THE APPLE II MAGAZINE

inCider

AN IDG COMMUNICATIONS PUBLICATION

ThunderScan Reviewed
Pg. 26

January 1988
USA $2.95
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TAKE A CHANCE!

Fourteen Programs To Manage Your Investments



THE APPLE IIc FAMILY TREE

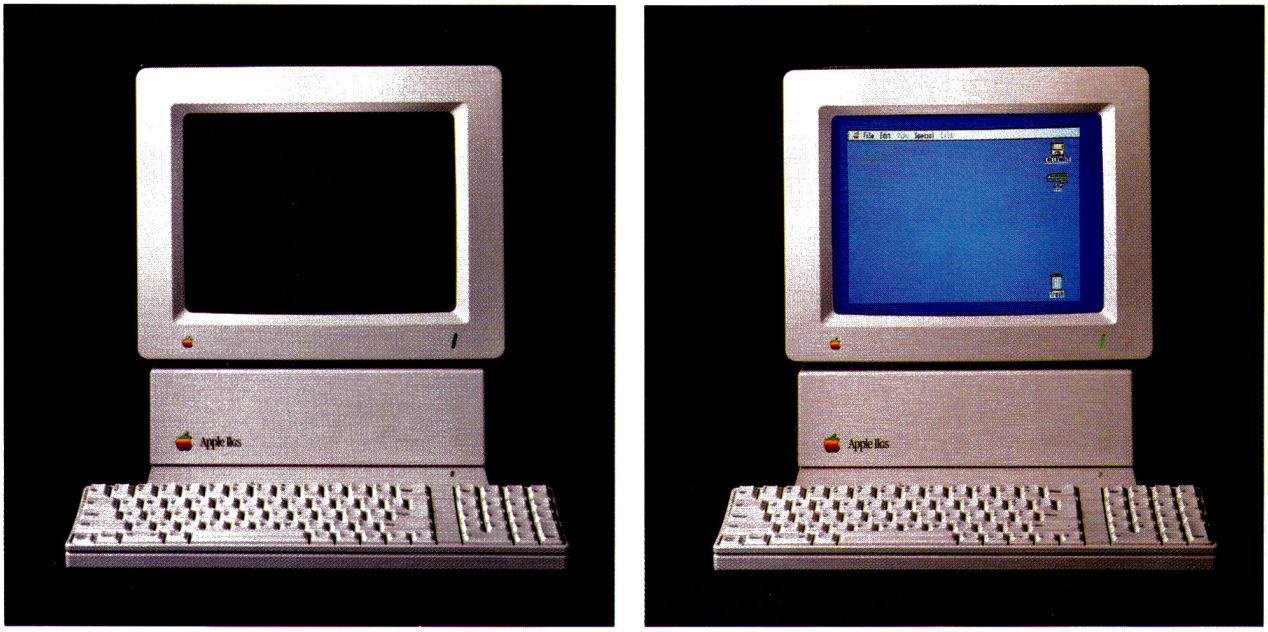
THE FINDER
A Look at the New IIGS System Disk

0 74471 12066 01

NEW IN THIS ISSUE:

inCider *On Line: Telecommunications Made Easy*
Expanded AppleWorks and Game Coverage

The High Performance Apple IIGS:



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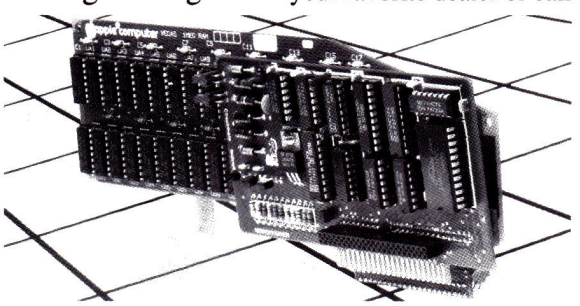

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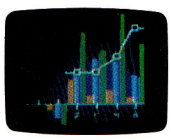
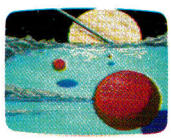
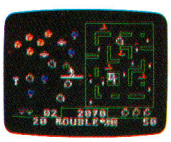

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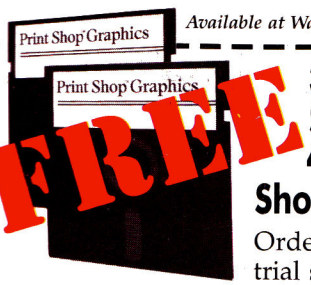

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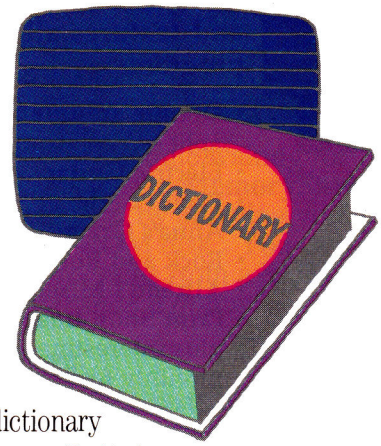

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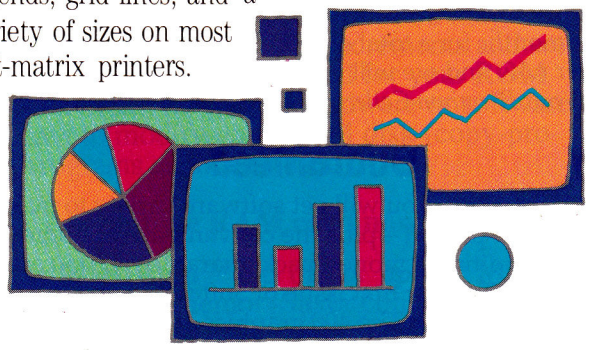

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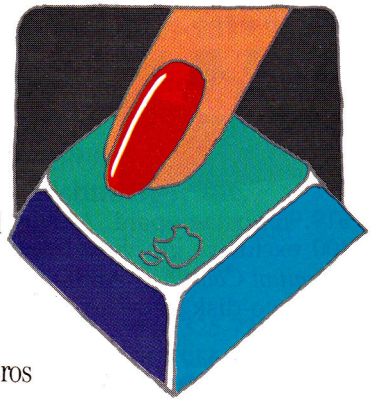

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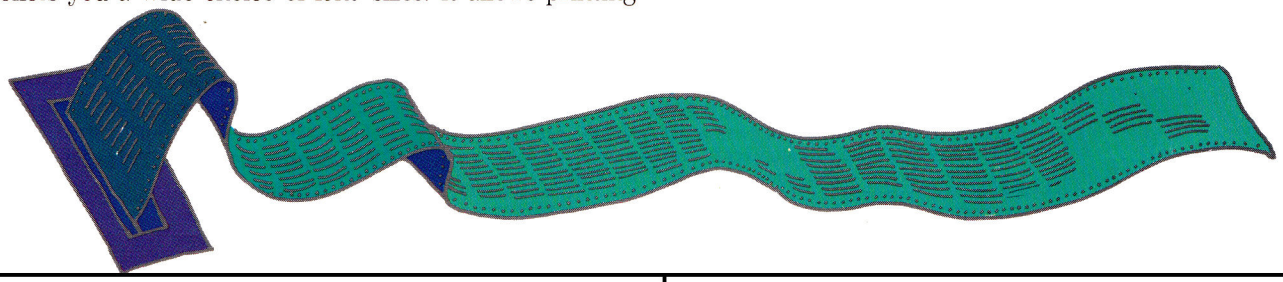

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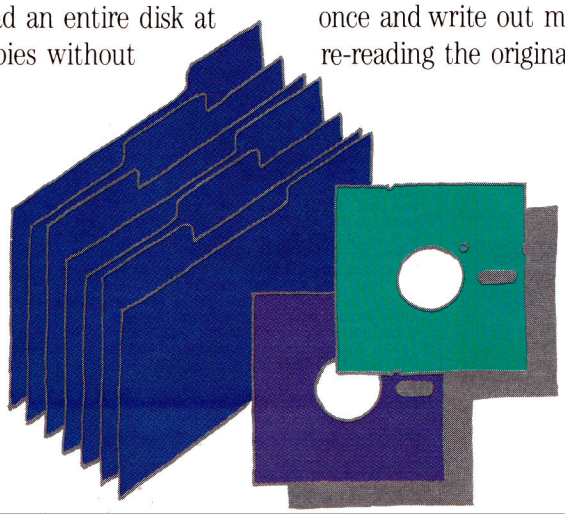

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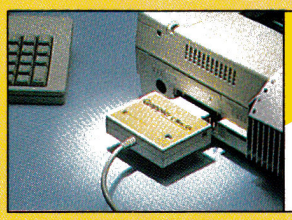

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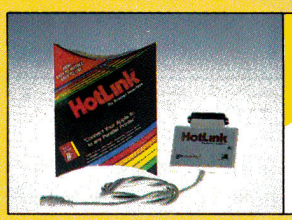

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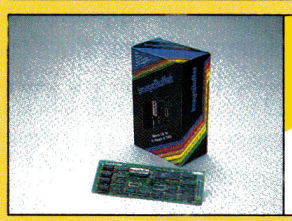

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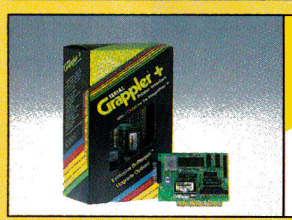

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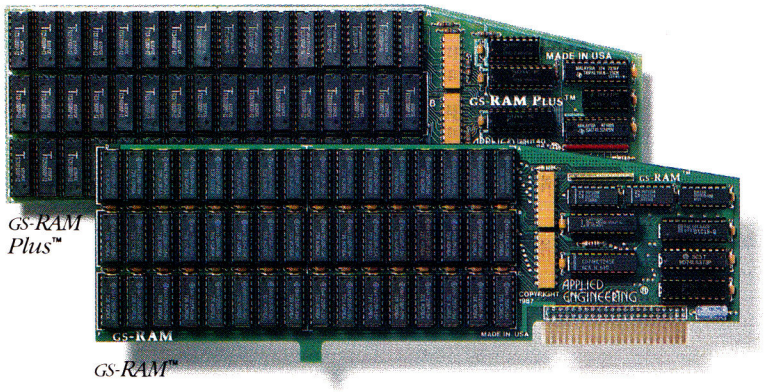

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inCider



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Managing your portfolio is easy with an Apple II as your investment partner. From stocks to coins to real estate, the right program can help you organize your data for profitable decision making.

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Graphs with the Works

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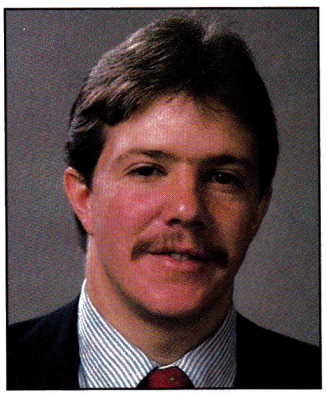
Field Trip will return in February with a look at vocabulary games. Mastering the IIGS will return on an occasional basis.

Evolution

by Dan Muse, Editor in Chief



"Apple IIs, Apple II users, and Apple II magazines are a stubborn lot, and we're not planning on going anywhere."

I have a difficult time remembering my own wedding anniversary, so it's not unusual that I was surprised when our marketing manager told me this issue marks *inCider*'s five-year anniversary.

Now, five years isn't long if you're *The New Yorker* or *Time*, but five years makes any computer magazine a veteran publication.

Looking back at that premier issue, it's amazing how many things about *inCider*—and the Apple II world—haven't changed, when you consider how many other things about them *have*. In fact, a quick look through the first table of contents includes four columns and departments (New Products, Reviews, Hints/Techniques, and Applesoft Adviser) that are also listed on this issue's contents page.

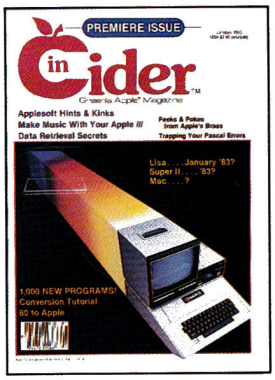
Some of the topics we think are interesting today the first editors of *inCider* also found worthy of coverage. For example, one of the stories featured on the January 1983 cover was "Make Music with Your Apple III." (Of course, that would read "Make Music with Your Apple IIe" or "Make Music with Your Apple IIGS" today.) Applied Engineering's PC Transporter, a board that lets Apple IIs run MS-DOS software, is hot news today, but in January 1983 the *inCider* news section ran an item headlined "Apple into IBM." The first paragraph read, "A San Jose, CA, firm has announced a plug-in card for the Apple II allowing it to run IBM Personal Computer programs."

These similarities say something about Apple II users and something about *inCider*.

Apple II users want the greatest amount of power and productivity they can squeeze out of their systems—whether that means writing their own programs, buying commercial software, installing a memory-expansion card, or setting up a RAM disk. And *inCider*'s mission has always been to help Apple II owners get the job done faster and better—whether at home, in school, or at the office—while having fun along the way.

These two constants have withstood changes at Apple Computer and changes in operations at *inCider*. In January 1983, *inCider* wrote about Steve Jobs and Apple chief executive officer A.C. Markkula. The Macintosh was a rumor and the Apple III was still alive and well—well, alive, anyway.

And in early 1983, *inCider* was published by Wayne Green, Inc. (CW Communications purchased it in the summer of 1983.) We've also gone through several staff changes over the years, but through all that the magazine has remained "true to the II."



inCider's premier issue, January 1983.

Staying "true to the II" hasn't always been easy, whether you're a user or a magazine. Apple itself lost sight of the II when it introduced the Mac (though we believe Apple is now committed to the II), and every industry pundit with a soapbox to stand on has foretold the death of the II. In fact, Stewart Alsop made this prediction for the second time in the September 30, 1987, edition of *P.C. Letter*. "The Apple II is actually already a dead computer. The only difference between the Apple II and a more dead computer like the IBM PCjr or the TI 99/4A or even Apple's own Lisa is that Apple won't take it off the price list or hold a press conference announcing its demise or otherwise make a stink about it. But I would be willing to bet dollars to cents that you'll never see another new Apple II model introduced by Apple."

Now, I suppose there's a slim chance Alsop knows something you and I don't. But I think there's a better chance we know something he doesn't. Apple IIs, Apple II users, and Apple II magazines are a stubborn lot, and we're not planning on going anywhere.

Maybe a five-year anniversary isn't such a big deal, but it's fun to look back at what was happening half a decade ago and see how much of it applies today. So as we sip our champagne, we're planning our 1988 issues and wondering how to locate Stewart Alsop so that we can take him up on his bet. ■

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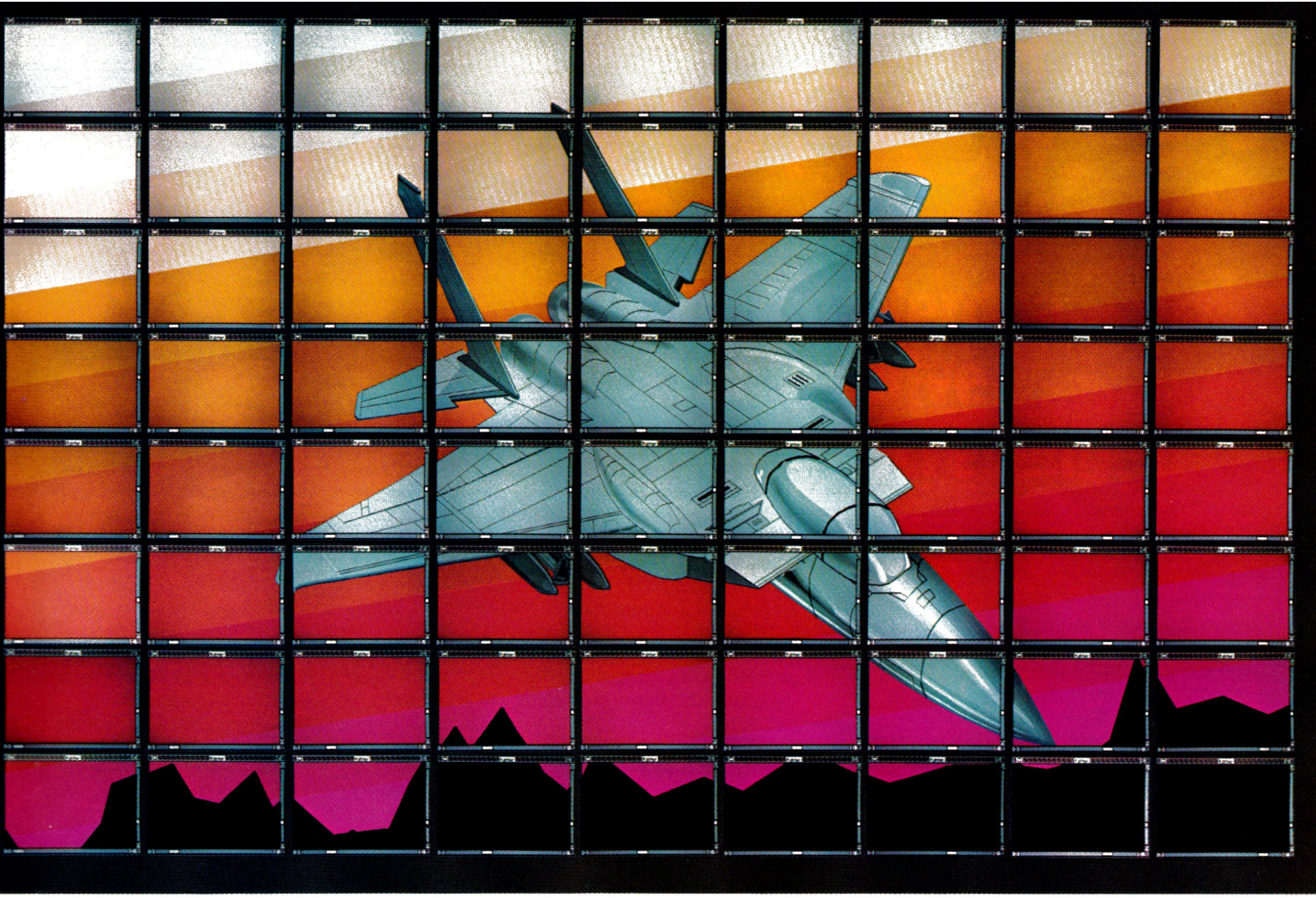

Drawing by Dale Crawford of StyleWare

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LETTERS

Double Print

In response to "PR#1 and Video, Too" (Apple Clinic, June 1987, p. 20), there's a simple way to print information to your screen and printer simultaneously. First, you need your IIc's backup of the System Utilities disk. Go to the advanced-operations menu and select "configure the serial ports." Select "set port 1." Then select "I know my PIN." The PIN for an ImageWriter I or II is 166/1224. Save this configuration to the backup System Utilities disk. Quit the Utilities, then run your program.

Each time you turn off your IIc, unfortunately, you must then boot to the System Utilities disk with the configuration on it. This works on my IIc and ImageWriter II, so I'm sure it will work on the ImageWriter I.

Mike Schumell
54 Park Avenue #4
Verona, NJ 07044

Thanks for the tip. See Apple Clinic, September 1987, p. 20, for another solution, as well. —eds.

The Power of RAM

I was extremely disappointed with your review of GS RAM cards ("More Memory, More Power," September 1987, p. 44). The article seemed to lack the facts necessary to present a truly unbiased view concerning our OctoRam card.

Table 1 states MDIdeas' SuperSonic card requires 1 megabyte; in fact, it doesn't require any memory at all.

The article also mentions some advantages and disadvantages of SIMMs. They're extremely easy to remove and install and have no pins to bend or break. They're readily available, but are currently a little more expensive, though prices are dropping. Another advantage is that they offer unequaled upward mobility. You don't have to buy another card if you want to expand your memory. There's also no piggybacking necessary to expand from 256K to 8 megabytes.

Speaking of piggybacking, we put the ESP ROM card on the front of the OctoRam because this wouldn't interfere with users upgrading their IIe to a GS. Plug a memory board into an upgraded IIe and you'll see the problem.

Finally, if you want to use ROMs, there are none currently available. If you use EPROMs, you must have an EPROM burner to write data to it.

This brings us to EEPROMs, which write a thousand times more slowly than static RAM (used on OctoRam ESP). A fully populated AST board with EEPROMs supports only 128K of ROM disk. Our ESP card, on the other hand, starts out with 128K and can expand up to 512K—enough to put the entire GS desktop and ProDOS 16 on it. Writing to it is extremely easy, and it acts like a bootable RAM disk that's always there. It writes instantaneously and doesn't cost an arm and a leg.

William Low, President
MDIdeas, Inc.
1163 Triton Drive
Foster City, CA 94404

Got Your Number

I'm disappointed that your review of math software (Field Trip, September 1987, p. 120) omitted Numbers of Fortune's key feature—the game's comprehensive recordkeeping utility.

Numbers of Fortune is a drill-and-practice game integrated with a recordkeeping system that not only shows percentages of right, wrong, and unanswered questions, but also records incorrect responses for up to 40 students on disk.

The integration of the utility component with an educational math game (all on one disk) provides users with a package that's more comprehensive than a simple drill-and-practice game. This recordkeeping feature makes the $49–$79 price range lower than current market prices.

David Greene, President
Fortune Software Inc.
70 Sierra Road
Boston, MA 02136

Having used Fortune Software's line of educational software in my classes, I take issue with your conclusions about Numbers of Fortune.

I've found that students are excited by programs like Numbers of Fortune that are fun, exciting, and easy to use, yet colorful cartoon-like programs, which soon become dull and repititious, bore them easily. Whether it's the current popularity of *Wheel of Fortune* or the excitement of landing on "big money," students love spinning the game wheel while gaining basic math skills.

The value of Numbers of Fortune is consistent with the comprehensive recordkeeping capability each math program provides. Teachers can obtain game results for up to 40 students easily, as well as review and evaluate actual incorrect responses. This feature is helpful for grouping learners and individualizing education. Since these customized drill-and-practice sheets are excellent for remedial instruction, I believe Numbers of Fortune's price tag is a real bargain.

Donna Fishman
Chapter 1 Program
James H. Eldredge School
First Avenue
East Greenwich, RI 02818

Noble Follies

Several readers have found difficulties with my program, Preschool Follies (September 1987, p. 65). The main problem occurs in the ONERR GOTO statement in line 100. This line causes all errors, including syntax errors, to branch through line 1840 to line 150, which displays the main menu. This move has confused some of you because syntax errors simply return control to the main menu instead of halting the program. This routine also traps Control-C: That's how Control-C returns you to the main menu from anywhere in the program.

To troubleshoot the program, delete line 100 temporarily. Syntax errors will now halt the program. (Control-C also halts the program with line 100 deleted.) Type GOTO 150 after Control-C to return to the main menu. When the program is running properly, insert line 100 to restore the Control-C function, returning to the main menu.

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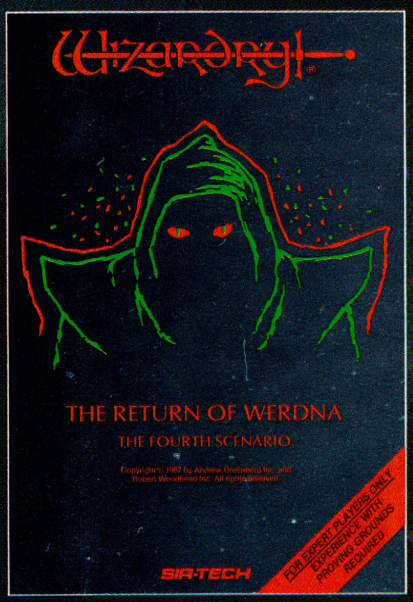

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PLAY IT TO THE HILT!

Line 2180 contains two plus signs separated by a space. Although the program works as printed, you can delete one of the plus signs. You can also delete line 6000, which I used only for testing.

Gary Noble
1422 172nd Place S.W.
Lynnwood, WA 98036

Gradebook Update

Ken Carlson ("Gradebooks Revisited," October 1987, p. 77) previewed our product, The Electronic Gradebook and Teacher's Utility, while we were in the process of testing the latest version. Since then, we've corrected the drawbacks he mentions. Namely, we've improved the speed greatly; the logo presentation boots up in five seconds, with the program loading in 15 seconds. Also, the option for altering grades requires you to enter the student number only once for all of that student's changes. Finally, a class average is now available for all students in a particular subject.

Linda Bunney
Computer E Z
P.O. Box 175
Lamar, MO 64579

"Gradebooks Revisited" omitted one program our 50-member staff has been using with tremendous satisfaction for two years. It's called Gradebook Plus Pro, from EMI Associates, Box 339, Los Altos, CA 94022 ($60 or $150 for a school master). It's fast and efficient. It's also available on a 3½-inch disk, and with Bill Basham's Diversi-Cache installed, it runs amazingly fast on the GS.

Preston Boomer
Science Department
San Lorenzo Valley High School
Felton, CA

Wanna Bet?

I'm not about to argue the laws of mathematics. And, certainly, promises of beating the odds of a lottery are without foundation. Your reference to lottery software ("There Oughta Be a Law," Stattus Report, October 1987, p. 22) as "worthless," however, misses a very real point.

Lotto Data, marketed by SRP, tracks lottery numbers and creates reports and charts. But there's one big difference over those programs you described: We don't promise you'll be able to win the lottery by using this program—because we can't.

For those interested in the world of numbers and truly random occurrences, this program affords an opportunity to sort and evaluate random data from the real world. A statistician can tell us about the odds and laws of a lottery, but it's a firsthand learning experience to see that numbers *do* follow the laws we've deduced—numbers are in fact distributed evenly over the long run. In short, Lotto Data is the proof of the principles we learn in school.

Susan Marie, President
SRP
P.O. Box 1491
Cupertino, CA 95015

I agree with Mr. Statt's conclusion that lottery programs are a joke. But I disagree with the logic that supports his statement.

Gamblers often hang around slot machines, waiting for a person who has just lost hundreds of quarters to finally give up, so that they can get their turn at a machine that's "ready" to win. If, after ten rolls of a die, you haven't seen a six, the law of averages says it's time for two. True, you still you have a one-in-six chance, but that's the little picture. In gambling, it's the big picture we're after.

The problem with computer-simulated lottery programs is that they can arrive only at the little picture. There's no way to make a computer think it's already rolled the numbers you say have come up in the past. The best way to play a lottery is by hand. And if you're really bent on winning, get a group of people to buy tickets and agree to share the winnings.

Konstantin J. Zsigo, President
Charlie Software
4908 South Hagadorn
Suite 25
East Lansing, MI 48823

Susan Marie is right. She brings up a point I didn't consider: Weekly lottery drawings are a better source of truly random numbers than, say, Applesoft BASIC.

Konstantin Zsigo is also right: My conclusion is correct. I hope we meet someday at a computer convention in Las Vegas, where I can hear Mr. Zsigo explain this mysterious "law of averages" to the croupier who's taking his money. —P.S.

Hallo, Deutschland

I'll be moving to Germany and want to get a telecommunications package that will let me call the States or transmit data internally on the continent. Will I be able to use Applied Engineering's DataLink (Editors' Choice, November 1987, p. 152) over the German telephone system?

John Reidt
221A Chestnut Street
Leavenworth, KS 66048

Technicians at Applied Engineering explained to us that the European communication system doesn't use the American Bell standard; they doubt you'll be able to use DataLink in Germany. —eds.

Image Control

My program, Control (Hints/Techniques, August 1987, p. 101), directs an ImageWriter I printer to skip over the perforations while listing a program. Unfortunately, that version doesn't work with the ImageWriter II.

Pages 73–74 of the *ImageWriter II Technical Reference Manual* (Addison-Wesley Publishing Co., Inc., 6 Jacob Way, Reading, MA 01867), contain the solution. To make the program compatible with either printer, load your copy of Control. (At the BASIC bracket prompt, type LOAD CONTROL.) Next, type in these new lines:

```
134 VTAB 5 : PRINT : CALL -868 :
    INPUT "Which ImageWriter are you
    using? ";IW$
136 IW = VAL (IW$) : IF IW < 1 OR IW
    > 2 THEN PRINT "Please enter a one
    or a two." : GOTO 134
195 IF IW = 2 THEN PRINT CHR$(27);
    CHR$(90) ; CHR$(0); CHR$(4) : GOTO
    250
```

Now save the program under the new name SAVE CONTROL2. To use the program, return to the directions in the August listing.

Bob L. Allen
27081 Segovia Circle
Mission Viejo, CA 92691

inCider *welcomes readers' comments regarding articles, letters, or other topics of interest. We reserve the right to edit letters for clarity, style, and space. Please address your correspondence to Letters,* inCider, *Elm Street, Peterborough, NH 03458.*

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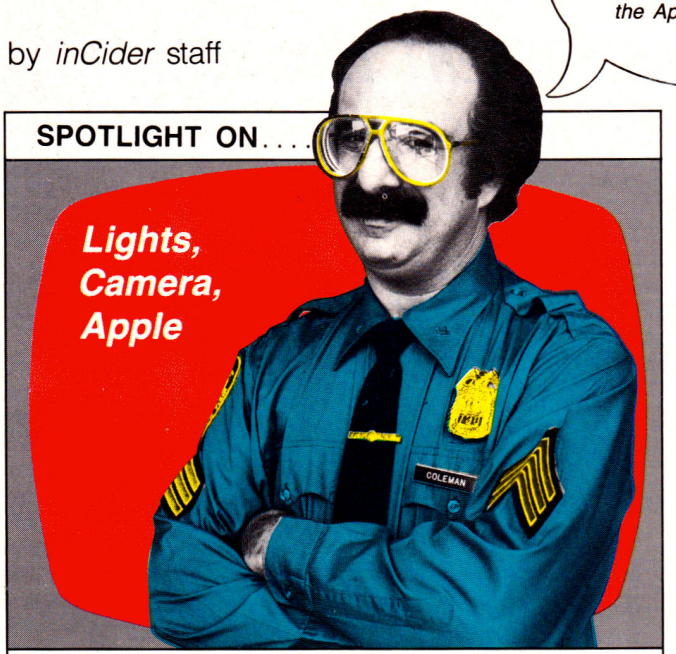
NEWS LINE

by *inCider* staff

SPOTLIGHT ON....

Lights, Camera, Apple



You may know him better as Sergeant Coleman on the popular CBS television series *Cagney and Lacey*, but Harvey Atkin, like many actors, is also in business for himself—and his Apple IIe is a helpful and patient business partner.

Atkin's enhanced IIe runs Manzanita's powerhouse accounting software BusinessWorks, with an Applied Engineering Transwarp accelerator and two Sider hard-disk drives with B-Sider tape backup. This actor not only needs to keep tabs on his performance engagements when he's not working on *Cagney and Lacey*—his career as a commercial real-estate broker keeps the disk drives humming, too.

Atkin has also enlisted his Apple to help keep track of his family history. He's an amatuer genealogist who "used to have a shoebox full of paper with notes all over the place." Atkin endorses Family Roots (Quinsept Software, Lexington, MA), with which he has "put everything together logically and created ancestral charts." —*Lafe Low*

DO YOU COPY?

There are three things you should never discuss at a cocktail party: politics, religion, and copy protection. You never know whether you're talking to a Democrat or a Republican, a Protestant or a Catholic, a software user or a software developer.

Apple II users protest that copy protection prevents them from installing programs on hard-disk drives, 3½-inch disks, and RAM disks. Some users secretly resent not being able to make illegal copies for friends.

But publishers scream "piracy" in fear of producing, as Roger Wagner, of Roger Wagner Publishing, says, "the most popular program never sold."

Whatever their reasons, many users are staying away from copy-protected software. Roger Wagner Publishing (El Cajon, CA) and Activision (Mountain View, CA) are aware of this trend, but the two developers are responding in two very different ways.

Activision's straightforward approach is sure to please users: The company has simply removed copy protection from its entire line of games (Shanghai, Aliens, and others) and productivity software (such as Writer's Choice). Why the change in policy? Stan Roach, Activision's vice president of marketing, told *inCider* he sees "hard disks playing an increasingly important role in the Apple II market."

Roger Wagner has taken a more complicated—and controversial—approach with SoftSwitch, its program selector for the Apple IIGS, which lets GS owners with at least 512K flip among three 8-bit programs. (See "Three Programs in Progress," October 1987, p. 72.) SoftSwitch is designed to be installed on every disk you own; that's why Roger Wagner feared "a public-domain nightmare" if SoftSwitch were sold unprotected, as all its earlier programs, such as MouseWrite and Merlin Pro, were.

The SoftSwitch copy-protection system is unique. When you install it on your GS, you alter its internal battery RAM so that SoftSwitch will run only on your machine. Wagner points out that this copy-protection scheme doesn't stop you from using hard-disk drives or RAM disks. Wagner maintains that "you'd never notice the copy protection, unless you tried to make a copy for a friend."

Apple users have hotly debated SoftSwitch's copy protection on bulletin boards, in user-group meetings, at AppleFest, and in the pages of Apple magazines.

Proponents, like Roger Wagner himself, argue that "copy protection" has become an emotional rallying cry, and that users have lost sight of the original intent of unprotected software—that you can use it with all your hardware.

Opponents say it just isn't right to physically alter the computer's internal memory—whether or not you "notice" it. Others worry that although Roger Wagner's scheme protects the developer against theft of property, and also protects the user's investment, it's not a practical solution to the larger problem: What happens if every program you own alters your Apple's internal memory?

Wagner knows how people feel about copy protection, a term he says "has gathered a lot of emotional baggage. When users hear 'copy protection,' they think they can't put [the program] on a hard disk."

The copy-protection controversy is nothing new to the Apple II world, but the popularity of 3½-inch disk drives and RAM disks, and perhaps hard disks soon, has added fuel to the fire. Things are getting interesting already: A company that until September 1987 protected every program it sold now protects nothing; another company, which never protected anything, adds a controversial copy-protection scheme to its latest product. Stay tuned.

—D.M.

PERFECTLY CLEAR

"We're a software company, and a software company has to support its products," says Kyle Mashima, director of product marketing at Claris Corporation. "Apple could afford to leave the support of AppleWorks to third parties."

Claris Corporation is Apple's first "spinout" company, to use John Sculley's phrase. Rather than face the work of supporting a handful of successful software products such as AppleWorks, Apple founded Claris. It's a separate company, with its own ideas about selling software.

Mashima laughs when asked how big a part of Claris' income AppleWorks represents: "Let's just say that AppleWorks is very important to us. We have to support it—at the very least you'll see better technical support and updating."

Claris would like to be there when integrated software for the Apple IIGS is introduced: "The IIGS is Apple's next machine, and AppleWorks is the kind of broad, horizontal market product Claris wants."

HyperCard for the GS will have to come from Apple. "HyperCard's a major technical investment, and, remember, Apple bundles it with its machines [Macs] now. That would be pretty hard to compete with."

Claris will provide *stackware*—software that works under HyperCard—for the GS when and if HyperCard becomes available on the latest II. For now, the good news, according to Mashima, is "Claris is probably more behind AppleWorks than Apple was."

—P.S.

TELL ME A STORY

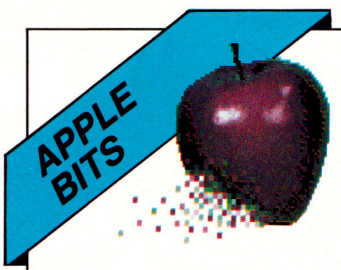
Kids who write can win Apple computers or Scholastic software by telling the best stories with Scholastic's Story Tree program. Scholastic Software's fourth annual Story Tree contest is open to students in grades 4–9 who use Scholastic's interactive creative-writing software.

A Story Tree narrative has a beginning, several middles, and even more endings: The young writer offers the reader a number of choices at every turn of the plot.

The winning Story Tree will bring home two Apple computers—one for the student, and one for his or her teacher to use in the classroom. Scholastic will award one grand prize to the best story at the junior-high level (grades 7–9), and another two computers for the best elementary-level (grades 4–6) writing. Ten runners-up at each level will receive $100 worth of Scholastic software.

Scholastic Software will accept entries from now until April 15, at Story Tree Contest, 730 Broadway, New York, NY 10003.**—P.S.**





■Look for lots of **integrated software for the GS** in the spring. Remember, if integrating three programs is a good idea, integrating six must be a better one.

■How about some programs—databases and spreadsheets, for starters—that take advantage of the speed and power of the **65816** without being taken advantage of by the GS' tools?

■The official word from Apple to the developer of **hardware** that could make the **GS** work like a low-priced **Mac II** was "go for it." Unofficially, some Apple engineers told him that Apple would "toss in the closet" any product that speeded up the GS significantly—and moved into the Mac's market.

■John Sculley bragged recently to software developers that the average Macintosh user knows how to handle six programs, while the average IBM PC user knows only two. The **average Apple II user** is the most versatile, switching back and forth among **12 applications**.

■Dick Metzinger, formerly vice president of marketing at Mindscape, jumped ship and took **Cinemaware** with him. Look for Defender of the Crown, a thrilling medieval adventure, for the GS soon.

■Western Design Center, of Mesa, Arizona, makes the **65816 chip** for the Apple IIGS. Nobody but Apple buys them, and Apple reportedly has ordered some newer, faster ones.

■Product name of the month: **Interface**, Star Development's (New Britain, CT) ProDOS program selector, mimics the most popular interface in the Apple II world, AppleWorks.

■Barney Stone at Stone Edge loves **Cattlecar Galactica**—a parody of programming languages, especially Applesoft BASIC, by old-time Apple staffer Bruce Tognazzini. Stone thinks a parody of a database manager would be good for a laugh, too.

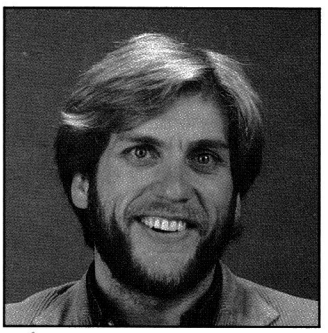
■**The Maryland Educational Technology Network** (METN) transmits software, electronic mail, and data to participating schools in Maryland, over the same broadcast bands as Maryland Public Television. Call (301) 356-5600 for more information.

■**Bill Larson**, Apple's consumer marketing manager, was quoted in a recent issue of *The San Jose Mercury-News* as admitting that "despite the relatively high price and delays, the IIGS is doing well." Surprising candor.

We're always looking for news of the Apple world. If you're making news, send your press releases and photographs to News Line, inCider, *Elm Street, Peterborough, NH 03458.*

The Check's in the Mail

by Paul Statt, Senior Editor



"You can learn some quick lessons about the Apple II market by hearing a few choice excuses."

It's a good thing you bought an Apple II. The modem manufacturer running a full-page color ad in *inCider*, the glib "ambassador" entertaining the crowd at your local user group with the latest word processor, the pretty woman enticing you to wear a button on your chest at AppleFest—they're an honest lot. Chances are you can buy the product you see advertised. An ad for an Apple II word processor usually means you can be typing a letter with it tomorrow.

Here's a rule of thumb: If we review a product in *inCider*, you'll find it on the shelf. We insist that whatever we review be available in stores. In the unlikely event you can't find that word processor, rest assured that nobody's trying to steal your money. But, as a precaution, don't ever pay for anything you can't buy.

Call and ask whether the product you want is available today. If the answer's an honest "No, I'm sorry, it's not finished yet," don't send any money, but don't hang up, either: You're sure to hear some entertaining stories:

- "The hard disk crashed." That's so hard to argue with, I've been saying it to my editor as I approach a deadline.
- "We're trying to put a 32-bit program on an 8-bit machine." No point trying to remain anonymous here—Springboard Publisher is late. But I think it'll be worth the wait; I admire and applaud John Paulson at Springboard for noting that "most desktop-publishing programs require faster microprocessors and bundles of memory because programmers get lazy."
- "I got married. Then Apple introduced the IIGS." This is a sad story. Will Troxell almost finished writing an Apple operating system for the 65816 coprocessor Checkmate sold for the Apple IIe and IIc. Will decided to get married and move to San Diego. Congratulations. But when the honeymoon was over, Apple had introduced the GS—and ProDOS 16. The 16-bit IIc has gone the way of the CP/M IIe and the steam automobile. Will's working on his tan and a math coprocessor. I hope he hurries.
- "The software's not ready." This one's a favorite of the hard-disk boys and the RAM-expansion kids. Software developers who fall behind might try to tell me, "The hardware's not ready," but I used to be tech editor and they can't fool me. Instead, if they're in the GS business, they say they're "waiting for Apple's fonts." I can't argue with that. Apple evidently started working on the GS fonts yesterday.
- "The documentation isn't ready." When I first heard that one, I thought it seemed reasonable: "Isn't it great that developers are taking such pains with their instructions?" Then the "docs" arrived. What were they waiting for, I wondered—the kids who wrote them to finish their naps, or bargain night at the local photocopy store?
- "The packaging's not ready." People who create games favor this excuse. When I get a gift, the wrapping means almost as much as the present—but when I buy software, it's what's inside that counts. Millions for marketing; pennies for product.
- "The programmer moved back to France," or the Sierra Nevada, or San Diego. "We lost a programmer to the fast life in Seattle," one developer confessed. Seattle? Things must have been really slow at that company.
- "Our competitor stole the prototype of our expansion board." This one's neatly double-edged. It not only explains why Company A (the victim) is three months late with its product, it also offers Company B (the criminal) an unspoken alibi for shipping its board four months late: They forgot to steal the docs, I guess.

You can learn some quick lessons about the Apple II market by hearing a few choice excuses. First, marketing—advertising and packaging—is as important as the product itself. Quality can't sell itself these days, I'm sorry to say—it also has to look high-class.

Second, documentation is written at the last minute, and not by the people who manufactured the hardware or wrote the program.

