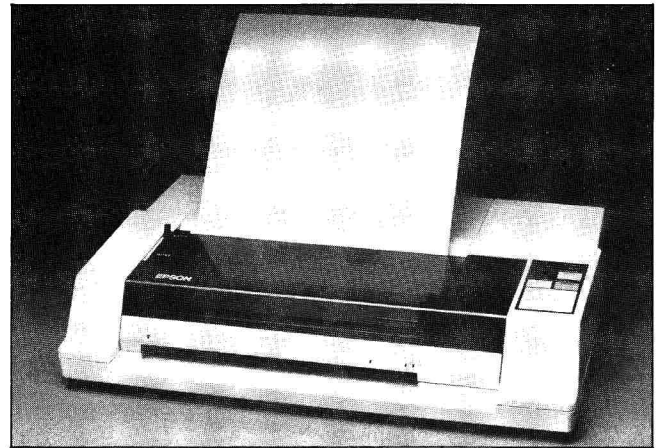
Digital Paintbrush for graphics, printers, and modems.

### Modem Bundled with Software

**InfoPhone** modem plugs directly into any AC outlet, clearing your desk of clutter. It features 300/1200 baud, full duplex, auto-dial and answer, voice/data switching, and pulse or touch tone. It links with your Apple through an RS-232 interface. The price of \$575 includes full software and free offers from The Source, Dow Jones, MCI Mail, and others. This is from Transend, 2190 Paragon Drive, San Jose, CA 95131. Mark Reader Service number 453.

### Complete Graphics System

The **Digital Paintbrush** is a pen-style input device for creating high-quality graphics. Software helps you draw and edit screens, or draw on someone else's screen through a modem. The system costs \$299 and works on any Apple II. **Flying Colors** (\$39.95) is an easy-to-learn drawing and "slide projector" program. **Flying Colors With Print-out** (\$69.95) adds a comprehensive screen dump. Contact: Computer Colorworks, 3030 Bridgeway, Sausalito, CA 94965. Use Reader Service number 466.



The new four-color Epson Plotter.

### Epson Enters the Plot

With 42 intelligent commands to reduce programming time, the four-color **Epson Plotter** (\$599) holds four out of ten available colored

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- 5. Government
- 6. Education/student
- 7. Business
- 8. Consultant
- 9. Other

**G. Do you ever move your Apple from one location to another? Check all that apply.**

- 1. Yes, transfer between home and office
- 2. Yes, transfer between home and school
- 3. Yes, transfer from room to room
- 4. No, it pretty much stays put

**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!!
- 10. Ask InCider
- 11. The Apple Clinic
- 12. Apple Extract

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**H. Which of the following peripherals do you own?**

- 1. Printer
- 2. Modem
- 3. Plotter
- 4. Joystick
- 5. Graphics Tablet
- 6. Monitor
- 7. 8800 Board
- 8. Disk Drives(s)
- 9. Other

**I. Which of the following peripherals do you plan to purchase during the next 12 months?**

- 1. Printer
- 2. Modem
- 3. Plotter
- 4. Joystick
- 5. Graphics Tablet
- 6. Monitor
- 7. 8800 Board
- 8. Disk Drives(s)
- 9. Other

**J. Which of the following magazines do you read regularly?**

- 1. inCider
- 2. A+
- 3. Softalk
- 4. Nibble
- 5. Call A.P.P.L.E.
- 6. Peelings II

**B. To what extent, approximately, do you use your Apple for business-related applications?**

- 1. Not at all
- 2. Up to 33%
- 3. 33%-66% of use
- 4. Almost exclusively

**C. To what extent do you use your Apple for home applications, including games and home education?**

- 1. Not at all
- 2. Up to 33% of use
- 3. 33%-66% of use
- 4. Almost exclusively

**D. Which of the following micro-computers 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. If you are an educator, do you use an Apple in the classroom?**

- 1. Yes
- 2. No
- 3. Not an educator

**F. Where is your Apple located? Check all that apply.**

- 1. Home
- 2. Office
- 3. School
- 4. Other

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**inCider** • December 1984

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- 7. Business
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- 12. Apple Extract

