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Apple II / Macintosh
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January 1990

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p. 132

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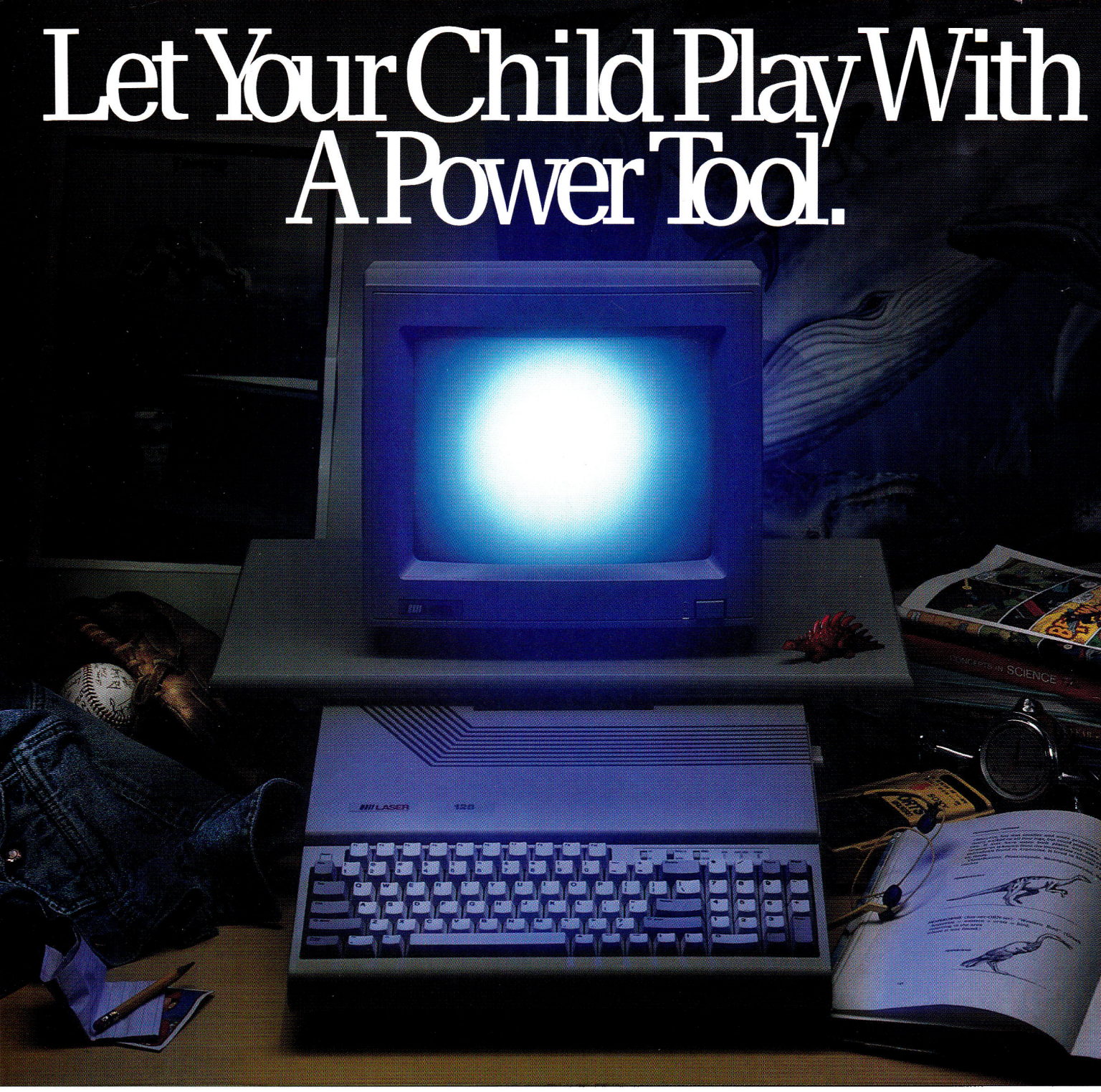

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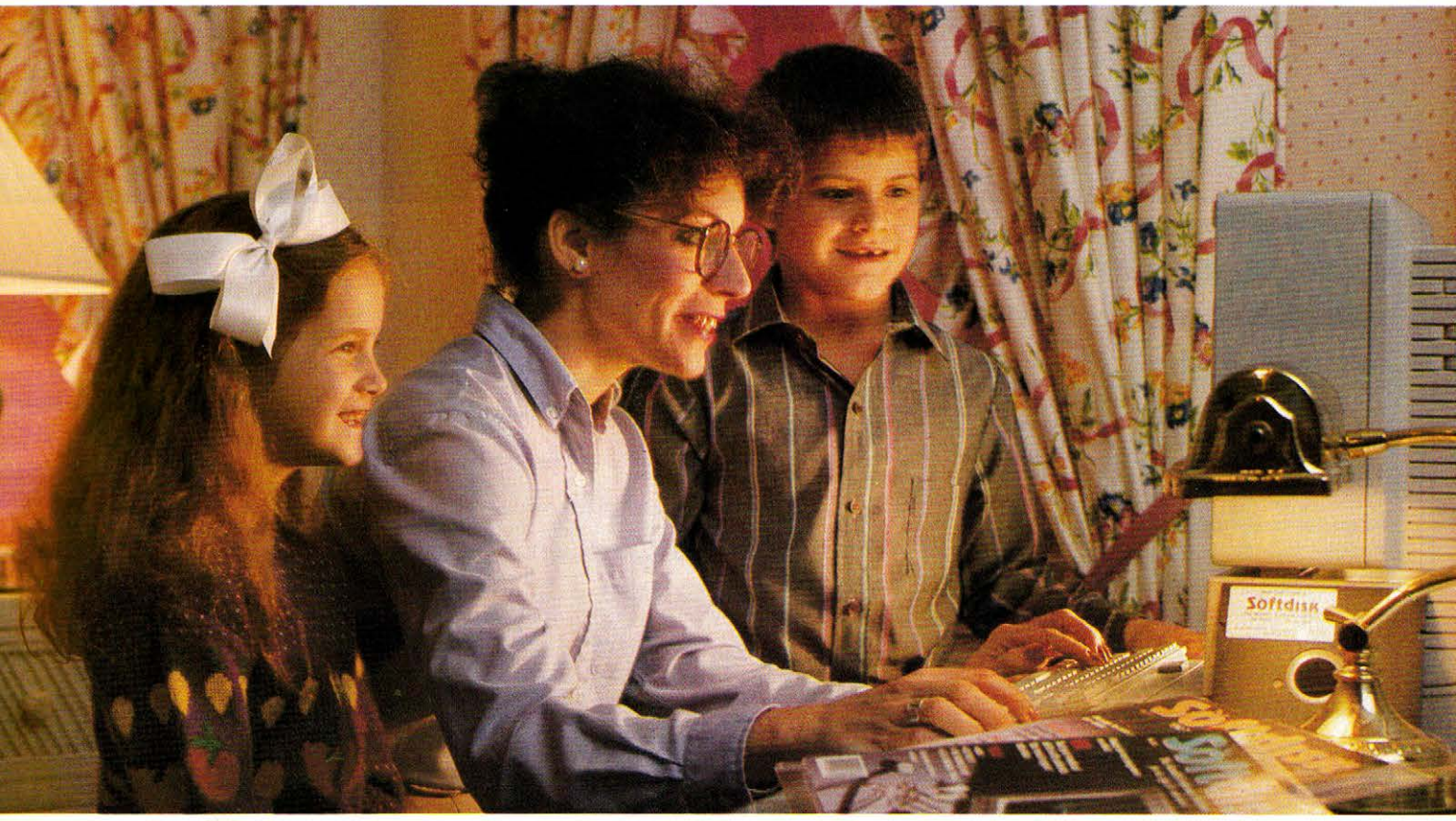

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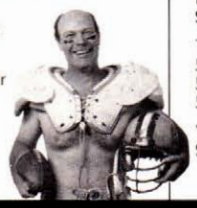

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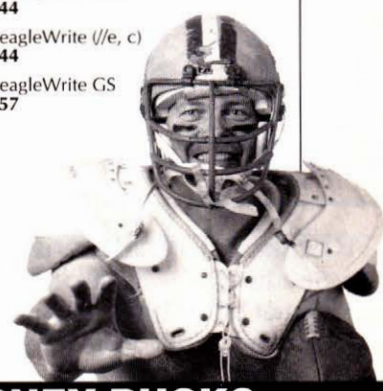

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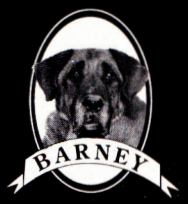

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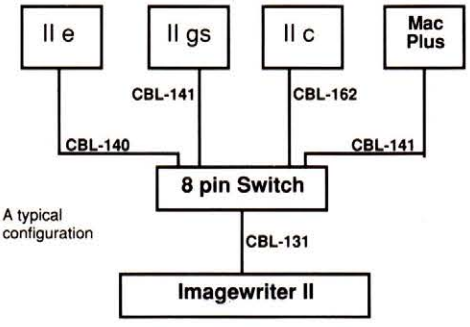

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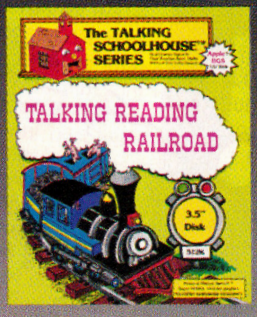

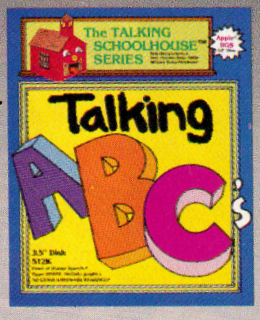

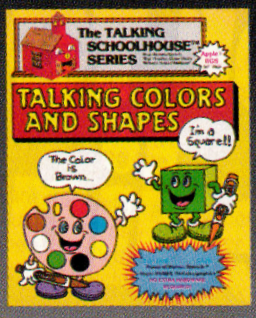

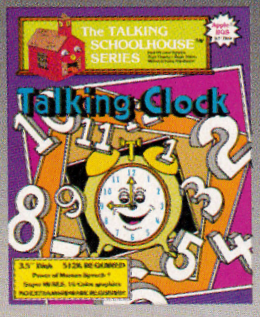

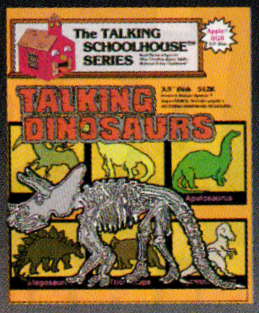

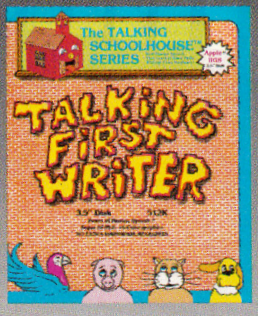

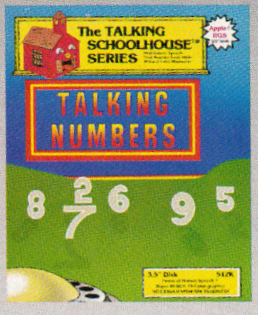

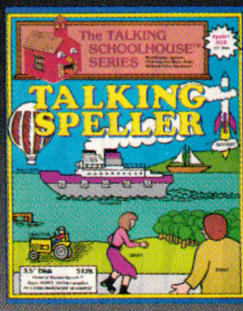

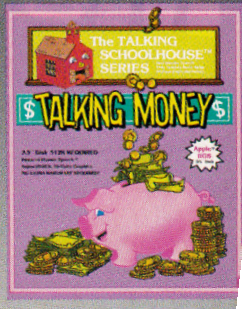

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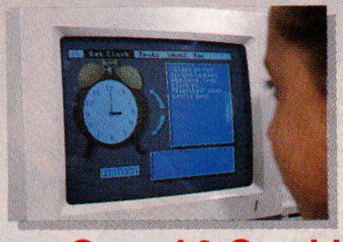

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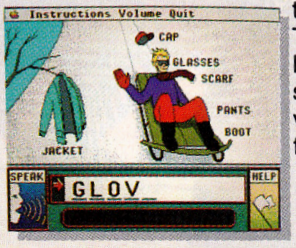

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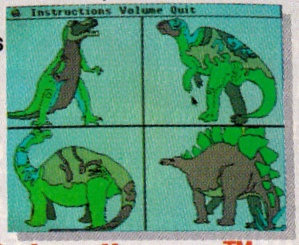

The Talking Schoolhouse™ Series

from Orange Cherry Software. All programs are currently available on 3.5" disks for the Apple IIGS. The suggested retail price is $49, $59 for the School Edition. To order, or for more information contact your dealer or call toll-free (800) 672-6002.

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54 Do-It-Yourself AppleWorks Checkbook

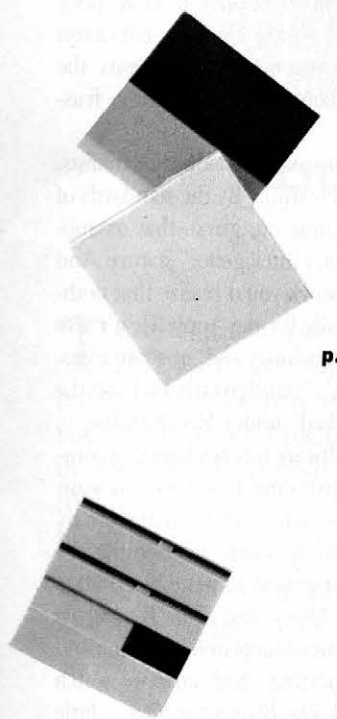
AppleWorks' database manager provides a handy alternative to personal-finance software. Start tracking your expenses with this easy-to-use checkbook template and find out where your money goes.