Third, the Apple II's still an easy market to break into: One person can be such an important part of a project that his or her absence can destroy it completely. One person alone can design a peripheral board. Another person can swipe it.

Keep at it, programmers and solderers of the world, hacking out peripherals and software you promised *inCider* months ago. We're patient. We'll only kid you gently.■

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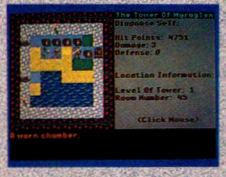

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APPLE CLINIC

by William Kennedy, Ph.D., Technical Editor

Apple Clinic is a forum for discussing Apple II hardware, software, and related subjects. If you have questions or answers, or want to make a statement, write to Apple Clinic, inCider, *Elm Street, Peterborough, NH 03458.*

Desperately Seeking in ProDOS

The following program lines are from a ProDOS-based BASIC program I wrote for the Apple IIe. From a random-access file these lines read seven numerical statistics for each of 22 players on eight to ten basketball teams. For some records there seems to be a lot of disk "searching" going on What's happening during the lengthy pauses in operation while the disk file is open? Is there anything I can do to make a significant improvement in the speed at which the program reads the statistics? Are there any precautions I should take during the filing of the statistics to make them easier to read later?

```
6429 REM #####READ PLAYER STATS
6430 PRINT D$"OPEN
     CONF.STATFILE,L810"
6440 FOR N = 1 TO TM: NN = N - 1
6450 FOR I = 1 TO 22
6652 M = M + 1: FOR J = 1 TO 7: II
     = 7 * (I - 1) + (J - 1)
6460 PRINT D$"READ
     CONF.STATFILE,R"; NN; "F"; II
6470 INPUT Q%(M,J)
6480 NEXT J
6482 NEXT I: NEXT N
6490 PRINT D$"CLOSE"
```

Marnold Ostby
Olivia, MN

Lots, yes, and yes—I hope you didn't expect short answers! The quickest and easiest way to retrieve files from disk is to get out your checkbook and buy a lot of extra memory to operate your files from a RAM disk. Or, purchase a good database-management package. Stone Edge Technologies' DB Master (P.O. Box 200, Maple Glen, PA 19002, 215-641-1825, $179) or even AppleWorks' database manager (Claris Corporation, 20525 Mariani Avenue, Cupertino, CA 95014, 408-996-1010, $249) are optimized to handle data in the fastest manner possible.

But I assume you're really interested in finding out more about random-access file processing and how to use it efficiently with BASIC. Besides, "techies" like myself love to answer the kinds of questions you pose.

First, here are a few guidelines to improve random-access-file retrieval rates significantly without costing you a dime:

1) Rewrite your files periodically by reading the records in sequence and writing them to a freshly formatted disk. Careful, though: Don't write records that are all zeros. That'll foul up "sparse" file indexing. (Look up sparse filing in a reputable ProDOS manual; I'm not going to say any more about it here.)

2) Keep record lengths small. It's usually better to have several short records than a few long ones.

3) Specify a record length that's a factor or a multiple of 512.

4) Whenever possible, retrieve all data of interest from a record before moving on to another record.

5) When reading several data fields from a record, let ProDOS find the first field you want to INPUT (unless it's actually the first field) by specifying a Field in the READ statement. Then have your program sequentially INPUT all the values from that first one to the last one of use. Simply discard the intervening fields you don't want.

I started developing these guidelines by consulting various Apple ProDOS manuals, Dan Bishop's Applesoft Adviser column in inCider *(particularly the October 1987 article, p. 101), and my favorite ProDOS reference source,* Beneath Apple ProDOS, *by Don Worth and Pieter Lechner (Quality Software, 1984). I found that ProDOS can't simply "read" a single byte from disk, or even just a few bytes. Rather, ProDOS stores all files, regardless of their "type," in "blocks" of 512 bytes each. To retrieve a single byte from a file, ProDOS must first find and load an entire block into RAM, then search for the byte in question.*

ProDOS maintains an index of locations on disk where you can find a file's blocks; it can readily calculate and load the block where the start of a particular random-access file record exists. But the blocks making up a file aren't necessarily found next to each other. In fact, if you don't WRITE your random-access file records in the order in which you want to use them, chances are they're all over the disk. That's one reason you've observed a lot of "searching" for some of the records. That's also the rationale for the first guideline. Disk "seek and read block" activities are slow.

I experimented with 810 byte-sized-record random-access files; I put the data all over the disk. I got a 10–15 percent improvement in access time when I wrote the file records sequentially to a fresh disk—not bad, but nowhere near what I'd expected. And the disk "searching" still seemed excessive.

So I continued to do some "research" on my own, experimenting with a variety of random-access-file constructs and comparing their various processing speeds. The accompanying ***Table*** *summarizes my findings. ProDOS "absolute" retrieval times are for those experimental programs that make ProDOS do most of the work of finding the desired datum or field. The BASIC program fragment in* ***Listing 1*** *shows how it does that: The program invokes the READ command, with Record and Field specifications similar to those in your*

Table 1. *Times to read every 20th of 400 data fields from ten records in a random-access file.*

	Processing Times (seconds)	
Record Length	**Absolute**	**Sequential**
810 bytes	117	36
1024 bytes	49	17

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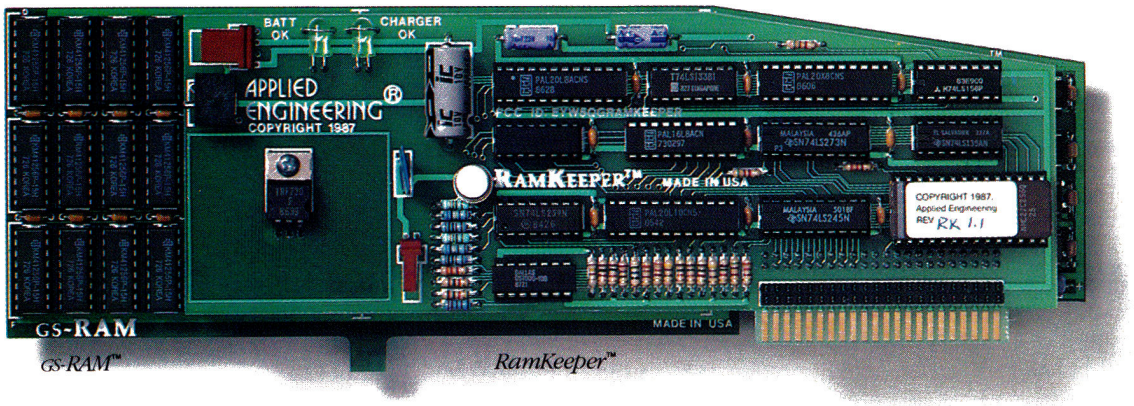

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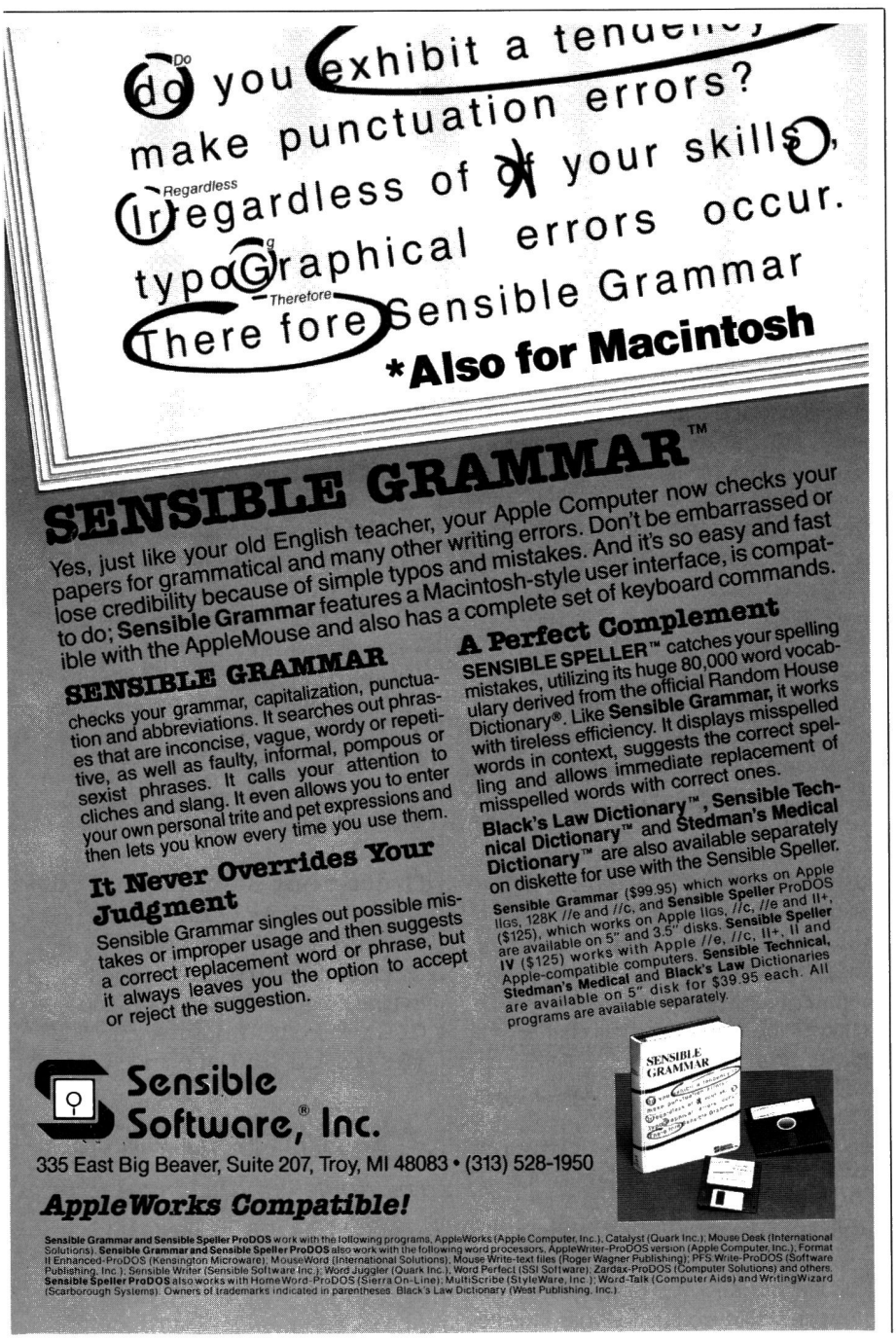
Listing 1. *BASIC program fragment in which the ProDOS READ command specifies each field of data for retrieval from a random-access-file record.*

```
100  FOR I = 1 TO 10
110  FOR J = 0 TO 404 STEP 20
120  PRINT D$;"READ TESTFILE,R";I;"F"J
130  INPUT A$: PRINT J, A$
140  NEXT J: NEXT I
```

Listing 2. *BASIC program fragment in which data selection and retrieval from a random-access-file record are "sequential."*

```
100  FOR I = 1 TO 10
110  PRINT D$;"READ TESTFILE,R";I;"F0"
120  FOR J = 0 TO 404 STEP 20
130  INPUT A$: PRINT J, A$
140  FOR K = 1 TO 19: INPUT A$: NEXT K
150  NEXT J: NEXT I
```



program's line 6460, before INPUTting each field.

The "sequential" retrieval times shown in the ***Table*** *are for those experimental programs that take over from ProDOS and do the work of selecting fields themselves. As shown in* ***Listing 2****, the program INPUTs every field in a record sequentially, up to the last field you're looking for. Along the way, it discards all but the desired fields.*

I also compared two record sizes: your 810-byte record and a 1024-byte length. I used the time-honored "one-one thousand, two-one thousand . . ." method to measure the time a program took to complete its task, so let's not quibble over seconds. Rather, it's the relative differences in speeds that are interesting.

The big winner of the race is the "sequential" method: Make your BASIC program do the work of selecting a field within a record. And, even more interesting, simply changing the record length to the next highest multiple of 512 above 810—1024—halves the RUN times.

What's going on? The foremost reason is that the Field specification in a BASIC READ statement makes ProDOS start counting from the first up to the specified field in a record. That takes processing time. But since field sizes and types usually vary, there's no way except a sequential search to find a particular field within a record. We have to perform the same task even when using the "sequential" method described above (shown in ***Listing 2****) to INPUT fields. And in a one-on-one contest to reach the* n*th field in a file, ProDOS wins hands down every time.*

So how did the sequential method win the race? The READ command with a Field specification makes ProDOS count fields starting from the beginning of the record every time*—even if the next field for INPUT is the very next field in the record. The sequential method just goes on to read that next field. Hence, the sequential method must read* n *fields to retrieve* n *fields from the same record. The "absolute" method reads* n! *(*n *factorial) fields to retrieve* n *sequential fields from the same record.*

The program reads only a single file block from disk into RAM for processing at any one time; that complicates matters further. That's okay if one or more of the desired fields are

stored in the same block as the first field in a record. It's even better yet if several records fit into a single block. ProDOS needs to seek and read only one block. Then it's a matter of processing time, which is much, much faster than disk-read time, to pluck data from the file.

Record sizes not evenly divisible by or longer than 512 bytes, however, will always be a problem. Some, if not all, records will "straddle" the file blocks; some fields will be in one file block, the rest in others. Parsing to a particular field in a straddled record will require at least two disk reads if that field isn't in the same block as the first field. Compound that with having to parse every field repeatedly (READ with Field specification) to INPUT sequential fields, and you have a disk-reading fiasco in progress. A lotta searchin' and ashakin' goin' on!

Do you now see the rationale for the recommendations? (And you thought I just made them up.) I leave it to you to actually optimize your program and file. I'd start by making each players' statistics a record. That way you can adjust the records to 512 bytes or less. (Make it a factor, remember?)

Then either partition one file by teams—first 22 or so records constitute team #1, and so on—or create a new file for each team. I recommend the former, but remember to allow for more than 22 players per team. Don't worry about disk space—ProDOS usually doesn't use any for records that don't have anything in them. From there, try to use a sequential-read algorithm like that in ***Listing 2*** *whenever you access the file.*

I wasn't kidding about buying a RAM disk. You can use it with a lot of other applications as well. Besides, think how fast you'll be able to process your teams if you follow my guidelines and have the added speed of a RAM disk. ■

Quickies

POKE 49205,0 so that ProDOS 8 programs that use the GS' super-hi-res screen will work with the ROM 2.0 upgrade.

—Jim Stevens

Put the UniDisk 3.5 controller into slot 7, then leave the drive empty if you want to boot from slot 6.

—Jerry Ray Bertelsen

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(Battery protects most gs RAM cards — even Apples')

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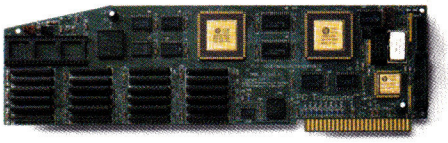

clone costs about the same as the PC Transporter. But the peripherals it takes to get the clone up and running make the clone cost about three times what our American-made card costs.

You don't have to buy new hardware to use PC Transporter.

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You can use your Apple mouse. Or an IBM compatible serial mouse.

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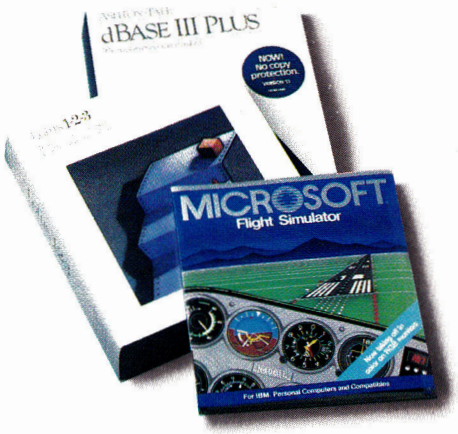
PC Transporter also is an Apple expansion card, adding up to 768K of extra RAM in the Apple mode. The Apple expansion alone is a $300 value.

Easy to install.

You can install PC Transporter in about 15 minutes, even if you've never added an expansion board. You don't need special tools. Simply plug it into an Apple expansion slot (1 through 7 except 3), connect a few cables and a disk drive, and go!



PC Transporter taps into the world's largest software library. Now your Apple can run most of the IBM software you use at work. And it opens a new world of communications programs, games and bulletin boards.

A universal disk drive controller.

PC Transporter supports 3.5″ and 5.25″ MS-DOS and ProDOS formatted diskettes. You'll shift instantly between Apple ProDOS and IBM MS-DOS.

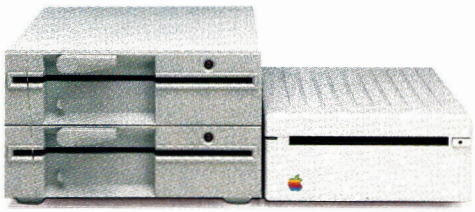
You'll need our versatile 5.25″ 360K drive system to run IBM applications from 5.25″ floppy disks. Use your Apple 5.25″ drive for Apple 5.25″ disks.

An Apple Disk 3.5 Drive will support the new 3.5″disks whether they're IBM MS-DOS formatted or Apple ProDOS formatted. The PC Transporter acts like an Apple Disk 3.5 Drive disk controller for IIGS, IIe, and II Plus users.

PC Transporter supports up to 5 drives in a number of combinations.

For example, you can connect a 5.25 Applied Engineering 360K dual-drive system directly to the card. Then plug two daisy-chained Apple 3.5 Drives (not the Apple UniDisk 3.5) to the dual-drive system. For a fifth drive, use a ProDOS file as an IBM hard disk.

PC Transporter controls Apple and IBM compatible disk drives. It supports 3.5″ and 5.25″ MS-DOS and ProDOS formatted diskettes.



Versatile data storage.

PC Transporter reads MS-DOS and translates it into Apple native ProDOS. You can store IBM programs and data 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 can use the Apple UniDisk 3.5 with its own controller card for storing programs and data, but not for directly booting an IBM formatted disk.)

You can even use our 360K PC compatible drive for ProDOS storage and a 143K Apple 5.25″ drive for MS-DOS storage.

Make your Apple speak IBM.

PC Transporter memory choices.

RAM in Apple mode:	RAM in IBM mode:	Price:
384K	**256K**	**$489.00**
512K	**384K**	**529.00**
640K	**512K**	**569.00**
768K	**640K**	**609.00**

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

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IIe/II Plus Installation Kit	**39.00**
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5.25″ IBM Format 360K Drive Systems	
Single-Drive System	**269.00**
Dual-Drive System	**399.00**
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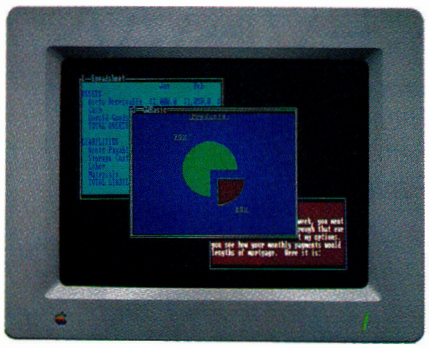
IBM Keyboard Cable	**34.00**
Sony RGB Monitor	**499.00**
Analog RGB Cable (for use with Sony monitor)	**39.00**
Digital RGB Cable (for use with Sony monitor)	**39.00**
Digital RGB Adapter	**24.00**
ColorSwitch (included with IIGS Installation Kit)	**44.00**
128K ZIP	**40.00**
PC Transporter Memory Expansion Chip Set	**per set**
8087-2 Math Co-processor Chip	**229.00**
Heavy Duty Power Supply (IIe and II Plus only)	**69.00**

See your dealer or call or send check or money order to Applied Engineering. MasterCard, VISA and COD welcome. Texas residents add 6¼% sales tax.



PC Transporter produces better IBM graphics than IBM. Analog is sharper than digital. So with an analog RGB monitor, PC Transporter's CGA graphics and text are superior to IBM's digital display — even while running IBM *software!*

And, you can also use an Apple composite monitor in IBM text or graphics mode.

Created by Apple's original designers.

The brains behind PC Transporter were also behind your Apple II.

The PC Transporter design team includes the former project managers for the creation of the Apple IIe and IIc. The co-designer of the Apple II disk controller. And the first full-time Apple programmer and author of the ProDOS operating system.

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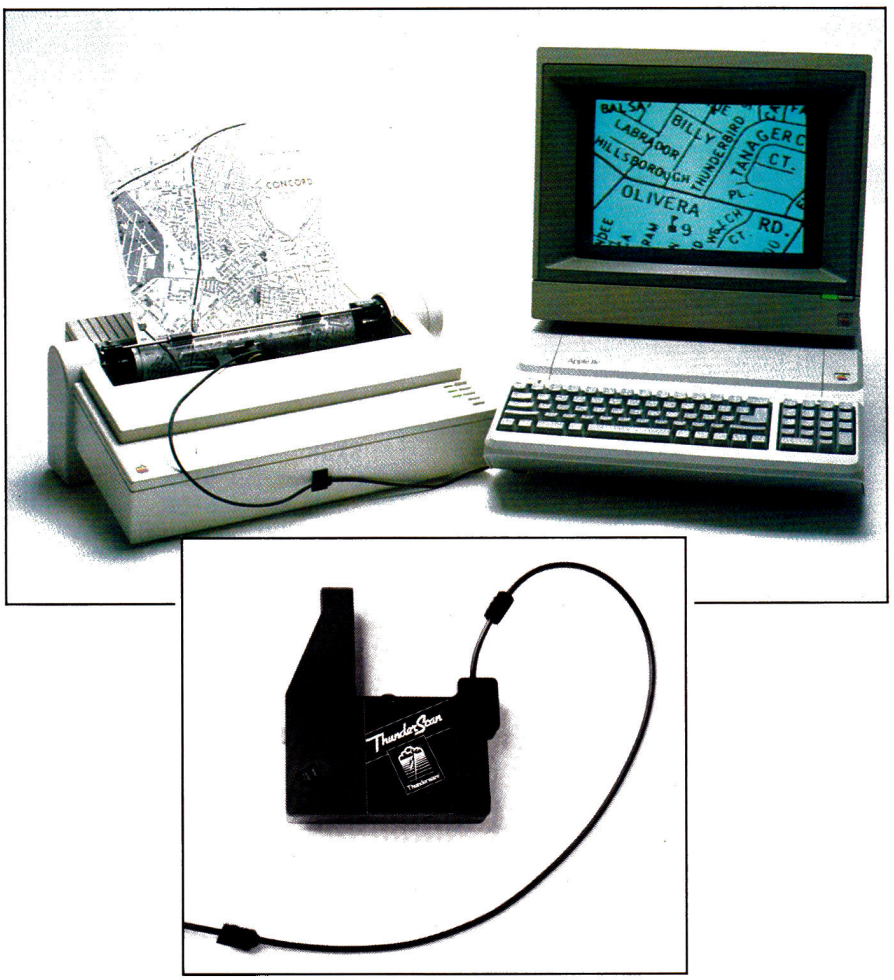
REVIEWS

ThunderScan; Postcards; RamUp; Quest for Files; Games Editors Play

Picture This

THUNDERSCAN

Thunderware, 21 Orinda Way, Orinda, CA 94563, (415) 254-6581
Optical-sensor image-acquisition system; ImageWriter I or II, Apple IIe, IIc, IIGS
$219
Rating: ■■■■■



Apple II computers have always offered good graphics capabilities, from the six-color hi-res of the original Apple II to the 16-color super-hi-res of the IIGS. Most Apple II users, however, aren't good at using graphics: They just aren't adept at creating recognizable images through programming or with painting programs. Luckily, there's help for the hopelessly unartistic, in the form of digitizers and scanners that let you transfer real-world images to the graphics screen of your Apple II.

ThunderScan from Thunderware is the latest Apple II image-acquisition system. Unlike ComputerEyes, VisionPlus, and most other similar devices for the Apple II line, ThunderScan doesn't get its input from a video camera or videotape machine. Instead, ThunderScan's optical sensor attaches to an Apple ImageWriter or ImageWriter II and "reads" pictures, and documents inserted into the printer's paper feed.

Setting up ThunderScan takes very little time and effort. Just attach a piece of white tape to the platen of your printer (the tape acts as a guide mark), plug ThunderScan into the joystick/mouse port of your Apple II, and replace your ImageWriter ribbon cartridge with the ThunderScan scanner—it fits the cartridge platform exactly.

Now boot the software and select the configuration option from the main menu. Tell the software which expansion slot your printer's using and what kind of ImageWriter you have. Once you've configured your software, you don't have to do it again unless you change your hardware.

To get an image into memory, select New Scan from the main menu. This option brings up the Scan Select screen, where you can determine what part of a picture you want to scan and whether you want to magnify the image. Other options let you specify the type of graphics screen you want to use—hi-res, double-hi-res, or GS super-res or ultra-res—and whether you want black-and-white, grey scale, or color.

Since the GS is the only Apple II that supports a true grey scale, ThunderScan software uses a halftone technique to produce such images on the IIe and IIc. Over a given area, the software mixes black and white pixels in the proper proportions to simulate different levels of grey.

A similar technique creates color images: The software assigns a color to each grey level of the original, resulting in false-colored images that can be quite striking. You can adjust the grey level or color associated with each intensity level of the original image. This feature gives you outstanding control over the graphics you input with the scanner, especially since ThunderScan saves an image to disk as it scans it.

The digitized images ThunderScan creates are quite good—of better quality than the ones I get using ComputerEyes on the IIe, and comparable to those obtained with VisionPlus on the GS. (See "Digitize to the Max," July 1987, p. 40.) Palette control is also on a par with VisionPlus, though not as simple. Overall, the quality of the images captured

inCider's Ratings

Excellent—remarkable, a must buy	■■■■■
Very good—impressive and recommended	■■■■
Good—average, solid performance	■■■
Fair—flawed but adequate	■■
Poor—unacceptable or unusable	■

Apple IIc, IIe, IIGs Users:

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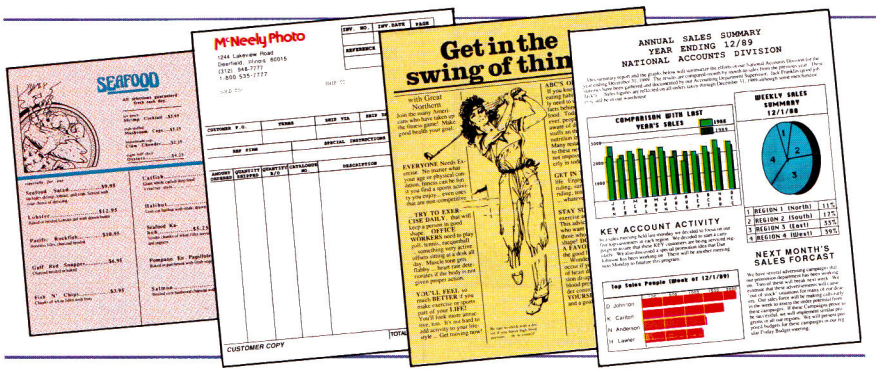

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SPECIAL FEATURES:

- **MacIntosh User Interface:** It's familiar and easy. Pull-down menus, icons, scroll bars and dialogue boxes help you learn and use the program quickly. Your display screen shows you exactly what your final product will look like when you print—What-You-See-Is-What-You-Get.
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- **Built-in Graphic Toolbox:** Draw lines, boxes, circles, rules and more. Plus, choose from a wide variety of built-in line and fill patterns, or create your *own*.
- **Graphics Importing:** Directly import graphics and illustrations from *any* standard Apple** double-high-resolution drawing program—including Broderbund's DAZZLE DRAW**. Then crop and size them to fit.
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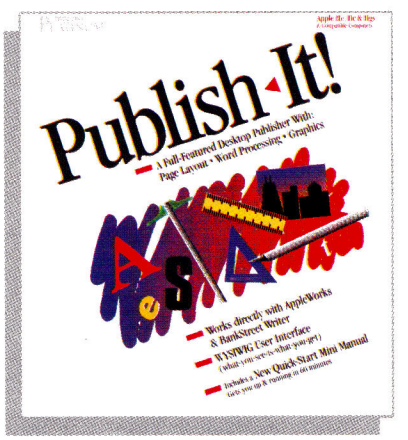

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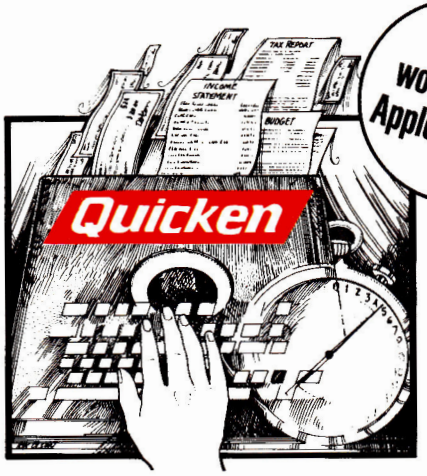

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—InfoWorld Review Board

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—Ken Landis, A+ Magazine

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and the level of control you have over the final product are very high.

ThunderScan has its limitations: Unlike a video digitizer, it can capture only images you can feed through your ImageWriter. That restriction, however, is also one of the unit's biggest advantages. If you already own an ImageWriter, ThunderScan is the most economical way to capture images for your Apple. It's certainly much cheaper than purchasing a digitizer and video camera.■

Robert M. Ryan
Hancock, NH



Madcap Messages

POSTCARDS

Activision, Inc., P.O. Box 7286, Mountain View, CA 94039, (415) 960-0410
Clip-art disk; 512K, Paintworks Plus (GS version); 64K (II, II Plus, IIe, IIc version) $24.95; blank Postcards $4.50 (50), $7 (100), $9 (150)
Rating: ■■■■ GS version
■■ 64K version

Four thousand ninety-six possible colors aside, have you ever wondered if there are any practical uses for GS paint programs? Well, wonder no more. Postcards for the Apple IIGS, an enhancement product for Activision's Paintworks Plus paint program, lets you be productive and creative at the same time.

If you're familiar with Paintworks Plus—or any of a number of other GS-style programs—you already know that this genre of software features colorful screens, pull-down menus, and mouse power. Postcards is no exception.

GS POSTCARDS—A MUST BUY

Postcards works like a single-function clip-art disk for Paintworks Plus, though Activision points out that you can also use the program to create memos, name tags, place cards, gift tags, and book marks.

The Postcards disk contains nearly two dozen folders of various predrawn, presized backgrounds, phrases in fancy fonts, and amusing clip art. Your postcard can feature almost anything—from a cockeyed bull or a cockroach to a fir tree or a portrait of Freud.

You begin by selecting a background (the beach, a cityscape, or a country road, for instance) from the ten scenes offered. If none of these backdrops suits your mood for the day, you can create your own background scene from scratch.

The Postcards disk includes a bordered, but otherwise blank, postcard template that looks like an empty picture frame. You can really open your creative throttle here and use a myriad of Paintworks Plus features to draw your scene, paint it, design its contents, and print "wish you were here" messages or cute sayings.

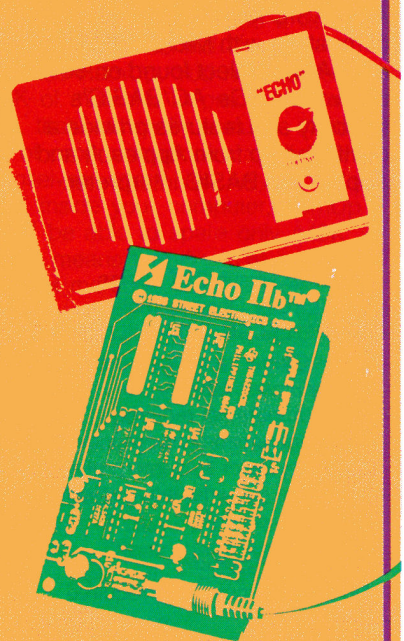
Once you've chosen the backdrop, save it under another name on a data disk so that you don't alter the original. Activision's new—and laudable—policy of removing copy protection from all productivity and creativity software (but not from games) should lessen your fear of losing the disk's original contents, since you'll have a backup as your working copy. Still, it's good form to use the Paintworks Plus "save as" command to change the postcard's name slightly with each revision you make.

Once you've chosen a scene—or created your own—and saved it, open one of the clip-art folders on the Postcards disk. Nearly 200 graphics therein range from the realistic (an ice-cream sundae that could give you a bad case of the munchies) to the zany (overgrown crustaceans) and the bizarre (a warthog wearing a bikini).

If you run out of ideas for using Postcards' graphics, you can use pictures from Activision's Clip Art Gallery. I created a postcard from scratch with Postcards' blank template, a Happy Birthday banner from the Clip Art Gallery, and a painting of a birthday cake from Postcards' clip art.

Selecting clip art from either Postcards or the Clip Art Gallery is a "cinch" with Paintworks Plus' lasso tool: Just glide the mouse to guide the lasso around the piece of art you

GREAT GIFT



The Echo IIb speech synthesizer is compatible with the Apple®IIe, II+ and the new Apple IIGS. It offers both text-to-speech and natural sounding speech capabilities. Its unique text-to-speech program gives the Apple an unlimited vocabulary. The Echo IIb also features distinctive natural sounding speech in a female voice. The fixed vocabulary of 720 words is supplied on disk and can easily be added to BASIC programs.

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want to copy to the Paintworks Plus clipboard. Reopen your previously saved scene file and paste the clip art wherever you want it. Be sure to save the newly enhanced scene. Open a clip-art disk file—a Postcards or Clip Art Gallery file of stock phrases, perhaps—and use the lasso tool again to clip the phrase you want. Reopen the postcard file and place your message. Then resave the completed scene.

Are there features you'd like to change in your postcard? No problem—change colors in the Paintworks Plus palette, flood an area with an alternative hue, and use Fat Bits to zoom in for fine detailing or to change the color of any graphic or text. Erase parts you no longer want, make the border a different color from the background, or put a huge mosquito into a moonscape. Anything goes—almost.

Paintworks Plus supports the ImageWriter II for both black-and-white and color printing. Postcards printed in black-and-white look okay. Color postcards are much more appealing, though printed color pictures never look as vibrant as they appear on an RGB monitor.

Postcards brings new meaning to the phrase "cut and paste." Not only do you perform these tricks electronically when you select clip art and place it into a scene, but you also need a glue stick (provided in the Postcards package) and scissors to convert your postcard creation from its regular form on ordinary printer paper to postcard stock. (Activision provides 25 blank postcards, and you can order more.)

Cynic that I am, I figured it would be a pain in the neck to cut the paper version, glue it to the postcard, then trim the edges. Was I wrong! If anything, this part of the process gives you a chance to really appreciate your creations and enjoy a few congratulatory chuckles before you address your postcards, stamp them, and mail them to friends and relatives who have already learned to tolerate your computer habit.

With Paintworks Plus, the Clip Art Gallery, and the newest member of the family, Postcards, there's practically no limit to the everyday things you can re-create in ways you've not yet imagined—though you'll need a little help from your GS, of course.

NOW THE BAD NEWS: POSTCARDS FOR OTHER IIs

The version of Postcards Activision designed for less mighty Apple IIs is a stark disappointment compared to the GS edition. Part of the problem stems from hardware restrictions, part from packaging hype, and part from the software itself.

Granted, the most basic Apples (the II, II Plus, and unadorned IIe) usually lack the 128K required for double-high-resolution graphics, truly functional paint palettes, and colorful screen displays. Be that as it may, many users have upgraded to the IIc or beefed up their IIes with more memory. Still, these folks are bound to be disappointed by Postcards' lack of features—especially color printing.

No color? That's right—and not just on paper, either. Although the Postcards box features brightly colored cards and even carries a sticker that boasts "Includes Paint Program," there's nary a pixel of color to be found in the program.

In place of the customary paint palette, this version of Postcards has a series of five patterns (which appeared as black, green, and purple on my Color Monitor IIc) with which you can customize your work. Some "paint program," huh?

These limitations notwithstanding, the fundamental steps for creating a postcard—and indeed the scenes and colorless clip art—are the same on the 64K version as on the GS version, with one exception. In the 64K version you can toggle between two separate screens or pages. You keep the background scene in screen-display one, and load the clip-art file into screen-display two. You can use a joystick or keyboard commands to clip the graphic you want from screen two, revert to screen one, and paste the graphic.

The program doesn't support the drawing tool I prefer—the mouse—so I found working with this version of Postcards awkward despite the ease of toggling between screens. That feature eliminates the file opening and closing that can slow down the postcard-making process on the GS.

The 64K program's command setup is simple. A command list with words such as *erase*, *draw*, and *undo* is arranged along the left-hand edge of the screen. You press the escape key to activate the command list, then press the first letter of the function

you want, such as Z for *zoom*. Some commands seem foreign, though: For example, you don't load a file, you *get* it, and instead of pressing P for *print*, you press O for *output*.

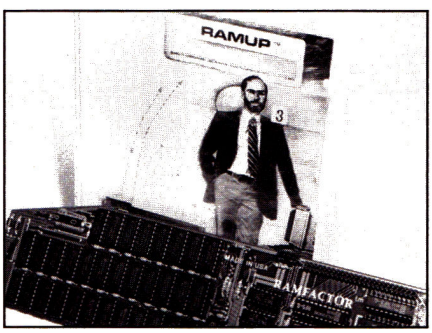
To its credit, the 64K version of Postcards supports many popular printers, including Apple, Epson, Okidata, Panasonic, and Star Micronics. While it supports color-capable printers such as the ImageWriter II and the Okimate 20, it still prints in only black-and-white.

An Activision spokeswoman recommends that you color your postcards with color pencils or fiber-point pens. Crayons might be suitable, she added, but remarked that they'd probably be too imprecise for staying within the lines. She admitted that the colorful graphics illustrations on the Postcards package are misleading and that the manual doesn't mention you have to color your postcards by hand.

It's too bad the Apple IIe/IIc version of Postcards doesn't work as an adjunct to a bona-fide paint program (as the GS version does) such as Dazzle Draw, Blazing Paddles, or one of Activision's paint programs. Still, for $24.95, Postcards might be just the kind of stand-alone application you've been searching for. And if you have children, coloring in their own postcards, gift tags, or bookmarks could be fun.

From my vantage point, it seems as if Activision should offer three separate versions of Postcards for the Apple II family. The GS version already deserves high marks for exploiting that machine's powerful graphics features. The existing 64K version should satisfy owners of basic Apple IIs and popular black-and-white printers. But Activision needs to consider the many thousands of Apple owners who use 128K IIes and IIcs with ImageWriter IIs or other color-capable printers.■

Cynthia E. Field
Wakefield, RI



Line 'Em Up

RAMUP

Quality Computers, 1365 Berkshire, Grosse Pointe, MI 48230, (313) 885-4270

Program-selector utility; Apple IIe, IIc, IIGS, 512K RAM-expansion board, one disk drive
$39.95
Rating: ■■■

Wouldn't it be great if you could turn on your Apple and load all the programs you use into RAM, so that you could flip among them instantly? There'd be no more disk-access time as you changed from one program to another. You'd have to use your disk drives only to save or load a file. That's the idea behind RamUp.

To use RamUp, you need at least 512K of memory. In practice, however, that isn't really enough. A number of programs require a full 512K themselves, and if you only have 512K inside your computer, RamUp would be able to spare only 448K.

That means that if you're limited to 512K of memory, you can't use programs such as SuperCalc3a. Other programs, such as VIP Professional, use so much space they leave little room for other software, which defeats the purpose of RamUp. The manual warns that any program that uses 128K or more of memory may "cause problems," so to really take advantage of RamUp's power and speed, you should have a megabyte or more inside your Apple.

RUNNING RAMUP

Once you've figured out how to load your software, RAMUP works fast. It's fascinating—and very handy—to be able to jump from one program to another without losing what you were doing with the first one. You can even boot a disk and use that pro-

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gram (the one you don't have in RAM), then come right back to where you were with the other programs stored in RAM. You can even boot and use other operating systems, such as DOS 3.3. You also have access to the ProDOS Filer Utility from RamUp.

Quality Computers provides a technical-support phone line and a free newsletter. The company will also update your unprotected RamUp disk at any time for $5.

Running RamUp is pretty straightforward, but for some reason the program checks your second disk drive a couple of times while it's loading as if it's searching for something. The second drive isn't mentioned in the manual.

WHAT PRICE DOCUMENTATION?

Sadly enough, the RamUp package is seriously wounded by its documentation. In addition to typographical errors and gramatically incorrect sentences, the manual manages to make every process within the program more complicated than it should be. Not that everything is easy; as the RamUp manual says, "Most of your software will work without modification," yet it requires you to "expand" many programs (including AppleWorks versions 1.0–1.3) before they can work with the system.

RamUp comes with a list of 28 programs it's ready to load. It lets you add other programs to the list, but the process is slow and convoluted. Besides adding the software with a menu selection in the RamUp utility, you must also modify two different text files (using a word-processing program). That's worse than it sounds; you need to sometimes—but not always—adjust number keys in one of these files. (The manual doesn't explain that.)

To learn how to do that, you need to read yet another disk file—one the program can't print, so you have to work through all the print-format codes, with lines like these: "The procedure for loading data files @#>with AppleWorks is described on page 21 of the RAMUP manual. E#CImportant information can also be found on page 18 concerning data >#<file changes, and a very detailed example of the dataz file =#★ructure can be found in the file 'DATA.FILE.DOC,' in the 7#5 directory /RAMUP/UTIL on the back of the RAMUP disk."

Yes, *data* is really spelled *dataz* in the file. To make things even more fun, there's no page 21 in the manual. There's gotta be a better way.

GOOD ENOUGH TO BUY?

