

THE APPLE II MAGAZINE

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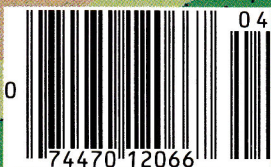
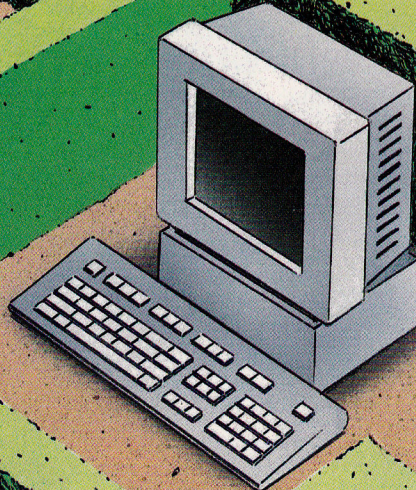
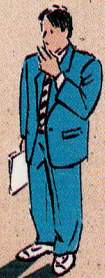
AN IDG COMMUNICATIONS PUBLICATION

## THE LOGICAL APPROACH Programming Made Easy *(Sort Of)*

### The Good, The Bad, and the SCSI

### 10 Hard Drives Compared

**Reviews:**  
Learning with LogoWriter  
XPress XChange  
EasyDrive 1.5  
Talking Reading and Me



# BIG TALKERS



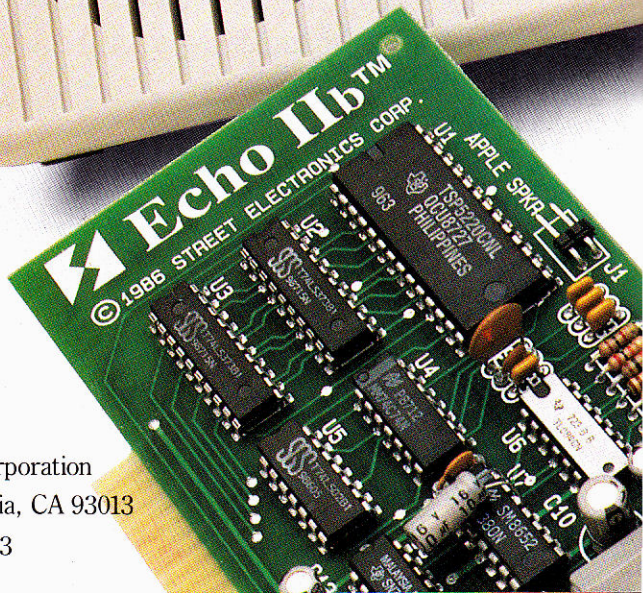
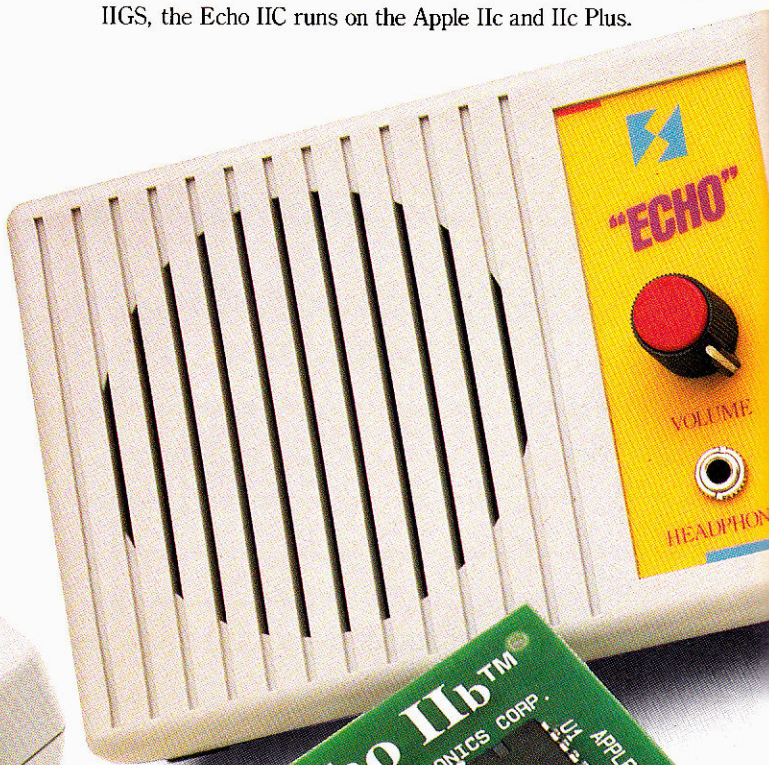
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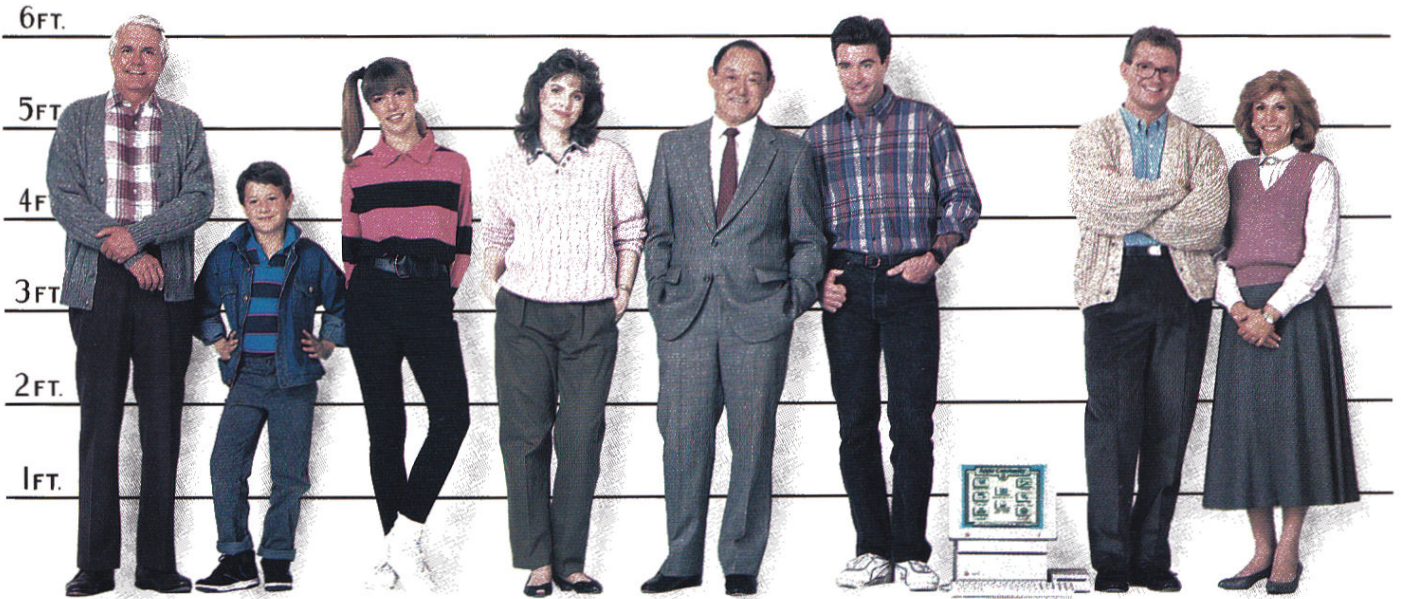
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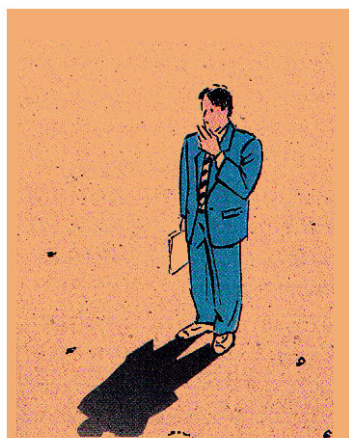
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Circle 54 on Reader Service Card



# A PRIL

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You don't need to be a computer wizard to learn to program—or to enjoy it. Relax as you stroll through a few BASIC techniques that will help you customize your programs and create practical solutions for home and business needs.

### 47 Which One to Buy? Drives: Part 2

There's more to hard-disk drives than storage and speed. In Part 2 of our series, *inCider* looks at the distinguishing features of the industry's most popular models.

### 54 Partners in Special Achievement

Thanks to a unique combination of innovative special-needs programs and adaptive devices, disabled Apple II users are saying, "I can"—at home, in school, and on the job.



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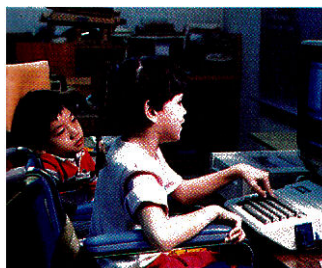
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## INCIDER'S VIEW

**W**hen someone else can write that program faster and better than I can, I'm no fool. I write a check.

# WHAT? ME PROGRAM?

By DAN MUSE \* EDITOR IN CHIEF

AS WE SAT DOWN TO PLAN THIS APRIL issue, I listened to some of our more technical staff members argue the need for a programming issue. The question wasn't so much should we cover programming, but rather how deeply.

The more I listened, the more I realized that not only do I not program my Apple II, but I have a hard time understanding why anyone who doesn't make a living—or intend to make a living—programming would want to.

After all, I didn't build my own car engine, I didn't construct my own house, I don't direct my own movies. Why would I want to program my own software? I love my Blazer, I live in my home, and I like movies as much as the next guy. I can also recognize a good piece of software when I see it. I can't program the way Bill Kennedy, our technical editor, can, but I'll take him on when it comes to using Publish It! or Paintworks Plus.

To my mind, outside of a quick-and-dirty routine that patches AppleWorks, for example, there's no point to writing programs unless you enjoy it or want to do it professionally. Programming isn't a prerequisite for computer owners. If you buy an Apple II don't feel it's your duty to take a programming course.

Paul Statt, our often-pedantic senior editor, says if you want good software, write good software (Status Report, p. 20). I say buy good software, and you'll see more good software developed. Computer software is a mainstream consumer item, just like videos and compact discs. Your dollars drive the market. If people stopped buying X-rated videos and started buying Shakespearean plays on tape, you'd see more of *The Merchant of Venice* and less of *Debbie Does Dallas*. The same holds true for software. If you're selective about what you buy, you'll send a message to software companies.

Computer technology has evolved dramatically in the last decade. Ten years ago, if you wanted good software you wrote it, because there weren't a lot of options. If the early pioneers wanted to stay warm, they built a log cabin. Necessity, after all, is the mother of invention. But when someone else

can build that log cabin or write that program faster, better, and more cheaply than I can, I'm no fool. I write a check and do what I like to do and what I'm good at.

While I don't think you need to know how to program, I do believe that it's important for you to understand how software works (*how* it's programmed), just as it's good to know how to change your oil or fix your flat tire. It's important to understand how your operating system operates so that you can take advantage of hard-disk drives, CD-ROM drives, and so on; it's helpful to know how to install accessory programs.

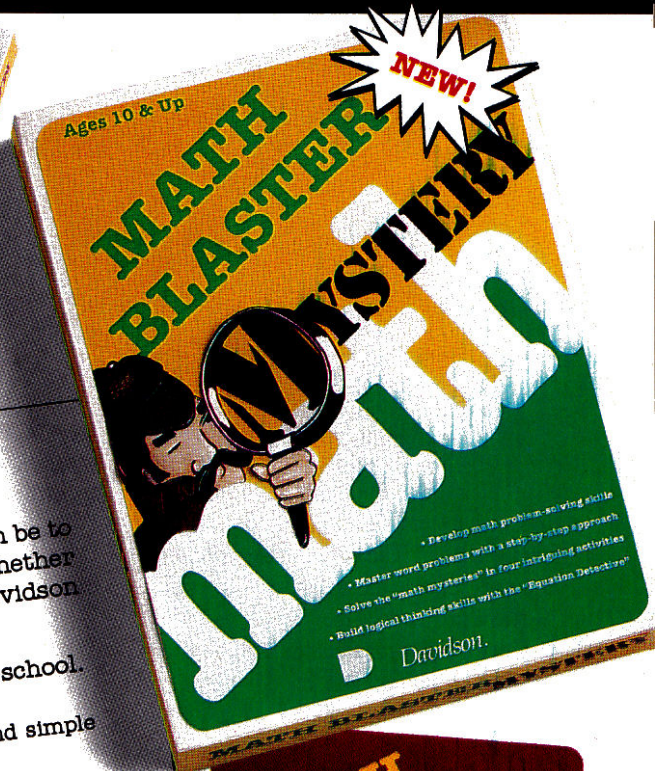
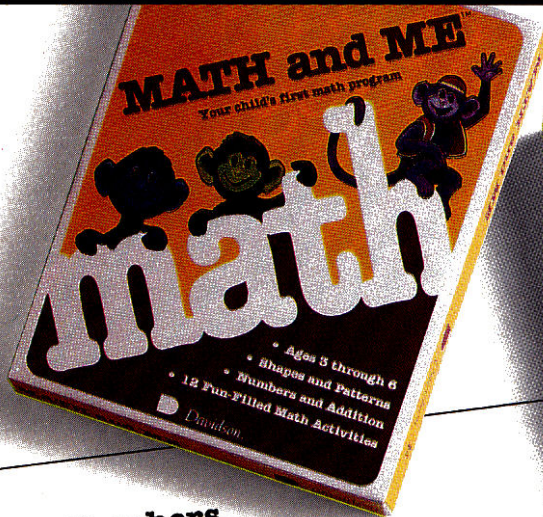
The result of the planning session I mentioned, then, is this month's cover story, "Back to BASICS," which focuses on the practical side of programming. If you're already a faithful reader of Applesoft Adviser or Apple IIGS BASICS (see Contributing Editor Joe Abernathy's premier column on p. 86), you'll probably find "Back to BASICS" too...basic. But there are some things everyone should know. Too many of us turn and run when we hear the *P* word, as if programming were all-or-nothing: Either you *never* type a line of code or you stay up all night typing in five-page program listings.

Unfortunately, the public still accepts the stereotype of the hex-crazed programmer. Only slowly are we realizing that programming is a skill, just as building a house or writing a novel involves particular skills. Programmers aren't nerds or nocturnal introverts. They're talented people. Children should be encouraged to cultivate their talents—programming, writing, painting, building, or whatever.

As a profession, programming is young. Many people who are successful programmers today started out in other professions. It's never too late to develop a love for programming. You might even discover you're good enough to make a living at it.

And if you don't end up wanting to make programming your life's work, you can take pride in saying, "I change my own oil; I build my own bookshelves; and I write my own AppleWorks patches." □

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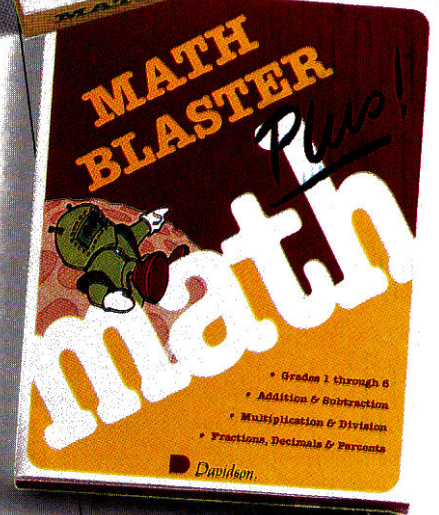
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# LETTERS TO THE EDITOR

## PARENTHETICALLY SPEAKING

**M**Y INCOME-TAX TEMPLATE ("Preparing Your Income Tax," January 1989, p. 54) stirred up quite a bit of dust. While many readers wrote to say thanks for the template, others were frustrated at being unable to enter long Formulas 7 and 17. The only publishing error I was aware of was the omission of @ before CHOOSE in Formula 10.

Eager to resolve the situation, I entered both formulas (including edit mode) exactly as printed in *inCider* and didn't have any problem. I even checked out the formulas with every previous version of AppleWorks, all the way back to version 1.1. Again, everything worked fine; frankly, I was stumped.

I then asked a total novice (my husband) to enter the formulas so that I could get a sense of what was happening. Sure enough, he left out one of the two closing parentheses at the end of Formula 7 and an open parenthesis before the second @LOOKUP in Formula 17. When he pressed Return, the computer beeped, the formula disappeared from the edit line, and the 1 reappeared on the edit line—exactly as my correspondents described. When he retyped properly, AppleWorks accepted the formula without further ado.

If you experienced this type of problem, I have good news. Though Formula 7 is correct as published, it's needlessly cumbersome. Instead, enter this one in C48 in the usual way:

@MAX(@SUM(C47.C35),@LOOKUP(G4,G9.G12))

As for Formula 17, enter it exactly as described in the column. When you've finished typing, take a few moments to make sure there are no typos. Before hitting Return, check all commas, periods, and (especially) parentheses. Make sure there are no spaces anywhere in the formula. If something's amiss, press the

left-arrow key to move the cursor along the edit line. Type in a missing character, or use Delete to erase an extra character, then press Return.

**Ruth K. Witkin**  
5 Patricia Street  
Plainview, NY 11803

## LIFE SPAN

**Y**OU MENTIONED IN APPLE BITS (October 1988, p. 18) that this is the second anniversary of the IIGS, which means that its lithium battery has only three years remaining. When the battery dies, will my GS also become useless? How can I and other users get a new battery when the current one runs out of power?

**Marcelo Banderas**  
8921 Powell Avenue  
St. Louis, MO 63144

*When the GS' battery, which should last for five years, runs out of power, and you've turned off your GS, the clock will stop ticking and the control panel's non-default settings will disappear. You'll still be able to access the control panel—even set the clock to the correct time and it'll tick along just fine when the GS' power is on.*

*Unfortunately, the battery isn't rechargeable, nor does the GS charge it when the computer's turned on. According to an Apple spokesperson, however, your Apple dealer will replace the GS' battery.*

—eds.

## KEEPING UP WITH UNCLE SAM

**R**EADERS SHOULDN'T USE THE table included in "Preparing Your Income Tax" (AppleWorks in Action, January 1989, p. 54) for estimated-tax

calculation. The table was for 1987 income; different numbers apply for 1988 and 1989.

**Phineas R. Fiske, CFP**  
Personal Financial Services  
P.O. Box 1401  
Melville, NY 11747

*Thanks for the notice. Ruth Witkin points out in the article that because Congress has changed the tax laws 19 times in 23 years, there's no guarantee those schedules, deductions, and percentages will be totally accurate when tax time approaches. Be sure to double-check all the facts.*

—eds.

## FUNCTIONAL KEYBOARD

**A**FTER READING YOUR NOVEMBER articles on the Apple IIc Plus and the Laser 128EX/2 ("A Little More For a Little Less," p. 50, and "An Underdog's New Tricks," p. 51, respectively), I'm wondering why you didn't mention the Laser 128 keyboard. I think it's vastly superior to the IIc's. In addition to the usual computer keys, the Laser keyboard has a numeric keypad and ten function keys. Writing letters with FredWriter, for instance, uses five of the functions: F3 (beginning a document), F4 (change case), F6 (end of document), F7 (find and replace words), and F9 (load file from disk).

**Christopher G. Utter**  
2205 Quinn Avenue  
Santa Clara, CA 95051

*Eric Grevstad, inCider's contributing editor and former review editor, points out that our earlier reviews of the Laser 128 ("Laser 128: An Affordable Compatible," December 1986, p. 58) and 128EX ("The Laser 128EX," August 1987, p. 49) gave more space to the Laser keyboard. He agrees that the numeric keypad is a great boon, though he doubts many owners can make use of the function keys.*

—eds. ►

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**BAHA'I PRESS**

IT WAS INTERESTING TO SEE THE Baha'i newsletter from Minot, North Dakota, mentioned in Status Report ("The Literary Life," December 1988, p. 18). Minot is just one of over 118,000 locales in more than 200 countries and territories where Baha'is reside.

I'm delighted you think we're nice people, but there's more to us than being tolerant of all religions and not fearing science. The Baha'i faith's central principles are the organic oneness and wholeness of mankind and the establishment of a just and lasting peace on the planet.

**Lisa Janti, Secretary  
Spiritual Assembly of the Baha'is  
of Los Angeles, California  
5755 Rodeo Road  
Los Angeles, CA 90016-5013**

*On a literary note—we apologize for misspelling Baha'i.*  
—eds.

**QUESTIONABLE IMAGE**

I'M SURPRISED THAT YOUR STAFF chose the overpriced ImageWriter II as the "Best Printer" ("Top Ten Hardware," December 1988, p. 43). How many of them have had to buy their own?

The same basic question arises when you consider disk drives or color monitors, too. When I bought my GS, I wasn't prepared to spend \$500 for an Apple RGB color monitor. Instead, I settled for a \$120 black-and-white. As my software selection grew, however, I decided to find a "reasonably" priced alternative. Magnavox recommended its own 8CM515. The lowest mail-order price I found for Apple was \$395 (shipping extra) with a 90-day warranty. For the Magnavox, I found a \$263 (including shipping) mail-order price with a two-year parts-and-labor warranty.

**Terry Murphy  
6360 Honey Bee Court  
Florissant, MO 63033**

**PRETTY PROSE**

WHILE YOU'RE REVIEWING desktop publishing, please don't exclude graphics products. Contrary to popular belief, *graphics* also refers to letters, not just pie charts and grids. (*Calligraphic* means beautiful writing.) I've yet to see a review of font graphics and, after waiting a year, I still haven't decided which font-enhancing package for AppleWorks to purchase. What's the best product out there for ease of use, number of typefaces, and number of font sizes for each typeface?

**Maureen Hurley  
7491 Mirabel Road  
Forestville, CA 95436**

*For enhancing AppleWorks' word-processor output, you're limited to TimeOut SuperFonts from Beagle Bros (6215 Ferris Square, Suite 100, San Diego, CA 92121) or Printrix or Fontrix from Data Transforms (616 Washington Street, Denver, CO 80203). Using the different fonts and type sizes offered by these three enhancements, and AppleWorks' page-formatting options (accessed by pressing Open apple-O), you should be able to achieve the desired effect.*

**SOFTWARE SURPRISE**

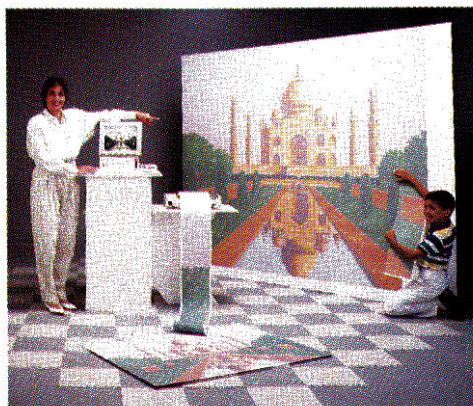
IT SEEMS THAT THE "WONDERFUL wizards of Pelican Software" who created SuperPrint wanted extra credit in their program. While using an Apple IIc with an external drive to create a sign, I removed one clip-art disk to replace it with another. When I pressed Escape accidentally without having a disk in the external drive, the central processing unit searched the master program disk and found some clip art that's not listed in the manual.

I believe the clip-art faces are of SuperPrint's creators. They're accompanied by a giant pelican and a tiny *Tyrannosaurus rex* holding a floppy disk. I enjoyed the extra surprise.

**Ernest Holly, Computer Coordinator  
St. Perpetua School  
3445 Hamlin Road  
Lafayette, CA 94549**

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**The Magic Touch**



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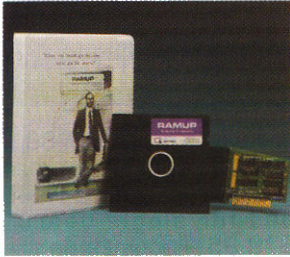
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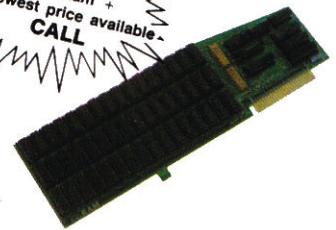
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# WHAT'S NEW

by inCider staff

## Baseball CARDS

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Card/Fax includes a built-in database of descriptions and market prices for more than 26,000 Topps baseball cards, for its \$95 purchase price. Databases for cards from other manufacturers are also available.

Card/Fax creates reports of cards bought, sold, and traded, as well as profits and losses, checklists, and wish lists of cards needed to complete a collection.

A preview program is available for \$15, or circle number 354 on the Reader Service card for more information.



SOFTWARE

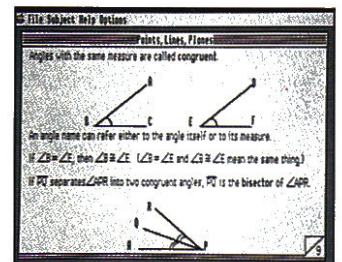
## LINES AND FIGURES

**Geometry**, Broderbund's award-winning interactive learning software for the Macintosh, is now available for the Apple IIGS.

In the best Broderbund tradition of educational software that's fun, too, you can use Geometry as a supplement to classroom work (it's designed with all the major geometry textbooks in mind), a refresher course, or for playing—at home.

Geometry covers a full year's course in self-paced, friendly lessons that make maximum use of the Apple "spatial" interface. Geometry is available with a

teacher's guide for \$89.95, in a lab pack for five students and a teacher at \$179.95, and for single users at \$79.95. It comes on three 3½-inch disks and requires a 512K GS. Write or call Broderbund at 17 Paul Drive, San Rafael, CA 94903, (800) 527-6263, or circle number 352 on the Reader Service card. —P.S.



## 1988 INDEX

AppleWorks isn't exactly the best indexing software in the world—its database simply doesn't have space in a single category for much information.

But Kula Software (2118 Kula Street, Honolulu, HI 96817, 808-595-8131) has attempted the impossible and listed all articles and reviews in all major—and some minor—Apple II publications in 1988 in the Kula Index.

inCider, A+, Nibble, Call-A.P.P.L.E., Open-Apple, and even APDLog, Reboot, and Scarlett are all included in these AppleWorks templates. Entries aren't as wordy as they are in FastFind, but all indexes are on two sides of a 5¼-inch disk and all are in AppleWorks database format for instant use—you don't have to learn to use a new program to look something up.

The Kula Index sells for \$6.95. That's also the price for each of a number of other indexes, such as Apple Classic Index, your old back issues of inCider, and the Entertainment Index of game reviews.

For more information look up and circle number 353 on the Reader Service card.

—P.S.

Title	Author	Subject	Distributor	Pu	Date	Page
File: InCider.88						
FIND RECORDS						
Escape: Review/Add/Change						
Find all records that contain GAME						
Press @-F to change Find.						
Ticket to London / Pam	rb Games Edit	simulation (geo	Blue Lion /	IC	Jan 88	36
Infocome Revisited	by Scott Mace	company	-	IC	Jan 88	113
Top Game	Paul Stett	simulation	Status Rep	IC	Feb 88	18
Xevious / Thexder / Ca	rb Games Edit	arcade / sports	Mindscape /	IC	Feb 88	37
Apple Word Play	by Cynthia E.	education	Field Trip	IC	Feb 88	84
Golf Simulations Dg I	by Scott Mace	sports / simula	Mace On Gam	IC	Feb 88	105
GS Hardball! / GBA Cha	-	entertainment	Games Edito	IC	Mar 88	45
Graphics Adventures: m	Scott Mace	adventure	Mace On Gam	IC	Mar 88	121
Border Zone / Project:	-	entertainment	Games Edito	IC	Apr 88	42
For the GS Only	Scott Mace	entertainment	Mace On Gam	IC	Apr 88	97
Why We Play Games	Dan Muse	entertainment	InCider's V	IC	May 88	8
The Wonderful World of	compiled by S	entertainment	-	IC	May 88	41
Games 49ers Play	by Jeff Cable	entertainment /	-	IC	May 88	62
Where in Europe is Car	-	entertainment	New Games	IC	May 88	64
Captain Kidd and the S	Tom Sherman	communications	On Line	IC	May 88	106
-----						
Type entry or use @ commands						@-7 for Help

## FREE

### SOFTWARE FOR THE BORED

Did the dealer who sold you an Apple II sell you a "flight simulator" game at the same time? Did it seem like "the game to have"? Did you get bored and put the game on your shelf next to War and Peace—for "later"?

Brad Fregger at Publishing International is willing to bet that a good old-fashioned arcade game will be a lot more fun. In fact, he's willing to bet a copy of Pharaoh's Revenge.

Send Fregger a letter explaining why your flight simulator is grounded, and a free copy of Pharaoh's Revenge will soon be winging its way to you. (Enclose a check for \$5 to cover shipping.)

Is Fregger mad? No, but he thinks, "People would enjoy arcade games more if they just played one—but too many computer owners never see one."

Pharaoh's Revenge is fun, and you sure can't beat the price. Contact Publishing International, 333 West El Camino Real, Sunnyvale, CA 94087, (408) 738-4311, for details. —P.S.



**GAMES**



# LOST IN LAS VEGAS

You wake up in the bathroom of a seedy Las Vegas hotel with no idea where you are or why you're there. Sound like *Deja Vu*? **Deja Vu II:** Lost in Las Vegas starts you off in that city and gives you seven days to come up with \$100,000 to pay off the notorious Chicago mobster Tony Malone—or else.

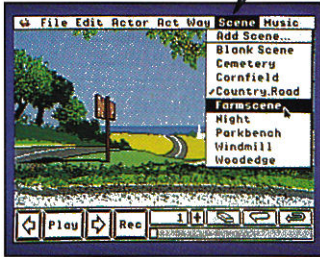
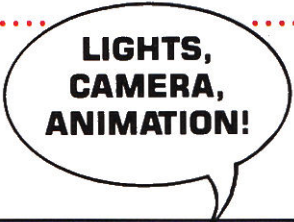
*Deja Vu II* works like the first game—just point and click to examine objects, go places, pick things up, or whatever. It sells for \$49.95, from Mindscape (3444 Dundee Road, Northbrook, IL 60062, 312-480-7667).

Also coming from Mindscape this spring is the action game **Hostage**. In this adventure, you'll command a six-member special-forces team assigned to rescue a group of hostages being held at a U.S. embassy overseas. You'll view the action from overhead, from outside the embassy, and from inside. *Hostage* features several difficulty levels and time limits to provide extra challenge. *Hostage* for the Apple IIGS will retail for \$39.95. For more information circle number 356 on the Reader Service card.

—L.L.

Electronic Arts' new *Cartooners* puts kids in the director's chair. Children can compose cartoon stories by choosing characters and backgrounds, then bringing them to life with animation. They can also insert speech balloons to add detail and depth to their characters.

Children can use *Cartooners* with *Instant Music* and its accompanying library disks to add musical scores to their creations. They can



also use backgrounds and artwork designed with *DeluxePaint II*, and print their *Cartooners* scenes to put illustrated storybooks together.

*Cartooners* runs only on the Apple IIGS and sells for \$59.95 from Electronic Arts (1820 Gateway Drive, San Mateo, CA 94404, 415-572-2787). For more information circle number 355 on the Reader Service card. —L.L.

## DEEP SUBJECT

Explore the world's most famous shipwreck in **Search for the Titanic**. You'll start off as a novice oceanographer, accumulating experience points and resources as you examine any of the 75-100 other historic shipwrecks included in the game. When you're ready, you can take on history's most notorious wreck—the Titanic. If you locate it and make a successful dive, you'll see actual digitized photographs of the wreck of the Titanic taken at depths of more than 12,000 feet.

The research staff at the Woods Hole Oceanographic Institute reviewed *Search for the Titanic* for accuracy, and the manual includes a foreword by Dr. Robert Ballard, head of the team that discovered the wreck of the Titanic. *Search for the Titanic* comes from Intracorp (14160 S.W. 139th Court, Miami, FL 33186, 305-252-9040) under its Capstone entertainment label. For more information circle number 357 on the Reader Service card.

—L.L.

**Apple President John Sculley:** "Even though the Apple II remains an important part of our business... to understand the pivotal role of the Macintosh II in 1988 is to have a clear vision of Apple's future."

**Epyx CEO David Morse:** "California Games is our all-time best-selling product."



# IIC PLUS POWER



The Ram Express card from Applied Engineering (P.O. Box 5100, Carrollton, TX 76011, 214-241-6060) adds more than just random-access memory (RAM) to the Apple IIC Plus.

Not only can you add 256K (\$249), 512K (\$399), or 1 megabyte (1024K, \$699); not only can you add an internal clock to your IIC (\$59); but you can turn your IIC Plus into an AppleWorks powerhouse.

Software included with Ram Express makes the AppleWorks clipboard ten times larger—you're no longer limited to 250 word-processor lines or spreadsheet rows. AppleWorks files can now be as much as 400 percent larger, and all of AppleWorks—program, startup, and even printer drivers—is loaded into Ram Express when you boot up. The IIC Plus' internal 3½-inch floppy drive will be the only drive you need. Ram Express software even makes it possible to copy 800K disks without swapping more than once.

Ram Express works with any Apple IIC, even an older model, that has memory-expansion connectors; check with your dealer if you're unsure. For more information circle number 350 on the Reader Service card. —P.S. ▶

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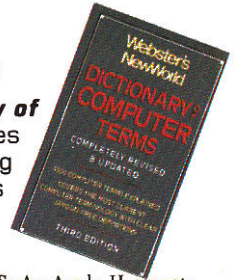
WHAT'S NEW



## RESOURCES

### LOOK IT UP

Webster's *New World Dictionary of Computer Terms* packs 4500 entries into 412 paperback pages—everything from AppleWorks to Z-80. Definitions strive to be timely and free of jargon:



**Print Shop TM:** A simple graphics package that performs several useful printing services easily and well. It prints standard and customized signs, greeting cards, posters, and letterheads, as well as multipage banners on fanfold paper with a wide selection of fonts, icons, borders, and graphics. Developed by Broderbund Software.

**ProDOS:** An Apple II operating system designed to support mass-storage devices and floppy-disk storage devices. ProDOS stands for Professional Disk Operating System.

**protocol:** Set of rules or conventions governing the exchange of information between computer systems. See HANDSHAKING.

Something for everybody, from beginner to professional programmer, all cross-referenced, and including several charts, all for \$6.95, from Simon and Schuster Reference Division, 1 Gulf+Western Plaza, New York, NY 10023, (212) 373-8234. Or look up number 358 on the Reader Service card. —P.S.

## BRINGING IT HOME

Computer-supply catalogs often—too often, for the average consumer—contain every kind of business software, letterhead printer paper, 8-inch floppy disk, and no games.

The *Home Computing Catalog* is different. It features more than 200 widely known home-education, home-entertainment, and home-productivity software packages. Each is described in detail, including all technical requirements.

In addition to the manufacturer's warranty, every product in the *Home Computing Catalog* carries this full guarantee: "If,

for any reason, you are not completely satisfied, return the item and we'll exchange it or refund your money."

But big buyers get the best deals from the *Home Computing Catalog*: For an annual fee of \$18, you can join the Home Computing Club and receive a 10 percent discount on catalog purchases.

For more information on the *Home Computing Catalog* and Club, write to P.O. Box 18890, Encino, CA 91416-8890, or call (818) 881-6600 or (800) 950-8030. For more information circle number 359 on the Reader Service card.

—P.S. ▶

■ Broderbund Software (San Rafael, CA) still offers **Carmen Sandiego** Day kits to schools that want to dedicate a day to the kids' favorite detective, but each kit now costs \$10. Call Broderbund at (800) 527-6263 to order.

■ Beagle Bros (San Diego, CA) has a simple upgrade policy: The update to the next version of any Beagle Bros product will always cost \$10, whether it's v.1.0 to v.1.1 or v.2.9 to v.3.0.



UPDATES

—P.S.



### APPLE BITS

■ **Taito** (Vancouver, BC) hopes to step away from the world of arcade action and release an old favorite, **Qix**, for the Apple IIGs. Qix is a real "mind game" — its strategy inspired research at some prestigious universities.

■ **Beagle Bros** (San Diego, CA) would like to add **digitized photographs** to **AppleWorks** Classic database files.

■ **Claris** (Mountain View, CA) will give away two **free upgrades** to **AppleWorks GS** this year—must be StyleWare's influence. All the more reason to register your AppleWorks with Claris.

■ Sales of **entertainment software** on the **GS** were unexpectedly strong last Christmas—but one national retailer compared the machine to the Commodore 64: "It sells only at Christmas."

■ In the midst of releasing computer favorites like Tetris in **Nintendo** format and suing Nintendo for its alleged monopoly over Nintendo games, **Tengen** (Milpitas, CA) let us know it would like to release arcade hits like **PacMania** and **Rolling Thunder** for the **GS**.

■ **Avon Books** (New York, NY) will publish two more novels based on **Infocom** (Cambridge, MA) interactive-text adventures—**Enchanter**, by Robin W. Bailey, and **Stationfall**, by Arthur Byron Cover. These aren't "novelizations," but rather "original adventures set in richly detailed Infocom universes."

■ Apple's **next GS** may have the unlikely configuration of 1 1/2 megabytes of memory; some operating-system software may be built into the machine's read-only memory (ROM).

■ The **Apple IIC Plus** was "flop city," according to a "friendly to the press" software developer, despite Apple's strong-arm tactics to make his company support it.

■ But Apple might still find a use for the **IIC Plus**. If, as rumored, Sears sells the machine, it could mean big trouble for **Laser** computers.

■ What do **Mediagenic** (Menlo Park, CA), **Broderbund** (San Rafael, CA), and **Electronic Arts** (San Mateo, CA) have in common with the American League pennant? They won't be in Boston this spring.

■ Some say the **Western Designs 65816** microprocessor used in the **Apple IIGs** isn't designed to be accelerated by a caching system on a chip, as the 6502 was.

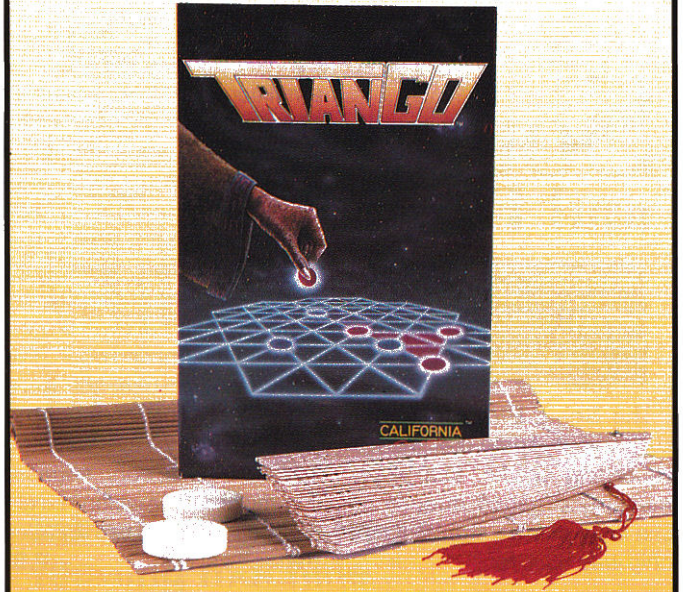
■ **MindCraft Software** (Torrance, CA), developer of **Magic Candle**, a nonviolent fantasy adventure, is an affiliated label of **Miles Computing** (Calabasas, CA), which in turn is an affiliated label of **Electronic Arts** (San Mateo, CA).