59 Balance Your Books with AppleWorks GS

Try a new form of "creative financing" with AppleWorks GS' database module. It'll help keep your personal accounts in the black and give *home economics* a whole new meaning.

64 The II/Mac Connection: Bit by Bit

Are the Apple II and the Macintosh really that different? Smart Apple II users are enjoying the technological advances that bridge these two computers.



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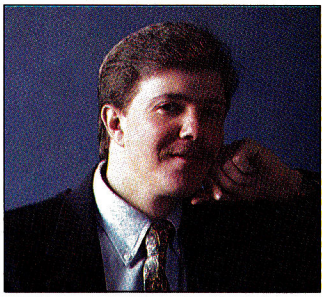


INCIDER'S VIEW

JOURNALIST, TEACH THYSELF

By DAN MUSE * EDITOR IN CHIEF

Reid and Hume know politics; Reid and Hume know MS-DOS; Reid and Hume know business. But the Apple II and education? No.

HAVE YOU SEEN THE NIKE COMMERCIAL featuring football and baseball star Bo Jackson? It shows Bo playing a variety of sports. After a football clip, for example, Los Angeles quarterback Jim Everett says, "Bo knows football." Michael Jordan offers, "Bo knows basketball." After a clip of Bo playing ice hockey, however, superstar Wayne Gretsky simply shakes his head and says, "No."

We recently came across a nationally syndicated computer column by ABC White House correspondent Brit Hume and *Washington Post* Rocky Mountain Bureau Chief T.R. Reid. Our conclusion is Reid and Hume know politics; Reid and Hume know MS-DOS; Reid and Hume know business. But the Apple II and education? No.

Perhaps these two should stick to writing and reporting on politics, since they seem lost trying to analyze the Apple II and educational computing. We'd love to write about politics, but we refrain. We all have opinions about Contra aid, SDI, and *glasnost*, but we don't publish our opinions on topics we aren't qualified to write about.

A couple months ago, Hume and Reid's column discussed Apple's plan to work with grocery-store chains to encourage schools to buy more computers for the classroom. The idea is for parents to bring their cash-register tapes to school; the school can use the tapes to get discounts on Apple computers. Hume and Reid didn't like Apple's arrangement because it might encourage sales of Apple IIs: "The personal computer in most American schools is the Apple II. It's a vintage machine from the earliest days of the PC revolution. It has almost nothing to do with the computers that grownups use on the job every day . . . . Teaching computers on an Apple II with one floppy drive is like teaching driver's education on a 1916 Model T."

Yes, the Apple II has been around awhile. So has the Corvette. But the Corvette you bought 20 years ago isn't the same one you'd buy today. The current iteration of the Apple II, the IIGS, is sophisticated in terms of graphics and sound, but it also has the crucial ability to run virtually every Apple II program ever created.

Reid and Hume's biggest misconception is evident in their statement: "It [the Apple II] has almost nothing to do with the computers that grownups use." Millions of "grownups" use Apple IIs every day. AppleWorks is probably the most-used software package in the history of computers.

That mistake, however, pales in comparison to their misunderstanding of the role computers play in schools: When Hume and Reid object that "students from coast to coast and kindergarten to senior high are being taught about computers on this museum piece," they're confusing *computer education* with *teaching using computers*. When you sit a first-grader in front of Reader Rabbit or Math Blaster you're not teaching the child how to use a computer. You're teaching him or her how to read or add.

About Apple II educational software Hume and Reid write: "By the standards of business software, most of this stuff is outrageously bad: It's slow, poorly designed, given to crashes if some poor kindergartner hits the wrong key. The education software in most classrooms gives students the wrong lessons—that computers are boring, frustrating tools."

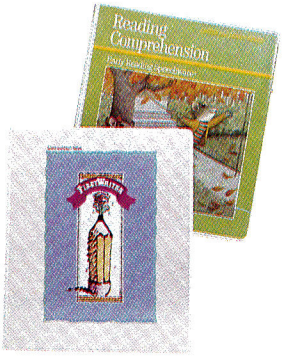
We wonder how anyone, let alone journalists, could come up with this stuff. "By the standards of business software"? Come on, guys—that oxymoron is worthy of "military intelligence" stature. And if you did your homework you'd realize that nothing is written specifically for the Apple II; it's also written for MS-DOS machines and, in some cases, the Macintosh. So if it's "outrageously bad" on the II, it's "outrageously bad" under MS-DOS, too.

You say Apple II software teaches kids that computers are boring, frustrating tools? So you want to save them from boredom and frustration by teaching them what to do when they see the C> prompt and by teaching them to write batch files?

We respect ABC News and *The Washington Post*—so naturally we were surprised by Hume and Reid's erroneous reporting. And now we watch ABC News and read *The Washington Post* a little more closely.□

Six More Great Reasons to Buy an Echo for Your Computer.

1.



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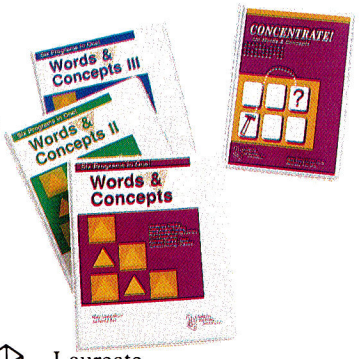

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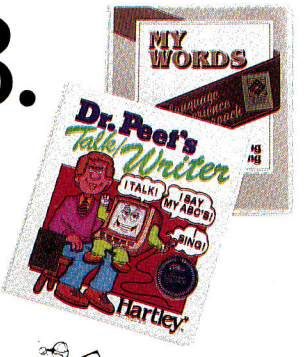

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Teachers and parents have found that talking software greatly enhances computer-based learning. Children enjoy the novelty of having their computer talk to them; their attention span is increased, verbal cues and reinforcement help non-readers, and learning becomes more personalized and fun.

While there are a few programs that use the Apple IIGS® built-in voice capability, for most of the Apple II family "talking software" it is still necessary to use an Echo Speech Processor.

These six leading software companies have helped the Echo® become the voice standard for educational computing. Call the telephone numbers listed above to find out more about these great programs.

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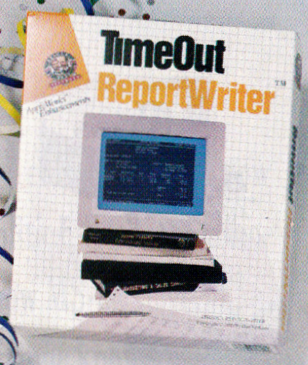

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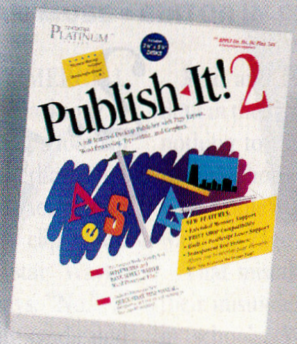

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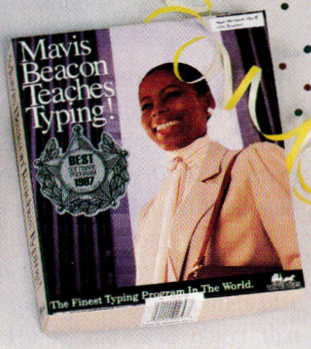

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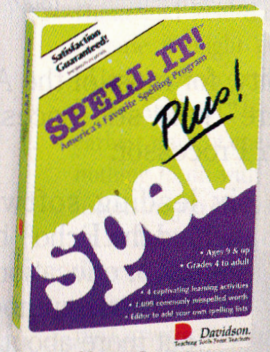

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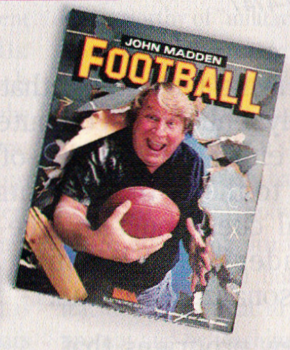

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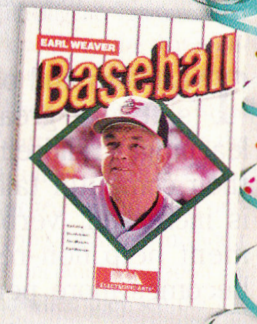

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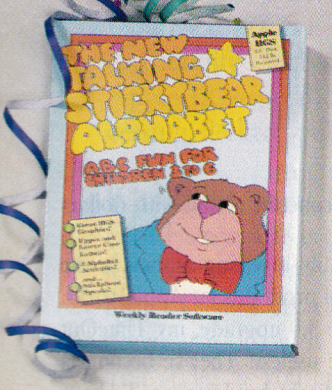

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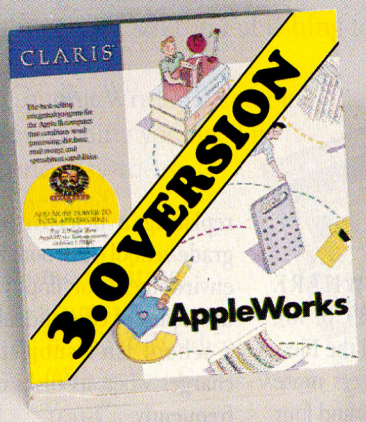

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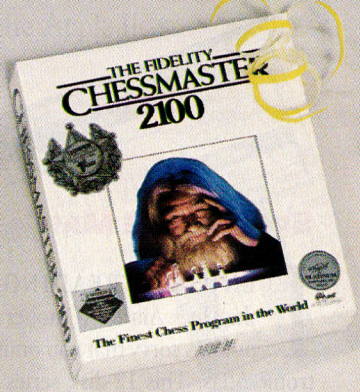

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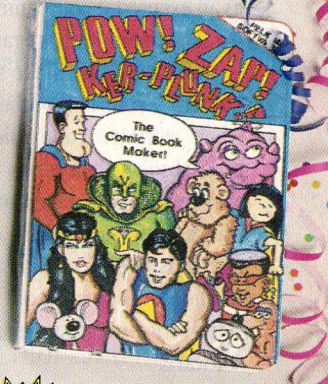

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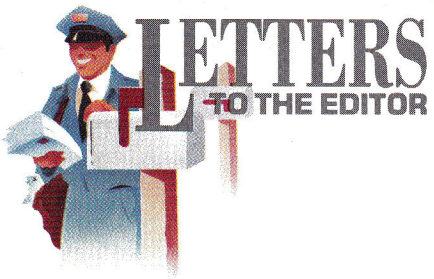

Spot on the Map

I ENJOYED READING "WHERE the Heck Am I?" (October 1989, p. 48), but was sorry that you omitted the Electronic Atlas. This 12-disk series covers more than 175 nations, the seven continents and four oceans, more than 90 seas, and our 50 states. A partial list of features includes multiple-search modes, comprehensive data, review games with two-player options and spelling practice, and data and test printouts.

James L. Negroni
President, Geo-Soft
253 Lake Thomas Drive
Winter Haven, FL 33883

Upon My Word

THE POINT OF YOUR OCTOBER editorial is well taken ("Fighting Temptation," p. 8), but I'd like to address another side of the copy-protection issue. This scheme, quite simply, isn't an effective deterrent to making copies. Instead, it serves mostly as an excuse for companies' high prices, which would remain high, regardless.

You state, "Just make sure you're ready to live up to your end of the bargain." I feel that when software companies take my money, then absolve themselves of all responsibility, they're also canceling our bargain. For instance, after purchasing one particular package, I discovered a hidden additional fee equal to almost 50 percent of the purchase price—simply for providing any support at all for the software.

In addition, after mentioning that a prominent educational-software company is removing copy protection, you express concern about lost revenue because of people making illegal copies. One revenue source that will dry up is the ridiculous $5–$50 fee for replacing a defective or damaged disk. A grade-school classroom is an extremely hostile environment for floppy disks. Making backup copies of educational software means that a school isn't subjected to replacement charges when its disks crash—which they do frequently.

There will always be those who try to take advantage of others. I believe, however, that consumer respect for upstanding companies such as Beagle Bros will do much more to reduce software piracy than any protection scheme will.

Carl E. Dotson
14717 Lynda Park Lane
Poway, CA 92604

We agree that software shouldn't be copy protected; inCider *has long been an opponent of protection schemes. Every user has the right to make backup copies of software, as well as load the program onto a hard-disk drive or a RAM disk.*

As software companies finally begin to realize this, it's important for two reasons that we, as users, don't abuse copyable software. First, if piracy abounds, you can bet that software publishers will return to copy protection. Second, copying software, cassette tapes, or videotapes—no matter how expensive—is illegal. —*eds.*

Does 3.0 Make Cents?

PLEASE TELL ME WHY I SHOULD buy AppleWorks 3.0. Give me a reason that really makes sense. Convince me that I can't live without it!

Paul Statt tells me to buy it ("Apples and Oranges," Stattus Report, October 1989, p. 22). "Don't complain to me that you have to pay $79 to upgrade," he chides. To whom *should* I complain? I'm getting fed up with all the built-in obsolescence we're seeing these days. While you're busy comparing apples and oranges, I must concern myself with dollars and cents.

I've been steadily investing money in the TimeOut series of programs for AppleWorks. Now, if I buy the 3.0 upgrade, my TimeOut programs will be useless! They've become a part of my AppleWorks, but I suppose I'd have to upgrade all of TimeOut, too. Where will the vicious circle end? Are we consumers or sheep being led to the shearing room?

Ed Giecek
Box 174
Granite Falls, WA 98252

Paul Statt responds, "AppleWorks 3.0 makes working with ProDOS subdirectories easier than even JEM Software's Pathfinder does. That's why I can't live without it." —*eds.*

Left Behind

LAFE LOW GAVE IIGS OWNERS some very disappointing news in October ("New GS: More for Your Money," What's New, p. 16). Apple releases a new, updated GS and doesn't even give current GS owners the option to purchase an upgrade kit!