If you use several software programs during the day, RamUp itself is an excellent package that will save you time and effort. Getting it up and running takes some time and effort (installing a program takes about four minutes), and the manual is often more of a hindrance than a help. You shouldn't even consider it unless you've got 1 megabyte or more inside your Apple, but if your Apple has enough memory, and you have enough patience, you'll get good use from RamUp.■

Gregory R. Glau
Prescott, AZ

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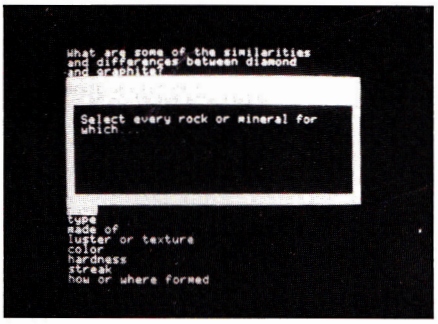

Database Education

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Mindscape Educational Software, 3444 Dundee Road, Northbrook, IL 60062, (312) 480-7667

Database programs with scientific or social-studies databases; 64K Apple IIe, IIc, IIGS
$49.95 each, $125 for a series
Rating: ■■■

In my school days, I used to dread spending hours in the library poring over volumes of encyclopedias and other reference works. I would have much preferred whizzing through a database like those in Mindscape's Quest for Files series. These programs don't pack as much information as an encyclopedia, but they cover a variety of academic topics and are easy to use, and students can arrange and sort through them in any order they like.

Although Quest for Files asks questions about the material (a teacher can assign others), the software doesn't follow drill-and-practice procedures or give students scores. In fact, the program won't let you type in answers to questions; the only places to write answers are the student-response sheets in the teacher's manual. Students search through the databases to reach their own conclusions, then test hypotheses based on their findings.

Quest for Files combines a simple database program with two series of data files, containing three titles each. The Science series includes Rocks and Minerals: The Upper Crust; Elements, Compounds, and Minerals: A Matter of Mystery; and Nutrition: Food, Glorious Food. The Social Studies databases are Families of the World: The Melting Pot; The American Presidency: Hail to the Chief; and The First U.S. Congress: Dawn's Early Light.

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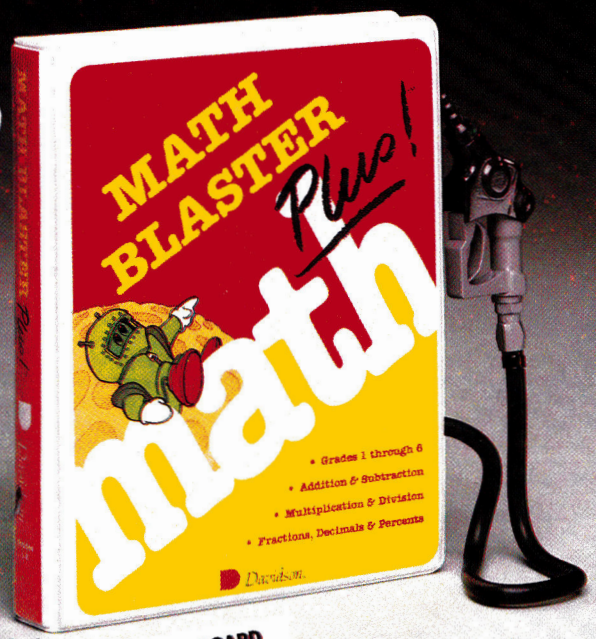

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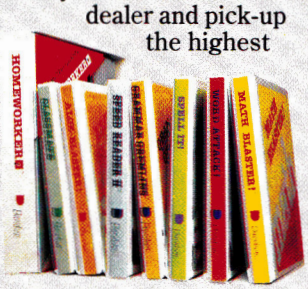

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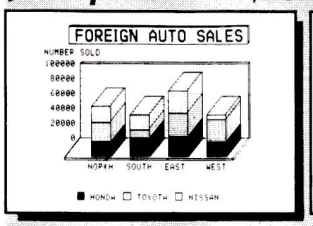

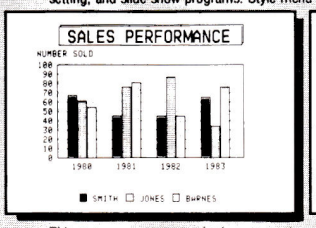

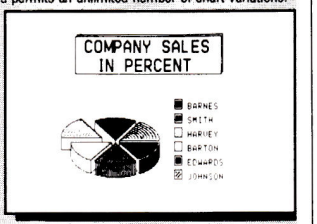

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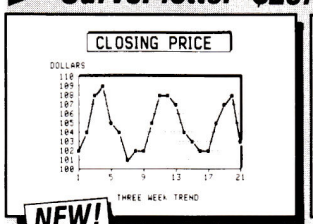

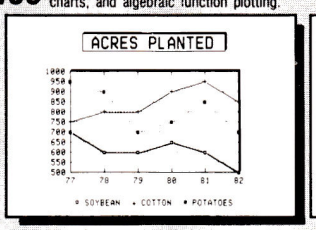

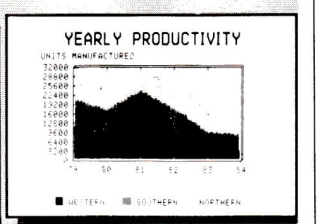

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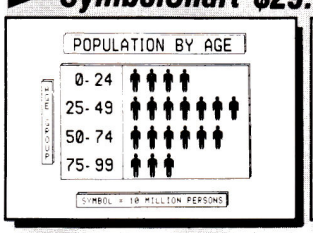

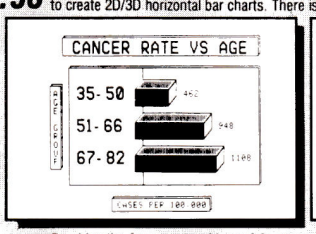

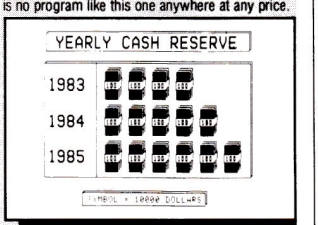

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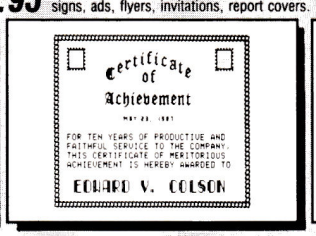

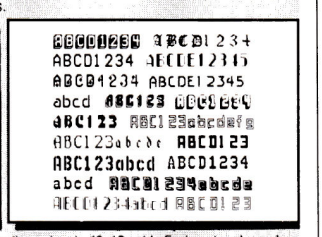

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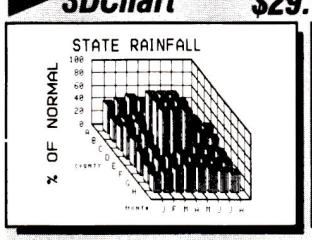

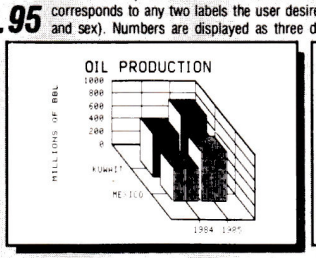

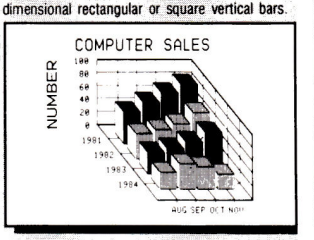

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REVIEWS

option to use the file manager by itself, and a tutorial in using the program's "simple sort" file finder.

The three lessons in each database include a series of questions students must answer by searching for the appropriate information in that database. For instance, one of the first questions in the American Presidency package is "Who was the youngest president to be inaugurated?"

Faced with a question, a student must decide how to go about searching through the database, selecting the relevant records (such as "age at inauguration"), and entering search criteria such as a target, greater-than, or less-than value (finding presidents under age 50, for example).

After finding answers to a series of questions, students can match the data they've found against one of three hypotheses, such as "The vice-presidency has been the most common stepping stone to the presidency" or "Having a lot of children was a real hardship for a farm family," to decide whether the information supports or rejects the hypothesis, or whether it remains unclear.

Once a student has exhausted the possibilities of the three predefined lessons, he or she can go directly to the file manager and use it independently, or a teacher or parent can design new lessons by assigning a student to find certain information. Students can just explore all records and fields, or search for specific information according to a teacher's assignment or their own interests.

Moving around in the Quest for Files databases is fairly simple, even for students with little or no previous computer experience. The spacebar and return key move through and select command options, while the escape key always returns you to the previous screen. On-screen prompts guide the student through appropriate choices and explain how the information is arranged.

Quest for Files is a good way for students to become comfortable with a variety of skills, from research methods and deductive reasoning to the process of weighing information and forming hypotheses, as well as learning the facts of the individual subject areas. As a bonus, they'll become familiar with database theory and the concept of computer database management. ■

Lafe Low
inCider *staff*

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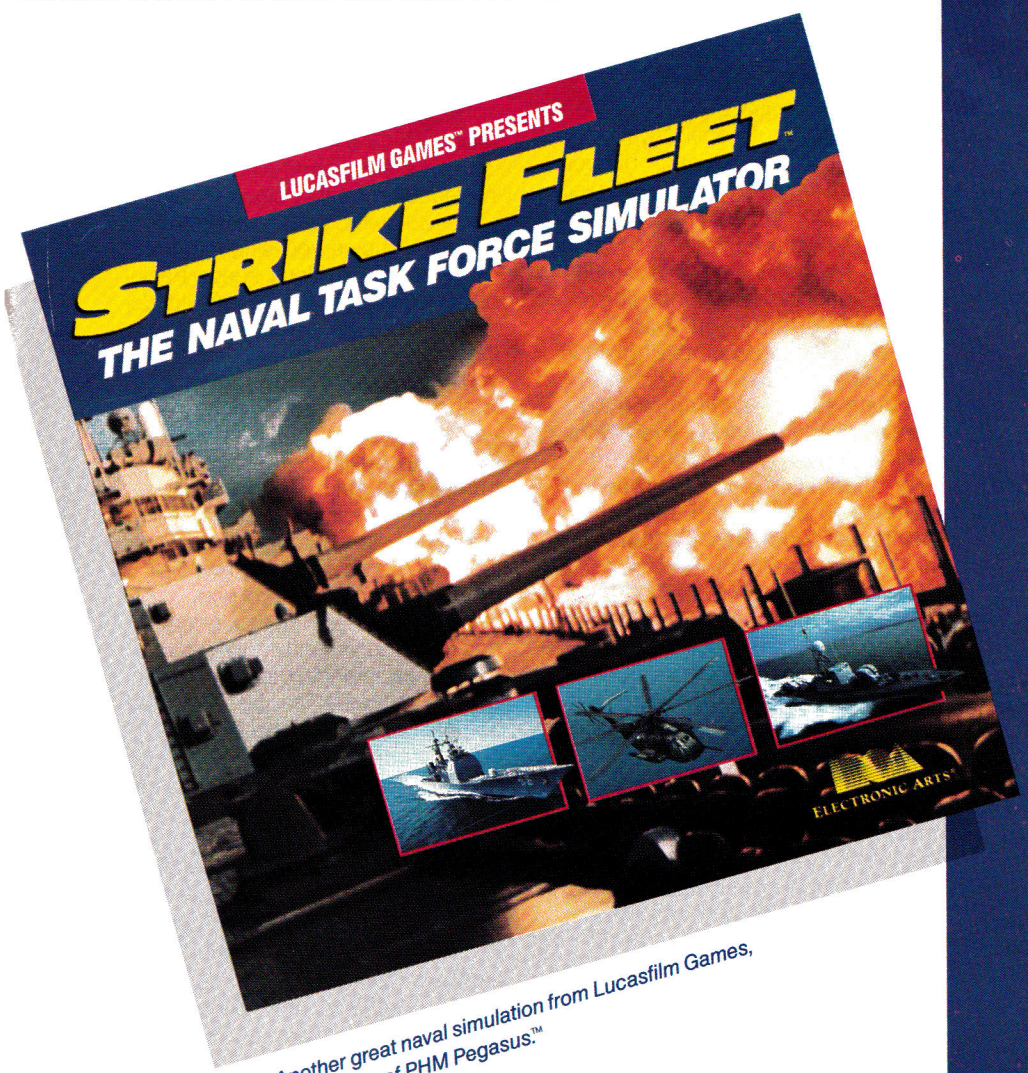

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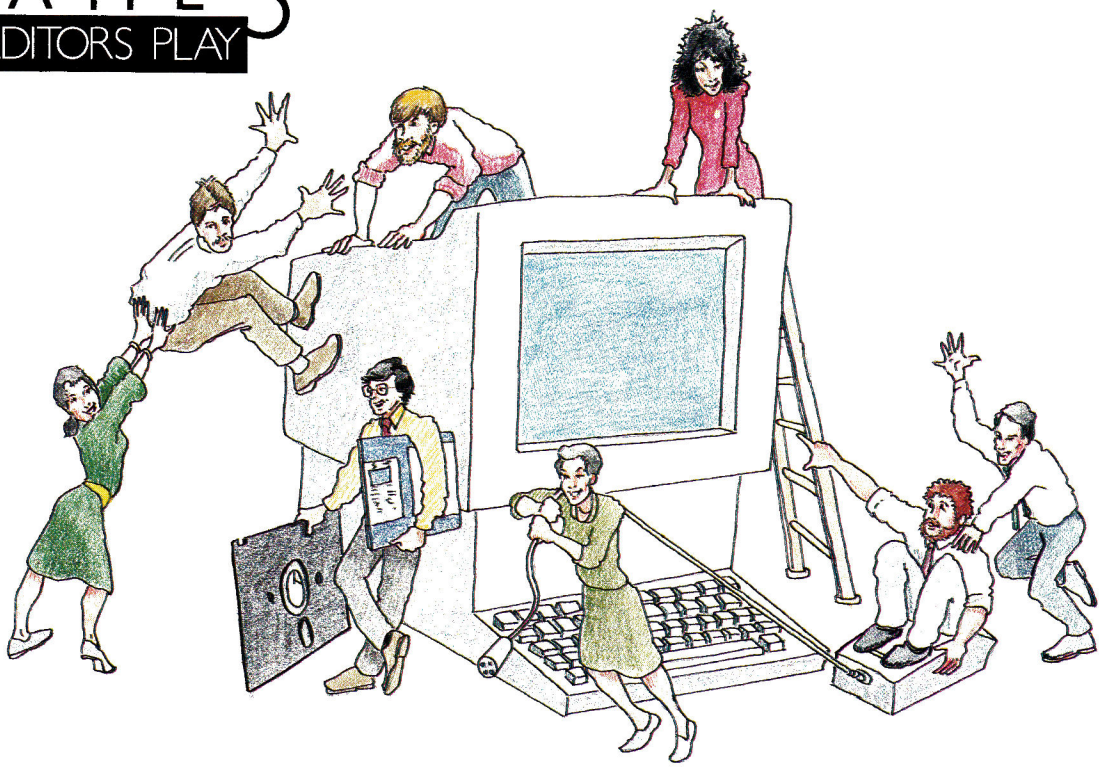


With this issue, Games Editors Play goes monthly. We figured it was time to make good our New Year's resolution—to play more games! This month's gathering is as diverse as ever. We've got a historical trip to London, a menacing golf match, a pick-up game of sandlot baseball, skiing at Mount Kilimanjaro, and a delicate exercise in global power. Wow, no wonder we doubled our playtime.



Pat O'Dell plays...

Ticket to London, *Blue Lion Software, P.O. Box 650, Belmont, MA, 02178. $39.95.*

Playing Ticket to London for the first time can be a humbling experience if you think you know history. But as you go along, you'll get better at making educated guesses and you'll start accumulating points—that's when things start to look up. By the second game I was hooked, at least for a few more rounds.

The game is set in the streets of London. You arrive in the city and proceed to Victoria Station, where an employee of your travel agent informs you he'll hold your return ticket for the duration of your stay. To retrieve your ticket, you'll have to give him the name of a famous Briton—and to identify that person, you have to make your way around London accumulating and deciphering clues.

Wherever you travel on the full-screen map of London, friendly natives stop you and pepper you with questions. Correct answers garner you points, and enough points earn you hints. Decipher a hint and it'll lead you to a clue. Questions range from easy ("What is Fleet Street?" and "Who is Princess Diana's oldest son?") to obscure queries about British culture, history, and geography. Since all questions are multiple choice, players shouldn't be daunted.

An example of an earned hint might be "enjoy pink fish." You must then find a place in London that will serve you salmon and arrive there during business hours. When you order, you'll receive a clue. The clues become increasingly specific as the game progresses, but even when I had accumulated seven clues, no one in this office was able to guess the identity of the famous person.

Ticket to London makes every effort to be realistic, which adds a great deal to the fun. When you pick a destination on the map, the program shows you a full-screen graphic of it. A clock keeps track of the time, and players would do well to keep an eye on it. Without the proper rest and nourishment, you'll collapse and be forced to lose a day for recuperation. Also, you must convert your American money to British pounds, and the banks have strict closing hours.

One nice feature of Ticket to London is its ability to save games in progress on the program disk. When you boot the program, it offers you a choice of characters and lets you resume a previous game—it's intended to be an ongoing challenge. The last thing the authors want is for you to figure it out in one sitting.



Bill Kennedy plays...

Famous Courses II, III, IV, *$34.95 for both, Accolade, 20813 Stevens Creek Boulevard, Cupertino, CA 95014.*

Did you ever play a round of golf and listen to a gallery of spectators cheer your great shots and

groan at your near misses? No? Me neither, at least not until I took to the Mean 18 links.

Just after booting the Mean 18 disk, a voice I swear is coming over the clubhouse PA system announces, "Accolade presents. . . ." Then, when I hear the swish of a golf club, it's all over. No longer am I seated at my tech bench. With a golf bag over my shoulder, I'm transported to one of several world-class golf courses, traipsing about, playing a round of golf I could only dream of in real life.

Mean 18 is one of the best golf simulations I've seen. It comes with a choice of three widely known 18-hole courses from the Masters tour; you can add to that collection from a growing library of Famous Course volumes. You can even design and save your own green with the course architect. Personally, I like Pebble Beach. I beat *inCider*'s Eastern sales manager, Dale Strang, there by one stroke—a birdie putt from 26 feet on the 18th green. The crowd loved it.

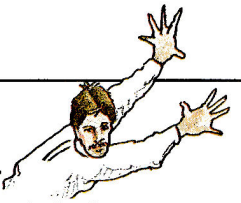
All the course scenery is displayed in graphics that do justice to the Apple IIGS. Each hole's characteristics are true to their real-life counterparts—even down to the clubhouse.

An on-screen golfer is your computer representative who actually goes through the motions of the swing. You'll watch the ball fly, bounce, or splash—where it goes depends on which club you choose, your stance, and when you click the mouse button for the power and "wrist snap" in your swing. Just stay clear of the trees, water, and sand hazards.

Fortunately for me, there's also a built-in caddie who'll choose the right club for the upcoming shot. There's a practice green and a driving range—highly recommended for newcomers to the game.

Mean 18's greatest attributes, though, are its sound effects. Each stroke, putt, water shot, or sand-trap shot comes over your speaker loud and clear—and very realistically. I'm constantly trying to please the gallery of onlookers with a great shot.

Now if I can only figure out how to cover these divots in my workbench. . . .



Dan Muse plays. . .

Street Sports Baseball, *Epyx, 600 Galveston Drive, P.O. Box 8020, Redwood City, CA 94063. $39.95.*

I'm not too old to remember the days of playing baseball in vacant lots and empty parking lots. While those settings didn't offer the aesthetics of Fenway Park or Yankee Stadium—or even a nice Little League park—there's a certain charm to learning the nation's pastime in your own backyard.

Now you can relive those days with Epyx's Street Sports Baseball. This game offers a fresh perspective on computer baseball games. The programmer must have had a big smile on his face as he developed this arcade-style game—home plate is a trash-can lid, first base is a piece of cardboard, and second is an old tire. In the outfield, you have to avoid tree stumps, puddles, you name it. The only thing missing is a grouchy old man who yells at you if you hit the ball into his yard.

Before the game begins, the locals—both boys and girls—gather on the stoop and you and your opponent (computer or human) pick teams. The greatest thing is that you don't have to worry about being the last player picked.

The screen is similar to those of other popular games of this genre. On the left is a close-up shot of the action—the pitcher and batter, the runner on the field, and so on. On the right is an overview of the field that lets you keep an eye on all the fielders and runners.

On the negative side, the action seems a little slow, especially between batters. Also, the learning curve could be a little more difficult, making the game more challenging for a longer period of time. In short, Street Sports Baseball isn't the slickest game you'll ever play, but the intangible "fun factor" and the personalities of the 16 sand-lot stars more than make up for any minor-league shortcomings.



Lafe Low plays. . .

Ski Crazed, *Baudville, 1001 Medical Park Drive S.E., Grand Rapids, MI 49506. $29.95.*

I'm definitely ski-crazed. In the autumn I'm like a little kid who can't wait for the first snowfall. It's a good thing a certain ski area in Vermont always opens in October, and it's a good thing there are games like Ski Crazed.

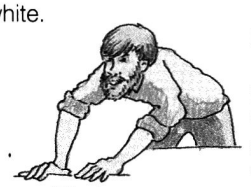
This game is more for the "Ski to die, dude" set than racer chasers—more for mogul mashers and aerial wizards than slalom aces. The courses (set on Mount Kilimanjaro, of all places) are loaded with moguls, big jumps, little jumps, and, of course, ice. There are a couple of courses with slalom gates, but the emphasis isn't on cutting a clean line through a race course in the shortest possible time. The trick is just to finish the course without falling too much.

If you do zig when you're supposed to zag, you'll do a nasty face plant or go spinning off the top of a mogul wrapped up in a snowball. You can fall twice and get up to finish the course, but if you fall a third time, the Kilimanjaro Ski Patrol comes to your rescue and you start the course again.

The slope names add a distinctively alpine flavor to the game. Some of them are real trails—Avalanche is one of the fabled Front Four at Cannon Mountain in Franconia Notch, New Hampshire, and Widow Maker at Stowe has scared the daylights out of many skiers over the years.

After you finish the game's 15 trails, or if you can't finish them and tire of trying, you can design your own ski slopes. Your customized trails can be as easy or difficult or long or short as you like. I made one that would have killed me in real life, and named it after

Cascade at Killington (which does kill me in real life). If you count moguls in your sleep and dream about snowstorms, Ski Crazed should hold you over until the mountains are white.



Paul Statt plays...

Balance of Power, *Mindscape, 3444 Dundee Road, Northbrook, IL 60062. $49.95.*

Somewhere between lunacy on the left and ranting and raving on the right—between wishful thinking that we had never invented the nuclear bomb and daring to drop one on Asia—we'll keep peace in the world or we'll destroy it. War in the nuclear age fails to amuse me as a game.

Balance of Power is no war game; if anything, it's a peace game. Balance of Power would have bored me when I was young; if kids today are excited by it, they've changed for the better. "New Games," those sports that call for cooperation, not competition, must have worked some magic on the young ones.

We old folks still have much to learn about waging peace, and Balance of Power has a lot to teach. You may not agree with Chris Crawford's vision of geopolitical reality—I don't. The powers you're steadying are the USA and the USSR; other nations only react to the eagle and the bear. And your options are almost all military. But play Balance of Power, because no other computer game comes near it for complexity and intelligence—intelligence both in the facts behind Balance of Power and in the style of play.

Play Balance of Power once, and you'll want to own it. The challenge is to survive the next five years without blowing everything up or giving everything to the Russians. It's not likely you'll succeed.

Playing Balance of Power is kind of like reading the newspaper—but instead of screaming, "That damned Reagan's sending more money to the Contras" or "That commie Congress is cutting the Contras' throats," you make the decisions. After reading that the Soviets have sent armies into Central America, you can choose to let them ride or to pick a fight. It's what I call "interactive computer fiction."

Praise goes to Chris Crawford not only for the cerebral foundation of Balance of Power, but also for its nuts and bolts. I played without a joystick or mouse, and found the keyboard translation—the game was designed for the Macintosh—as slick as the game itself. The whole game—its heart is a very large database—is kept in RAM, which makes playing faster and more fun.

I've never beaten Balance of Power, and I'm no hawk. The game scares me, because I wonder if the President and the General Secretary play any better than I do.□

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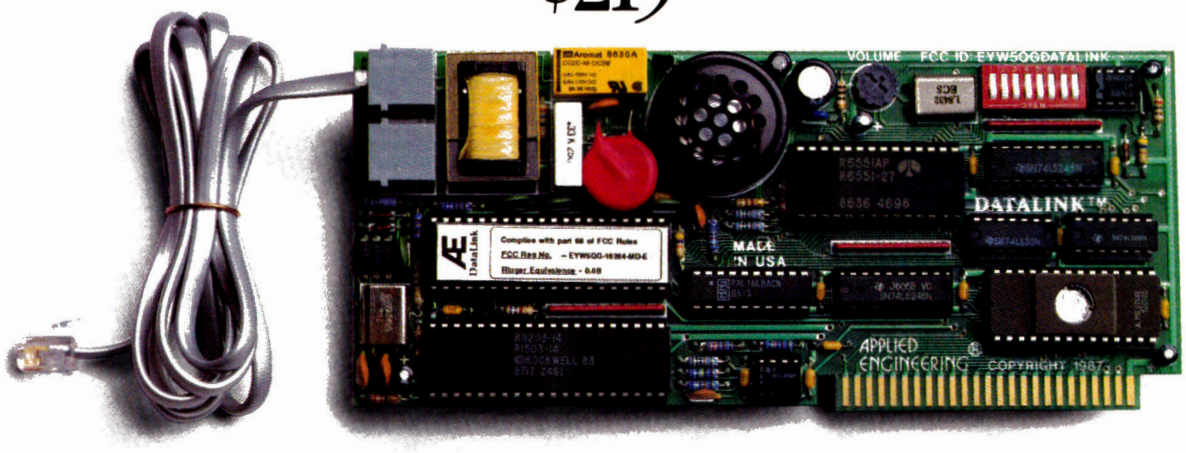

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Laser 128 2-Slot Expansion Box 49.
Laser 128 Cables
(Parallel, Serial, RGB or Modem) 16.
Laser 128 Mouse 49.

Backup Utilities & Boards

Alpha Logic Locksmith 6.0 36.
Central Point Software Copy II Plus Version 6 21.
Utilico Software E.D.D. IV 21.
E.D.D. IV Plus *(II, II+, IIe w/Disk II)* 79.
E.D.D. IV Plus *(IIe w/DuoDisk or UniDisk 5.25")* 89.

Entertainment Software

Access Software
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Famous Course Disk Vol. 2 12.
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Electronic Arts
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California Games *(IIe or IIGS Version)* 26.
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World Games, World Games *(IIGS)* or Destroyer *(IIGS)* 26.
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Infocom
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Strategic Simulations
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Battle Cruiser, Battle Group, Kampfgruppe, Mech Brigade, North Atlantic '86, Sons of Liberty, Warship, or War in the South Pacific *(each)* 40.
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Communication Software

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First Byte/Electronic Arts
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Modems

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Accelerators/Ramcards/Z-80/80 Column Cards

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RamWorks III *(64K to 3 MB)* Call
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C. Itoh 3.5" DS/DD Color Disks *(box of 10)* 25.

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M-1409 *(180cps Dot Matrix NLQ) 10"* 349.
M-1509 *(180cps Dot Matrix NLQ) 15"* 389.
HR-20 *(20cps)* Daisywheel 359.
HR-40 *(35cps)* Daisywheel 599.
TwinWriter 5 799.
Epson LX-86/LX-800 Call
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FX-286e Most Call
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Microline 192*Plus (200cps Dot Matrix 10")* 339.
Microline 193*Plus (200cps Dot Matrix 15")* 489.
Microline 292P *(240cps Dot Matrix 10")* 539.
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Panasonic
KXP-1080AP *(100 cps) ImageWriter Compatible* 249.
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Investment Software *That Pays Off*

Whether you're venturing into stocks, stamps, commodities, or real estate, your Apple II and the right investment program can help you organize your data and manage your portfolio.

by Cynthia E. Field

A savvy investor knows that throwing money carelessly into securities, real estate, or collectibles can be a lot like playing the lottery—hit or miss. But whether you're a bull, a bear, a baron, or a ferret, you also know that a well-planned investment strategy can beat a conventional savings plan any day.

What you may *not* know is that you already have a silent partner—your Apple—to help you track your investments more precisely and manage them more successfully. Whatever your investment objectives, at least one of the two dozen programs described below can help you minimize risk and maximize reward.

WALL STREET MEETS MADISON AVENUE

Understandably, most investment software focuses on one of America's most appealing ventures—the stock market. But shouldn't you go on line, as brokers do, to get the most timely information for making prudent buy and sell decisions?

"Not at all," according to George Maniscalco at Standard & Poor's Corporation, New York. According to Maniscalco, "That's a misconception. Going on line carries a horrendous cost. At 300, 1200, or even 2400 baud [the rate at which most modems transfer data], you'd spend a small fortune bringing in dozens of pieces of information on thousands of companies. And it would take a huge amount of time."

Maniscalco's solution? Standard & Poor's **Stockpak II** (see Reviews, December 1985, p. 127) and its monthly or twice-monthly disks of market data.

Each updated disk includes historical information on hundreds or even thousands of companies, depending on whether you choose the Amex (American), NYSE (New York), OTC (over-the-counter), or composite (selections from all three) stock-exchange version. Imagine the time you'd spend if you had to use a database program to type in financial information for thousands of companies on your own!

Stockpak II makes it easy to cull the stocks in which you might want to invest. Use the program's built-in selection criteria—or create your own formulas. Maniscalco likens


DOW JONES

the program to—of all things—a dating service: "You can tell the program you're looking for a company that's got a good-quality image, is stable, and pays a high dividend."

Stockpak II's database and graphics features not only let you compare two companies, but also present any face-off in the form of bar graphs you can print, together with tabular data.

As you've probably guessed, such responsiveness and power don't come cheaply. (Consult your accountant: You may be able to deduct the costs of Stockpak II and the other programs described here.) The least-expensive Stockpak II subscription costs $245 for 12 monthly updates. For that amount of money, you have your choice of disks containing 1500 NYSE companies, 800 Amex companies, or a composite of 1500 widely traded companies from all three national exchanges.

Despite the expense, if you're serious about the stock market and favor fundamental analysis, Stockpak II in one form or another should probably be your very next stock-market investment.

OTHER HOLDING PATTERNS

You say $245 isn't within your budget? At least four other stock-market-analysis programs are available—at prices ranging from about $30 to $100.

Portfolio II (Navic Software) and **Stock Master/Stock Plot** (Dynacomp) are electronic portfolio managers programmed to accept the information you enter about the stocks you already own, or propose to own.

Like many of the other investment programs discussed in this article, Portfolio II operates under DOS 3.3, requires only 48K, and features a 40-column screen display of solid capitals.

The interface seems a bit aged, but this feature doesn't completely detract from the program's capabilities. Portfolio II handles up to 40 securities and plots pricing trends in hi-res graphics. Using your criteria for profit-taking and for stopping losses, the program can "recommend" when to sell a stock.

Stock Master/Stock Plot is marginally (no pun intended) better than Portfolio II. Dynacomp's program likewise sports an older-type interface and is configured for the Apple Silentype printer, a thermal dot-matrix model that was popular when the Dow had not yet broken 1000.

Stock Master/Stock Plot can handle up to 30 stocks in as many as eight portfolios. The program stores as much as ten years' worth of fiscal data for each company in which you're interested. Unfortunately, you have to look up these data in conventional sources and type them into the program.

Like Portfolio II, Stock Master/Stock Plot can adjust for stock splits and can present securities trends graphically. Like many programs from the early 1980s, Dynacomp's package isn't completely bullet-proof: The program crashed on two occasions when I tested it. Although I didn't lose any important data, my confidence in the program was diminished.

Let's say you're a more eclectic investor—one who spreads his or her risk by holding stocks, bonds, mutual funds, Treasury bills, and CDs. If you're an AppleWorks fan, you might consider purchasing preconfigured portfolio templates. (See the accompanying sidebar, "Watching Your Money Grow with AppleWorks.")

If you don't want to be bothered with spreadsheets and you think you'd like a stand-alone investment package, investigate **The Market Pac** from H&E Computronics. According to company literature, this broad-based investment calculator handles stocks (including warrants and options), convertible bonds, and money-market funds. In addition, The Market Pac performs merger analysis, calculates linear and moving-average trends, and forecasts cash flow.

Although I wasn't able to secure an evaluation version

Watching Your Money Grow with AppleWorks

If you're like me, you've been spoiled by newer interfaces and powerful programs like **AppleWorks** that you can turbocharge to perform nearly any investment task.

While researching a previous article about enhancements for AppleWorks (see "Save Time with Templates," December 1987, p. 89), I discovered **Investment Portfolio**, a series of spreadsheet templates that help you keep track of your stocks, bonds, and mutual funds. Other inexpensive investment-related packages include **Financial Calculator** and **Success with AppleWorks**. Both sets of templates include loan-payment and amortization utilities.

The main advantage of templates—besides their low cost—is that, if you already own AppleWorks, you know what commands to use to load, save, rename, edit, and print your data. To its credit, AppleWorks rarely crashes, supports ProDOS peripherals such as 3½-inch and hard-disk drives, works with virtually any printer, and is easy to use.

But AppleWorks is more than a spreadsheet program. Fred Field (probably no relation), a Cape Cod real-estate broker from Cotuit, Massachusetts, uses the AppleWorks database and word processor to track the 500 or so customers he's garnered during the course of his work representing a major condominium developer and in his position as president of Hooper's Landing Associates. He credits AppleWorks with helping him sell 65 condominiums in a single year.

As for his own real-estate investments, Field still uses a conventional checking account (the paper-and-pen variety) to manage his four apartments and one condominium. He's considering using **Quicken**, Intuit's AppleWorks-compatible checking-account program, or getting into the AppleWorks spreadsheet, but quips, "I've never been able to get the day it will take me to get comfortable with a new program." That's easy to understand when you're selling dozens of properties in a single year.

Whether you need a database to store company financial histories, a word processor to woo condo buyers, or a spreadsheet to prepare an amortization schedule, AppleWorks may be the best investment partner you've ever had.□ **—C.F.**

Æ Update . . .

A new method of backing up IIGS memory is introduced by Applied Engineering. A new plug-in card called RamKeeper can be used with a GS-RAM, GS-RAM Plus, and Apple IIGS memory card and most other IIGS memory cards to keep system memory intact when the computer is turned off. RamKeeper has its own battery and separate power supply that powers your IIGS memory card when the computer is turned on and when it's off. IIGS computers can now "cold boot" in about 4 seconds with programs and data available for instant response. With RamKeeper, two IIGS memory cards can reside in the same IIGS memory slot. RamKeeper has an additional benefit by reducing the strain on the Apple IIGS power supply because it no longer has to supply power to the IIGS memory card(s).

RamFactor upgrade doubles RamCharger's battery back-up time. An upgrade kit for RamFactor, consisting of two replacement chips, will double the amount of time the RamCharger battery back-up option can last in the event of a total power failure. This upgrade costs $20.00 and increases the back-up time from 6 to 12 hours for a 1 megabyte RamFactor. And with this upgrade, the back-up time for a 5 Meg RamFactor will be about 7 hours. Since RamCharger has its own built-in power supply, it can back up a RamFactor indefinitely. The reason for the improvement on RamFactor is to increase the back-up time in the event of a total power failure. The new RamFactor piggybacks are available in 1, 2, 3 and 4 megabyte sizes.

A new high performance parallel printer interface card is introduced by Applied Engineering. Parallel Pro is compatible with virtually all parallel printers and offers extensive graphics printing capabilities: hi-res, double hi-res, IIGS super hi-res screens, mixed graphics and text, emphasized, double sized and inverse text, 90° rotate, center, right and left justification, and spectacular color printing (up to 22 colors). A six foot cable is included for connection to a parallel printer. Parallel Pro sells for just $89.00. Parallel Pro has an optional plug-in buffer called Buffer Pro. Buffer Pro can free your Apple from controlling the printer and can handle up to approximately 256 pages of text. The expandable 32K Buffer sells for $89.00 and the 256K buffer sells for only $139.00.

DataLink modem chosen Editor's Choice award from inCider Magazine in the November telecommunications issue. Part of the reason why the 300/1200 baud DataLink was chosen for this prestigious honor was due to the completeness of the DataLink package. DataLink is a full-function modem that includes full-featured communication software containing on-line help screens and the most powerful macro language available in an Apple II communications program. The DataLinker software even includes a set of ready-made macros that will allow instant access to many popular services with only a few simple keystrokes. DataLinker software has even more added features since inCider chose DataLink as Editor's Choice. Version 1.1 of the DataLinker software now supports multiple start/stop bits and parity settings that make it easier to connect with even more computer services (like some college mainframes) as well as a "Chat" mode that is useful when calling another terminal program. An update to the latest version of DataLinker software costs $10.00 directly from Applied Engineering.

Applied Engineering's headquarters will be closed for the holidays. Applied Engineering will close its offices at 3:00 pm on Tuesday, December 24th and will re-open on Monday, January 4th. An order service will be in use during this time period for those who wish to have priority shipments when the office is re-opened on the 4th. If your dealer is out of stock, Applied Engineering will be able to take orders in time for Christmas delivery until December 22nd. However, try to order in advance of this date to save money on shipping expenses. Applied Engineering wishes everyone a wonderful holiday season and a happy New Year.

Æ APPLIED ENGINEERING™

The Apple enhancement experts.

of The Market Pac by press time, a spokeswoman at H&E Computronics assured me that this program, like others from her company, comes with a 30-day money-back guarantee: You receive a full refund if the program isn't what you're looking for.

OPTIONS AND COMMODITIES

If you're into these more rarefied forms of investing, two programs—**Options Analysis** from Dynacomp and **The Commodity Trader** from AV Systems—can assist you in these complex, number-crunching arenas.

Options Analysis, which uses the Black-Scholes model, includes seven programs for calculating values of puts and calls and for evaluating spreads and straddles. The Commodity Trader, likewise of early 1980s vintage, plots linear regressions and determines correlation coefficients for the commodities you're following, such as corn, soybeans, Swiss francs, and plywood.

Unfortunately, you must painstakingly transcribe data for these commodities from conventional sources such as *The Wall Street Journal* into The Commodity Trader. According to Adrian Vance, president of AV Systems and designer of The Commodity Trader, this deficiency has kept the program from being a successful commodity itself. As Vance notes, "Most of the potential buyers wanted a system that would run on the IBM and would operate as a terminal program, producing visual charts from the raw data [received by modem]."

Nevertheless, Vance's program is popular with "a small number of traders who prefer to work with independent, inexpensive sources of data, [who] are in foreign countries, or [who are] on college campuses where some of the programs can be used for analysis and modeling."

If you fit into one of these categories, or you'd like to test the commodities waters without getting soaked, consider The Commodity Trader. Priced at only $32, it's available either from AV Systems or via Kinko's Academic Software Exchange, a division of Kinko's copy centers, which are located throughout the U.S.

GIVE ME LAND—LOTS OF LAND

Unlike stocks, bonds, options, and commodities, real-estate investments—especially rental properties—can be labor-intensive, requiring vigilance in addition to elbow-grease. And if you're *not* using your Apple to help you with your real-estate investments, you could be wasting time and losing money. It's not difficult to get started: You may already own the programs you need.

For instance, the flip side of the introductory disk that comes with the Apple IIc, The Apple at Play, includes a series of investment programs called Financial Tools. Some of these programs calculate the future value of annuities or the growth potential of a savings plan.

Others calculate loan payments and amortization schedules. I use these utilities often to play "what if" with various mortgage scenarios. In a matter of seconds, you can determine how a monthly mortgage payment will change if you extend the term of the loan or manage to shave half a percentage point off the rate.

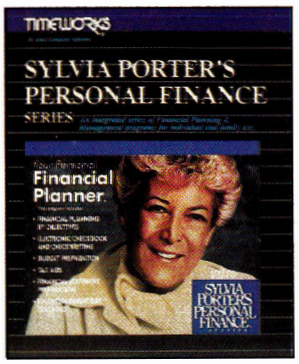
What if you use a II, II Plus, IIe, or GS? With the correct formulas (which you should be able to find in a business-math book or get from your accountant), you can create custom templates for your spreadsheet program.

For day-to-day money management, the small-scale investor can use nearly any personal-finance program, but preferably one that has the capability to handle multiple checkbooks. For example, to manage accounts for five rental condominiums, I use Broderbund's **On Balance**. The program has a modern interface and is wonderfully flexible. It's easy to correct mistakes, add accounts, and get nearly any printout—including balance sheets for any or all properties. And it's especially convenient to print monthly checks for condo fees, mortgages, and utilities on a speedy ImageWriter II.

If you're a large-scale investor, other options may work better. **The Property Manager** from Dynacomp is a complete accounting system for owners. It keeps track of tenants, lease expirations, vacancies, and vendors, in addition to maintaining a general ledger and records of accounts payable and receivable.

Professional property managers should investigate **The Landlord**, written by Systems Plus and available from H&E Computronics. This sophisticated program performs clerical and accounting chores, claims to be suitable for commercial as well as residential properties, and prints separate income statements for each owner.

Coming Soon to a Dealer Near You



Artificial intelligence hasn't yet taken a shine to investments. But two major software publishers, Timeworks and Simon & Schuster, are reportedly working on programs that, while not exactly expert systems, are expected to carry the imprimatur of experts.

Timeworks' program-in-progress will constitute the second volume in Sylvia Porter's Personal Finance Series and is expected to take a general approach to investment management. Simon & Schuster's package is purportedly being prepared under the direction of Albert Lowry, the "no-money-down" real-estate guru.