■ Look for **Claris** (Mountain View, CA) to make an initial public offering of **common stock** this summer, helping to complete its divorce from Apple.

■ Sean Barger, developer of **Dondra** at **Spectrum Holobyte** (Alameda, CA) went to **Microworlds** (Chatsworth, CA) and took **Dondra** with him—the computer game, not the model you saw at Apple-Fest, much to dismay of the guys at Microworlds.

■ **Innovative Systems** (Severn, MD) has developed a new board with accompanying software that patches **AppleWorks**. The **Floating Point Engine** (\$299) makes spreadsheet calculations fly. □ —P.S.

# China invented it; Japan nationalized it; California Dreams perfected it.



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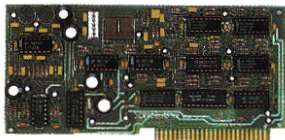
TRIANGO is available for MS-DOS, Commodore 64/128, Amiga, Apple IIGS and Macintosh computers.

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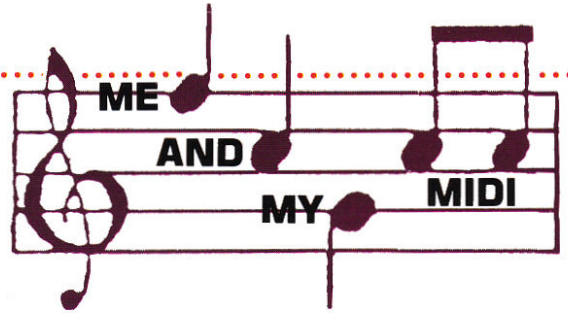
# SOUND and Fury



The Sonic Blaster board turns your Apple IIGs into a recording studio, and plays music and sound effects in the **true stereo** the Ensoniq chip was built for.

The Sonic Blaster, \$129 from Applied Engineering (P.O. Box 5100, Carrollton, TX 76011, 214-241-6060), has its own amplifier, so you don't need to plug in a pair of amplified speakers to enjoy stereo sound—you can use your existing sound system.

You can record and play back sound from a microphone, compact disc, record, tape player, television, or video-cassette player; none of that hardware's included, but Applied does give away easy-to-use software that lets you cut, copy, paste, amplify, reverse, fade in, fade out, or echo sounds. For more information, circle number 351 on the Reader Service card. **—P.S.**



RESOURCES



If you use an Apple II to make music, the glossy computer-music mags often forget all about you. But *Music, MIDI, and Your Apple II: The Monthly Newsletter for the Musician in All of Us*, remembers.

It's written for users at all levels of musical and Apple experience, and contains helpful hints, product reviews, do-it-yourself projects, and educational notes. A recent issue reviewed the Casio DH-100 digital horn—"an extremely fun instrument for the money" with "a few MIDI implementation quirks"—and featured rumors about a new Apple IIGs/Mac machine in 1989.

*Music, MIDI, and Your Apple II* is available by subscription only, for \$14.95 a year, from MMP Systems, 20681 Celeste Circle, Cupertino, CA 95014, (408) 996-9270, or circle number 360 on the Reader Service card for more information. **—P.S.**

WE'RE ALWAYS LOOKING FOR NEWS OF THE APPLE WORLD. IF YOU'RE MAKING NEWS, SEND YOUR PRESS RELEASES AND PHOTOGRAPHS TO WHAT'S NEW, INCIDER, ELM STREET, PETERBOROUGH, NH 03458.

## Putting It All Together

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### DESKPAK / Desk Accessories

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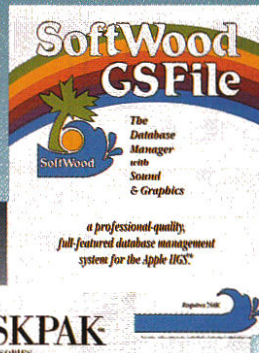
This one amazing product includes 19 accessories in all — any one accessory could cost you as much, if purchased separately! As a special bonus, DESKPAK includes Apple's GS/OS, the newest operating system for the Apple IIGS!

Here it is — DESKPAK — a Mini Database, Mini Word Processor, Accessory Manager, File Manager, Appointment Scheduler, 80-year Calendar, 3-in-1 Clock, Desk Calculator, Password Security, Screen Protector, Screen Image Saver, Clipboard, 2 Scrapbooks, Drawing Tools, Start-up Screen Customizer, ASCII Chart, and even 2 games.

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### SOFTWOOD GS FILE / Database

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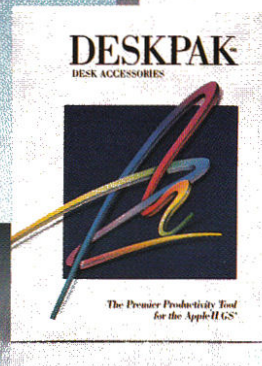
Think about the possibilities — membership rosters with pictures, real estate listings with houseplans, record collections with musical highlights, recipes with colorful photos, pictorial vocabulary lessons, foreign language pronunciation, and much more.

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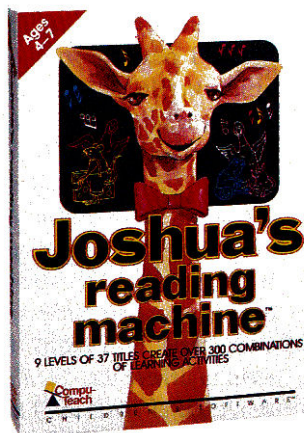
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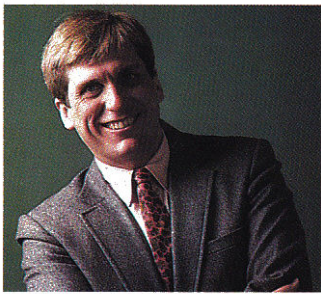
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## STATUS REPORT

# WRITE IT YOURSELF

By PAUL STATT \* SENIOR EDITOR

**M**ore diversity means more fun. The best software won't be written until everyone knows how to write software.

PICTURE THE PROGRAMMER. HE DRINKS Jolt cola and reads science-fiction paperbacks in his spare time—usually days, because he's up all night hacking code or eating Chinese food. (I don't mean to be sexist, but programmers as a group are as male as the National Football League. Don't forget as you read this that I'm talking about programmers *as a group*; thank God for individual exceptions.) He plays Dungeons and Dragons (at worst), and chess (if he's at all sociable.) Math is a snap: A good programmer can calculate six-figure logarithms with one hemisphere of his brain tied behind his head.

Programmers are to the intellect what Superman is to the body. My stereotypical programmer is very different from you and me—so is it any wonder that you and I complain so much about software?

Imagine, for example, the fine educational software that someone who never really understood fractions could write. Programmers, as a group, were brilliant kids with bad grades. Learning wasn't their problem in school; it was boredom. Today's software was written by a programmer who figured out least common denominators before the teacher mentioned them.

Even productivity software might be more fun if it weren't written by a guy obsessed with finding a faster, better way to calculate everything. For instance, I certainly don't object to watching my printer work while I wonder what's for supper. But then some programmer who can't say no to speed strolls up with a printer driver to "make my life easier." Thanks.

Imagine *games* written by a different breed of programmer. Am I the only player in the world who's noticed how few computer games take place outside a nameless medieval kingdom, outer space, a battlefield, or a sports stadium? Programmers seem to believe that *The Hobbit* and *Dune* are the apotheosis of literature. I might even enjoy interacting with interactive fiction if some programmer had recognized that *Moby-Dick* was "interactive multimedia hypertext" when it was written—with a quill pen—140 years ago, and had enjoyed reading it.

But whom do I have to blame? I've never written

a program longer than an envelope addresser in my life (unless you count those two-line recursive jobs in Logo that draw circles and satisfy my need for daydreaming).

So who am I to complain if I can't do it better myself? But if millions of people like me became programmers—beer drinkers, habitués of old bookstores, Red Sox fans, and voters who support candidates who never win—the programs they'd write would make me happier. If you're willing to leave software to "professional programmers," be prepared to put up with the kind of software they like and shut up.

*Writer's Digest*, a monthly magazine for professional scribblers, has a circulation of 225,028. They're men, women, farmers, alcoholics, religious fanatics—a motley crew, I'm sure. They're not wondering how to write better letters. *Doctor Dobbs' Journal of Software Tools* and *Computer Language*, a couple of monthly magazines for professional hackers, reach 33,124 and 33,435 programmers, respectively. They're not wondering how to write better envelope addressers, and I'll bet they're almost all men.

Six times the circulation means six times as many writers as programmers. It's statistically more likely that some writer will tickle my fancy than that some computer programmer will—whether he or she writes a sports game, a word processor, or a painting program. Is it any surprise that I buy six times (at least) as many books as programs and get six times (at least) the pleasure from them?

More programmers mean more diversity. More diversity means more fun. We might not all become programmers; we might not expect our children to learn to program in school as early as they learn to read; but the best software won't be written until everybody knows how to write software.

Benjamin Disraeli (1804–1881), who in his spare time served as prime minister of Britain, once said, "When I want to read a novel, I write one." You should learn to program, if only to say, "When I want to play a computer game, I write one." You might be quoted in *Bartlett's* someday. Disraeli isn't. □

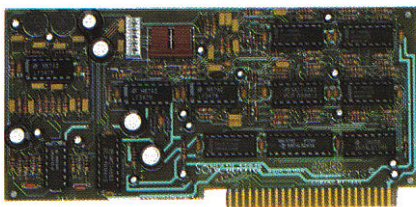


# Sonic Blaster.™ It's why they put the "S" in IIGs.

**Sonic Blaster™, the IIGs's first full-featured stereo digitizer, brings a new dimension to computing...the element of fun.**

Record sounds, tailor them with extensive editing options and play your own amplified versions back through your home stereo speakers. Sonic Blaster automatically digitizes and play back GS games that use the computer's built-in Ensoniq sound chip (as almost all do), with thundering results.

Kick back with your favorite computer game and immerse yourself in a roomful of sound effects. Create strange answering machine messages. Drop an interesting background sound into your phone conversations (we provide 17 to get you started). Change screen colors with a virtually infinite palette of color.



*Sonic Blaster's ultra-low-noise digital design is certified by the FCC.*

## Use your own equipment.

Use the equipment you already have. You don't need special amplified speakers because Sonic Blaster's built-in amplifier works with standard 8 Ohm speakers, small or large, including those monsters next to your stereo. Take sounds from your favorite TV show, album, compact disk, VCR, even a microphone. Then amplify, play backward, create echoes and

fades, cut, copy and paste with the Super Hi-Res software we include.

**We designed Sonic Blaster to be complete. Here's a quick tour of part of the software screen:**

### The Buttons

Stop, Play, Pause and Record buttons, perform the same functions they do on a tape recorder. Also included are Single and Continuous Play buttons and a VU Meter to visually represent input levels.

### The Sound Graph

The Sound Graph is the waveform at the bottom of the screen. Portions of the Sound Graph are selected with the mouse and then edited using the cut, copy and paste options within the Edit menu.



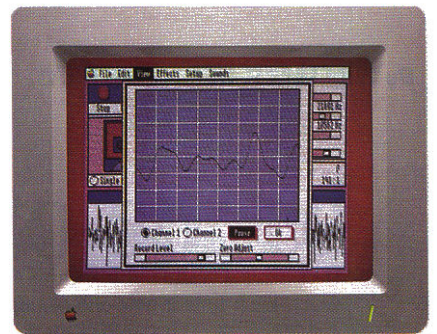
*Seventeen sound effects to get you started. Add your own collection of sounds.*

### The Bars

The Volume bar controls amplitude of the playback. Playback and Record mode sample rates are adjusted with the next pair of bars and the Record Level bar adjusts the level from the source connected to the Sonic Blaster's input connector.

### The Blocks

Three blocks give readouts of file length, available memory, bytes selected and resolution ratio.



*"See" the sound on the oscilloscope.*

### The Oscilloscope

Sonic Blaster's built-in oscilloscope gives you a real-time display of input sounds. Use it to set your input levels before recording. Or use the Auto Gain feature to adjust the level automatically.

### Sonic Blaster

**\$129**

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# SMOOTH OPERATOR

Each version of Apple's disk-operating system, ProDOS, is "downward" compatible with older versions—you shouldn't have any problem with data files.

By **WILLIAM P. KENNEDY, Ph. D.**

## PRODOS GAMES

**A**PPLÉ'S PRODUCED SEVERAL versions of ProDOS in the last few years. Each time a new one comes out, I've saved it over the older version on my System and program disks. Now I'm beginning to fear that by doing so I'm heading for trouble. Will all the programs and files I've created and saved using the old ProDOS versions still work with these newer versions?

**Terell Smith**  
Marburg, West Germany

*Each version of Apple's disk-operating system, ProDOS, is "downward" compatible with older versions; you shouldn't have any problems with your data files or most programs. The newer ProDOSes are safer and more efficient to use because Apple has fixed the "bugs" in older versions and has added new features. For example, how many of you found AppleWorks, which was distributed with ProDOS 1.1.1, wouldn't accept dates beyond December 31, 1987? Later versions of ProDOS fixed that problem.*

*I've heard, however, of some programs failing to operate correctly with newer versions of ProDOS. That happens when programmers don't follow specific ProDOS "access" guidelines. It's best to keep a copy of earlier versions of ProDOS available, even though program failure owing to incompatibility with*

*a particular version of ProDOS is quite rare.*

*In addition, the data files, but not programs, you've stored using 8-bit ProDOS, now called ProDOS-8, are also compatible with GS/OS, the 16-bit disk-operating system used with Apple's IIGS. ProDOS-8 programs, however, still need the 8-bit disk-operating system to work on the GS. You can find ProDOS-8 on the GS System Master in the System subdirectory (folder) named P8.*

## TIME-OUT

**U**NDER "FEATURES" IN THE APPLE IIGS *Owner's Guide*, Appendix D, p. 156, you'll find "a built-in clock, so documents can be marked with the date and time you created or revised them." Neither I, nor nine Apple dealers I talked to, could figure how to make the time appear under the AppleWorks spreadsheet column "Time." What's the use of the clock?

**C. Fink**  
Dallas, TX

*No clock, including the GS' built-in timekeeper, inserts the current time into the "Time" function of AppleWorks' spreadsheet automatically. UltraMacros, part of the TimeOut series from Beagle Bros (6215 Ferris Square, San Diego, CA 92121, 619-452-5500), includes a time-insertion feature.*

*Also, ProDOS versions 1.1.1 and earlier (version 1.1.1 came with your AppleWorks version 2.0 or*

*earlier) don't read the GS clock correctly. Replace those earlier versions with the file P8 found in the Systems folder on your GS System Master. Don't forget to rename P8 to ProDOS.*

*Take a closer look, however, at one of the first screens appearing while AppleWorks starts up on your GS. Isn't the correct date displayed automatically when you're asked to "Type today's date"? And, when you select "Add files to the desktop" or "List all files on the current disk drive," aren't they "stamped" with the date and time you created or updated them?*

*In both cases, as well as whenever a program or application uses ProDOS, AppleWorks date- and time-stamps the resulting files when you save data. That's just one use of the built-in GS clock. Many other GS applications—AppleWorks GS, for example—even offer an on-screen clock, usually as a "desk accessory."*

## PROOFER PROBLEMS

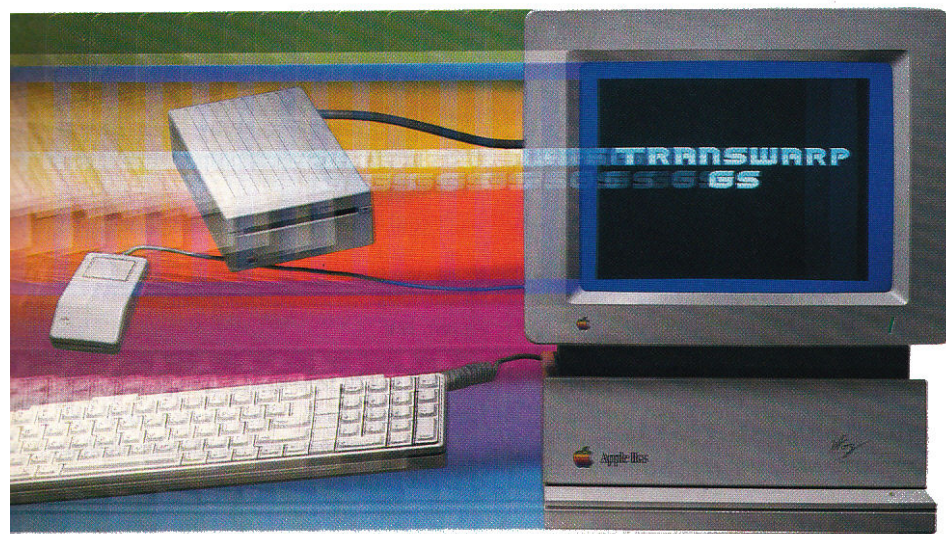
**I**TYPED IN YOUR PROOFER PROGRAM listing from the January issue of *inCider* (p. 22) and everything works well. However, I never could get lines 40 and 90 to match proofer values with those you published. Is something wrong?

**Edward Acker**  
Keene, NH

*No, Edward, the problem isn't with your version of the Proofer. It's with mine. My apologies to all of you who have experienced problems with the newest version of the Proofer, published first in January and again in March (p. 24).*

*We had a small glitch in the program that generates our proofer numbers for publication. The fix, unfortunately, requires a new version on your end as well. You can find that new version (2.1) in "Back to BASICS," p. 42 in this issue. Use it to proof our published BASIC listings from now on. Fortunately, the Proofer's short—no hard feelings! ▶*





# The IIGS just got up to speed.

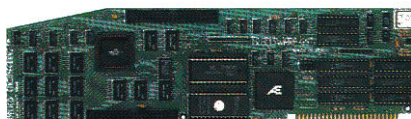
**T**ransWarp GS,<sup>™</sup> Applied Engineering's new accelerator for the IIGS, is shipping now.

Employing the latest surface-mount technology. Incorporating not two, but five layers of circuitry. Meet the most technologically advanced board we've ever produced. TransWarp GS.

With it, your IIGS rips along at 7 MHz, compared to its native 2.8. The difference isn't merely noticeable, it's astounding. Pull-down menus fly open, folders leap off the finder, screens change in an eyeblink. Your IIGS feels like a color Mac...it's an entirely new computer environment!

## Full compatibility.

Completely compatible with all standard hardware and software, TransWarp GS has been extensively



*More than twice as fast—that's computing at TransWarp speed!*

tested by all the major publications and by Applied Engineering.

## So complicated, it's simple.

Plug in one connector, then insert TransWarp GS into slot 3 or 4 (the board won't override either slot's function), set your control panel and prepare yourself for warp speed.

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From AppleWorks GS to Zany Golf,

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**TransWarp GS Accelerator \$399**

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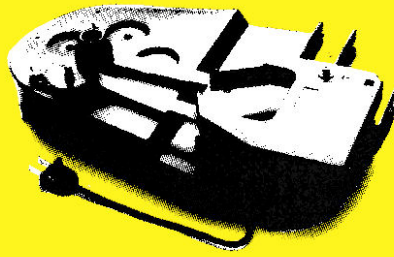
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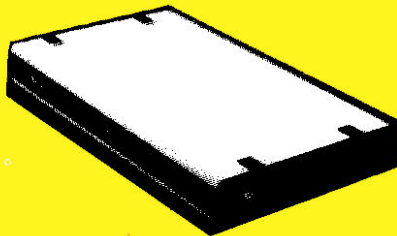
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## APPLE CLINIC

### NEW APPLE DRIVES

I'VE BEEN USING MY APPLE IIE ALMOST continuously since I purchased it in September 1984. Recently, my local dealer condemned one of my Apple Disk II drives to the "worn-out" heap. Can you recommend a new drive, particularly one that won't cost me an arm and a leg? Shouldn't I have a 360K drive?

**Jack Bush  
Fallon, NV**

*I'm not going to recommend a "foreign" disk drive, Jack. Not that I think Apple's are the greatest—it's just that I've seen too many compatibility problems with third-party disk drives. Besides, price does sometimes indicate quality.*

*Also, I don't know of any manufacturer of 360K disk drives for the Apple II. Perhaps you mean an 800K disk drive, such as Apple's UniDisk 3.5?*

*Upgrading to a UniDisk might be your smartest move. It's more compact, less destructible, and faster, and stores some four and a half times more data.*

*Although it's slightly more expensive, the only real drawback is that the 3 1/2-inch drive is incompatible with standard DOS 3.3. Fortunately, several software magicians have created DOS 3.3 patches and enhancements for use with Apple's UniDisk 3.5. These essentially create multiple DOS 3.3 volumes on a single disk and provide the necessary "device drivers" to read/write to the high-capacity drive. One of my favorites is ProFix by Nordic Software (3939 North 48th Street, Lincoln, NE 68504, 800-228-0417, \$49.95). Contact the company or consult your local dealer or user group. □*

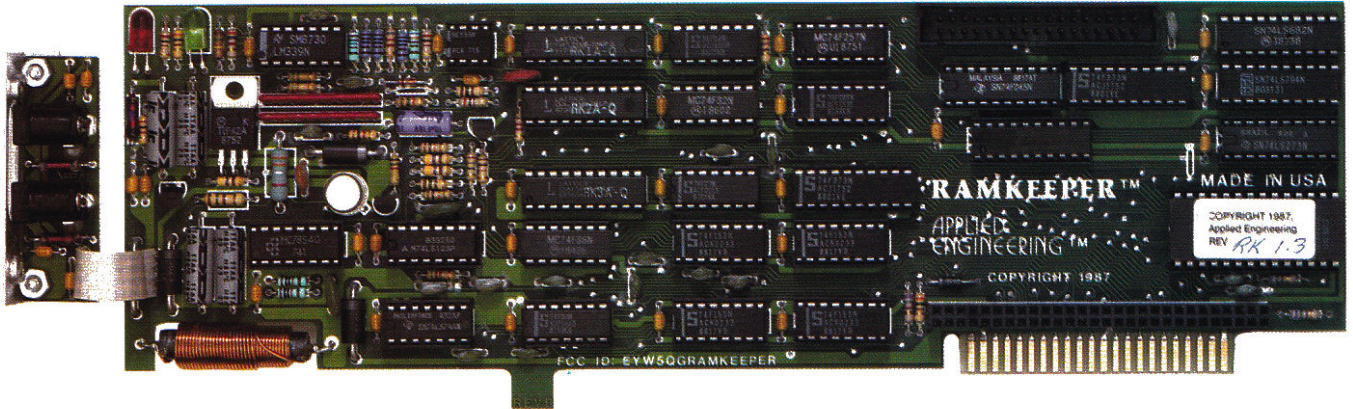
## QUICKIES

To use your Apple mouse instead of a joystick, load your Applesoft program, then type the following sequence (use a return character instead of the comma): **PR#4, Control-A, PR#0, RUN.**

—Jim Edwards  
Johnstown, PA

APPLE CLINIC IS A FORUM FOR ANSWERING YOUR QUESTIONS ABOUT APPLE II HARDWARE AND SOFTWARE. ADDRESS YOUR CORRESPONDENCE TO APPLE CLINIC, INCIDER, 80 ELM STREET, PETERBOROUGH, NH 03458. BECAUSE OF THE VOLUME OF LETTERS, MOST WON'T APPEAR IN PRINT, BUT EXPECT A RESPONSE VIA POSTCARD.

# RamKeeper™ If not the first board you add to your IIGS



## Certainly the second.

Chances are the first board you add to your computer will be for memory expansion. RamKeeper™ makes a smart second addition by performing *two important tasks*:

**First**, it gives you a sensible way to grow beyond the Apple memory expansion board that probably came with your IIGs. Apple's board has room for only 1 MEG of memory, and the new, integrated programs need a MEG just to boot.

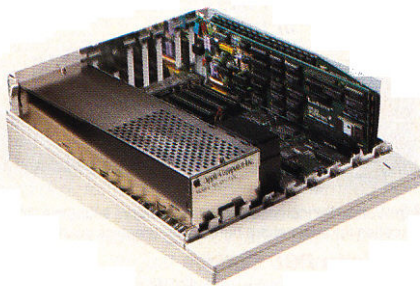
RamKeeper lets you add a second memory board to your memory expansion slot with a special "back pocket" connector. That way, you can use your 1 MEG Apple board and still expand beyond its 1 MEG limit. And RamKeeper "sees" the two boards as one, so all you'll notice is the increased memory.

**Second**, RamKeeper creates battery-backed Ram and ROM. Safely store your system software, often-used application programs and most-needed files on RamKeeper-enabled ROM. It's like an internal, electronic hard disk (up to 16 MEG!), but five times faster than an ordinary hard disk.

Turn your computer on and see the finder in 13 seconds, instead of several minutes.

### Safe storage

RamKeeper powers up to two memory boards simultaneously, even when your computer is turned off. What's more, the stored programs are protected against power outages by the reliable Gel/Cell battery we include. Startup checksums are employed to verify that no data was lost



**RamKeeper is easy to install and stores programs in an "instant on" electronic hard disk.**

while the power was off. To protect the operating software against program crashes, we installed RamKeeper's controlling firmware in an EPROM.

You can even mix different brands of boards. For example, an Apple board with at least 512K of memory (based on 256K x 1 chips), and AE's (MEG-chip based) GS-RAM Plus™ or GS-RAM Ultra™ boards. And most all other brand and size combinations are also possible.

### Advanced enough to be easy

We designed RamKeeper to be easy to use. Instructions are clear and most functions are automatic. For example, there's no need to manually configure if you add a second board, it's done automatically. The configuring is linear, so there's less chance of a program crash. And *you* decide how much memory to devote to ROM and to RAM—all without affecting your stored files.

### Compare features:

RamKeeper includes a collection of important features like *disk caching* that

tremendously accelerates access time to the 3.5 drive, running most applications up to *seven times faster*.

Our *diagnostic utility* feature graphically detects the presence of bad or improperly-installed chips and tests for CAS before RAS chips.

And RamKeeper features Applied Engineering's meticulous craftsmanship, 5-year warranty, 15-day money-back guarantee\* and our American-made pride.

### Use AppleWorks?

AppleWorks users will find another bonus. Our AppleWorks enhancement package dramatically increases AppleWorks word processor lines from 7,250 to 22,500. Database records are increased from 6,350 to 22,500 and clipboard capacity climbs from 255 lines to 2,042.

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**\$189**

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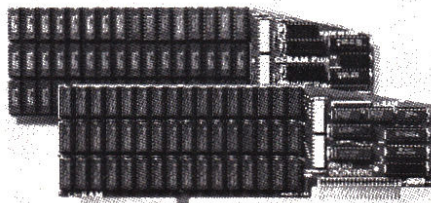
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GS-RAM & GS-RAM Plus expand main memory on your IIGs

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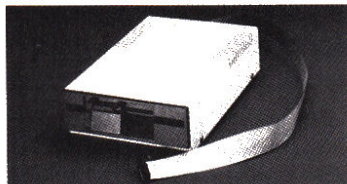
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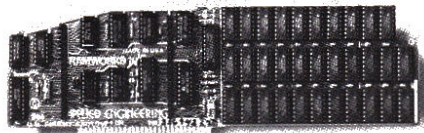
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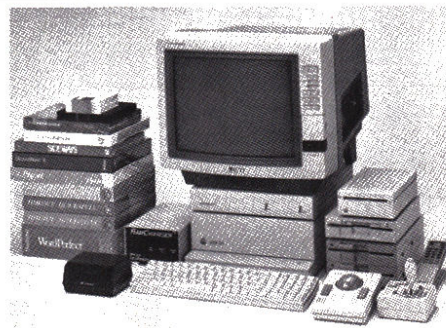
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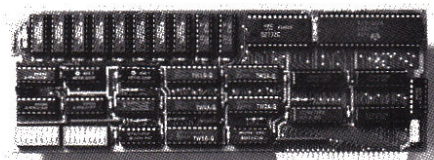
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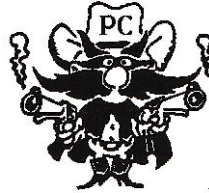
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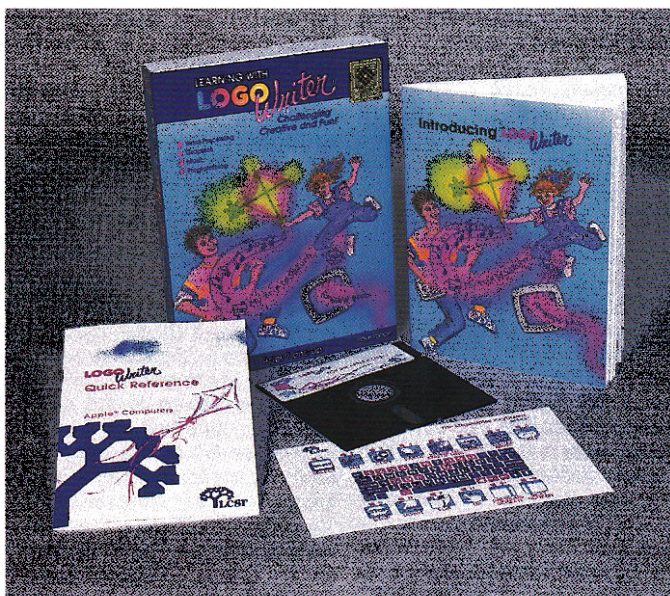
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# REVIEWS

## INCIDER'S RATINGS

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## LOGO AT HOME



### LEARNING WITH LOGOWRITER

\*\*\*\*\*

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Canada J7V 6B3, (514) 455-5636,  
(800) 321-LOGO

LOGO programming, graphics, and  
word-processing software; 128K Apple IIe, IIc,  
IIgs, \$99

**Rating:** ♦ ♦ ♦ ♦ ♦

Learning with LogoWriter brings the LogoWriter programming language out of the classroom and into your home. Like the classroom LogoWriter package, this new edition lets you generate geometric shapes, colorful graphics, and animation. The package also includes a word processor and a tone command with a repertoire of 12 notes for playing simple tunes.

Published by the same people who developed the original LogoWriter and Lego

TC Logo (see "Building Bricks and Bytes," Reviews, June 1988, p. 32) for Lego Systems, Learning with LogoWriter is easy to learn and very flexible. The package comes with a tutorial, *Introducing LogoWriter* (a 14-chapter primer on programming basics); a *Quick Reference* guide for a more technical look at LogoWriter primitives (the language's built-in vocabulary); a laminated sheet identifying most of the software's special keys and key combinations; and the LogoWriter disk with

program, tutorial, and scrapbook pages (containing help, shapes, and sample files).

Each scrapbook page has two sides: the turtle side where you can write and draw, add labels to pictures, and control the turtle; and the procedure side, where you define programming instructions. LogoWriter starts you off on the procedure side of the page whenever you select New Page or load a scrapbook file.

The lower section of each page is the Command Center, where you type instructions. Command Center procedures are executed immediately when you press Return. They aren't stored permanently on a scrapbook page, though, so unless you copy them to the procedure page, they'll be lost later.

One of LogoWriter's nicest features is the ease with which you can edit programming commands and text. Whether you're on the turtle page, procedure page, or in the Command Center, simply use the arrow keys to direct the cursor to an error, delete it, and retype as necessary. Because editing's so simple, students can spend their time exploring procedures and trying out command variations.

LogoWriter lets you select text for cutting, copying, and pasting. You can cut or copy text from the turtle side of a scrapbook page and paste it to the procedure side or *vice versa*. You can also copy to a totally new scrapbook page.

If you're in the Command Center on the Procedure page, repeating a command is easy—and you don't have to retype the entire line. Simply direct the cursor to the first letter of the command, press the right-arrow key until the cursor rests at the end of the line, then press Return. The procedure will be executed again automatically.

The program disk includes a LogoWriter tutorial (called Learn), which briefly introduces some of the more popular Logo drawing procedures: moving the turtle forward and backward, changing direction, turning left or right, walking the turtle across the screen with▶

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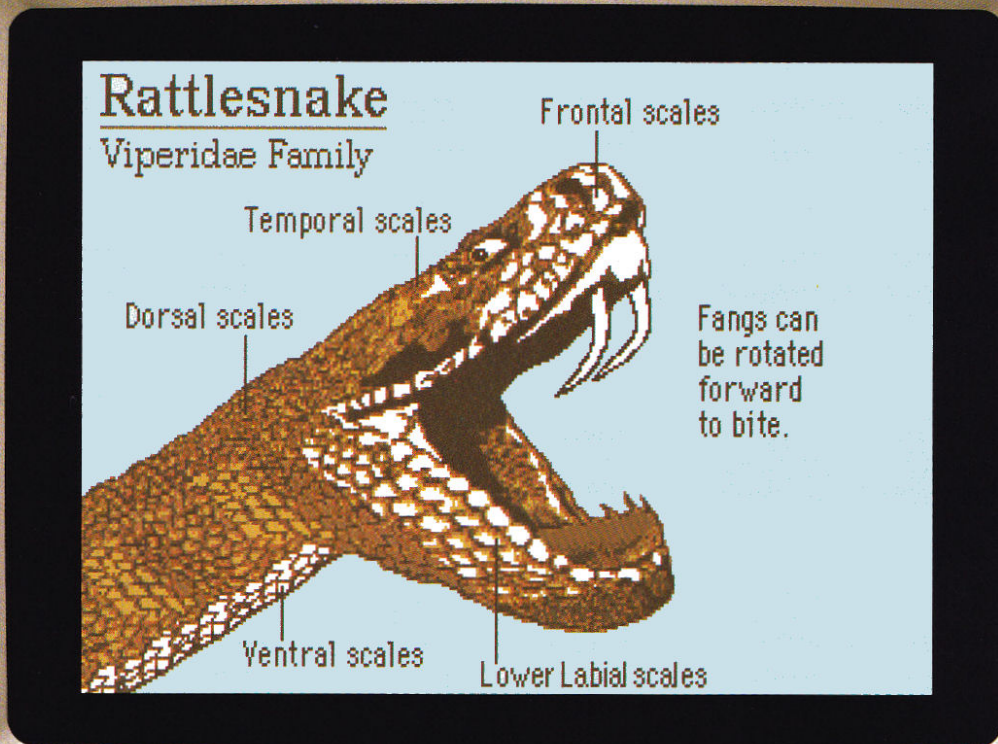
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out drawing, resuming drawing, changing the turtle's color, using the fill command to color any shape you've drawn, writing a procedure using the Repeat command (the turtle re-executes a command automatically), and clearing graphics from the work area. There are many more things you can do with LogoWriter, but the commands you'll learn in the tutorial are enough to get you started.

Logo is more than a programming language. You can use it as a total learning environment to teach geometry, general math principles, probability, creative writing, social studies, spelling, and whatever else you choose. LogoWriter adds its own bells and whistles by letting you combine text and graphics, transform the turtle from a cursor to a shape, work with up to four turtles simultaneously, and stamp shape designs on screen for artistic effect.

Another of LogoWriter's more flexible features is its ability to create macros—special control-key commands that reduce a series of keypresses to one combination. A macro comes into play when you press one of ten previously programmed letters (N, O, P, Q, R, V, W, X, Y, and Z) in conjunction with the control key. For a macro to work, you'll have to put the When instruction inside a procedure. For example, at the Command Center type:

```
when "q [repeat 3 [fd 50 rt 120]]
```

Press Return, then press Control-Q; the turtle will execute a triangle. You can save control-key commands if they're entered as a procedure on that page. Flip to the procedure page and type:

```
to macro
```

```
when "q [repeat 3 [fd 50 rt 120]]
```

```
end
```

Press Escape to save the procedure, then give the page a name, such as Shortcut. If you don't, it will be lost when you shut down the computer. Once you load control-key procedures into memory, they'll execute the programmed events whenever you press the appropriate key combination.

## CREATIVITY BY DESIGN

LogoWriter's ability to mix text with graphics and generate hardcopy gives it potential as a simple desktop publisher. If you plan to print, though, remember to configure LogoWriter to work with your particular hardware. Apple IIGS owners should select Super Serial

Card from the interface list. ImageWriter LQ owners can select either ImageWriter option from the printer list. For a sample project (an illustrated invitation), follow the tutorial in the manual.

The LogoWriter program disk also contains a shapes page with 25 predesigned illustrations, with room for five more you can design yourself. Refer to the manual to see what these shapes look like; otherwise you'll have to stop what you're doing to figure out what shape to import. You can design new shapes for the turtle with the built-in shape editor.

Choose Shapes from the Contents page, flip to the procedure page, and press the open-apple and right-arrow keys until an empty shape screen appears. Each consists of a 10-by-16-pixel grid. Use the arrow keys to move the cursor around the screen and the spacebar to fill (or empty) the pixel where the cursor rests. When you're finished, flip to the turtle page to see what the shape looks like. You can copy LogoWriter shapes from one screen to another simply by pressing Open apple-3 (to copy) and Open apple-4 (to paste).

Refer to the manual to see what all the shapes look like, otherwise you'll have to stop what you're doing to figure out what shape to import into your work file. In the version reviewed here (2.0), the shapes on the scrapbook disk didn't match the shapes on the program disk. When queried about the discrepancy, the technical people at LCSi assured me that a revised version with matching program and scrapbook shapes would be out by the time this review appeared in print. If yours is the older version, return it to LCSi for an exchange.

You can get additional LogoWriter scrapbook disks and activity cards for primary and intermediate levels—as well as intermediate-level project booklets—from LCSi. You can also trade in your 3½- or 5¼-inch disk if you need the other format. LCSi offers a free swap if you send in the original program disk.

## LET YOUR TURTLE DO THE WALKING

Learning with LogoWriter is an enjoyable introduction to Logo programming procedures. Without bogging you down in complexity, it takes an informal look at a number of primitives and provides an intriguing taste of what you can do with the language. □

**Carol S. Holzberg**  
Shutesbury, MA

## CABLE CONNECTION



## XPRESS XCHANGE

\*\*\*\*\*

**XPRESS INFORMATION SERVICES LTD.,**  
Regency Plaza One, 4643 South Ulster  
Street, Suite 340, Denver, CO 80237,  
(303) 721-1062

On-line information and financial service (via cable-television connection); Apple IIe, IIc; \$125  
XPress XChange; \$225 XPress Executive

Rating: ♦ ♦ ♦ ♦ ♦

There are two things my wife forbids me to have in the house—a gun and a modem. She sees them as deadly to our health—physical or financial. With telephone bills already close to the size of the national debt, she adamantly refuses to take out a fourth mortgage to pay for the expenses associated with services like The Source or CompuServe.