Does this indicate the future of Apple's support for II owners? I've had an Apple II for a long time, but this is making me consider switching to an IBM clone.

John E. Fox, P.E.
2050 Spring End Court
Lawrenceville, GA 30244

School of Thought

AS A HIGH-SCHOOL PHYSICS teacher, I've been using several Apple II programs that interface the computer to the science classroom and lab. I'm now writing a proposal to utilize some of our ►

Quality Software

Tailor-Made For The Apple IIGS

Font Factory GS™

Font Factory GS is a "standard IIGS font" editor that can modify or create fonts for use with almost all Apple IIGS-specific programs, including word processing, desktop publishing and drawing programs.

Why Limit Your Choice?

Font Factory GS is great for automatically changing a font size or for smoothing the ragged edges of a large font. Design custom pictures or symbols. Use the drawing tools with the mouse and see the different font styles as you create each character. It's easy to create custom keyboard characters for math, science, and foreign languages.

Font Factory GS is supplied on a 3.5" disk and requires an Apple IIGS with 768K and one disk drive.

Suggested retail price only $39.95 (demo $6).

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GS owners have wanted a way to manage their files, folders and disks without having to quit their program and return to the "Finder". Now a New Desk Accessory called Disk Access makes these tasks easy to do while using another program!

This New Desk Accessory will save you countless hours of time and frustration!

- Initialize a disk
- Create a new folder
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- Catalog files/folders/disks
- Copy files in folders and disks
- Find a hard to find file by name

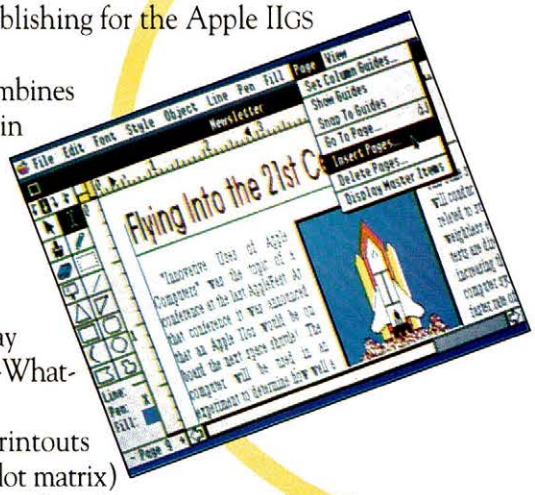
...and many other useful features

$49.95 (demo $6). Works with any GS/OS compatible software that supports NDA's.

GraphicWriter III™

Superior Desktop Publishing for the Apple IIGS

GraphicWriter III combines everything you need in one easy-to-use package!



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- WYSIWYG display (What-You-See-Is-What-You-Get)
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- Automatically flows text from column to column, page to page
- Instantly wraps text around graphics

Included Free:

- Built-in spelling checker
- Sample page layouts
- Hundreds of clip art images
- GS/OS
- 30 fonts in a variety of sizes

GraphicWriter III delivers all the power and speed you've wanted from a IIGS-specific program. **And it requires only 512K!**

With its Mac-like interface and innovative design, you will be publishing in less than 30 minutes. You'll enjoy making fliers, newsletters, forms and other documents!

The Apple IIGS Buyer's Guide declares: "The serious desktop publisher will find GraphicWriter III a workhorse that can produce complex layouts of extremely high quality."

■ Powerful Word Processor ■ Full Color Graphics
■ Advanced Page Layout

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Troy, MI 48083
(313) 528-1950

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LETTERS TO THE EDITOR

county's funds that have been put aside for "innovative projects." My proposal is titled *Integrating the Apple Computer into the First-Year Physics Class.* I'd like to receive information from others who are familiar with this topic.

Jim D. Crawford
Redan High School
5447 Redan Road
Stone Mountain, GA 30088

FOR THE PAST 17 YEARS I'VE required the students in my chemistry and physics classes to complete a science project. During these same years I've compiled several extensive resource lists for helping students and teachers simplify the process of completing a science-fair project.

Thanks to the computer, I've been able to put these lists into a database format. These databases are now available as AppleWorks files (version 2.0) and in printed form. If you're interested in a file, mail a large, self-addressed, stamped envelope, and I'll send a printed copy of the "JournalArts" database free. A bound, printed copy of all 11 databases is available for $7 and on disk for $20.

Michael H. Farmer
P.O. Box 193
Tigerville, SC 29688

DIRECTING THE FUTURE

FOR THE LAST TWO OF MY 20 years in the classroom, I've found a number of constructive ways to use an Apple IIe. All that's required is some familiarity with the Apple II and AppleWorks and a little knowledge of Applesoft BASIC.

My immediate problem is that I have access to just one computer. This occurred while four GSes, four ImageWriter IIs, along with monitors and disk drives, continued to sit in the stockroom all last year.

The school bought this equpment with "magnet funds" and set aside the Apples for the magnet program only. Unfortunately, teachers in this program knew nothing about computers, were uncomfortable using them, and left them parked on mobile carts in the closet. The school used these Apple IIs only one night a week—during our after-school BASIC class.

This now brings us to a larger problem. In my district, and probably in most large districts, there's a complete absence of leadership, direction, and inspiration in the area of computers. Educators aren't encouraged to study computers; by salary-scale recognition, they're actually discouraged from studying this wondrous tool.

Economically, from the teacher's point of view, it makes more sense to take outside classes that involve campfire sing-alongs, canoeing, weenie roasts, and so on. We'll receive salary increments and advanced degrees for doing so.

I'll bet my souped-up IIGS that the central administrators would prove illiterate in computers, technology, and math, if they were tested in those areas. Can we expect such people to be drummers for computers and technology, where the Japanese and other nations are rapidly assuming preeminence? Today, having such people lead our school districts isn't very different from having people who can't read or write directing our children's education.

We need people who can serve as an engine to drive us into computer literacy, and those people don't exist in the educational establishment.

Richard Young
2509 Tuscola
Flint, MI 48503

MORE FOR THE MENU

I'VE ACQUIRED MANY PUBLIC-domain disk accessories and menu fonts for my IIGS, and I'd like to continue adding more of them. Is there any way to increase the number of fonts and DAs you can have in a pull-down menu?

Andrew Goldstein
Box 424, Dutch Quad
SUNY Albany
Albany, NY 12222

System 5.0 (GS/OS) has "scrolling" menus, so you can have many more DAs and fonts than in previous desktops. Just copy the extra fonts and DAs into their respective FONTS and DESK.ACCS folders inside the SYSTEM subdirectory of your boot disk. —eds.

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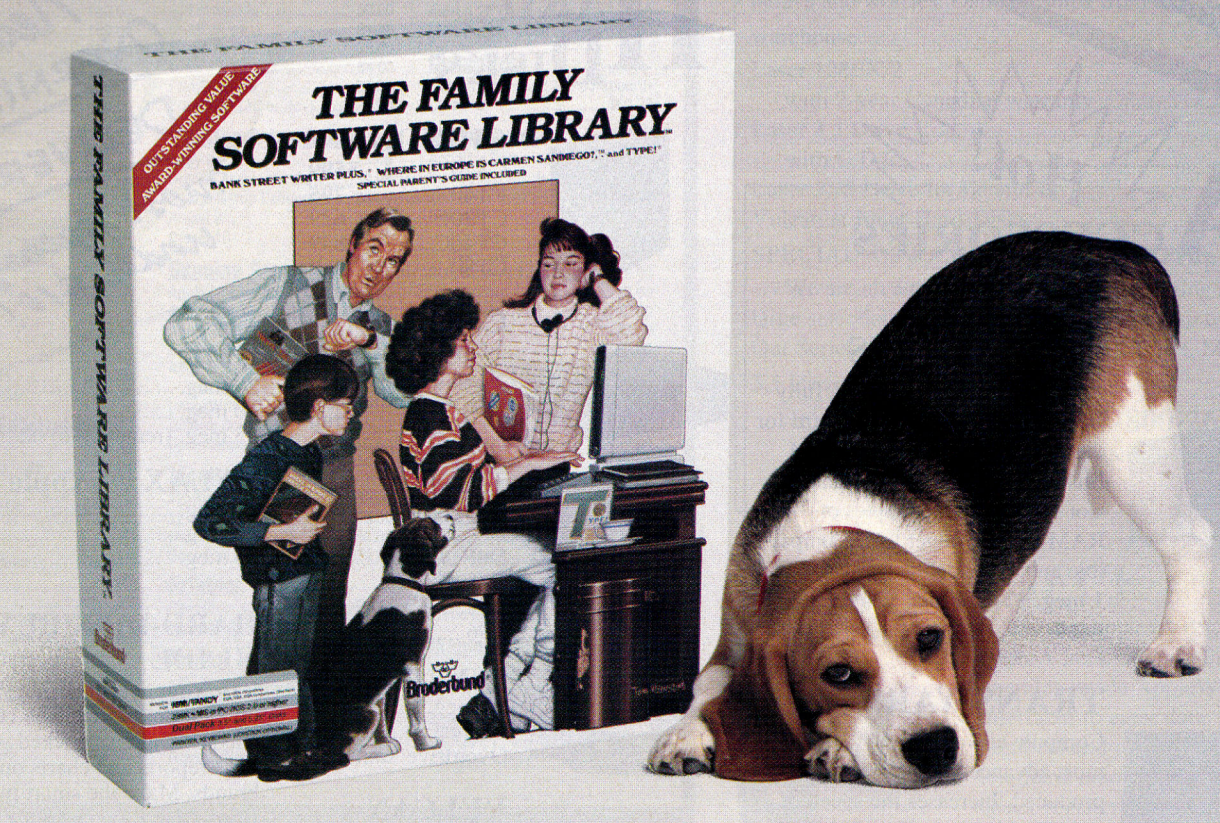

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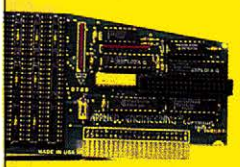
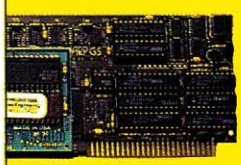


Applied Engineering's new, fully DMA compatible memory card for the IIGS. Simply plug GS-RAM Plus into your memory expansion slot for up to 8 megabytes of RAM at your finger tips. Compatible and expandable.
1 meg. $249, 2 meg $369, 3 meg. $489

TRANSWARP GS



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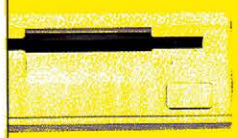

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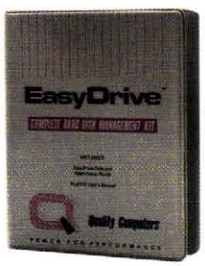

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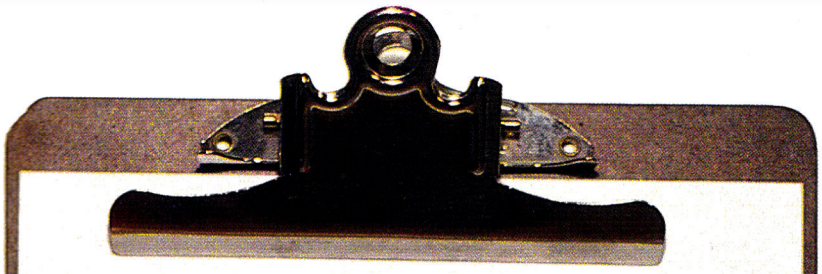
, peripherals, and enhancements...



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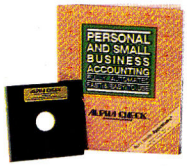

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1 meg.	249
1.5 meg.	329
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1 meg.	249
2 meg.	369
3 meg.	489
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WHAT'S NEW

edited by Paul Statt

APPLEFEST SAN FRANCISCO

Desktop-publishing programs for the Apple IIe/IIc and IIGS are a lot like the weather in New England: If you don't like a program's features, wait a minute and they'll change. Unlike New England weather, though, the changes in the leading desktop-publishing packages are all good. At AppleFest/San Francisco in September, Milliken, Seven Hills Software, and Timeworks each showed new and improved versions of their desktop-publishing software.

Milliken's **Medley** was one of the first GS programs available; although the software was ambitious, it didn't stand up well to critics who complained about its speed. As with many GS-specific programs, the fault didn't lie completely with the software: The original version of GS/OS didn't do much to make the machine more efficient. And as Milliken's Michael Moore also noted, "Apple convinced us to program Medley in C to make it more portable." What Medley's first edition may have gained in terms of portability to other computers, however, it sacrificed in terms of speed on the GS.

Medley 2.0, scheduled to ship in early to mid-October, is much faster than its predecessor. "Critical parts have been rewritten in assembly language," Moore explains. In addition to demonstrating the speed enhancement assembly-language programming provides, Medley 2.0 utilizes System Disk 5.0 fully, and offers condensed printing and improved memory management, according to Moore. Medley 2.0 also takes advantage of ExpressLoad, a routine developers can use to make GS programs load much faster than they have in the past.

Registered Medley users will receive an upgrade to version 2.0 automatically. The retail price is $129. For more information, contact Milliken Publishing, 1100 Research Boulevard, St. Louis, MO 63132, (314) 991-4220.

Seven Hills Software's **GraphicWriter 3.0** has wowed the crowds at the last two AppleFests; the only thing it's lacked has been a shipping date. At press time Seven Hills President Earl Childers said this much-anticipated program would ship in late October, however.

The most impressive thing about GraphicWriter 3.0 is that it works on the 512K GS, a big advantage for schools that can't afford to add extra memory to their machines. It imports AppleWorks 3.0 files, as well as files from older versions of AppleWorks. Another nice feature is its compatibility with Beagle Bros' TimeOut SuperFonts. Seven Hills is definitely bullish on compatibility: This new version of GraphicWriter also reads text files created by Bank Street Writer, MouseWrite, FRed-Writer, and Apple Writer. "We wanted to be compatible with the programs that are most used in schools," says Childers. With that philosophy it's not surprising that GraphicWriter 3.0 is also compatible with Print Shop and Print Shop GS graphics, and with super-high-resolution graphics, such as those you'd produce with Paintworks Gold or DeluxePaint II.