If you already use Sylvia Porter's **Your Personal Financial Planner** (see Reviews, April 1986, p. 36) to manage your home finances, or if real estate is your game, stay tuned for more information on these programs as they're released.

Until then, the programs reviewed in the accompanying article can organize your investment portfolio, provide vital investment information, and forecast significant investment trends. Until truly expert systems are developed, however, you'll have to continue to depend on your own decision-making powers.□ **—C.F.**

The Landlord requires 128K and a ProDOS hard-disk drive. The program is priced at $595 and comes with the same 30-day money-back guarantee as The Market Pac, the securities-analysis program described above.

TOUGHER ALL THE TIME

Most real-estate investors would agree that deciding what properties to buy in the first place is more difficult than ever, in light of rising mortgage rates and recent changes in federal tax laws.

Fortunately, a program such as HowardSoft's **Real Estate Analyzer** (see Reviews, March 1986, p. 76) can mollify the frustration caused by hours of conventional property-selection analysis.

Real Estate Analyzer uses data you provide about a property's income and expenses in addition to your estimates of your tax bracket, the expected inflation rate, and potential property appreciation. The program performs a variety of short- or long-term projections, including analyses of returns on investment and internal rates of return. Each thorough property evaluation takes no more than a few minutes, so it's a cinch to perform comparative analyses of two potential investments.

You can print fully formatted reports—complete with customized title pages—for presentation to partners or mortgage-loan officers.

If you don't need all the advanced features Real Estate Analyzer provides in a single program, you can take a simpler approach and purchase separate **Real Estate Analysis Modules** from Realty Software. At $75 each, these modules seem a bit pricey to me, but may be just what you're looking for. Titles include Home Purchase, Loan Amortization, Construction Cost/Profit, Tax Deferred Exchange, and Income Property Analysis.

BULLISH ON COLLECTIBLES

If you consider stocks too volatile and real estate too time-consuming, perhaps you favor investments that are more tangible and take up less space. Stamps, coins, baseball cards, comic books, and who-knows-what-else are becoming increasingly popular hedges against inflation.

Avid hobbyists who catalogue their holdings the conventional way with paper and pencil may be happy to learn that they can employ their Apples as electronic albums. You can use the AppleWorks database or any other, such as **Bank Street Filer**, to store up-to-date details about your collection.

As you can imagine, data entry is time-consuming, however, and can put a damper on the enjoyment you get from your collection. Luckily, stamp and coin collectors have a more agreeable alternative.

Compu-Quote offers two time-saving portfolio managers: **Stamps** and **Coins**. The Stamps program—available for the United States, Canada, Great Britain, and the United Nations (Germany and Israel are in the works)—includes the latest descriptions and values of all stamps listed in the philatelist's bible—the *Scott's* catalog.

All you do is tell the program which stamps you own. Enter the *Scott's* catalog number, and the software automatically fills in each stamp's record with information such as the year issued and the denomination. Give your best estimate of the stamp's quality (average, fine, very fine; unused never hinged, unused hinged, used), and the pro-

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Open-Apple is Tom Weishaar's monthly newsletter for knowledgeable Apple II users. It's thin but packed tight with Apple II lore, humor, letters, tips, advice, and solutions to *your* problems. Compared to other Apple II publications, *Open-Apple* has the highest new-idea-per-issue ratio, the clearest writing, the funniest cartoons, the longest index, the *only* warranty (all your money back if you're not satisfied), and it takes up the least shelf space. The only thing it doesn't have is the most subscribers. Yet.

II cue #31

To change AppleWorks 2.0 so that it can make up to 255 copies of a word processor document, slip a fresh *copy* of your AppleWorks program disk in the drive and, from Applesoft, enter:

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BSAVE SEG.M1,T$00,L1,A768,B36074
```

For more information, see "AppleWorks as copy machine," in the October 1987 *Open-Apple*, page 3.71

From our fan mail:

I have bought all your back issues and eagerly await each new one. With so many other commercial rags out there filled with articles that tell me which key to push, etc. your approach is warmly appreciated.
David Madfes
San Francisco, Calif.

I can't close without saying how much I enjoy *Open-Apple*. I'm not a programmer, so much of what you say is over my head. But I like the substance and dialogue in your articles (you're fun to read), and occasionally I pick up a useful piece of information.
Howard Hanchey
Alexandria, Va.

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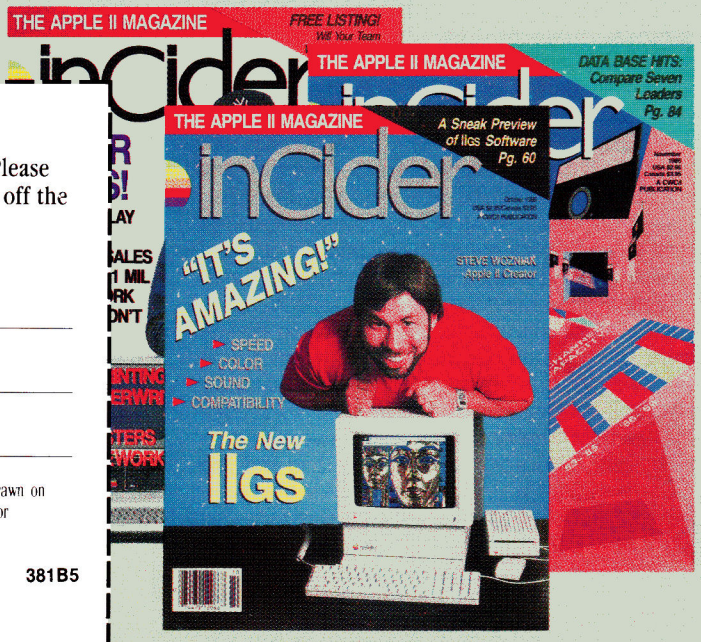

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gram enters its current value automatically.

Compu-Quote's Coins program operates in similar fashion. Estimates of value are taken from auctions, from the *Blue Book*, and from Trendex.

Reasonably priced, yearly updates for both Stamps and Coins are available. They *don't* require you to re-enter all your holdings. Each update includes the latest valuation information, as well as data for new stamps released or coins minted during the previous year.

Stamps and Coins are valuable additions to the philatelist's or numismatist's software library. Various reports generated by these programs are crucial not only for investment reasons, but for insurance and estate-planning purposes, as well.

TRUE EXPERT SYSTEMS

No program I found can make investment decisions for you. (For a description of two upcoming programs designed under the direction of financial experts, see the accompanying sidebar, "Coming Soon to a Dealer Near You.") Any one of the programs mentioned above, however, can help you organize and calculate investment information.

Once you begin computerizing your investments, you'll probably discover that the best expert system of all is the one you compile yourself—implementing one or more of these Apple II programs and your own incalculable investment experience.■

Cynthia E. Field is the author of Field Trip, inCider*'s column on educational software. She teaches botany at the University of Rhode Island and is a free-lance journalist specializing in computer-related topics. Write to her at 60 Border Drive, Wakefield, RI 02879. Enclose a self-addressed, stamped envelope if you'd like a personal reply.*

Product Information

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Broderbund Software
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(415) 492-3500

Coins, $95
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Reader Service Number 310

Financial Calculator
Investment Portfolio
Applied Scientific
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The Landlord, $595
The Market Pac, $99.95
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Valley Cottage, NY 10989
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(716) 265-4040

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RamWorks III gives you a huge AppleWorks desktop — 366K with the 512K RamWorks III and on up to 2251K with the 3 MEG RamWorks III (even after *all* of AppleWorks automatically loads in memory).

RamWorks eliminates AppleWork's internal memory limits. While AppleWorks 2.0 makes up to 6,350 database records available, you get up to 22,600 with RamWorks. Instead of AppleWorks' 7,250 word processing lines, you get up to 22,600 lines. And Clipboard capacity zooms from AppleWorks' 255 lines to 2042 lines.

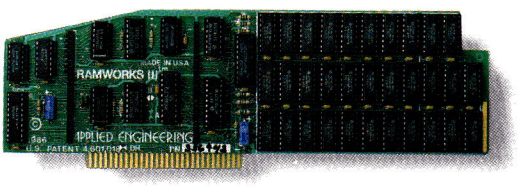
RamWorks boards include an AppleWorks print buffer — up to 125K in the 512K model — so you can keep working while your printer is printing. Also, you don't have to buy a separate print buffer, a savings of up to $250.00.

Autosegments large files.

RamWorks automatically segments large files so they can be saved on two or more disks. When you need to work with the file, you simply load it in the same sequence you saved it.

Add up to 3 MEG without using a single expansion slot.

RamWorks III, even when it's carrying its full 3 MEG of new memory, fits in your IIe's auxiliary slot. Your valuable expansion Slots 1 through 7 are free for other peripheral cards.



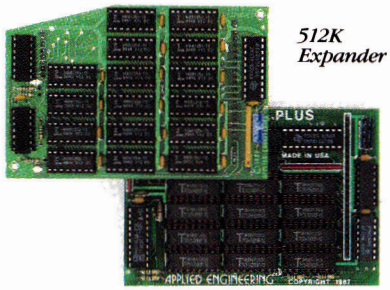
RamWorks III expansion board

If you don't need all of that power now, you can start with as little as 64K. It's easy to add memory to the expandable RamWorks III board as your needs grow.

You can go to 1 MEG on the main board using standard RAMs. That's

more memory than most people ever use. (1 MEG is about 500 pages of text.)

For even more power, snap an Applied 512K, 1 MEG or 2 MEG expander card into the RamWorks III low profile connector. The expander card won't interfere with Slot 1.



512K Expander

2 MEG plus Expander

Recover your investment in the wrong card.

Most of it anyway.

If you bought some one else's RAM card — one that's not recognized by your programs — RamWorks III can help recoup your loss. Pull the memory chips off your old card and plug them into RamWorks III.

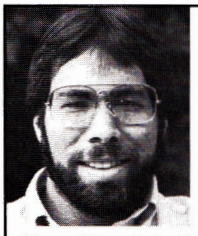
Truly compatible.

RamWorks III is compatible with more off-the-shelf software than any other RAM card. It is recognized by all memory intensive programs.

Its power enhances AppleWorks, Pinpoint, Howard-Soft, FlashCalc, ProFILER, Managing Your Money, SuperCalc 3a, VIP Professional and many, many more ... even software written specifically for Apple cards.

RamWorks III is compatible with most hardware add-ons like ProFile and Sider hard disks.

Of course, RamWorks III is fully compatible with all IIe's — enhanced or unenhanced, American or European.



"I wanted a memory card for my Apple that was fast, easy to use, and very compatible; so I bought RamWorks."

Steve Wozniak, the creator of Apple Computer.

Easy to install and use.

RamWorks III quickly plugs into your IIe's auxiliary slot. You get memory expansion and super-sharp 80 column text (U.S. Patent 4601018).

RamWorks III comes with everything you need to get up and running. The easy-to-understand manual shows you how to get the most from your new memory. The two accompanying 5¼" disks include a graphics utility program, AppleWorks enhancement program, ProDOS and DOS 3.3 RamDrive™ and other useful utility software.

Superior color graphics, more readable text.

The ColorLink™ RGB option gives brilliant, sharp graphics and text.

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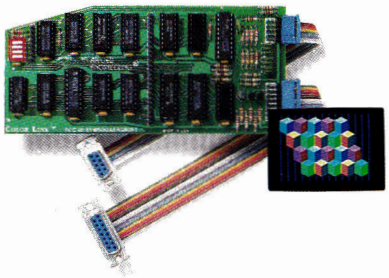
You can use Apple or IBM RGB monitors. ColorLink provides Apple standard analog and IBM standard digital RGB outputs (cables included).

ColorLink offers four text colors so you can use the one that's easiest on your eyes (others offer only green).

The ColorLink option plugs into the back of RamWorks III. It doesn't interfere with Slot 1.

You can order ColorLink with your RamWorks III board or add it later.



ColorLink® RGB option. IBM digital output cable. Apple analog output cable.

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You can explore powerful programming possibilities with Applied's optional 65C816 card. It's capable of linearally addressing more than 1 MEG.

It connects to RamWorks III's built-in CPU port. Instead of using another slot, Applied's 65C816 card simply replaces the 65C02. It maintains complete 8-bit compatibility.

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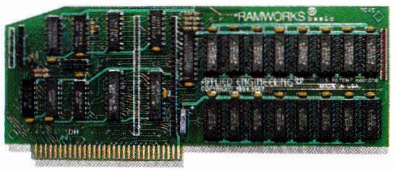

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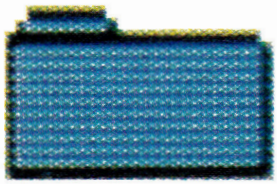
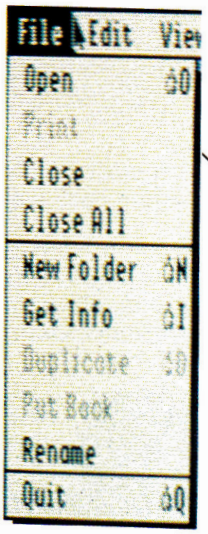
Looking at the FINDER





A "file" menu gives you access to basic data-file operations.

by Eric Grevstad

With a colorful array of pull-down menus, icons, smart windows, and zoom boxes, the GS' new Finder makes file selection and ProDOS operations easier than ever.

We've found the Finder. One year after the Apple IIGS first appeared and buyers read about it in the *Owner's Guide*, the ProDOS Finder—the Macintosh-style, mouse-controlled desktop that lets you manipulate GS disks, directories, and files as convenient on-screen icons—is finally here, on the latest edition of Apple's IIGS System Disk. (The new System Disk, version 3.1, requires the new version 01 ROM used in current GS models or available from your Apple dealer.)

Version 1.0 may not be everything for which Finder fans had hoped; for that matter, the latest version of ProDOS 16 (at this writing) still isn't the fast, powerful 16-bit operating system the IIGS is meant to have. But few are complaining, and no one's looking back. GS owners can finally exercise their mice without someone saying, "Hey! Isn't that the 8-bit, monochrome IIc program Mouse Desk?"

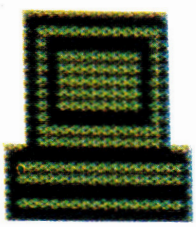
Before we look at the new Finder's features, let's review briefly some of the software differences between the IIGS and older Apples, along with the difference between a system disk and a System Disk. The capitalized version is still a fairly new concept in the Apple II world.

BOOTING AND CHOOSING

Whether they measure 3½ or 5¼ inches, floppy disks fall into two categories. A system disk (not capitalized) is one with an operating system on it—a bootable disk you can use to start your computer, as opposed to a disk that's formatted simply to hold data files.

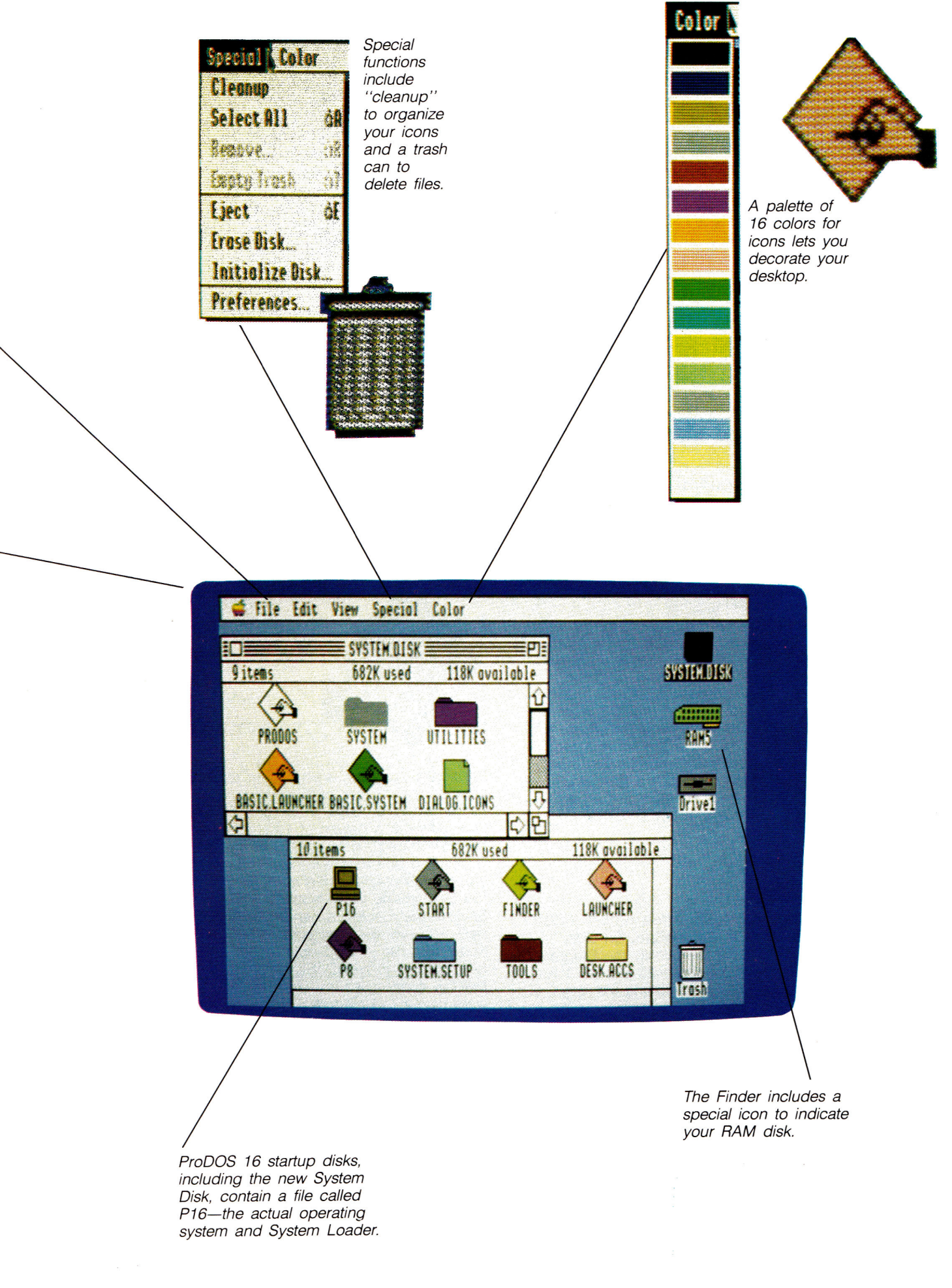
Most Apple II software is provided on bootable disks, loading a program as soon as you turn on the machine. You often don't have to know what the invisible operating system is—ProDOS, DOS 3.3, Pascal, or a minimal boot system like that found on game disks.

The same is true of IIGS applications. Writer's Choice Elite or DeluxePaint II owners can boot their program disks and start working, which is exactly what folks with only one 3½-inch drive usually do. Such owners will set the System Disk that comes with the GS aside, using it only occasionally for the file-copying or disk-formatting functions of the System Utilities program it contains, as with the IIc System Utilities disk or the old IIe ProDOS Filer.



"The ProDOS Finder is here, on the new GS System Disk—and no one's looking back."

ProDOS 16, however, works in more complicated ways than the boot-and-run routes of 8-bit operating systems such as ProDOS 8 or DOS 3.3. Part of this complexity makes things easier for GS programmers, whose applications can tap into supplied tools like the Memory Manager and Window Manager instead of having to manage every-



Special functions include "cleanup" to organize your icons and a trash can to delete files.

A palette of 16 colors for icons lets you decorate your desktop.

The Finder includes a special icon to indicate your RAM disk.

ProDOS 16 startup disks, including the new System Disk, contain a file called P16—the actual operating system and System Loader.

thing themselves. Part of it involves the GS' Clark Kent ability to change from a 16-bit computer into an 8-bit Apple II when given an older program.

And part of the complexity is due to ProDOS 16's anticipation that you'll need a program selector, a menu for people who have more than one program on one disk. Today's disks are bigger, able to hold more programs—expanding from 143K to 800K and beyond to newly affordable hard disks. Bigger programs push the move to bigger disks: A graphics- and feature-packed GS program is huge compared to its 8-bit predecessor. Both are connected to the rising clamor against copy protection—software publishers' answer to feudalism; it keeps you from using new storage devices and operating systems.

The simplest kind of selection is seen in MS-DOS systems, whose programs don't come on bootable disks; their program selector is the user, who boots DOS and then types the name of the program he or she wants to run. Many Apple II owners with hard disks (and programs they can install on those devices) enjoy friendlier selectors, such the menu found in Glen Bredon's ProSel. But ProDOS 16 is specially designed to start programs from a selector and return to one after quitting them, as the Macintosh does with its own Finder. The IIGS System Disk is a good example.

GETTING READY TO BEGIN

The System Disk, like other ProDOS 16 startup disks, uses certain files and subdirectories during its boot routine—a much more baroque process than that of ProDOS 8 or DOS 3.3, doing everything but clicking its heels and turning around three times before lying down. Finding a readable disk in a drive ("Check startup device!" appears if there is none) and finding it isn't a DOS 3.3, Pascal, or game disk, the system looks for a file named PRODOS.

On 8-bit disks, this file *is* ProDOS, the ProDOS 8 (or earlier) operating system, and the GS boots into Apple II emulation mode. On ProDOS 16 disks, the file is a setup program with a number of functions: It checks into the /SYSTEM subdirectory or folder and loads a file called P16, containing the actual operating system and System Loader; goes down another level into the /SYSTEM /SYSTEM.SETUP folder to load TOOL.SETUP and any other RAM-based patches to ROM routines (important extensions and bug fixes); then climbs back up into /SYSTEM and looks for a 16-bit program named START.

On the new System Disk, START is a short program that checks available memory, then loads either the 51K Finder or the 6K Program Launcher as appropriate. On older System Disks or IIGS applications, it's usually the Program Launcher, the only 16-bit selector then available.

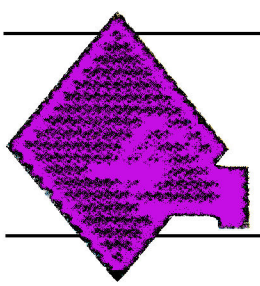
If there's no START file, PRODOS loads the first program it can find in the root directory with a filename extension of .SYS16 (for 16-bit programs) or .SYSTEM (for 8-bit programs). The latter require the system to load P8, the copy of ProDOS 8 also stored in the /SYSTEM directory, replacing P16. (To be specific, PRODOS leaves the actual loading of programs to part of its code called PQUIT, which stays in a special location in memory and reappears whenever you exit an application later; it supports stacked or "calling" programs to which it will return after running others.)

You'll find other files on your System Disk, of course—BASIC.SYSTEM to run Applesoft programs, additional folders within the /SYSTEM folder holding /DRIVERS, /FONTS, and /TOOLS for applications to use, and a disappointingly empty /DESK.ACCS folder for desk accessories. There's also room to add your own programs or files. But the most interesting item on the disk is the new Finder.

MORE LIKE THE MAC

The IIGS Program Launcher, with its scrolling menu of programs and folders, has always been a first-class program selector. It's been widely disparaged merely because it's failed to meet people's expectations; the announcement of the GS got people lusting after Macintosh-style icons and graphics, not a mousetext-based menu, and the ability to perform disk- and file-utility functions instead of merely picking programs. Many owners of the earlier System Disk disabled the Launcher, a 16-bit program that looked like an 8-bit program, in favor of the Apple II DeskTop, a revision of 1986's Mouse Desk—an 8-bit program that looked like a 16-bit one.

The new 16-bit Finder lays the DeskTop to rest. Both programs look and work like the Mac Finder, with a bar of pull-down menus, a trash can that deletes files, and disk icons that open to show windows of disk files and folders (either as icons or lists sorted by name, date, size, or file type). Using the mouse, you can drag icons around



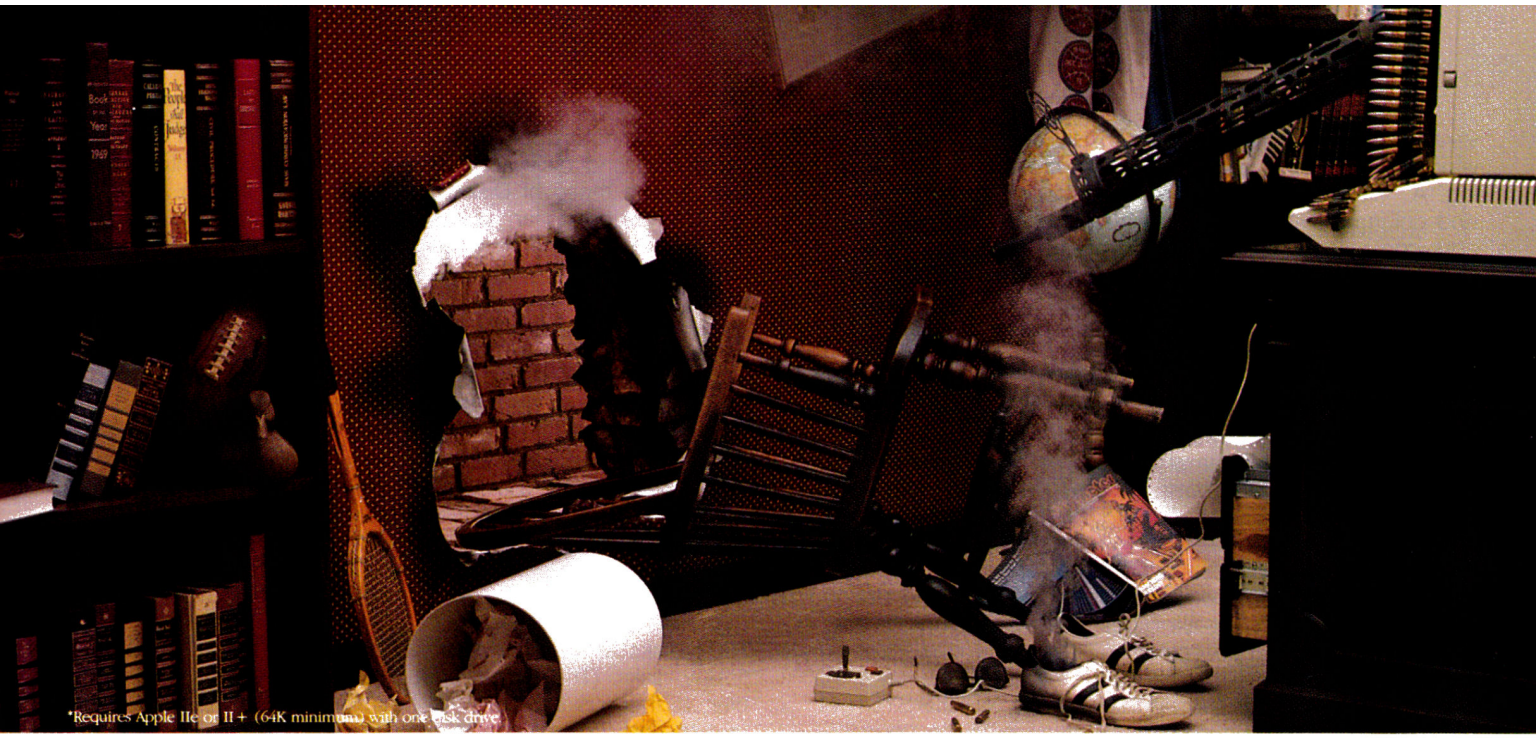
"The Finder says 'IIGS' at a glance."

the screen, click to select one or more files, and double-click to open a disk or folder or run a program. The Finder, however, says "IIGS" at a glance—it's in color, right down to a palette of 16 shades for icons and a rainbow-striped Apple symbol in the menu bar.

DeskTop devotees will miss a few features: the Selector that let you create a mini-menu of programs you could run by pressing Open apple-1, -2, and so on; the Startup function that booted a non-ProDOS disk directly in a specified slot; and desk accessories such as Calculator and Show Text File in the Apple menu. (They were actually 8-bit programs in the /DESKTOP/DESK.ACC folder instead of real GS accessories in /SYSTEM/DESK.ACCS, but they were nice to have.)

Also, the DeskTop is noticeably faster at redrawing the screen and opening and closing windows, performing the same open-close-open sequence in 15 versus 28 seconds in rough stopwatch tests. That's partly because double-hi-res monochrome graphics is faster than super-hi-res color, and partly because the Finder checks a data file on disk to reopen each window in the size and position in which you closed it last, as the Mac does, instead of opening an unsorted, generic window every time. (An option in the Finder's "Preferences" menu, or holding the option key while closing, disables this feature, cutting our speed test to 21 seconds.)

But smart windows are only the first of the Finder's ad-



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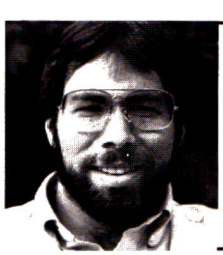

"I recommend Applied Engineering products wholeheartedly!"

Steve Wozniak, the creator of Apple Computer

What's best, the Phasor works with more off-the-shelf software than any other sound card you can buy. So now all your favorite games — like Skyfox™, Under Fire™, Willy Byte™, Tactical Armor Command™, Maze Craze™, Zaxxon™ and Ultima IV™ — can have shattering sound effects. Educational packages like Music Construction Set™, Guitar Master™ and Music Star™ are also dramatically enhanced.

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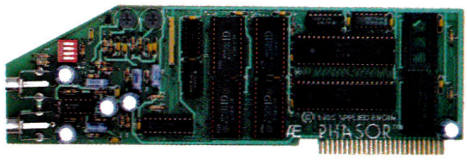

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vantages. Besides scroll bars and size and close boxes, windows now have zoom boxes to toggle full-screen viewing. A "cleanup" function arranges icons into neat rows and columns; with Cleanup, window sizing and placement, and icon colors, you can spend hours decorating your desktop. The trash can, combining a helpful reminder with a cute gimmick, bulges when you put something into it. (A "remove" command deletes files quickly if you don't want to drag icons to the trash.)

One of the Mac Finder's main attractions is that it lets you double-click on a data file to start the application that created it—opening a MacWrite document to open the word processor, for example. The new Finder lets you do this with Applesoft programs. (A new file called BASIC .LAUNCHER starts BASIC.SYSTEM automatically when you select a program.)

An icon editor available to software developers should let them do the same, designing custom icons and assigning them corresponding file types and applications. If the Finder can't find an application by using the icon's programmed pathname—it first looks for AppleWorks on a 5¼-inch disk, reporting, "The application APLWORKS.SYSTEM can't be found for this document" even if it's on your 3½-inch disk—it remembers the correct pathname after you launch the program manually, letting you double-click on a document thereafter.

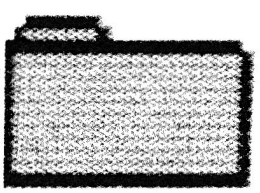
The Finder includes an Edit menu with undo, cut, copy, and paste commands and a Clipboard, but the functions don't work with the Finder itself. These text commands are designed for use with desk accessories such as pop-up notepads.

THE FINDER AS FILER

The best news about the Finder, though, isn't its status as a colorful program selector. It's the Finder's increased power as a disk and file utility, a program that makes operating-system functions such as copying and formatting an easy point-and-shoot process like the Mac's.

The /SYS.UTILS folder still has the 8-bit System Utilities program, controlled with the arrow keys and used by sinners in hell to copy 3½-inch disks with one drive (approximately 15 minutes of swapping source and target disks every ten seconds). For less swapping, there's a new 8-bit FastCopy program along the lines of Diversified Software Research's superb Diversi-Copy—not as fast, but with nice touches such as AppleWorks-style menus and prompts to write-protect the source disk.

"The best news is the Finder's increased power as a disk and file utility."



But, except for a few System Utilities specialties such as converting DOS 3.3 files to ProDOS, the Finder itself should do the job. Though slower on screen, it works faster than the IIGS DeskTop: It copied two files from a 3½- to a 5¼-inch disk in 22 seconds compared to 40, and copied a folder containing three files in 53 seconds versus 1 minute 45 seconds.

Pop-up option menus let you decide how to copy duplicate filenames (skipping or overwriting individual or all occurrences) and disks (completely replacing the contents of Disk A with those of Disk B, or adding B's files to A). Double-clicking on an icon opens it as usual; double-clicking on its filename gives instant access to the rename function.

The erase-disk and initialize-disk functions are fast and efficient, working directly on a highlighted icon instead of requiring you to insert the System Disk and specify a slot and drive as with the DeskTop. When you eject a 3½-inch disk from its drive, the Finder will dim its icon, but leave it on screen, unlike the DeskTop, so that you can drag the new icon over the old (or vice versa) to copy disks or files; it will prompt you to swap disks as necessary.

Like the DeskTop, the Finder senses 3½-inch-disk changes but can't automatically tell when you remove or insert 5¼-inch floppies; double-clicking on a 5¼-inch-drive icon replaces the DeskTop's pull-down check-drives command. The Finder even has separate icons to indicate RAM disks and hard drives along with the two sizes of floppy disks. (The former should become increasingly popular; in the IIGS tradition, the new System Disk takes a minute and 20 seconds to boot from an Apple 3.5 Drive.)

GETTING BETTER ALL THE TIME

Finder 1.0 isn't perfect, but programmers Dan Oliver and Cheryl Ewy deserve credit for taking a big step toward what GS system software is supposed to be. The next improvement will probably depend on the arrival of ProDOS 16 version 2.0—the real ProDOS 16, written in 16-bit code, optimized for fast performance on the 65C816, and with extra features ranging from a built-in disk-formatting function to support for an unlimited number of open files and on-line devices.

The ProDOS 16 now in use, from the first Woz Limited Editions' version 1.0 to the new System Disk's version 1.3, is actually a shell built around ProDOS 8 and 65C02 code. (Check the /SYSTEM/P16 file; it's of a type listed in the technical manuals as "ProDOS 8 reserved.") Neither Oliver nor Ewy would predict a release date for 2.0 when *inCider* asked.

Meanwhile, the new Finder, with its colorful controls and built-in utilities, gives users and programmers plenty to play with. The IIGS continues to move closer to the concept of a personal, colorful, II-compatible Macintosh—like the Mac in its operating software, its ease of use, and the tradition of the appearance of good software a year and a half after the machine's debut.■

Eric Grevstad, inCider*'s former review editor, is now a free-lance journalist. Write to him c/o* inCider*, 80 Elm Street, Peterborough, NH 03458.*

TML Pascal

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- Complete control over the speed, pitch, volume, tone and gender of the generated speech.
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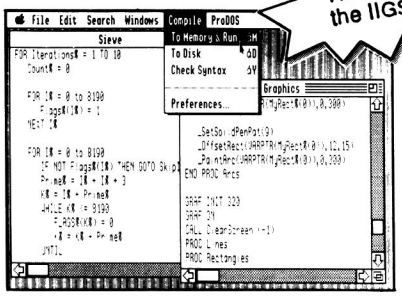

New for the IIGS

TML BASIC

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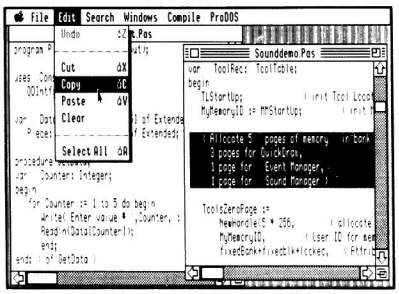

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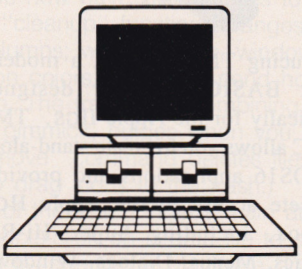

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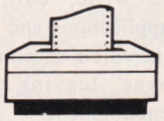

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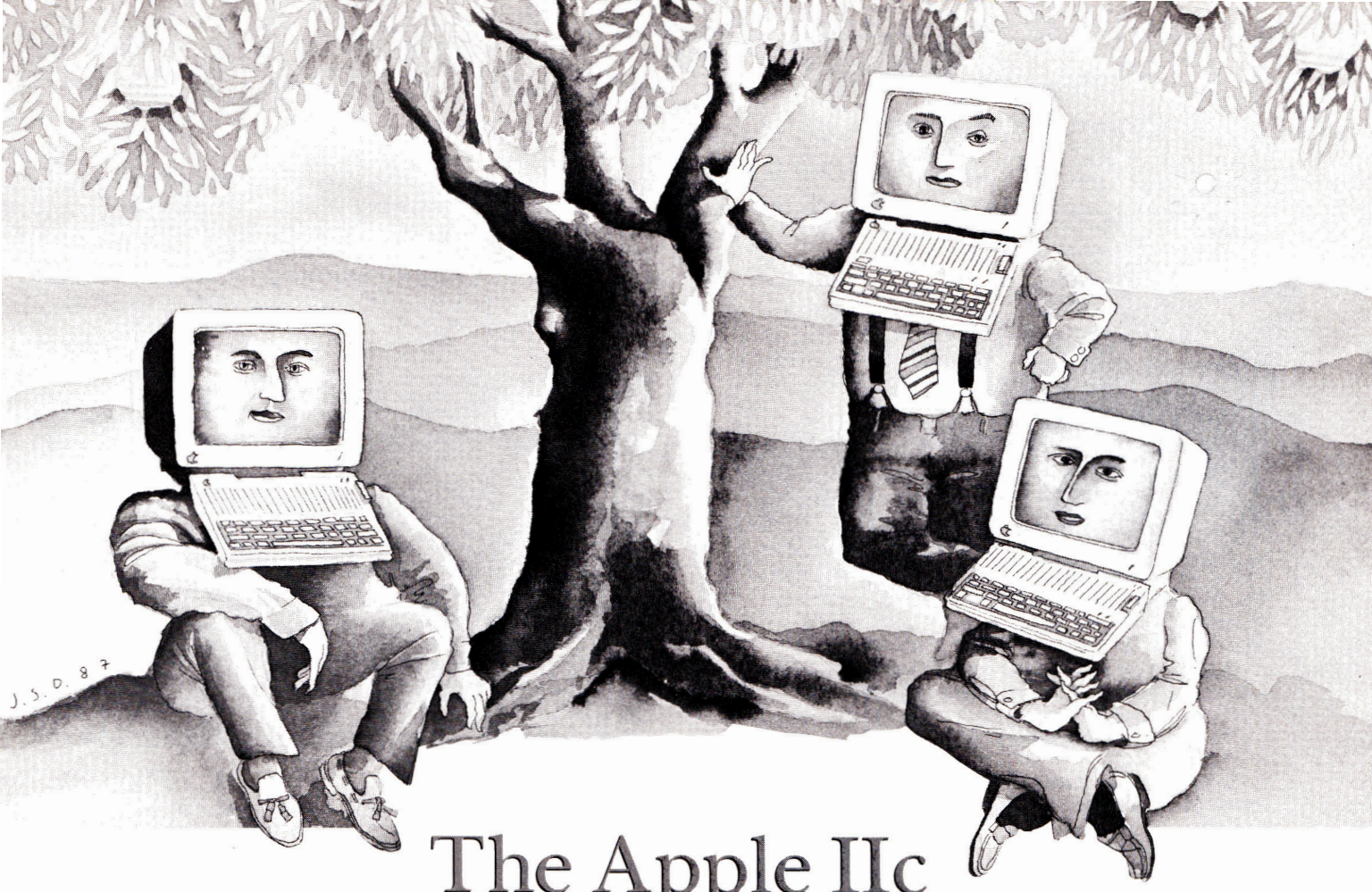

The Apple IIc FAMILY TREE

by Owen W. Linzmayer

Over the last three years, Apple has produced not one, but three IIcs, and the differences among them are significant for software developers and users alike. If you're having trouble with a IIc application, the problem may be incompatibility between your version of the machine and your program—not a bug in the software.

Since Apple announced the original IIc in 1984, it has introduced two other unique versions of the computer: the UniDisk 3.5 IIc, which supports 800K 3½-inch disk drives; and the memory-expansion IIc, which you can increase internally to 1 megabyte of RAM (random-access memory).

You can update even the original IIc by installing a new motherboard, but it's important that you know which IIc you have, because the technical differences among the three models affect programming, peripheral purchases, and productivity. (Apple has also produced five international versions of the IIc in two languages. The differences between these machines and the North American IIc are simply cosmetic, though, and concern only the keyboard layout and character set.)

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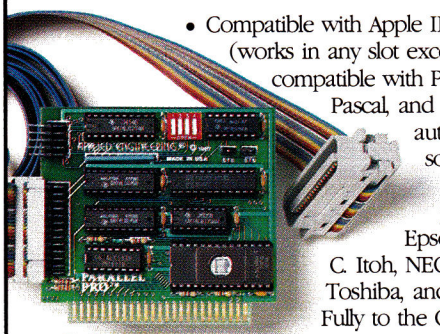

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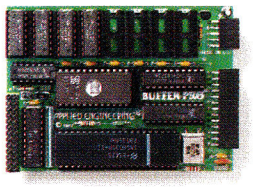

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identification byte at ROM location 64447 ($FBBF in hexadecimal). Examine the ID byte from Applesoft BASIC by typing PRINT PEEK (64447), or enter the system monitor with CALL – 151 and type FBBF. The value of this byte is 255 ($FF) in the original IIc, zero ($00) in the UniDisk 3.5 version, and 3 ($03) in the memory-expansion model. (See **Table 1**.)

Table 1. Apple II-series identification bytes. Material taken from Apple IIc Technical Reference Manual.

Machine	$FBB3	$FB1E	$FBC0	$FBBF
II	$38			
II Plus	$EA	$AD		
III (in II-emulation mode)	$EA	$8A		
IIe	$06		$EA	
IIe (enhanced)	$06		$EO	
IIc	$06		$00	$FF
IIc (UniDisk 3.5)	$06		$00	$00
IIc (memory expansion)	$06		$00	$03
IIGS	$06		$E0	

THE ORIGINAL IIc

Apple introduced the first IIc at San Francisco's Moscone Center in April 1984 as part of its "Apple II Forever" marketing campaign. The machine has a "closed" architecture and comes equipped with a 65C02 microprocessor and 128K of RAM. Unlike its predecessors—the II, II Plus, and IIe—the IIc doesn't have expansion slots. Instead it has *ports*, the equivalent of firmware interface cards installed in slots. (See **Table 2**.)

Table 2. Original IIc port characteristics. Material taken from Apple IIc Technical Reference Manual.

Port	Entry Point	Port Connector	Use
1	$C100	serial port 1	printers
2	$C200	serial port 2	communications
3	$C300	video connectors	enhanced video firmware
4	$C400	mouse	mouse
5	$C500	reserved	
6	$C600	disk drives	built-in & external drives
7	$C700	no device	external-drive startup (under ProDOS only)

The original IIc supports only two disk drives: its built-in drive, treated as slot 6, drive 1; and one external disk drive, treated as slot 6, drive 2, or as slot 7, drive 1 under ProDOS, so that under ProDOS you can use the external drive as a startup. If you want to add an 800K UniDisk or a hard-disk drive such as the **ProAPP 20** or **Quark QC20** (now distributed by Sun Remarketing), you must upgrade your motherboard. Expect to be charged for this upgrade unless you purchase an **Apple IIc Memory Expansion Card** or **UniDisk 3.5** drive.

As noted above, you can start the original IIc from your external floppy under ProDOS. To do so, insert a ProDOS disk in the external drive; from the system monitor, type CALL -151 and press 7 Control-P; or from Applesoft, type PR#7. If you try this on a UniDisk 3.5 IIc, the computer will display the message "AppleTalk Offline" at the bottom of the screen, presumably because the UniDisk 3.5 IIc has been programmed to expect AppleTalk networking firmware in slot 7.

All IIcs and enhanced IIes contain a 32-icon MouseText character set in ROM (see **Figure 1**), which programmers can use to create a Macintosh-style user interface in text mode. MouseText offers considerable speed advantages over a graphics-based approach to re-creating the desktop metaphor with the 1.02-megahertz 65C02.

Since few developers used MouseText graphics, Apple replaced one pair of characters in the original MouseText character set: inverse F and G, which when printed side by side create a "running man." (See **Figure 2**.) This swap won't make programs crash—just display the new icons instead of the "running man." (The new icons are used especially in the AppleWorks file-card interface.) To

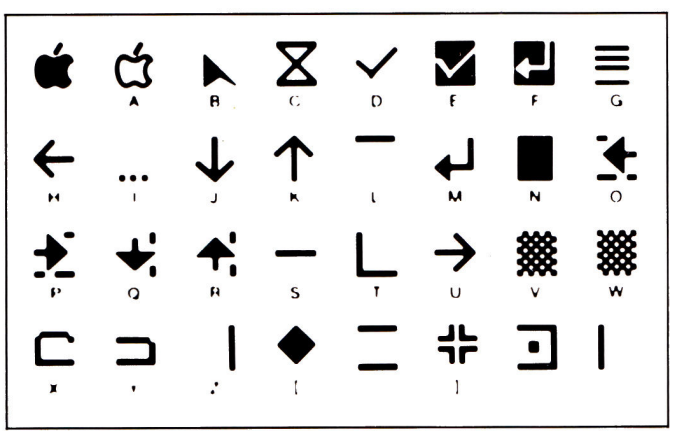

Figure 1. New MouseText character set, reproduced with permission of Addison-Wesley Publishing Company, 6 Jacob Way, Reading, MA 01867, from current edition of Apple IIc Technical Reference Manual. *Note the new icons F and G.*

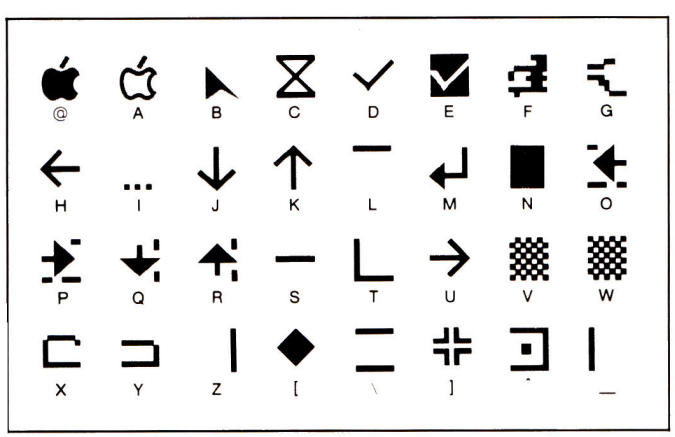

Figure 2. Original MouseText character set, reproduced with permission of Addison-Wesley Publishing Company, 6 Jacob Way, Reading, MA 01867, from early edition of Apple IIc Technical Reference Manual. *Note the "running man" icons, F and G.*

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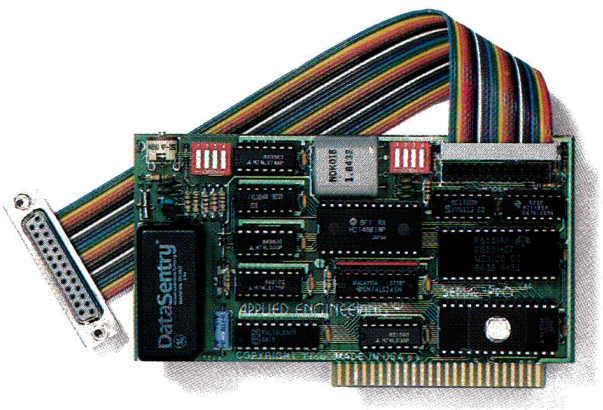

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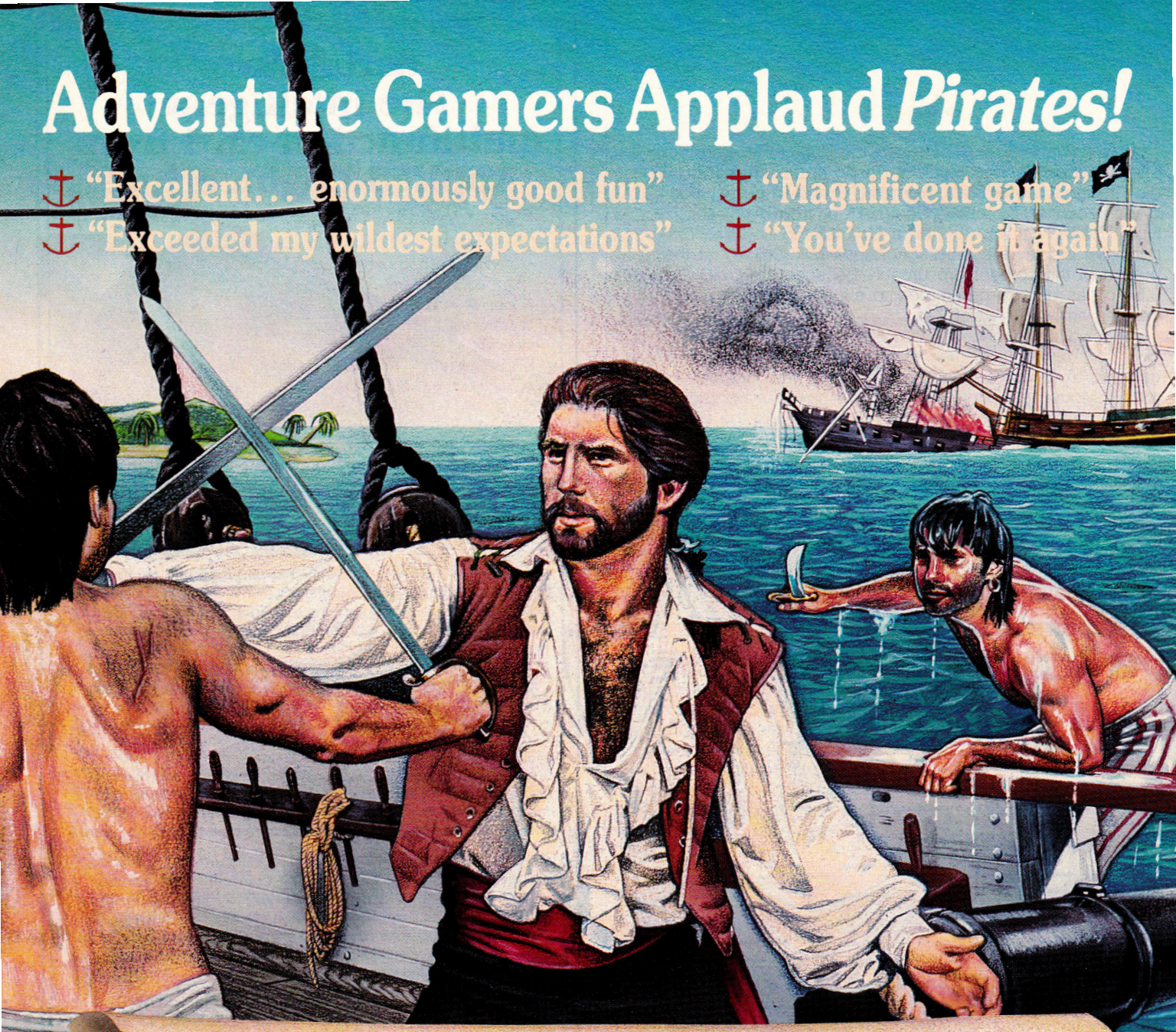

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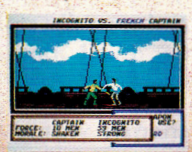

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Table 3. UniDisk 3.5 IIc port characteristics.

Port	Entry Point	Port Connector	Use
1	$C100	serial port 1	printers
2	$C200	serial port 2	communications
3	$C300	video connectors	enhanced video firmware
4	$C400	mouse	mouse
5	$C500	Protocol Converter	intelligent block-type devices
6	$C600	disk drives	built-in & external drives
7	$C700	reserved	

Table 4. Memory-expansion-IIc port characteristics.

Port	Entry Point	Port Connector	Use
1	$C100	serial port 1	printers
2	$C200	serial port 2	communications
3	$C300	video connectors	enhanced video firmware
4	$C400	memory expansion	memory-expansion card
5	$C500	Smartport	intelligent block-type devices
6	$C600	disk drives	built-in & external drives
7	$C700	mouse	mouse

see the MouseText characters that reside in your ROM, run the accompanying **Program listing** from Applesoft.

Apple IIcs produced prior to December 1984 had a problem with timing of serial output through port 2, the modem port. The root of the difficulty was a crystal in the serial interface that sometimes resulted in unreliable data transmission via non-Apple modems at 1200 baud or faster. According to a spokesperson for Hayes Microcomputer Products, the widely known modem manufacturer, the IIc's ports "operate 3 percent more slowly than specified. This significantly exceeds the operating range set forth in the Electronic Industries Association (EIA) standard RS-404." The EIA allows a deviation of plus or minus 2 percent.

Apple can't specify the exact range of serial numbers of the affected machines, but if you have an early IIc and are experiencing modem problems, you may require a new motherboard. Initially Apple replaced the boards at no cost to the user, but check the current policy with your dealer.

Program listing. *Routine displaying MouseText character set.*