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**Hardware requirements.** Apple II or Laser computer with 128K memory and one disk drive. 3.5-inch bit copy requires Laser 128EX or IIgs (or Apple II computer with Central Point Universal Disk Controller) and a 3.5-inch IIcs, Chinon or Laser drive.

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# Programs & Peripherals

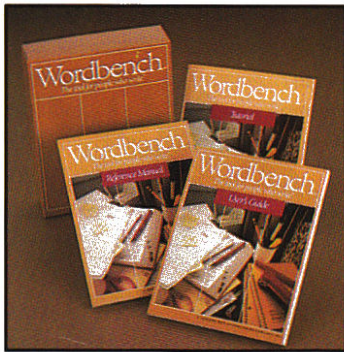
## Modems

Anchor Automation 1200E 2400E	119.	Practical Peripherals	
Applied Engineering DataLink Modem 1200B (Int II+, IIe or IIgs)	159.	Practical Modem 1200 SA Mini	79.
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EPIC		Prometheus Pro Modem 2400 (External)	255.
Epic 2400 Classic II Internal w/Proterm	179.	Pro Modem 2400G (Non Expandable)	179.
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		U.S. Robotics U.S. Robotics Courier 1200	199.
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		U.S. Robotics Courier 2400E	379.
		U.S. Robotics Courier HST 9600	689.

## Printer Interface Cards

Apple Apple Super Serial Card	119.	SMT	
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Applied Engineering Buffer Pro 32K	95.	Print Tech II (Parallel Interface)	37.
BufferPro 128K or 256K	Call	Thirdware	
Serial Pro (II+, IIe, IIgs)	115.	Finger Print GSi Ver 2 (Includes Desktop Accessories-IIgs)	Special 79.
Parallel Pro (II+, IIe, IIgs)	85.	Finger Print Plus	
Orange Micro Grappler C/Mac/GS	79.	(Specify Cables: Parallel, Serial or ImageWriter II-II+ & IIe)	89.
ProGrappler (Apple IIe or IIgs)	84.		
Serial Grappler Plus	62.		

## Wordbench by Addison Wesley



**Wordbench** is the new way to prepare documents that goes beyond word processing. **Wordbench** lets you start your project with a full-featured Outliner and Notetaker, helping you organize your ideas, references, and notes, long before you begin to write the first draft. Then, unleash the **Wordbench** Writer to pull all of your work together clearly and effectively, without retyping. **Wordbench** lets you add creativity and correctness to your documents with its Brainstormer to help put your creative processes to work, a Thesaurus to help find the perfect word, and a Spellchecker to help you mind your "P's" and "Q's". And when it's time to print, **Wordbench** lets you add the text formatting you need to add impact and style to any presentation.

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## Utilities & Languages

Absoft AC/BASIC (16-bit BASIC Compiler for IIgs)	84.	ORCA/Pascal (IIgs)	69.
Big Red Computer		ORCA Desktop (IIgs)	34.
PS Lovers' Utility Set (AP or IIgs)	29.	TML Systems	
Roger Wagner SoftSwitch (IIgs)	39.	TML Basic (IIgs)	84.
Merlin 8/16 (IIe, IIc, IIgs)	79.	TML Pascal (IIgs)	84.
The Byte Works		TML Source Code Library (IIgs)	35.
ORCA/M Assembler (IIgs)	39.	TML Speech Toolkit (IIgs)	49.
ORCA/Pascal Desktop Debugger (IIgs)	80.	Zedcor	
		ZBASIC 4.0 Interactive Compiler	39.

## Disk Drives & Hard Disk SubSystems

American Micro Research (Micro Sci)		Cutting Edge XL 30 + SCSI HD (IIe & IIgs)	629.
A5 D Half Height 5 1/4" Drive (IIgs Daisychain)	155.	XL 45 + SCSI HD (IIe & IIgs)	829.
A.5 Half Height (II+ & IIe)	129.	First Class T6 60MB Tape	709.
A.5C Half Height (IIc)	129.	D2 20MB HD (IIe & IIgs)	Special 509.
Micro Sci C2 Controller	52.	D4/A 40MB HD (IIe & IIgs)	645.
Applied Engineering		D4/T 40MB HD/High Perf. (IIe & IIgs)	855.
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Transdrive Half Height 360K	119.	Rodime Rodime 20 Plus Ext HD (IIe, IIgs)	629.
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## FingerPrint GSi by Thirdware



**FingerPrint GSi** is the graphics utility card that instantly captures and dumps screen images to your printer or disk. But **FingerPrint GSi** does much more - you can crop, rotate, stretch, invert, reposition and enlarge captured images up to 140 feet by 100 feet. You can also reload saved screen images into graphics programs, desktop publishing packages, and word processors that support imported

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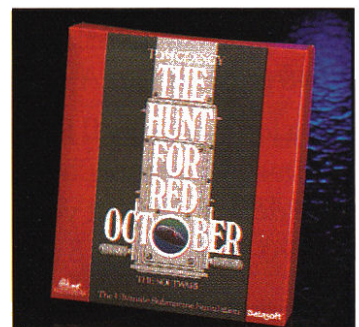
**FingerPrint GSi for the IIcs** ..... 79.

## Accessories

Apple Computer Apple Mouse IIe	125.	Printer Muffler 132	58.
Apple Mouse IIc	85.	Printer Muffler Stand 80 or 132	24.
Applied Engineering TimeMaster II H.O.	79.	AntiGlare Filter IIgs	39.
Sonic Blaster (IIgs)	109.	System Saver (Platinum or Beige)	69.
IBM Style Keyboard	119.	System Saver (IIgs)	75.
Audio Animator (IIgs)	185.	New Turbo Mouse (Reg. or ADB)	119.
Asher Engineering		Kraft	
Turbo Trackball (IIe or IIgs)	69.	Universal 3 Button Joystick (IIe or IIc)	34.
Big Red Computer		Koala Technologies	
Labels, Labels, Labels	29.	Koala Pad Plus w/Graphics Exhibitor	84.
Bose		Kurta	
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CH Products Hayes Flight Slick	52.	MDIdeas	
Hayes Mach II Joystick (Beige or Platinum)	29.	Digitizer Professional (IIgs)	139.
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EADB-105 Extended Keyboard (IIgs)	Special 149.	MouseTrak	
Digital Vision		MousePad 7"x9" Size	8.
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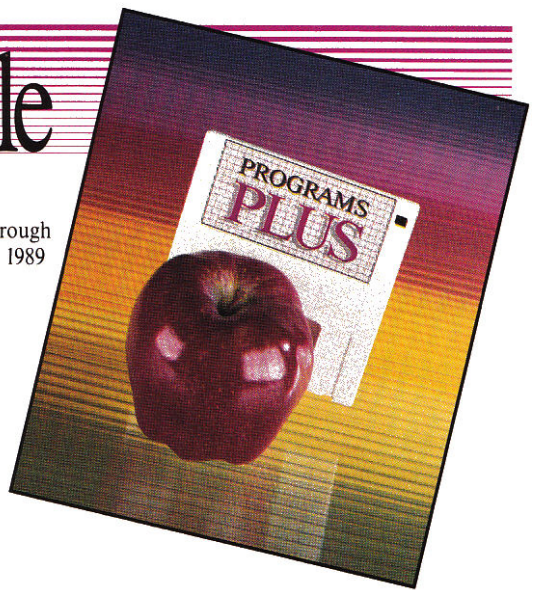


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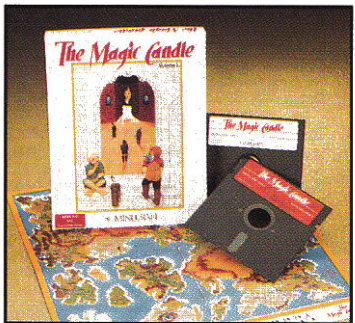
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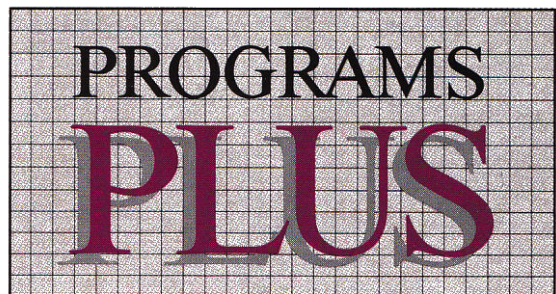
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uses. Data are transmitted via cable as a one-way radio signal at 9600 baud. When you purchase the XPress XChange kit for a one-time fee of \$125, you receive a signal decoder box, software, splitter device, serial cable to connect the decoder to your computer, and all the necessary documentation. There are no hidden costs and no monthly bills.

Regardless of which service you buy, installation is a snap. Basically, your television cable runs into the splitter device, and separate cables carry the signal to your television and the decoder box. The serial cable then connects the decoder box to your computer and you're ready to go.

Once you've connected everything, all that remains is to boot the XPress software. On-screen instructions at the main menu explain how to navigate throughout the XChange and Executive services. You can get to a variety of features from the main menu, but clearly the most significant choices are Category Selection and Information Display.

Choosing Category Selection brings up a second menu listing the major sections from which you can receive information. Once again, ease of use is enhanced by complete on-screen instructions. The nine categories available cover a wide spectrum of topics—News, Sports, Weather, Lifestyles, Entertainment, Tech Talk, Shopping, Information XChange, and Inside XPress. When you select a category—and you can select as many or as few as you like—you're telling the software to capture from the XPress data stream all incoming information that corresponds to the “tagged” subject areas.

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ues on software, travel packages, and high-tech specialty items abound. The Flea Market category lets you advertise your own goods and services free of charge.

Entertainment news is sure to be popular among XPress users. Topics here range from daily horoscopes to soap-opera updates, from top-ten movie and book reviews to gossip about who's who among the jet set.

The Sports category bombards living-room jocks with stories, scores, schedules, standings, statistics, game summaries, and transactions for every major professional sport, as well as college and Canadian sports. A general category named Other Sports takes care of bowling, horse racing, boxing, and so on. There's even a daily Sports Quiz for trivia buffs.

Of all the categories, none is as impressive or comprehensive as News, though. Headlines and stories are on your screen almost as soon as they cross the AP and UPI wires. Business and financial headlines as well as articles on personal investment and banking are provided by *USA Today* and the Cable News Network. International reports come straight from worldwide wire services to you, bringing news supplied by TASS (from the Soviet Union), Agence France Presse, Xinhua (from China), and other foreign news agencies. They're translated into English, with the exception of Notimex out of Mexico City (which is in Spanish). The educational value of the News category alone justifies the purchase of XPress' service.

### BUY, SELL, OR TRADE

The XChange service also offers basic stock information, with quotes transmitted three times a day—at market opening, midday, and closing. All quotes use Standard & Poor's format, and you can set up a personal portfolio that lets you track more than 100 stocks.

For those who need detailed and timely financial information, though, XPress Executive is the way to go. The Executive Kit is identical to the XChange, except that it offers extensive business data usually available only through an expensive, specialized stocks-and-bonds information bank such as the Dow Jones News/Retrieval Service.

Executive service offers customized, continuously updated stock quotes emanating from all major U.S. and Canadian exchanges and released on a 15-minute delayed basis. In addition to providing stock quotes, Executive

taps the resources of Standard & Poor's, *Business Week* magazine, and McGraw-Hill to glean current and pertinent financial news and analysis. Reports directly from the Securities and Exchange Commission keep you informed on merger and acquisition filings to help you make intelligent investment decisions.

Other information provided by Executive service includes interest and exchange rates, mutual-fund updates, and market statistics on metals, money, and commodities. Optional software lets stock traders and investors who use XPress Executive set limit alarms, use a mouse for selections, export information to Lotus 1-2-3, and display charts and graphs as stock quotes are received.

The XPress Executive Kit costs \$100 more than the XChange and costs \$19.95 a month to maintain. For those of you who are familiar with the expense of accessing similar financial databases, however, Executive service is a real bargain—especially when you consider you're receiving sports, entertainment, news, and everything else as a bonus.

### ONE-WAY STREET

The biggest drawback to using either XPress service is that it allows only one-way data. The wide selection of convenient features overcomes some of that, however. Keyword searches and user-selectable category choices provide excellent control over the information coming into your machine and you can send all available data to either your printer or disk, allowing for instant hardcopy or later transfer to a word-processing program.

How many stories can your machine hold at one time? It depends entirely on your computer's memory. Because XPress stories vary from 50 to 6000 characters in length, it's hard to say how many you can store at any given time. As a rule of thumb, 128K lets you capture about 40 stories. Messages at the bottom of your screen alert you when memory is full—you can then read, print, or save your material in RAM, clear old data, and begin accumulating new stories.

As an educational tool, source of entertainment, or financial adviser, XPress XChange and Executive offer a lifetime of service for a one-time fee. In an age when information is essential, XPress is a must for computer owners—whether you own a modem or not. □

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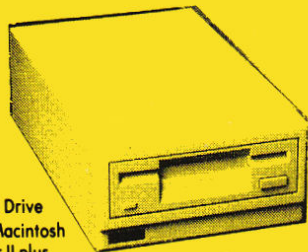
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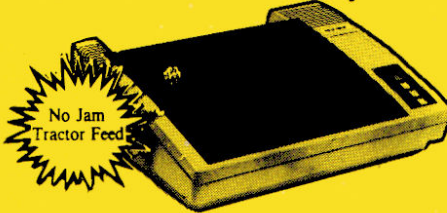
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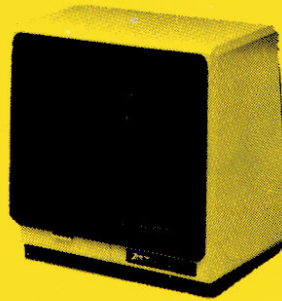


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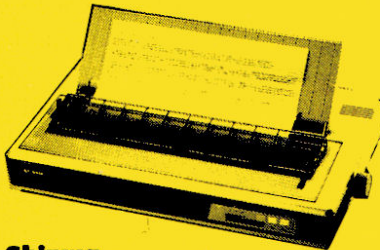


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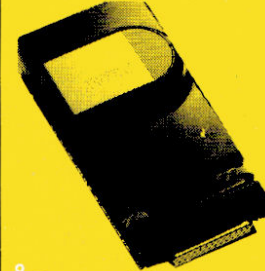
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# B

# ACK to

# ASICS

Talk to your Apple in a language it understands—spend an hour with our programming tutorial and learn how a few BASIC techniques can make your Apple a more effective tool for home and business productivity.

By **WILLIAM P. KENNEDY, Ph.D.**

## P

## ROGRAMMING'S

just for kids and hackers!" Okay—so you're perfectly happy using your Apple II to write letters to mom and balance your checkbook. Maybe you're just not interested in how your computer works or how you can make it work better.

No, we don't think that's the problem. You've probably avoided learning to program because you think you haven't got time. Or you may have tried typing in a program listing from your favorite magazine, only to spend frustrating hours retyping it when it didn't work, only to find it prints your name across the screen 5000 times.

It doesn't have to be that way. You can learn something about programming *and* understand what you're doing after only an hour's lesson. In fact, after studying this article carefully, you'll have written three useful programs. After that you'll be able to take advantage of the many programs *inCider* and other publications offer to make your Apple more accessible, useful, and responsive. Typing in listings and modifying them are good ways to learn more about programming—to learn by doing. You'll come to understand what the programmer's talking about, enough to apply the same techniques to programs you write yourself.

Check the sidebars accompanying this article. These three programs were selected for true beginners, to get you started on a hassle-free programming career. Don't start programming until you've read through the text, though, or you'll miss a number of tips and techniques that will help you get going.

### BASIC BASICS

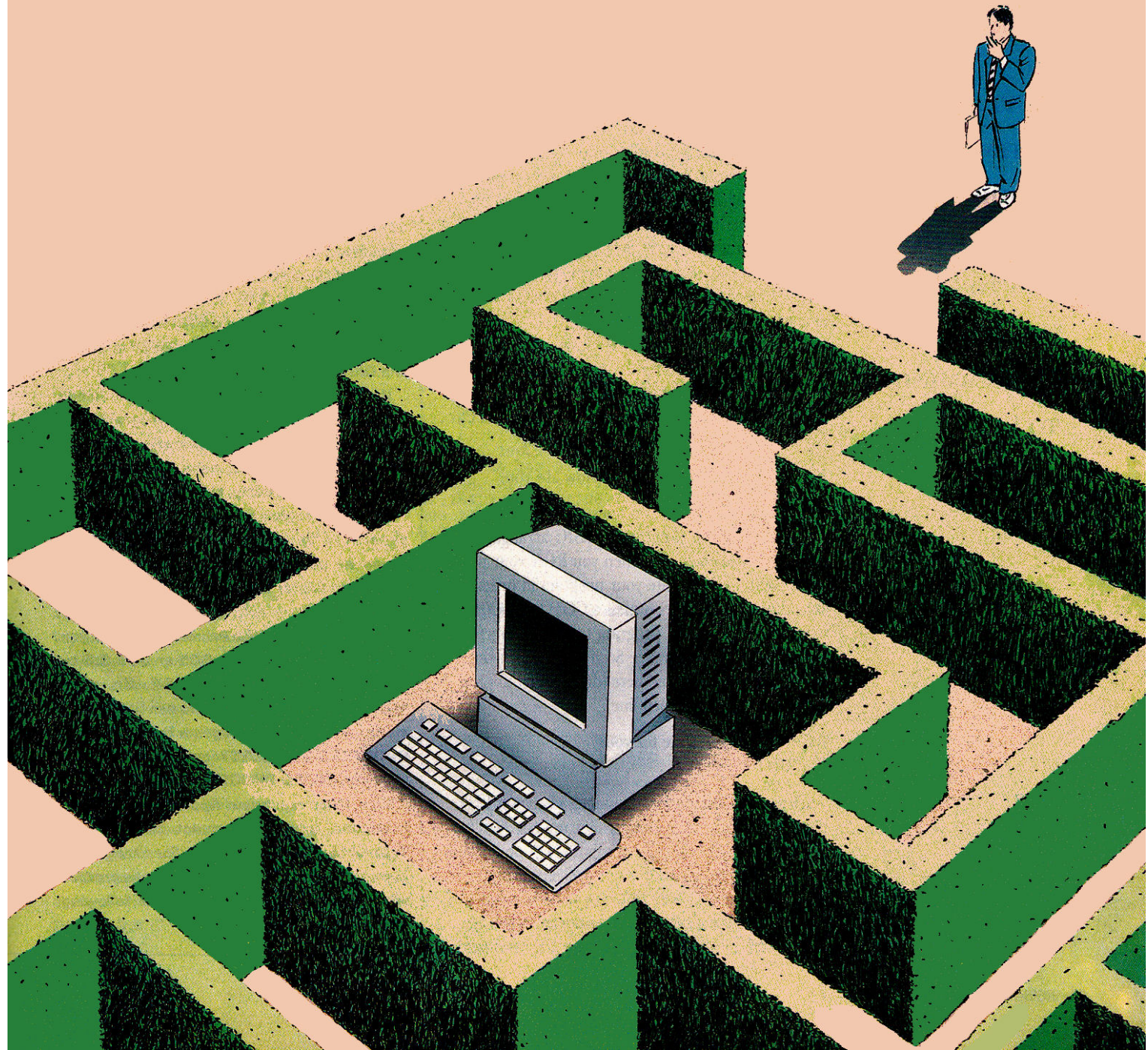
Let's talk about computer languages first. You can write programs for your Apple using bizarre-looking hexadecimal codes, which your computer will understand. But why bother? Rather, a computer language lets you compose English-language commands that make sense to you, then converts them.

There's a beginner's programming language built into every Apple IIe, IIc, IIc Plus, II Plus, even IIGS—Applesoft BASIC. If you turn on your Apple with no disks in the drives and hit the control and reset keys quickly, Applesoft BASIC will automatically appear, displaying a square bracket (]) known as the BASIC prompt. You type your BASIC commands next to the prompt, in either *direct* or *deferred mode*.

In direct mode your Apple will execute the BASIC command immediately after you press the return key. Return tells your computer you've completed typing the command. Try it now. For example, type: ►



A2



**“TYPING IN LISTINGS AND MODIFYING THEM ARE GOOD WAYS TO LEARN MORE ABOUT PROGRAMMING— TO LEARN BY DOING.”**



PRINT “Hi there” and press Return. Just beneath your typed *command line* should appear the words *Hi there*, which you just told the computer to PRINT. (By the way, you can use the question mark—?—instead of PRINT. Go ahead, try it.)

Direct mode is handy for trying out commands before you use them in a program—to examine variable values when debugging, for example—and for LOADING and SAVEing your programs to disk. Direct commands aren’t stored in your Apple’s memory. Once executed, they’re “forgotten.”

Now type this:

```
10 PRINT “Hi there”
```

and press Return. Nothing there, except what you typed? Good. Including a line number *before* the command indicates you’re typing in deferred mode—programming.

Now type RUN and press Return. The direct command RUN tells your Apple to execute your program, so the message *Hi there* should appear.

Got it? You can type RUN and your Apple will PRINT “Hi there” forever if you like. That’s because a BASIC program (deferred mode) is stored in your Apple’s memory until you turn off the computer or erase the program from memory with the direct command NEW. In fact, before typing a second listing, you need to NEW the system. Otherwise, you may end up with merged listings.

A BASIC program consists of a series of numbered lines, each containing a BASIC command also known as a *statement*. You can put more than one statement on a single line; just separate them with a colon (:). For instance, when you RUN the program

```
10 PRINT “Hi there”: PRINT “How are you?”
```

your Apple will PRINT two lines of messages.

As you compose programs, BASIC arranges the commands automatically; when you RUN your program BASIC will execute your program in order of ascending line numbers (unless a GOTO or GOSUB statement changes the program’s “flow”—directs it elsewhere in the program). So if you type in these lines exactly as presented here (don’t forget to press Return at the end of each line):

```
100 PRINT “How’s life for you?”  
10 PRINT “I’m fine.”
```

you’ll see this sequence of messages when you RUN the program:

```
I’m fine.  
How’s life for you?
```

One other direct command is important when typing in BASIC programs: LIST. Alone, the command

does just what the word suggests—displays your program in ascending line-number order on your screen so that you can see the progress of your work.

You can temporarily suspend and then restart LISTING for long programs by pressing the control and S keys simultaneously (written as *Control-S*). Or, you can stop LISTING a program before it reaches the last line number by pressing Control-C. Control-C will also stop execution of a RUNning BASIC program prematurely.

In addition, when you want to examine and edit a particular segment of your program just specify a line number after LIST, such as LIST 10 to display

### Applesoft Proofer

Carefully type in the Applesoft BASIC program shown in *Listing 1* (ignore the bracketed numbers!) and SAVE it on disk as MAKE.PROOFER; it POKEs the PROOFER program into memory (line 50). If you’re using DOS 3.3, type in lines 1000–1020 shown in *Listing 2* instead of those in *Listing 1*.

Now type RUN. If you entered the program correctly, you should see the message “Proofer installed!” and a flashing cursor adjacent to the BASIC prompt (>). If not, press Control-Reset, LOAD MAKE.PROOFER, fix the problem, SAVE, and try RUNNING it again. Most often, you can find the error in one of the DATA statements.

If all’s well, type LIST. An inverse number should appear following each program line; they should match those appearing in brackets in *Listing 1*. If not, make sure you typed the program correctly, then recheck DATA.

Use the Proofer to compare the numbers generated by your LISTed programs with those we publish. If they’re the same, you typed the line(s) correctly and the program should work.

You can activate the Proofer each time you start up BASIC from ProDOS or DOS 3.3 by typing RUN MAKE.PROOFER. Or, once MAKE.PROOFER is RUN, you can BSAVE the machine-language program it creates as PROOFER,AS300,LSC7 on your disk. You then can BLOAD PROOFER and CALL 768.

Also, if you reset your Apple or use the PR# command, you’ll disconnect the Proofer. Type CALL 768 to restart it. For example, to get a listing of your program with the proofer numbers on your printer, use the following sequence:

a single line, or LIST 10-100 if you want to check a series of line numbers in your program.

## BASIC EDITING AND DEBUGGING

We have yet to hear of anyone who can consistently type in programs correctly the first time. When RUN, faulty versions "crash": BASIC displays a line number where the error occurred along with an error message that may or may not mean anything to you. Use our Applesoft Program Proofer (see the accompanying sidebar and listing) to locate and correct errors before they crash your program.

The Proofer is available only for *inCider* program

listings, though; what about programs you might type in from other sources or those you create yourself?

Most beginners "debug" their programs by simply retyping the errant line, continuing tediously through each mistake until the program works correctly.

That's okay for the standard *syntax* error (a typo or incorrect statement), although we'll discuss an easier method of editing in a moment. Two other common errors, however, *out of data* and *illegal quantity*, can crash a BASIC program on a line *other* than where the errant value actually occurs! Some beginners just retype the entire program until they get it right—no wonder few people ever continue programming.

There's a more precise way to correct the problem. An out-of-data error and sometimes an illegal quantity occur because of a mistyped or missing DATA state-

- 1) LOAD or type in your program.
- 2) PR#1 to activate the printer.
- 3) CALL 768 to restore the Proofer.
- 4) LIST should print your program.
- 5) PR#0 to restore printing on screen.
- 6) CALL 768 to activate the Proofer.

Proofer doesn't count spaces between REM and its message or DATA and the data values. So, there shouldn't be a difference in the proofer number between

10 REM Only one space after REM

and

10 REM Five spaces after REM

Trailing spaces after a REM message or DATA list *do* count. You might first try editing a DATA line with an incorrect proofer number (see accompanying feature); make sure to press Return at the end of the line to see whether the proofer number changes.

In addition, the proofer number includes the order in which you enter a line, particularly the order of values in a DATA statement. So, 10 DATA 1,2,3 will generate a different proofer number from 10 DATA 1,3,2. □

—W.K.

### Listing 1. ProDOS version of MAKE.PROOFER.

```
10 REM MAKE.PROOFER -- NEW ProDOS version 2.1 [7738]
20 REM by Bill Kennedy [3084]
30 REM Copyright 1989, inCider [4733]
40 REM [194]
50 FOR I = 768 TO 966: READ N: POKE I,N: NEXT I [2872]
60 CALL 768 [685]
70 TEXT : HOME : PRINT : PRINT "Proofer installed!" [2530]
80 PRINT "BSAVE it as PROOFER,AS300,L$C7" [6170]
90 END [308]
1000 DATA 162,29,160,3,173,48,190,141,182,3 [3496]
1010 DATA 173,49,190,141,183,3,142,48,190,140 [3674]
1020 DATA 49,190,169,0,133,60,133,61,96,201 [3514]
1030 DATA 141,240,3,76,178,3,134,70,132,71 [5275]
1040 DATA 186,138,105,7,170,189,0,1,201,214 [5436]
1050 DATA 208,7,189,255,0,201,229,240,28,189 [5614]
1060 DATA 253,0,201,40,208,6,169,0,201,141 [5325]
1070 DATA 208,15,189,255,0,201,13,240,93,169 [5612]
1080 DATA 0,133,60,133,61,240,85,165,60,5 [5145]
1090 DATA 61,240,23,32,87,219,32,87,219,165 [7673]
1100 DATA 50,72,41,63,133,50,166,60,165,61 [7460]
1110 DATA 32,36,237,104,133,50,160,0,132,60 [7749]
1120 DATA 132,61,177,155,200,17,155,240,43,200 [8374]
1130 DATA 177,155,200,24,113,155,133,66,32,191 [8413]
1140 DATA 3,177,155,240,27,32,184,3,177,155 [7725]
1150 DATA 240,20,201,32,208,3,200,208,245,72 [1211]
1160 DATA 32,184,3,104,201,58,240,229,177,155 [1280]
1170 DATA 208,243,166,70,164,71,169,141,141,67 [1318]
1180 DATA 3,76,0,0,69,66,133,66,24,101 [1099]
1190 DATA 60,133,60,144,2,230,61,200,96 [1092]
```

### Listing 2. Substitutions for DOS 3.3 version.

```
1000 DATA 162,29,160,3,173,83,170,141,182,3 [3481]
1010 DATA 173,84,170,141,183,3,142,83,170,140 [3669]
1020 DATA 84,170,169,0,133,60,133,61,96,201 [3502]
```

ment. Programmers usually place DATA statements and their accompanying values at the end to be READ throughout the program. Figuring out which DATA line contains the incorrect value may not be easy—you may have to review your DATA values item by item.

To speed that process, keep in mind this tip: ►

**“A COMPUTER LANGUAGE LETS YOU COMPOSE ENGLISH-LANGUAGE COMMANDS THAT MAKE SENSE TO YOU.”**

“Out of data” means you’re missing one or more values. Count up the number of values (separated by commas) in each line and compare that with the number of values in the original program. “Illegal quantity” often means you’ve typed an extra comma in one of your DATA statements. Or the program line where the error occurred may have tried to POKE a DATA value (insert a value into a particular memory location) greater than 255 or less than zero. Scrutinize values that exceed those limits carefully. Beyond that, you’ll just have to LIST and compare your DATA directly with the published text.

Several BASIC text editors are available, but because they depend somewhat on your knowledge of Applesoft itself, they’re not very useful for the beginner. Rather, Applesoft BASIC provides a crude but effective “line editor” that can take a lot of the tedium out of retyping BASIC programs. Press the escape key (ESC) once and notice what happens to the flashing cursor: You have just entered the “free cursor” zone. Press the *I*, *J*, *K*, and *M* keys individually and watch the direction in which your cursor moves. Now press any other key. (The spacebar is the easiest to remember.) That should return your cursor to normal.

Now LIST or retype line 10 from one of the programs above. Use the example 10 PRINT “I’m fine.”

the right- and left-arrow keys until the cursor is positioned over the first character you want to change. (If you make a mistake, press Control-X to start over, or simply re-enable the free cursor by pressing Escape again.) For example, position the cursor over the *f* in the word *fine* in our example. Now type anything, *four* for example, but *before* pressing Return use the right-arrow key to *parse* (trace) over the remaining characters in the line. LIST 10 again or just RUN the program to see your changes.

Line editing can be as simple as that! The right-arrow key treats whatever character you parse with the cursor just as though you had typed it. Similarly, the left-arrow key deletes the character under the cursor from the typed line even though it may still remain on screen.

The free cursor, on the other hand, ignores anything over which the cursor passes. You must position the cursor originally at the beginning of the line and parse over all characters you want to retain as part of the line, because you’re indeed “retyping” the entire line. Using the right-arrow key to capture characters instead of retyping them ensures you don’t introduce additional mistakes.

You also can use the free cursor to insert characters and statements into a previously typed line or remove them. Just follow the instructions above and parse to the point of insertion or deletion.

If the portion you want to delete is at the end of the line, just press Return. Otherwise, re-enable the free cursor. Move over that part of the line you want to delete; restore the standard cursor; parse over the remainder of the line with the right-arrow key; and press Return.

To insert, position the free cursor in an unused space on screen after parsing to the point of insertion in the original line. Type in the material you want to insert; re-enable the free cursor; move it to the spot where the original line should continue; set the cursor to normal; parse the remaining characters with the right-arrow key; and press Return. Voilà!

One final note on free-cursor editing: Extra spaces are introduced into a program line when

**Startup**

**You can use the Applesoft BASIC Program listing presented here as the “boot” program for your programming disk, as described in the accompanying article. Type in the listing**

**and SAVE it as STARTUP. That name is unique; whenever you turn on your Apple with a ProDOS BASIC disk in the boot drive, the machine LOADs and RUNs STARTUP automatically.**

**Be sure a copy of PRODOS (an 8-bit version) and BASIC.SYSTEM are also stored on disk.**

**Startup’s pretty simple. Following some introductory REMarke (lines 10–30), line 40 activates your Apple’s 80-column text mode. Line 50 then PRINTs a simple message. Line 70 tells ProDOS to list a CATALOG of your disk contents on screen. Finally, line 80 removes the program from memory (NEW) automatically so that you can start typing in another listing. □**

**Program listing. Startup.**

```
10 REM Startup program for BASIC
   boot [5867]
20 REM by Dr. Bill [2155]
30 REM Copyright 1989,
   inCider [4733]
40 PRINT CHR$ (4);"PR#3" [1177]
50 PRINT "Programming disk
   files:" [5350]
60 PRINT CHR$ (4);"CATALOG" [1172]
70 NEW [568]
```

**—W.K.**

Press Escape, then the *I* key until the free cursor is positioned over the leftmost character in the line number (*I* in the number 10 in our example) and press the spacebar to restore the normal cursor. Press

its LISTing uses more than one screen line. Those extra spaces may cause errors if they’re edited into your program line when you use the right arrow.

You can reformat your LISTing to remove those

extra spaces by typing `POKE 33,33` for a 40-column display, or `POKE 33,70` for an 80-column display, then `LISTING` the program. The width of the `LISTING` will be reduced to 33 or 70 characters, respectively, but intervening spaces in continued lines will disappear. Press Control-Reset to restore normal 40- or 80-column format.

You may be wondering why we asked you to turn on your Apple with no disks in the drives. Well, Applesoft BASIC knows less about disk drives than it does about compact discs. It needs help in the form of a disk-operating system (DOS) and a DOS-command interpreter.

The most modern disk-operating system that works with every Apple II is Apple's Professional Disk Operating System (ProDOS), a set of machine-language programs that handle saving and retrieving data from disk. Applesoft uses the 8-bit version of ProDOS, also known as ProDOS-8 to differentiate it from ProDOS-16, or GS/OS. GS/OS is a faster, more enhanced operating system, but you can use it only with a GS and not with Applesoft BASIC. (See "GS/OS," November 1989, p. 56, for more information.)

Applesoft BASIC also needs the help of a DOS-command interpreter, `BASIC.SYSTEM`, to manage disk functions. ProDOS handles only the most rudimentary disk processes; you can access it only via machine language. `BASIC.SYSTEM` converts Applesoft-like statements into commands ProDOS understands.

You can find ProDOS and `BASIC.SYSTEM` just about anywhere—in many commercial productivity packages and all Beagle Bros and Applied Engineering software products, for instance—but it's best to locate them on a copy of the ProDOS System Master or System Utilities. GS owners can find ProDOS and `BASIC.SYSTEM` on the GS System Master. There's just one thing to be aware of: The 8-bit version of ProDOS that Applesoft requires is a file named `P8` in the System subdirectory or folder.

Before you start any programming project, it's a good idea to take a couple of blank or discarded disks, and use the Apple Utilities disk that came with your computer to format them and copy ProDOS (GS users must rename `P8` to ProDOS) and `BASIC.SYSTEM` to them.

You now should have at least one working, "bootable" ProDOS disk. Put it into drive 1 and turn on your Apple (called a *cold boot*) or press Control-Open apple-Reset (a *warm boot*). After a short spell of disk spinning, you should see a screen like this:

```
PRODOS BASIC 1.1
```

```
COPYRIGHT APPLE COMPUTER, 1983-84
```

```
] (a space-sized cursor should be flashing here)
```

To make doubly sure you're using ProDOS BASIC, try typing `CAT` and press Return; this command,

which stands for *catalog*, lists the names of the files on your disk. If something went wrong, you'll see `SYNTAX ERROR` and hear a beep. Try `CAT` again after pressing the caps-lock key down. If you still don't get a response, try formatting a fresh disk.

There are three other commands you need to know before you start typing in and using programs: `SAVE`, `LOAD`, and `RUN`. They're Applesoft-like commands that work with ProDOS to store and retrieve your BASIC programs from disk.

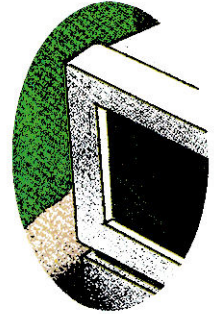
Type the direct command `SAVE` and the name of your program, then hit Return, to copy the BASIC program you typed into your Apple's memory onto your program disk. ProDOS creates a new file the first time you use the program's name. Thereafter, if you use that name, the copy in memory will replace the one on disk *without asking you* if that's okay. Be careful you don't replace a good copy with a badly edited one. Give each edited version of your program a unique name, perhaps by appending a number suffix. `SAVE` the program you're typing in *before* you attempt to `RUN` it, and `SAVE` as often as you edit.

When `SAVED`, a program exists both in your Apple's memory and on disk. When you turn off your computer, or when the program crashes because it still contains bugs and you have to "reboot" the system, the copy of your program in memory disappears. (That's why it's important to `SAVE` your program before trying to `RUN` it.) `LOAD` followed by the program's name copies it from disk into memory.

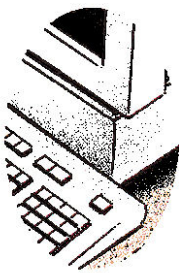
`RUN`, as you saw earlier, executes your BASIC program. You can't `RUN` a program on disk; you have to `LOAD` it first into your Apple's memory. `BASIC.SYSTEM` will automatically `LOAD`, then `RUN`, a BASIC program for you; just type `RUN` followed by the program's name. Be careful, though: `LOAD` and `RUN` (each followed by a filename) replace any BASIC program that might be currently in your Apple's memory with the one on disk.

Now let's get the show on the road. You're all ready to type in and begin using the three programs accompanying this article. The first Applesoft BASIC program helps you "start up" your computing day on the right foot. When you turn on your Apple's power with your program disk in the "boot" drive, the BASIC program named Startup will automatically `LOAD` and `RUN`. Startup simply produces a catalog of your disk contents, similar to the one you earlier produced manually, listing the names of any programs and files that are stored on your program disk.

The second program is our Applesoft Program Proofer. It automatically computes a "check sum" value for each line of BASIC code you type in. You can then compare that value with *inCider's* published number (the bracketed number at the end of each program line). If they match, the program is guar- ▶



**“USING THE  
RIGHT-ARROW  
KEY TO CAPTURE  
CHARACTERS  
INSTEAD OF  
RETYPING THEM  
ENSURES YOU  
DON'T  
INTRODUCE  
ADDITIONAL  
MISTAKES.”**



## AppleWorks Patcher

You can use the *Program listing* presented here to modify AppleWorks. Type it in and **SAVE** it as **AW.PATCHER**.