According to Childers, if you bought GraphicWriter 2.0 before August 1, 1989, you can upgrade to 3.0 for $25 by sending in the original disk. If you bought version 2.0 after August 1989, you can upgrade for $5 if you send in the original disk and your receipt. GraphicWriter 3.0 will carry a retail price of $149.95. Childers says that lab packs and site licenses will also be available. Contact Seven Hills Software, 2310 Oxford Road, Tallahassee, FL 32304, (904) 575-0566.

Publish It! (and its successor Publish It! 2) have dominated the desktop-publishing market for the last couple of years; Timeworks isn't content to sit on its laurels, however. That's good news for Publish It! users. **Publish It! 3** makes a great program . . .well . . . greater.

According to Timeworks, Publish It! 3 supports color printing as well as PostScript printers' gray-scale capability (important if you want to add a gray screen behind a box of text, for example). And while it isn't a GS-specific program, Publish It! 3 lets you import super-hi-res black-and-white and color graphics; the program also supports GS fonts.

Publish It! 3 lets you "lock groups" so that you can keep text and graphics frames connected. That is, you can lock your picture's graphics frame with the caption's text frame. You can also cut, copy, and paste groups; for example, you can copy the format of one page to other pages.

As with Medley 2.0 and GraphicWriter 3.0, you can import AppleWorks 3.0 documents into Publish It! 3. Timeworks hadn't set an upgrade policy at press time, but expect something in the $20–$30 range, according to a company representative. The retail price will be $129.95. For more information on Publish It! 3, contact Timeworks, 444 Lake Cook Road, Deerfield, IL 60015.

—Dan Muse, Editor in Chief

HARDWARE

No news might be good news in some quarters. You decide this one: No particularly intriguing new Apple II hardware devices were introduced at September's AppleFest in San Francisco.

Apple Computer had the opportunity last fall to bring out what could have been the best Apple II yet. But instead of a faster, meaner machine, Apple simply fattened the **GS' memory**: RAM to 1.125 megabytes and ROM to 256 kilobytes. Apple rewrote the firmware to include many of the enhancements first introduced in GS/OS version 5.0 last year.

All's not no-news about the new GS, fortunately. The battery that runs the GS clock and charges the Control Panel RAM for about three-fifths of its expected lifetime is no longer soldered in place or hidden under the power supply. And RAM-card manufacturers are elated that Apple no longer hogs the expansion slot; all 1.125 megabytes are on the motherboard.

Perhaps the good news at AppleFest is that other manufacturers, rather than introducing exciting new products, are taking the time to update their proven stock.

For example, Digital Vision (66 Eastern Avenue, Dedham, MA 02026, 617-329-5400) has released an excellent GS version of the software for its video digitizer, **ComputerEyes**. Features include 320 or 640 pixels by 200 lines; full-color, super-high-resolution graphics with post-digitized dithering, palette, and contrast control; and picture cropping, sizing, and other electronic transformations. The new version of ComputerEyes GS also saves graphics in any of several formats for compatibility with a variety of other GS programs, such as Roger Wagner's HyperStudio.

Speaking of **HyperStudio**, the latest version is nearly bug-proofed. Its demo ran almost continuously for three days at AppleFest.

First Class Peripherals (2221 Old Oakland Road, San Jose, CA 95131, 800-538-1307) has put new cases around its **DF series 20-, 40-, and 70-megabyte hard-disk drives** so that they'll fit comfortably between the GS and the monitor. (The drives' performance specifications aren't too shabby, either.) There's lots of wide-open space inside—enough room for another disk drive, a tape backup, and a Conserver-type fan and sockets. Watch for those additional features at the next AppleFest.

Applied Ingenuity (14922 Ramona Park Boulevard, Unit M, Baldwin Park, CA 91706, 818-960-4415) and CMS Enhancements (3080-A Airway Avenue, Costa Mesa, CA 92626, 714-549-2953) provided the other side of the no-news coin. AI demonstrated the **CDrive**, a hard-disk replacement for the IIc's internal floppy. Although cracking open a IIc to install a CDrive might not appeal to most IIc owners, the disk's speed and performance compared with those of floppies, or even an external hard drive, should allay most fears.

AI has also released a **videotape recorder-based backup system for hard-disk drives**. A six-hour tape will store some 640 megabytes at a rate of 40 megabytes per hour. That's slow, but to some, worthwhile, compared with the extensive floppy swapping necessary in most standard backup systems.

Finally, CMS seems to have reawakened to the Apple II market after a year or so of neglect. To demonstrate its intentions, the company introduced a **44-megabyte removable hard-disk drive**. Yes, take one hard-disk cartridge out and put another in, just like a floppy. And CMS continues to be the only hard-drive manufacturer with multi-user systems for the Apple II.

—Bill Kennedy, Senior Technical Editor

THE GAMES GO ON

GAMES

September's AppleFest in San Francisco wasn't *all* fun and games, but there were enough new new titles to keep *inCider*'s editors busy.

Broderbund (17 Paul Drive, San Rafael, CA 94903, 415-492-3200) was showing off its latest creations—**Prince of Persia** and **The Ancient Art of War**. We were surprised to not see **Downhill Challenge**, though, because that was waiting in our mailboxes when we returned.

Prince of Persia is an action-adventure game by the author of Karateka. You play a young prince who has been imprisoned in an evil vizier's dungeon; you have an hour to escape and rescue the princess before she's forced to marry him. The animation is incredible. As you run, jump, and climb through the dungeon, it looks as though you're watching a movie rather than a computer game.

The Ancient Art of War is the land version of Broderbund's previously released Ancient Art of War at Sea. You'll challenge some of history's greatest military commanders—Alexander the Great, Genghis Khan, Napoleon, Geronimo, and others—in any of 11 historic campaigns.

Downhill Challenge is an exhilarating simulation of ski jumping, slalom, giant slalom, and downhill racing. You can train and compete in each event on three increasingly difficult courses. Fluid animation and scrolling, combined with spectacular graphics, provide a feeling as close to real skiing as we've seen yet in a computer game.

Both Prince of Persia and The Ancient Art of War run on ►

APPLEFEST SAN FRANCISCO

GAMES

an Apple IIe, IIc, or IIGS with 128K; they sell for $34.95 and $44.95, respectively. Downhill Challenge is for the GS only (with 512K), and costs $29.95.

Accolade (550 South Winchester Boulevard, Suite 200, San Jose, CA 95128, 408-985-1700) is still hard at work on previously announced titles—Fast Break, Grand Prix Circuit, Heatwave, Blue Angels, and a few others; they should be available when you read this. The company's also doing another $19.95 course disk for Jack Nicklaus' Greatest 18 Holes of Major Championship Golf. **Jack Nicklaus Presents the International Courses** will bring you to the Australian Gold Club in Kensington, Australia; the St. Creek Golf Club in Nagoya, Japan; and the Saint Mellion Golf and Country Club in Cornwall, England. All these courses were actually designed by Jack himself, by the way, so don't expect an easy round of golf.

Electronic Arts (1820 Gateway Drive, San Mateo, CA 94404, 415-571-7171) has shipped its long-awaited and much anticipated **Earl Weaver Baseball** and **John Madden Football**. EA also surprised us with **Keef the Thief**. Keef is a lighthearted adventure game in which you're a juvenile delinquent faced with survival in the Tri-City area. You'll have to battle creatures such as a hungover goblin and a killer chicken—definitely not your standard adventure fare. Earl Weaver and John Madden sell for $39.95 and $49.95, respectively, and run on the Apple IIe, IIc, and IIGS. Earl requires 128K and John needs 64K. Keef the Thief sell for $49.95 and runs only on the 512K GS.

A new face in the crowd—Victory Software—wasn't showing at AppleFest, but we heard about the company's new adventure role-playing game for the Apple IIGS. **2088: The Cryllan Mission** casts you as a soldier, science officer, nurse, or doctor assigned to locate the missing crew of the U.S.S. *Houston*. You'll need 1.25 megabytes in your GS and $69.95, but you'll have a lot of exploring to do. You can contact Victory Software at (713) 493-3232 for more information.

Keep an eye out for more detailed evaluations of these new games in the pages of *inCider*'s Game Room.

—Lafe Low, Review Editor

Kids' Stuff

Kids (and their parents) certainly had reason to cheer at AppleFest/San Francisco in September. Many of the new companies exhibiting and most of the new titles shown are focused on children.

McGee, from Lawrence Productions, is definitely a new approach to children's software: There are no confusing words or menus, just graphics depictions of choices, which a child simply selects with a mouse.

McGee has just awakened on a beautiful morning and has the whole house to explore. That, in a nutshell, is it. Your child can steer McGee toward the bathroom, downstairs, even outside to play on the swing. Everything McGee does looks and sounds great, and your kids will be able to work through the entire scheme without your help. We were so taken with McGee that we made it Editors' Choice this month (p. 132).

Positively Rewarding, from Thomas Software, is another unique title we saw at AppleFest. As the name implies, positive reinforcement is the reason behind this program. It presents kids with behaviors they keep track of themselves—such as making the bed and doing their homework—and rewards them for consistent good behavior. In conjunction with positive reinforcement from teachers and parents, Positively Rewarding will help foster good behavior and improved self-esteem.

Kids can make their own comic books with *Pow, Zap, Kerplunk*, the latest from Pelican Software. Pow, Zap, Kerplunk lets kids choose backgrounds, characters, and colorful artwork, then add stories to their comics in speech bubbles.

SOFTWARE

Kids can then print their creations in a variety of sizes and styles—from complete comic books to full-sized posters. Pelican is also coming out with additional art disks for the program.

For more information, contact Lawrence Productions at (800) 421-4157; Thomas Software at (408) 867-9323; and Pelican Software at (203) 677-6288.

—Lafe Low, Review Editor

MORE KIDS

SOFTWARE

There are ten million children in the United States between the ages of 3 and 5, and one million of them have computers at home, according to Broderbund Software's market research. Broderbund hopes to reach them all with **The Playroom**.

In the Broderbund tradition of mixing entertainment with education—Carmen Sandiego defined a genre of computer software—The Playroom looks to youngsters like a game. It uses a highly intuitive interface: The screen simulates a playroom. But education is hiding behind The Playroom's doors; seven games introduce children to early math, reading readiness, telling time, typing, logical thinking, and spelling. Other activities are just plain fun.

Broderbund has tested The Playroom with parents, preschool teachers, professors of education, educational consultants, and, most importantly, children such as 6-year-old Charlie Lemcke, who reported, "It's fun! I like it because there are lots of things to do."

The Playroom should be available now for the Apple II for $39.95, from Broderbund Software, 17 Paul Drive, San Rafael, CA 94903, (415) 492-3200.

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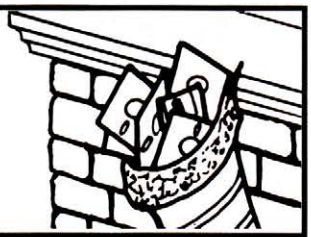
*Commodore version does not complete Forms 3903, 4562, 6251, and Schedule E

Circle 140 on Reader Service Card.

Software Stocking Stuffers



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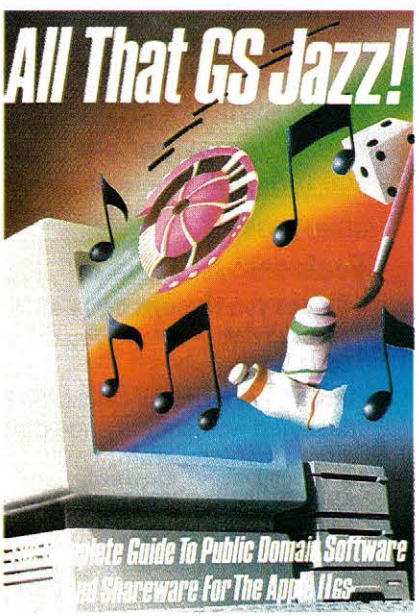
ALL THAT JAZZ

RESOURCES

All That GS Jazz! is the ultimate guide to affordable Apple IIGS software—it describes in detail more than 1000 public-domain programs for the GS, from graphics and games to fonts and desk accessories, utilities to telecommunications. And to make sense of all that software, the book features four separate indexes—by subject, by filename, by disk title, and by disk number—to make finding just the right application easier.

Each disk costs only $9; *All That GS Jazz!* is $5. If you're wondering whether public-domain software is worth it, let Owen Linzmayer, *inCider* author and formerly technical editor of *A+*, help. For $35.95, you'll receive his choice of six programs (as listed in the February 1989 *A+*)—Wheel (Hangman with Vanna), IconEd (create icons), Viewer (slide show), Bounce-It (Arkanoid clone), Control Panel NDA, and F1 Race (car chase)—in addition to the catalogue and some surprise software. For details on a great deal, call or write the Public Domain Exchange, 2074C Walsh Avenue, Department 25, Santa Clara, CA 95050, (508) 496-0624, or circle number 360 on the Reader Service card.



"If Apple would establish a separate division to develop and aggressively market Apple II products, re-establishing their reputation as the excellent general-purpose computers that they are, we believe that the Apple II could make major inroads into market segments that have been lost over the years to MS-DOS systems."

—Barney Stone, President, Stone Edge Technologies
in a "white paper" on the state of the Apple II presented for discussion to a group of independent Apple developers at AppleFest/San Francisco, September 1989

QUOTES

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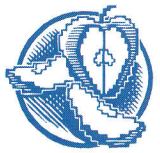


■Some Apple marketing experts warned us recently that developers ought not to take everything **Apple's "evangelists"** say as "gospel." Hmmm.