```
10 PRINT : PRINT CHR$(4);"PR#3" : INVERSE
20 PRINT CHR$(27);"@ABCDEFGHIJKLMNOP
   QRSTUVWXYZ[\]^_";
30 NORMAL
```


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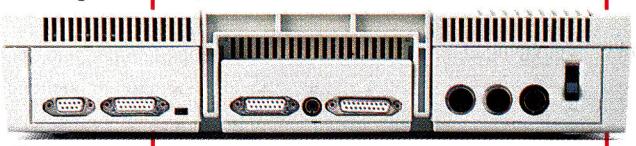

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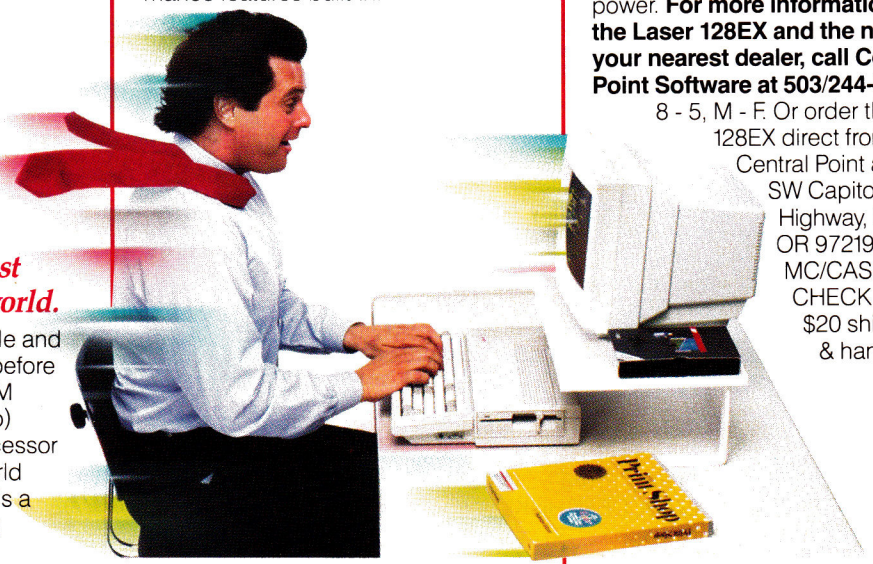

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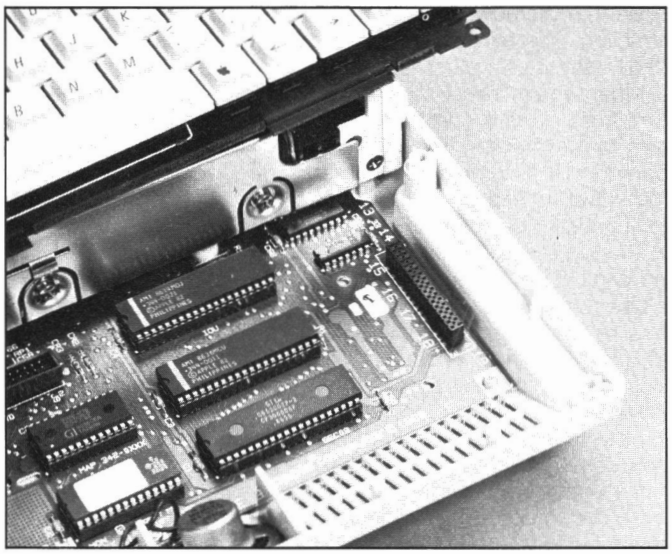
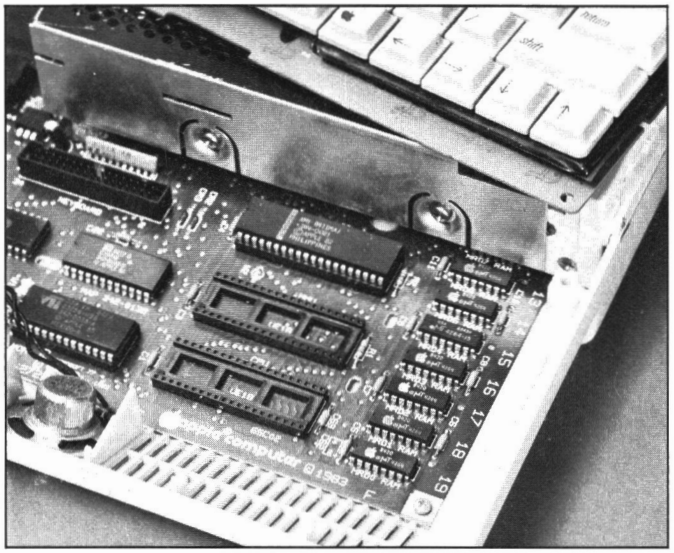


The motherboard of the latest IIc, the memory-expansion model, includes an internal connector supporting Apple's IIc RAM card.



Original IIc motherboard, with 65C02 microprocessor, 128K of RAM, and 16K of ROM. It supports certain third-party RAM cards, but not Apple's.

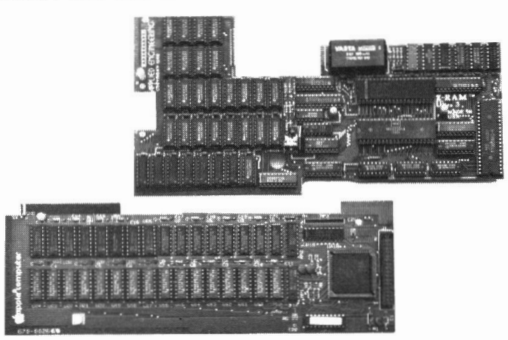
THE UNIDISK 3.5 APPLE IIc

Apple announced the second IIc—the UniDisk 3.5 IIc—in the spring of 1986. As the name implies, this model contains the Protocol Converter that supports UniDisk 3½-inch disk drives and other mass-storage devices. Furthermore, Apple doubled the ROM to 32 kilobytes to accommodate several new features.

If you have an original IIc and purchase a UniDisk 3.5 drive from your local Apple dealer, he or she should upgrade your computer for free. This involves a complete motherboard swap and essentially leaves you with a UniDisk IIc in your old case. Although the casual user won't recognize the difference, the internal changes are significant.

First, UniDisk 3.5 and memory-expansion IIcs use a 23256 32-kilobyte-by-8-bit ROM, double the ROM of the original IIc, as noted above. The extra space accommodates the Protocol Converter, four new serial-port commands, two new system-monitor commands, a mini-assembler, an improved interrupt handler, built-in diagnostics, and new external-drive startup procedures.

Second, the Protocol Converter firmware (slot 5) converts program calls to it to a format the machine can transmit over the disk port; that is, it provides a standard way for programs to use disk drives, whether 5¼-inch, 3½-inch, or hard disk.



Top, AE's Z-RAM Ultra; bottom, Apple's Memory Expansion Card.

On the memory-expansion IIc, the Protocol Converter is called Smartport. (The IIGS also uses Smartport calls.) It's the same basic firmware interface by a different name. The Smartport bus is a daisy-chain configuration of intelligent devices (sometimes called "bus residents"), which are connected to the external-drive portion the IIc. Unlike the original IIc, the UniDisk 3.5 IIc doesn't use slot 7, drive 1 for external drives. The firmware for slot 7 was reserved for the AppleTalk network firmware. (See **Table 3**.)

A Disk IIc hangs onto the end of the daisy chain; its operation is transparent to host software running under ProDOS and remains dormant when a program addresses a Smartport bus resident. That means that even if you buy a hard disk and a UniDisk 3.5 drive, you can still use your old 5¼-inch floppy as long as you connect it as the device farthest from the IIc. (See **Figure 3**.) Theoretically, up to 127 devices may be present, limited only by power supply. That is, the original IIc may not provide enough power.

Another important difference between this model and the original IIc is the set of four new serial-port commands in both port 1 and port 2 in the UniDisk 3.5 IIc. These commands make it easier to write programs that are compatible with the Apple Super Serial Card: They make these ports work like the card.

Also, two new functions in the system-monitor firmware—STEP and TRACE—facilitate debugging of assembly-language programs. STEP runs monitor programs one line at a time; TRACE steps continuously through the program and stops only when you press the solid-apple key or when it encounters a BRK command.

The IIc's new ROMs also include a mini-assembler that lets you enter machine-language programs directly from the keyboard. Without an assembler, you must write your program, then use monitor commands to store the hexadecimal values for the opcodes and operands.

To enter the mini-assembler, first type CALL −151 to invoke the monitor, then at the asterisk prompt type an exclamation point and press Return. The prompt should change from an asterisk to an exclamation point. To enter

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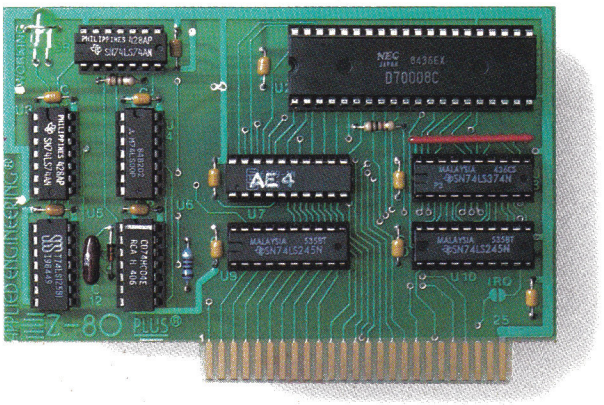

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code into memory, type the address, a colon, and the instruction. The mini-assembler doesn't accept labels; you must use actual values and addresses.

When you're ready to execute your program, press Return from a blank line to leave the mini-assembler and return to the monitor. The mini-assembler is no match for commercial assemblers, such as Roger Wagner Publishing's **Merlin Pro**, but it's suitable as a bare-bones utility for on-the-fly programming.

To stop the execution of a program unconditionally on an original IIc, use a forced cold-start reset by pressing Open apple-Control-Reset instead of turning the power off and on. On other versions, hold down the open-apple key until the built-in drive starts to spin. If you release the key before the drive starts to spin, the machine drops into Applesoft or won't reboot.

Note that if you hold down both the open-apple and solid-apple keys during power-up or cold-restart, the computer executes a built-in exercise code; you'll see a colorful lo-res screen. After approximately 30 seconds, the message "System OK" will appear in the center of the screen if everything is functioning properly. Apple production personnel use this self-test, but the rest of us can ignore it.

On the UniDisk 3.5 IIc, you can force a cold restart to skip the internal floppy and pass control to the external drive port at the $C500 entry point if there's no disk in the internal drive. This lets the system start up from the first intelligent drive connected to the external drive port (the UniDisk 3.5 drive in the example depicted in **Figure 3**). You can use ProDOS or Pascal if you want to start the system from an external drive, but DOS 3.3 and versions of Pascal earlier than 1.3 won't work.

THE MEMORY-EXPANSION MODEL

Apple announced the third edition of the IIc on September 15, 1986, along with the IIGS. The memory-expansion IIc has all the features of the UniDisk 3.5 model, as well as a 34-pin internal connector to support Apple's optional IIc Memory Expansion Card. (See the accompanying photo of the latest motherboard.) Of the three different versions, the memory-expansion IIc is the easiest to identify, because Apple switched the color of the keyboard to "platinum" to match the color scheme of the GS and its new Macs. The change is purely external; it doesn't affect keyboard function.

If you open the IIc case and examine the machine's internal structure, you'll notice four 32K RAM chips along the right-hand side of the motherboard; they replace the 16 8K integrated circuits that made up the main and auxiliary RAM banks in the previous versions. This arrangement decreases the overall number of components on the motherboard, and reduces production costs and the probability of hardware malfunction substantially.

You can expand Apple's IIc Memory Expansion Card up to 1 megabyte (1024K) in 256K steps; it's functionally the same as the Apple memory-expansion card for the IIe, with one notable difference: The card "lives" in slot 4 (on the IIe, the memory-expansion card goes into any slot but the auxiliary slot); its firmware is included in the ROM on the IIc motherboard. (See **Table 4**.)

That means you can't depend on the firmware ID bytes to tell you whether a card is installed. Since the firmware is inside the IIc, every memory-expansion IIc "thinks" a memory-expansion card is installed. Unlike the other "peripheral cards" in the IIc, the memory-expansion board

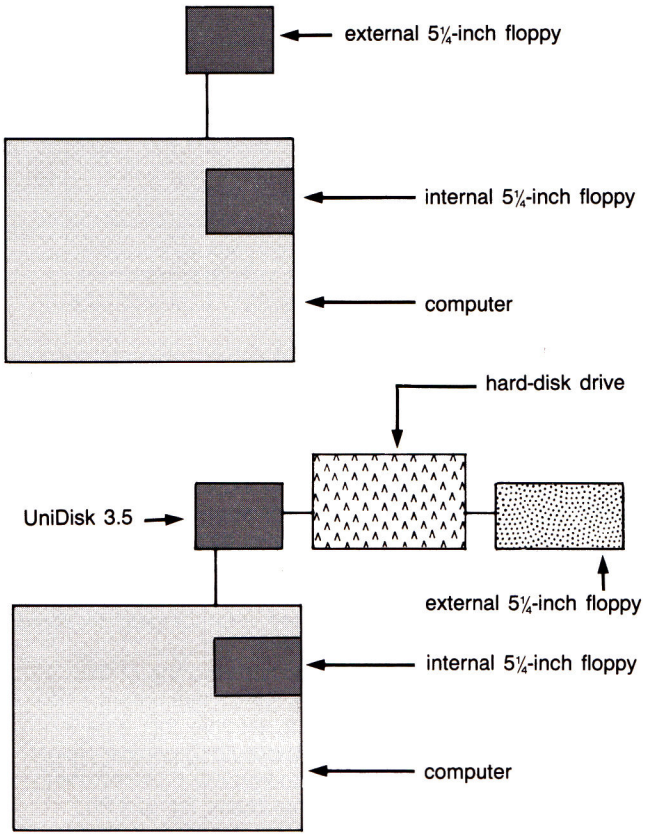

Figure 3. Top, original IIc maximum disk configuration; bottom, sample UniDisk 3.5 IIc drive configuration.

isn't necessarily present. Programmers must interrogate the card to see how many blocks of memory are actually available. If there are no free blocks, the IIc has no memory-expansion card installed.

The machine accesses the Apple Memory Expansion Card as a RAM disk, not as an extension of the IIc's main memory—unlike IIe auxiliary-slot memory-expansion cards, or Checkmate and Applied Engineering cards for the IIc. Because of this arrangement, you must format the card with accompanying software before you can use it; before execution, you must transfer to main memory any programs you've placed on the RAM disk. Under DOS 3.3 and Pascal, it appears that you can initialize the memory-expansion card, but trying to access the RAM disk will result in an I/O error.

If you purchase an Apple IIc Memory Expansion Card, you're entitled to a free motherboard upgrade if you don't own a "platinum" IIc. You can exceed the apparent 128K memory ceiling of original and UniDisk 3.5 IIcs, but not with Apple's card. Your choices are limited to Applied Engineering's **Z-RAM Ultra** series, the **MultiRAM CX** cards from Checkmate Technology, and Legend Industries' **C' Card**. (See "Go Beyond The IIc's Limit," September 1987, p. 51).

Another significant ramification for IIc memory expansion is that Apple moved the mouse firmware from slot 4 to slot 7. Programs should scan the IIc's slots just as they would the IIe's—first trying slot 7 to see whether it contains a particular device, then slot 6, slot 5, and so on.

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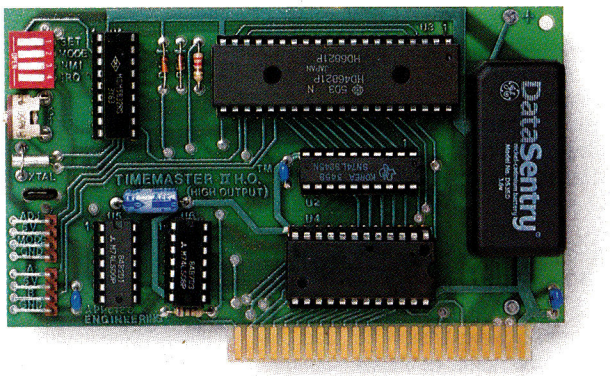

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Since most commercial programs include a scan routine for the IIe, it's relatively easy for programmers to make mouse-based programs compatible with the new IIc.

Some IIc software *assumes* the mouse is in slot 4; such programs will report to you that you can't start up from the memory-expansion card. The solution is simple: Change IN#4 to IN#7, and PR#4 to PR#7. In fact, Apple recommends strongly that programs always scan slots for peripheral devices, regardless of the machine on which they're running, to ensure compatibility in the event of unanticipated future hardware changes.

As indicated, the memory-expansion version of the IIc places the mouse firmware at $C700 and the memory-expansion card at $C400. A cold start sets a number of soft switches, then passes control to the memory-expansion-card I/O entry point at $C400. The machine returns control eventually to the startup routine. On the original IIc, the restart routine begins by booting the internal 5¼-inch drive. To force a cold restart from a machine-language program in the memory-expansion IIc, use JMP $C400 (the expansion-card entry point) or PR#4.

Enabling keyboard and serial-input buffering requires setting certain *screen holes*—locations within $0400–$600, the text and graphics screen, that don't appear on your display—to specified values. In the memory-expansion IIc, Apple has changed those locations. When the company reorganized the firmware to accommodate the memory-expansion card, it reassigned some screen holes. This difference can crash any software that uses keyboard or serial-input buffering.

Check the version of the machine on which your program is running. Programmers should pay attention to the fact that things can move around even in the IIc, making any hard-coded slot assignment an almost guaranteed source of incompatibility.

THE IIc TO COME

While rumors and speculation prevail during any conversation about a new IIc, there's some indication from Apple that a new IIc is in the works. *Apple IIc Technical Reference Note #6: Buffering Blues* of April 2, 1987, refers to a not-yet-released revision 4 of the IIc firmware that will correct a bug in version 3 ROM (the memory-expansion IIc). Apple has a policy of not announcing new products until the company is ready to ship them, but for many people, mentioning this ROM is confirmation enough that a new IIc is on the way.

Only Apple knows *exactly* what features the new IIc will offer, but it isn't difficult to make an educated guess. Look for an internal 800K UniDisk 3.5 drive. It's also a good bet that Apple will bundle a mouse with every new IIc, now that the GS has made the Mac-style user interface popular on II-series computers.

Rumor has it that the engineers at Apple have come up with a way to reduce the size of the external power supply, too—so much so that it will be built into the IIc case, making the IIc a much more portable computer.

Wishful thinkers expect the IIc to be a GS without slots, and that's entirely possible. Without slots, the machine wouldn't need a large GS-type power supply. Let's face it, the GS is very similar to existing IIcs in that a number of popular peripheral-card functions are built in. But let's hope Apple will provide external access to at least one slot (as on the Laser 128 from Video Technologies) to appease third-party hardware developers.

Which IIc is yours? The three distinct versions of this machine present a unique dilemma for programmers and everyday users alike. (If you want to explore this area in greater detail, take a look at the *Apple IIc Technical Reference Manual*, published by Addison-Wesley, 6 Jacob Way, Reading, MA 01867, available in hardback for $24.95.) Being aware of the differences among the three models, though, is your best defense against the frustration of hardware/software incompatibility.■

Owen W. Linzmayer is a free-lance journalist specializing in Apple II coverage. Write to him at 16 Trowbridge Road, Morris Plains, NJ 07950.

Product Information

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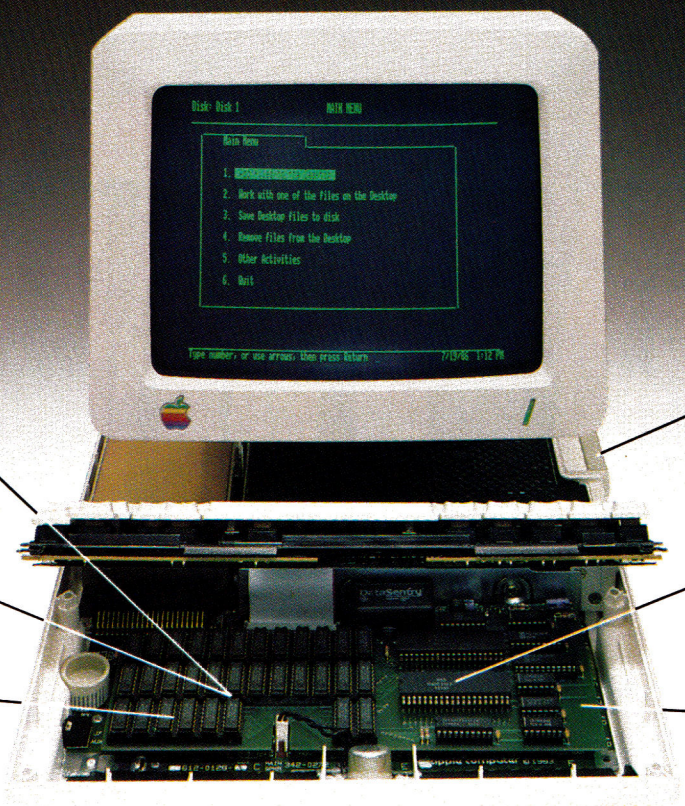

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Also This Month:
AppleWorks Q&A
by Kelly Stirn
page 72

Planning Your Budget: Part 2

by Ruth K. Witkin

Budget your expenses by tracing your cash flow with the AppleWorks spreadsheet.



Never ask of money spent
Where the spender thinks it went.
Nobody was ever meant
To remember or invent
What he did with every cent.
—Robert Frost

You can look at budgeting the way the poet Robert Frost did—with a jaundiced eye—or look at it this way: Budgeting is a way to spend less, save more, or, at the very least, save something. Yes, it does take time to develop a workable plan. Yes, it's a bother to account for every penny spent. And indeed, if you're accustomed to spending freely where and when you wish, you're likely to need every ounce of willpower you can muster to stick to your plan. On the other hand, in the words of Woody Allen, "Money is better than poverty, if only for financial reasons."

Last month, you entered budget-projection formulas. In this session, you'll enter the formulas that keep track of what you actually spend. You'll also save your spreadsheet under a different name, enter practice numbers, and, in a fireworks finale, fix the headings in place and open a second window to keep distant areas of the spreadsheet on screen at the same time.

ENTERING FORMULAS

Use the AppleWorks Startup and Program disks to load the file Budget from your data disk. You should now see the spreadsheet Review/Add/Change screen.

Figures 1 and **2** show formula locations. Refer to last month's column (p. 120) for descriptions of formulas 1–6. Cell locations here refer to the spreadsheet you're building (**Figures 1–4**), not to the completed spreadsheet. (See the accompanying **Table** for a summary of formulas 1–6.) Move your cursor to the cell indicated and type the corresponding formula. When the formula is complete, compare your results with the description. If they agree, press Return. If you have a problem with the formula, press Escape and start again.

UNDER (OVER) BUDGET

Formula 7 subtracts the amount you actually put into bank savings and your credit union (C9) from the amount you budgeted (B9), and, in D9, enters how much you're under or over budget.

Cell location: D9
Description: +B9–C9

SPENT AS PERCENTAGE OF INCOME

Formula 8 calculates the amount you put into bank savings and credit union (C9) as a percentage of your net income (B3) and enters the result in E9.

Cell location: E9
Description: +C9/B3

Cell B3 is empty. Since you can't divide by zero, formula 8 produces an error message. Now protect formulas 7 and 8 from change: Place your cursor on D9 and press OA-L. Type B (for *Block*), move the cursor to E10, and press Return. Type **PN**.

Next, copy formulas 7 and 8 into the other cells in their columns. Formula 7 will copy, at the same time, the percentage format, and both formulas will copy their protected status. Instead of repeating the copy process over and over, it makes sense to copy the formulas into every cell in columns D and E, then blank out the cells that don't need them.

First, copy: Leave your cursor on D9. Press OA-C and press Return. Press the right-arrow key to highlight D9 and E9 (the source) and hit Return again. Move the cursor to D10 and type a period. Press OA-8, then down arrow seven times to highlight rows 9–94 in columns D and E (the destination). Hit Return again.

AppleWorks now asks whether B9 (highlighted on the entry line) is a *No change* or *Relative* reference. The first three cell references (B9, C9, and B9) are relative; the last one (B3) is abso-

	Formula	Location	Description
1	Savings & Investments	B13	@SUM(B12.B8)
	Personal	B29	
	Insurance	B44	
	Education & Professional	B69	
	Gifts & Contributions	B85	
	Other Expenses	B92	
2	Total Household	B22	@SUM(B21.B15)
		B78	
3	Total Transportation	B37	@SUM(B36.B31)
4	Total Income Tax	B50	@SUM(B49.B46)
	Loans & Debts	B56	
	Health Care	B62	
5	Total Monthly Expenses	B94	@SUM + B13 + B22 + B29 + B37 + B44 + B50 + B56 + B62 + B69 + B78 + B85 + B92
6	Budget Under or Over Income	C97	+ B3 – B94

Table. Summary of budget spreadsheet formulas 1–6.

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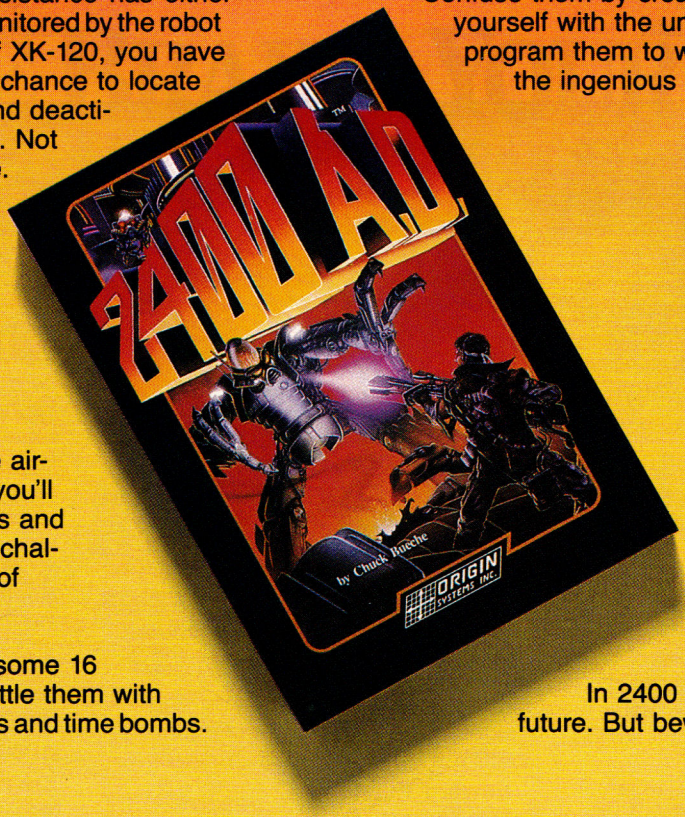

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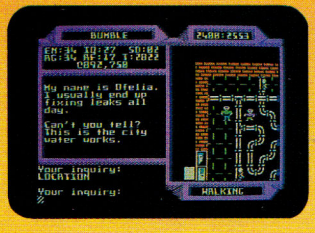

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lute: Type **R** three times and press Return once.

Now blank out the cells that don't need the formulas: Place your cursor on D14 and press OA-B to bring up the Blank screen. Type **B** and press the down-arrow key, then the right-arrow key (to highlight D14–E15); press Return. AppleWorks asks whether you really want to clear these protected cells. Indeed you do, so type **Y**.

In the same way, blank out cells D23–E24: Place your cursor on D23 and press OA-B. Type **B**, press the down-arrow key, then the right arrow. Press Return and type **Y**.

Follow the same procedure to blank out the following cells: D30–E31, D38–E39, D45–E46, D51–E52, and D57–E58. You'll also want to blank out cells D63–E64, D70–E71, D79–E80, D86–E87, and D93–E93.

It's been a while since you saved the spreadsheet, so leave your cursor where it is and press OA-S.

SPENT UNDER OR OVER BUDGET

Formula 9 subtracts the total amount spent (C94) from the total amount budgeted (B94) and enters the amount by which you're under or over your budget in C98.

Cell location: C98
Description: +B94–C94

CASH FLOW THIS MONTH

Formula 10 subtracts the total amount spent (C94) from your monthly income (B3) and enters your monthly cash flow in C99. Cash flow is the amount of money you have left after subtracting expenses from income.

Cell location: C99
Description: +B3–C94

Now protect formulas 9 and 10: Place the cursor on C98 and press OA-L. Type **B** and move the cursor to C99. Press Return and type **PN**. This completes the formulas. Press OA-S to store the spreadsheet on disk.

ENTERING DASH LINES

Figures 3 and **4** show the lines that separate the items in a category from the total. Each line is indented two spaces and stops one character shy of the full column width, which prevents it from forming a continuous line when you copy it into cells to the right.

First, insert a row to contain the lines: Press OA-2 to jump the cursor to row 13. Now press OA-I to bring up the Insert screen. Press the return key to confirm *Rows*, and type **Y** to clear or remove protected cells. Type **1** to specify one row, and hit the return key to confirm the row.

Now enter a line in B13: Place the cursor on B13 and type quotation marks. Press the spacebar twice, type eight minus signs, and hit Return.

Next, copy this line to C13, D13, and E13: Leave your cursor on B13 and press OA-C. Press Return twice. Move the cursor to C13, type a period, press OA-right arrow to move the cursor to E13, and press Return.

Using the clipboard to insert the lines simplifies matters. First, copy row 13 (containing the lines) to the clipboard: Leave your cursor on B13 and press OA-C. Type **T** to select *To clipboard* and hit Return.

Now copy the row of lines from the clipboard: Place your cursor on B23

AppleWorks Q and A

Page Numbering

I wrote a book of 476 pages with AppleWorks on my enhanced IIe, and it wasn't until I had finished and connected the chapters that I realized AppleWorks can't number pages accurately beyond 256.

Sid Spiesql
Encino, CA

AppleWorks contains a bug that prevents it from printing accurately beyond page 256, even though the manual clearly states it can print up to page 512. Bob Lissner, the author of AppleWorks, is currently trying to pinpoint the problem. If it's a simple fix, we'll print the patch here in a future article. The problem appears to be limited to the word processor.

For the time being, you may want to try this trick: Once you've completed your book and you know where page breaks occur, type in the digit representing the 100th place, 200th place, and so on, whenever you reach these values. Follow these digits immediately with the "print page no" command.

For example, when you reach page 200, enter 20^ in the footer, where the caret is a "print page no" command. Place a "page number" command before the header starting with page 1. When you reach page 210, enter 2^ in the footer. The next time you have to make a change is when you get to page 300 and every hundredth page thereafter.

Printing Snags

I have what appears to be a printer problem with AppleWorks: CTRL-I 0N appears in the top left corner of all my documents, and I can't print anything but ten characters per inch.

Edward Rearick
Morristown, NJ

If all printers had consistent interfaces and control codes, AppleWorks wouldn't have to worry about entering these codes and users wouldn't be struggling to understand printer manuals and control codes.

You're entering the control codes for your printer-interface card incorrectly. When a printer or interface-card manual requires you to enter "control" characters (usually abbreviated as CTRL), press the control key on the left side of the Apple II keyboard and the accompanying character at the same time. For example, if the manual requires you to enter CTRL-I 0N as your interface-card control character, follow this procedure:

1) Select "specify information about your printer(s)" from the Other Activities menu.

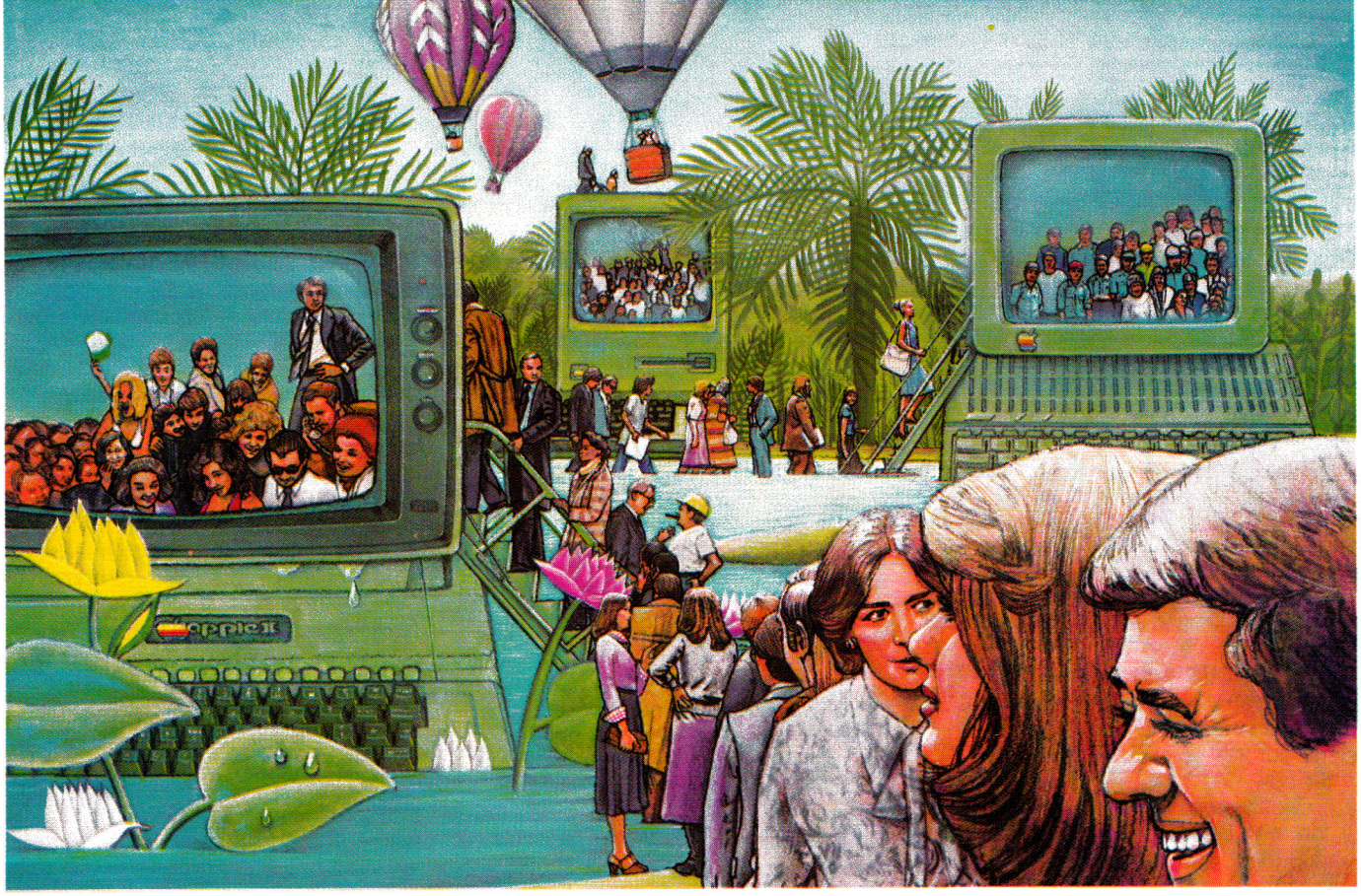
2) Choose to change the printer specifications for your printer.

3) Select "interface cards."

4) To the question "Is this OK?" answer "no."

5) Enter your control codes: Press the control key and the I key at the same time.

Continued



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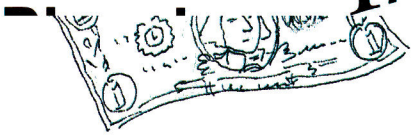

and press OA-C. Type **F** to select *From clipboard*, and type **Y** to clear the protected cells. When using the clipboard, you don't have to insert a line yourself, because AppleWorks does it for you.

Follow the same process to enter the row of lines above B31, B40, B48, B55, B62, B69, B77, B87, B95, and B103. In each case, place your cursor on the designated cell, press OA-C, and type **FY**. Now press OA-S to store the spreadsheet on disk.

SAVING UNDER A DIFFERENT NAME

When you keep Budget as a master spreadsheet, you don't have to blank out the practice numbers you enter now or your own numbers from a previous month. All you have to do at the start of each new month is load Budget and save it under a different name. Try it now: Leave the cursor where it is and press OA-N to start the Name command. Type **JANUARY 1988** and press Return. Now press OA-S to store the copy on disk.

Figures 3 and **4** show practice numbers. To make data entry faster, first turn off automatic recalculation: Leave your cursor where it is; press OA-V to bring up the Standard Values screen, and type **RFM** to select *Recalculate Frequency Manual*.

Now press OA-1 to jump the cursor to row 1. Place the cursor on B3. Type **3385** (AppleWorks will produce a comma and two decimal places) and move the cursor to B9. Type **25** and move the cursor to B10. Type **50** and move the cursor to B11. Continue in this way—typing a number and moving the cursor—until you enter all the numbers in columns B and C.

Instead of turning on automatic recalculation, press OA-K and watch the formulas go to work. When recalculation stops, your spreadsheet should look like the one in **Figures 5** and **6** (the completed spreadsheet, as shown in last month's column).

PRINTING YOUR SPREADSHEET

This spreadsheet is 72 characters wide and prints at ten characters per inch on two consecutive sheets of 8½-by-11-inch paper. To position it nicely on each page and start the second page at the proper place, let's change the margin settings.

Leave your cursor where it is. Press OA-O to bring up the Printer Options screen. Type **LM** and press Return. Type **.4** and hit Return again. Now type **RM** and press the return key. Type **.4** and press Return again. Next, type **TM** and hit Return. Type **.4** and press Return again. Type **BM** and hit Return. Type **.8** and press Return again. Press OA-S to store these settings on disk and return the spreadsheet to the screen.

Now turn on your printer and print the spreadsheet: Leave your cursor where it is and press OA-P to bring

6) Press the zero key immediately and then type capital N. Don't enter any spaces or dashes in the control code even though they may appear that way in the manual.

That should solve your CTRL-I 0N problem. Not being able to print anything other than ten characters per inch may be related to how manuals use abbreviations to describe the codes that make various printer features work. For example, a manual may describe the codes for 12 cpi as ESC US VT. Many users mistakenly type in the actual keyboard characters US and VT—but US is actually an abbreviation for the up-shift character or a control-underline character, and VT is an abbreviation for vertical tab, or Control-K.

*The accompanying **Table** is a list of other abbreviations and their control-code and hexadecimal equivalents that may help you determine what to enter when you see them in your printer and interface-card manuals.*

Stripping Out Returns

Sometimes I need to replace return characters globally with something else, such as adding a character before the Return, or, perhaps, eliminating extra return characters captured from an electronic bulletin board. When I try to do this in AppleWorks, it thinks I made a mistake and beeps at me. I've tried entering CTRL-M, but that's no solution.

Harvey Waxman
Worcester, MA

You can't use the AppleWorks word processor's replace command to substitute another character for Return. There are two ways around this, though. The most obvious is to press Open apple-Z to zoom in and see all the extra Returns and replace or delete them. Another method is to print the document as an ASCII file, then write a BASIC program that will search for characters with a value of 13 and replace or delete them.

When reading an ASCII file into AppleWorks from a bulletin board, be sure to set the left and right margins to zero and characters per inch to 12. This will help you get the full potential of 80 characters per line.□ **—Kelly Stirn**

Got a question about AppleWorks? Write to Kelly Stirn c/o inCider, *80 Elm Street, Peterborough, NH 03458.*

CHAR	TYPE	HEX
NULL	Control-@	00
SOH	Control-A	01
STX	Control-B	02
ETX	Control-C	03
ET	Control-D	04
ENQ	Control-E	05
ACK	Control-F	06
BEL	Control-G	07
BS	Control-H	08
HT	Control-I	09
LF	Control-J	0A
VT	Control-K	0B
FF	Control-L	0C
CR	RETURN	0D
SO	Control-N	0E
SI	Control-O	0F
DLE	Control-P	10
DC1	Control-Q	11
DC2	Control-R	12
DC3	Control-S	13
DC4	Control-T	14
NAK	Control-U	15
SYN	Control-V	16
ETB	Control-W	17
CAN	Control-X	18
EM	Control-Y	19
SUB	Control-Z	1A
ESC	Escape	1B
FS	Control-\	1C
GS	Control-]	1D
RS	Control-]	1E
US	Control-_	1F

Table. *Printer-control-code abbreviations.*

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Viewmaster 80 *Super resolution 80 column card. Compatible with all 80 column software. Includes all you need to run AppleWorks on a II+ or Franklin* ... **$109**

RamFactor *Slot 1-7 memory expansion card. Runs AppleWorks on II+, IIe, IIGS, & Franklin. Battery backup option for permanent storage.*

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RamFactor 1 MEG **$299**
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Pinpoint Point-to-Point **$78**

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Deluxe Paint II **$74**

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up the Print screen. Press Return to confirm *All*. Press Return again to identify the printer (or type a printer number, then Return). Type today's date, and press the return key twice to confirm the date and one copy. The printer whirs, and here's a copy of your budget spreadsheet.

FIXING HEADINGS ON SCREEN

Let's pretend you're working on your own budget. Things are going great, but there's one small problem—as you move further down the spreadsheet, you can't see the column headings any longer, which makes it difficult to know which column contains what.

The remedy is simple: Have AppleWorks anchor those headings in place. First, position the spreadsheet so that row 5 (the first row of headings) is at the top of the screen. Now place the cursor on A8 and press OA-T to bring up the Title screen. Press the return key to confirm *Top*. Press the OA-down arrow key combination several times and you can see that the headings are indeed fixed in place.

A SECOND WINDOW

Seeing the results in C109, C110, and C111 is just as helpful when you work on a budget, and you can keep these numbers on screen in a second window. You can have fixed titles or a second window, not both, so first restore the spreadsheet to its standard condition: Press OA-T and hit Return.

Position the spreadsheet so that row 111 is at the bottom of the screen. Place your cursor on A108. Press OA-W to bring up the Windows screen. Type **T** to select *Top and bottom*. Now press the down-arrow key three times so that rows 109, 110, and 111 are visible.

Now press OA-J to jump the cursor to the top window. To see how nicely things work, overtype a few of the numbers now in the cells: Place the cursor on B28, type **50**, and move the cursor to C28. Type **50** again and move the cursor to B81.

Type **0** (zero) and move the cursor to C81. Type **0** (zero) again and press Return. Press OA-K to recalculate. The formulas show that the amount you budgeted exceeded your income by 5.38. Since you underspent your budget by 30.96, the result was a positive cash flow of 25.58.

Figure 1. Top portion of budget spreadsheet showing formula locations.

File: BUDGET REVIEW/ADD/CHANGE Escape: Main Menu

	A	B	C	D	E
1			MONTHLY BUDGET		
2					
3	NET INCOME				
4					
5		Amount Budgeted	Amount Spent	Und(Over) Budget	Spent as % of Inc
6	EXPENSES				
7					
8	Savings & Investments:				
9	Bank, credit union			[7] 0.00	[8] ERROR
10	Stocks & bonds			0.00	ERROR
11	Mutual funds			0.00	ERROR
12	Other investments			0.00	ERROR
13	Total Savings/Investments	[1] 0.00	0.00	0.00	ERROR
14					
15	Household:				
16	Mortgage or rent			0.00	ERROR
17	Taxes, insurance			0.00	ERROR
18	Utilities			0.00	ERROR
19	Phone			0.00	ERROR
20	Maintenance, repairs			0.00	ERROR
21	Furnishings, improvements			0.00	ERROR
22	Total Household	[2] 0.00	0.00	0.00	ERROR
23					
24	Personal:				
25	Food, beverages			0.00	ERROR
26	Clothing			0.00	ERROR
27	Grooming			0.00	ERROR
28	Miscellaneous			0.00	ERROR
29	Total Personal	0.00	0.00	0.00	ERROR
30					
31	Transportation:				
32	Commutation			0.00	ERROR
33	Gasoline			0.00	ERROR
34	Parking, tolls			0.00	ERROR
35	Car repairs, maintenance			0.00	ERROR
36	Car registration, license			0.00	ERROR
37	Total Transportation	[3] 0.00	0.00	0.00	ERROR
38					
39	Insurance:				
40	Life, disability			0.00	ERROR
41	Car			0.00	ERROR
42	Medical, dental			0.00	ERROR
43	Personal property			0.00	ERROR
44	Total Insurance	0.00	0.00	0.00	ERROR
45					
46	Income Taxes (not withheld):				
47	Federal			0.00	ERROR
48	State			0.00	ERROR
49	Local			0.00	ERROR
50	Total Income Taxes	[4] 0.00	0.00	0.00	ERROR
51					
52	Loans & Debts:				
53	Car loan			0.00	ERROR
54	College loan			0.00	ERROR
55	Other loans, debts			0.00	ERROR
56	Total Loans/Debts	0.00	0.00	0.00	ERROR
57					
58	Health Care (unreimbursed):				
59	Doctor			0.00	ERROR
60	Dentist			0.00	ERROR
61	Medication			0.00	ERROR
62	Total Health Care	0.00	0.00	0.00	ERROR
63					
64	Educational & Professional:				
65	Tuition, books, board			0.00	ERROR
66	Day care, lessons			0.00	ERROR
67	Memberships			0.00	ERROR
68	Books, periodicals			0.00	ERROR
69	Total Educ/Professional	0.00	0.00	0.00	ERROR
70					
71	Recreation:				
72	Meals out			0.00	ERROR
73	Movies, plays			0.00	ERROR
74	Sports, hobbies			0.00	ERROR
75	Vacation			0.00	ERROR
76	Baby sitter			0.00	ERROR
77	Cable TV			0.00	ERROR
78	Total Recreation	0.00	0.00	0.00	ERROR
79					

Figure 2. Bottom portion of budget spreadsheet showing formula locations.