### Program listing. AppleWorks Patcher.

```

10 REM AW.Patcher modifies Appleworks [6017]
20 REM by Dr. Bill [2155]
30 REM Copyright 1989, inCider [4733]
40 D$ = CHR$(4): REM Gets ProDOS' attention [5206]
50 PRINT D$;"PR#3": HOME : REM 80-Column mode [5571]
60 M = 0: ONERR GOTO 1000: REM If can't find AW [2581]
70 PRINT D$;"BLOAD /APPLEWORKS/APLWORKS.SYSTEM,AS200
  0,TSYS" [9570]
80 POKE 216,0: REM Remove error trap [2782]
90 HOME : PRINT : VTAB 10 [1391]
100 INPUT "AW address you want to change (0 to quit)
  -->";A [10172]
110 IF A = 0 THEN 200: REM Quit modifications [2530]
120 IF A < 8192 OR A > 24575 THEN PRINT CHR$(7);"
  Address incorrect! Please reenter.": GOTO 100 [10032]
130 PRINT : PRINT "Address ";A;" currently contains
  the value "; PEEK (A) [9609]
140 PRINT "Change address ";A;: INPUT " to what valu
  e (0-255) -->";N [7717]
150 IF N < 0 OR N > 255 THEN PRINT CHR$(7);"Value
  incorrect! Please reenter.": GOTO 140 [5190]
160 PRINT : PRINT "Okay to POKE ";A;";N;:" (y or n)
  ?"; [7187]
170 GET A$: IF A$ = "n" OR A$ = "N" THEN PRINT : PRINT
  "No changes made...": FOR I = 1 TO 2000: NEXT I: GOTO
  90 [8244]
180 IF A$ = "y" OR A$ = "Y" THEN PRINT : POKE A,N:M
  = 1: GOTO 90 [3491]
190 PRINT CHR$(7);: GOTO 160 [1936]
200 IF NOT M THEN 250: REM Any changes made? [4213]
210 ONERR GOTO 1000: REM If AW removed from drive [3378]
220 PRINT D$;"BSAVE /APPLEWORKS/APLWORKS.SYSTEM,AS20
  00,TSYS" [3194]
230 POKE 216,0 [820]
250 HOME : PRINT "All done...": END [3086]
1000 PRINT CHR$(7): PRINT "Can't find Appleworks s
  ystem file!" [3209]
1010 PRINT "Insert a backup copy of /APPLEWORKS prog
  ram disk" [3803]
1020 PRINT "into a drive and press Return...": [2921]
1030 GET A$: IF A$ < > CHR$(13) THEN PRINT CHR$(
  7);: GOTO 1030 [4317]
1040 PRINT : IF M THEN 220 [1125]
1050 GOTO 70 [519]

```

	AppleWorks 2.0		2.1	
	Address	Value	Address	Value
Remove spacebar	14468	44	14118	44
Remove date entry	14148	208	14436	208
	14149	19	14437	19

Table. Patching AppleWorks' spacebar and date prompts.

After preliminary REMARKS and initializations (lines 10-60), Patcher LOADs APLWORKS.SYSTEM from the "program" side of your /APPLEWORKS backup disk (line 70). ONERR "traps" (lines 60 and 210) and support error-handling code (lines 1000-1050) make sure APLWORKS.SYSTEM can be found on disk.

Patcher then asks for an address (line 100), lets you know its current contents (line 130), then asks for a new value (line 140) and whether it's okay to change the original AppleWorks value (line 160). The intervening program lines (110-130 and 150) make sure the entered address actually points to the AppleWorks program in memory (8191 < address < 24576) and that the new value is POKEable (0=<value<256).

If you respond *y* for *yes*, make the change, Patcher then and only then modifies AppleWorks by POKEing the new value in line 180. Note that any modifications you make to the AppleWorks program in memory, not on disk. If you make a mistake, press Control-Reset and RUN the program again. Only after you make all your changes and enter 0 (zero) for an address will Patcher SAVE the modified AppleWorks on disk (lines 200-250).

What are some patches you might make? *inCider* and other magazines publish AppleWorks patches regularly, but the most popular ones remove the spacebar and date prompts when you boot up AppleWorks. The accompanying *Table* summarizes the addresses and values you should enter when using Patcher to modify AppleWorks versions 2.0 and 2.1. □ —W.K.

anted to operate correctly. Otherwise, you need to re-enter or edit the line. Use it to help you type in the third listing presented here as well as the BASIC programs in this and future issues of *inCider*.

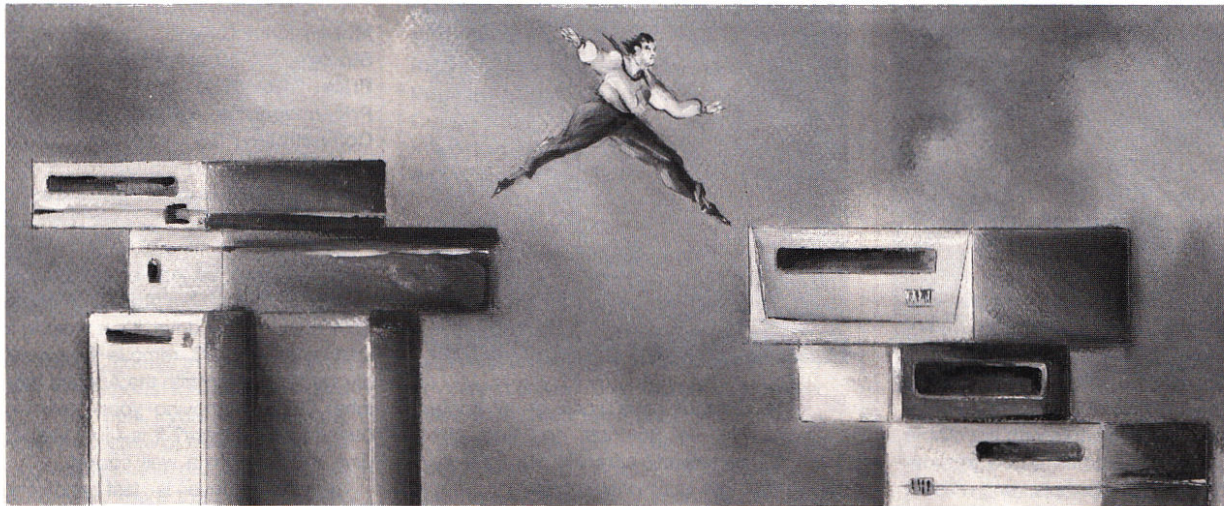
Finally, our third program listing lets you "patch" AppleWorks—add some slick features to the Apple

II world's most popular software package. Whether you're putting a listing together from scratch or tinkering with someone else's, that's what programming's all about—writing software that works for you, whose features make sense for your needs and enhance your enjoyment of the machine. □

# Which One to Buy?

# D | R | I | V | E | S

P | A | R | T | . | 2



**A**LL hard disks are not created equal. Here's *inCider's* rundown of the leading contenders—what to look for, what to watch out for.

by *inCider* staff

FOR SPEED, STORAGE, AND ORGANIZATION, nothing beats a hard-disk drive—especially for GS owners. If you need to stash big packages and files or large numbers of programs and data, then find them *fast*, a hard disk is a must. Part 1 of our three-part series discussed the pros and cons of mass storage; now in part 2 we'll examine the strengths and weaknesses of ten of the leading hard-disk models.

The drives highlighted here represent just a sampling of products available for the Apple II family; they offer a variety of storage capacities, interfaces, and price levels. Get acquainted with the various configurations you'll encounter as you begin your search for the hard-disk drive that's perfect for *your* home or business system.

## BACK TO SCSI

Before you make a decision, it's a good idea to review some of the factors that go into your selection of a hard-disk drive. For one thing, as you shop you're certain to hear the word *interface* tossed around. It refers to the method by which your hard-disk drive connects to your computer. Hard drives come with

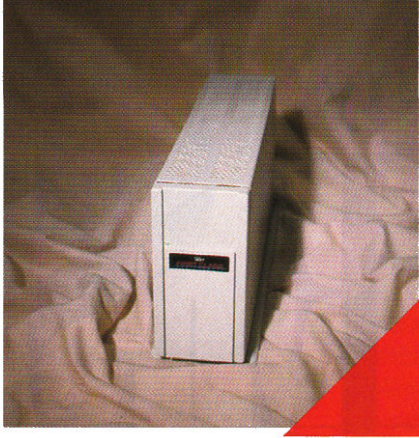
either a proprietary interface or a SCSI (pronounced *scuzzy*, small-computer-systems interface).

A proprietary interface card usually comes with the drive and works only with that particular drive on the Apple II. If you buy an MS-DOS computer, you'll need a new interface card. (And depending on whether the manufacturer supports that system, you may need a new hard drive.)

SCSI, although designed originally as a standard for all types of computers, is now several standards. When a company says its drive is a SCSI drive, ask what type. Apple, for example, has its own version of SCSI; many other companies, though, produce their own proprietary versions, so you'll have to buy that company's SCSI card when you buy its hard disk. A drive that adheres to Apple SCSI will work with any IIe or IIGS (as long as you have an Apple SCSI card in one of your slots) and the Macintosh, which has a built-in SCSI port.

## COMMON-SENSE CRITERIA

Note that "benchmark" tests such as maximum seek rates and other data, which hard-disk-drive ►



## SIDER D4/T

### FIRST CLASS PERIPHERALS

3579 Highway 50 East  
Carson City, NV 89701  
(702) 883-4000

**Models:** Sider D2, D4T, D4A, D9, C96  
**Storage:** 20, 40, 40, 90, 90 megabytes  
**Price:** \$595, \$995, \$795, \$1695, \$2495  
**Price/megabyte:** \$29.75, \$24.88, \$19.88, \$18.83, \$27.72  
**Compatibility:** IIe/GS  
**Interface:** Apple SCSI  
**Accompanying support software:** proprietary, ProSel

**F**irst Class Peripherals offers the widest variety of drives: 20-, two 40-, 60- and two 90-megabyte models.

The Sider D4/T "turbo" 40-megabyte hard-disk drive is one of the best midrange models around, and it works with any Apple IIe or GS. The drive comes with a proprietary controller card, manuals, and ProSel software. The D4/T is, as dealers say, a "plug and play" solution. It's easy to set up; the cable connecting the interface card to the drive seems a bit fragile, though. The drive comes formatted with ProDOS.

The D4/T's "turbo" tag might lead you to expect it to perform faster. It does perform better than the nonturbo Sider D4/A or D2; it offers no noticeable difference in loading speed compared to other manufacturers' drives tested here, however.

At \$895, the D4/T is affordable. Unfortunately, with the smaller price tag comes a larger, heavier unit. The D4/T, as well as the other Sider products, is more than twice as big as other drives tested. To many users, that's only a trivial concern. If your desk space is limited, or you plan to move your hard-disk drive around a lot, though, the D4/T isn't the most compact model.

If you want to run non-ProDOS applications from a hard-disk drive, the Sider D2, a 20-megabyte product, is the only drive that lets you install multiple operating systems—ProDOS, DOS 3.3, CP/M, and Pascal—in different partitions. Drives that adhere to the SCSI standard, such as the higher-capacity Sider models, are limited to ProDOS applications and files.

## CT-20C

### CHINOOK

601 Main Street  
Longmont, CO 80501  
(303) 678-5007

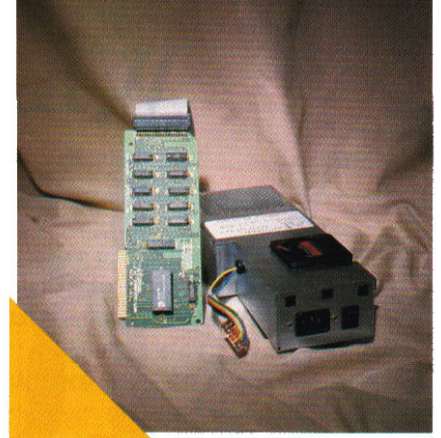
**Models:** CT-20c, CT-20, CT-30, CT-40  
**Storage:** 20.5, 20.5, 31.5, 43 megabytes  
**Price:** \$650, \$875, \$975, \$1075  
**Price/megabyte:** \$32.50, \$42.68, \$30.95, \$25  
**Compatibility:** IIe/IIc/IIc Plus/GS  
**Interface:** disk-drive port, Apple SCSI  
**Accompanying support software:** EasyDrive



**T**he Chinook drive works on all Apple II's—IIe, IIc, IIc Plus, and IIgs—but it's particularly attractive for IIc owners. In fact, it's their only choice.

Among the hard drives tested, the Chinook CT-20c is the only one that doesn't need a SCSI card or a special hard-disk controller card. In the IIc, the CT-20c plugs into the disk-drive port; in the IIc Plus and GS, it works via the Smartport. (The GS requires a UniDisk 3.5 device driver, too. IIcs are "closed" systems—you can't add a SCSI or any other controller card.) In the IIe, it plugs into a disk-drive port just like a 3½-inch drive; you'll need a UniDisk controller card here.

At press time, the Chinook drive presented certain compatibility problems with GS/OS. The company is aware of the difficulty and assures us it will be corrected. The drive is probably better suited for IIc and IIc Plus owners anyway. Chinook offers other drives that are more appropriate for the GS. The CT-20c isn't the cheapest or fastest model, but it's a viable solution for IIc owners who need mass storage.



## INNER DRIVE

### APPLIED INGENUITY

14922 Ramona Boulevard  
Baldwin Park, CA 91706  
(818) 960-1485

**Model:** Inner Drive  
**Storage:** 20, 40 megabytes  
**Price:** \$499, \$650  
**Price/megabyte:** \$24.95, \$16.25  
**Compatibility:** GS  
**Interface:** modified GS/OS  
**Accompanying support software:** proprietary

**I**f you have an Apple IIgs, you should take a look at this product. Even though it's an internal drive, it's a snap to install. Just open your GS, remove the power supply, and replace it with the Applied Ingenuity Inner Drive. Removing your power supply doesn't sound easy? It is—just like unplugging a cord from a wall socket.

The Inner Drive is fast and cheap—admirable qualities in a hard disk. The drive comes preformatted with a modified version of GS/OS. Applied Ingenuity has added its own routines to both the operating system and the hardware. Therefore, simply copying Apple's GS/OS won't do the job. The modification can create conflicts with some of Apple's utilities, such as the Advanced Disk Utilities.

In its instructions, Applied Ingenuity does warn you to copy its A.I. UTILITIES folder to a floppy disk in case you need to reinstall the hard-disk driver. It's helpful that the Inner Drive comes preformatted and that the manual strongly reminds you to copy the A.I. UTILITIES folder. However, it would be more helpful if Applied supplied the modified operating system on disk.

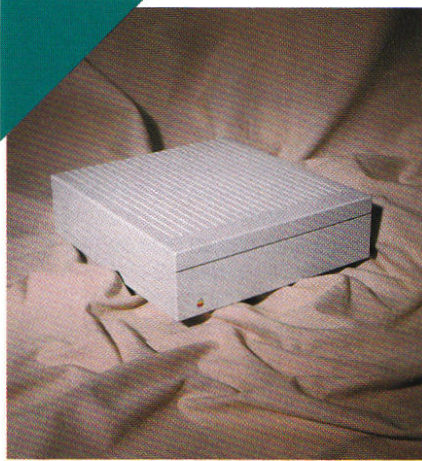
Overall, though, the combination of low price, ease of setup, and internal installation makes the Inner Drive a winner for GS owners.



## HARD DISK 20SC

**APPLE COMPUTER**  
20525 Mariani Avenue  
Cupertino, CA 95014  
(408) 996-1010

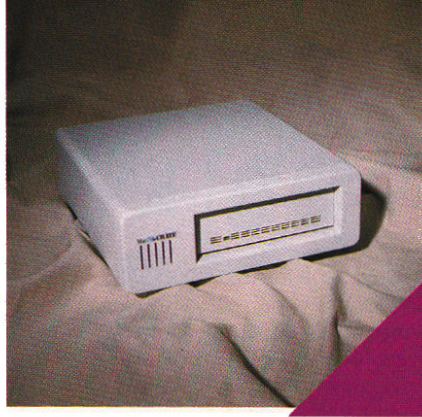
**Models:** HD20SC, HD40SC  
**Storage:** 20, 40 megabytes  
**Price:** \$1099, \$1699  
**Price/megabyte:** \$54.95, \$42.48  
**Compatibility:** IIe/GS  
**Interface:** Apple SCSI  
**Accompanying support software:** none



**T**he HD20SC comes in peripheral platinum and sports the colorful Apple logo. "Big deal," you say? To many Apple users, the peace of mind that comes with buying Apple-brand products is worth a little extra—well, more than a little extra. In our price-per-megabyte formula, the Apple hard-disk drive comes in at a whopping \$54.95. That's more than \$32 per megabyte more than the most affordable hard disk (the Sider D4 Turbo), and still \$10 more than the second most expensive drive in our tests.

While there's not much in the drive itself to make it more attractive than other products mentioned, there's something to be said for buying Apple products—especially if you're a beginner. As with most Apple products, the owner's guide is well written and easy to follow. If you're not familiar with hard-disk drives, you'll appreciate that. And, because it's an Apple product, you know that support is available, although it won't be cheap.

The 20SC retails for \$1099, but, as with the GCC HyperDrive, you can expect to pay considerably less at your dealer's. Still, unless you're hopelessly stuck on buying only Apple products, you can find a better price/performance ratio among the many other hard-disk drives on the market.



## MACCRATE

**CRATE TECHNOLOGIES**  
6850 Vineland Avenue  
North Hollywood, CA 91605  
(818) 762-1196

**Model:** MacCrate  
**Storage:** 20, 40, 60 megabytes  
**Price:** \$575, \$755, \$839  
**Price/megabyte:** \$25.75, \$18.87, \$13.98  
**Compatibility:** IIe/GS  
**Interface:** Apple SCSI  
**Accompanying support software:** none

**C**rate Technologies' MacCrate uses the same physical disk found inside the Apple Hard Disk 20SC and the GCC HyperDrive. They look different on the outside, but on the inside you'll find that each uses Seagate Technologies' hard-drive mechanism. Crate's product, however, offers the lowest retail price.

These drives are "true" SCSI drives: They'll work with Apple's SCSI card and don't require a propriety interface card supplied by the drive's manufacturer (although Crate produces its own Apple-standard SCSI card called SmartCrate, priced at \$129). The Apple, GCC, and Crate drives all work with the Apple IIe, the GS (with Apple's SCSI card), and the Macintosh line.

The Crate hard disk comes in a horizontal case about the same size as the Apple drive. It includes no utility software and is preformatted for the Macintosh, so you'll have to use GS/OS or the ProDOS System Utilities disk to format the drive. Crate offers a relatively low retail price, however—\$575. Of course, you'll need to add the price of an Apple SCSI card, but it comes with software for initializing and verifying the hard disk.

Sensitive Apple II users may suffer a bit of an identity crisis, as the drive sports the name MacCrate and the documentation makes no reference to the Apple II, but the low price tag will help you get over it.

## HYPERDRIVE

**GCC TECHNOLOGIES**  
580 Winter Street  
Waltham, MA 02154  
(617) 890-0880

**Models:** HyperDrive FX-20, FX-40, FX-60, FX-80  
**Storage:** 20, 40, 60, 80 megabytes  
**Price:** \$999, \$1399, \$1499, \$1999  
**Price/megabyte:** \$49.95, \$34.98, \$24.98, \$24.99  
**Compatibility:** IIe/GS  
**Interface:** Apple SCSI  
**Accompanying support software:** proprietary



**G**CC Technologies (formerly General Computer Corporation) is a good name in hard-disk drives. In fact, it has been making hard drives longer than Apple has. So if you're looking for a proven company and don't necessarily want to buy Apple, the HyperDrive could be your answer.

On the inside, the HyperDrive uses the same Seagate mechanism as the Apple and Crate drives. It's sturdier, though; it's also larger owing to rubber shock-mounting brackets surrounding the disk. This system protects your data in case you accidentally bump or drop the drive. (We don't recommend that you test that yourself.)

As with the Apple and Crate drives, the HyperDrive comes from the factory with only Macintosh software. GCC does sell Apple II software for this model, though. At \$1399 for the FX-40 (40 megabytes) and \$999 for the FX-20 (20 megabytes), the prices may seem steep. Most outlets will offer you a much better deal, however: Expect to pay about \$900 for the 40-megabyte drive and \$600 for the 20-megabyte version. A note for the fashion-conscious: Yes, the HyperDrive is platinum. ▶



## PREFERENCE

### WESTERN DIGITAL

2445 McCabe Way  
Irvine, CA 92714  
(714) 863-0102

**Model:** Preference Hard Disk AP  
**Storage:** 20, 40, 80, 120 megabytes  
**Price:** \$895, \$1195, \$1695, \$2395  
**Price/megabyte:** \$44.75, \$29.88, \$21.19, \$19.96  
**Compatibility:** IIe/GS  
**Interface:** Apple SCSI  
**Accompanying support software:** proprietary, Apple Disk Utilities

**T**he Preference from Western Digital is the new kid on the block—and a fashionable and formidable new kid it is. Available in 20-, 40-, 80-, and 120-megabyte capacities, it's housed in a platinum case that's about the size of a 5¼-inch floppy-disk drive.

The Preference is comparable in speed to Apple, Crate, and GCC models. You may be able to find cheaper hard-disk drives, but the Preference is the most compact of the bunch. And—if you're into such things—it has the most attractive package.

As we were going to press with this issue (mid-January), Western Digital announced 80- and 120-megabyte drives for the Apple II and Macintosh. It's important to remember that if you're using ProDOS 8, you can access only 32 megabytes. You can partition a 60-megabyte drive into two 30-megabyte partitions, but any drive that exceeds the 64-megabyte limit isn't practical for IIe owners. These high-capacity drives are priced at \$1695 and \$2395, respectively, and fit into a small 3-by-6½-by-8-inch package. Like the 20- and 40-megabyte drives, the new products include shock-mounted protection.

Overall, Western Digital's hard-disk drive is a quiet, efficient performer. There's not much to dislike about the Preference.

## SD LINE

### CMS

1372 Valencia Avenue  
Tustin, CA 92680  
(714) 259-9555

**Models:** SD20U/A2S, SD30U/A2S, SD60U/A2S  
**Storage:** 20, 30, 60 megabytes  
**Price:** \$895, \$1295, \$1295  
**Price/megabyte:** \$44.75, \$43.17, \$21.58  
**Compatibility:** IIe/GS  
**Interface:** proprietary SCSI  
**Accompanying support software:** proprietary, Filer



**E**ach hard disk from CMS is actually two drives in one. Using jumper pins, you can "hardware-partition" the drive for use by two or more computers. (Each must have the CMS interface, though.) You can, for instance, divide the SD60U/A2S 60-megabyte drive into two 30-megabyte partitions (although you can select many other combinations). You then connect, format, and use the first partition while a colleague uses the second partition as though it were an entirely separate drive. You each have access to the other's partition, but access can be restricted, using jumper pins on the interface, to "read only."

CMS drives are true multi-user systems: The interfaces automatically eliminate "request collisions" so that the drive won't be confused and lock up if two computers attempt to access their respective partitions simultaneously. Don't think of this arrangement as a local-area network, though. It isn't. Everything works fine as long as you and your colleague stay in your own partition. The drive is multi-user, but the partitions are single-user. You can use your colleague's partition as long as he or she isn't. If you try to access a partition in use, the system can lock up, resulting in loss of data.

The only drawback to the CMS hard drives is in understanding and installing the jumper pins on the interface card.



## SLIMLINE

### Advanced Information Concepts

2150 Paragon Drive  
San Jose, CA 95131  
(408) 433-9776

**Models:** SlimLine, SlimLine II  
**Storage:** 45, 90 megabytes (removable)  
**Price:** \$1795, \$3095  
**Price/megabyte:** \$39.89, \$34.39  
**Compatibility:** II Plus/IIe/GS  
**Interface:** Apple SCSI  
**Accompanying support software:** proprietary

## DATAPAK

### Mass Micro Systems

550 Del Rey Avenue  
Sunnyvale, CA 94086  
(408) 522-1200

**Models:** DataPak, DataPak Duet  
**Storage:** 42.5, 85 megabytes (removable)  
**Price:** \$1799, \$2999  
**Price/megabyte:** \$42.09, \$35.28  
**Compatibility:** II Plus/IIe/GS  
**Interface:** Apple SCSI  
**Accompanying support software:** none

**H**ere comes a curve ball: the removable hard disk—with ejectable cartridges about the same diameter as a 5¼-inch disk, but about a quarter inch thicker. Speed is comparable to that of the other drives tested.

Why would you want a removable hard disk? You could put all your information on one cartridge and a complete backup on the second; cartridges are as portable as floppies, as well. The potential is high for removable-cartridge hard-disk drives; unfortunately, the price is also high. Storage is limited only by the number of cartridges, though. Cartridges cost about \$150 each.

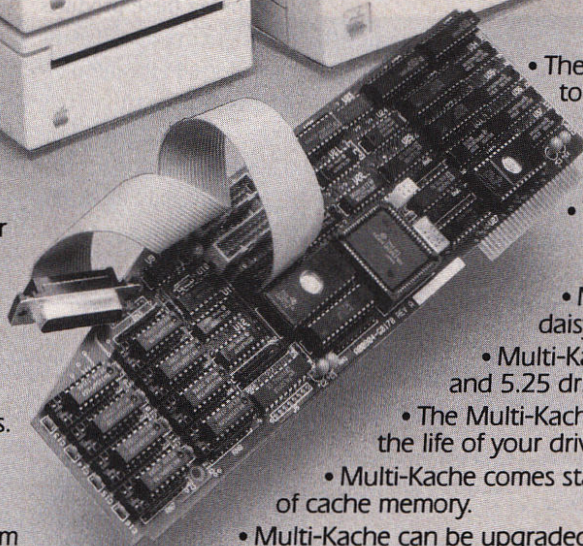
Using these drives with the GS poses one small problem: GS/OS sees them as tape-backup units, not hard drives. That means you can't partition them with Advanced Disk Utilities; however, you can partition them with the utilities that come with Apple's SCSI card. ▶

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	Meg.	Finder (sec.)	AppleWorks GS (min.)
Sider D4/T	40	44	3.24
Inner Drive	20	n/a*	3.12
MacCrate	20	53.3	3.39
Mass. Micro	45	48.5	3.19
Adv. Information	45	48.3	3.16
HyperDrive FX-40	40	50.8	3.22
Preference	20	52.9	3.23
Apple HD20/SC	20	52.9	3.23

\*Applied Ingenuity uses a proprietary operating system other than GS/OS.

**Table.** Test shown here measures the time it takes to "warm boot" GS/OS (hitting the control, open-apple, and reset keys simultaneously to load it into RAM from a hard disk). If the times seem slow, it's because we loaded the operating system with ten desk accessories and 20 fonts. We also measured the time it takes to boot AppleWorks GS from the Finder.

manufacturers often use as selling points, are absent from the accompanying product descriptions. While such technical information is important, the drives tested here offer comparable performance in most categories. (See the **Table**, left.)

Similarities among drives are often the result of several models using identical drive mechanisms (from Seagate Technologies, for example). The most important differences among these products

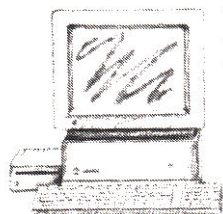
are quality of testing by their respective manufacturers, the support software they offer, and the interface with which each drive is equipped. Rather than rely on nebulous technical details to make your decision, consider these three criteria: compatibility with your current Apple and the computers you'll buy in the future; range of features, including setup and support software; and price.

Rumors of equipment problems with specific hard-disk drives have made the rounds on various bulletin-board systems over the last several weeks. *inCider* has been unable to verify any of these rumors; we use several different hard-disk drives continuously and haven't experienced persistent problems with any particular drive. In any event, though, it's best to purchase your hard drive from a reputable dealer, rather than through mail order, even if it means not buying the exact drive you had in mind. That way, you can demand technical assistance and expect readily available service if anything goes wrong.

## THERE'S MORE

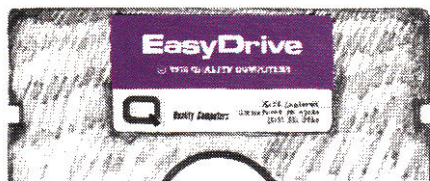
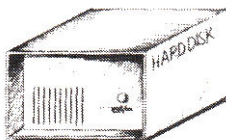
Finally, although many of the hard-disk drives presented in this article come preformatted with ProDOS (Apple's Professional Disk Operating System) and include support programs in the box, there are a number of issues you need to consider before committing to a particular operating system or type of management software. Foremost among them is maintenance of your hard drive. Next month, *inCider* addresses that question, as well as other topics that will help you get the most from your hard disk. □

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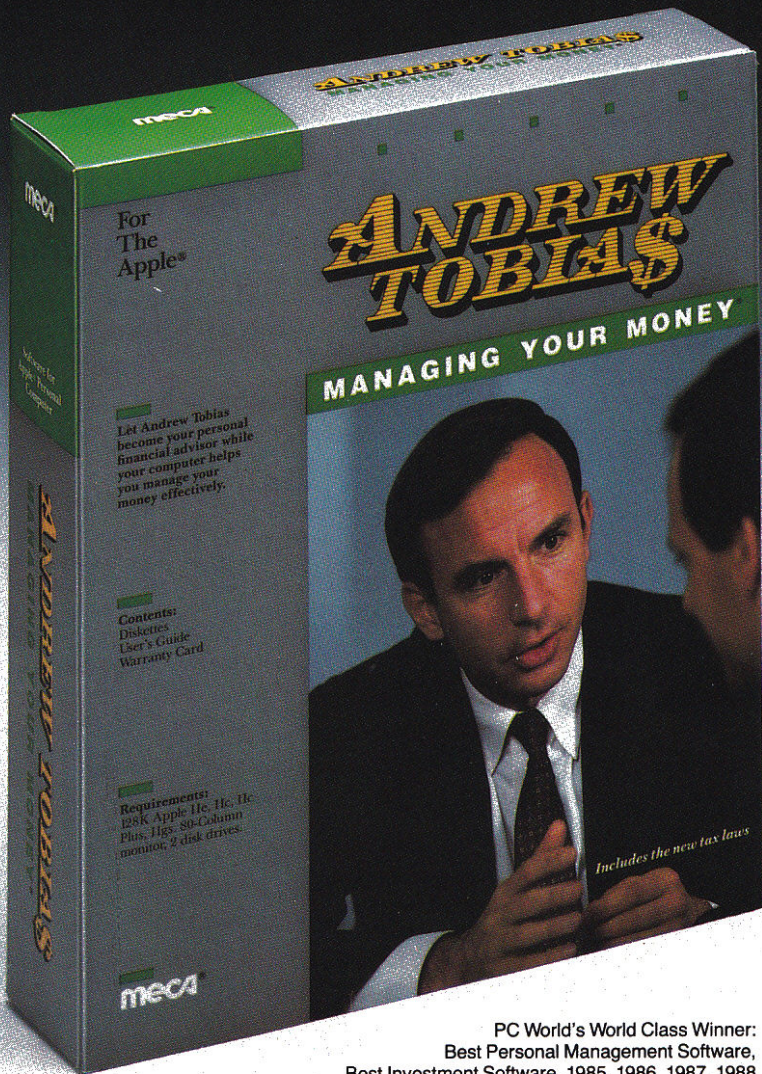


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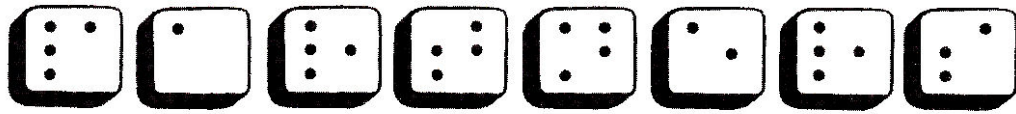
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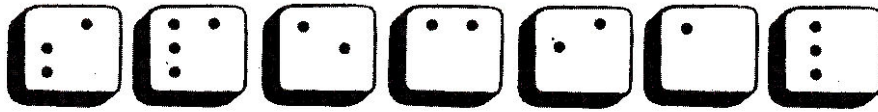
INC



P A R T N E R S



I N



S P E C I A L



A C H I E V E M E N T

By CYNTHIA E. FIELD, Ph.D.

At home, in school, and on the job, Apple IIs are meeting the challenge of special-needs education and assistance in innovative ways. Discover the latest hardware and software developments that are helping disabled users reach their potential.

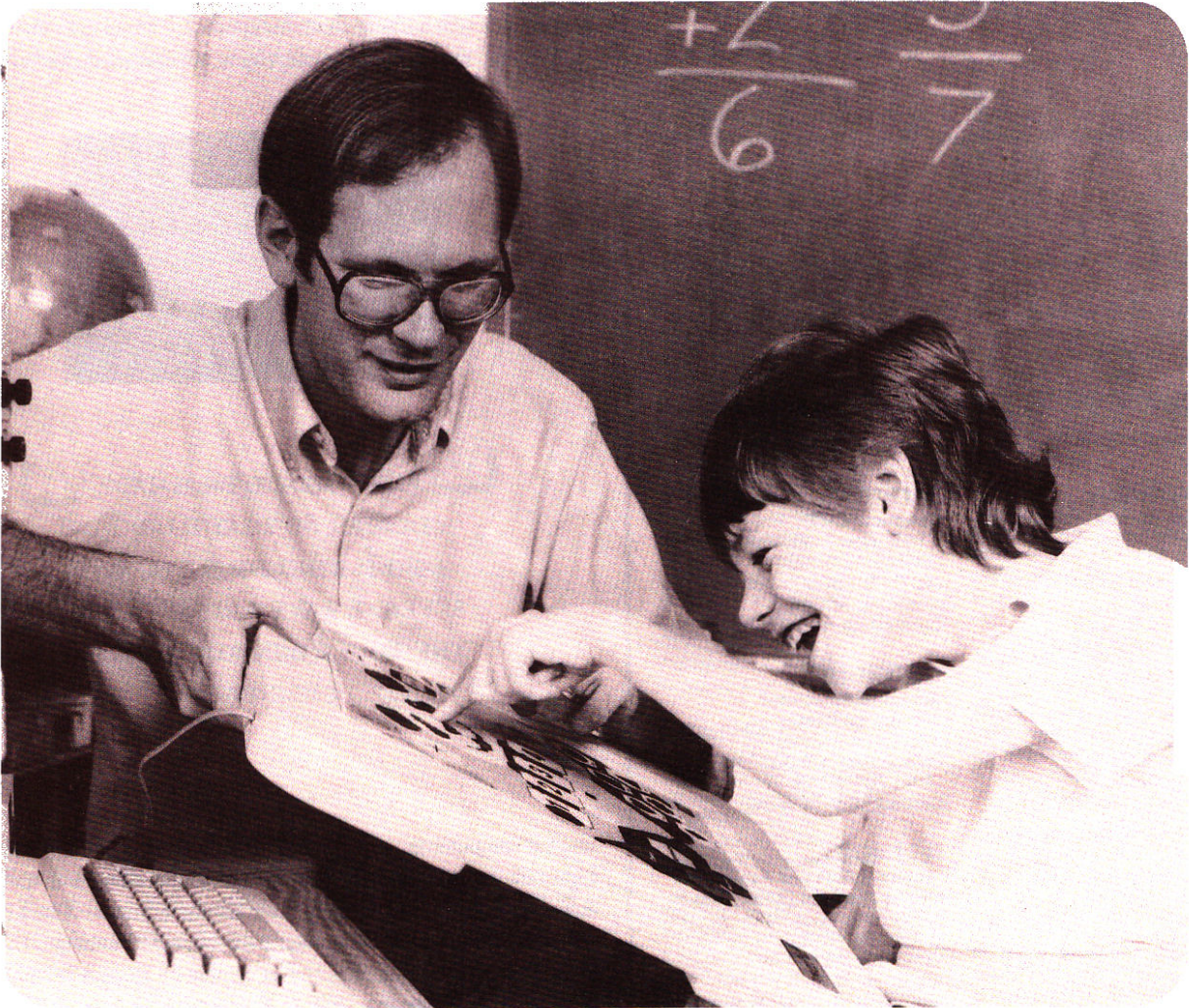
**P**op a disk in the drive, flip a switch, read the screen, start typing—your Apple II's pretty easy to use, right? Just like turning on a light or setting an alarm clock—simple, right?

Not always, not for everyone. For Lake Kissick, Jr., Rose Angelocci, and millions of other disabled people, maneuvering a disk into a drive, flipping a switch, reading a screen, and hitting the right keys—simple tasks most of us don't even think

about—present an almost insurmountable physical obstacle.

But not totally insurmountable. While familiar alternative computer peripherals such as the joystick, mouse, KoalaPad, and Muppet Learning Keys are merely convenient for most Apple II users, similar "adaptive" hardware devices and compatible programs are making the crucial difference between isolation and responsibility, between dependence and autonomy, for countless

“ ADAPTIVE HARDWARE DEVICES AND COMPATIBLE PROGRAMS  
ARE MAKING THE CRUCIAL DIFFERENCE BETWEEN  
DEPENDENCE AND AUTONOMY. ”



others challenged by physical or developmental handicaps.

Lake Kissick is confronting that challenge every day at home and at work. Whether he's writing a newsletter on his Apple IIe or participating in recreational activities like water skiing, Kissick refuses to let the effects of severe cerebral palsy stop him from accomplishing "the things we [the disabled] were meant to do."

In his full-time job as a product evaluator for the

Prentke Romich Company (a developer of adaptive devices in Wooster, Ohio) Kissick marshals his interest in computer technology to help the physically challenged—even those who, like himself, are wheelchair-bound and unable to speak—to live independently. Day to day, Kissick relies on Prentke Romich's **LightTalker**, an alternative Apple II keyboard. Because it incorporates both an optical head pointer and speech synthesis, Kissick uses it for word processing, for communication—and▶

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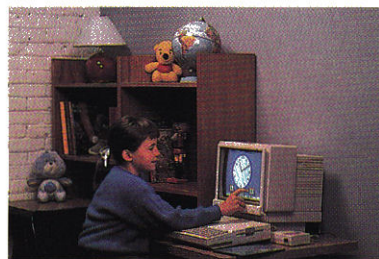
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for granting telephone interviews.

At the Assistive Device Resource Center, a program sponsored by Meeting Street School/Easter Seals of Rhode Island, Judith Hammerlind Carlson, senior speech and language therapist, points out that while many of the children and adults she serves are "multiply physically handicapped" they're all—like Kissick—"keyboard disabled," as well. The same holds true for the more than 100 children in the organization's school program, for which Hammerlind Carlson is the computer coordinator.

"The aim," she says, "is to provide *choices*. We have some children who ac-



“ THE AIM IS TO PROVIDE CHOICES. SOME CHILDREN ACCESS THE COMPUTER IN SEVERAL WAYS, AMONG THEM THE TOUCHWINDOW SCREEN OVERLAY. ”

cess the computer in several ways." Among them are Prentke Romich's LightTalker and TouchTalker, an alternative input device with speech synthesizer for those who can use their hands; Edmark's TouchWindow screen overlay, which circumvents the keyboard entirely; Dunamis' PowerPad, a large, square input tablet; Sunburst's Muppet Learning Keys; the Tash Mini Keyboard; Unicorn Engineering Company's Unicorn II Expanded Keyboard; and a wide variety of switches that respond to pressure, slight movement of a head or facial muscle, or eye movement (such as the EyeTyper 300) to select and display individual letters or words. While some of these devices hook up to the Apple's game or input/output port, others require a computer interface, such as Don Johnston Developmental Equipment's Adaptive Firmware Card.