■Best PR of the month comes from **True BASIC, Inc.** (Hanover, NH): "True BASIC Software Now Runs on Apple IIs." Seems all you have to do is buy Applied Engineering's PC Transporter card. The BASIC is true, if the advertising isn't. True BASIC will even sell you a Transporter; call (800) TR-BASIC for details.

■***Business Week*** pans educational computing in its July 17, 1989, issue: "It's hard for schools to justify spending more when the value still seems so vague." Nobody knows what to buy. Sally Bowman, director of the **Computer Learning Foundation**, responds that "the article melodramatized a familiar problem without acknowledging emerging solutions." A week later, *Business Week* is an official partner of CLF, offering 30 percent discounts to advertisers who buy space through CLF in a special section called "Endangered Species: Children of Promise" in the October 20 issue.

■**Origin Systems** (Londonderry, NH) left the copy protection off when it released its new hit artificial-intelligence simulation **OMEGA**. The pundits say a proliferation of hard drives, RAM disks, and accelerators is making this step necessary for publishers. But what does Origin say? "We figure the game's advanced enough that you can't play it without the manuals anyway." Now there's a way to fight piracy.

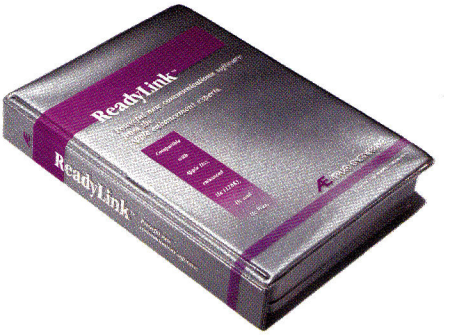
■**Davidson & Associates** (Torrance, CA) doesn't just sell school software. This developer has issued a position on adult illiteracy. Using computers, "students are provided with an opportunity to learn in a nonthreatening, self-paced environment that puts them in control." Provided they have computers.

■The **Morgan Davis Group** (San Diego, CA) has introduced a new **"program-launcher launcher."** This program enables your Apple IIGS to automatically launch into a particular application after a power loss—particularly handy if you run a BBS—or opt to launch the Finder or ProSel.

■The address for a company called **ASIC Enterprises**—31332 Via Colinas, Suite 112, Westlake Village, CA 91632, (818) 597-9165—looks to us like the old address for Bits and Pieces Technology, makers of the Rocket Chip accelerator. ASIC says it hopes to bring to market a 20-megahertz 65816 microprocessor for the Apple IIGS.

■A new Apple II **virus** has arrived in the States from France, and is usually spread via the freeware **DataSmith** utility program. It scrambles block zero on infected disks. This is the third Apple II virus brought to you via the French connection, in about as many programs. We had a way of dealing with this sort of thing in the good old days of bulletin boards—the blacklist.

■Is **Apple** looking for a way to manufacture the Apple II more cheaply?



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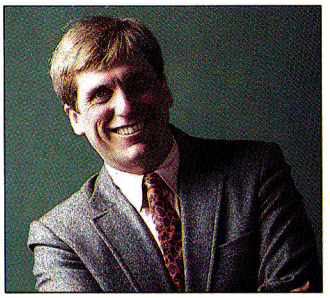

STATTUS REPORT

GOOD GRAPHICS GALLERY

By PAUL STATT * SENIOR EDITOR

Powerful computers are doing for science and mathematics what microscopes and telescopes did in an earlier time. Computers could do the same for art.

FINALLY SOMEBODY HAS TIED TOGETHER all the loose ends—fractal geometry, Mandelbrot plots, virtual realities, visual experiments, procedural graphics, image processing, and all the other bizarre kinds of computer graphics being created today—into a tight, coherent theory. I didn't even have to invent it myself. In *Visualization: The Second Computer Revolution* (Abrams, New York, $49.95), Richard Friedhoff has done the synthesis for me, I thought, as I glanced through 200 pages of impressive computer "art."

"When we visualize," Friedhoff maintains by way of introduction, "we restructure a problem so that more of it is processed by the preconscious part of our brain—the visual system that is our silent partner." Computers can make visualization easy: Just imagine the difference between dragging an icon into a trash can and typing DELETE /HARDDISK/BUSINESS/LETTERS/MOM, or the ease with which TimeOut Graph can make AppleWorks spreadsheet data visible.

One of the many fascinating examples of visualization in Friedhoff's book is the technique by which military computers can make a fuzzy snapshot appear clear—it involves Fourier analysis of a digitized photograph. It would take a while on an Apple II, but you could clean up all those faded family photographs.

The "photographs" of Neptune we saw last year were really visualization of electromagnetic data—Voyager 2 carried no camera, but radios that relayed data to computers in Pasadena that created images of the outer planets. To mathematicians, the very existence of the science of chaos (see Stattus Report, "Something Strange," August 1989, p. 20) was unknown until computers let them "see" numbers on a video monitor.

The word *visualization* means "seeing what was once invisible." In this sense, powerful computers are doing for science and mathematics what microscopes and telescopes did in an earlier time. Computers could do the same for art, as well, just as linear perspective—once an artist's "trick"—changed the way people see.

I wish Friedhoff had synthesized more. You'll need to make your own connections. A reader ignorant of ray tracing and celluar automata, say, will come away from *Visualization* still wondering why they're in the same book. Perhaps that wonder is what's needed. A reader wondering, "Can a computer think?" and "What is perception?" will see that the questions relate, but not so simply that Friedhoff—or I—could explain it in a sentence. A picture, it's true, is worth a thousand words of explanation of visualization. The illustrations in *Visualization* are more like questions than answers. Visualization is certainly a young science, and the young ask a lot of questions.

Visualization reminded me of Graphics Gallery, the refrigerator door for computer graphics that *A+* magazine used to publish and *inCider* doesn't. I never much liked Graphics Gallery—it wasn't art I would pay to see, and I think you deserve better when you buy *inCider*.

Roger Goode, *inCider*'s art director and an accomplished computer artist, puts it this way: "The computer is a tool, like paints or brushes. If you don't know how to paint, using a different tool won't make you an artist." Roger created the illustration on page 41 in the July 1989 *inCider*; I'd say that was good art.

There's no real theory of computer art yet; nobody knows what's good. The theory sketched in *Visualization* is as good as any: Computer art should make the invisible visible. I enjoy computer art when I visit a science or art museum, but nobody sends me any at *inCider* that I'd hang on my refrigerator, let alone publish in a national magazine.

That's a challenge. Read *Visualization*, study your programming or your art history or both, and create something with your Apple that changes the way I see the world. I promise we'll publish it. If you're *really* proud of what you did, send it to Daria Barclay at the ABACI Gallery of Computer Art, 312 NW 10th Street, Portland, OR 97209, (503) 228-8642 (slides only; deadline January 1). I've never seen the gallery, but I hear it's publishing a series of books on computer art.□

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QUICK TIPS AND ANSWERS

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By WILLIAM P. KENNEDY, Ph.D.

POST-DATING PRODOS FILES

I OWN AN OLDER MODEL (CIRCA 1984) Apple IIc and recently purchased a used Applied Engineering IIc System Clock, which, I understand, has been discontinued. The clock requires that I modify my application disks by installing a "driver" that date/time-stamps my ProDOS files automatically. Some of my disks are copy protected, however, and won't accept the modification. How can I date/time-stamp later the files those copy-protected applications create? I have Copy II Plus. Can I use its sector editor to change the date/time stamp?

Donald Burr
Carpinteria, CA

There are several utilities you can use, Don, to change the creation and modification date/time stamps on your ProDOS files. A sector editor, such as the one available in Copy II Plus, is the most difficult for two reasons. First, you must do a lot of hunting for the directory entry of the file and the bytes where the date/time stamp for that file are stored. Second, you've got to encode the date and time manually.

The ProDOS 8 Technical Reference Manual *published by Addison-Wesley (Reading, MA, $29.95) comes with a ProDOS Exerciser program (similar to Copy II Plus) that lets you easily select and modify all of a file's ProDOS specifications, including the date/time stamp.*

But save yourself the hassle of sector editing. Type in and use "ProDOS Dater" by Martin Lavoie (Hints/Techniques, September 1988, p. 104) to post-date and time-stamp your files. Note that the program contains one small error. Line 12511 should read: 12511 IF M = 10 AND D > 31 THEN 12400

APPLE II IDENTIFICATION

IS THERE ANY WAY TO IDENTIFY from Applesoft BASIC which Apple II my student is currently using?

Frank Walter
Syracuse, NY

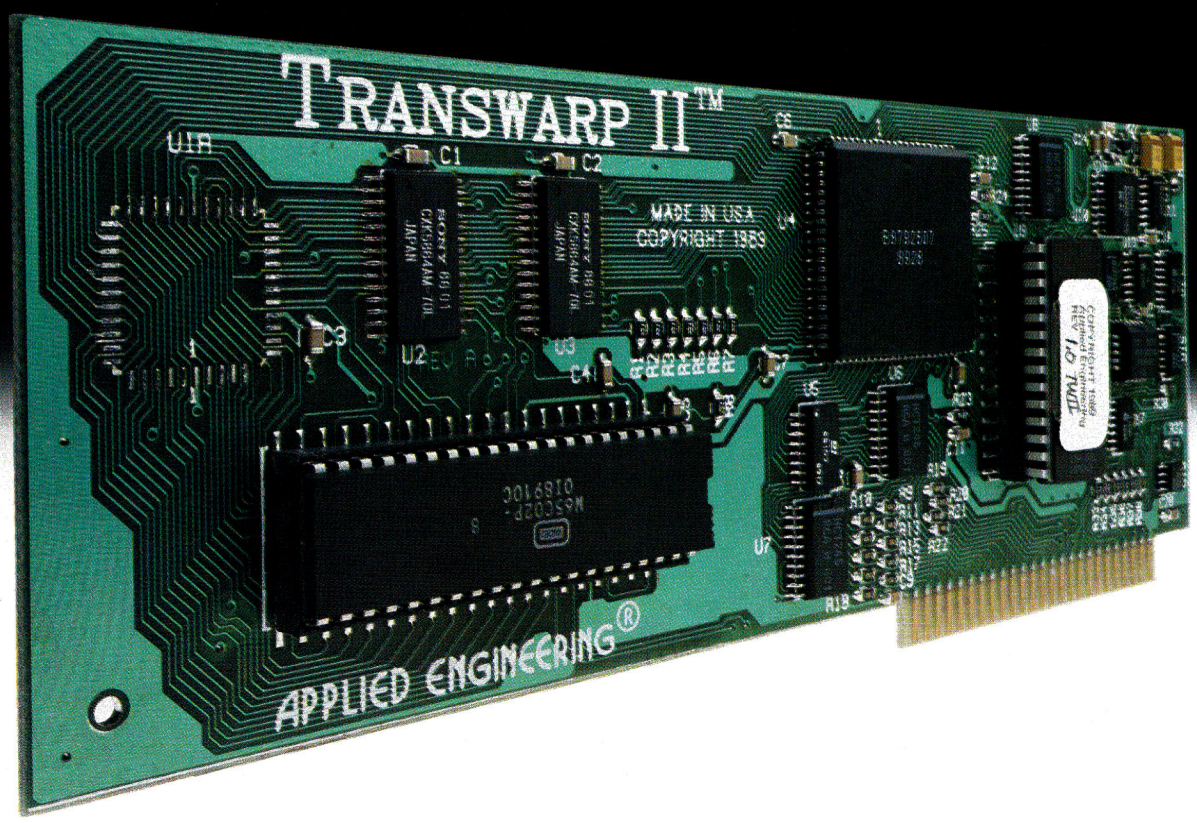
The Apple II Developer Technical Support group at Apple Computer has recommended that programmers examine the contents of four ROM bytes to establish on which Apple II a program is executing. The accompanying ***Table*** *gives those addresses and their corresponding values.*

From Applesoft BASIC, simply use an IF PEEK(address) = value. . . THEN . . . examination to determine the machine type. For example, to identify an Apple IIc Plus, you might use the code sample: IF PEEK (64435) = 6 AND PEEK (65055) <> 96 THEN is a GS; otherwise, something else.

Note that all current 8-bit Apple II ROMs contain the machine-language RTS command ($60 or 96) at location 65055 ($FF/FE1F). Current GSes have a short utility starting at that same address that returns compatibility information in the 65816's registers. I won't discuss those now, except to say that the ROM-byte value might change in later GS ROM versions. That's why in the above example I tested whether PEEK (65055) was 96 or not, rather than use the GS-specific value of 173. ►

Machine	ROM Address				
	64286	64435	64447	64448	65055
Apple II	—	56	47	96	96
Apple II Plus	173	234	234	234	96
Apple III (emulation)	138	—	234	—	96
Apple IIe	—	6	192	234	96
Apple IIe (enhanced)	—	6	0	224	96
Apple IIc	—	6	255	0	96
Apple IIc (3.5 ROM)	—	6	0	0	96
Apple IIc (orig. RAM expansion)	6	3	0	96	—
Apple IIc (rev. RAM expansion)	6	4	0	96	—
Apple IIc Plus	—	6	5	0	96
Apple IIgs	—	6	0	224	173

Table. Apple II machine-identification ROM locations and values (decimal).



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PRINTED CATALOG

I'VE GOT DOZENS OF DISKS CONtaining dozens of short AppleWorks files. How do I get a printout of the catalogs? I'm tired of hand-writing the filenames.

Alvin Flory
Fukuyama, Japan

Thank you, Alvin, for a simple printer question. You made my day.

Simply boot into ProDOS BASIC from a disk containing the files ProDOS and BASIC.System, such as your Apple IIc ProDOS System Master. Next to the BASIC prompt (]), type PR#1 and press Return to activate your printer. Then insert your AppleWorks data disk(s) into the boot drive and type CATALOG,S6 (,S5 if you booted from a UniDisk or internal 3½-inch drive) to print a complete listing of your files, or CAT,S6 (or ,S5) for the shortened version.