```
 80|Gifts & Contributions:
 81| Holidays                                                  0.00      ERROR
 82| Weddings, birthdays                                       0.00      ERROR
 83| Political                                                 0.00      ERROR
 84| Charitable                                                0.00      ERROR
 85|  Total Gifts/Contributions        0.00        0.00       0.00      ERROR
 86|
 87|Other Expenses:
 88| Children's allowances                                     0.00      ERROR
 89| Legal, financial services                                 0.00      ERROR
 90| Child support                                             0.00      ERROR
 91| Alimony                                                   0.00      ERROR
 92|  Total Other Expenses             0.00        0.00       0.00      ERROR
 93|
 94|  Total Monthly Expenses      [5]  0.00        0.00       0.00      ERROR
 95|
 96|=========================================================================
 97|BUDGET UNDER (OVER) INCOME                  [6]  0.00
 98|SPENT UNDER (OVER) BUDGET                   [9]  0.00
 99|CASH FLOW THIS MONTH                       [10]  0.00
100|=========================================================================
```

Figure 3. Top half of budget spreadsheet showing practice numbers.

```
File: JANUARY 1988              REVIEW/ADD/CHANGE              Escape: Main Menu
===============A=================B==========C==========D==========E=====
  1|                             MONTHLY BUDGET
  2|=========================================================================
  3|NET INCOME                          3385
  4|=========================================================================
  5|                                Amount     Amount    Und(Over)  Spent as
  6|EXPENSES                       Budgeted     Spent     Budget    % of Inc
  7|-------------------------------------------------------------------------
  8|Savings & Investments:
  9| Bank, credit union                  25         0
 10| Stocks & bonds                      50        50
 11| Mutual funds                        50        25
 12| Other investments                    0         0
 13|                                --------   --------   --------   --------
 14|  Total Savings/Investments
 15|
 16|Household:
 17| Mortgage or rent                 654.15    654.15
 18| Taxes, insurance                  48.23     48.23
 19| Utilities                            86     97.89
 20| Phone                                35     43.12
 21| Maintenance, repairs                 50         0
 22| Furnishings, improvements           359       387
 23|                                --------   --------   --------   --------
 24|  Total Household
 25|
 26|Personal:
 27| Food, beverages                     425    446.72
 28| Clothing                            100        64
 29| Grooming                             18        18
 30| Miscellaneous                        50     32.78
 31|                                --------   --------   --------   --------
 32|  Total Personal
 33|
 34|Transportation:
 35| Commutation                         101       113
 36| Gasoline                             45      36.5
 37| Parking, tolls                       50     27.83
 38| Car repairs, maintenance             20    123.45
 39| Car registration, license              0         0
 40|                                --------   --------   --------   --------
 41|  Total Transportation
 42|
 43|Insurance:
 44| Life, disability                    186       186
 45| Car                                   0         0
 46| Medical, dental                     103       103
 47| Personal property                     0         0
 48|                                --------   --------   --------   --------
 49|  Total Insurance
 50|
 51|Income Taxes (not withheld):
 52| Federal                             110       110
 53| State                                17        17
 54| Local                                 6         6
 55|                                --------   --------   --------   --------
 56|  Total Income Taxes
 57|
```

You can store a second window on disk with the spreadsheet and everything will be just as you left it when you reload the spreadsheet. Your printed spreadsheet, however, won't show even a hint of the other window. Now close the second window: Leave your cursor where it is, type OA-W, and press Return to confirm *One*. That's all there is to it.

FINAL COMMENTS

Chances are the items and categories in my budget won't entirely suit your budget. Before you do anything else, modify the master to reflect your lifestyle. Change labels, insert (OA-I) and delete (OA-D) rows, and do anything else to customize the budget to your needs. Then save the file as Budget as usual.

Each month, load Budget and use OA-N to give it a new name. Then store the new file on disk. Enter the numbers for the new month, and you're well on your way to controlling your money. Next time, you'll create a spreadsheet that summarizes your monthly budgets.■

Ruth K. Witkin is a consultant in computer applications for business. She's the author of the hotCider template disk and handbook Success with AppleWorks *(*inCider, *CW Communications),* Managing with AppleWorks *(Howard W. Sams & Co.), and* Personal Money Management with AppleWorks *(John Wiley & Sons). Write to her at 5 Patricia Street, Plainview, NY 11803. Enclose a self-addressed, stamped envelope if you'd like a personal reply.*

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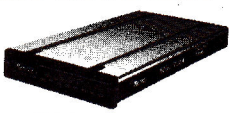

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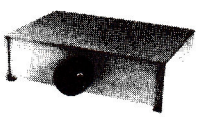

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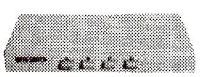

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Figure 4. Bottom half of budget spreadsheet showing practice numbers.

Loans & Debts:				
Car loan	168	168		
College loan	119	119		
Other loans, debts	0	0		
Total Loans/Debts				
Health Care (unreimbursed):				
Doctor	30	55		
Dentist	65	45		
Medication	18	22		
Total Health Care				
Educational & Professional:				
Tuition, books, board	0	0		
Day care, lessons	150	150		
Memberships	15	15		
Books, periodicals	35	27		
Total Educ/Professional				
Recreation:				
Meals out	65	86.48		
Movies, plays	28	36		
Sports, hobbies	35	19.75		
Vacation	0	0		
Baby sitter	22	20		
Cable TV	37	37		
Total Recreation				
Gifts & Contributions:				
Holidays	0	0		
Weddings, birthdays	50	50		
Political	50	0		
Charitable	10	0		
Total Gifts/Contributions				
Other Expenses:				
Children's allowances	20	20		
Legal, financial services	0	0		
Child support	0	0		
Alimony	0	0		
Total Other Expenses				
Total Monthly Expenses				
BUDGET UNDER (OVER) INCOME				
SPENT UNDER (OVER) BUDGET				
CASH FLOW THIS MONTH				

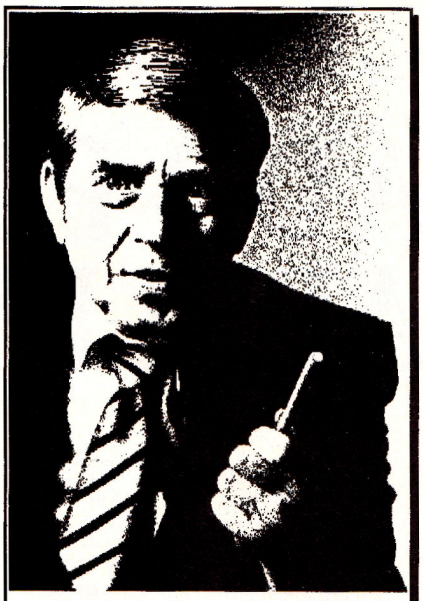
Figure 5. Completed spreadsheet, top portion.

File: JANUARY 1988 REVIEW/ADD/CHANGE Escape: Main Menu

	MONTHLY BUDGET			
NET INCOME	3,385.00			
EXPENSES	Amount Budgeted	Amount Spent	Und(Over) Budget	Spent as % of Inc
Savings & Investments:				
Bank, credit union	25.00	0.00	25.00	0.0%
Stocks & bonds	50.00	50.00	0.00	1.5%
Mutual funds	50.00	25.00	25.00	.7%
Other investments	0.00	0.00	0.00	0.0%
Total Savings/Investments	125.00	75.00	50.00	2.2%
Household:				
Mortgage or rent	654.15	654.15	0.00	19.3%
Taxes, insurance	48.23	48.23	0.00	1.4%
Utilities	86.00	97.89	(11.89)	2.9%
Phone	35.00	43.12	(8.12)	1.3%
Maintenance, repairs	50.00	0.00	50.00	0.0%
Furnishings, improvements	359.00	387.00	(28.00)	11.4%
Total Household	1,232.38	1,230.39	1.99	36.3%

Figure 6. Completed spreadsheet, bottom portion.

26 Personal:				
27 Food, beverages	425.00	446.72	(21.72)	13.2%
28 Clothing	100.00	64.00	36.00	1.9%
29 Grooming	18.00	18.00	0.00	.5%
30 Miscellaneous	50.00	32.78	17.22	1.0%
31				
32 Total Personal	593.00	561.50	31.50	16.6%
33				
34 Transportation:				
35 Commutation	101.00	113.00	(12.00)	3.3%
36 Gasoline	45.00	36.50	8.50	1.1%
37 Parking, tolls	50.00	27.83	22.17	.8%
38 Car repairs, maintenance	20.00	123.45	(103.45)	3.6%
39 Car registration, license	0.00	0.00	0.00	0.0%
40				
41 Total Transportation	216.00	300.78	(84.78)	8.9%
42				
43 Insurance:				
44 Life, disability	186.00	186.00	0.00	5.5%
45 Car	0.00	0.00	0.00	0.0%
46 Medical, dental	103.00	103.00	0.00	3.0%
47 Personal property	0.00	0.00	0.00	0.0%
48				
49 Total Insurance	289.00	289.00	0.00	8.5%
50				
51 Income Taxes (not withheld):				
52 Federal	110.00	110.00	0.00	3.2%
53 State	17.00	17.00	0.00	.5%
54 Local	6.00	6.00	0.00	.2%
56 Total Income Taxes	133.00	133.00	0.00	3.9%
57				
58 Loans & Debts:				
59 Car loan	168.00	168.00	0.00	5.0%
60 College loan	119.00	119.00	0.00	3.5%
61 Other loans, debts	0.00	0.00	0.00	0.0%
62				
63 Total Loans/Debts	287.00	287.00	0.00	8.5%
64				
65 Health Care (unreimbursed):				
66 Doctor	30.00	55.00	(25.00)	1.6%
67 Dentist	65.00	45.00	20.00	1.3%
68 Medication	18.00	22.00	(4.00)	.6%
69				
70 Total Health Care	113.00	122.00	(9.00)	3.6%
71				
72 Educational & Professional:				
73 Tuition, books, board	0.00	0.00	0.00	0.0%
74 Day care, lessons	150.00	150.00	0.00	4.4%
75 Memberships	15.00	15.00	0.00	.4%
76 Books, periodicals	35.00	27.00	8.00	.8%
77				
78 Total Educ/Professional	200.00	192.00	8.00	5.7%
79				
80 Recreation:				
81 Meals out	65.00	86.48	(21.48)	2.6%
82 Movies, plays	28.00	36.00	(8.00)	1.1%
83 Sports, hobbies	35.00	19.75	15.25	.6%
84 Vacation	0.00	0.00	0.00	0.0%
85 Baby sitter	22.00	20.00	2.00	.6%
86 Cable TV	37.00	37.00	0.00	1.1%
87				
88 Total Recreation	187.00	199.23	(12.23)	5.9%
89				
90 Gifts & Contributions:				
91 Holidays	0.00	0.00	0.00	0.0%
92 Weddings, birthdays	50.00	50.00	0.00	1.5%
93 Political	50.00	0.00	50.00	0.0%
94 Charitable	10.00	0.00	10.00	0.0%
95				
96 Total Gifts/Contributions	110.00	50.00	60.00	1.5%
97				
98 Other Expenses:				
99 Children's allowances	20.00	20.00	0.00	.6%
100 Legal, financial services	0.00	0.00	0.00	0.0%
101 Child support	0.00	0.00	0.00	0.0%
102 Alimony	0.00	0.00	0.00	0.0%
103				
104 Total Other Expenses	20.00	20.00	0.00	.6%
105				
106 Total Monthly Expenses	3,505.38	3,459.90	45.48	102.2%
107				
108 ==========				
109 BUDGET UNDER (OVER) INCOME		(120.38)		
110 SPENT UNDER (OVER) BUDGET		45.48		
111 CASH FLOW THIS MONTH		(74.90)		
112 ==========				



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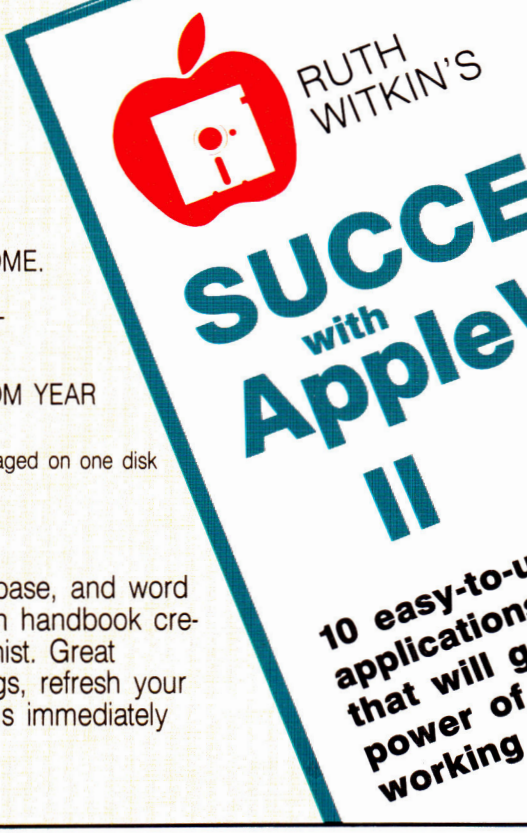

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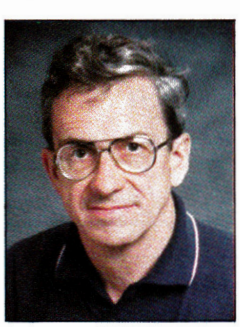

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Opening Pop-Up Windows

Add style to your BASIC programs with pop-up message boxes—all it takes is a little PEEKing and POKEing in video RAM.



by Dan Bishop

Ever use "pull-down" menus? Some of the more impressive applications on the market today include them in their repertoire of "user-friendly" enhancements.

You've seen them—the program displays a row of icons across the top of the screen; you point to one with a mouse and a window scrolls down beneath the symbol to reveal a secondary list of options. The window covers whatever material occupied that area of the screen previously, but as soon as you make a selection, the menu disappears and the screen returns to its original state.

You can add similar windows to your own Applesoft applications: You can program in help notes and error messages that "pop up" in the middle of your screen. A pop-up window covers the information behind the displayed message until you press a specified key; the screen then resumes its original appearance.

Windowing involves some simple move commands that copy screen data to a safe place while the program displays the help message; the program then copies these data back to their original memory locations when you "close" the window.

In commercial programs, these functions are lightning fast, since they're usually written in assembly language and compiled into machine code. But you can write similar operations in BASIC, too. The only difference you'll notice is that your message windows will take longer—a few seconds—to appear and disappear.

VIDEO MEMORY

Before you can produce pop-up messages in your BASIC programs, you need to understand how your Apple handles video-display data. Applesoft reserves a block of random-access memory (RAM) for video memory, called text-page 1, which begins at RAM address 1024 and runs through 2047.

When you use text mode, each character that appears on screen is stored simultaneously as numeric code in the text-page 1 block of memory. Each location in memory corresponds to a specific location on screen. For example, if your screen currently displays *ABC* in the upper-left corner, memory locations 1024, 1025, and 1026 contain 193, 194, and 195—Applesoft's code values for A, B, and C in standard (white-on-black) display mode.

Your Apple's video memory contains a few gaps, though; the relationship between memory addresses and screen locations isn't one smooth stream. In standard text mode, your Apple can display 40 characters per row. The codes for characters in the first row reside in RAM-locations 1024–1063. But locations 1064–1103 contain the codes for characters in row 9, while row 17 uses locations 1104–1143.

Video memory doesn't use the next eight RAM locations (1144–1151) at all. They equal the difference between 128 (a power of 2 in binary code) and 120 (three 40-column rows); your Apple uses them for other functions.

To summarize, rows 1, 9, and 17 account for the first 128 bytes of video memory, 1024–1151. Rows 2, 10, and 18 use the next 128 bytes, 1152–1279. This pattern holds for the rest of text-page-1 memory, ending at location 2047. Your Apple doesn't use the last eight bytes in each 128-byte block for video RAM. The accompanying **Table** relates text-page-1 memory addresses to screen-display locations.

Now that you know how video RAM is organized, you need a formula to calculate the exact RAM location of any display position, given its row (*r*) and column (*c*) number. In fact, if you can calculate the address of the first character in any given row, you can determine the rest of the row's addresses by adding (c – 1) to the first character's address. The following formula handles this task:

```
1024 + (r - 1)*128 - (INT((r - 1)/
8 + 0.005)*984
```

Try substituting any value from 1 to 24 for *r*, the row number. The result should correspond to that row's column-1 address shown in the accompanying **Table**.

SAVING DISPLAYED TEXT

Using this formula, you can develop a pop-up-message-handling routine. After you decide on the screen location for the pop-up message, you must copy the codes stored in those corresponding RAM locations to a safe place before displaying the message box. To remove the box, copy the original code values back to video RAM; as your Apple copies each character back into place, it appears automatically on screen and replaces the message box.

Applesoft provides two commands for tampering directly with RAM. *PEEK(address)* returns the code value currently stored at the specified address. For example, V = PEEK(1024) assigns the code value for the character appearing in the upper-left corner of the screen to the variable V. *POKE address,code* places a new code value into the specified address.

Table. RAM locations for video-text-page 1.

RAM Addresses	Screen Row
1024–1063	1
1064–1103	9
1104–1143	17
1144–1151	nonvideo
1152–1191	2
1192–1231	10
1232–1271	18
1272–1279	nonvideo
1280–1319	3
1320–1359	11
1360–1399	19
1400–1407	nonvideo
1408–1447	4
1448–1487	12
1488–1527	20
1528–1535	nonvideo
1536–1575	5
1576–1615	13
1616–1655	21
1656–1663	nonvideo
1664–1703	6
1704–1743	14
1744–1783	22
1784–1791	nonvideo
1792–1831	7
1832–1871	15
1872–1911	23
1912–1919	nonvideo
1920–1959	8
1960–1999	16
2000–2039	24

The simplest way to copy the codes you obtain with PEEK to a different RAM location for temporary safekeeping is to define a two-dimensional array at least as large as your message box. At the cost of some memory, you can simplify the program somewhat by dimensioning the array to fit your screen—24 rows by 40 columns. This way, your program will save in array element (i,j) the code for the character appearing in row *i* column *j* on screen.

The accompanying **Program listing**, a modified version of last month's Menu Selector (p. 129), creates a pop-up message box in the middle of the screen. The program restores your original text to the screen when you're finished reading the message.

Line 125 dimensions the array RS to contain one element for each screen location. Since this array stores only character codes, you can cut the memory requirements in half by specifying the array as an integer array, using RS%(24,40) instead of RS(24,40)—an important factor in longer programs.



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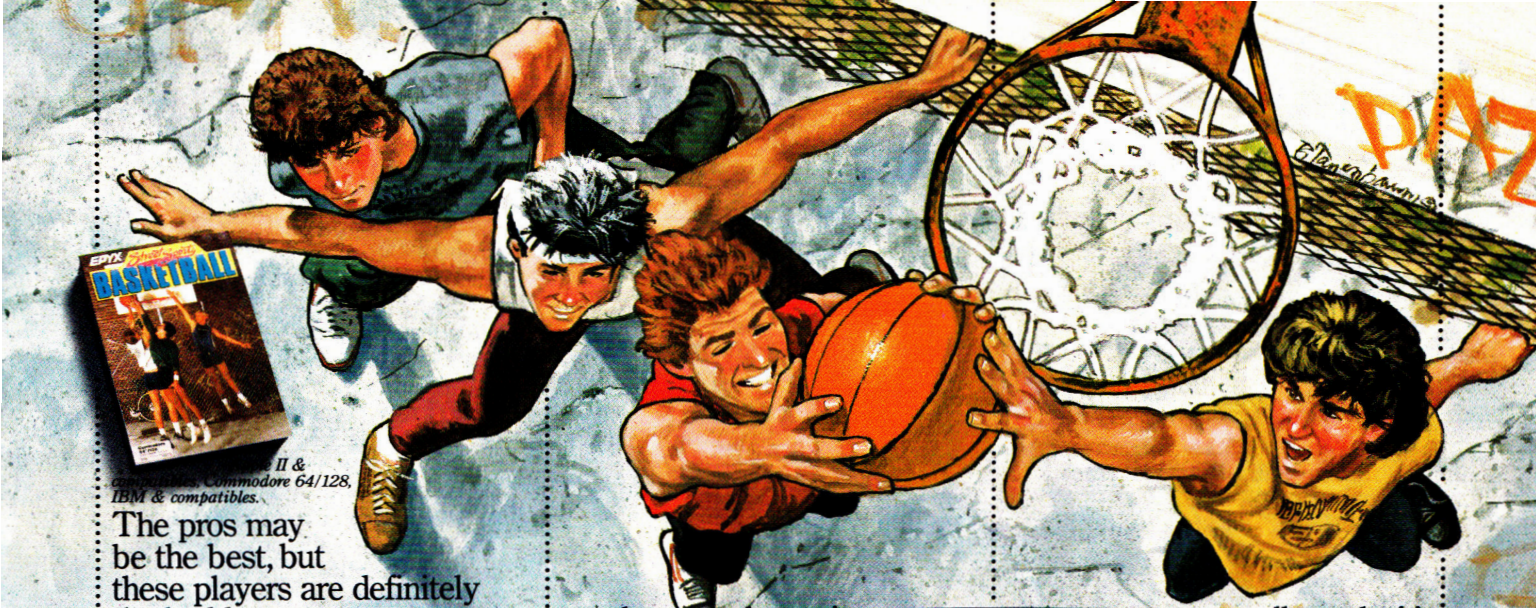

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Notice that somebody just stole second base. Funny, it was here a minute ago.

ANOTHER HIT.

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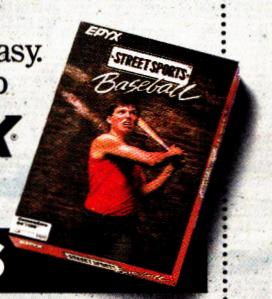

THE STREET SPORTS SERIES

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Program listing. Demonstration program creating a pop-up message box.

```
1   REM      WINDOWS FOR MENUS
2   REM      AND MESSAGES
3   REM     BY   DAN BISHOP
4   REM     APPLESOFT ADVISOR
5   REM    INCIDER, JANUARY 1988
6   REM
10   GOSUB 100: REM  INIT.VARS.
15   GOSUB 1000: REM  FILL SCREEN
20   GOSUB 200: REM  DISPLAY MENU
30   GOSUB 300: REM  MENU ROUTINE
40   GOTO 20
90   END
95   REM
96   REM  ************************
97   REM  INITIALIZE MENU ARRAY
98   REM  ************************
99   REM
100   HOME
105   READ M1: DIM M1$(M1,2): READ M1$(0,0)
110   FOR I = 1 TO M1
115   READ M1$(I,0),M1$(I,1),M1$(I,2)
120   NEXT I
125   DIM RS(24,40)
130   DEF  FN PK(X) = 1024 + (X - 1) * 128 - ( INT ((X - 1)
      / 8 + 0.005) * 984)
135   RETURN
195   REM
196   REM  ************************
197   REM  DISPLAY COMPLETE MENU
198   REM  ************************
199   REM
200   VTAB 1: HTAB 1
205   FOR I = 0 TO M1
210   PRINT M1$(I,0);" ";
215   NEXT I
220   INVERSE
225   VTAB 2: HTAB 1: PRINT  SPC( 40);
230 M = 1: GOSUB 250
235   NORMAL : RETURN
245   REM
246   REM  **********************
247   REM  DISPLAY 1 MENU ITEM
248   REM  **********************
249   REM
250   VTAB 1: HTAB  LEN (M1$(0,0)) + 2 * M
255   INVERSE : PRINT M1$(M,0);
260   HTAB 33: PRINT M1$(M,1);
265   NORMAL : RETURN
266   REM
267   REM  **********************
268   REM  UN-HILITE ITEM
269   REM  **********************
270   VTAB 1: HTAB  LEN (M1$(0,0)) + 2 * M
275   NORMAL : PRINT M1$(M,0);
280   HTAB 33: PRINT  SPC( 7);
285   RETURN
293   REM
294   REM   **********************
295   REM  KEYBOARD ENTRY OF
296   REM  MENU SELECTION AND
297   REM  CHOICE VALIDATION
298   REM  **********************
299   REM
300   GET Z$:MF = 0
```

Listing continued.

The subroutine at lines 1100–1125 copies the character codes from video RAM to the RS array. Before executing GOSUB 1100, be sure to assign appropriate values to the four variables RB, RE, CB, and CE. RB and RE represent the beginning and ending row numbers (1–24); CB and CE signify the beginning and ending column numbers (1–40) for the pop-up box. Although you could eliminate these variables and simply save the whole screen each time, the process becomes cumbersome. As written, the program saves only the area of the screen the message box will cover.

Line 1105 uses a function, PK, defined in line 130. PK contains the formula for calculating RAM locations from a given row value. Note that the definition of the function in line 130 uses a dummy variable, X. You should define a function to handle any formula your program uses often. You must identify the formula's dummy variable in parentheses immediately following the name of the function. To use the function in your program with a value, place that value in parentheses and assign to a variable the value that function returns, as shown in line 1105.

Suppose you need to calculate the sum of the first four nonzero powers of X several times for different values of X. Define a function called PW to handle this problem. At the beginning of your program, include the following line:

```
DEF FNPW(X)=X*X*X*X+
X*X*X+X*X+X
```

Now suppose you need to assign to variable M the value resulting from summing the first four powers of some other variable, K. The following line takes care of the problem:

```
M=FNPW(K)
```

In this example, the program reads K's value into the function definition as X. It carries out the calculation, returns the result, and assigns it to M.

In the accompanying **Program listing**, row-loop-counter I takes on each row value between RB and RE. For each value of I, the program uses the PK function defined in line 130 to calculate an address (RS). At line 1110, the program enters an inner loop controlled by J, which takes on column values between CB and CE. With each value of J, the program calculates an exact address in video RAM (RS+J–1), PEEKs its character code, and assigns it to the RS(I,J)th

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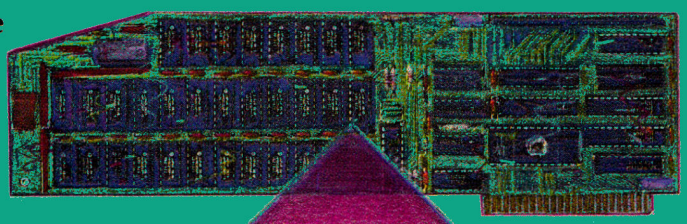

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Listing continued.