According to Hammerlind Carlson, "One child may use a head stick in the morning when his spasticity is under control. Later in the day when he's tired, he might use a scanning array on the Adaptive Firmware Card." Adaptive input devices, including pneumatic (sip-and-puff) switches, head sticks, mouth sticks, optical pointers, and a number of other types of switches such as those mentioned above, are available from a variety of companies—Prentke Romich, Don Johnston Developmental Equipment, Sentient Systems Technology, R/M Systems, Words+, and Zygo Industries among others.



"Through the firmware," she continues, "we can hook up a multi-switch, for example, and program any keyboard characters we want. To use a program like Spinnaker's Facemaker Gold, I tell one switch to be the *W* key (to make the animated character on screen wink) and another to be the Return key. You can save these programs [the switch configurations] to disk. Teachers [in our school] sometimes get together in the afternoon and make up these arrays and save them."

Thanks to the efforts of Hammerlind Carlson's team and the adaptive hardware they've chosen, handicapped children at the school can access popular off-the-shelf software or programs designed especially for al-



“NOT ALL SPECIAL-NEEDS PROGRAMS TALK OR REQUIRE ADAPTIVE HARDWARE. SOME FOCUS ON SOCIAL AND EMOTIONAL GROWTH OR ENHANCEMENT OF BASIC SKILLS.”

ternative input, such as UCLA/LAUSD Microcomputer Team's **Wheels on the Bus**, Edmark's **Edmark Reading Program**, Laureate Learning Systems' **The Talking Picture Series**, Marblesoft's **Mix 'n Match**, PEAL Software's **Exploratory Play**, and Exceptional Children's Software's **The Rabbit Scanner**.

#### APPLES LISTEN AND RESPOND

Voice recognition is still another input option, one that's used in home-control and telephone ordering systems as well as in special-needs settings, particularly with users who have limited arm and hand mobility.

Recognition systems (a plug-in card or external unit, plus software on disk) work by comparing incoming sounds to patterns of speech, called *templates*, stored in memory. In most systems, you create templates by recording various spoken letters, commands, and other appropriate words as you "train" the unit to recognize your voice. Thereafter the system responds only to your voice. (Even someone with somewhat impaired speech can use such a system, as long as he or she pronounces words consistently.) If an incoming sound matches a stored sound closely enough, the system "recognizes" it and carries out your command.

Some systems, such as the **Lis'ner 1000**, let you create templates for use with off-the-shelf commercial programs of any type; others, like the ▶

#### KENTUCKY

**Disabled Citizens Computer Center**  
Louisville Public Library  
4th and York Streets  
Louisville, KY 40203  
(502) 561-8637  
AppleLink: X0654

#### LOUISIANA

**Supergroup/CATER**  
Center for Adaptive Technology & Educational Resources  
3340 Severn Ave.  
Metairie, LA 70002  
(504) 888-8964  
AppleLink: X1328  
Contact: Melanie Ferrand

#### MASSACHUSETTS

**Massachusetts Special Technology Access Center (MASTAC)**  
P.O. Box J  
Bedford, MA 01730  
(617) 275-2446  
AppleLink: X0795  
Contact: Kathy Huggins

#### MICHIGAN

**Living and Learning Resource Centre**  
Physically Impaired Association of Michigan  
601 W. Maple Street  
Lansing, MI 48906  
(517) 487-0883  
AppleLink: LLRCPIAM  
Contact: Donna Heiner

#### MINNESOTA

**Pacer Center, Inc.**  
4826 Chicago Ave. South  
Minneapolis, MN 55417  
(612) 827-2966  
AppleLink: X0647  
Contact: Daniel Berks

#### MISSOURI

**Computer Resource Center**  
St. Louis Easter Seal Society  
1710 Mississippi Ave.  
St. Louis, MO 63104  
(314) 776-1996  
AppleLink: UKNES  
Contacts: Nancy Lacey,  
Sue Uknes

#### MONTANA

**Parents, Let's Unite for Kids (PLUK)**  
1500 North 30th Street  
Billings, MT 59101-0298  
(406) 657-2055  
AppleLink: X1381  
Contact: Katharin Kelker

#### NEVADA

**Nevada Computer and Technology Center for the Disabled**  
819 Las Vegas Blvd. S.  
Las Vegas, NV 89101  
(702) 382-3358  
AppleLink: X0644  
Contact: Bruce McAnanny

#### NEW YORK

**Techspress Resource Center for Independent Living**  
401 Columbia Street  
Utica, NY 13502  
(315) 797-4642 (voice or TDD)  
AppleLink: TECHSPRESS  
Contact: Russ Holland

#### OHIO

**Communication Assistance Resource Service (CARS)**  
3201 Marshall Road  
Dayton, OH 45429  
(513) 298-0803  
AppleLink: X0645  
Contacts: Pat Cashdollar,  
Terry Trzaska

#### TENNESSEE

**East Tennessee Special Technology Access Center**  
University of Tennessee  
Claxton  
Knoxville, TN 37996-3400  
(615) 974-6228  
AppleLink: ETNSTAC  
Contact: Lois Symington

#### West Tennessee Special Technology Resource Center for the Disabled

P.O. Box 3683  
227 McCowat  
Jackson, TN 38303  
(901) 424-9089  
AppleLink: X1254  
Contact: Margaret Doumitt

#### TEXAS

**Partners Resource Network**  
6465 Calder Avenue  
Beaumont, TX 77707  
(409) 866-4726  
AppleLink: X1497  
Contact: Janice Foreman,  
Michael Meyer

SPECIAL NEEDS

INFORMATION GUIDE

**Adaptive Firmware Card G32 for the Apple IIcs G32 for the Apple IIe**  
Don Johnston  
Developmental Equipment  
P.O. Box 639  
1000 North Rand Rd.  
Wauconda, IL 60084  
(312) 526-2682  
\$450  
*Reader Service No. 300*

**Apple Keyboard Emulator AKI IIe**, \$325  
**LightTalker with Echo Speech Module**, \$3490  
requires Apple Keyboard Emulator  
**TouchTalker with Echo Speech Module**, \$2895  
requires Apple Keyboard Emulator  
**Apple II Keyguards**, \$119  
Prentke Romich Co.  
1022 Heyl Road  
Wooster, OH 44691  
(800) 642-8255  
(216) 262-1984  
*Reader Service No. 301*

**AppleWorks Companion Talking Disk**  
requires SlotBuster II  
**Magic Music Teacher**  
requires Echo IIb, Echo IIc, or Cricket  
Access Unlimited/  
SPEECH Enterprises  
9039 Katy Freeway  
Houston, TX 77024  
(713) 461-0006  
\$49.95  
*Reader Service No. 303*

**BEX**, \$400  
requires Echo, SlotBuster, or other serial voice device  
**TranscriBEX Module**, \$100  
requires BEX  
Raised Dot Computing  
408 S. Baldwin  
Madison, WI 53703  
(608) 277-9595  
*Reader Service No. 305*

**CompuLenz**  
Florida New Concepts  
P.O. Box 261  
Port Richey, FL 34673-0261  
(813) 842-3231  
\$204.95  
*Reader Service No. 307*

**Developing Reading Power**  
Mindscape  
3444 Dundee Road  
Northbrook, IL 60062  
(312) 480-7667  
\$49.95  
\$99.90 lab pack  
Version 1: grades 3-4  
Version 2: grades 5-6  
*Reader Service No. 308*

**Dr. Peet's Talk/Writer**  
Hartley Courseware  
133 Bridge St.  
Dimondale, MI 48821  
(517) 646-6458  
(800) 247-1380  
\$69.95  
requires Echo IIb, Echo IIc, Cricket  
*Reader Service No. 309*

**Easy Street**  
MindPlay  
P.O. Box 36491  
Tucson, AZ 85740  
(800) 221-7911  
\$49.99  
supports Echo IIb, IIc, Cricket  
*Reader Service No. 310*

**Echo IIb**, \$129.95  
**Echo IIc**, \$179.95  
**Echo Headphones**, \$19.95  
Street Electronics  
6420 Via Real  
Carpinteria, CA 93013  
(805) 684-4593  
*Reader Service No. 311*

**Edmark Reading Program**, \$450  
**TouchWindow**, \$199.95  
**II Plus Adaptor**, \$14.95  
Edmark Corp.  
P.O. Box 3903  
Bellevue, WA 98009  
(206) 746-3900  
*Reader Service No. 312*

**Exploratory Play**  
PEAL Software  
5000 North Parkway  
Calabasas, CA 91302  
(818) 883-7849  
\$150  
*Reader Service No. 313*

**EyeTyper 300**  
Sentient Systems  
5001 Baum Boulevard  
Pittsburgh, PA 15213  
(412) 682-0144  
\$3495  
*Reader Service No. 314*

**Improving Your Self-Concept**  
MCE, Inc.  
157 S. Kalamazoo Mall  
Suite 250  
Kalamazoo, MI 49007  
(616) 345-8681  
(800) 421-4157  
\$69.95  
*Reader Service No. 316*

**KoalaPad**  
Koala Technologies Corp.  
269 Mt. Hermon Road  
Scotts Valley, CA 95066  
(408) 438-0946  
\$139.50  
*Reader Service No. 317*

**Lelps**  
Dataflo Computer Services  
HC 32 Box 1  
Enfield, NH 03748  
(603) 448-2223  
\$49.95  
requires Applied Engineering Phasor Board for speech mode  
*Reader Service No. 318*

**Lis'ner 1000**  
Micromint  
4 Park St.  
Vernon, CT 06066  
(203) 871-6170  
\$189 and up  
*Reader Service No. 392*

**Locator Dots**  
Prodigy Products Co.  
864 Cambridge Rd.  
Cleveland Heights, OH 44121  
(216) 381-0500  
\$4.95, 2 6-packs  
\$34.80, 24 6-packs  
*Reader Service No. 319*

**Magic Slate**, \$99  
**Muppet Learning Keys**, \$99  
**Apple II Plus Adaptor**, \$9.95  
Sunburst Communications  
39 Washington Ave.  
Pleasantville, NY 10570  
(914) 769-5030 (collect.)  
(800) 431-1934  
*Reader Service No. 320*

**MBOSS-1 Braille Printer** (10 cps), \$1995 plus \$30 shipping  
**MBOSS-35 Braille Printer** (35 cps), \$3495 plus \$30 shipping  
VTEK  
1625 Olympic Blvd.  
Santa Monica, CA 90404  
(213) 452-5966  
*Reader Service No. 321*

**Mix 'n Match**  
Marblesoft  
21805 Zumbrota N.E.  
Cedar, MN 55011  
(612) 434-3704  
\$55 IIe version  
\$57 IIc Plus/GS version  
plus \$4 shipping  
*Reader Service No. 322*

**MultiScribe GS**  
Claris Corporation  
440 Clyde Ave.  
Mountain View, CA 94043  
(415) 960-1500  
\$99.95  
*Reader Service No. 323*

**Ohtsuki BT-5000 Braille Printer**  
Ohtsuki Communication  
985 Moraga Road  
Lafayette, CA 94549  
(415) 283-0600  
\$5180  
*Reader Service No. 324*

**Personal Reader Automatic**, \$9950  
**Hand Camera**, \$7950  
Kurzweil Computer  
185 Albany St.  
Cambridge, MA 02139  
(617) 864-4700  
*Reader Service No. 326*

**Phasor**  
Applied Engineering  
P.O. Box 798  
Carrollton, TX 75006  
(214) 241-6060  
\$169  
*Reader Service No. 327*

**PortaBraille**  
Southland Manufacturing  
680 Bizzell Drive  
Lexington, KY 40510  
(606) 253-3066  
price undetermined at press time  
*Reader Service No. 328*

**PowerPad**, \$99.95  
**Apple cable**, \$29.95  
Dunamis, Inc.  
3620 Highway 317  
Suwanee, GA 30174  
(404) 932-0485  
*Reader Service No. 329*

**The Rabbit Scanner**

Exceptional Children's Software  
P.O. Box 487  
Hays, KS 67601  
(913) 625-9281  
\$29.95  
*Reader Service No. 331*

**Reader Rabbit**

The Learning Company  
6493 Kaiser Drive  
Fremont, CA 94555  
(415) 792-2101  
\$59.95 GS talking version  
*Reader Service No. 332*

**Read-a-Logo**

**Level I:** preschool-grade 1, \$79.95

**Level II:** grades 1-3, \$79.95

**Level III:**

preschool-grade 3, \$149.95

Teacher Support Software

P.O. Box 7130

Gainesville, FL 32605

(904) 371-3802

(800) 228-2871

support Echo IIb, IIc, Cricket,

SlotBuster II

*Reader Service No. 333*

**Romeo Brailer**

Enabling Technologies

3102 S.E. Jay Street

Stuart, FL 34997

(407) 283-4817

\$2750 (RB-20)

\$3495 (RB-40)

*Reader Service No. 334*

**SlotBuster II, \$149.95**

**Speech Synthesis Options,**

\$14.95-\$39.95

RC Systems

121 West Winesap Road

Bothell, WA 98012

(206) 672-6909

*Reader Service No. 335*

**Small Talk Plus**

Computer Aids Corporation

124 West Washington Blvd.

Fort Wayne, IN 46802

(219) 422-2424

\$1495

*Reader Service No. 336*

**Talking Math and Me**

Davidson & Associates

3135 Kashiwa Street

Torrance, CA 90505

(213) 534-4070

\$49.95

*Reader Service No. 337*

**The Talking Picture Series:**

**Talking Nouns I**

**Talking Nouns II**

**Talking Verbs**

Laureate Learning Systems

110 East Spring Street

Winooski, VT 05404

(802) 655-4755

\$100 each

require TouchWindow

or PowerPad

support Echo IIb, IIc, Cricket

*Reader Service No. 338*

**Talking Stickybear Alphabet.**

\$49.95

**Lab Packs** (5 copies), \$85

**Upgrade to Stickybear**

**Alphabet Talking Version, \$15**

plus original disk

Weekly Reader Software/

Optimum Resource

10 Station Place

Norfolk, CT 06058

(203) 542-5553

*Reader Service No. 339*

**Talking Text Writer**

Scholastic Software

P.O. Box 7502

Jefferson City, MO 65102

(212) 505-3000

\$149.95

requires Echo IIb, Echo IIc, or

Cricket

*Reader Service No. 304*

**Tash Mini Keyboard**

TASH, Inc.

70 Gibson Drive

Markham, Ontario

Canada L3R 4C2

(416) 475-2212

\$325

*Reader Service No. 340*

**II Write**

Random House Software

400 Hahn Road

Westminster, MD 21157

(212) 751-2600

\$93.27

*Reader Service No. 341*

**Ufonic Voice System**

Educational Technology

6150 North 16th St.

Phoenix, AZ 85016

(602) 230-7030

\$245

*Reader Service No. 342*

**Unicorn II**

**Expanded Keyboard**

Unicorn Engineering

6201 Harwood Avenue

Oakland, CA 94618

(415) 428-1626

\$325 with 6-ft. cable

\$385 with 16-ft. cable

\$5 shipping

*Reader Service No. 343*

**Voice Master**

Covox

675-D Conger St.

Eugene, OR 97402

(503) 342-1271

\$89.95

*Reader Service No. 392*

**Wheels on the Bus**

UCLA/LAUSD Microcomputer

1000 Veteran Ave.

Los Angeles, CA 90024

(213) 825-4821

\$18

*Reader Service No. 344*

**Zygo ScanWriter**

Zygo Industries

P.O. Box 1008

Portland, OR 97207

(503) 684-6006

*Reader Service No. 345*

# Before you spend anything on peripherals for your Apple



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OTHER



SPECIAL



NEEDS



PRODUCTS

**The Adventures of Jimmy Jumper: Prepositions.** \$29.95  
**Color Find.** \$14.95  
**Letter Find.** \$29.95  
**Run Rabbit Run.** \$39.95  
**Sight Word Spelling.** \$29.95  
**Timekeeper** (published by Edmark), \$39.95  
**Touch N' Match** (published by Edmark), \$29.95  
**Touch N' See** (published by Edmark), \$39.95  
 Exceptional Children's Software  
 P.O. Box 487  
 Hays, KS 67601  
 (913) 625-9281  
*Reader Service No. 331*

**Blueprint for Decision Making.** \$69.95  
**Following Directions.** \$69.95  
**Money Matters.** \$49.95  
**Signs & Symbols.** \$69.95  
**Study Skills.** \$69.95  
**Test Taking Made Easy.** \$69.95  
 MCE, Inc.  
 157 S. Kalamazoo Mall  
 Kalamazoo, MI 49007  
 (616) 345-8681  
 \$69.95  
*Reader Service No. 316*

**Brick by Brick: CCD Version.** \$497 per level  
**Brick by Brick: Synthesized Speech Version.** \$557 per level requires Echo IIb, IIc, Cricket, or Ufonic  
**My Words.** \$69.95 requires Echo IIb, IIc, or Cricket

**Project STAR: CCD Version.** \$537 per level  
 Adult Literacy Program  
**Project STAR: Synthesized Speech Version.** \$560 per level  
 require Echo IIb, IIc, Cricket, Ufonic, or DoubleTalk  
 Hartley Courseware  
 133 Bridge St.  
 Dimondale, MI 48821  
 (517) 646-6458  
 (800) 247-1380  
*Reader Service No. 309*

**Compudaptor Model 3100** (Apple II, II Plus). \$1100  
**Compudaptor Model 3100e** (Apple IIe)  
**Compudaptor Model 3200 (IIc)** \$1300 each  
 R/M Systems  
 22903 Fern Avenue  
 Torrance, CA 90505  
 (213) 534-1880  
*Reader Service No. 306*

**Concentrate!**  
**on Words & Concepts**  
**Concentrate!**  
**on Words & Concepts II**  
**Concentrate!**  
**on Words & Concepts III** \$85 each  
**Early Vocabulary Development Series:**  
**First Words**  
**First Words II**  
**First Verbs**  
**Primeros Verbos** (Spanish First Verbs) \$200 each  
**Early Vocabulary Demonstration Diskette.** \$25

**Voice Master**, include only preselected words, such as operating-system and Applesoft commands, you must merge with your own voice.

To enhance a child's learning and enjoyment even further, a number of special-needs programs, such as Access Unlimited/SPEECH Enterprises' **AppleWorks Companion** (for "talking" AppleWorks), Scholastic Software's **Talking Text Writer**, Teacher Support Software's **Read-a-Logo**, Hartley's **Dr. Peet's Talk/Writer**, MindPlay's **Easy Street**, and Dataflo's **Lelps** (Spanish version also available), translate keyboard, modem, or alternative input into synthesized speech. (A number of special-needs programs are also available as freeware in the public domain; at least two organizations we're



“ADAPTIVE INPUT DEVICES INCLUDE SIP-AND-PUFF MECHANISMS, HEAD AND MOUTH STICKS, AND UNITS SUCH AS THE LIGHTTALKER THAT RESPOND TO EYE MOVEMENT.”

aware of—Technology for Language and Learning and The Communicator Apple Users Group—have adapted some public-domain programs for speech output.)

Many "talking" programs let you toggle speech on and off; your program may verbalize each keystroke and cursor movement as you type, or you may be able to tell it to read your screen, document, or file back to you letter by letter or word by word for proofreading after you've finished typing. Dozens of talking word processors, spreadsheets, database-management programs, and communications programs give disabled Apple II users, particularly those with impaired vision or speech, all the advantages the computer offers in handling business, school, social-contact, and entertainment needs.

Unlike programs such as Weekly Reader/Optimum Resources' **Talking Stickybear Alphabet**, Davidson & Associates' **Talking Math and Me**, or The Learning Company's **Talking Reader Rabbit**, which use the Ensoniq sound chip in the GS to generate clear, crisp, digitized speech, most currently available "talking" software produces robotic-sounding, though comprehensible, speech through voice cards or external units interfaced to your II.

Compatible boards include RC Systems' **SlotBuster II**, Applied Engineering's **Phasor**, and Educational Technology's **Ufonic Voice System**.

By far the most popular models among speech synthesizers supported by "talking" software, however, are those made by Street Electronics: the **Echo IIc** (formerly Cricket) for the Apple IIc and the **Echo IIb** for the Apple II Plus, IIe, or IIGS.

### A NEW WAY OF LOOKING AT THINGS

For some visually impaired computer users, word processors with large-display options, such as Claris' **MultiScribe GS**, Random House's **II Write**, Broderbund's **Bank Street Writer III**, and Sunburst's **Magic Slate**, may do the trick. For others, screen magnifiers such as Inter-



“AN APPLE II WITH AN ADAPTIVE DEVICE SUCH AS THE TOUCHTALKER CAN BE AN UNTIRING PERSONAL ASSISTANT AT SCHOOL, AT HOME, OR ON THE JOB.”

national Marketing Services' **CompuLenz** may help.

Still other users, especially those like Rose Angelocci who are totally blind, depend largely on speech synthesizers, as described above, to read keyboard input, messages, and other information downloaded via modem, or material received via optical scanner (text reader), such as Enabling Technologies' **Ready Reader** or Kurzweil Computer Products' **Personal Reader**. Prodigy Products' braille keycap labels, called **Locator Dots**, can help with touch typing, too.

### WRITING IN BRAILLE

Without a moment's hesitation, Angelocci, a college student and an employee at Louisiana State University's Training and Resource Center for the Blind, enthusiastically endorses Raised Dot Computing's **BEX** word-processing program. She uses BEX to load, edit, and store lecture notes she's typed on a Computer Aids Corporation **Small Talk** portable computer.

After class, Angelocci hooks up the Small Talk by cable to her Apple IIe and loads the lecture notes into BEX. BEX and the Echo IIb speech synthesizer "read" the notes back to her for editing. She quips that even her sighted friends depend on BEX at exam time: "I type my lecture notes in class, and I get *every* word!"

#### Words & Concepts Series:

**Words & Concepts**  
**Words & Concepts II**  
**Words & Concepts III**  
 \$185 each  
 support TouchWindow  
 \$5 shipping charge, \$2.50  
 handling charge per item  
 support Echo IIb, IIc, Cricket  
 Laureate Learning Systems  
 110 East Spring Street  
 Winooski, VT 05404  
 (802) 655-4755  
*Reader Service No. 338*

#### Cotton's First Files

MindPlay  
 Unit 350  
 P.O. Box 36491  
 Tucson, AZ 85740  
 (800) 221-7911  
 \$49.99  
 supports Echo IIb, Echo IIc,  
 Cricket  
*Reader Service No. 310*

#### First Math

**Flash Math**  
**Spell and Tell**  
 Spanish version available  
**Tell and Spell**  
 Spanish version available  
 Dataflo Computer Services  
 HC 32 Box 1  
 Enfield, NH 03748  
 (603) 448-2223  
 \$49.95  
 require Applied Engineering  
 Phasor Board  
*Reader Service No. 318*

#### Great Beginnings, \$99.95

#### Language Experience Recorder

**Plus**, \$99.95

#### Make-a-Flash, \$59.95

#### Sentence Starters, \$99.95

#### Stories from

#### the Planet Zee, \$99.95

support Echo IIb, IIc, Cricket,

#### SlotBuster II

Teacher Support Software

P.O. Box 7130

Gainesville, FL 32605

(904) 371-3802

*Reader Service No. 333*

#### Magic Slate II, \$99

#### Lab Pack (10 copies),

\$297 each

#### Corvus Network Version, \$297

#### Muppet Slate, \$75

#### Lab Pack (10 copies), \$225

#### Muppetville, \$65

#### Muppet Word Book, \$65

#### Lab Pack (10 copies), \$195

#### Appletalk Network Version,

\$195

Sunburst Communications

39 Washington Ave.

Pleasantville, NY 10570

(914) 769-5030

*Reader Service No. 320*

#### Optacon II Tactile

#### Reading System, \$3395

#### Versapoint-40, \$3595

Telesensory Systems

455 N. Bernardo Ave.

Mountain View, CA 94043

(415) 960-0920

*Reader Service No. 325*

#### Public-Domain Programs

#### Adapted for Speech Output

The Communicator

Apple Users Group

Route 4

Box 263

Hillsville, VA 24343

(703) 766-3869

after 5 p.m.

group members only

\$10/year membership fee

\$5 shipping per disk

*Reader Service No. 330*

#### Representational Play

PEAL Software

5000 North Parkway

Calabasas, CA 91302

(818) 883-7849

\$150

*Reader Service No. 313*

#### Talking Reading and Me

Davidson & Associates

3135 Kashiwa St.

Torrance, CA 90505

(213) 534-4070

(800) 556-6141

\$49.95

*Reader Service No. 337*

#### Talking Text Libraries I-IV,

\$59.95 each

#### Talking Text Speller, \$99.95

Scholastic Software

P.O. Box 7502

Jefferson City, MO 65102

(212) 505-3000

(800) 541-5513

(800) 325-6149

*Reader Service No. 304*



SPECIAL



NEEDS



RESOURCES

## References, Product Databases, and On-Line Services

### **Add-Ons: The Ultimate Guide to Peripherals for the Blind Computer User**

\$16.95 braille or audio  
\$19.95 print  
(includes UPS charge)  
January 1986

### **A Beginner's Guide to Personal Computers for the Blind & Visually Impaired.**

\$6  
audiocassette, regular print  
November 1983

### **The Second Beginner's Guide to Personal Computers for the Blind & Visually Impaired**

\$12.95 braille or audiotape  
(free matter)  
\$14.95 print  
(includes UPS charge)

second edition, June 1987  
National Braille Press  
88 St. Stephen Street  
Boston, MA 02115  
(617) 266-6160

### **ABLEDATA**

Adaptive Equipment  
Newington Children's Hospital  
181 East Cedar Street  
Newington, CT 06111  
(800) 344-5405  
products database

### **Apple Computer Resources in Special Education and Rehabilitation**

DLM Teaching Resources  
P.O. Box 4000  
Allen, TX 75002  
(214) 248-6300  
\$19.95  
1989 edition

### **Assistive Device Resource Center Brochure**

Meeting Street School  
667 Waterman Avenue  
East Providence, RI 02914  
(401) 438-9500 x45  
free

### **Augmentative Communication News**

One Surf Way  
Monterey, CA 93940  
(408) 649-3050  
\$37 for individuals  
\$57 for organizations  
bimonthly

### **CAC Report**

Computer Aids Corporation  
124 West Washington Blvd.  
Fort Wayne, IN 46802  
(219) 422-2424  
\$20/year audiotape  
or large print  
bimonthly

### **The Catalyst**

Western Center  
for Microcomputers  
in Special Education  
1259 El Camino Real  
Menlo Park, CA 94025  
(415) 326-6997  
\$10/year for individuals  
\$15/year for organizations

### **Challenged American**

Loy & Loy Communications  
P.O. Box 4310  
Sunland, CA 91040  
(818) 353-3380  
\$12/year

### **Closing the Gap**

\$26 per year  
bimonthly

### **Microcomputer Resource Book for Special Education**

Dolores Hagen  
\$19.95  
Closing the Gap, Inc.  
P.O. Box 68  
Henderson, MN 56044  
(612) 248-3294

### **Communication Outlook**

Artificial Language Lab.  
405 Computer Center  
Michigan State University  
East Lansing, MI 48824  
(517) 353-0870

With either of her two Enabling Technologies braille printers Angellocci can print lecture notes in braille or reports in standard print for sighted teachers. (Other braille-printer manufacturers include Ohtsuki, Telesensory Systems, VTEK, MCS/Triformation, and Southland Manufacturing.) Some programs can even produce braille on an ordinary dot-matrix printer. The software translates keyboard or modem input into mirror images of braille patterns; the indentations printed on specially designed paper become raised dots when you turn the paper over. BEX also supports large-character printing on the ImageWriter II, a valuable option for partially sighted Apple II users.



“MANY CHILDREN AND ADULTS  
ARE ‘KEYBOARD-DISABLED.’  
ALTERNATIVE INPUT TABLETS  
SUCH AS DUNAMIS’ PRODUCTS  
HELP SPECIAL-NEEDS USERS  
OVERCOME THAT OBSTACLE.”

In addition to the dozens of products and companies mentioned in this article, hundreds more are devoted to helping computer users with special needs. Not all such programs talk or require adaptive hardware; many hearing-impaired Apple II users, for instance, use ordinary modems and communications software to exchange messages on line. Many programs, such as MCE's **Improving Your Self-Concept** for special-education students and Mindscape's **Developing Reading Power** for ESL (English as a second language) and “at risk” students, focus on social and emotional growth or enhancement of basic skills.

How can you determine which products or services are right for your needs or for your children, students, or clients?

1. Start with DLM Teaching Resource's comprehensive guide, **Apple Computer Resources in Special Education and Rehabilitation**. This hefty volume contains some 400 pages of information about Apple II products for those with behavioral, cognitive, hearing, physical, speech, and vision impairments.

2. Check our state-by-state directory of Apple-sponsored National Special Education Alliance centers. (See the accompanying sidebar.) Children and parents, as well as educators and rehabilitation professionals, ▶

Continued

# Why we sell more Apple expansion cards than Apple.™



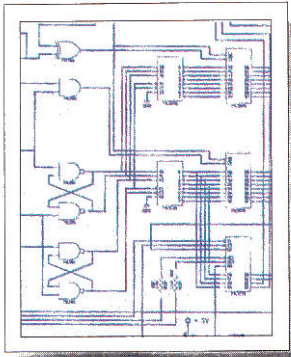
We specialize more.



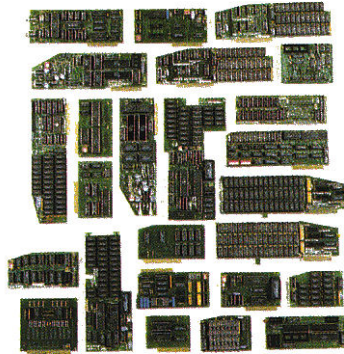
We support more.



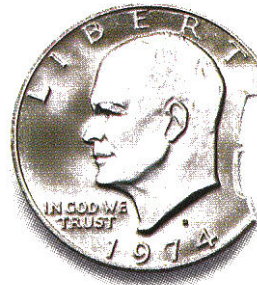
We guarantee more.



We innovate more.



We offer more.



We cost less.

When you add it up, you'll add us on.

**AE** APPLIED ENGINEERING®  
*The Apple enhancement experts.*

P.O. Box 5100, Carrollton, TX 75011, (214) 241-6060



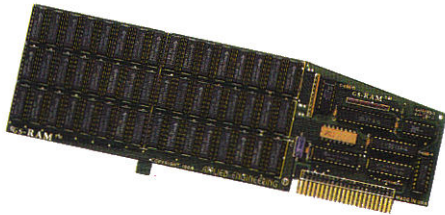


# Three good reasons to buy a memory card from Applied Engineering.

Applied Engineering makes three different memory cards for the IIGS because every IIGS owner is different. Each card was designed to suit specific needs:

## 1.

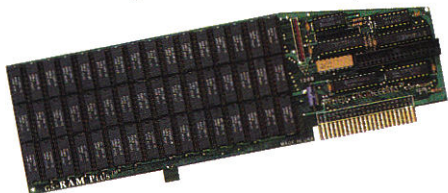
**GS-RAM™** Start with as little as 256K of memory and grow in affordable 256K increments to 1.5 MEG (an amount that once sounded large, but is now considered a moderate amount of memory expansion.) Incorporates 256K x 1 chips.



<b>GS-RAM w/256K</b>	<b>\$219</b>
<b>1 MEG</b>	<b>\$639</b>
<b>1.5 MEG</b>	<b>\$919</b>

## 2.

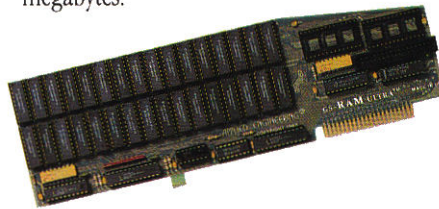
**GS-RAM Plus™** Expands from 1 to 6 MEG in 1 MEG increments. Originally designed for power-users requiring a great deal of internal memory, this card has recently found favor with many moderate users. MEG-sized jumps in memory have now become practical for many users because of the enormous memory requirements of today's software titles. Incorporates 1 MEG x 1 chips.



<b>GS-RAM Plus w/1 MEG</b>	<b>\$599</b>
<b>2 MEG</b>	<b>\$1049</b>
<b>3-6 MEG</b>	<b>CALL</b>

## 3.

**GS-RAM Ultra™** AE's newest memory card incorporates a new chip - the 256K x 4, which has four times the density of 256K x 1 chips. GS-RAM Ultra offers incremental expansion like the GS-RAM and ultimate size like the GS-RAM Plus. It's expandable from 256K to 4 MEG in 256K increments, so you can start small and still grow to a massive 4 megabytes.



<b>GS-RAM Ultra 256K</b>	<b>\$239</b>
<b>512K</b>	<b>\$399</b>
<b>768K-4 MEG</b>	<b>CALL</b>

We've also added ROM sockets to the GS-RAM Ultra. ROM sockets allow hardware-based applications to be loaded permanently into EPROMs...an increasingly important feature when application become available from Applied Engineering and others.

### Consider your needs.

Need a moderate amount of memory? **GS-RAM** lets you start small and takes you up to 1.5 MEG. Need lots of memory right away? **GS-RAM Plus** is your best bet. Want to start small and leave open the possibility of a huge internal memory? **GS-RAM Ultra** is your card. And our **GS Expander™** piggyback card adds up to 2 MEG to any of the three cards. Call AE for prices.

### Trade in your Apple card.

We even offer a trade-in credit for your Apple IIGS memory card, so you can switch to an AE card with more features and greater capacity. Still have questions? Call us, we'll be happy to discuss your particular applications.

### DMA compatibility.

All three of our GS memory cards are fully DMA compatible (and they're the ONLY large-format cards that are), so they not only run all GS software, they also support *current and future* DMA peripherals.

Installation couldn't be easier, the cards just plug in. And all three cards feature Applied Engineering's meticulous craftsmanship, along with our 5-year warranty, our 15-day money-back guarantee\* and our American-made pride.

### Still more:

Each of our GS memory cards comes with many other exclusive features, *disk caching* that tremendously speeds up many programs, including AppleWorks, by virtually eliminating disk access. Our *diagnostic utility* feature graphically detects the presence of bad or improperly installed chips and tests for CAS before RAS chips. And our *AppleWorks enhancement* package dramatically increases AppleWorks' word processor lines (from 7,250 to 22,500), database records (from 6,350 to 22,500), clipboard capacity (from 255 lines to 2,042) and more.

### Order today!

To order or for more information, see your dealer or call (214) 241-6060 today, 9 am to 11 pm 7 days. Or send check or money order to Applied Engineering. MasterCard, VISA and C.O.D. welcome. Texas residents add 7% sales tax. Add \$10 outside U.S.A.

**AE APPLIED ENGINEERING®**

*The Apple enhancement experts.*

A Division of AE Research Corporation.

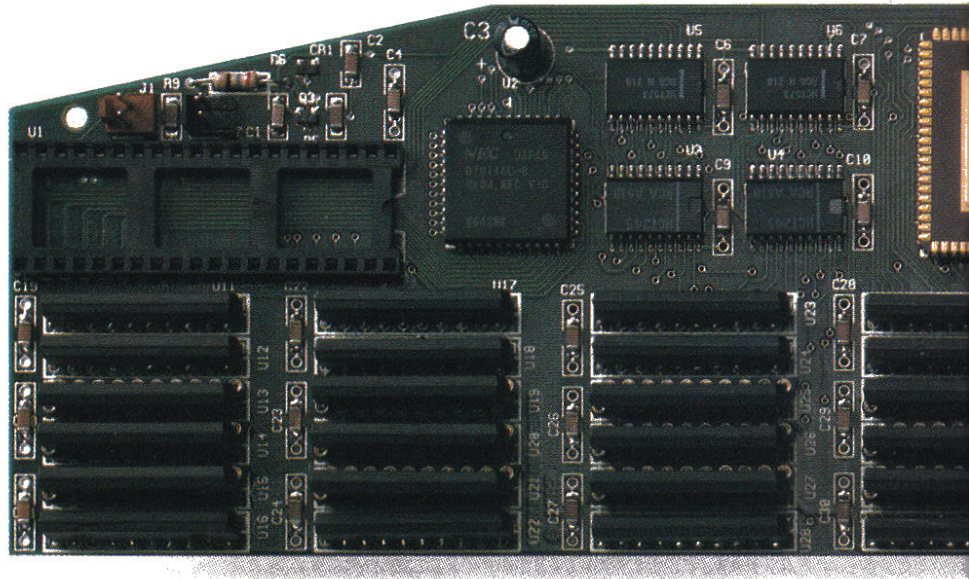
**(214) 241-6060**

P.O. Box 5100, Carrollton, TX 75011

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\*When purchased from Applied Engineering, or thru a participating dealer.

# It's not what we think of PC



Actual Size

## it's what every

**We're not the only ones excited about PC Transporter™. Our new "PC on a card" wonderboard has drawn rave reviews from the experts**

*"Darned if the thing doesn't work. PC Transporter is a technical tour de force. It's ingenious . . . a remarkable success."*

— *InCider*

Applied Engineering's PC Transporter gives your Apple IIGS, IIe or II+ the power to speak IBM's MS-DOS. Run MS-DOS programs on your Apple at more than *three times the speed* of an IBM XT.

### For the first time . . .

Bring your MS-DOS work home from the office and use your Apple to get caught up . . . or get ahead.

Run Lotus 123, dBASE III PLUS, Symphony, Microsoft Word, Flight Simulator and thousands of other business and entertainment titles - on your Apple!

Shop both sides of the software aisles and discover a new world of programs and software that you can now enjoy.

Exchange ProDOS and MS-

DOS files with your MS-DOS friends and co-workers. Even transfer your own files from ProDOS to MS-DOS and back again.

Store IBM programs on any ProDOS storage device including the Apple 3.5 Drive, Apple UniDisk™ 3.5, Apple 5.25 Drive, SCSI or ProDOS compatible hard drives.

### You don't have to be a programmer.

PC Transporter was designed by experts, so you don't have to be one to use it. The design team includes the former project managers for the Apple IIe and IIc, the co-designer of the Apple II disk controller and the author of ProDOS.

We include clear, understandable installation instructions, "pre-boot" software and even an installation video to help.

PC Transporter acts as a universal disk drive controller, enabling your Apple 3.5 Drive to run MS-DOS or ProDOS and to shift instantly from ProDOS to MS-DOS.

*"Extremely versatile . . . one of the most ingenious and exciting products we've seen."*

— *Classroom Computer Learning*

### Tailor your configuration.

What do you need to get up and

running? That depends on what equipment you already own and what you'll be running. For example: if you plan to use strictly 3.5 format MS-DOS, an Apple IIGS disk drive does the job. If you need 5.25 IBM capability, you'll need one of our IBM-style disk drives which will also store ProDOS.

There's even a socket on PC Transporter for an 8087-2 Math Co-processor chip to speed you through spreadsheets.