Notice that you probably won't see the word CATALOG *(or* CAT*) on screen, because PR#1 redirects all output to the printer. Type PR#0 to redirect output back to the screen.*

This method works with all Apple IIs, not just the IIc. Those of you who have a printer in another slot, simply substitute that slot number as n *in the PR#n command. Also, for convenience, many folks clip out the catalog listing from the printed page and paste or tape it to the disk sleeve. Just remember to label the disk with the volume name, so that you can later match the disk to the sleeve and its catalog.*

FILE-RECOVERY EXPERT

I HAVE A FULL 3½-INCH APPLEWorks data disk that's no longer readable. I think its directory has been damaged. Is there any way to retrieve the disk's files?

Kit Gage
Brookfield, VT

Backups, Kit? When will we ever learn?

Glen Bredon's ProSel ($39.95, available through Quality Computers, 15102 Charlevoix, Grosse Pointe, MI 48230, 800-443-6697) contains a utility called Scavenge, which might be able to reconstruct the directory for you. And ProSel contains other block and sector editors, should you have the patience and expertise to repair the disk yourself. Similar products are also available from other sources. Copy II Plus from Central Point Software (15220 Northwest Greenbrier Parkway, #200, Beaverton, OR 97006, 503-690-8090, $39.95 plus $5 shipping), for instance, contains an editor.

Better yet, get an expert to fix the disk for you. Pete Johnson, P.O. Box 84, New London, MN 56273, seems to enjoy the work. He should—he's quite good at recovering even the most stubbornly damaged files.

QUICKIES

Format 3½-inch disks using the 2:1 interleave from the GS Finder, unless you're using a UniDisk 3½-inch drive. Otherwise, you'll lose performance and possibly data.

—Richard Witt
Blue Springs, MO

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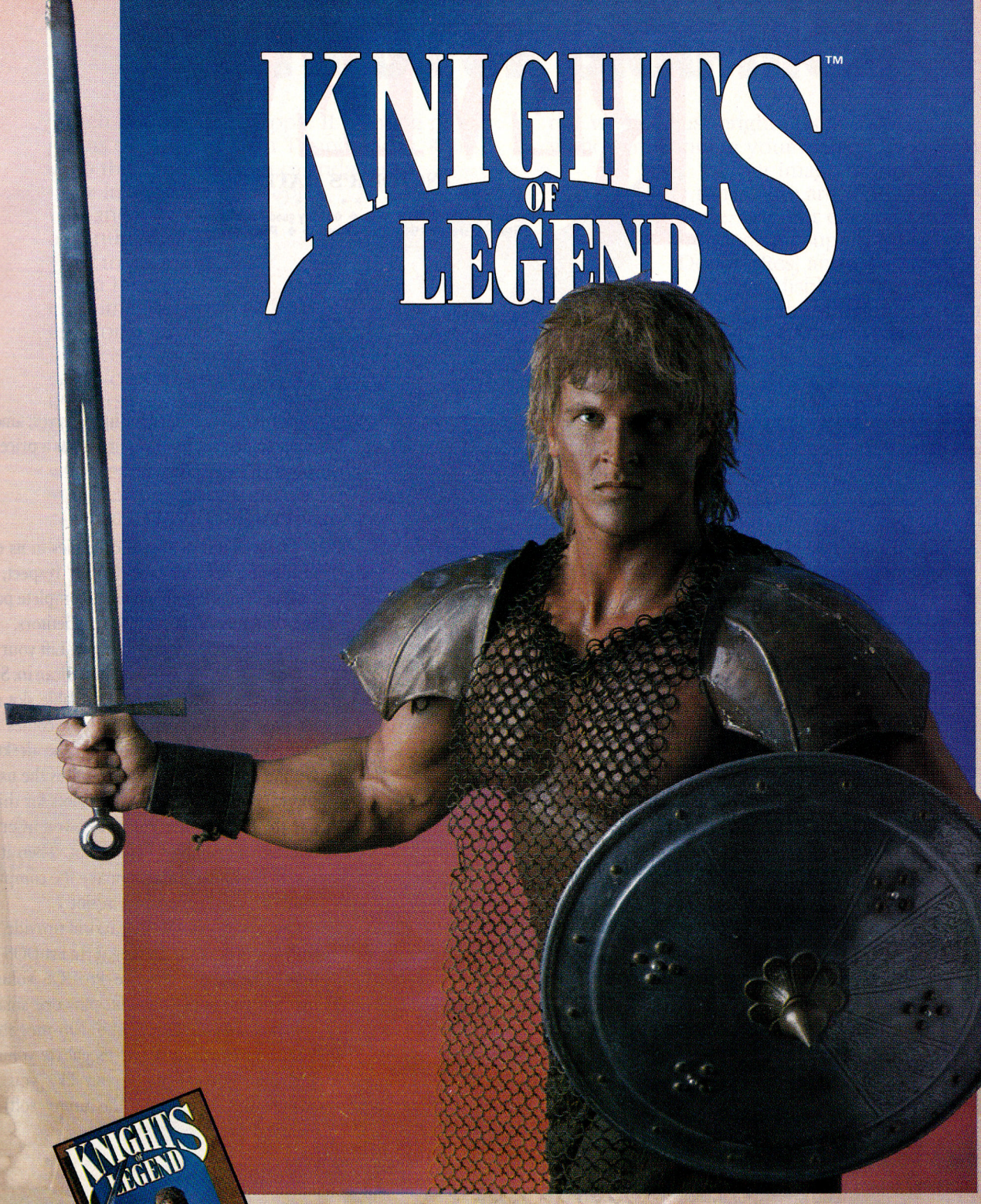

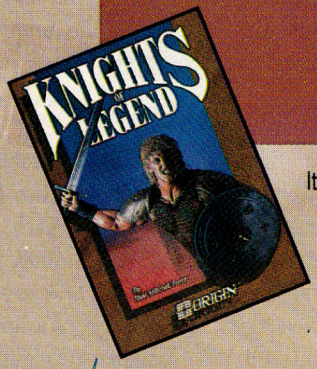

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Rating: ◆ ◆ ◆ ◆ ◆

A hard drive may seem like a luxury to those who have never owned one. After you've used a hard drive, though, your computer will seem amateurish without one. Hard drives let you organize your programs and data, and offer a tremendous boost to your productivity. No matter what your dealer says and no matter how your checkbook wishes it weren't so, the Apple II virtually requires a hard drive—so says today's software, so says the hardware, and so says the operating system—three tough arguments.

Applied Engineering presents an elegant solution—the racy new Vulcan, the fastest drive currently available, laden with features. The unit fits inside your computer and replaces the power supply; besides adding megabytes of storage, it enhances your system's power and increases the cooling air flow within your computer. The Vulcan sets a new performance standard for hard drives; among other trade-offs, however, it carries a price tag to match its abilities.

ADVANCING THE ART

The true test of a hard drive lies in its ease of use and maintenance. In that respect, the Vulcan brings together a more complete package than any of its current competitors.

Installation is a snap—literally. Lift your old power supply out and snap the Vulcan in. Slide the interface card into any available slot and it's time to power up. The drive comes formatted and ready to boot into the desktop. On the Apple IIGS—which requires the use of several unoccupied expansion slots for things like the mouse—the Vulcan lets you insert its interface card into a "used" slot. Then it accesses a software utility to make the computer think the card is installed in slot 7.

Out of the box, the Vulcan will provide you with however many 32-megabyte ProDOS volumes (the largest possible ProDOS volume) the unit you bought will fit, plus one smaller volume. For instance, the 100-megabyte Vulcan gives you three 32-megabyte volumes and one 4-megabyte. If you like you can change this setup with the utility software included with the drive.

VOLUMES OF DATA

You can configure any combination of ProDOS volumes, as many as two Pascal volumes of up to 16 megabytes each, and DOS 3.3 volumes with 140K and 400K partitions. Pascal volumes—no matter how large—are restricted to 77 files because of a limitation in Pascal itself. You can have up to eight partitions active at one time. If you have one of AE's PC Transporter cards, you can also use the Vulcan (or any ProDOS hard drive) as an MS-DOS device.

On the GS, the Vulcan's built-in firmware automatically creates a classic desk accessory

Continued on p. 36

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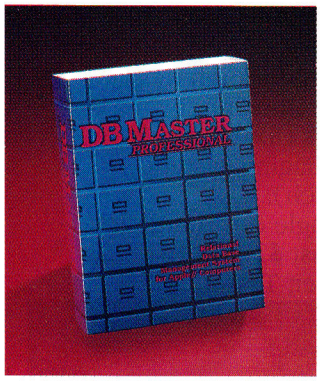
PROGRAMS & PERIPHERALS



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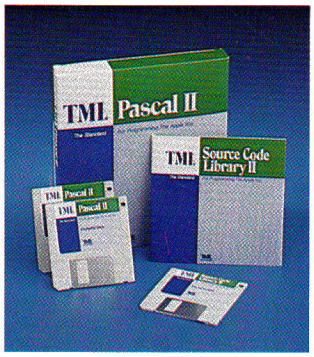

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L & L GBBS .....79.
United Software Industries
ASCII: Express Pro: Prodos .....72.
ASCII: Express Mousetalk 1.5 .....69.

Fractal Explorer by ECLAT Microproducts

An easy to use, fractal creation program which includes a flexible slideshow with dazzling color effects. No numbers to enter. Includes an informative and educational instruction manual. Online help menus and prompts guide the user along the way to create and display striking fractal pictures derived from the Mandelbrot and Julia set. Compatible with popular paint programs. ..... **$28.**

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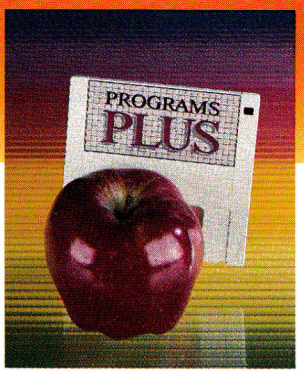
OVERNIGHT



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Specials good through Jan. 31, 1990

InnerDrive by Applied Ingenuity

InnerDrive is the original internal hard disk for the IIgs. It comes with a heavy duty power supply, cooling fan and controller card. Already formatted, it requires about 5 minutes to install and it's ready to run. The leader in performance and affordability, it's the fastest and the lowest cost hard disk system. Uses standard GS/OS. Available for the IIe and is compatible with Prodos, Dos 3.3 and MS Dos.

PRINTERS

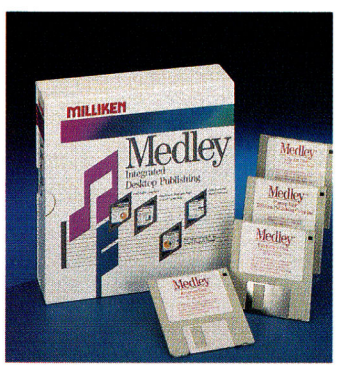
Apple
ImageWriter II ..... 459.
Brother
M-1109AP *(ImageWriter Comp.)* ..... 249.
Laser Computer, Inc.
Laser 190A w/Serial Interface ..... 239.
Panasonic
KXP-1180I/M2 *(192 cps)* NLQ Mode ..... 199.
KXP-1191I/M2 *(240 cps)* NLQ Mode ..... 269.
Seikosha
Seikosha SP 1000
(Imagewriter Compatible) ..... 235.

Thunderscan by Thunderware

Thunderscan transforms any ImageWriter printer (except the LQ) into an inexpensive, high-quality scanner. All you need is a IIe, IIc, IIc+ or IIgs to turn any printed image into a 16 gray shade, high-resolution Apple II graphic - the highest resolution of any Apple II scanner. And ImageWriter and LaserWriter printer drivers allow for actual size. Now *Thunderscan* offers Apple IIgs specific software. .. **$159.**

GRAPHICS PACKAGES

Abracadata
Design Your Own Train ..... 35.
Design Your Own Home: Architecture *(IIgs)* or Interiors *(IIgs)* ..... 59.
Design Your Own Home: Landscape *(IIgs)* ..... 59.
Design Your Own Home: Architecture, Interiors or Landscape ..... 47.
Architecture Library 1, 2, 3 or 4 *(AP or IIgs)* ... 21.
Interiors Library 1, 2 or Landscape Library 1 ..... 21.
Activision
PaintWorks Gold or Draw Plus ..... 66.
Paint/Write/Draw *(Not Protected IIgs)* ..... 80.
Baudville Award Maker Plus *(IIe & IIgs)* ..... 24.
816/Paint *(Works On All Apples)* ..... 46.
Beagle Bros. Beagle Draw *(IIgs)* ..... 52.
Berkeley Softworks GEOS *(C+)* ..... 79.
GEOPublish ..... 65.
GEOS, GEOCalc or GEOFile ..... 45.
Broderbund Dazzle Draw *(AP or C+)* or Show Off *(IIgs)* ..... 39.
Print Shop *(AP or C+)* or Fantavision ..... 29.
Print Shop *(IIgs)* or Fantavision *(IIgs)* ..... 39.
Print Shop Companion ..... 25.
Print Shop Graphics Library I, II, III or Holiday Ed. ..... 16.
Print Shop Graphics Lib. Sampler Ed. *(IIgs)* .. 24.
Print Shop Graphics Lib. Party Ed. *(IIgs)* ..... 24.
Eclat Fractal Explorer *(AP or IIgs)* ... ***Special*** 28.
Electronic Arts DeluxePaint II *(IIgs)* ..... 65.
DeluxeWrite w/DeluxePaint II *(IIgs)* ..... 85.
DeluxeWrite *(IIgs)* ..... 52.
EPYX Art & Film Director *(IIgs)* ..... 55.
Printmagic *(AP or C+)* ..... 34.
Create-A-Calendar ..... 21.
Lynx Computer
Supergraphix 256 w/music *(IIgs)* ..... 69.
Roger Wagner Graphic Exchange *(IIgs)* ..... 35.
So What Software Iconix *(IIgs)* ..... 35.
Springboard
Certificate Maker Library #1 ..... 19.
Springboard Publisher 2.0 *(IIe or IIgs)* ..... 79.
Certificate Maker or Newsroom ..... 26.
Fonts For Springboard Publisher *(IIgs)* ..... 19.
Newsroom Clip Art Collection Vol. 1, 2 or 3 ... 14.
Thunderware
Thunderscan Apple *(IIgs, IIe, & IIc)* ***Special*** 159.