```
305  IF M > 1 AND  ASC (Z$) = 13 THEN  GOSUB 400: RETURN
310 Z = 0: FOR I = 2 TO M1
315  IF Z$ = M1$(I,0) THEN Z = 1:M = I
320  NEXT I
325  IF Z = 1 THEN Z = 0: GOSUB 400: RETURN
330  IF  ASC (Z$) <  > 21 THEN  GOTO 350
335  GOSUB 270:M = M + 1
340  IF M > M1 THEN M = 1
345  GOSUB 250: GOTO 300
350  IF  ASC (Z$) <  > 8 THEN  GOTO 370
355  GOSUB 270:M = M - 1
360  IF M < 1 THEN M = M1
365  GOSUB 250: GOTO 300
370  IF Z$ <  > "?" AND  NOT ( ASC (Z$) = 13 AND M = 1) THEN
      GOTO 300
375 RB = 7:CB = 6:RE = 16:CE = 34: GOSUB 1200
380  GOTO 300
395  REM
396  REM  **********************
397  REM  MESSAGE VERIFYING THAT
398  REM  SELECTION WAS OK.
399  REM  **********************
400  HOME
405  HTAB 1: VTAB 12
410  PRINT "YOU HAVE MADE A VALID SELECTION"
415  PRINT "FROM THE MAIN MENU."
420  PRINT
425  PRINT "   PRESS ANY KEY TO CONTINUE...";
430  GET ZZ$
435  IF M <  > M1 THEN  GOSUB 1000: RETURN
440  PRINT : PRINT
445  PRINT "YOUR CHOICE WAS TO END.  GOOD-BYE!": END
450  VTAB 22: HTAB 1
455  PRINT  SPC( 119);
460 MF = 0: RETURN
991  REM
992  REM  ********************
993  REM  ROUTINE TO FILL
994  REM  SCREEN WITH TEXT.
995  REM  ********************
996  REM
1000  VTAB 3: HTAB 1
1005  FOR J = 33 TO 53
1010  FOR I = J TO J + 39
1015  PRINT  CHR$ (I);
1020  NEXT I,J
1025  VTAB 1: HTAB 40
1030  RETURN
1091  REM
1092  REM  ********************
1093  REM  STORE TEXT THAT FALLS
1094  REM  BEHIND MESSAGE WINDOW
1095  REM  ********************
1096  REM
1100  FOR I = RB TO RE
1105 RS =  FN PK(I)
1110  FOR J = CB TO CE
1115 RS(I,J) =  PEEK (RS + J - 1)
1120  NEXT J,I
1125  RETURN
1141  REM
1142  REM  ********************
1143  REM  RE-DISPLAY TEXT THAT
1144  REM  WAS SAVED.
1145  REM  ********************
```

Listing continued.

element in the RS array. (Note that Applesoft lets you use the same name for a single variable and for an array.)

Lines 1150–1175 handle the reverse process, which restores the contents to video RAM. The program uses the same two loops, and POKEs the code in array element RS(I,J) into location (RS + J – 1).

THE POP-UP BOX

Keep in mind that the accompanying code is a sample program demonstrating how the various functions work. Once you've mastered these subroutines, you can tailor them to suit your own programming needs.

After initializing variables (GOSUB 100), the subroutine at line 1000 fills the screen with a regular pattern of characters. This creates a screenful of text so that you can see the text-save and text-restore processes clearly.

The program calls lines 1200–1290 whenever you enter a question mark to call up a help message. Recall that the program has already defined RB, RE, CB, and CE as the beginning and ending row and column numbers for the pop-up box.

Line 1200 calls the text-save subroutine at line 1100. It creates a white box in the middle of the screen by printing several rows of blank spaces in inverse mode. These rows are exactly the length of the message box (CE – CB + 1) and begin printing at row RB and column CB (using HTAB CB).

Next, the program paints the inside of the box black, leaving only a white border to set the message box apart from the screen's text. At the same time, four POKE instructions set the active window for the screen display to correspond to the inside of the box:

- POKE 32, CB sets the left edge of the active window to column CB (0–40). Since DHTAB uses values between 1 and 40, this is actually one column beyond the white border on the right. Say, for example, CB = 12. HTAB CB starts printing in the 12th column. POKE 32,CB defines the left window edge as the 13th column, since column numbering begins with zero when you use POKE.

- POKE 33, (CE – CB – 1) defines the width of the active window. Since (CE – CB + 1) created the border, which delineates the active window, the width must be (CE – CB – 1), or two columns less than the width de-

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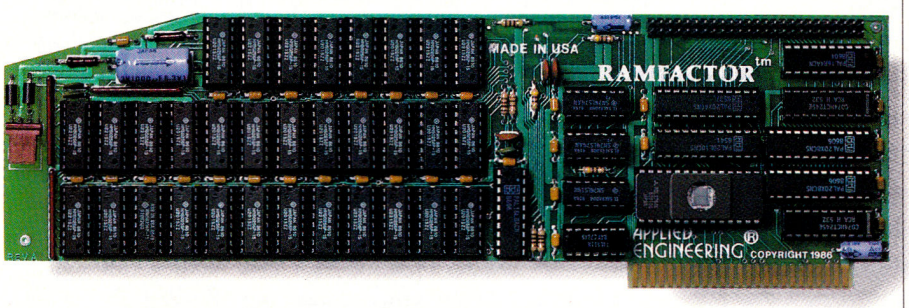

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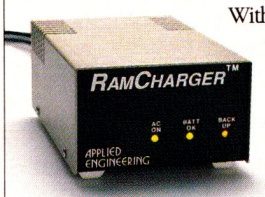

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Listing continued.

```
1146  REM
1150  FOR I = RB TO RE
1155 RS =  FN PK(I)
1160  FOR J = CB TO CE
1165  POKE RS + J - 1,RS(I,J)
1170  NEXT J,I
1175  RETURN
1191  REM
1192  REM  ******************
1193  REM  CREATE MESSAGE WINDOW
1194  REM  AND DISPLAY MESSAGE
1195  REM  ******************
1196  REM
1200  GOSUB 1100
1205  INVERSE
1210  FOR I = RB TO RE
1215  VTAB I: HTAB CB: PRINT  SPC( CE - CB + 1);
1220  NEXT I: NORMAL
1225  POKE 32,CB
1230  POKE 33,CE - CB - 1
1235  POKE 34,RB
1240  POKE 35,RE - 1
1245  CALL  - 936
1250  PRINT M1$(M,2)
1255 MF = 1
1260  PRINT "*** PRESS <RETURN>. ***";
1265  INPUT "";ZZ$
1270  POKE 32,0: POKE 34,0
1275  POKE 33,40: POKE 35,24
1280  GOSUB 1150
1285  VTAB 1: HTAB 40
1290  RETURN
4995  REM
4996  REM  **********************
4997  REM  DATA FOR MAIN MENU
4998  REM  **********************
4999  REM
5000  DATA  7, "MAIN MENU:"
5001  DATA  "?","HELP","PRESS <?> WHEN ANY OPTION  IS HIGHLIG
      HTED TO RECEIVE  HELP MESSAGE FOR THAT ITEM."
5002  DATA  "A","ADD","USE THIS OPTION TO ADD A   NEW NAME TO
       YOUR MAIL-LIST."
5003  DATA  "E","EDIT","USE THIS OPTION TO CHANGE  INFORMATIO
      N ON ANYONE      ALREADY IN YOUR MAIL-LIST."
5004  DATA  "D","DELETE","USE THIS OPTION TO PERMA-  NENTLY R
      EMOVE A RECORD FROM YOUR MAIL-LIST."
5005  DATA  "L","LIST","USE THIS OPTION TO DISPLAY YOUR ENTIR
      E  MAIL-LIST ON  THE SCREEN."
5006  DATA  "P","PRINT","USE THIS OPTION TO PRINT   MAIL-LABE
      LS."
5007  DATA  "Q", "QUIT","SELECT THIS OPTION TO END  THE PROGR
      AM."
```

End of listing.

fined by the border.

- POKE 34,RB sets the top of the active window to row RB(0–24). As does HTAB, VTAB counts from 1 to 24, so the program defines the active window one row below the border.
- POKE 35,RE – 1 sets the bottom row of the active window.
- CALL – 936 clears the active window to black and moves the cursor to its home location, the upper left-hand corner of the window.

With the window boxed in and cleared, the program prints the appropriate help message, with *Press <RETURN>* beneath it, inside the window. Pressing Return issues the four POKE instructions, with values of zero, 40, zero, and 24, to restore the active window to full screen. Then the program calls the text-restore subroutine at line 1150 to rewrite the text over the message box.

As long as you're using only one pop-up box or pull-down menu at a time, or multiple boxes don't overlap, your program needs just one array for temporary storage. Be sure your program assigns appropriate values to RB, RE, CB, and CE whenever you issue a GOSUB 1200 call.

In pull-down menus appearing directly beneath a main-menu selection, each selection will use different values for RB, RE, CB, and CE. If you store these four variables in a two-dimensional array, such as EJ(M1,4), where M1 is the number of menu options (as in the **Program listing**), you can assign them appropriate values for each menu option the same way the **Program listing** selects an appropriate help message to display.

If your program crashes while you're using one of the windows, you may have to type in the following four commands to restore screen operation:

```
POKE 32, 0
POKE 33, 40
POKE 34, 0
POKE 35, 24
```

SAVING SPACE AND TIME

Of course, an assembly-language implementation of the save-text and restore-text subroutines greatly reduces the time and memory these operations require. The RS array the **Program listing** uses for temporary storage requires 4 × 25 × 41, or 4100, bytes of storage—suitable for the demonstration program, perhaps, but sloppy.

Using RS% for the array name cuts storage in half, to 2 bytes per element, for 2050 bytes. In assembly language, though, you can store these elements in a byte-for-byte mirror-image format, requiring only 1025 bytes to save a whole screen. Next month, we'll look at ways to incorporate a few simple assembly-language instructions into our BASIC programs.■

Dan Bishop owns and operates a microcomputer consulting business. Write to him at 4124 Beaver Creek Drive, Fort Collins, CO 80526.

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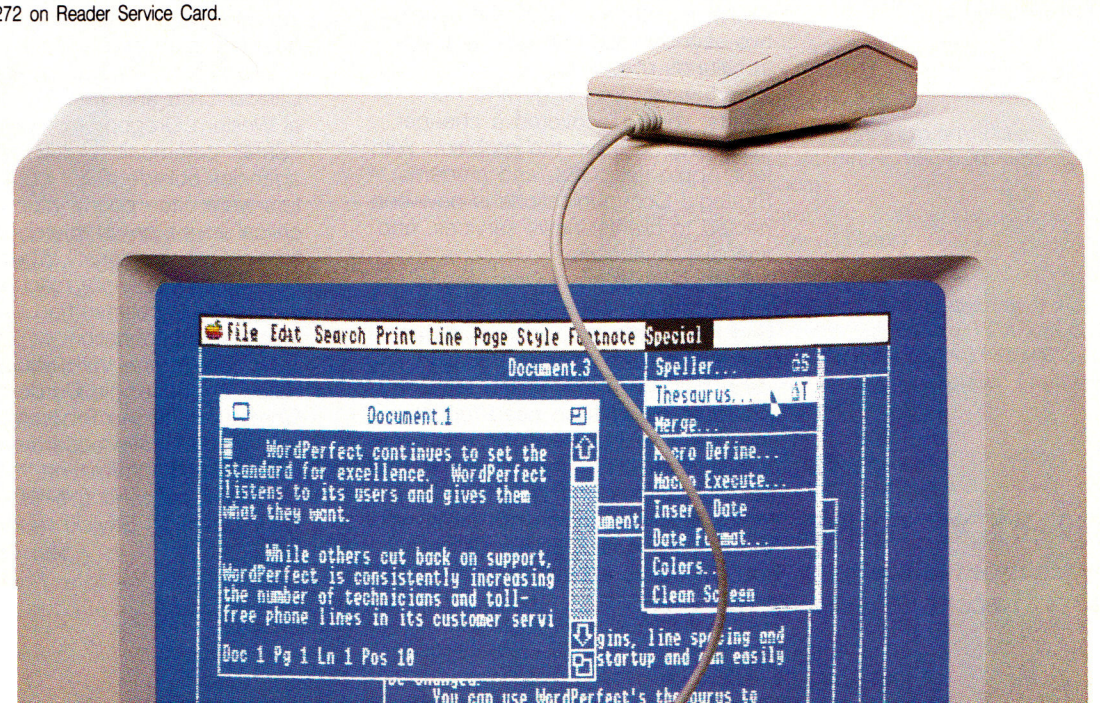
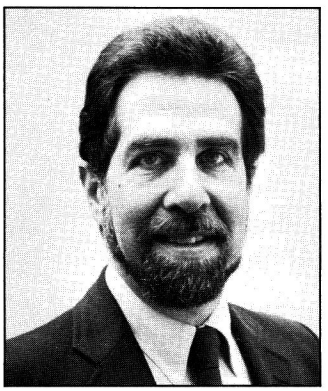


Apples Log On

Introducing inCider On Line*, a new monthly column exploring the world of telecommunications hardware, software, and services.*



by Tom Sherman

In New York, Peggy Berk is facing a deadline. As president of Strategic Communications, she's announcing a new change in a client's firm, a development that may affect the price of its stock. To avoid the possibility that someone might take advantage of private information, the Securities and Exchange Commission requires public disclosure of anything that will have an impact on stock prices—immediate disclosure.

First, Peggy has to draft the financial release and send it to her client and the firm's lawyers for approval. They'll return the draft with comments. Next, Peggy will make any necessary changes and send the new version back to the client and lawyers. After they've approved the final draft, Peggy will send the new copy to Dow Jones and other media and make sure their announcement reaches the stock market. Later, she'll assess the impact of the announcement on her client's stock price.

Picture the process. All the people involved in the decision—Peggy, her client, the lawyers—must wait by their telephones to confer on each step. Each version of the announcement must be retyped and sent by messenger from one office to the others. With lawyers' fees, staff time, and the cost of messenger service (picture them trudging through New York slush), the price of even the simplest two-page release can quickly climb to thousands of dollars.

Fortunately for Peggy and her clients, she's discovered a cheaper, faster way to solve the problem. With four Apple IIes, GSs, and modems, Strategic Communications is now connected to clients, news services, and financial databases.

Instead of using messengers to shuttle papers back and forth, Peggy and her clients exchange drafts and comments electronically. Because each new version is edited easily by computer, there's no need for retyping. Because the electronic exchange is fast, there's no time wasted waiting for messengers and telephone calls. When the final version has been written and approved, Peggy delivers it to Dow Jones and sends it electronically to PR Newswire and other media.

Then, using financial services on line, she instantly confirms whether the announcement has crossed the ticker and assesses its impact on the stock. Her report is posted in a private on-line conference—accessible only to Peggy and her client—where members of the company can read it at their convenience. Because the on-line record is permanent, it's easy for Peggy and her clients to review and refine this process.

On-Line Tip

If someone picks up a phone extension on the line you're using, he or she may interrupt or garble your on-line connection. Here's a solution: AT&T makes a "line-status indicator" ($16.95), which you insert between the phone line and the instrument. It's a simple circuit with an LED that flashes when someone's on another extension. Installation takes just five minutes.□ **—Jim Russell**

IN HUMAN SERVICES

In Salem, Oregon, the Oregon Child and Youth Service Network is meeting. This alliance of 14 organizations is dedicated to the treatment of emotionally disturbed children, youth, and families around the state. With offices separated by hundreds of miles and three mountain ranges, these agencies used to have trouble sharing information and preparing for their quarterly meetings.

Explains Vic Savicki, director of the Clinical Child and Youth Work Program at Western Oregon State College, "Small, community-based, nonprofit agencies outside major population centers were often poorly informed about critical issues or completely left out of time-critical decisions." When agency representatives finally reached a decision, they sometimes had to base it on incomplete information.

Not any more. With equipment donated by the Apple Corporate Grants Community Affairs Program, Network agencies all have equal access on line to timely information. "As the electronic networking skills of members evolved," Savicki reports, "we

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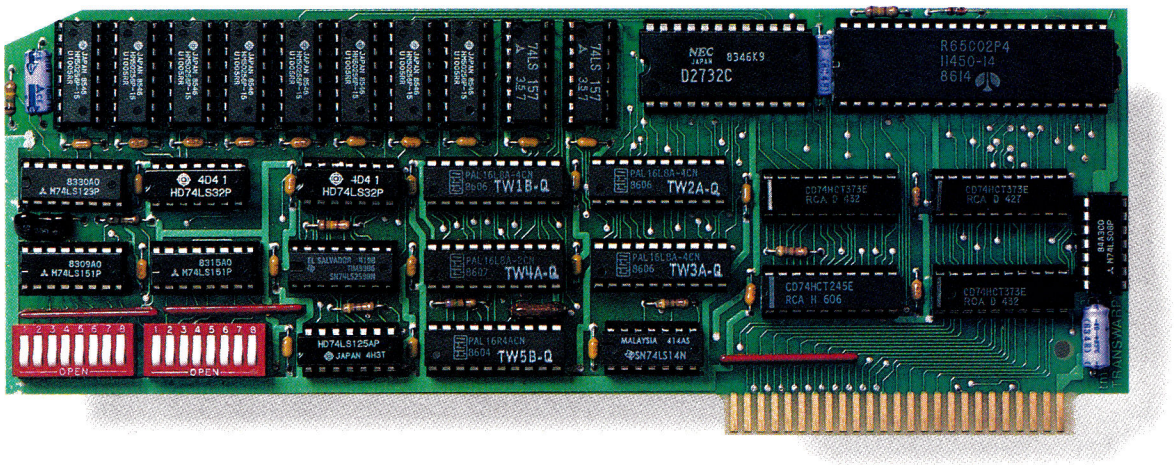

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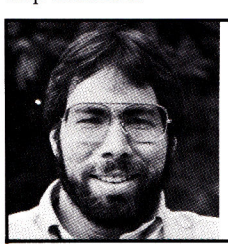

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Steve Wozniak, the creator of Apple Computer

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used telecommunications for passing information, stating opinions, debating issues, planning meetings and conferences, checking factual bases of rumors, and gathering database information relevant to the needs of the network as a whole."

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Like other groups connected on line, the Oregon Child and Youth Service Network has discovered that sharing information electronically does a great deal more than improve face-to-face meetings. The Network saves money through group purchases, for example, and quickly gathered timely information for a state legislative committee, resulting in improved treatment for clients. Many group processes—especially those involving text, such as newsletters and planning projects—are accomplished more effectively with the help of on-line connections.

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continued

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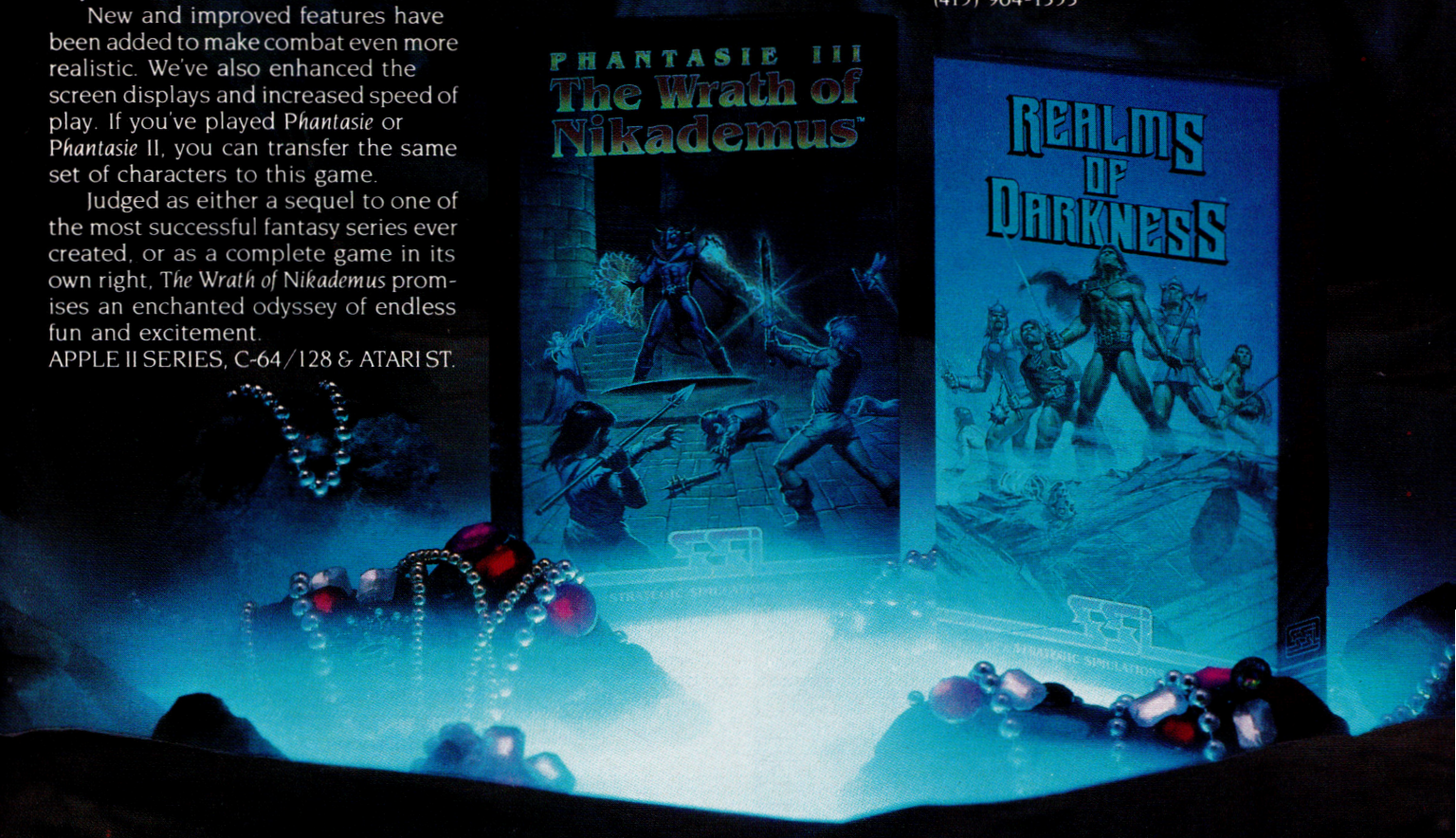

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__ communications software/hardware
__ computer-assisted conferences
__ education
__ electronic mail
__ financial information
__ games
__ information (public databases)
__ information systems (CompuServe, GEnie, The Source, Delphi, and others)
__ meeting people
__ personal development
__ professional development
__ public-domain programs
__ shopping on line
__ special interests (please name them:_____)

__ travel (and other leisure activities)

__ other (please specify:_____)

2. What kinds of on-line services have you used already? What kinds do you plan to use in the next three months?

have used		plan to use
___	databases	___
___	education	___
___	electronic mail	___
___	financial services	___
___	games	___
___	information services	___
(Which?_____)		
___	local bulletin boards	___
___	real-time conferences	___
___	asynchronous conferences	___
___	travel planning	___
Other:_____		

3. What kind of hardware/software do you own or expect to buy in the next three months?

own		expect to buy
___	Apple II Plus	___
___	Apple IIe	___
___	Apple IIGS	___
___	Apple IIc	___
___	internal modem	___
(brand:_____)		
___	external modem	___
(brand:_____)		
___	communications software	___
(brand:_____)		

KEEPING IN TOUCH

In Kansas City, Missouri, Sandy Brockmann is writing a letter of welcome. Past President of the local Apple Bits Users Group (ABUG), Sandy is sysop (system operator) of the group's electronic bulletin board. Every day, some 60 Apple owners call the board to discuss topics of current interest, to solve technical problems, and to exchange public-domain programs and private mail messages.

If you call (816-523-0304), you might join a conversation about abortion or the end of the world, get information about configuring your printer, or download a shareware telecommunications program. You might check out the equipment wanted and for sale, catch up on special vendor offers to club members or browse through Gallimaufrey, a hodgepodge of Apple news items Sandy has posted.

If you become a regular visitor, you may receive a letter from Sandy, who takes special pleasure in the friendly atmosphere the board's users create. People who move out of the area sometimes call from long distances to find out what's happening. "Some people read public discussions for a long time before they get up nerve enough to respond," she says. "I try to make them feel at home. You might be sending messages to the president of a major corporation, but that person's just like anyone else who's never been on line before." Sandy enjoys meeting people on line, where many social barriers disappear.

WORLDWIDE NETWORKING

In Berlin, Germany, Pan American pilots check on line for news about the financially troubled company. In all seven cities where Pan Am pilots are based—including Miami, San Francisco, New York, Los Angeles, Philadelphia, and Providence—computers are available to get timely information from a series of on-line conferences. Another 200 Pan Am members of the Airline Pilots Association (ALPA) connect to these conferences with computers at home.

John Mitvalsky, connected with his new Apple IIGS, explains that the Pan Am pilots wanted an on-line system that could provide information no matter where they are. "It's important for us," he says, "to avoid rumors, to en-

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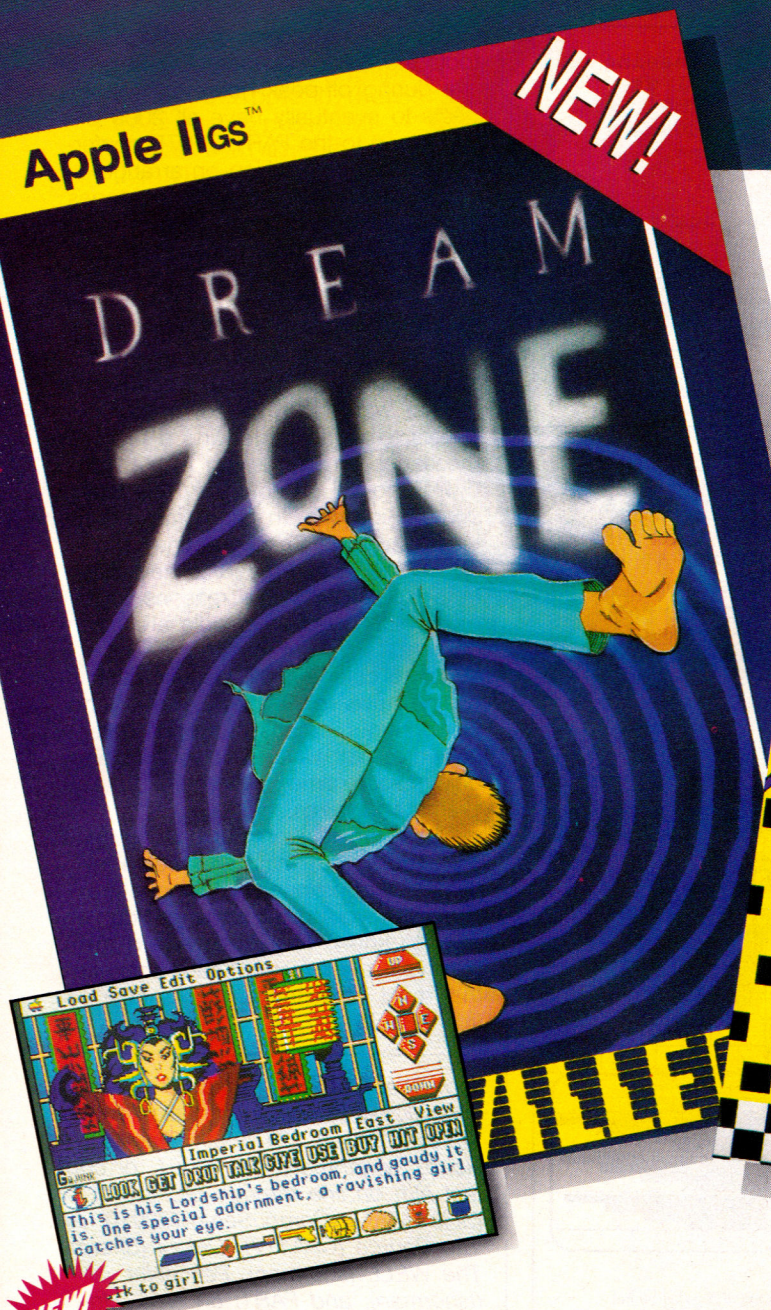



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4. Anything else we should know? What's your most pressing question? If you've been on line already, please tell us about any bulletin boards, databases, or other on-line services you'd recommend to other inCider readers. Share with us an experience you've had on line -- important, funny, or provocative.

5. We'd like to be able to get in touch with you, but this is optional:

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The Pan Am pilots' organization foots the bill for its members to go on line during off-peak hours and expects to eventually have all 2000 pilots joined to the PARTICIPATE conferences. They're working on arrangements to send urgent Telex messages through NWI to pilots on layover at hotels worldwide, should any crisis demand immediate response.

SHARING WITH OTHERS

In Swarthmore, Pennsylvania, I'm starting this new column. Because *inCider* wants to respond to your interests, I began by leaving a few messages on line asking Apple II owners to tell us how they use telecommunications. In fact, I met Peggy, Vic, John, and Sandy on line, and they generously agreed to help illustrate just a few of the reasons why more than 2 million people are now on line.

Future columns will discuss other on-line news for Apple II owners—not just communications hardware and software, but ways to solve problems, enjoy leisure time, and share programs and ideas.

One thing telecommunications can't do is read your mind—so we've included a questionnaire to make it easier for you to tell us what you want to know. There's a reward for mailing it back to us: future columns that meet your needs. Let us hear from you.■

Tom Sherman is a free-lance journalist specializing in computer-related topics. Write to him at 224 South Chester Road, Swarthmore, PA 19081, or contact him on line through GEnie (SHERMAN), CompuServe (72010,12), The Source (CPA177), Delphi (Sherm), The WELL (sherman), PeaceNet (tsherman), and PARTI on NWI, Unison, and The Source (Tom Sherman).

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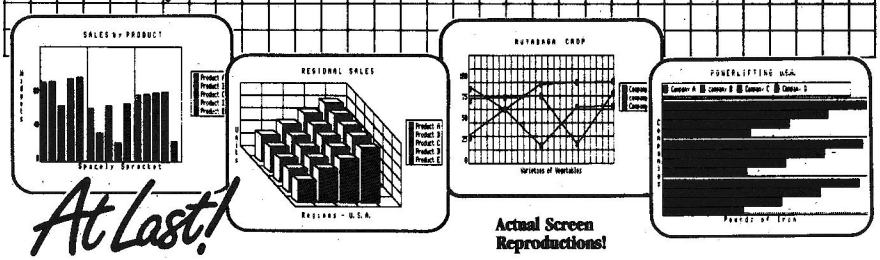

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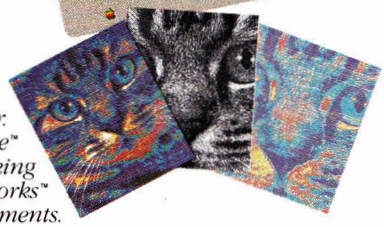

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Apple users know that there's always an easier way to get the job done. A shortcut here, an elegant twist there. That's what Hints/Techniques is all about. It's an information swap for readers who want to share their programming pointers, DOS tips, hardware secrets, AppleWorks applications, WPL enhancements, and all those other insights that make you go "Aha!" in the night.

RAM-Disk Exec File

by Brian L. Zimmerman

Why not combine the advantages of an "exec" file with the speed and convenience of the ProDOS RAM disk to create a command file that can run "in the background"?

For example, suppose you want to avoid typing in pathnames and commands (UNLOCK, RENAME, SAVE, LOCK, and so on) every time you update a BASIC program and save a backup copy. You can "batch" such commands and put them into an exec program file (a text-type file, sometimes also called a batch file) on the RAM disk ProDOS sets up automatically in memory. This lets you execute commands from the RAM disk (instead of a physical disk drive) while you have a BASIC program in RAM at the same time.

Listing 1 demonstrates this setup. Type in the program, save it as BACKUP, then run it to install your BASIC program in memory and an exec file, named Save, on the RAM disk. Whenever you want to save the current version of your BASIC program, type EXEC SAVE to lock the file on disk. The program automatically renames the old file on disk (now your backup copy), adds a period, and locks the file. Whenever you enter EXEC SAVE, you repeat the process and delete the former backup copy.

To update a different BASIC program file, type RUN BACKUP to load the file and create a new SAVE-command exec file. Just type the filename or pathname once, regardless of the number of times you need to save any changes you make in the program.

Listing 1. Backup.

```
100 D$ =  CHR$ (4):R$ =  CHR$ (13): PRINT D$;"SAVE/RAM/BACKUP"
110  PRINT D$;"PR#3": PRINT  CHR$ (17): VTAB 4: INPUT
     "UPDATE PROGRAM NAMED: ";F$
120  VTAB 10: PRINT "Where is your program file?"
130  VTAB 18: PRINT "(Press a Number or Return to Accept)"
140  VTAB 13: HTAB 9: PRINT " SLOT # 6" CHR$ (8);: GET S$:
     PRINT S$: IF S$ = R$ THEN S$ = "6"
150  VTAB 15: HTAB 9: PRINT "DRIVE # 1"; CHR$ (8);: GET DR$:
     PRINT DR$: IF DR$ = R$ THEN DR$ = "1"
160 SD$ = "S" + S$ + ",D" + DR$: ONERR  GOTO 180
170  PRINT D$;"LOCK";F$;",";SD$: GOTO 190
180  POKE 216,0: VTAB 18: PRINT "CAN'T FIND THAT FILE! -
     PRESS RETURN";: GET K$: GOTO 110
190  ONERR  GOTO 210
200  PRINT D$;"LOCK";F$;".,";SD$: POKE 216,0: GOTO 230
210  VTAB 14: PRINT "CREATING DUMMY BACKUP FILE ON ";SD$
220  POKE 216,0: PRINT D$;"CREATE ";F$;".,TBAS,";SD$
230  HOME : VTAB 10: PRINT "CREATING COMMAND FILE ON RAM DISK..."
240  FOR I = 1 TO 1000: NEXT I: PRINT D$;"PREFIX/RAM"
250  PRINT D$;"OPEN SAVE": PRINT D$;"CLOSE SAVE"
260  PRINT D$;"DELETE SAVE": PRINT D$;"OPEN SAVE"
270  PRINT D$;"WRITE SAVE": PRINT "PREFIX,";SD$
280  PRINT "UNLOCK ";F$;".": PRINT "DELETE ";F$;"."
290  PRINT "UNLOCK"";F$: PRINT "RENAME";F$",";F$;"."
300  PRINT "LOCK ";F$;".": PRINT "SAVE";F$
310  PRINT "LOCK ";F$: PRINT "PREFIX /RAM"
320  PRINT "PRINT"; CHR$ (34);"FILE SAVED AS '";F$;
     "' ON ";SD$; CHR$ (34)
330  PRINT D$;"CLOSE SAVE": HOME : VTAB 5
340  PRINT "BASIC PROGRAM, ";F$;",": PRINT
350  PRINT "IS IN MEMORY & AWAITING UPDATE!": VTAB 12
360  PRINT "Use EXEC SAVE to save with backup copy.": VTAB 14
370  PRINT "Backup filename ends with a period.": VTAB 16
380  PRINT "RUN BACKUP to update different programs."
390  PRINT  CHR$ (21): VTAB 23: PRINT D$;"LOAD ";F$;",";SD$: END
```

USING YOUR RAM DISK

Backup is quick and easy to run. At startup, it lets you specify a filename (or pathname) and the slot/drive location of your BASIC program file. Before loading your program, it saves a copy of itself to the RAM disk; after loading your program, it leaves the ProDOS prefix set to /RAM. As a result, whenever you want to work on a different BASIC program, type RUN BACKUP to load it and run it, even after changing disks.

Type CAT to verify that the files Backup and Save are on volume /RAM. To catalog a disk in drive 1 without resetting the prefix, type CAT,S6 or CAT,S6,D1. To clear the prefix, type PREFIX/ or PREFIX/,S6,D1.

You can also save updated versions of your program to a second disk in the same slot/drive you specified earlier: Type EXEC SAVE again. Make sure the second disk already contains a copy and a backup under the same partial pathname. If there's no backup, run **Listing 1** on disk to create one. It first creates a dummy backup file to prevent Save from crashing when it tries to delete a nonexistent file.

LOCKING UP

Keep in mind that the EXEC SAVE command automatically unlocks the file you named using the Backup program without sending a "file locked" warning. Loading a different program without running Backup first to specify a new filename, then saving the file with the old EXEC SAVE command still in RAM, may overwrite the previous program file. Avoid this by keeping the prefix set to /RAM and



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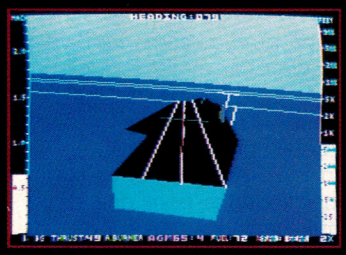

1985 - High-performance Jet flight simulator for the IBM, Commodore 64, and Apple II computers



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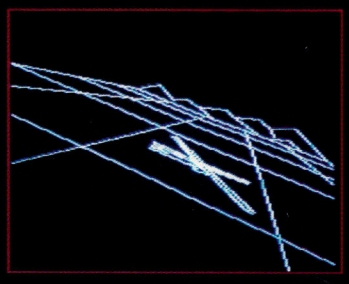

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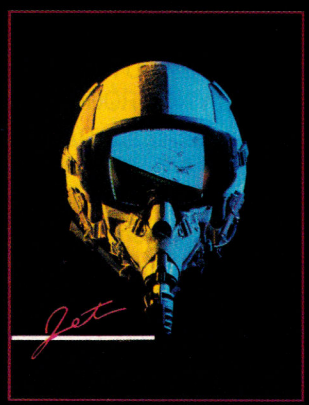



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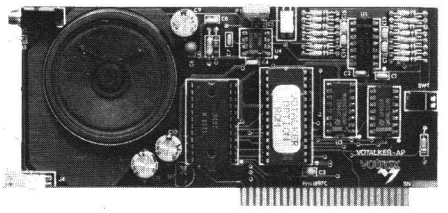

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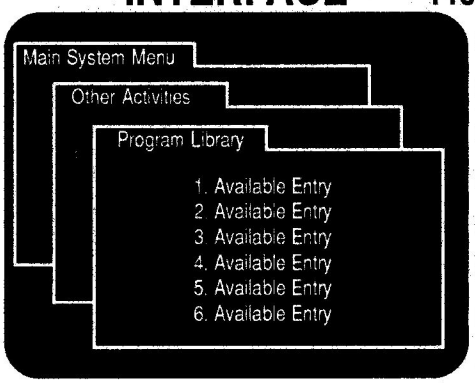

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typing RUN BACKUP to load a new program file.

While this program creates its own special exec file, you might find other applications or modifications to suit your needs. For example, you could program a copy-command exec file that runs on the RAM disk to copy a group of specified files from one drive to another by loading and saving each one.

Or, use a word processor to create exec files directly by listing BASIC or ProDOS commands in a text file. You can name the file Startup; it might use LOAD and SAVE commands or BLOAD and BSAVE to load various program files automatically to your RAM disk at startup.

The advantage of using a BASIC program to create your exec file is that BASIC, unlike a traditional exec file, allows keyboard input to define such variables as filenames and disk drives.■

Write to Brian L. Zimmerman at 108 South Shields Road, Columbia, SC 29223.

Tips on File Transfer

by David S. Parke

Make uploading easy on yourself: To upload an Applesoft program via modem, just add one line to convert it a text file. At line 0, enter the following:

```
0 PRINT CHR$(4);"OPEN textfilename":
  PRINT CHR$(4);"WRITE textfilename";:
  1,xxx:PRINT CHR$(4),"CLOSE textfile-
  name" :END
```

Rename "textfilename" with a maximum of eight characters, the first of which must be a letter; substitute your program's last line number for "xxx."

When running the program, only the first line will execute, saving the entire program (except line 0) as text. Using ASCII, you can now upload this file to phone lines; follow the documentation for your particular communications program.

Downloading files is even easier. At the DATABASE prompt, type the filename and its extension (.TXT, .BAS, .BIN, .DOC,) which instructs your communications software to capture the file as a text file (an ASCII file).

Return a .BAS program to Applesoft format first. Exec the filename and save it as you would any BASIC

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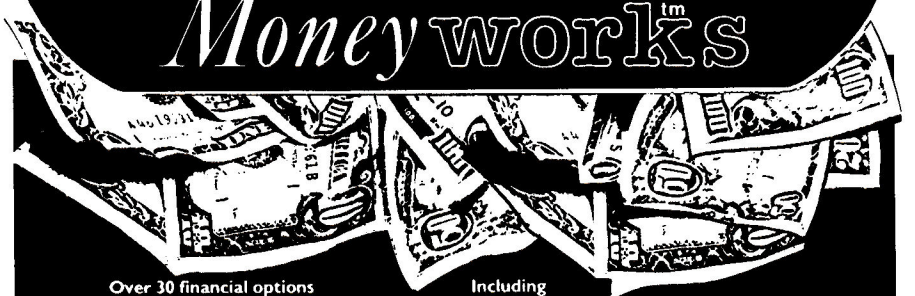

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program. A binary (.BIN) file is stored differently. Download it as a text file, then make it binary with a conversion program.■

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Applesoft Recovery

by James L. Liles

While the routine Unnew (Hints/Techniques, September 1987, p. 144) can list a file, it can't retrieve an Applesoft program. Since Applesoft's end-of-program and variable-table pointers aren't set, any variable is stored on top of the program; any attempt to edit the program crashes Applesoft. You must then press Control-Open apple-Reset to reboot.

The accompanying machine-language routine (see **Listing 2**) may bring back your Applesoft program. If

Listing 2. Recovery.