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- 2. A+
- 3. Softalk
- 4. Nibble
- 5. Call A.P.P.L.E.
- 6. Peelings II

**B. To what extent, approximately, do you use your Apple for business-related applications?**

- 1. Not at all
- 2. Up to 33%
- 3. 33%-66% of use
- 4. Almost exclusively

**C. To what extent do you use your Apple for home applications, including games and home education?**

- 1. Not at all
- 2. Up to 33% of use
- 3. 33%-66% of use
- 4. Almost exclusively

**D. Which of the following micro-computers 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. If you are an educator, do you use an Apple in the classroom?**

- 1. Yes
- 2. No
- 3. Not an educator

**F. Where is your Apple located? Check all that apply.**

- 1. Home
- 2. Office
- 3. School
- 4. Other

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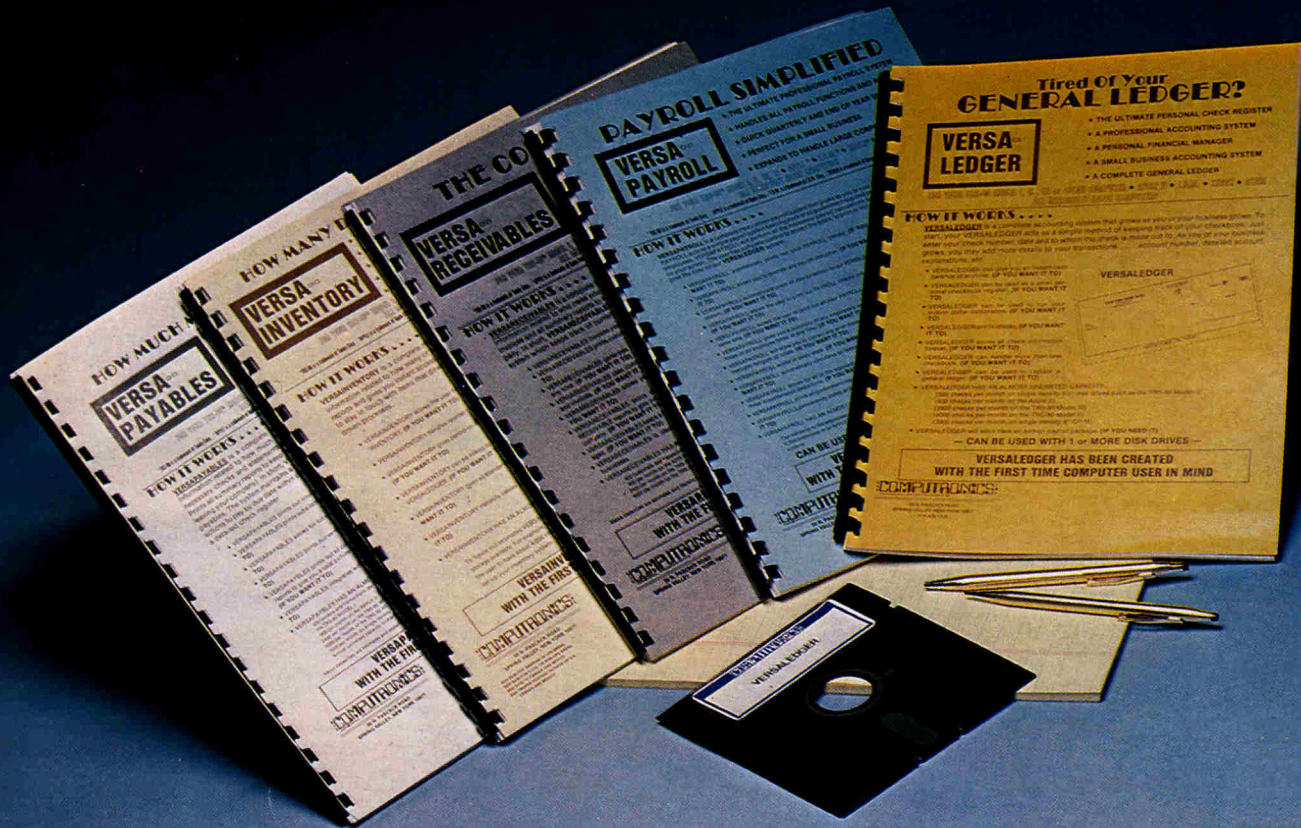
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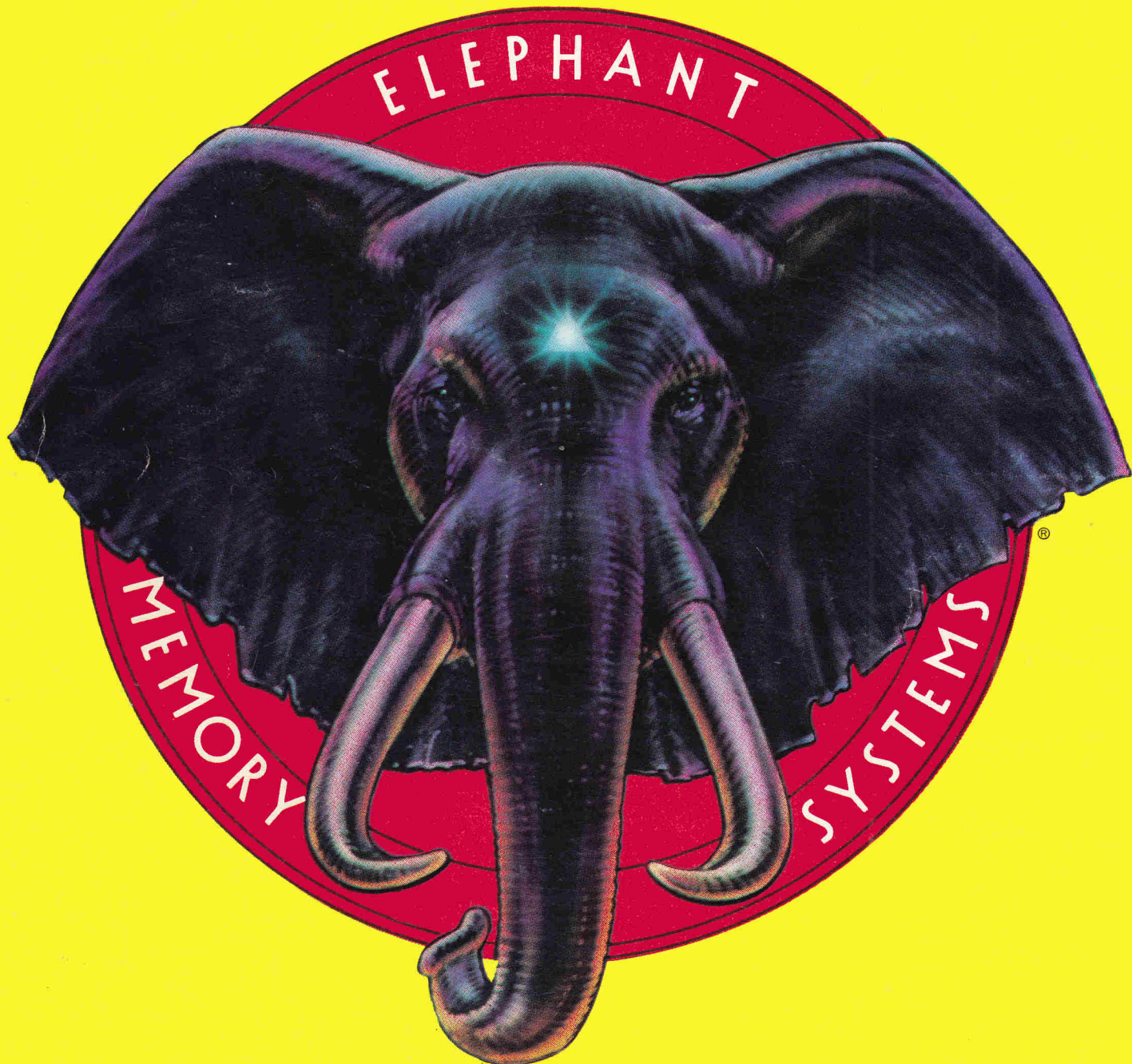
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