Medley by Milliken Publishing

Medley, a powerful desktop publishing program gives you word processing, page layout, and graphics. Twenty fonts, a dictionary and thesaurus are available with Medley's word processor. Medley's page layout program automatically wraps text around any object. Artwork and digitized pictures import easily into *Medley*, or create original art using Medley's powerful art tool. For the IIgs. ..... **$79.**

TimeOut TeleComm by Beagle Bros.

Log on to your favortie information service right inside AppleWorks — with ***TimeOut TeleComm***! Just cut and paste your captured text from the review buffer into an AppleWorks file, or send from any word processor file on the desktop. Keep your commonly used phone numbers in a data base and *TeleComm* will dial the number for you — and send your login sequence when the connection is made! ..... **$45.**

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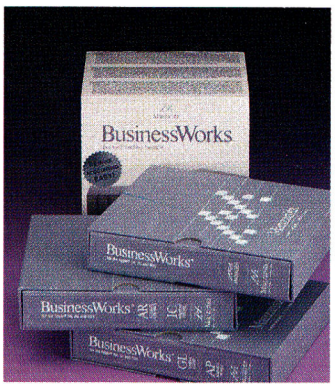
Laser Computer, Inc.
Laser 128 Computer ..... 369.
Laser 128 includes an Expansion Slot, RGB Video Output, Parallel Printer Port, and a 10 Key Numeric Keypad!
Laser 128EX Computer ..... 399.
Laser EX includes a Built-in RAM Expansion Board, Universal Disk Controller,Built-In Expansion Slot,and Ports for all Peripherals!
Laser 128EX II Computer *(5¼ or 3½)* ..... Call
Laser 190A Printer w/Serial Interface ..... 225.
Laser RGB Monitor ..... 299.
Laser Amber Monitor ..... 95.
Laser 128 Disk Drive *(IIgs)* ..... 105.
Laser 128 2nd Disk Drive *(5¼", ½ height)* ..... 95.
Laser 128 800K 3.5" Drive w/Controller ..... 219.
Laser 128 Cables *(Parallel, Serial, RGB or Modem)* ..... 16.
Laser 128 Mouse ..... 45.



BusinessWorks Bundle by Manzanita

BusinessWorks is the accounting package for small and medium size businesses. Combining G/L, A/P, A/R and inventory control in one flexible package. *BusinessWorks* lets you set up your accounts the way you want. Customize your reports to display the information you want displayed. *BusinessWorks* looks and acts like AppleWorks. *BusinessWorks* is the accounting solution for the Apple II. ..... **$269.**

UTILITIES & LANGUAGES

Absoft AC/BASIC *(16-bit BASIC Compiler for IIgs)* ..... 84.
Big Red Computer
PS Lovers' Utility Set *(AP or IIgs)* ..... 27.
Micol Systems
Micol Advanced Basic *(IIgs) V3.0* ..... 89.
Roger Wagner
SoftSwitch *(IIgs)* ..... 39.
Merlin 8/16 *(IIe, IIc, IIgs)* ..... 75.
So What Software
Disc Commander *(IIgs)* ..... 29.
Hyper Launch *(IIgs)* ..... 35.
Call-Box *(IIgs)* ..... 69.
The Byte Works
ORCA/M Assembler *(IIgs)* ..... 39.
ORCA/Pascal Desktop Debugger *(IIgs)* ..... 80.
ORCA/C Desktop Debugger *(IIgs)* ..... 80.
ORCA DeskTop *(IIgs)* ..... 34.
ORCA/Disassembler *(IIgs)* ..... 32.
TML Systems
TML Basic *(IIgs)* ..... 82.
TML Pascal II *(IIgs)* ..... ***Special*** 82.
TML Source Code Library II *(IIgs)* .... ***Special*** 35.
TML Speech Toolkit *(IIgs)* ..... 45.
Zedcor
ZBASIC 4.0 Interactive Compiler ..... 39.

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Continued from p. 30

(CDA) with which to manage the drive. It functions identically to the ProDOS software, with the added convenience of a CDA.

On the utilities disk, you'll find a patched version of ProDOS 8 that lets you access eight volumes. (Four would normally be the limit.) A patched version of DOS 3.3 lets you issue an INIT command for volumes on the hard drive, and also fixes a couple of lingering bugs in DOS 3.3.

Once you have your drive volumes configured, you get to a unique set of features. You can turn volumes on and off (in case you have more than eight partitions), "write-protect" volumes so that you can't erase any information from them, and specify the volume to boot at startup.

MANAGEMENT ISSUES

To protect against loss of data, you should back up your hard drive regularly. For this, the Vulcan provides Apple's sturdy Backup II (and for DOS 3.3, a modified version of FID). This brings us, however, to an inherent weakness. There's no Apple II utility software truly suited to maintaining a modern hard drive. Using a combination of utilities, you can get the job done vaguely and slowly. For instance, my source-code library is composed of about 1700 files arranged into some 80 subdirectories, occupying about 20 megabytes. Quick now, how do I find the file I wrote a year ago containing routines to manage windowing in ORCA/Pascal? How do I compare it to files containing similar routines in any of nine other languages? Painstakingly—that's how.

Hard drives—whether a 20-megabyte or a 200-megabyte—need a second-generation file-management utility. You need to be able to search, sort, and manipulate the thousands of files and subdirectories one of these units will hold. The Vulcan shares this shortcoming with any other mass-storage device, but that doesn't excuse it. Applied Engineering has put together the most complete set of utilities to date for an internal hard drive that leads the market in every other way. Now the company needs to take the important step of finishing the job.

LIFE IN THE FAST LANE

Twelve seconds to the GS Finder; 10 seconds to AppleWorks GS. Sounds good, doesn't it? It is. The Vulcan walks all over the competition. Hard-drive speed is usually measured in average access time (how fast it can locate information), but that doesn't provide a realistic measure of how a drive performs under standard system use. The Vulcan's traditional access times are 68 milliseconds for the 20- and 40-megabyte units, and 28 milliseconds for the 100-megabyte drive. That sizzling speed is achieved thanks to a high-quality internal tracking unit. The 100-megabyte model also employs caching; the GS adds a custom driver for an ultimate effective rate of 12 milliseconds.

What does all that mean to you? It means the Vulcan is two or three times as fast as the fastest SCSI drives currently available, and seven times faster than most Apple II hard drives. It means that on a GS with a TransWarp accelerator and the 100-megabyte Vulcan, your hard drive will actually be faster than your RAM card. That's fast.

EXTRAS

Other features of the Vulcan include a replacement 70-watt power supply (as opposed to the stock 40- to 60-watt units), a built-in cooling fan, enhancements to support the Apple II Plus fully, and compatibility with European power. You can also add an external "in use" light, or a mirror gizmo to turn your GS' green light red when your computer's accessing your drive. The Vulcan's compatible with CP/M, as well—though that statement is somewhat misleading. It works, but you have to buy AE's version of the operating system, which makes several patches necessary for use with the Vulcan.

You can upgrade your drive to a larger model if you ever outgrow yours. Applied Engineering will actually replace the entire inner assembly of the drive and copy the contents of your old unit to the new platter. The cost is the difference in list prices between the units plus a handling fee.

INTERNAL VS. EXTERNAL

The final performance issue you must consider is that the Vulcan is an internal hard drive. Internal drives are nice—they fit right into the CPU case, out of sight and out of the way. With AE's internal drive, you also get a souped-up computer out of the deal.

An internal drive, however, is like an inground swimming pool—it's great to have, but it goes with the house. External hard drives, on the other hand, are a transferable investment. If you change computers, you change hard-drive interface cards, not hard drives. ►

AT A GLANCE

Joshua's Reading Machine (December 1989, p. 121, by Carol Holzberg), Compu-Teach, 78 Olive Street, New Haven, CT 06511, (800) 44-TEACH, (203) 777-7738; 128K Apple IIe, IIc, IIc Plus, IIGS; $39.95
Rating: ◆ ◆ ◆

Joshua's Reading Machine encourages kids to practice reading with *Mother Goose Rhymes*, traditional children's songs, and *Aesop's Fables*. Each category presents several familiar titles, such as *Mary Had a Little Lamb*, *Hey Diddle Diddle*, *The Farmer in the Dell*, *The Boy Who Cried Wolf*, and *The Tortoise and the Hare*.

Children begin by picking a category: Songs, Fables, or Rhymes. Each section then presents a menu of nine exercises, all designed to reinforce reading mastery. Exercises are sequential—each is slightly more difficult than the preceding one and builds on previously learned skills.

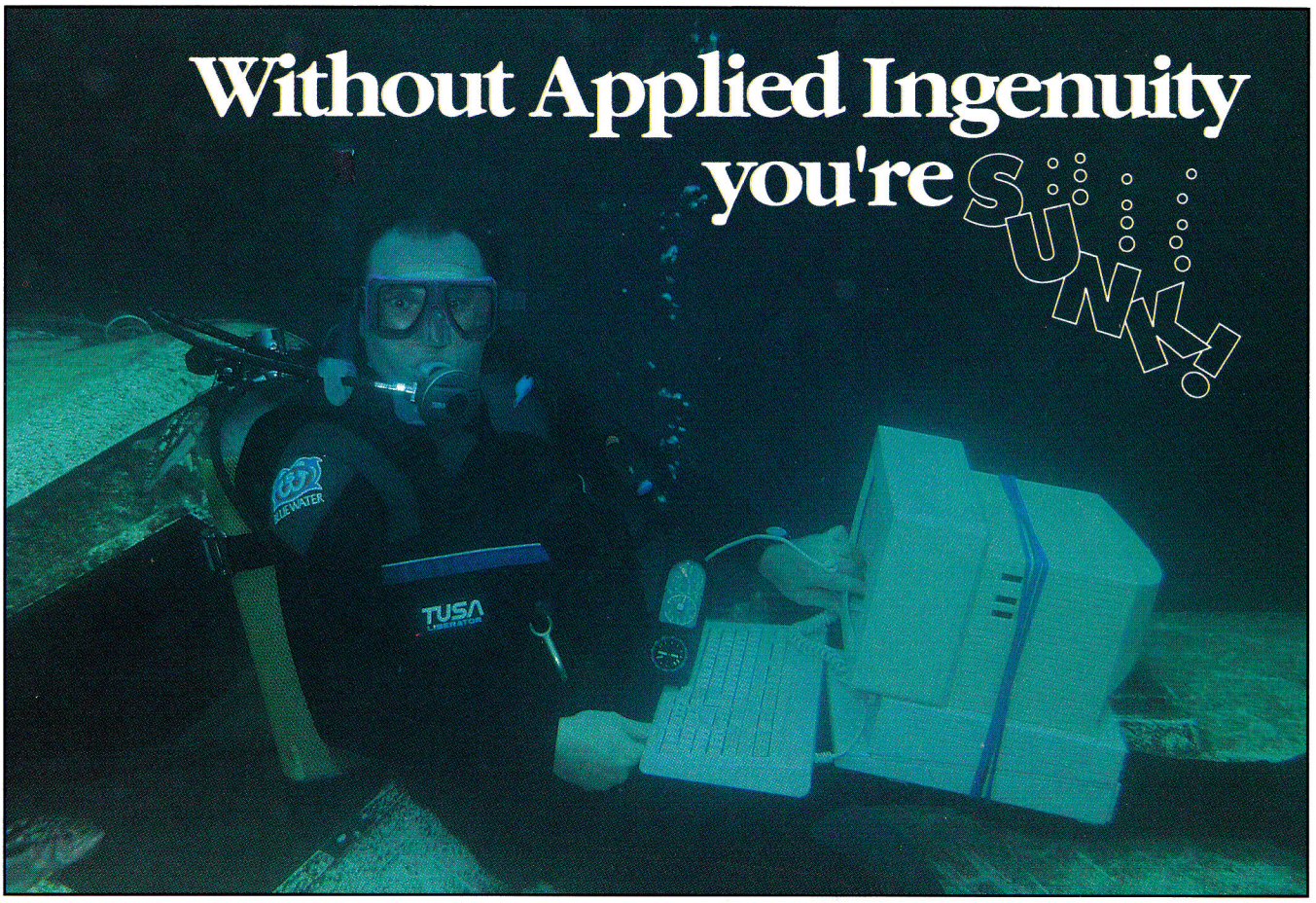
Joshua's Reading Machine is simple to operate. Kids need to use only three keys to move from section to section. They probably won't be able to work entirely without adult supervision, though, because there too many menus to read. Grownups will have to assist nonreaders with some of the menu options.

Kidwriter Golden Edition (December 1989, p. 43, by Carol Holzberg), Spinnaker Software, One Kendall Square, Cambridge, MA 02139, (617) 494-1200; 768K Apple IIGS, printer required; $49.95
Rating: ◆ ◆ ◆ ◆

Kidwriter Golden Edition lets children design colorful storybooks complete with backgrounds and illustrations. Youngsters can print individual pages or entire books, or present the pages as colorful slide shows with musical accompaniment.

Children begin by clicking on the *Background* button and selecting any of 18 possible scenes—such as a stage, alpine or jungle settings, the interior of

Continued



Diver: David Westbrook, President of Applied Ingenuity. Photo: Phil Blood of Adventure Diving Center, San Dimas.

Ever get the sinking feeling that you are paying too much for your hardware? Like a breath of fresh air Applied Ingenuity makes quality affordable.