Call Applied Engineering or ask your dealer for more details on your specific needs.



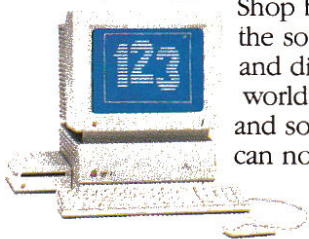
*"An excellent solution for at least half a million people who enjoy Apple II computing at home and endure MS-DOS at work."*

— *MicroTimes*

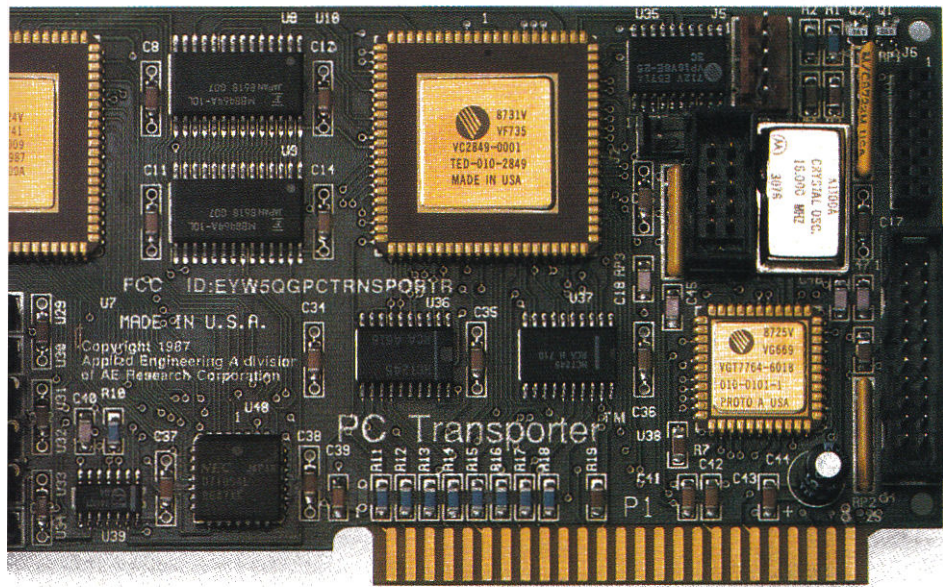
### A few words about cost.

Compare the price of a PC Transporter — you'll find it about on par with even the cheapest, stripped-down IBM clones.

Then consider that your PC Transporter gives the Apple peripherals you already own the power to work



# Transporter™ that counts . . .



## one else thinks.

with MS-DOS programs.

You won't need two of everything. And you won't have to crowd your desk with an extra CPU, an extra monitor, an extra disk drive or two, an extra mouse, an extra modem, an extra hard disk or an extra printer.

Your Apple peripherals and PC Transporter will not only work, you'll get *faster operation* and *better quality graphics*.

Add in the cost of the peripherals you'd need for that "cheap" clone, and you'll see the price of a PC Transporter start to look very attractive indeed.

*"PC Transporter has created quite a stir. It's accuracy guarantees a whole host of uses . . . a masterpiece of engineering."*

— Apple Soft

A few more considerations - you can access up to 768K of extra RAM for use with your Apple programs. PC Transporter conforms to the Apple II Memory Expansion Card protocol when in Apple mode. That's a \$500 value even if you never use the card for MS-DOS.

PC Transporter comes with our exclusive AppleWorks Expander™ program that dramatically enhances

*"When you buy a PC Transporter, you're not just giving your Apple the ability to act as a PC clone, you're upgrading your computer in a big way for all your Apple II computing."*

— Nibble

the capacity, speed and capabilities of AppleWorks.

The Expander increases word processor lines, database records, clipboard capacity, automatically segments files, provides a built-in print buffer and much more.

RAM in Apple mode	RAM in IBM mode	Price
<b>768K</b>	<b>640K</b>	<b>\$679</b>

Note: The IBM mode is 128K less because the PC Transporter uses 128K for system memory.

**IIgs Installation Kit \$49**  
**IIe/II+ Installation Kit \$39**

### Optional 5.25 IBM Format 360K Drive Systems

Single-Drive System	<b>\$259</b>
Dual-Drive System	<b>\$399</b>

\*When purchased from Applied Engineering or thru a participating dealer

### The do-everything computer.

Turn your Apple into a fast, powerful, work-at-home tool. The incredible combination of ProDOS and MS-DOS means a computer that'll run practically anything. And know that Applied Engineering stands behind PC Transporter with our 15-day money back guarantee\* and a full one-year warranty.

*"Gives Apple II users the best of two worlds . . . an impressive engineering feat."*

— A+

### Order today!

To order or for more information, see your dealer or call (214) 241-6060 today, 9 am to 11 pm, 7 days. Or send check or money order to Applied Engineering. MasterCard, VISA and C.O.D. welcome. Texas residents add 7% sales tax. Add \$10 outside U.S.A.

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## CASHING IN

Put your money to work with an AppleWorks spreadsheet that calculates interest rates for investments you can bank on.

By RUTH K. WITKIN

TO PARAPHRASE CHARLES LAMB'S Pithy aphorism, "The human species, according to the best theory I can form of it, is composed of two distinct races, those who borrow and those who lend." In this session, you'll create a spreadsheet that shows how the money you lend can grow over time. Next month you'll examine the other side of the coin—a spreadsheet that calculates the cost of borrowing.

One way to add to your finances is to lend to a borrower, such as a bank or the federal government, with the understanding that your money will earn interest. The *interest rate*—the fee the borrower pays to use your money—is generally related to how much you lend, for how long, and at what risk.

While interest rate is the most visible yardstick in measuring one situation in comparison with another, the borrower's compounding practices determine how much your money actually earns. When money is compounded, the interest rate is applied to the principal plus interest. In effect, you're earning interest on interest. The number of times during the year your money is compounded converts interest rate into *effective annual yield*. The more frequent the compounding, the higher the yield.

The spreadsheet in **Figure 1** calculates the growth of any amount of money compounded any number of times annually at any interest rate for any length of time (in this example,

as long as 25 years). But that's not all. It also lets you see how long the money will last if you withdraw a steady amount each year—a great help in retirement planning.

When you enter the amount invested, annual interest rate, number of compound periods, and annual withdrawal amount, the formulas produce the effective annual yield, a year-by-year accounting of principal and interest, an annual withdrawal, and the balance remaining after each annual withdrawal.

### A SPREADSHEET FROM SCRATCH

Use the AppleWorks Startup and Program disks to make a new file for the spreadsheet. Name the file **INTEREST**. You should now see the spreadsheet Review/Add/Change screen with the cursor in A1. Use the following summary to get the spreadsheet started:

**Long lines.** Enter a double line across row 2 in columns A through F: Place the cursor on A2 and type quotation marks. Hold down the equal-sign key until the sign reaches the right edge of F2, and hit Return. Leave the cursor on A2 and copy the row to the clipboard: Press OA-C to start the Copy command; type T to select *To clipboard*; and press Return.

You need the same line in row 9, so copy from the clipboard: Place the cursor on A9; press OA-C and type F to select *From clipboard*.

Next, enter a single line across row 12 in columns A through F: Place the cursor on A12;

type quotation marks; hold down the minus-sign key until the sign reaches the right edge of F12; and hit Return.

**Column width.** Each column is now nine characters wide. Use the Layout command (OA-L), *Columns* option, and *Column width* option to reduce column A to five characters and increase columns C through F to 14 characters each.

**Labels and numbers.** Enter all labels and numbers shown in **Figure 2**. Before you type the spreadsheet title, *INTEREST EARNED CALCULATOR*, in C1, type quotation marks and press the spacebar seven times to indent. In E11, type quotation marks before the label (*inc Inflatn*), short for *including inflation*. The numbers are in column D, rows 3 through 8, and in A13. Don't bother to press Return after typing each entry. Simply move the cursor to the next cell that needs an entry. Press Return when you're finished.

**Formats.** Most of the numbers are dollar amounts, but dollar signs will only crowd the columns. Instead, use the Value command (OA-V) to set a standard *Value format* of *Commas* with two decimal places.

Next, use the Layout command (OA-L) to reformat the following cells: D3 (initial investment) and D7 (regular annual withdrawal) to show Dollars with no decimal places; D5 (times compounded annually) for *Commas* with zero decimal places; D6 (effective annual yield) for *Percent* with two decimal places; A13 and A14 (year numbers) for *Commas* with zero decimal places. The year-number formula you'll soon enter in A14 and duplicate down the column will copy the *Commas* format into the other cells. And finally, use OA-L to right-justify all headings in rows 10 and 11.

Now press OA-S to store your work on disk.

### ENTERING THE FORMULAS

Next, enter the formulas that perform your calculations. First, read how the formula ►

Erasmus at sea:  
Bridge of the Erasmus

Score: 0  
Moves: 1

The gale tears at you, biting deep within, and you know that if you don't make landfall soon you'll all be dead. You are John Blackthorne, Pilot-Major of a dead fleet: one ship left out of five, eight and twenty men out of one hundred and seven, and only ten of those can walk. No food, almost no water, and that brackish and foul.

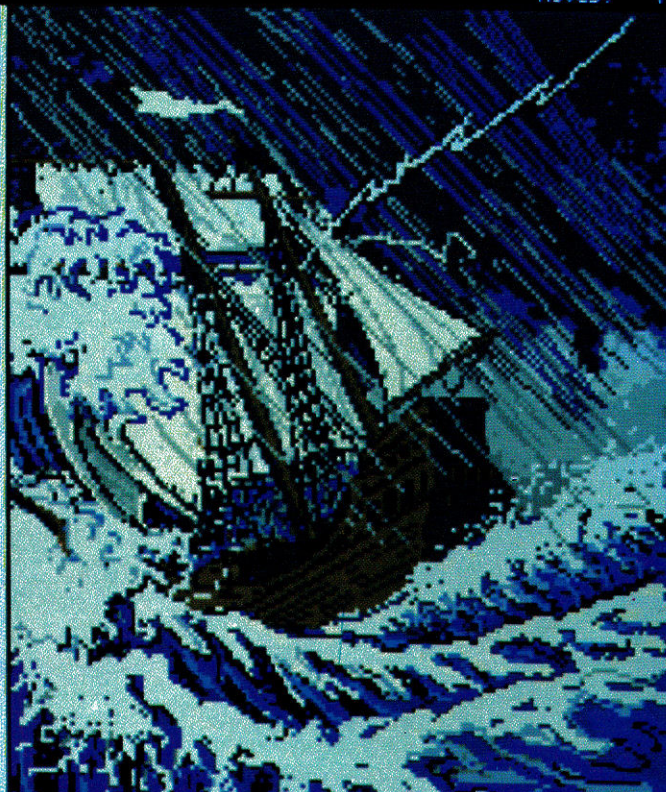
#### Bridge of the Erasmus

This is the bridge of the Erasmus, a Dutch merchant and privateer. The unlashd wheel is directly forward of you, a sea chair is lashed to the deck aft of the wheel, and the ship's bell is hanging here. Spray blows past in an angry torrent.

The wheel dominates the quarterdeck. It is turned straight and free to turn now.

The ship heels in a sudden squall, throwing you from your post at the wheel, which, uncontrolled, begins to turn to port.

>STRAIGHTEN THE WHEEL



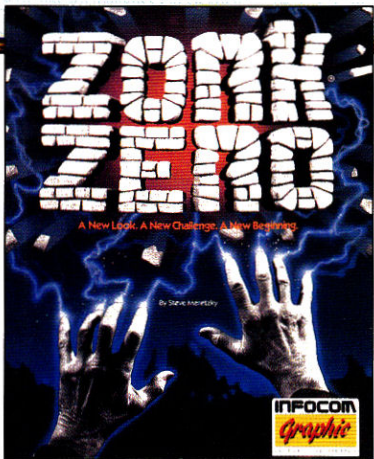
# INFOCOM'S NEW GRAPHICS WILL BLOW YOU OUT OF THE WATER...

# Encyclopedia Frobozzica



Megaboz

According to this article, Megaboz was a mysterious wizard who lived a hermit's life in the Publio Valley. Some say he cast a Curse which will someday bring down the Empire, but royal spokesmen have denied all such rumors. Megaboz vanished in 789 QUE; some say the effort of casting the curse destroyed him.



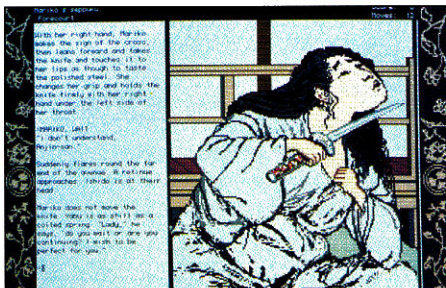
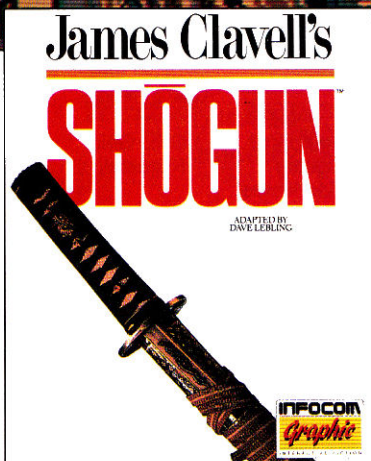
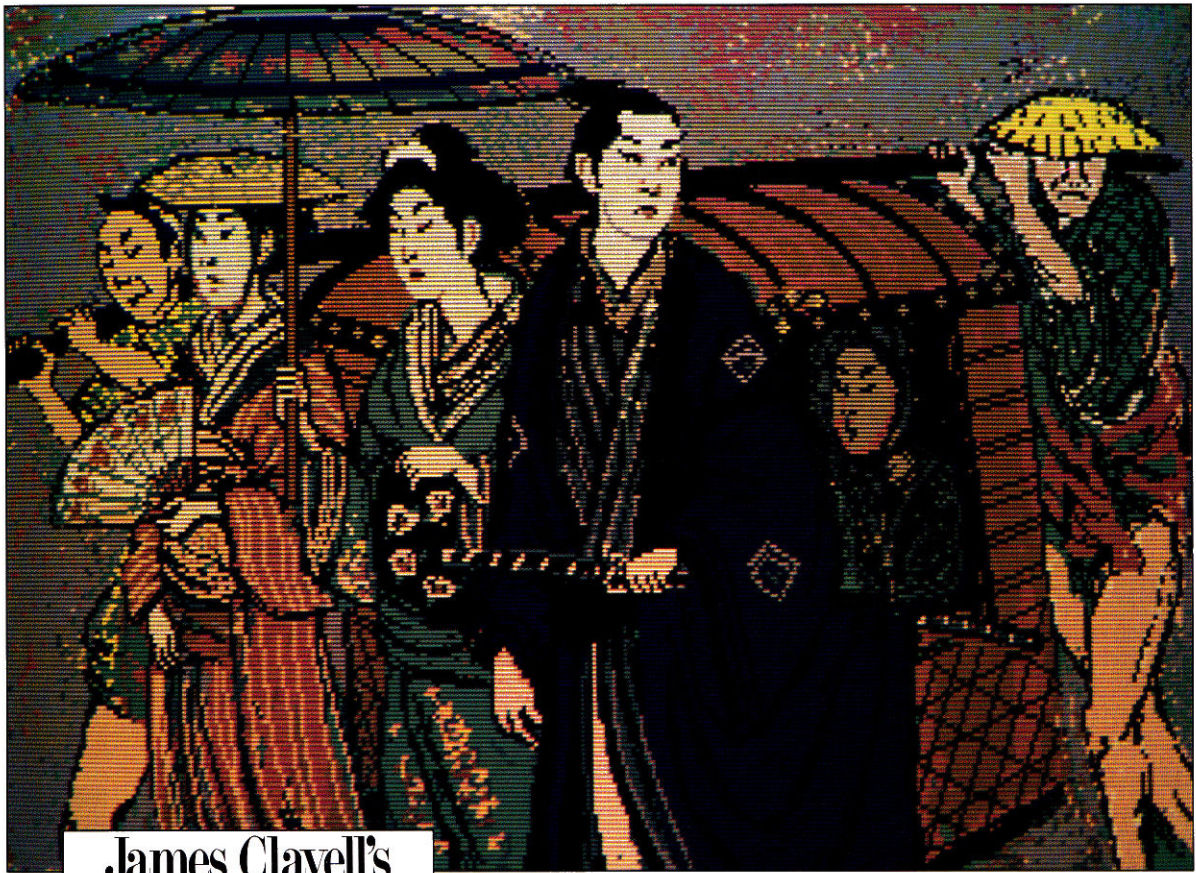
### ZORK ZERO

The game that started it all has a new beginning! *Zork Zero* is the interactive fiction prequel to the *Zork Trilogy*, the most popular entertainment software product of all time. In *Zork Zero*, an unpredictable jester challenges you with puzzles, paradoxes and plenty of fun as you seek out objects ranging from the curious to the sublime.

- One million satisfied game players can't be wrong! Discover the origins of the Great Underground Empire in this new and exciting chapter of *Zork*.
- *Zork Zero* integrates graphics into the game play with visual puzzles, illustrated maps and a Zorkian encyclopedia.
- *Zork Zero* includes our most requested features: a friendlier parser for easier typed-in commands, on-screen hints, mapping, optional mouse interface and sound.
- *Zork Zero* is by Steve Meretzky, author of *Leather Goddesses of Phobos*, *The Hitchhiker's Guide to the Galaxy* and *Planetfall*.
- Your *Zork Zero* package includes the game disk, a secret spell, "Lives of the Twelve Flatheads" Calendar and an unusual blueprint.
- *Zork Zero* is available for most personal computers. See the order form on the reverse side for machines and prices.



(Top) The Great Underground Empire comes alive with spellbinding graphics.  
 (Center) Look for *Zork Zero* at a software retailer near you.  
 (Bottom) New visual puzzles will challenge you like never before.



(Top) Experience the drama and pageantry of 16th Century Japan in *Shogun*.

(Center) Infocom's *Shogun* captures all the power of the novel.

(Bottom) Rich text and vivid graphics weave a gripping story of honor, intrigue, and survival.



## JAMES CLAVELL'S SHOGUN™

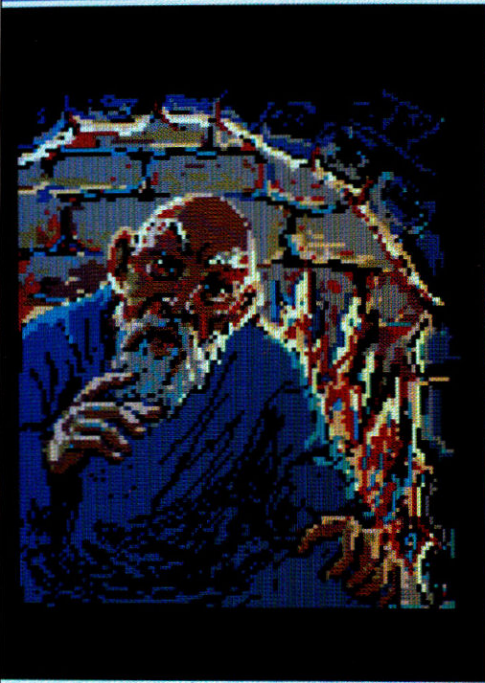
Now James Clavell's compelling saga of power and intrigue in 16th Century Japan comes to life in a riveting work of interactive fiction. You play the

English sea-pilot John Blackthorne, a stranger who must learn to survive in the exotic world of feudal Japan. How you act, what you say and whom you befriend will determine your fate and the course of the game.

- *Shogun* is an adaptation of James Clavell's novel in which you actually become the hero. If you enjoyed the book or television miniseries, you will love the interactive version of *James Clavell's Shogun*.
- *Shogun's* breathtaking graphics are designed in the style of 16th Century Japanese painters. You have never seen computer screens like these.
- *Shogun* features on-screen hints and friendlier language interface.
- *James Clavell's Shogun* is a collaboration between two extremely popular authors: James Clavell, whose bestselling novels include *Noble House™* and *Tai Pan™*, and Dave Lebling, author of the *Zork Trilogy* and *Enchanter®*.
- Your *Shogun* package includes a game disk and Blackthorne's map of the known world.
- *James Clavell's Shogun* is available for most personal computers. See the order form on the reverse side for machines and prices.



**Journey**



For six long hours, we climbed steeply up the side of the Sunrise Mountain, and thus we came to the high tower of Astrix, the Wizard. No sooner had we arrived, then the tower's massive oak door opened.

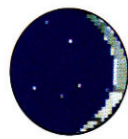
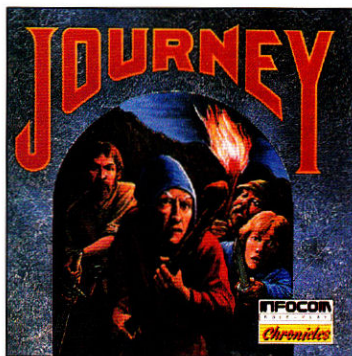
"I have been following your progress with great interest," the Wizard said, stroking his stringy gray beard. "You are a very resourceful group, that is certain!"

His voice became dark and we seemed to wince from some unseen injury. "The question is: Have you mettle enough to make siege on the Evil One himself?" And then, smiling, the darkness fell from his voice, and he answered his own question, "We shall see, I suppose; we shall see."

Leading us to his hearth, he sat us in a semi-circle around the blazing fire and spoke. "There is a story I must tell, a story of the Seven Stones. Created in a time lost to living memory, these Stones contained the very strength and essence of our world. Of the Seven, Four were entrusted to the races of men who could use them best: Elves, Dwarves, Nymphs, and Wizards."

"These are the Four: the Elf Stone, green as the forests of old, and the Dwarf Stone, brown as the caverns of Forn a-klamen; the Nymph Stone, blue as the deep waters of M'nera, [MORE]

	The Party		Individual Commands
Back	Bergon -->	Cast	Tell Legend
	Praxix -->	Scout	
	Minar -->	Drop	Inventory
Game	Tag -->		




## JOURNEY™

*Journey* into a world of natural beauty and unnatural magic, a world of monsters and melee, an entirely new world of entertainment software. In *Journey*, you lead a party of four adventurers on a noble quest to save the countryside from evil. *Journey* combines Infocom's storytelling expertise with the essence of role playing games to create the truly new genre of "role-play chronicles."

- *Journey* requires no typing and can be played entirely with a keyboard, a joystick, or a mouse.
- If you like RPG's, interactive fiction or fantasy stories, you'll love the saga of *Journey*.
- Over one hundred stunning graphics give you new vistas to explore at every stage of your quest.
- Favorite Infocom writer Marc Blank, author of *Zork*, *Deadline*® and *Enchanter*, has developed *Journey* and the new role-play chronicles.
- Your *Journey* package includes a game disk, a beautifully illustrated map and a quartz crystal secured in a velvet pouch.
- *Journey* is available for most personal computers. See the order form on the reverse side for machines and prices.



**Journey**



Hurth was asked by Praxix about the true story of the Dwarf Gates. Hurth replied eagerly, pleased to give us a taste of Dwarvish history.

"Our fathers built four gates, each leading to one of the outposts of the world. The Barn is in, where you entered, was our link to the plains of Lavin. The Barn i-Fee, at the opposite end of the Long Road, leads to the forests of the Elves. And the Barn i-Lan leads upwards to the high mountains of Thul."

"And what of the fourth gate?" Bergon asked.

"Of the fourth gate, the Barn i-Lan," Hurth replied gravely, "it is not spoken. Perhaps it is no longer used; this is what we Dwarves hear most."

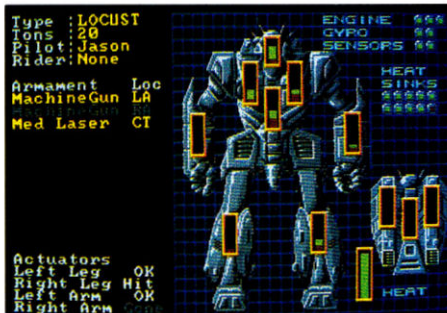
	The Party		Individual Commands
Present	Bergon -->	Cast	Tell Legend
Back	Praxix -->	Hurth -->	Tell Story
Enter	Hurth -->	Tag -->	Drop
Close	Tag -->		Inventory

(Top) Magical creatures and wondrous wizards inhabit the world of *Journey*.

(Center) Ask for *Journey* at your favorite software retailer.

(Bottom) You must interpret what you find for your journey to be successful.

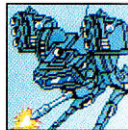




(Top) Animated outtakes let you zoom in on the action.

(Center) The package tells you that *BattleTech* means business.

(Bottom) Detailed scan helps keep track of damage sustained in combat.



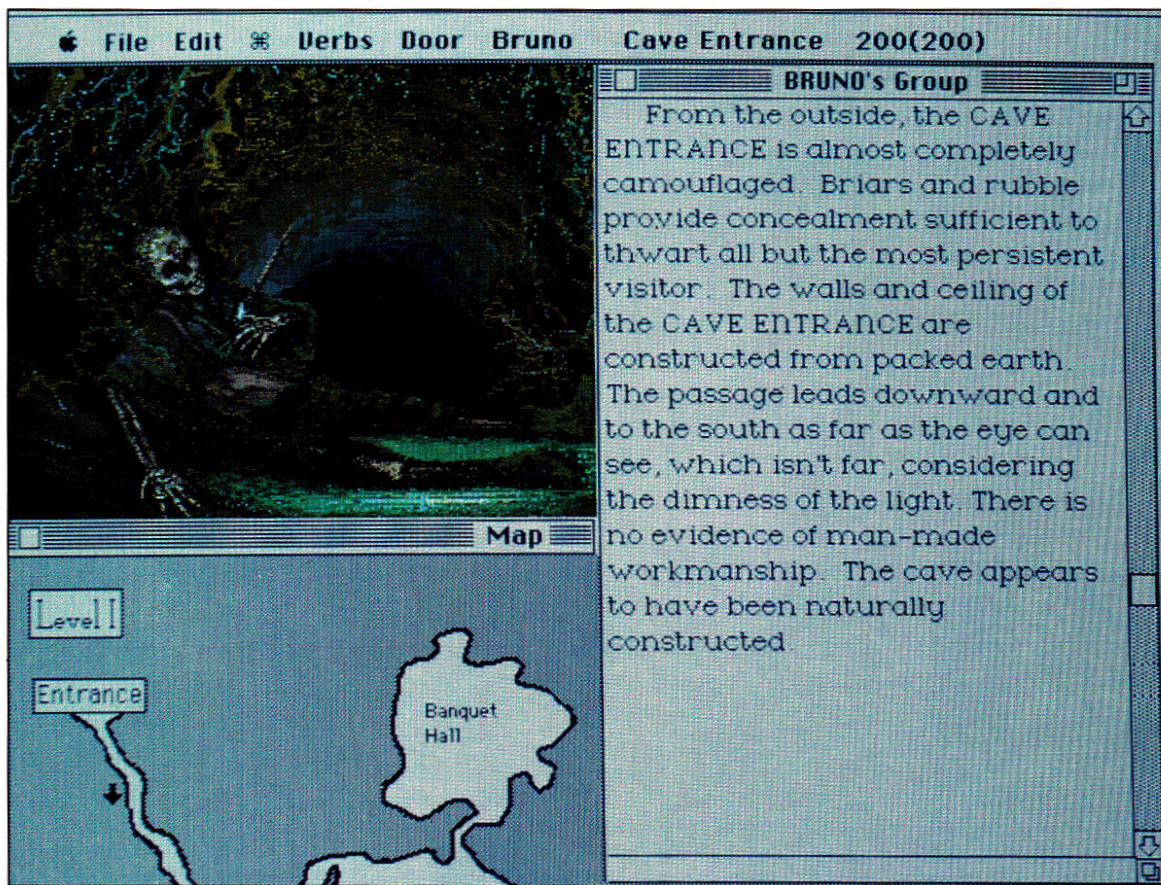
### BattleTech®: The Crescent Hawk's Inception™

In the 31st Century, brutal wars are waged in giant machines, and human lives are cheaper than water.

In this action-packed RPG, you are Jason Youngblood, a warrior cadet who must fight to preserve his planet, his honor and his life.

- *BattleTech* is the first computer RPG set in the powerful BattleTech universe.
- *BattleTech* includes "The Arena," a gladiatorial module you can play again and again to hone your skills and accumulate supplies.
- *BattleTech* features the richness of plot and depth of detail that you have come to expect from Infocom games.
- You will see animated game sequences rendered in the distinctive style of Japanese "manga" comics.
- *BattleTech* features the largest RPG universe ever created, with over four million different locations on the computerized playing board.
- *BattleTech* features the most explosive warfare and complicated strategy of any computer RPG.
- *BattleTech* is a fully integrated part of FASA's BattleTech universe. It was developed with Westwood Associates, creators of Phantasia™ III, Questron™ II and Summer Games.®
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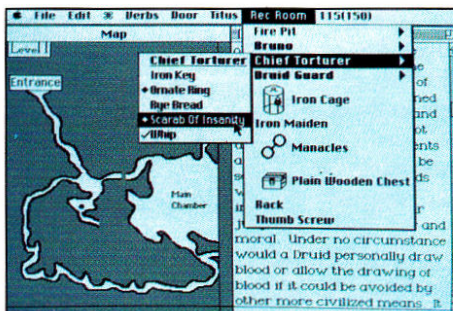




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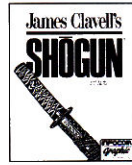
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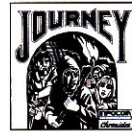
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 ‡Available February, 1989.  
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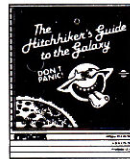
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Continued from p. 88

works. Then place the cursor on the cell receiving the formula. Move the cursor to the cell locations shown in the formula description, and type everything else.

When the formula is complete, compare each character on your screen with the description here. If everything agrees, press Return. If something's amiss, press Escape and start again.

### FORMULA 1: EFFECTIVE ANNUAL YIELD

Formula 1 divides interest earned in the first year (C13) by the amount invested (D3) and enters the effective annual yield in D6, assuming you've invested the money for one full year.

Cell location: D6

Description:  $+C13/D3$

There's no interest earned in C13, so D6 shows 0.00%.

### FORMULA 2: YEAR NUMBERS

Formula 2 adds 1 to the number in the cell above (A13) to start the sequence of year numbers in A14.

Cell location: A14

Description:  $1+A13$

You'll copy Formula 2 down its column, along with other formulas, after you enter all formulas.

### FORMULA 3: BEGINNING AMOUNT (YEAR 1)

Formula 3 doesn't calculate anything. It simply copies the investment amount in D3 to the beginning-amount cell in Year 1 (B13).

Cell location: B13

Description:  $+D3$

### FORMULA 4: BEGINNING AMOUNT (YEAR 2)

Formula 4 copies the balance remaining after withdrawal at the end of Year 1 (F13) to the starting amount in Year 2 (B14).

Cell location: B14

Description:  $+F13$

There's no balance remaining in F13, so B14 shows zeros.

### FORMULA 5: INTEREST EARNED

Formula 5 converts interest rate (D4) to a percentage and divides it by number of compound periods (D5). This result is raised to the power of the number of compound periods (D5) multiplied by the starting amount (B13).

Figure 1. AppleWorks interest-earned spreadsheet.

INTEREST EARNED CALCULATOR						
3	Amount Invested		\$85,000			
4	Annual Interest Rate (%)		9.75			
5	Times Compounded Annually		365			
6	Effective Annual Yield		10.24%	1		
7	Regular Annual Withdrawal		\$7,500			
8	Assumed Annual Inflation Rate (%)		4.00			
10	Year	Starting Amount	Interest Earned	Ending Amount (inc Inflatn)	Withdrawal	Balance Remaining
13	1	85,000.00	8,703.75	93,703.75	7,500.00	86,203.75
14	2	86,203.75	8,827.01	95,030.77	7,800.00	87,230.77
15	3	87,230.77	8,932.18	96,162.94	8,112.00	88,050.94
16	4	88,050.94	9,016.16	97,067.10	8,436.48	88,630.62
17	5	88,630.62	9,075.52	97,706.14	8,773.94	88,932.20
18	6	88,932.20	9,106.40	98,038.60	9,124.90	88,913.70
19	7	88,913.70	9,104.50	98,018.21	9,489.89	88,528.31
20	8	88,528.31	9,065.04	97,593.36	9,869.49	87,723.87
21	9	87,723.87	8,982.67	96,706.54	10,264.27	86,442.27
22	10	86,442.27	8,851.44	95,293.70	10,674.84	84,618.87
23	11	84,618.87	8,664.73	93,283.59	11,101.83	82,181.76
24	12	82,181.76	8,415.17	90,596.93	11,545.91	79,051.03
25	13	79,051.03	8,094.59	87,145.62	12,007.74	75,137.88
26	14	75,137.88	7,693.90	82,831.78	12,488.05	70,343.73
27	15	70,343.73	7,202.99	77,546.72	12,987.57	64,559.15
28	16	64,559.15	6,610.67	71,169.82	13,507.08	57,662.74
29	17	57,662.74	5,904.50	63,567.24	14,047.36	49,519.88
30	18	49,519.88	5,070.69	54,590.57	14,609.25	39,981.32
31	19	39,981.32	4,093.97	44,075.29	15,193.62	28,881.66
32	20	28,881.66	2,957.40	31,839.06	15,801.37	16,037.69
33	21	16,037.69	1,642.21	17,679.90	16,433.42	1,246.48
34	22	1,246.48	127.64	1,374.12	1,374.12	0.00
35	23	0.00	0.00	0.00	0.00	0.00
36	24	0.00	0.00	0.00	0.00	0.00
37	25	0.00	0.00	0.00	0.00	0.00
38						
39						

Figure 2. Labels and practice numbers.

INTEREST EARNED CALCULATOR						
3	Amount Invested		85000			
4	Annual Interest Rate (%)		9.75			
5	Times Compounded Annually		365			
6	Effective Annual Yield					
7	Regular Annual Withdrawal		7500			
8	Assumed Annual Inflation Rate (%)		4			
9						
10	Year	Starting Amount	Interest Earned	Ending Amount	Withdrawal	Balance Remaining
13	1					
14						
15						

The formula then reduces this result by the starting amount (B13) to provide the interest earned in C13.

Cell location: C13

Description:  $(1+(D4/100/D5))^{D5*B13}-B13$

### FORMULA 6: ENDING AMOUNT (YEAR 1)

Formula 6 adds the beginning amount (B13)

and interest earned (C13) to produce the ending amount for the first year in D13.

Cell location: D13

Description:  $+B13+C13$

Now copy Formulas 5 and 6 into one cell below: Place the cursor on C13, press OA-C, and press Return; move the cursor to D13, and hit Return again; press the down-arrow key to highlight C14; and hit Return once

more. To tell AppleWorks which cell references are *No change* (press Return) and which are *Relative* (type R), press Return three times and type R four times. C14 and D14 now contain zeros.

**FORMULA 7: INITIAL WITHDRAWAL AMOUNT**

Formula 7 copies the initial withdrawal amount from D7 to E13.  
Cell location: E13  
Description: +D7

**FORMULA 8: WITHDRAWAL AMOUNT (YEAR 2)**

Formula 8 calculates an annual withdrawal that keeps pace with inflation. Clearly, you can't withdraw more than you have in the account, so the IF function prevents any number exceeding the ending amount from appearing on the spreadsheet. The Test statement compares the prior withdrawal (E13) plus the assumed inflation rate (D8) with

the ending amount (D14). If prior withdrawal plus inflation is less than or equal to the ending amount, the Then statement calculates the new withdrawal and enters the result in E14. If the prior withdrawal plus inflation is greater than the ending amount, the Else statement copies the ending amount from D14 to E14.

Cell location: E14  
Description: @IF(E13\*(1+(D8/100))<=D14,E13\*(1+(D8/100)),D14)

**FORMULA 9: BALANCE REMAINING**

Formula 9 subtracts the withdrawal amount (E13) from the ending amount (D13) and produces the balance remaining in F13.

Cell location: F13  
Description: +D13-E13

Copy Formula 9 into the cell below: Leave the cursor on F13 and press OA-C; hit Return twice; press the down-arrow key to highlight F14; and hit Return again. Both cell references are relative, so type R twice. AppleWorks now calculates the amounts in Year 2.

**PROTECTING THE FORMULAS**

You'll soon be copying formulas down their columns. It's a good idea to protect them first, because AppleWorks can copy the formula and protection at the same time. Start with the formula that generates the effective annual yield: Place the cursor on D6 and press OA-L to bring up the Layout screen. Hit Return to confirm *Entry*, and type PN.

Now protect the formulas in rows 13 and 14: Place the cursor on A13 (which includes the number 1—not a formula, but it doesn't matter). Press OA-L and type B to select *Block*. Press OA-Right Arrow, then Down Arrow to highlight both rows, and press Return. Type PN.

**ORDER OF RECALCULATION**

AppleWorks routinely recalculates by columns, meaning that it calculates the formulas from top to bottom in the first column, then from top to bottom in the second column, and so on. On this spreadsheet, the formulas must calculate across rows, so change the standard order: Leave the cursor on A13 and press OA-V to bring up the Standard Values screen; type R to select *Recalculate*; hit Return to confirm *Order*; and hit it again to confirm *Rows*.

**COPYING THE FORMULAS**

Now place the cursor on A14 so that you can copy the formulas: Press OA-C and hit Return; press OA-Right Arrow to identify the source; and hit Return again. Press the down-arrow key to show the start of the new location. Type a period, press OA-Down Arrow twice, then Down Arrow once to move the cursor to row 37, and hit Return.

To tell AppleWorks which cell is *No change* and which is *Relative*, type R twice, hit Return three times, type R five times, hit Return once, type R twice, hit Return once again, and type R three times. When calculations stop rippling down the screen, your spreadsheet should look like the one in **Figure 1**.

**SETTING THE PRINTER OPTIONS**

This spreadsheet is 75 characters wide and prints at ten characters to the inch. Change the margin settings to position it well on the printed page: Leave the cursor where it is and press OA-O to bring up the Printer Options screen. Type LM to select *Left Margin* and press Return. Type .3 and hit Return again. Now type TM to select *Top Margin* and press Return.

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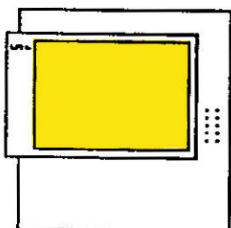
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Type **1** and hit Return again.

All other print settings remain at AppleWorks standards. Press OA-S to store this final version on disk, which also returns the spreadsheet to the screen.

### PRINTING YOUR SPREADSHEET

Turn on your printer and run out your spreadsheet. Leave the cursor where it is; press OA-P to bring up the Print screen; press Return to confirm *All*. Press Return to confirm the printer (or type a printer number, then Return). Type today's date and hit Return twice, the second time to confirm one copy. The printer whirs and here's your spreadsheet.