```
*0300.0800
0300- D8 A5 67 85 FD A5 68 85
0308- FE A0 04 B1 FD F0 19 C8
0310- D0 F9 A2 00 A0 00 98 91
0318- 67 C8 91 67 BD 75 03 F0
0320- 06 20 ED FD E8 D0 F5 60
0328- A5 FD 85 FB A5 FE 85 FC
0330- 38 98 65 FD 85 FD A5 FE
0338- 69 00 85 FE A0 00 A5 FD
0340- 91 FB C8 A5 FE 91 FB B1
0348- FD 88 11 FD D0 BB 18 A5
0350- FD 69 02 85 69 85 6B 85
0358- 6D 85 AF A5 FE 69 00 85
0360- 6A 85 6C 85 6E 85 B0 A2
0368- 00 BD AA 03 F0 06 20 ED
0370- FD E8 D0 F5 60 87 D4 E8
0378- E9 F3 A0 F0 F2 EF E7 F2
0380- E1 ED A0 E3 E1 EE EE EF
0388- F4 A0 E2 E5 A0 F2 E5 E3
0390- EF F6 E5 F2 E5 E4 A0 E2
0398- F9 A0 F4 E8 E9 F3 A0 F0
03A0- F2 EF E7 F2 E1 ED AE 87
03A8- 8D 00 87 D4 E8 E5 A0 F0
03B0- F2 EF E7 F2 E1 ED A0 E8
03B8- E1 F3 A0 E2 E5 E5 EE A0
03C0- F2 E5 E3 EF F6 E5 F2 E5
03C8- E4 A1 87 8D 00 38 00 39
03D0- 4C 00 BE 4C 00 BE 4C FD
03D8- AA 4C B5 B7 AD 0F 9D AC
03E0- 0E 9D 60 AD C2 AA AC C1
03E8- AA 60 4C 51 A8 EA EA 4C
03F0- 59 FA 00 BE 1B 4C 03 BE
03F8- 4C 00 BE 4C 59 FF EB BF
0400- B0 B3 B4 B8 AD A0 C6 C4
0408- A0 B6 B9 A0 B0 B2 A0 B8
0410- B5 A0 C6 C5 A0 B6 B9 A0
0418- C2 B0 A0 C1 B2 A0 A0 A0
0420- A0 A0 A0 A0 A0 A0 A0 A0
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0440- B0 B0 A0 B3 B9 A0 A0 A0
0448- A0 A0 A0 A0 A0 A0 A0 A0
0450- B0 B4 B1 B8 AD A0 C3 B2
0458- A0 C1 B0 A0 C1 B0 A0 C1
0460- B0 A0 C1 C4 A0 C1 B0 A0
0468- C1 B0 A0 C3 B5 A0 A0 A0
0470- A0 A0 A0 A0 A0 A0 A0 A0
0478- A0 A0 A0 00 A0 A0 C0 A0
0480- B0 B3 C4 B0 AD A0 B4 C3
0488- A0 B4 C3 A0 C2 B5 A0 C2
0490- C4 A0 C3 B2 A0 C1 C1 A0
0498- C5 C1 A0 B4 C3 A0 A0 A0
04A0- A0 A0 A0 A0 A0 A0 A0 A0
04A8- B0 B4 B3 B8 AD A0 C3 B6
04B0- A0 C2 B0 A0 C1 B0 A0 C2
04B8- B0 A0 C1 B0 A0 C1 B0 A0
04C0- C3 B3 A0 C2 B2 A0 A0 A0
04C8- A0 A0 A0 A0 A0 A0 A0 A0
04D0- B0 B4 C1 B0 AD A0 C1 B0
04D8- A0 C2 B4 A0 C2 B3 A0 C2
04E0- B0 A0 C3 B1 A0 C2 B0 A0
04E8- C2 B0 A0 C1 B0 A0 A0 A0
04F0- A0 A0 A0 A0 A0 A0 A0 A0
04F8- 04 7F A0 FF A0 A0 00 A0
0500- B0 B4 B5 B8 AD A0 C1 B0
0508- A0 C1 B0 A0 C3 B1 A0 C3
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0528- B0 B4 C3 B0 AD A0 C3 B3
0530- A0 C1 B0 A0 C1 B0 A0 C1
0538- B0 A0 C1 C4 A0 C1 B0 A0
0540- C1 B0 A0 C3 B2 A0 A0 A0
0548- A0 A0 A0 A0 A0 A0 A0 A0
0550- B0 B5 B2 B8 AD A0 C2 B0
0558- A0 C3 B1 A0 C2 B0 A0 C1
0560- B4 A0 C1 B0 A0 C3 B1 A0
0568- C1 B0 A0 C1 B0 A0 A0 A0
0570- A0 A0 A0 A0 A0 A0 A0 A0
0578- FF 28 A0 01 A0 A0 A0 A0
0580- B0 B4 C5 B0 AD A0 C2 B0
0588- A0 C2 B0 A0 C1 B0 A0 C3
0590- B0 A0 C1 B0 A0 C1 B0 A0
0598- B0 B0 A0 C1 B0 A0 A0 A0
05A0- A0 A0 A0 A0 A0 A0 A0 A0
05A8- B0 B5 B4 B8 AD A0 C1 B0
05B0- A0 C2 B5 A0 C2 B2 A0 C2
05B8- B0 A0 C3 B2 A0 C2 B0 A0
05C0- C2 B1 A0 C1 B0 A0 A0 A0
05C8- A0 A0 A0 A0 A0 A0 A0 A0
05D0- B0 B5 C2 B0 AD A0 C1 B0
05D8- A0 C1 B0 A0 C3 B3 A0 C2
05E0- B1 A0 C2 B0 A0 C1 B0 A0
05E8- C1 B0 A0 C1 B0 A0 A0 A0
05F0- A0 A0 A0 A0 A0 A0 A0 A0
05F8- 60 A0 A0 17 A0 A0 A0 A0
0600- B0 B5 B6 B8 AD A0 C3 B1
0608- A0 C1 B0 A0 C1 B0 A0 C1
0610- B1 A0 C1 B0 A0 C1 B0 A0
0618- C3 B2 A0 C2 B0 A0 A0 A0
0620- A0 A0 A0 A0 A0 A0 A0 A0
0628- B0 B5 C4 B0 AD A0 C2 B0
0630- A0 C3 B1 A0 C2 B0 A0 C1
0638- B0 A0 C1 B0 A0 C3 B1 A0
0640- C1 B0 A0 C1 B0 A0 A0 A0
0648- A0 A0 A0 A0 A0 A0 A0 A0
0650- B0 B6 B3 B8 AD A0 C2 B0
0658- A0 C2 B0 A0 C1 B0 A0 C3
0660- B0 A0 C1 B0 A0 C1 B0 A0
0668- C3 B2 A0 C2 B0 A0 A0 A0
0670- A0 A0 A0 A0 A0 A0 A0 A0
0678- FF 00 00 A0 FF FF 00 00
0680- B0 B5 C6 B0 AD A0 C1 B0
0688- A0 C1 B0 A0 C1 B0 A0 B1
0690- B8 A0 C1 C4 A0 C1 B0 A0
0698- C1 B0 A0 C3 B1 A0 A0 A0
06A0- A0 A0 A0 A0 A0 A0 A0 A0
06A8- B0 B6 B5 B8 AD A0 C1 B0
06B0- A0 C1 B0 A0 C3 B1 A0 C2
06B8- B2 A0 C2 B0 A0 C1 B0 A0
06C0- C1 B0 A0 C1 B0 A0 A0 A0
06C8- A0 A0 A0 A0 A0 A0 A0 A0
06D0- B0 B6 C3 B0 AD A0 C3 B1
06D8- A0 C1 B0 A0 C1 B0 A0 C1
06E0- B0 A0 C1 C4 A0 C1 B0 A0
06E8- C1 B0 A0 C3 B1 A0 A0 A0
06F0- A0 A0 A0 A0 A0 A0 A0 A0
06F8- 00 89 00 00 FF FF 00 00
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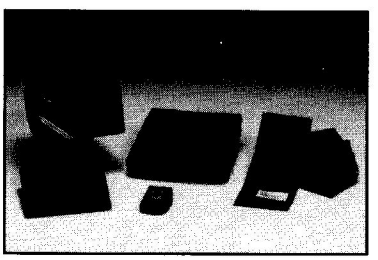
Listing continued.



IT ISN'T OVER 'TIL IT'S COVERED

Your computer has become an integral part of your lifestyle, therefore appropriate steps should be taken towards its care and maintenance. When you decide to treat your computer to the finest dust covers money can buy. **COMPUTER COVER COMPANY** can deliver. We design and fit an individual cover for each component in your computer system. Our commitment to quality, superior workmanship and customer satisfaction is evident throughout our entire line of products.

Have you ever tried vinyl, naugahyde or cloth dust covers? If you have, then you can appreciate why our covers are constructed from *400 Denier Rip Stop Nylon*. Our covers are water and static resistant, they **will not tear, crack or create lint problems.**

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Set #		Base Price*
200	Monitor, CPU/Keyboard, Mouse	**$20.95***
210	Monitor, CPU/Keyboard, Mouse, External Drive	**$23.95***
220	Monitor, CPU/Keyboard, Mouse, Printer	**$29.95***
230	Monitor, CPU/Keyboard, Mouse, Printer, External Drive	**$31.95***

II GS Cover Sets

Set #		Base Price*
300	Monitor/CPU, Keyboard, Mouse	**$29.95***
310	Monitor/CPU, Keyboard, Mouse, External Drive	**$31.95***
320	Monitor/CPU, Keyboard, Mouse, Printer	**$37.95***
330	Monitor/CPU, Keyboard, Mouse, Printer, External Drive	**$39.95***

Macintosh and IIe Cover Sets Available.

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	Box of Six	5 or less
Black	**$21.95/$3.66 ea.**	**$4.50 ea.**
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Keyboard: ☐ IIc CPU/keyboard [NAC] $ NAC

APPLE II GS SET # _____ **BASE PRICE** $ _____

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☐ Unidisk 3.5 [NAC] ☐ IIe Disk II [NAC] ☐ IIc 5.25" [NAC] $ _____

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☐ Stacked UNI 5.25 (add $2.00) ☐ Stacked UNI 3.5 atop UNI 5.25 (add $2.00) $ _____

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Listing continued.

```
0700- B0 B6 B7 B8 AD A0 C6 C6
0708- A0 C2 B5 A0 C3 B6 A0 C2
0710- B0 A0 C3 B1 A0 C2 B0 A0
0718- C2 B0 A0 C1 B0 A0 A0 A0
0720- A0 A0 A0 A0 A0 A0 A0 A0
0728- B0 B6 C5 B0 AD A0 C2 B0
0730- A0 C2 B0 A0 C1 B0 A0 C3
0738- B0 A0 C1 B0 A0 C1 B0 A0
0740- B0 B0 A0 B0 B0 A0 A0 A0
0748- A0 A0 A0 A0 A0 A0 A0 A0
0750- B0 B7 B4 B8 AD A0 C1 B0
0758- A0 C2 B7 A0 C2 B4 A0 C2
0760- B0 A0 C3 B2 A0 C2 B4 A0
0768- C2 B4 A0 C1 B0 A0 A0 A0
0770- A0 A0 A0 A0 A0 A0 A0 A0
0778- FF 89 00 D0 FF FF 00 00
0780- B0 B7 B0 B0 AD A0 C2 B0
0788- A0 C3 B2 A0 C2 B5 A0 C1
0790- B1 A0 C1 B0 A0 C3 B2 A0
0798- C1 B0 A0 C1 B0 A0 A0 A0
07A0- A0 A0 A0 A0 A0 A0 A0 A0
07A8- B0 B7 B6 B8 AD A0 C3 B2
07B0- A0 C1 B0 A0 C1 B0 A0 C1
07B8- B0 A0 C6 C6 A0 C6 C6 A0
07C0- C3 B2 A0 C2 B0 A0 A0 A0
07C8- A0 A0 A0 A0 A0 A0 A0 A0
07D0- B0 B7 C4 B0 AD A0 C2 B0
07D8- A0 A0 B0 A0 C2 B0 A0 C1
07E0- A0 A0 A0 A0 A0 A0 B0 A0
07E8- A0 A0 A0 A0 A0 A0 A0 A0
07F0- A0 A0 A0 A0 A0 A0 A0 A0
07F8- C3 09 00 07 FF FF 00 00
0800- 00
```

End of listing.

you typed DEL to erase it, if you changed the start-of-program pointer since erasing it, or if you've loaded another program or defined some variables, some or all of your restored program will be "garbage" lines you'll have to delete. The only time Recovery fails entirely is when it encounters a line longer than 256 bytes; you'll see an error message in that case.

Recovery runs at location 768 ($300), but you can move it elsewhere; just be sure you edit the references to the messages in lines 37 and 80 accordingly.■

Write to James L. Liles at P.O. Box 59, Candor, NC 27229-0059.

Got a hint of your own? inCider *would like to see it. If we can use it in Hints/Techniques, we'll buy it from you. Send your tip to* inCider, *Elm Street, Peterborough, NH 03458.*

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Numeric Keypad (//e, //+) $89
//c System Clock (external) $48
Sider 10 Meg (//e, GS) $450
Sider 20 Meg (//e, GS) $565
B Sider 20 Meg Tape B/U $550
Quark 10 Meg Hard Drive $879
Meiji 5.25 ½ Height Drive $75
//c or GS Adapter Cable $15
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NEW PRODUCTS

edited by Pat O'Dell

Hardware

NO MORE STRETCHING

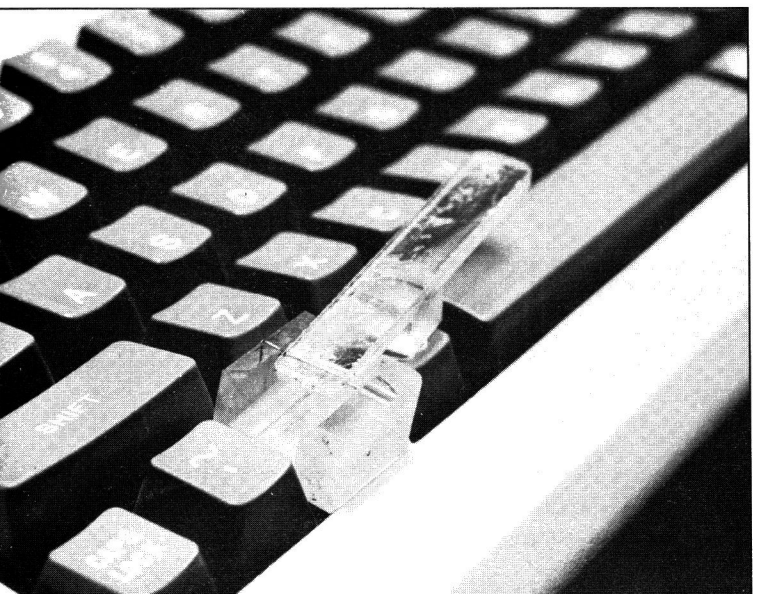
Inventor Hartt Porteous is offering **touch typists** a solution to a small but troublesome problem. His Port Key Extender lets you hit the open-apple key or any other left-hand key without moving from the home position. It's designed for typists who are forced to slow down every time they have to lift their hands from the keyboard. The extender costs $5 and can be installed in about three minutes. You can order it directly from Hartt Porteous, 491 West Robinwood, Fresno, CA 93704. For more information, circle Reader Service number 359.

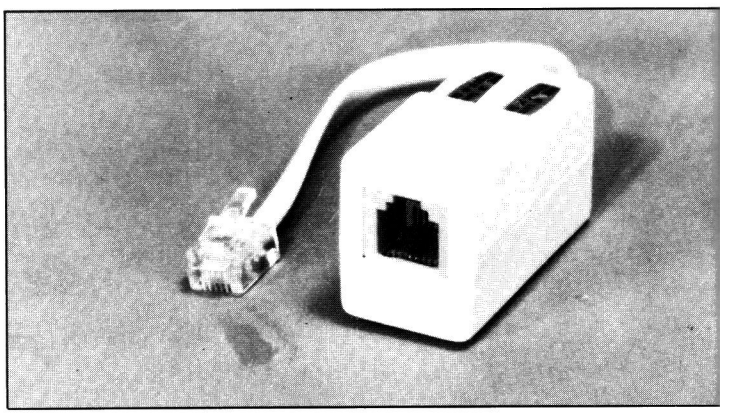
APPLE COMPUTING, IBM STYLE

If you've always secretly preferred **IBM-style keyboards**, you can now order one for your Apple from Martek Electronics. The keyboard comes with all the equipment necessary to plug it into your Apple II Plus or IIe keyboard connector. It offers one-keystroke command entry, programmable function keys, and a separate cursor keypad.

In addition, the company is offering full guarantees for a 15-day trial period. (Keyboards must be returned in original condition.) You can order the keyboard assembled or in kit form. The cost for the Apple II Plus keyboard is $50 for the kit and $70 assembled; the IIe keyboard is $60 for the kit and $80 assembled (add $6 for shipping and handling), from Martek Electronics, P.O. Box 24, Novi, MI 48050. For more information, circle Reader Service number 364.

The Port Key Extender for touch-typing computerists.





Data Spec's Data Interrupt Eliminator protects modems and telephones sharing the same phone lines.

MAKE MY DAY

Data Interrupt Eliminators from Data Spec prevent accidental **loss of data** when your modems and telephones share the same lines. The eliminator automatically disables any extension picked up while the line is in use; you'll need one eliminator for each telephone or modem on the line. They're available in four models, from $9.95 to $13.95. For more information, contact Data Spec, 20120 Plummer Street, Chatsworth, CA 91311, (818) 993-1202 or circle Reader Service number 360.

THIRST FOR MEMORY

Applied Ingenuity's GS Juice gives IIGS users **low-cost RAM**. These cards come in four versions: zero K, 256K, 512K, and 1 megabyte. For further information, contact the company at 248 North Orange Avenue, West Covina, CA 91790, (818) 337-8773, or circle Reader Service number 361.

SPEEDING HOME

If Santa delivered your Christmas computer without a printer, Okidata's new 180 model is one to consider. This **nine-pin printer** works at 180 characters per second in draft mode, is graphics-capable, and can print four-part forms. The Okimate 180 retails for $329. For more information, call (800) OKI-DATA or circle Reader Service number 362.

SPROUTING A COMPUTER

If you have limited space for your computer, the Computree gives you **extra room** for your monitor, CPU, printer, documentation, even a detached keyboard, which you can place on separate pivoting arms that pull out from the main trunk. Each table is vertically adjustable in 1-inch increments. The Computree is available from Computree Concepts, 1915 West Glenoaks Boulevard, Suite 200, Glendale, CA 91201, (818) 843-1860. For more information, circle Reader Service number 357.

TAKE A STAND

MicroStation is designed to help computer users regain space on their desktops. This **monitor stand** is made of heavy vinyl-coated steel tubing. It lets you raise detached monitors above your desk and use the area below for storing and using your keyboard. MicroStation is priced at $25.99. For more information, contact Suncom Inc., 260 Holbrook Drive, Wheeling, IL 60090, (312) 459-8000 or circle Reader Service number 358.

DATA PROTECTION MADE EASY

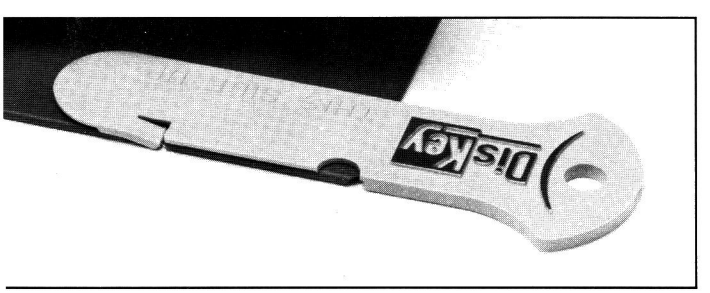
Teachers and parents who want to protect program disks while children use a computer now have an easy and inexpensive solution. DisKey, from Cro-Research, is an alternative to write-protect tabs when you need **temporary disk protection**. The key is designed to work with most 5¼-inch floppy disks; you can use it at any time after you've inserted a disk to prevent your child from writing to the disk. DisKey is available from Cro-Research, P.O. Box 129, Lyons, CO 80540, (303) 823-5088 for $1.69. For more information, circle Reader Service number 356.

Software

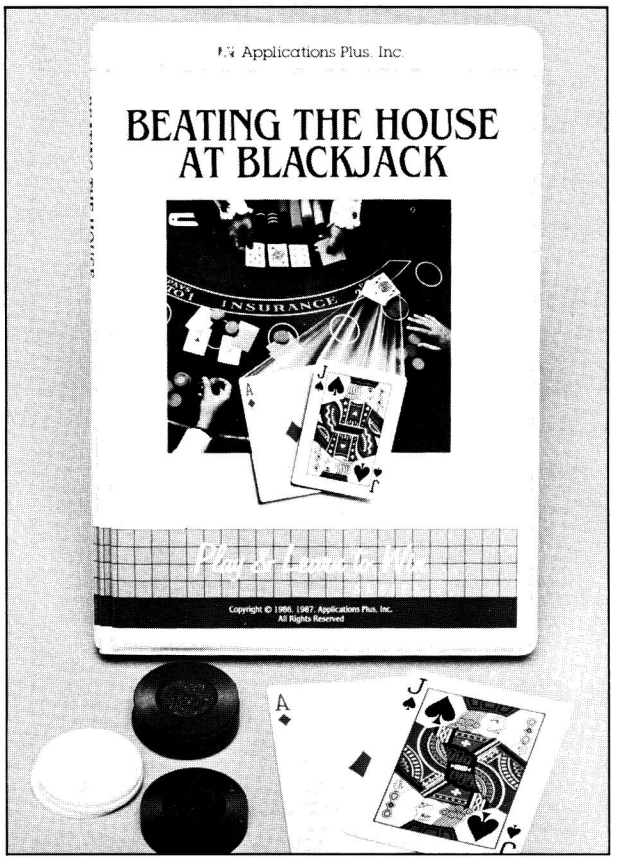
GROWING DATA

Plant Perfect is a **horticultural database** of almost 1100 species. This first volume contains listings of plants that grow well in the mild winter areas of California; databases covering other areas of the country are in the works, though, and you can customize Plant Perfect to include listings for your region.

Each record includes several fields, such as plant name, type, texture, size, season, uses, color, and any special notes you want to add. You can modify and add to information in the existing listings or the ones you've created. Plant Perfect sells for $65, plus $6.23 for tax, shipping, and handling, from Jasmine Software, 6506 Arizona Avenue, Suite 112, Los Angeles, CA 90045. Circle Reader Service number 366 for more information.



CroResearch's DisKey write-protects programs while your children use them.



Improve your chances at the casino with the help of Applications Plus' Play & Learn to Win series.

POKER FACE

Aspiring gamblers now have an opportunity to improve their skills. The Play & Learn to Win series from Applications Plus includes **Vegas Video Poker, Championship Poker, Strategic Craps**, and **Beating the House at Blackjack**.

These games are designed to help players win more frequently and at higher stakes. Beating the House at Blackjack, for example, teaches you how to count and memorize cards played in order to calculate who may have a greater chance of winning. Vegas Video Poker sells for $29.95 and Beating the House at Blackjack for $34.95. Prices for the other two titles were unavailable at press time. Applications Plus is located at 15720 Harmony Way, Apple Valley, MN 55124, (612) 432-5560. For more information, circle Reader Service number 354.

AUTOMATIC GRAPHICS

If you work with AppleWorks spreadsheets, Graphic Edge will let you use them to create **color charts and graphs**. Each time you edit your spreadsheet, Graphic Edge redraws the corresponding graph automatically. The program also supports The Print Shop and other graphics programs. Graphic Edge retails for $89, from Pinpoint Publishing, 5865 Doyle Street, Emeryville, CA 94608, (415) 654-3050. For more information, circle Reader Service number 355.

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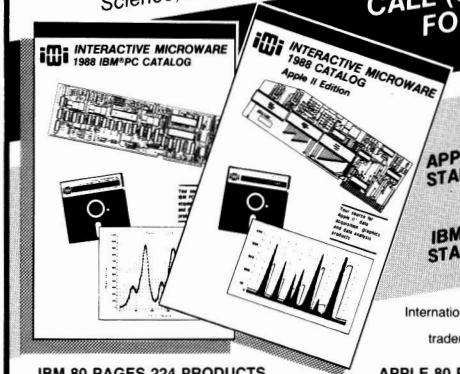

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NEW PRODUCTS

Product Updates

● Activision is now shipping noncopy-protected versions of four of its creativity/productivity packages for the GS: **Paintworks Plus**, **Writer's Choice Elite**, **Draw Plus**, and **The Music Maker**. Activision will contact registered software owners by mail to explain how to obtain the new editions. Unregistered owners can get the new versions by submitting proof of purchase, the product code number from the back cover of the manual, and a $10 check or money order (for each program) to Activision IIGS Upgrade, P.O. Box 7287, Mountain View, CA 94039.

● **Sensible Software** has moved to larger offices. You can contact the company at 335 East Big Beaver, Suite 207, Troy, MI 48083, (313) 528-1950.

● An enhanced version of **Silent Service** for the Apple IIGS has surfaced. The new version of the program incorporates the GS' sound and graphics for an even more realistic simulation. It requires at least 256K and can be played on a black-and-white, RGB, or composite color monitor. Contact Microprose for details at 120 Lakefront Drive, Hunt Valley, MD 21030, (303) 771-1151.

● Abracadata's **Design Your Own Home: Architecture** is available in two new versions. The GS edition, requiring a mouse and 512K, uses 640-by-200 super-hi-res mode to provide more vivid graphics. Version 2.0, for the IIe and IIc, sports a new user interface, including icons and pull-down menus. It requires a mouse, paddle, graphics pad, or joystick and 64K of memory. Updates from earlier versions are available from Abracadata at P.O. Box 2440, Eugene, OR 97402, (503) 342-3030.

● K–12 MicroMedia Publishing has announced upgrades for **Library Circulation Manager** and **Catalog Card and Label Writer**. Version 2.0 of Library Circulation Manager eliminates repetitive typing of due dates and allows batch entries; version 6.0 of Catalog Card and Label Writer can be installed on a hard disk and lets you view a card before printing it. For more information, contact the company at Six Arrow Road, Ramsey, NJ 07446, (201) 825-8888.

● Strategic Simulations' latest version of **President Elect: 1988** can include Lt. Colonel Oliver North as a Presidential candidate. The company has analyzed North's performance amd calculated his stance; get the scoop from Strategic Simulations at 1046 North Rengstorff Avenue, Mountain View, CA 94043, (415) 964-1353.

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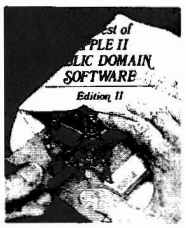

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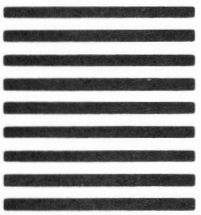

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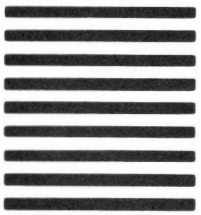

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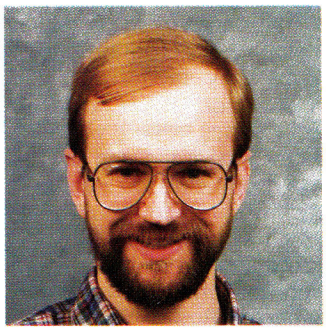

by Scott Mace

"I was missing the point. Infocom is the best storyteller in software today."

Once upon a time, in the city of Cambridge, Massachusetts, a software company called Infocom was born.

It wasn't like other software companies of its day. Infocom intended to make a name for itself telling stories. Its first adventure had the unlikely title of **Zork: The Underground Empire** (125 CambridgePark Drive, Cambridge, MA 02140, 617-492-6000, $39.95). Since then, Infocom has told lots of tales, but they all have one thing in common: To finish the story, you have to solve a fiendish puzzle first.

I've waited a long time for someone to come along who could spin better yarns. You see, unlike many computer gamers, I don't enjoy puzzle solving alone. I want to know how the story comes out!

In past columns (see "The State of Interactive Fiction, 1987," February 1987, p. 113) I've looked at other aspiring storytellers. And in other publications I've taken a few shots at Infocom for creating a series of similar games—all text, no graphics, not now, not ever—or so it seemed.

THE BEST STORYTELLER

I was missing the point. Infocom *is* the best storyteller in software today. The puzzles and traps are incidental. Sometimes they add to the plot, but they're always subservient to it. And some of the stories are getting pretty good.

Take **The Lurking Horror** ($39.95). Its author, Dave Lebling, boasts impressive credentials. He coauthored the original mainframe Zork, as well as Zork I and its sequels on the Apple II and other computers. Then he created **Enchanter** ($29.95), **Starcross** ($14.95), **Suspect** ($39.95), and **Spellbreaker** ($49.95) on his own.

Lebling studied at the Massachusetts Institute of Technology (MIT), and since his schools days has probably wanted to tell a story about what lurks inside the halls of an academic computing center. MIT computer people practically live in the labs, and The Lurking Horror is that story.

Here's the plot: A massive snowstorm traps you in the building; any attempt to leave would be extremely foolish—almost certain suicide. So there you are, with two rooms in which to work—the computing room with its terminals, printers, and souped-up machines, and a kitchen, complete with microwave and a refrigerator stocked with Coke and Chinese food.

You log onto your computer. A term paper on which you were working appears on your screen; its contents have been strangely altered, and you begin to suspect this is more than the usual ProDOS problem.

Suddenly, you faint. When you awaken, the scene has changed: "This is a place. Things move about on a broken, rocky surface. Harsh sounds split the air. Something sticky grabs at your feet. There is no color, everything is drained of brightness, dull, and lifeless. A path descends into a shallow bowl of black basalt. . . ."

There's more, but I won't give it away. By this time any reasonable person—especially a computer fanatic like me—is hooked. I want to know how the story ends.



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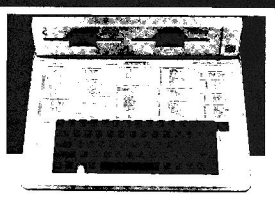

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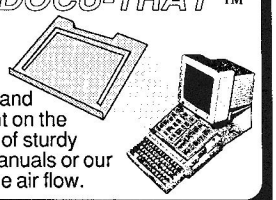

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MACE ON GAMES

A NEW GENERATION IS BORN

As good as Lebling is, he represents the old school at Infocom. Amy Briggs, the 25-year-old author of **Plundered Hearts** ($39.95), represents the new generation of Infocom storytellers. Briggs' background in British literature led her to write this 17th-century romantic story:

"A crash overhead! Pirates are boarding the Lafond Deux! The first mate hurries you into Captain Davis's cabin.

"'Good, you brought the girl,' Davis smirks. 'She'll keep the pirates busy. She was only a tool of Lafond's, anyway. Let me just find that cof—' A man on deck screams in agony and Davis starts. 'Let's go.' The captain thrusts you on the bed and walks out, locking the door.

"His laugh echoes. 'Best get comfortable, girl. You're like to be there for the rest of your life.'"

You find yourself locked in a small room on board a pirate's ship. You must figure out two things: how to escape and whether or not the safety of one pirate's protection is better or worse than that of the next. The element of trust/distrust is strong in this story, which adds to the intrigue of puzzle solving.

Plundered Hearts is an ambitious attempt to inject female protagonists into the genre, even if it starts with the kind of standard bodice-ripper storyline and package artwork that seem calculated to sell in supermarkets. Let's hope that kind of hit-us-over-the-head approach isn't needed as much in the future.

WHO ARE NORD AND BERT?

Perhaps inspired by other software companies' tampering with the basic form of interactive fiction, Infocom is experimenting itself. In Jeff O'Neill's **Nord and Bert Couldn't Make Head or Tail of It** ($39.95), Infocom introduces an alternative to traditional mapping, as well as a hint system.

That doesn't necessarily mean you'll get to the end of the story any faster. "Nord and Bert" is actually eight stories in one, with passwords at the end of seven of them. You'll need each one to complete the eighth story.

The strange plot has eight branches: Go to the Shopping Bizarre, Play Jacks, Buy the Farm, Eat Your Words, Act the Part, Visit the Manor of Speaking, Shake a Tower, and Meet the Mayor—quite differt from "go north and kill dragon."

This alternative to mapping is intriguing. At all times, a top menu bar shows you your location, and tells you where else you can go. Then, by typing those locations, you go there. Simple.

In fact, Nord and Bert is all about words. The story is laced with bad puns: When you look at a fanged man biting into boxes of breakfast food, he's described as a "cereal killer." Ouch. You'll also find homonyms and spoonerisms (words with sounds transposed, such as "lunching mobsters" who become "munching lobsters").

If you can live through the verbal zingers, you'll probably survive the game and read the end of the story. So give Infocom some credit: Reading stories has never been so much fun.■

Scott Mace is editor and publisher of Microcosm, *a monthly newsletter on computer games. Write to him at 6510 Copper Ridge Drive #T-1, Baltimore, MD 21209.*

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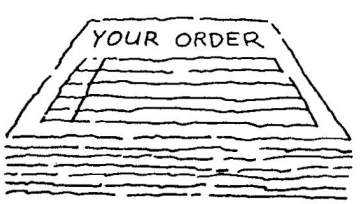

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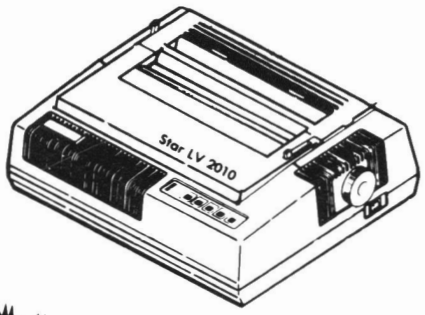

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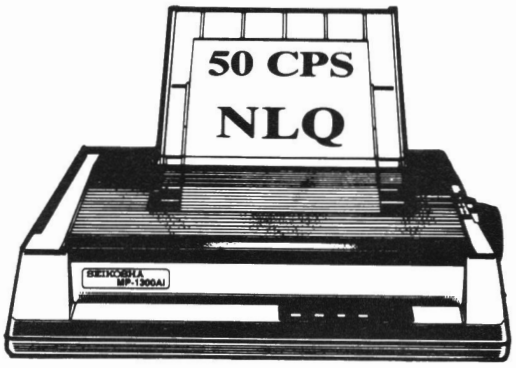

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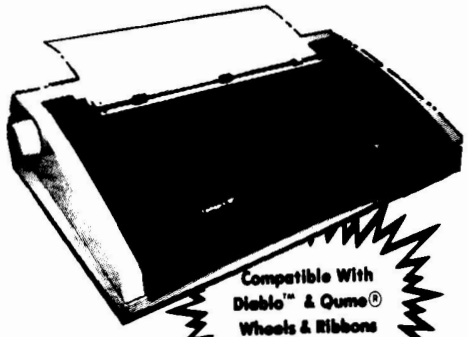

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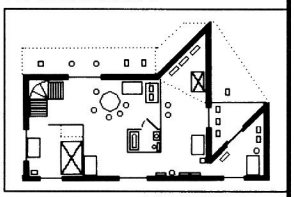

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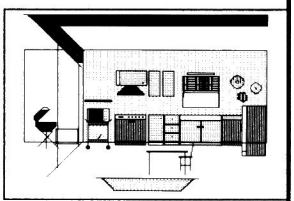

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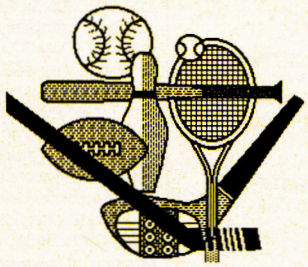

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inCider

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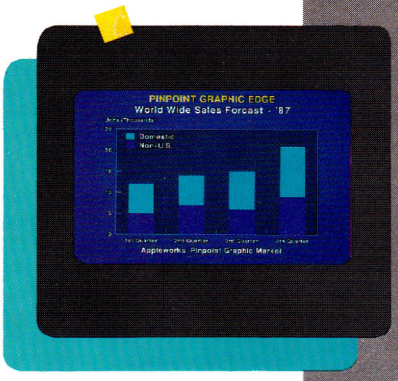
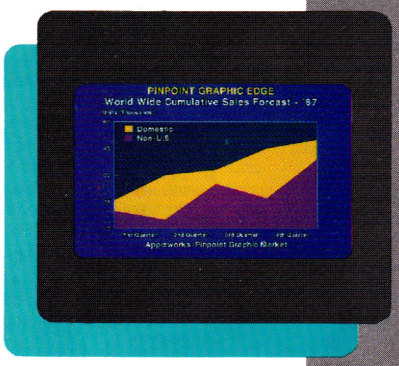




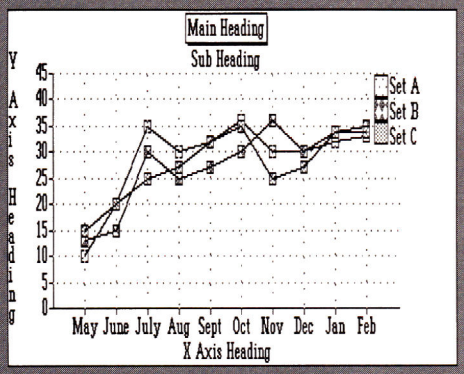
Turning the inherently dull rows and columns of numbers that fill any spreadsheet into something clear, understandable, and even impressive-looking may seem like an impossible task. But if you're crunching numbers with AppleWorks, **Graphic Edge** lets you turn the nuts and bolts of your spreadsheets into visual representations on screen—line, point, pie, bar, stacked-bar, area, and hi-lo graphs. Best of all, it's *easy*.

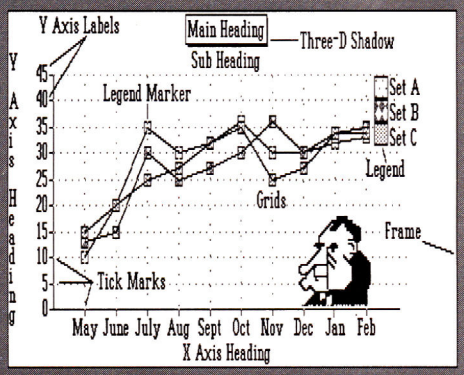
The Graphic Edge manual compares the creation of a chart to making a pepperoni pizza, and that's a pretty good analogy. Start by choosing the type of graph you want and entering your data. Once you've selected the parameters, choose Plot Graph from the command bar, and you've got an instant picture of your spreadsheet data.

Then customize: Add whatever toppings you like—headings, backgrounds, even clip art you've created yourself or imported from another ProDOS application such as Dazzle Draw or The Print Shop. You can also alter the increments on the X and Y axes and add grids. Change from color (patterns you've designed or predefined hues) to black-and-white; cut and paste; draw lines, boxes, and ovals—just as you would with a drawing program. If your graph doesn't look the way you thought it would—if you graphed the wrong information, say—just choose "worksheet" to go back and redo it.

Graphic Edge is noncopy-protected and works just like AppleWorks—even down to asking, "Are you sure?" when you want to do something that may be potentially damaging to your current file. If you've been using AppleWorks for your spreadsheets, the transition to Graphic Edge should be relatively painless. From the main-menu screen, you wouldn't know Graphic Edge from AppleWorks, except for the identifier; the familiar file folders and commands are all there.

Whether you're presenting your sales records to your boss or a proposal to an important client, or just want something a little spiffier than a row of numbers to outline your home finances, Graphic Edge comes to the rescue—for $89 from Pinpoint Publishing, 5865 Doyle Street, Suite 112, Emeryville, CA 94608, (415) 654-3050. If you want to put your numbers into pictures, this is the AppleWorks add-on for you. ■





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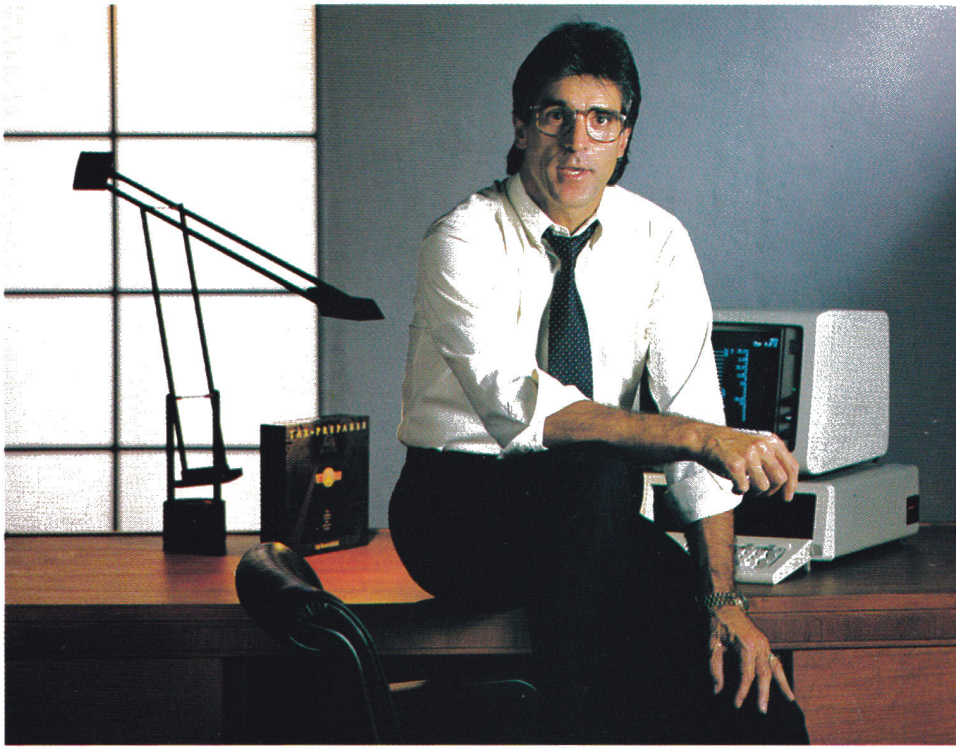

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