### WATCHING MONEY GROW

This spreadsheet lets you view money growth from two angles: with no withdrawal and with a steady withdrawal each year.

As an example of the first instance, let's say you've inherited \$100,000. After considering several investment options carefully, you've decided on one that pays 10.5 percent with daily compounding. You expect annual inflation to remain at 4 percent, and you don't plan any withdrawals in the immediate future.

Before entering these numbers, turn off automatic recalculation so that AppleWorks doesn't recalculate all formulas each time you type in a new number: Leave the cursor where it is and press OA-V; type **RFM** (for *Recalculate Frequency Manual*).

Now enter these numbers: In D3, type **100000**; in D4, type **10.5**; and in D7, type **0**. Press OA-K to recalculate the spreadsheet.

Take a good look at D6, which shows an effective annual yield of 8.7 percent. With an annual interest rate of 10.5, this clearly doesn't make any sense. What's going on?

The formula in D6 is a *forward reference*—a condition that occurs when a formula needs the result of a formula in a cell below it to do its own calculations. Once recalculation passes by, it doesn't return.

In this spreadsheet, the formula in D6 needs the result of the formula in C13. This means you must recalculate the spreadsheet a second time after you change a number in D3, D4, or D5. So, press OA-K to recalculate again. Cell D6 should now contain 11.07 percent. That's better.

### RETIREMENT AND ESTATE PLANNING

Now suppose you're of retirement age. Your

contributions over the years to retirement plans, including interest, have grown to a tidy sum of \$325,700. You plan to take this money in a lump sum, pay whatever taxes are due, and put most of the remainder into the safest income-producing investments you can find.

You can estimate your life expectancy to be about 15 more years and you want to leave a cash estate of at least \$150,000 to your spouse. After trying a few "what ifs" with the annual withdrawal amount, you've come up with the right mix. You can withdraw \$33,000 initially plus 4 percent more each year to stay even with inflation, and you'll still have \$159,212.18 remaining at the end of 15 years. If you're around longer than that, you'll still have money to live on.

To see how this works, enter these numbers: In D3 type **325700**; and in D7 type **33000**. Press OA-K once, wait for recalculation to stop, and press OA-K again. Now press OA-Down Arrow twice to see the results in the later years.

Here's a way to make "what-if" sessions eas-

ier: Enter a formula in F8 that copies the amount in the target cell. That way you won't have to move the cursor up and down the spreadsheet each time you change a number.

Try it now. Say you want to keep the balance in the 15th year visible. Place the cursor on F8, type a plus sign, move the cursor to F27, and press Return. To identify the amount in F8, move the cursor to E8 and enter **After 15 Years**. If you want to keep the contents of another cell visible instead, simply change the formula.

Next month you'll create a spreadsheet that calculates the cost of borrowing. ■

RUTH K. WITKIN IS A CONSULTANT IN COMPUTER APPLICATIONS FOR BUSINESS. HER PUBLISHED WORKS INCLUDE THE TEMPLATE DISKS AND HANDBOOKS *SUCCESS WITH APPLEWORKS I, II, AND III (INCIDER, IDG COMMUNICATIONS/PETERBOROUGH)*. WRITE TO HER AT 5 PATRICIA STREET, PLAINVIEW NY 11803. ENCLOSE A STAMPED, SELF-ADDRESSED ENVELOPE IF YOU'D LIKE A REPLY.

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# FOLD, STAMP, AND MAIL!

Getting your message across can be fun, creative, and informative—  
from neighborhood groups to business organizations,  
newsletters are making the rounds.

By **CYNTHIA E. FIELD, Ph.D.**

IF *INCIDER'S* DESKTOP-PUBLISHING contest last summer was any indication, everyone, it seems, is on a newsletter kick. And what could be better than a missive you just fold, stamp, and mail? Let's design a two-page newsletter that communicates your special message—and helps keep the U.S. Postal Service in operation.

## ON YOUR MARK

The newsletter I designed for this column has a particular theme: It's an advertisement for a Cape Cod motel. You can adapt a layout like this one to just about any topic, however.

I used "seaside" graphics to support my theme. If you're advertising a toy store, you might insert an illustration of a clown where I placed my "beachgoers." If you belong to a book club, try a picture of a bookshelf or a digitized image of some widely known writer. Run an investment service? You might opt for bulls and bears, or maybe a bar graph.

## GET SET: TEXT AREAS

To arrive at my layout, I worked with Timeworks' **Publish It!**, a powerful yet undemanding page-design program that runs on any 128K Apple II. (A IIe must be enhanced.) Timeworks sells three volumes of attractive, professionally drawn clip art; I used graphics from all three. My motel-newsletter layout

looks simple—and despite its 23 different "objects," it is.

Before you begin, be sure to have a near-empty, formatted data disk so that you can save your newsletter-in-progress frequently. It's especially important to save the basic layout, even before you type the first word into the body of the newsletter. You can then use this basic layout, or template, over and over for successive issues of your publication.

With **Publish It!** loaded, start a New file. Pull down the Special menu and click on Size to Fit. Working on Page 1 (**Figure 1**), select the T-shaped text tool from the tool palette. "Rubber-band" the title area into place (hold down the mouse button and drag) by starting about 1½ inches down from the top edge of the page and about ¼ inch in from the left edge. (Use the on-screen rulers as guides.) Make the title area a little more than an inch high and about seven inches wide.

The next step for this object, and for all others, is to make sure the object is "activated," so that you can edit it or check its specifications. An activated object has little corner "handles"; if your first text area doesn't have handles, select the pointer tool, the first one in the tool palette, and click on the object.

Pull down the Objects menu and click on Show Specifications. Try to make your object's specifications closely match those listed in the accompanying **Table**, the precise specifications of the objects in my motel newsletter.

Referring to the **Table**, use the text tool to create the two columns on Page 1. Next, click on the right-arrow graphic located at the bottom left of the screen under the tool palette. The program will add a second page to the newsletter. On this page, you'll create three more text areas: two columns and the return-address section of the mailing panel.

With the text areas completed, go back to Page 1 by clicking on the left arrow located at the bottom left of the screen under the tool palette. It's a lot like flipping back a page in a book.

## GET SET: GRAPHICS AREAS

Next add the graphics areas where we'll later import ready-made clip art. Page 1 requires three graphics areas: for the pail and shovel, for the beachgoers, and for the bottom border (which reminds me of the "lowers" in a set of dentures).

Click on the graphics tool (it looks like an X-in-a-box) in the tool palette. Following the guidelines in the **Table**, rubber-band the sand-pail graphics area into place.

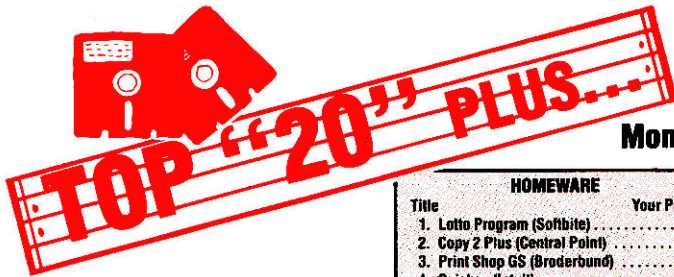
Next, rubber-band the area where the beachgoers will end up "sunning themselves." Finally, create the area for the "lowers."

At this point, the screen should show three blank rectangles representing the three text areas (for the title and two columns). You should also see three shaded rectangles for the three graphics areas.

Take some time to familiarize yourself with **Publish It!**'s Special menu and with switching from one page view to another. I find Size to Fit the best mode for laying out a page. Show Half Size seems best for working with headlines. Show Full Size is best for typing in text, for activating small or thin objects, and for viewing graphics exactly as they'll appear on the printed page.

Flip to Page 2 (**Figure 2**). Rubber-band four graphics areas on this page: one for the "up-▶





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# Flight notes

# 6B

✈ **New IIGS Flight Simulator?** - Flight Simulator II for the Apple II plus, IIe, and IIc computers has been a phenomenal success ever since it was introduced back in 1984. While the program set new standards for graphic animation and simulation realism in its time, FS2 has never really been updated to take advantage of subsequent advances in hardware/software technology and 6502-compatible processing power. Most noticeably, Flight Simulator II has never utilized the special graphics and sound capabilities of the Apple IIGS computer.

Due to a great increase in the number of calls and written requests in recent months, we've begun to consider the possibility of doing a completely revised Flight Simulator II program specifically for the IIGS. This would present several big (but not insurmountable) programming difficulties. Larger questions concern the viability of such a product from a sales and marketing point of view. Would a IIGS-specific version of Flight Simulator pay back the programming time and effort we'd have to invest in its development? Is the IIGS market large enough to support this product? We'd be interested in hearing from you IIGS owners on this subject. Would you like to see us release a Flight Simulator II program specifically for your computer? For those of you who already own an Apple II copy of FS2, would you be interested in upgrading to a IIGS-specific Flight Simulator program? Please feel free to call or write us and let us know your opinions. Your feedback in this case really can make a difference.

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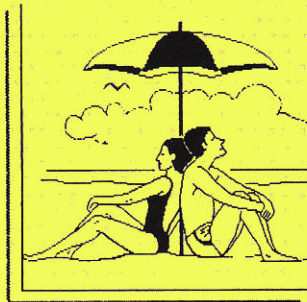
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## William & Mary Condominium Motel



### Welcome to Cape Cod!



Completely renovated, the William & Mary Condominium Motel has already become a favorite with visitors who want to take their vacation right in the heart of world-famous Cape Cod.

Leave your car behind and, admiring the scenery along the way, walk to the nearby ocean beaches.

### Your First Resort

At the William & Mary Condominium Motel, you enjoy quiet privacy in beautifully appointed rooms, with all the amenities and conveniences you would expect to find in large hotels.

Color cable TV, large double bed, sleep sofa, brand new kitchen appliances, full bath, and a private enclosed patio await you.

Stretch out on the comfortable poolside furniture or hop in for a refreshing dip in our heated pool.

Best of all, you can enjoy all this and be within a short walk to Dennisport for shopping, window gazing, or dining at the fine restaurants.

Figure 1. Page 1 of motel newsletter.

pers" (top border), one for the "lowers" (bottom border), one for the sailboat, and another for the stamp graphic. Once again, follow the specifications in the **Table**.

### GO GRAPHICS!

Back on Page 1, click on a graphics area to activate it. Insert the disk containing the clip art you want into the data drive. Pull down the File menu and click on Import Picture.

Select the appropriate picture file, crop the picture, press Return, and voilà—the graphic's imported. If you're not working in Show Full Size mode, change to it now so that you can see the picture.

Follow the same procedure for all other imported artwork. If you want to use artwork

identical to mine, use the On.The.Beach file from the **People, Places & Things** clip-art disk for the pail and shovel and for the beachgoers graphic.

You'll find the sailboat and stamp graphics in the Music and Locks files, respectively, on the **Education Graphics** disk. The upper and lower borders are in the Bullets file on the **Symbols and Slogans** disk.

### GO TEXT!

Most of the layout work is behind you. You're ready to type the newsletter's title. Choose the I-beam from the tool palette and place it inside the title-text area. From the Font menu, select the DesPlaines 36 font and outline style. Type in the title: William & Mary

## General Information

### RESERVATIONS

A deposit of one-third of the total amount is required for stays in excess of three days, of stays of less than three days, a deposit of one day is required. Any balance must be paid upon arrival.

All reservations are subject to receipt of deposit and our confirmation. Our acceptance of reservation is made with the understanding that *you will be responsible for the entire period reserved.*

### CANCELLATIONS

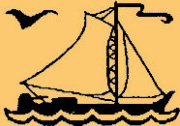
Written cancellations received 14 days before arrival date will receive full refund of deposit. On notice received less than 14 days, deposits will be refunded subject to re-rental of requested reservations if no loss is incurred by us.

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Your accommodations will be ready for occupancy by 2:00 P.M. Check-in time is 2:00 P.M. to 9:30 P.M. Check-out time is by 11:00 A.M.

In consideration of other guests, pets are not permitted; kennels are nearby.

William & Mary Condominium Motel  
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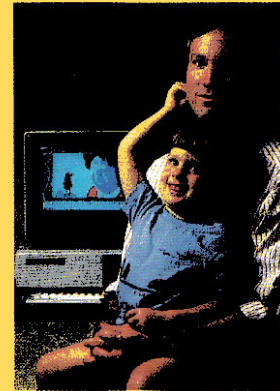
Off Season Rates before June 28 and after Labor Day

9.7% Massachusetts Occupancy Tax must be added to total amounts.

### DIRECTIONS

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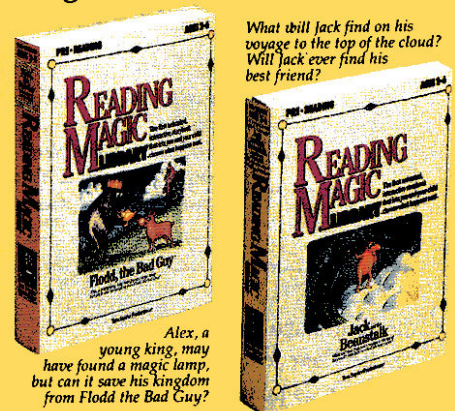
Reading aloud with young children is an essential step in their early education, and

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What will Jack find on his voyage to the top of the cloud? Will Jack ever find his best friend?

Alex, a young king, may have found a magic lamp, but can it save his kingdom from Flodd the Bad Guy?

Figure 2. Page 2 of motel newsletter.

Condominium Motel (or whatever).

Highlight this text by holding down the mouse button and dragging the mouse across each letter until you've selected the whole title. Pull down the Format menu and choose Justification. From the dialog that opens, select Center and turn off the Use Page Standard feature. Your title should center itself on screen.

For the body of this newsletter, I used the 12-point Deerfield font, Publish It!'s default font for text areas. Remember to place the I-beam tool in any text area before you try typing or editing text.

I typed all text in Show Full Size mode. Because each column is less than half a page wide and fits completely on the computer

screen, I didn't run into one common problem: In some modes, the screen constantly shifts and redraws itself.

Don't worry about typing the same text I did. Experiment and type anything you want, even nonsense paragraphs. After all, we're practicing, not taking an exam.

### DRESSING UP

For headlines, such as "Welcome to Cape Cod," highlight the text by dragging the mouse as we did for the title. Click on Next Size (Font menu), then Justification (Format menu) to center each headline as we did for the title above.

To enlarge the first letter of each paragraph on Page 1, highlight the letter, then pull down

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Title: Border	Rnd. Rect.	0.554	1.295	7.388	1.776
Title	Text	0.776	1.479	6.962	1.334
Title:Graphic	Graphic	6.144	2.634	1.415	0.581
Page 1: Column 1	Text	0.468	3.293	3.325	6.977
Page 1: Column 2	Text	4.651	3.362	3.325	7
Beach Scene	Graphic	0.804	4.716	2.605	2.552
Half-frame	Line	0.702, 0.823, 0.823, 0.719	4.79, 4.743, 7.261, 7.4	n/a, n/a, 2.593, 2.588	2.593, 2.563, n/a, n/a
Column Divider	Line	4.206	3.366	n/a	6
Bottom Border	Graphic	1.93	10	4.661	0.313
Page 2: Column 3	Text	0.775	1	3.325	6.1
Page 2: Column 4	Text	4.594	1.055	3.325	6.1
Top Border	Graphic	1.893	0.5	4.659	0.312
Column Divider	Line	4.305	1	n/a	6.1
Dividing Lines: Column 4	Line	4.586, 4.586, 4.586	1.551, 1.552, 4.09	3.331, 3.331, 3.331	n/a, n/a, n/a
Retn. Address	Text	1.644	7.554	4	2
Sailboat	Graphic	0.702	7.856	1.933	1.333
Stamp Locus	Graphic	6.627	7.702	1.2	0.875
Bottom Border	Graphic	1.895	10.368	4.662	0.315

Table. Specifications (in inches) for objects used in newsletter template.

## PRODUCT INFORMATION

**Publish It! 1.1.** \$99.95  
**Publish It! 2.** \$129.95  
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 Reader Service No. 303

the Font menu and click on Next Size. The result? These letters, like those in headlines, appear in 24-point Deerfield.

On Page 2, type subheadings in solid capital letters to make them stand out. Select each and make it boldface (Font menu) for greater emphasis.

In paragraph 2 on Page 2, I underlined and italicized the warning that motel clients are responsible for the entire period they reserve. You can use a similar method to highlight important text.

Now prepare the return address using the 12-point DesPlaines font. Place the I-beam tool in the return-address text area, pull down the

Font menu and click on Select Font. Then type in your return address.

### SHAPING UP

Let's add some finishing touches. Click on the round-rectangle tool (eighth from the top of the palette). Following the specifications in the **Table**, rubber-band a round rectangle into place on top of the title area.

Whoa! The round rectangle *covers up* the title! Let's fix that. Making sure the round rectangle is activated (with those little handles), pull down the Objects menu and click on Move to Back. See? The round rectangle actually becomes a *border* around the title.

You can experiment with borders by using different line weights, pen patterns, or fill patterns (Objects menu). Remember—with object-oriented graphics you play with *layers* of things and can move layers behind or in front of other layers.

### THE LINEUP

Let's finish off Page 1 of our newsletter by adding half a window frame around the graphics area in Column 1 and a vertical divider between Columns 1 and 2. Click on the straight-line tool—the sixth one down in the tool palette.

Rubber-band the lines into place according to the **Table's** guidelines. Don't fret if things don't look perfect so far: Another benefit of object-oriented graphics, and a program like Publish It!, is that you can activate any object at any time and move it or resize it.

Flip to Page 2 and continue with the straight-line tool. You want to add a vertical divider between Columns 3 and 4, two horizontal dividers under *ACCOMMODATIONS*, and one line under the motel's rate schedule.

### RUN THE PRESSES

After putting the finishing touches on your newsletter (and saving each improved version), print it (File menu) via Publish It!'s double-strike mode.

Use this as your "master" and make as many copies as you need. Instead of white copy paper, why not try blue, beige, or even goldenrod?

If you've followed the specifications shown in the **Table**, you'll find the newsletter easy to fold in thirds. Look at the half frame around the beachgoers. See the uppermost of the two horizontal lines that comprise the bottom of the frame? Use this line as a folding guide for the top third of the newsletter. Then fold up the bottom third to reveal the upside-down mailing panel.

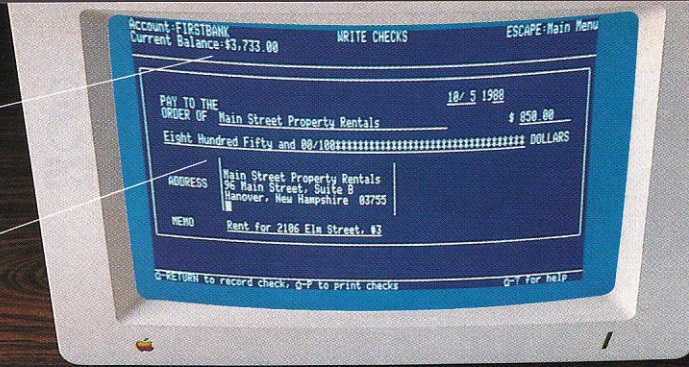
Turn the folded newsletter 180 degrees and seal it with a slip of tape or a staple. Add an address label for the recipient and a stamp for Uncle Sam! □

CYNTHIA E. FIELD IS A CONTRIBUTING EDITOR AND THE AUTHOR OF FIELD TRIP, *INCIDER'S* COLUMN ON EDUCATIONAL SOFTWARE. WRITE TO HER AT 60 BORDER DRIVE, WAKEFIELD, RI 02879. ENCLOSE A SELF-ADDRESSED, STAMPED ENVELOPE IF YOU'D LIKE A PERSONAL REPLY.

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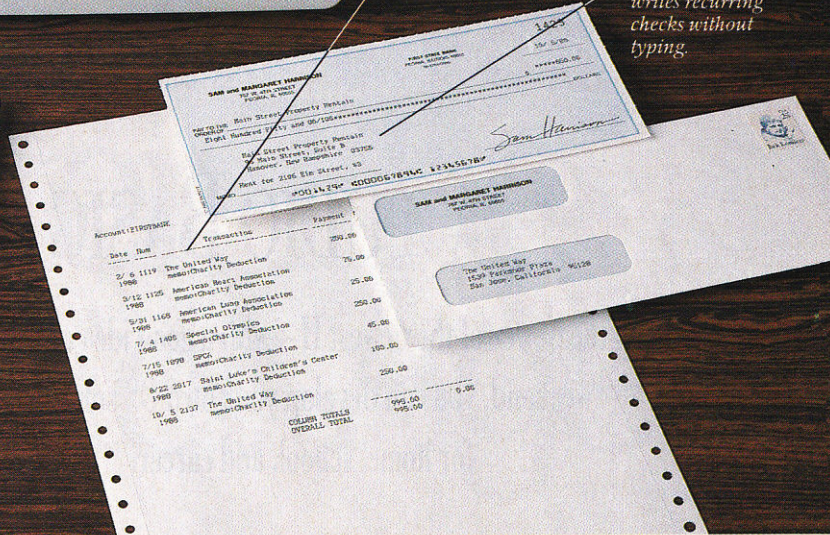
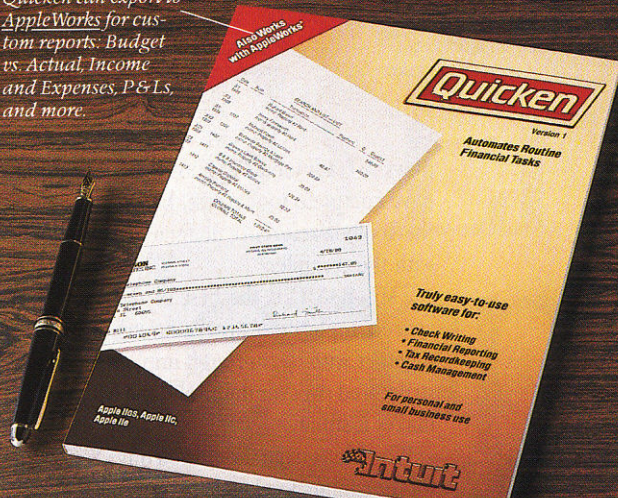


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# S STUDIO BASIC

Tap the power of the newest II—with a good idea and an idle weekend, you can develop your own GS solutions for home, school, and career.

By **JOE ABERNATHY**

UNTIL RECENTLY THE MOST POWERFUL Apple II has also been the most difficult II to program. But don't let the IIGS intimidate you; let it challenge you. Thanks to several third-party language developers, the full creative scope of the IIGS is now available to you as a BASIC programmer.

## DEVELOPMENT PLATFORMS

Before you even write your first line of code, you'll need to determine which compiler to use. Unlike built-in Applesoft, the 8-bit *interpreter* that translates BASIC into machine language line by line, *compilers* translate an entire BASIC program into machine language. Currently, you can choose among four commercial BASICs. (A fifth is scheduled for release this summer.) As you read the following rundown, keep your ultimate programming goals in mind. That should be the determining factor in selecting the compiler that's best for you.

**AC/BASIC.** This is the fastest way to program your IIGS. Intuitive one-word commands replace traditional Toolbox access, making desktop programming readily accessible even to beginners. AC/BASIC is good for any casual custom programming, but lacks the speed or flexibility to produce high-level applications.

Any Microsoft-compatible BASIC compiler can share AC/BASIC source code, so you can adapt a well-designed AC program written on

your IIGS for another brand of computer in just a few hours.

**GS BASIC.** No longer produced or supported, this compiler is still available through the Apple Programmers and Developers Association (APDA) at Apple Computer.

**Micol Advanced BASIC.** The new kid on the block is being touted as a latter-day Applesoft, with Toolbox support and structure added. This compiler, which doesn't require in-depth instruction, lets you merge special GS capabilities with programs written on older IIs.

Micol is the only BASIC that can produce classic desk accessories (CDAs, like the GS control panel), a feature that should be available in every language. It also supports structured programming considerably more advanced than that of other compilers.

Micol BASIC isn't targeted at those who want to produce "genuine" IIGS desktop applications. This capability exists in theory, but not in practice. Although Micol Systems plans significant enhancements, for now you'll have to weigh its comparatively limited abilities against its price, the highest of any IIGS BASIC.

**ORCA/BASIC.** ByteWorks plans to release ORCA/BASIC this summer. You'll be able to use this product with other ORCA languages in a single program. Reportedly, ORCA/BASIC will incorporate a number of other powerful features not yet available in IIGS BASIC. **TML BASIC.** This language produces the fastest programs and has the best manual. It em-

ploys a traditional Toolbox interface: You'll have complete tool access, but you must use the Toolbox reference manuals in conjunction with the compiler.

TML BASIC is the best of the lot for advanced application programming. Its power, together with its thorough implementation of structured programming and the GS Toolbox, makes it shine.

Which language should you buy? Your goals for the coming weekend are only half the story. Consider also what you hope to be doing six months from now, and choose a product that will grow with you.

If you prefer traditional Applesoft and a text-based interface, or want to write CDAs, Micol Advanced BASIC will add the most to your efforts. Choose TML if you want to design a large desktop application. AC is the best for spare-time programmers who want to present their work under the desktop metaphor.

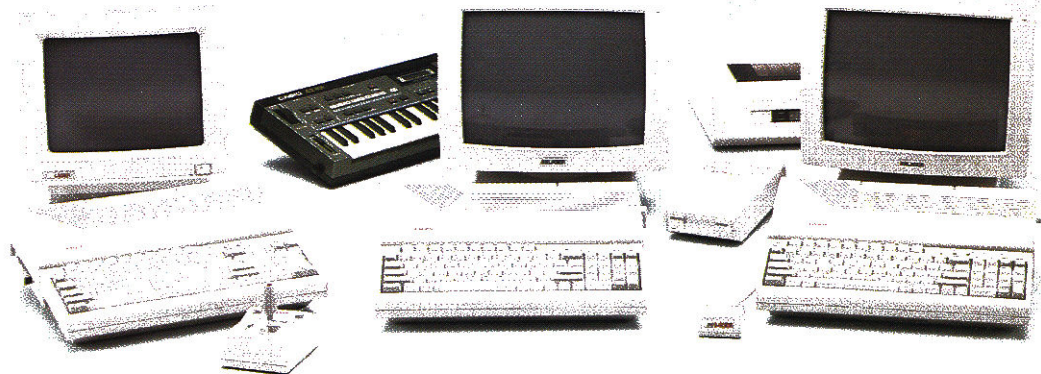
## STRUCTURED PROGRAM DESIGN

A structured program is one you write in terms of "building block" subroutines. Structured programming requires more learning and planning than does simple hacking at the keyboard, but you must embrace it to realize the GS' abilities. Soon, you'll wonder how you got by without it.

The theory behind modular programming is that you can define even a large program as a series of low-level tasks. When you first write a procedure, its simple scope makes it easy to program and debug. You can then use the procedure, if designed properly, in every program that needs its services. You'll eventually develop a personal library of procedures that might handle anything from graphics to database manipulation.

Looking at the big picture, structured design adds elegance to program flow. Procedures replace the GOTO statement, for instance. (Think of them as a latter-day version ►

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of GOSUB.) Eliminating GOTO forces you to use solid program logic, and has the side benefit of making programs self-documenting.

Modular design is based on control structures—language features that let you plan block design and program flow. Control structures are a series of statements in the form of IF/THEN/ELSE, DO/UNTIL, DO/WHILE, and so on. This differs from Applesoft BASIC, in which a program can move only forward in a straight line (line 10, line 20, and so on).

The best way to grasp these structures is to see them in action:

```

IF Online% = Nil% THEN
  PROC DoDialOut (Phone%)
ELSE
  PROC DoLogon (Macro%)
END IF
WHILE NOT EOF (FileIndex%)
  PROC ReadLine
  PROC ShowLine
WEND
DO
  PROC ReadClient
UNTIL ClientNum% = NumClients%
DO
  PROC ReadDataStream
  CharCount% = FN CountEm
WHILE NOT EOL (1)
CASE TestScore% OF
  100 : PROC SetCurve
  90 : PROC DoA
  80 : PROC DoB
  70 : PROC DoC
  60 : PROC DoD
ELSE
  PROC DoFlunk (Student$)
ENDCASE

```

Although each compiler offers a different set of control structures, there will always be a way to make the program do what you want it to. For instance, only Micol BASIC offers the CASE statement, but you can mimic it with the IF/THEN/ELSE of AC and TML.

In the examples above, you can see that procedures, identified by PROC, and functions (procedures that calculate and return a value) are an integral part of structured program flow. Here are examples of what some of the definitions of the fictitious procedures used above might look like:

```
PROC DoDialOut (Phone%)
```

## Listing 1. inCider.Shell.

```

-----
* File: inCider.Shell
* By Joe Abernathy
* (C)1989, Joe Abernathy. All Rights Reserved.
* Compiler: AC/BASIC for the Apple IIcs.
* Compile this shell with the "no standard menus" option selected.
-----
* Portions of this program include material copyrighted (C) by Absoft
* Corp. 1988. Used with permission. All other copyrights acknowledged.
-----
* Customize the ABOUT box:
* $About "inCider Shell, By Joe Abernathy"

GOSUB DoSetup
DoMenu
ON MENU GOSUB menuproc
MENU ON

main:
  GOTO main

-----
* Get global variables
* Construct menu bar
* Init menu event trapping
* Enable menu event trapping

* Event-driven program
* QUIT forces exit

-----
menuproc:
  menunum = MENU(0)
  itemnum = MENU(1)
  IF menunum = 1 THEN
    IF itemnum = 1 THEN
      GOSUB 10
    ELSEIF itemnum = 2 THEN
      GOSUB 20
    ELSEIF itemnum = 3 THEN
      GOSUB 30
    ELSEIF itemnum = 4 THEN
      GOSUB 40
    ELSEIF itemnum = 5 THEN
      GOSUB 50
    ELSEIF itemnum = 6 THEN
      GOSUB 60
    END IF
  END IF
RETURN

-----
* This routine generates the standard new file dialog. It does not
* do anything with the selected file. In a program, you would use the
* which$ value as a parameter to the editing routines in your library.

10:
  f$ = FILES$(0,"DEFAULT.NAM")
  IF f$="" THEN RETURN
  which$ = f$
  MENU ' Should be called after working with the file.

RETURN

-----
* This routine generates the standard get file dialog. It does not
* do anything with the selected file. In a program, you would use the
* which$ value as a parameter to the editing routines in your library.

20:
  f$ = FILES$(1,"DIRTXT")
  IF f$="" THEN RETURN
  which$ = f$
  MENU ' This should actually be called after working with the file.
RETURN

-----
30:
  KillFiles
  MENU
RETURN

-----
* DELETE a file
* sub from inCider.Tools
* Unhighlight menu bar

```

```

PROC InitModem
PROC OffHook
PROC DialIt (Phone%)
END PROC
PROC ReadLine

```

```

LOCAL x$
tmpline$ = ""
WHILE NOT EOL (FileIndex%)
  x$ = GetChar
  tmpline$ = tmpline$ + x$

```



```

-----
40:                                     ' PRINT a file
    f$ = "null"                         ' Force first While loop ..
    WHILE f$ <> ""
        f$ = FILE$(1,"TXTSRC")          ' Generate file dialog box
        IF f$ <> "" THEN                 ' If not Cancel was clicked ..
            PrintFile(f$)              ' SUB from inCider.Tools lib
        END IF
    WEND
    MENU                                 ' Unhighlight menu bar
RETURN

-----

50:                                     ' Type a file to screen
    f$ = "null"                         ' Force first While loop ..
    WHILE f$ <> ""
        f$ = FILE$(1,"TXTSRC")          ' Generate file dialog box
        IF f$ <> "" THEN                 ' If not Cancel clicked ...
            TypeFile(f$)                ' SUB from inCider.Tools ..
        END IF
    WEND
    MENU                                 ' Unhighlight menu bar
RETURN

-----

60:                                     ' QUIT
    MENU                                 ' Un-inverse menu bar
    END

-----

DoSetup:                               ' Set up program globals
    top = 26                             ' Screen dimensions:
    left = 4
    bottom = 197
    right = 618
    WindEx = 2
    flag = 0
    filenum = 1
RETURN

-----

SUB DoMenu
    MENU 1,0,1," File"                   ' Create menu bar
    MENU 1,1,1,"New"                     ' The FILE menu
    MENU 1,2,1,"Edit"                    ' is it for now.
    MENU 1,3,1,"Delete"
    MENU 1,4,1,"Print"
    MENU 1,5,1,"Type"
    MENU 1,6,1,"Quit"
END SUB

-----
' With structured programming, you will develop libraries of routines to
' handle various standard tasks. These must be attached to the program at
' compile time. This is done in AC/BASIC by putting appropriate INCLUDE
' directives at the end of the source code. You should create a data volume
' to hold these libraries. Below, specify for INCIDER.TOOLS the disk volume
' in which you have it installed.

'$INCLUDE "**/ASRC/BASIC/AC/DUMP/INCIDER.TOOLS"

-----
' The End. (inCider.Shell)

```

WEND  
END PROC

In the first instance, the procedure "dial out" is made up of smaller procedures that

instruct the program to "initialize the modem," "take the phone off the hook," and "dial."

To introduce structured programming on the IIGS, the first program you'll write is a shell for AC/BASIC (Listing 1) that shows how

to manage various aspects of the desktop, such as pull-down menus. You can reuse this shell in subsequent programs. In addition, I'll present a library of low-level software tools (Listing 2) you'll want to use in most of the programs you write later.

In coming issues, I'll use the shell as a platform on which you'll implement dialogs, user input/output, data management, graphics, sound, and more.

What if you're using a different compiler? If it's TML BASIC, send a self-addressed, stamped envelope to *inCider* and you'll receive free of charge the shell implemented in TML BASIC. (It's too lengthy to print here.) You can download the shells from *inCider's* BBS (603-924-9801), and you can also refer to the product information listed at the end of the column. Because Microl Advanced BASIC isn't oriented toward desktop programming, no shell is available for it.

I'll discuss each tool in the library individually in a moment, but you also can learn from examining the program as a whole:

- Each procedure handles a narrowly defined task you'll probably be able to use in a later program. Logical branching replaces the GOTO statement for directing program flow. This makes debugging easier, and lends a self-documenting quality to the program.
- Mnemonic variable names, as opposed to abstract numbers and letters, make your intent much clearer. Consistent indentation of inner loops and control structures makes the program easy to read.
- Procedures included in the *inCider.Tools* library are the low-level routines most applications need. On a more advanced level, you'll want to build libraries in a topical fashion—for instance, sound, graphics, or input/output.
- In the shell, notice that subroutines 40 and 50, which correspond to the menu choices Print and Type, must provide the parameters (the filename) the program will print or display. *PrintFile* and *TypeFile* are essentially dumb, but this quality makes them suitable for a wide variety of applications. Study their implementation in *inCider.Tools* with this in mind. Compare to *KillFiles*.
- In the Subroutine *DoSetup*, I maintain a list of global variables. Because BASIC has no formal variable-declaration feature as Pascal does, it's a good idea to adopt this convention to keep your global variables straight, even ►

though you don't need to.

●To add a capability to the shell, add a line to the DoMenu subroutine, a corresponding line in the MENUPROC routine, and a label to do the actual work. The ON MENU directive makes this program design possible; it activates event polling in which the system will automatically handle any selections made from the pull-down menus. Your manual explains this at length, but all you really need to know is how to make it work. No other compiler uses this methodology.

●The last line of inCider.Shell uses the \$INCLUDE directive to tie the inCider.Tools library to the main program. Note that this directive is written just as shown, including the REMark character.

●The inCider.Tools library is a set of utilities that'll be some of the first building blocks you'll need. When designing your own procedures, remember to keep things simple, and document each procedure thoroughly so that you don't have to wonder how to call it or modify it later.

**Listing 2. inCider.Tools.**

```

'-----
' File : inCider.Tools
' (C)1989, Joe Abernathy. All Rights Reserved.
' Compiler : AC/BASIC for the Apple IIgs.
'-----
' This library requires global variables declared in inCider.Shell.
'-----

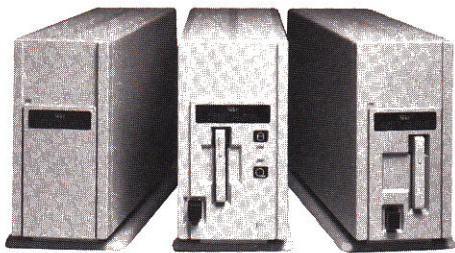
' Procedure PrintFile -- Print a file.
' You must pass name of file to print in thefile$.

SUB PrintFile(thefile$)
  SHARED FileNum          ' Global var
  FileNum = FileNum + 1
  OPEN thefile$ FOR INPUT AS FileNum          ' Open file passed in thefile$
  OPEN "LPT1:PROMPT" FOR OUTPUT AS FileNum + 1 ' Open printer
  WHILE NOT EOF(FileNum)
    LINE INPUT #FileNum, a$
    PRINT #FileNum + 1, a$                    ' Print line from thefile$
  WEND
  CLOSE #FileNum + 1
  CLOSE #FileNum
  FileNum = FileNum - 1
END SUB

```

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# The PRAISES.



It seems like it happens year after year. The leading publications to the Apple II marketplace, in product reviews and round-ups, single out First Class Peripherals and *The Sider* for special praise.

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INCIDER MAGAZINE, DECEMBER 1988

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```

'-----
' Procedure TypeFile -- Show a file on the screen.
' You must pass name of file to type in myfile$.

SUB TypeFile(myfile$)
  SHARED FileNum
  FileNum = FileNum + 1
  DoWind(1)
  OPEN myfile$ FOR INPUT AS FileNum
  WHILE NOT EOF(FileNum)
    LINE INPUT #FileNum, a$
    PRINT a$
  WEND
  CLOSE #FileNum
  FileNum = FileNum - 1
  DitchWind
END SUB

'-----
' Procedure KillFiles -- Kill one or more files, using std dialog.

SUB KillFiles
  f$ = "null"
  WHILE f$ <> ""
    f$ = FILE$(1)
    IF f$ <> "" THEN
      KILL f$
    END IF
  WEND
END SUB

```

Continued

## INDIVIDUAL TOOLS

**PrintFile (thefile\$).** This procedure prints a file to the installed printer. It requires that you pass the name of a file as its parameter. In my example, I get the filename from the standard select-file dialog, then repeatedly call PrintFile until you select the Cancel button. No error checking is performed to ensure that a printer is on line.

This procedure uses the "device name" LPT1 to send output to a printer in slot 1. You can change the device name to SCRN, KYBD, COM1, or CLIP to send a file to the screen, keyboard, any serial device, or the clipboard. COM1 and LPT1 use the modem and printer ports on the back of the GS.

**TypeFile (myfile\$).** This procedure prints a file to the screen display. It works like PrintFile, requiring that you pass it the filename to type.

**KillFiles.** KillFiles generates its own standard file dialog, and kills any number of files until you select Cancel. I wrote it this way to provide

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# The PRICES.

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Continued

```

'-----
' Procedure MsgDialog(msg$,style%) -- Generate dialog with a text string,
' and one or two buttons depending on
' the value of style%. When this proc
' detects OK, it ends. If Cancel was
' clicked, the val cancel% is set to 1.
'-----
SUB MsgDialog(msg$,style%) SHARED
cancel% = 0
DoWind
LOCATE 2,2
PRINT msg$
BUTTON 50,1,"OK", (left+20,bottom-160)-(left+120,bottom-145),1
IF style% = 2 THEN
    BUTTON 51,1,"Cancel", (left+135,bottom-160)-(left+235,bottom-145),1
END IF
WHILE DIALOG (0)=0 ' Clear dialog queue ...
WEND
WHILE DIALOG(0)<>1 ' Wait for real event ...
WEND
x = DIALOG(1) ' Read the event
IF x = 51 THEN cancel% = 1
END SUB
'-----
' Procedure DoWind(kind%) -- Open a window.
' kind% specifies the style number.
'-----
SUB DoWind(kind%) SHARED
WindEx = WindEx + 1
WINDOW WindEx,"", (left,top)-(right,bottom),kind%
END SUB
'-----
' Procedure DoWind -- Generate a window for use with dialogs.
'-----
SUB DoWind SHARED
WindEx = WindEx + 1
WINDOW WindEx,"", (left-5,top+10)-(right+5,bottom-100),2
END SUB
'-----
' Procedure DitchWind -- Close a previously opened window, decrement the
' window counter variable.
'-----
SUB DitchWind SHARED
WINDOW CLOSE WindEx
WindEx = WindEx - 1
END SUB
'-----

```

something against which to weigh the design of PrintFile and TypeFile.

**MsgDialog (msg\$,style%).** Generates a standard dialog for your communication. Required parameters are a text string—the message you want to display—and the style of dialog. The procedure generates an “OK” button automatically. If style% has a value of 2, MsgDialog will also generate a “Cancel” button.

If you specify and click on the Cancel button, MsgDialog will set the value of the global variable cancel% to 1, as a way of communicating with the calling routine. You could use this value for a test, as in the following:

```

IF NOT cancel% THEN
    SortList
    ShowList
    CloseFiles
ELSE
    CloseFiles
END IF

```

**DoWind.** This procedure opens a full-screen document window with the screen dimensions established in DoSetUp (in the inCider.Shell). It also increments the global-window counter variable WindEx.

The reason for using global screen dimensions is portability. Screen size is one of the key differences between computers that support AC/BASIC-compatible compilers. By limiting hard-wired dimensions to one occurrence in the program, it becomes easier to adapt the program.

**DoWind.** This procedure works like DoWind, but generates a window suitable for a dialog box.

**DitchWind.** This tool closes the most recently opened window, then decrements the window counter.

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JOE ABERNATHY IS A PRODUCTION EDITOR AND OCCASIONAL ARTS CRITIC AT THE HOUSTON CHRONICLE. HE'S ALSO A CERTIFIED APPLE DEVELOPER AND THE AUTHOR OR COAUTHOR OF EIGHT APPLE II PROGRAMS. WRITE TO HIM AT P.O. BOX 66046, HOUSTON, TX 77266-6046.

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Rating: ♦ ♦ ♦ ♦

The EasyDrive hard-disk management system stands alone as a gateway for novices into the complex world of mass-storage devices and the ProDOS operating system. Quality Computers has succeeded in creating a product that combines the features of the program selector ProSel with the ease of use of the GS Finder—and wrapping the whole thing in a package uniquely accessible to beginners.

Quality's philosophy of easy operation begins with the documentation—a booklet introducing ProDOS, written from the viewpoint of teaching the basics of running a hard drive. Combined with an installation program on disk, the manual lets even a complete beginner get up and running on a hard drive within minutes. EasyDrive works.

#### TEST DRIVE

To provide some benchmarks for comparison, I chose Glen Bredon's popular ProSel for the IIe/IIc and Apple's GS Finder, the most

widely used methods of hard-drive management. ProSel is fastest by a narrow margin and includes the widest variety of features; the Finder running under the new GS/OS (Graphics and Sound Operating System) looks best; but EasyDrive is tops in accessibility.

Desk managers are usually judged by how efficiently and easily they get the job done. I compared EasyDrive, ProSel, and the Finder on an Apple IIGS with 1.75 megabytes of RAM (random-access memory) and a 64.9-megabyte SCSI (small-computer-systems interface) hard drive from CMS. The drive was partitioned into two 32-megabyte volumes, with a total of 26 megabytes occupied. One 3½- and one 5¼-inch disk drive were attached to the IIGS desktop bus (the polling of which affects the Finder's speed).

I measured the amount of time required with each of the three desk managers to launch and return to the desktop from two ProDOS 8 applications (the game LifeLike and AppleWorks) and two ProDOS 16 applications (MultiScribe GS and the ORCA/M assembler); the results appear in the accompanying **Table**.

Times for launching AppleWorks may appear slow, but my copy had the full TimeOut series of enhancements from Beagle Bros installed. Also, times for returning to the Finder vary depending on how you use the GS/OS disk cache. GS/OS seems to be the most efficient if you use more GS software than IIe/IIc software; timing differences between ProSel and EasyDrive are too small to really matter.

Something more difficult to measure than launching speed, but just as important, however, is how intuitively each program handles desk management itself. With EasyDrive and ProSel you can build an applications menu by hand or page through a directory tree as you look for executable files. The Finder gives you the Mac-style idiom in which you click open nested folders to get to what you want. Is it simpler to build those applications menus the first time or to flip through folders every time? That depends on your preference, your level of experience, and whether or not you run GS software. Comparing the two third-party products, however, EasyDrive's applications menu is superior to ProSel's. It's more convenient to use and easier to maintain.

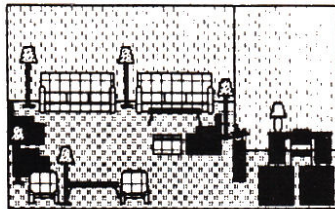
#### EASY RIDER

That leaves accessibility. Many GS owners may consider the Finder the most fun of the

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three, but its initial setup is touchy and complex—even with the Mac-style installation routines introduced with the advent of GS/OS. ProSel is downright combative. EasyDrive is the only package to fully consider ease of setup, so it wins in that category. It's the fastest, easiest way to bring up a hard drive.

### THE COMPETITION

But there's more to managing a hard drive than simply launching software. The GS Finder pampers you with visuals and ProSel empowers you with features, so EasyDrive is picking on two strong competitors. Both ProSel and the Finder are entrenched. Both have been on the market for years, and both have improved considerably since their initial releases. EasyDrive is the new kid on the block. After you've gained some experience, you may wish for more sophisticated capabilities (as promised in EasyDrive updates), but in the meantime it relies on being a great place to start.

### GROWING PAINS

Certain functions are notable for their absence in the first version of EasyDrive. In comparison, ProSel lets you exhume deleted files, compare files, fix files, sort a directory, move files, edit file attributes, and format a device; it also includes a nibble editor, disk-usage mapping, and startup scripting. The Finder offers advanced features such as caching and a universally accessible clipboard, but the Finder also lacks some of ProSel's functions—most notably a file fixer and a disk optimizer.

Both EasyDrive and ProSel include facilities for backing up your hard drive, and both work well. You can back up and restore RAM to your hard drive, back up to floppies, or back up to a file on your hard drive. Apple also produces an efficient backup utility, but you have to purchase it separately.

### IMPROVEMENTS

To summarize, ProSel has the most of what a hard-drive owner needs. EasyDrive includes the basic features you'll need and will offer more in future releases. The Finder under GS/OS is vastly improved and is unique in its interface. Good software gets to be great software by going through a maturation process based on user feedback and the addition and enhancement of abilities. That's where EasyDrive is.

The first version of EasyDrive I looked at

had two apparent bugs: The Rename option was troubled, and EasyDrive sometimes stumbled when returning from ProDOS 16 applications, forcing a hard reboot. The user inter-

function has been enhanced and is now called EasyAdd, with access to multiple volumes and menus; a disk optimizer has been added to cut file fragmentation and increase search

		EasyDrive	ProSel	Finder
		L/R	L/R	L/R
ProDOS 8	LifeLike	5/5	3/1	9/29
	AppleWorks	14/5	13/1	18/29
ProDOS 16	MultiScribe GS	29/10	27/8	24/14
	ORCAM	14/15	12/12	8/12

**Table.** Benchmark comparisons for three hard-drive management programs; all times in seconds. L = launch time; R = return to desktop.

face also contained two flaws: Mouse support was incomplete, making directory-tree walking time-consuming, and EasyDrive had to be installed physically on each device it was going to manage, including individual floppy disks.

The latest version (1.5) sports a number of additions and improvements: You can now store EasyDrive files in any subdirectory; the menu system has been revised; the P-Add

speed; and the P-Shooter function has been updated and is now called Tree Surgeon, with an 80-column directory listing that lets you see all fields in a catalog listing.

### LOOKING AHEAD

The new menu system lets you use multiple menu panels to organize your programs. Standard menu items are now stored in pull-down ▶

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menus. A new menu item, Launch, lets you execute a program via its pathname if you don't want to add it to the menu. The menu can now execute selections from multiple volumes, and you can make selections with a single keypress. EasyDrive's faster, too.

Quality is rewriting the EasyDrive documentation, but there's nothing wrong with the current manual. I asked a beginner who had no experience with hard drives or ProDOS to read it, and she acquired a full working knowl-

edge of both within a half hour.

Apple users win when the state of the art advances, and that's what's happening with hard-drive management. Quality Computers, which also sells hard disks, identified a legitimate need for friendly, full-featured desk-management software when it noticed that two or three drives were returned each month by owners who were frustrated by their difficulty. Those users' needs inspired EasyDrive and are shaping its future direction.

Walker Archer, one of EasyDrive's programmers at Quality, says he plans to develop a 16-bit version for the GS that will use the graphics desktop tools, but remain text based (resembling EasyDrive 1.5 more than the Finder). Archer is also studying the practicality of a disk-caching scheme similar to GS/OS'. With GS/OS you can set aside part of your RAM card as a *cache*, which then remembers what the computer read most recently from the hard drive and gets it from fast cache memory the next time the machine needs it. This speeds up the Finder's windowing by two to three times over uncached ProDOS 16. That approach could likely be made to work just as well for a ProDOS 8 desk manager.

Other features in the works include most of the ProSel options lacking in earlier versions of EasyDrive, with the exception of some of the more technical items such as nibble editing and disk-usage mapping. EasyDrive disk updates should be priced at approximately \$5; updates requiring a new manual will be slightly higher.

## MANAGEMENT STYLE

The EasyDrive hard-disk management system makes a strong contribution. It's the software of choice if you're new to hard drives. Experienced users may also find EasyDrive the most convenient desk manager available for the Apple IIe and IIc. Quality Computers plans to do battle with the Finder and the mouse interface championed by Apple for the GS and the Mac. But EasyDrive's real strength right now is serving as a way to get started and as a hard-drive manager that will run on a bare-bones IIe. There's a trick you'll never see the Finder do.

## THE VERDICT

Is EasyDrive worth the money? The answer is a qualified yes. It's the most expensive of the three, but it's the only one braving the mainstream market. The Finder is free from Apple dealers, who provide mixed support. ProSel costs \$39.95; you print the documentation from the back of the disk and receive support if you have a GENie account. EasyDrive is \$69.95, but somebody answers the phone, and somebody cares about its future. EasyDrive fills a unique niche. For a beginner, it's the best choice. □

**Joe Abernathy**  
Houston, TX

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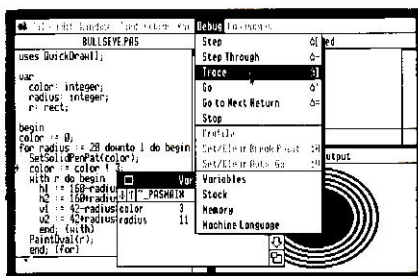
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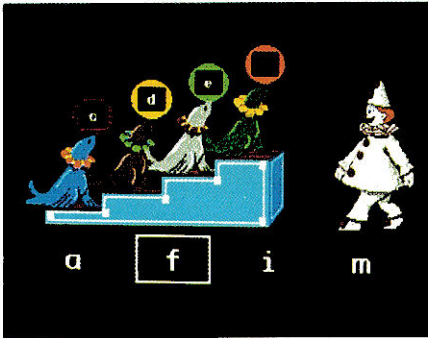
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Rating: ♦ ♦ ♦ ♦

**R**eading never sounded so good. If you're looking for educational software to teach reading-readiness skills to children aged 4-7, take a look at Davidson's new Talking Reading and Me—and listen.

### SPEAK UP

Speech, graphics, and price differences aside, the GS version of Reading and Me is virtually identical to the older, 8-bit edition. It offers the same sequence of 12 activities to give youngsters practice in four areas—Readiness, Alphabet, Phonics, and Words. As kids work their way through these exercises, Reading and Me encourages them to classify objects, recognize letters, associate sounds, learn words, and read simple sentences.

The look and feel of the Davidson "early-learner interface" makes program operation almost intuitive. The main menu in Reading and Me shows four colorful icons representing different subject areas. Children choose a subject by selecting an icon—they can either point and click with a mouse or use the arrow keys and the spacebar.

Once a child picks a subject area, the program presents a colorful submenu offering three sequenced activities. It isn't necessary to do them in order, although each one builds on previously learned skills. The computer asks a preset number of questions; after the

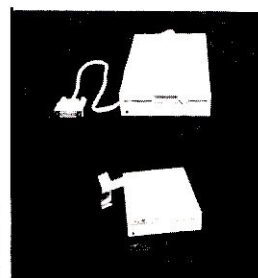
child answers them, the program will automatically return to the submenu. Children may also quit an activity at any time by pressing Escape.

Talking Reading and Me features colorful animated graphics similar to the older version's, rewarding correct answers with musical reinforcement and encouraging messages. When children complete an activity, you can print a personalized certificate with a picture for them to color. (Printing is the only oper-

ation for which you'll need the manual. It's identical to the 8-bit edition, except for a two-page GS addendum.)

### CLOWN ANTICS

Even the youngest preschoolers will enjoy the activities in the Readiness and Alphabet modules. Readiness has kids matching pairs of objects, picking out a clown who doesn't match three others, and classifying four objects to select the one that doesn't belong. Alphabet



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lets children recognize target letters, match upper- and lowercase letters, and practice sequences.

Correct answers are rewarded with positive sounds, musical reinforcement, and animated clown antics. Colorful bow ties jiggle, ears wiggle, and eyes blink. If a child answers incorrectly, he or she will see a "try again" message. After two incorrect attempts, the program gives the child the correct answer. It might have been better to give hints rather than answers; that way a child would have to figure out the solution instead of letting the program do the work.

Older children will enjoy the challenges presented in the Phonics and Words modules. Phonics encourages beginning readers to associate words with their sounds. Children view a picture in Phonics and supply the missing initial consonant for its word form, supply the missing ending consonant, and match rhyming words.

Words emphasizes words and sentences. To complete Words—the most difficult subject area—children must be able to read. The first activity presents a sentence with one word in picture format. Children must choose its word form from the four options at the bottom of the screen. Game 2 requires youngsters to select the correct picture for an underlined word in a sentence. Game 3 really polishes a

child's reading skills, because it consists of straight text with no pictures at all. To succeed, children must choose the correct word from four options to complete the target sentence.

The program rewards correct answers with personalized congratulatory messages—off-beat animated clowns engaged in humorous activities—on screen and spoken.

### SOUND ADVICE

Does talking software help your child read better or learn to read faster? In the long run, perhaps not. But for now, you'll find that talking software adds a new dimension to a young child's computer experience. The human voice personalizes learning.

Talking Reading and Me can speak in one of two voices. Children click on a picture of an adult woman or a young child. For speech above a whisper, though, you'll have to go to the GS control panel and turn up the volume almost to the maximum.

Unfortunately, with the sound set that high, the musical reinforcements are somewhat tinny and the speaker tends to warble. Speech synthesis at this level still has some kinks, too—the voice is rather crackly and some letters aren't pronounced accurately.

Despite these slight deficiencies, Talking Reading and Me has some advantages that are lacking in its nontalking cousin. Hearing a

human-like voice speak numbers, letters, and words is more than just high-tech entertainment: Digitized speech attracts children to the computer because it makes the presentation friendlier. When directions are spoken, youngsters can learn on their own.

Moreover, using speech as a teaching tool involves another of the child's senses in the learning process. As a result, kids may begin to associate spoken sounds with their written counterparts more quickly. And because the talking version minimizes the need for adult participation, it may also encourage children to be more independent at the computer.

### SOUNDS EASY

Talking software for the GS is growing more popular as developers start to take advantage of the Ensoniq chip—there's no need to purchase additional hardware. Talking Reading and Me uses this sophisticated technology while simultaneously encouraging a positive attitude toward reading.

Speech software is nice to have, but it isn't crucial. Children enjoy playing games, and they can build fundamental reading skills with either version of Reading and Me. It's a challenging, fun-filled introduction to the most important basic skill they'll ever learn. □

**Carol S. Holzberg**  
Shutesbury, MA



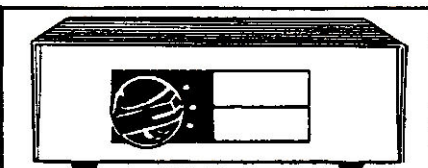
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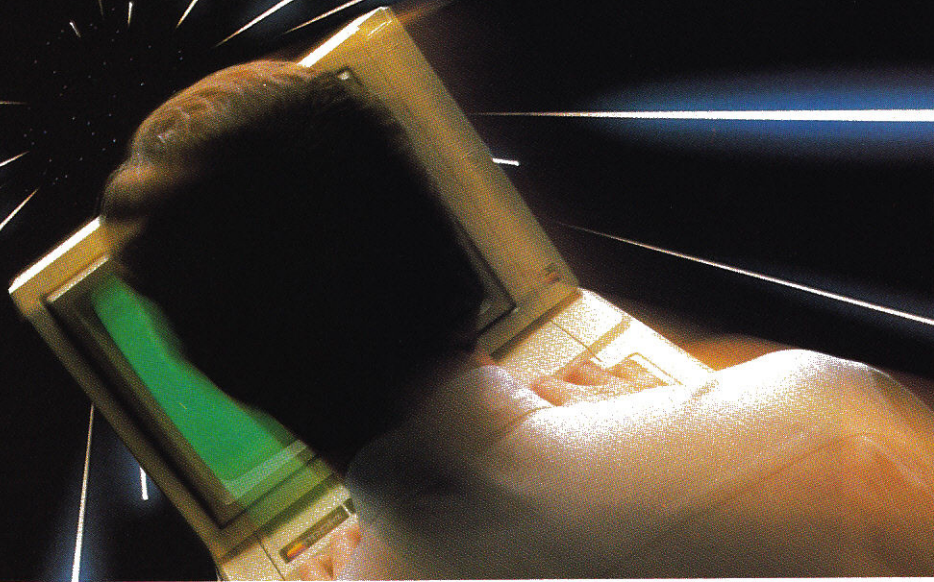
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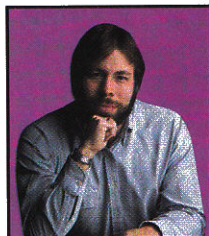
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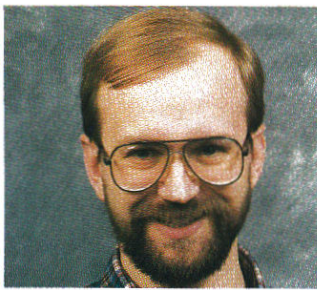
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# AppleFest'89 Boston

PB



# MACE ON GAMES

# I N THE MOOD

By **SCOTT MACE**

**E**ven more noteworthy than the graphics or sound is the way these games make you approach puzzle solving.

TREAT YOURSELF TO ADVENTURE, MYSTERY, and fantasy, all at the click of a mouse. Three popular Macintosh titles are now ready for the Apple IIGS—and your enjoyment. ICOM Simulations' **Uninvited** (\$44.95), **Deja Vu** (\$49.95), and **Shadowgate** (\$49.95, distributed by Mindscape, 3444 Dundee Road, Northbrook, IL 60062, 312-480-7667, 800-221-9884) use quite untraditional sights and sounds to explore traditional adventure-game subjects.

### FILMS NOIRS

To get things rolling in *Uninvited*, you have to push open the door of your crashed car before it explodes. The digitized sound of your car blowing sky-high follows soon after, then a crash of thunder as lightning flashes across the sky.

for objects you can use to dispel these demons and continue your journey. Anything you can click on probably contains clues. Of course, you'll come across a number of dead ends and sudden demises, as well.

Hard-boiled detective work is the hallmark of *Déjà Vu*, which begins in the restroom of a seedy bar. Murderous muggers roam the city streets and alligators infest the sewers below. Hidden in the pockets of your trenchcoat are several objects you'll need along the way—including a gun.

*Déjà Vu* also includes some nice cinematic features, such as a gunshot shattering a lock or a window. The plot's a bit weak, but in games like this (as in many 1940s movies) atmosphere is everything. Each detail is carefully considered, right down to the police sirens and the suspicious looks of the newsstand vendor.

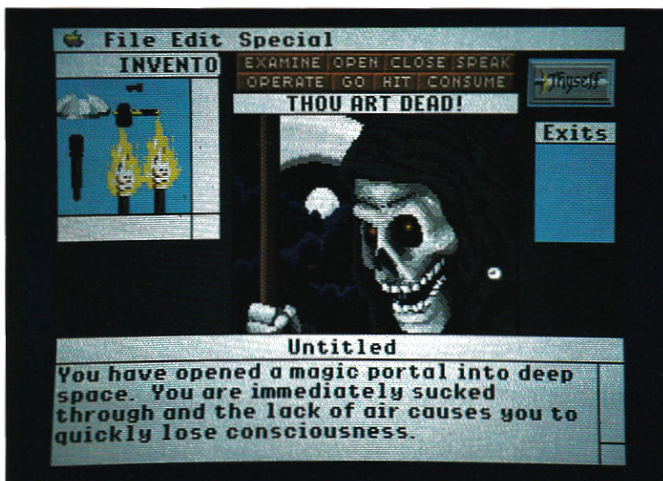
*Shadowgate* is bound to be the most popular of the three games: It incorporates the ICOM interface into the crowd-pleasing fantasy role-playing genre. Here's a tip: While exploring the vast fortress of *Shadowgate*, you'll have to hoard your supply of torches carefully. Once you run out, the entire scene fades to black and you're lost. Watch out for those bottomless pits, too.

### FRIENDLY PERSUASION

If you thought *Dungeon Master* (see "Deeper and Darker Dungeons Galore," February 1989, p. 94) was the only way to do a totally interactive mouse-based game, take a look at these ICOM adventures; you'll marvel at how friendly the ICOM trilogy is. Just point and click to select objects and activate commands.

This simplicity is partly the result of basing the programming on GS/OS—which was crucial to making the games run well on the IIGS. Note that you'll need the latest ROM—version 01—or you'll get an error message saying the programs were unable to load. GS/OS comes on the game disks, so don't worry if your dealer doesn't have GS/OS when you go in to upgrade your IIGS ROM.

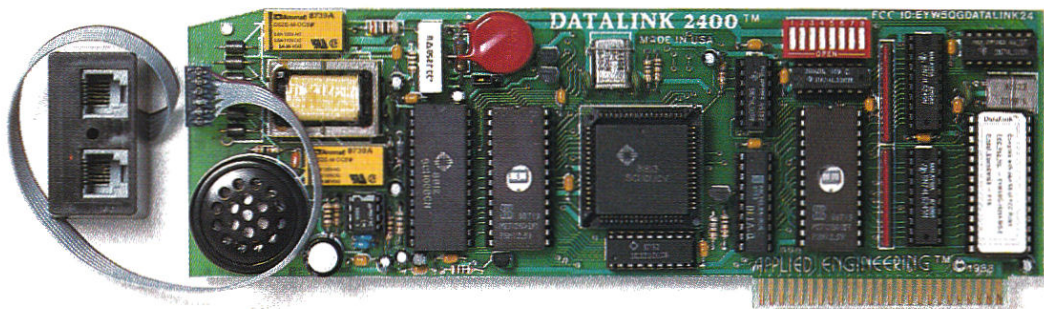
You can scroll through the windows in *Uninvited*, ▶



**New depths in fantasy role playing: Shadowgate's eerie setting combines with the GS' realistic sound and graphics in an outstanding mystery adventure, guaranteed to give you the creeps.**

That's just the beginning. Next you come upon a seemingly empty mansion—*Uninvited* has a "haunted house" feel to it as you creep through room after room. Sinister beings, ghosts, and gremlins lurk around every corner. You'll soon find yourself casting about in closets and dresser drawers

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Déjà Vu, and Shadowgate to store up plenty of objects in your inventory. You can resize the windows or zoom them to full-screen size. You can also "clean up" your objects (arrange them in order from smallest to largest) or "mess them up" (a humorous command that scatters the items in a window randomly).

**BEYOND WORDS**

None of the games is completely nonverbal. The characters in each adventure communicate with you via a scrolling text window at the bottom of the screen. You can speak with them by typing short messages into a pop-up window invoked by the speak command.

You can also activate word "buttons" in each game with a point and click. After you select an object, you can Examine, Open,

Close, Hit, or Consume that object when appropriate. You can also Operate an object, such as a key in a lock. You can choose to leave a room through a visible exit or via the exits window, showing the direction of each choice. Click on an exit in the window, then click on Go to leave; double-click on the exit to go through it immediately.

**SOUND EFFECTS**

ICOM has taken extra care to use the IIGS' sound capabilities in these games. In Déjà Vu, Rudy Vallee chirps *Winchester Cathedral* from an old Victrola. In Shadowgate, the sound of breaking glass is a realistic digital recording. While the sounds aren't key to game play, they add authenticity and set new expectations for IIGS entertainment experiences—careful attention to detail.



**Déjà Vu brings the hard-boiled detective novel to the colorful GS screen. From seedy bars to back alleys to the local casino, atmosphere is all.**

Even more noteworthy than the graphics or sound is the way these games make you approach puzzle solving. Rather than type queries or move rapidly from room to room, you linger. You'll have to touch every object and every surface, never knowing when you might find a loose stone or some other slight indication of a clue. Games of this type are much subtler than those of earlier generations.

Uninvited, Déjà Vu, and Shadowgate anticipate the day we'll interact with video images to select objects such as cars, buildings, people, or some famous bit of footage to affect the outcome. These games certainly won't replace traditional text or map-based games, but they

herald the arrival of a new genre—games that are friendly beyond words. □

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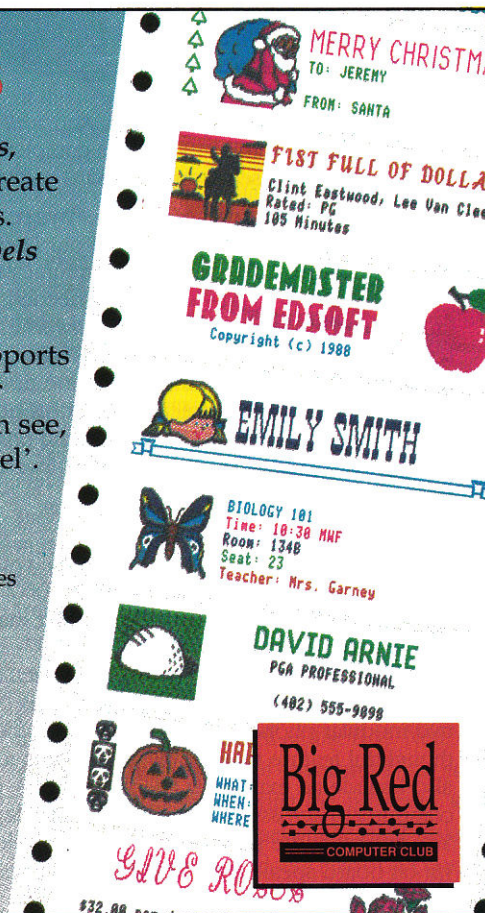
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# Æ Update . . .

Applied Engineering's new 3.5 Drive is currently undergoing FCC certification and will be released soon. The drive is fully compatible with the Apple 3.5 Drive to work with the IIGS, Macintosh series and computers equipped with AE's PC Transporter. Final retail price has yet to be established, but insiders claim AE's strategy is to put a high quality drive on the market at a "stunningly" low price.

TransWarp GS™ is now shipping. The Transwarp GS accelerator for the Apple IIGS began shipping in February. The accelerator increases processing speed from 2.6 MHz in the fast mode to 7 MHz in TransWarp mode. TransWarp GS occupies slot 3 without sacrificing the slot's dedicated function. TransWarp GS is priced at \$399, and is available now.

TransWarp™ is chosen All-Time Best Accelerator. RamFactor™ is All-Time Best RAM card. AE's TransWarp accelerator for the Apple Iie and II+ has been chosen the all time best accelerator by *inCider* Magazine. RamFactor has been selected as the all time best RAM card. The awards were based on a polling of *inCider's* editors and contributors.

GS-RAM Ultra™ AE's new IIGS memory card, is now available. GS-RAM Ultra incorporates a new DRAM technology utilizing 256K x 4 chips. One DRAM set consists of 2 individual 256K x 4 chips totaling 256K. The card is user-expandable in 256K increments to a total of 4 megabytes. GS-RAM Ultra also contains ROM sockets that are designed to accommodate future applications, as they become available.

Trade in your Apple IIGS memory card. For a limited time, an Apple IIGS memory card can be sent directly to Applied Engineering for a cash trade-in toward the purchase of an Applied Engineering IIGS memory card. Ask your dealer or call Applied Engineering for details.

Applied Engineering now offers low profile MacRAMs™ for the Macintosh Plus, SE and II. The new lower profile SIMM memory module assures proper clearance for all Macintosh peripheral cards and internal devices. Applied Engineering still offers medium height MacRAMs (compatible with most peripheral cards) at a slightly lower price.

Applied Engineering is shipping a newly designed 5.25 Apple II drive. The new drive includes a DB-19 connector for direct connection to the external drive port on the Apple IIc, IIc Plus, or IIGS. A 20 pin adapter cable is also included for direct connection to the drive port on the Iie or II+ Disk II-style controller. The new drive with adapter sells for \$149 and is covered by a 1 year warranty.



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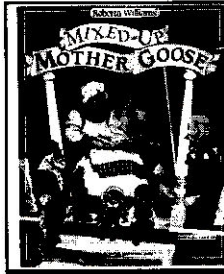
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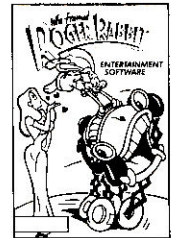
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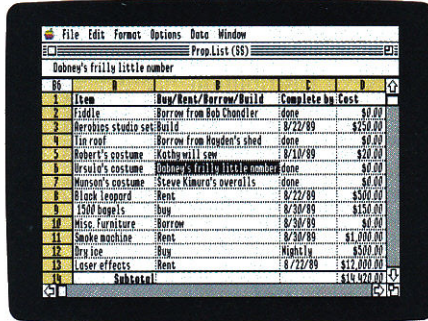
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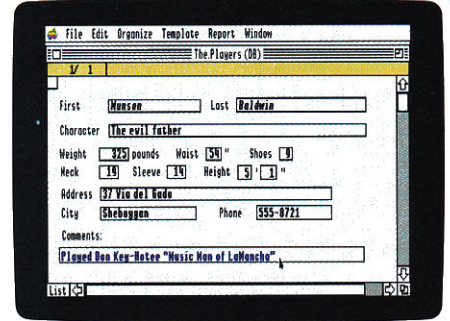
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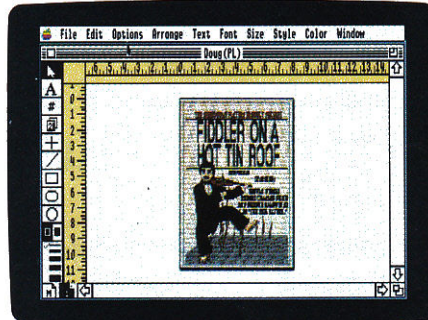
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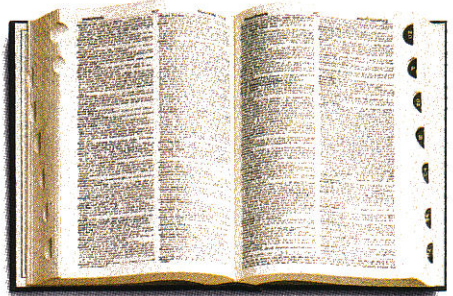
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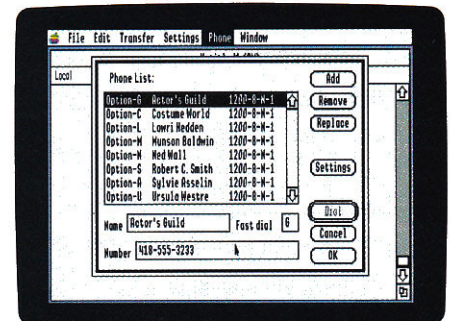
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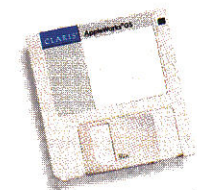
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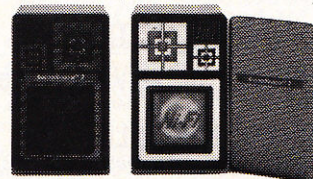
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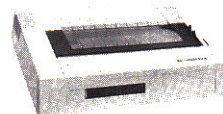
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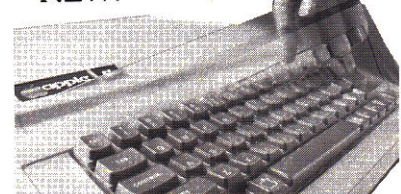
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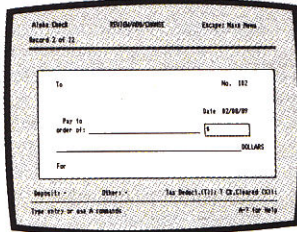
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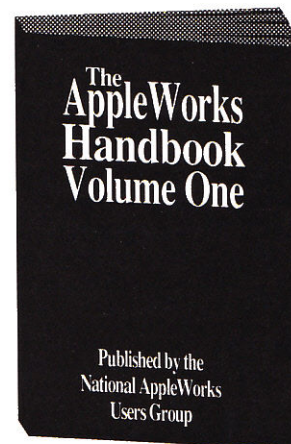
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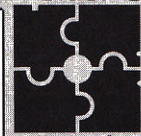
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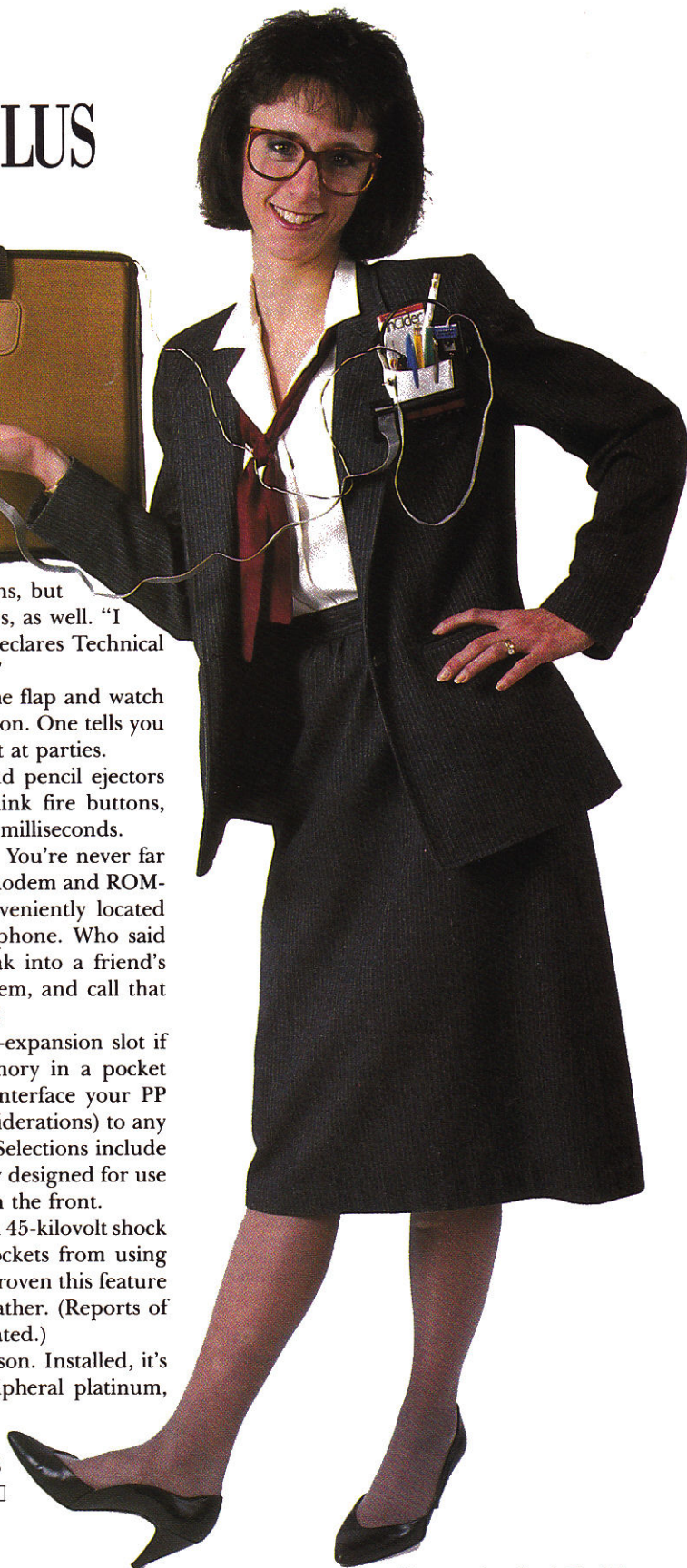
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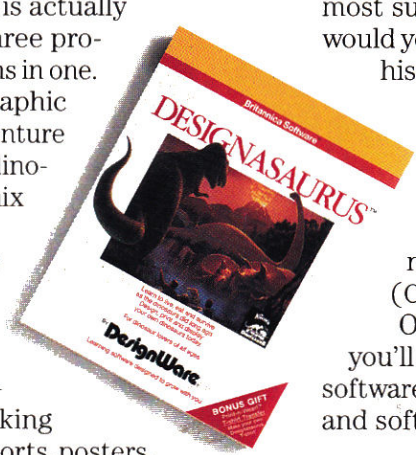


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