Applied Ingenuity started a revolution with the first low cost hard drive and we continue to supply innovative products that will enhance your Apple computers capabilities.

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InnerDrive: The first internal hard disk for the IIgs. It's 100% compatible, fast and affordable. InnerDrive has proven effective, with more than a year of service and thousands of units sold. Our heavy duty power supply works automatically with all voltages. Unlike others it is cool running and features the first 16 bit data transfer for a IIgs hard drive. InnerDrive supports 8 partitions and unlike the competition, utilizes a visual drive indicator. InnerDrive is ProDOS and DOS 3.3 compatible.

OverDrive: Compact, and fast, we designed this low cost external hard drive for the IIe, II+, Laser 128, and IIgs.

Juice Plus: Up to 4 megabytes of memory for your IIgs. 100% Apple and DMA compatible.

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Circle 54 on Reader Service Card.

When you're talking about $1800, you don't want to have to repeat the purchase if your work should require you to move to a Macintosh or IBM clone.

The other problem with an internal hard drive is that it won't support a network. You can run the Vulcan as an isolated drive in a machine connected to an AppleTalk network, but you can't make it the host hard drive in a network. Who but a school would need this capability? Many people choose, for instance, to keep their old IIe when buying a GS, and don't want to have to buy a hard drive for each machine. You may develop an interest in running a bulletin board. You can pick up an old II Plus or IIe for a couple of hundred dollars and use it to run the board sharing an existing external drive. You may not know where your interests and expertise will be in three years, but you can bet you'll have the same external hard drive.

ELEGANCE AND EXPENSE

The Vulcan is a hard drive in the grand tradition of the Apple II—elegant, innovative, flexible, and in all aspects the leader of the field. That brings us to the price.

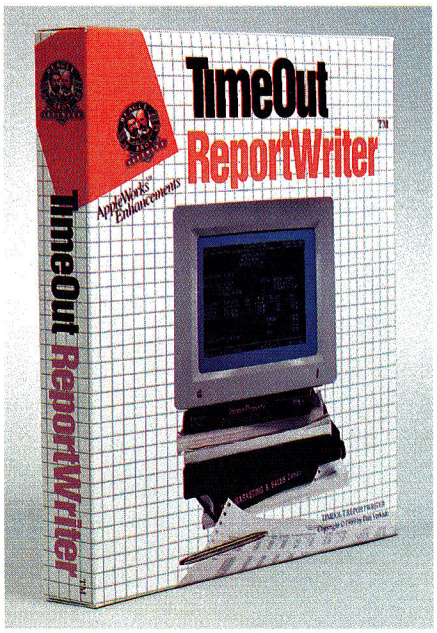
Whenever Applied Engineering does something, it does it right. Then the company puts a matching price tag on the product. I'd like to stress, however, that the Vulcan isn't that expensive as far as hard drives with comparable features go, and this is one area in which you most certainly get what you pay for.

You can buy a good, basic, external 60-megabyte SCSI drive with 40-millisecond access time and network capability for $800. Add $100 if you don't have a SCSI card. Better yet, you can build your own hard drive. You can get 20 megabytes for about $300, 100 megabytes for about $800. That's $1000 cheaper than the 100-megabyte Vulcan (or about $600 cheaper than the price you'd actually end up paying for it). That doesn't mean you should rush to the phone and start ordering parts. Homebrews are easy to build, but putting the software utilities together takes patience.

I've used a lot of different hard drives and the Vulcan is the best, and Applied Engineering is a most reputable and responsive outfit. Should you buy a Vulcan? Sure, as long as you're aware of the alternatives. All things considered, it looks as though Applied Engineering has done it again.

Joe Abernathy
Houston, TX

TIMEOUT REPORTWRITER



Beagle Bros,
6215 Ferris Square, Suite 100, San Diego, CA 92121, (619) 452-5500

Relational report generator for AppleWorks; 128K Apple IIGS, IIe, IIc, IIc Plus; AppleWorks (version 2.0 or 2.1); $79.95

Rating: ❖ ❖ ❖ ❖

Over the years, AppleWorks has undergone several facelifts to improve its performance—a number of upgraded versions and a variety of third-party add-ons that add muscle. The most notable of those extras are Beagle Bros' TimeOut enhancements, which plug some operational gaps by providing such functions as a spelling checker, a thesaurus, bit-mapped typefaces, and keyboard macros. Now comes TimeOut ReportWriter, a utility that lets AppleWorks do something it never could before—combine data from several unrelated word-processor, database, or spreadsheet files, for true "relational" potential.

Like the other TimeOut applications, ReportWriter's a "pop-up": You install it on your AppleWorks program disk, and call it up within the program by pressing Open apple-Escape and selecting *ReportWriter* from the TimeOut menu.

CAN YOU RELATE?

Before ReportWriter came along, AppleWorks files consisted of "flat" or discrete ►

AT A GLANCE

Continued

a cave, outer space, a tropical island, or the interior of a house. The program also includes a blank background so that youngsters can create their own. Once kids decide on a background, they can call up an icon-based clip-art menu organized by category—transportation, weird creatures, vegetation, animals, people, letters, and numbers, for instance.

When your kids have completed the illustration, they're ready to call on Kidwriter's word-processing tools to add text at the bottom of the screen. Children can also enter text anywhere on the background as long as the cursor appears in the shape of a square. If it looks like a pointer, click on the ABC icon to invoke text mode.

Monsters & Make-Believe (December 1989, p. 40, by Jerry Greer), Learning Lab Software, 2100 Nordhoff, Chatsworth, CA 91311, (800) 222-7026 (CA), (800) 247-4641; 128K Apple IIe, IIc, IIc Plus, IIGS; color monitor and printer recommended; $39.95 nontalking, $49.95 talking
Rating: ❖ ❖ ❖

Monsters & Make-Believe lets children design and build critters out of a wide variety of bodies, heads, legs, arms, eyes, noses, and mouths displayed on screen. They can select any parts from the assortment, and only their imaginations will limit the possibilities. They can also place their monsters against several backgrounds—including a blank screen and one with a scary castle.

After your kids have completed a monster, they may select one of several speech bubbles. Once that's in place, they can type a message within it, or enter text on the blank background to use in picture storybooks. They can make changes and corrections with the built-in mini word processor, then save final versions of drawings and stories to disk. One especially noteworthy feature is

Continued

The Power and the Glory

Vulcan internal hard drives are not only the fastest hard drives on the market, they're the most powerful. By a long shot. Vulcan's built-in power supply was custom-designed by Applied Engineering to provide the power other systems (and your unenhanced Apple II) lack.

Sheer, raw power

A typically enhanced Apple II system (with 3 or 4 expansion cards) needs a heavy duty power supply. Vulcan's power supply is rated at more than 70 watts. *Double* the capacity of other hard drives and double the native capacity of your Apple. The power supply components are heatsinked to the aluminum case, and to harness all that power, Vulcan incorporates an ultra-quiet, flush mounted cooling fan.

Unmatched speed

For speed, Vulcan incorporates an ultra-fast 16-bit data bus controller, not the less expensive 8-bit others use. The result? You'll load AppleWorks GS in less than 14 seconds. Boot GS/OS into the finder in 18 seconds. Verify disks at the astounding rate of more than 180 blocks per second. Vulcan wins any speed test.

Upgradeable Flexibility

Choose a Vulcan from 20, 40, 100 — all the way to a staggering 200 MEGs. Vulcan is upgradeable, so it grows as your needs grow. And we don't mean by daisy-chaining additional hard drives. When you upgrade Vulcan, you pop one out and *replace* it with another.

Use virtually any operating system: GS/OS (v5.0 is included), ProDOS 8, DOS 3.3, CP/AM or Pascal 1.3. Vulcan supports them all with sixteen partitions (access four simultaneously). Choose slot 1, 2, 4, 5, 6 or 7. Even pseudo-slot to slot 7 from elsewhere. Vulcan works on 110/220 VAC, even European 115/230 VAC at 50-60 Hz.

Easy to use

Vulcan simply pops in; replacing the Apple power supply under your computer's hood. Our built-in firmware automatically installs itself as a Desk Accessory for write protection and partitioning. The software we provide lets you easily park heads, back up and reformat.

Vulcan gives your Apple IIGS, IIe, II+ or II an upgradeable combination of useable speed, safe power (it's FCC certified) and practically unlimited size. It's a powerful and glorious advance into the Apple II future.

Order today!

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

Vulcan 20 MEG	**$699**
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AT A GLANCE

Continued
that kids are encouraged to use their creations after printing them—as pictures to color, for instance.

Teleworks Plus (December 1989, p. 32, by Joe Abernathy), Activision, 3885 Bohannon Drive, Menlo Park, CA 94025-3048, (415) 329-0800; 768K Apple IIGS, modem required; $99.95
Rating: ◆ ◆ ◆

Teleworks Plus is the first product to marry GS Finder technology with the modem. It fits in as the only terminal software designed specifically for your GS. It operates completely under the standard GS desktop; you can manage an entire on-line session with the mouse and pull-down menus.

Teleworks offers some features unchallenged by other terminal programs.

Continued

file structures. You couldn't easily link data from separate files in different formats. With ReportWriter, you can incorporate information from up to 11 files into a single master file. Files need share only one common field to be joined.

For instance, teachers can create a master file that merges a database file of student names, addresses, phone numbers, emergency contacts, and so on with a spreadsheet file that calculates overall performance on tests, research assignments, and homework. Corporate users can merge information from an electronic "rolodex" with financial details from an accounts-receivable spreadsheet to generate monthly invoices, complete with subtotals and number of days between any two dates.

You could also use ReportWriter to design parts lists, income statements, and purchase orders with boilerplate text lifted from a word-processor document. Because ReportWriter also includes a posting option, you could access an inventory file and generate a sales report that posts sales data in that file while subtracting items sold from the overall inventory list.

You can also customize several of ReportWriter's features with other TimeOut utilities. You can configure your disk drive for completed reports, accept or modify the character ReportWriter uses to delimit report fields, position ReportWriter to create new records during posting, and inform ReportWriter whether you're using Applied Engineering's Desktop Expander.

If you do have an Applied expansion card, note that ReportWriter requires version 3.1.4 or later of the company's Expander software to generate accurate reports.

If you have an earlier version, answer no to question 2 in the ReportWriter configuration menu (*Using the AE Expanded Desktop*). Otherwise, you may get some unexpected results. Technical support at Beagle Bros points out that ReportWriter may crash if you try to print large files (documents more than two screens wide and two screens long) when AppleWorks is patched with Expander versions earlier than version 3.1.4.If you answer no, you'll be able to print small files correctly until you secure an updated version of the Expander software.

AppleWorks then.

While old favorites are hard to part with, here's one exception.

Introducing the new AppleWorks® 3.0 program. It has the same look and feel of original AppleWorks plus dozens of new features. Like a super-fast spell checker. Advanced spreadsheet functions. More mailing labels across the page. Easier access to files. Built-in support for more printers and memory cards. An expanded clipboard, and much more.

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ReportWriter also eliminates the need to duplicate information from one file to the next. Data from one document are easily accessible by another. Duplication means wasted time, increased opportunity for error, and less available desktop space.

Begin by indicating the master file. Master files may retrieve information from database, spreadsheet, and word-processor files, but only database and spreadsheet files can be master files. Next, specify the other files, fields, or records that contain the information you need for your report.

The ReportWriter manual includes a tutorial to help familiarize you with features and operations. It teaches you how to design master-file report formats by defining report "fields" or data items. Each report can include up to 254 fields (considerably more than the 30-field limit of the AppleWorks database)—data files, calculations, or keyboard entries. Reports can be up to 127 lines long and 240 columns wide.

Reports larger than the conventional 79-column screen width will scroll horizontally, similar to the way the screen scrolls in the AppleWorks spreadsheet when the characters extend beyond the right edge of the screen (and similar to the way the database scrolls in AppleWorks 3.0). The space available on disk determines the maximum number of records any given report can hold.

Reports may contain up to seven different sections. ReportWriter uses special markers to separate one section from another, and the sections will always appear in the same order. If you don't want your calculations or notes to appear in the printed report, you can put them in a special work area.

Each section can include a title (at the top of a page or on a page by itself), a header or footer (with specific information on each report page), an area for the main body of data, one for subtotals, and one for a "closing," which prints after the subtotals at the end of a page or on a page by itself. For instance, businesses could use the closing area for an advertisement such as "Thank you for shopping at . . ."; educators can use it for personal notes such as "Looking forward to seeing you after Christmas break."

Use the ReportWriter Editor to define the

Continued on p. 100

At a Glance

Continued

The built-in scripting language is particularly strong; an auto-learn scripting feature lets you record procedures to manage an entire session or selected parts. One obvious use is to record the dialing and log-on process for any bulletin board you call regularly. You may also want to have your mail scanned and saved to disk.

With all its impressive features, Teleworks Plus has a number of operational problems, as well as a couple of features that could have been designed better. Despite its troubles, though, you'll come away from it liking it. In the middle of a work session at your GS, it doesn't seem as much of an interruption to go on line if you stay in the same desktop environment. Teleworks is tantalizingly close to breaking new ground, but for now the ball is in Activision's court. □

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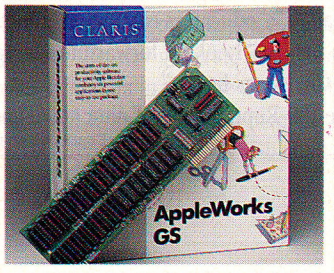

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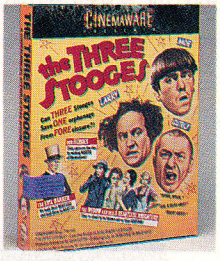

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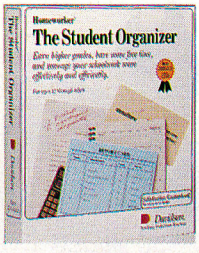

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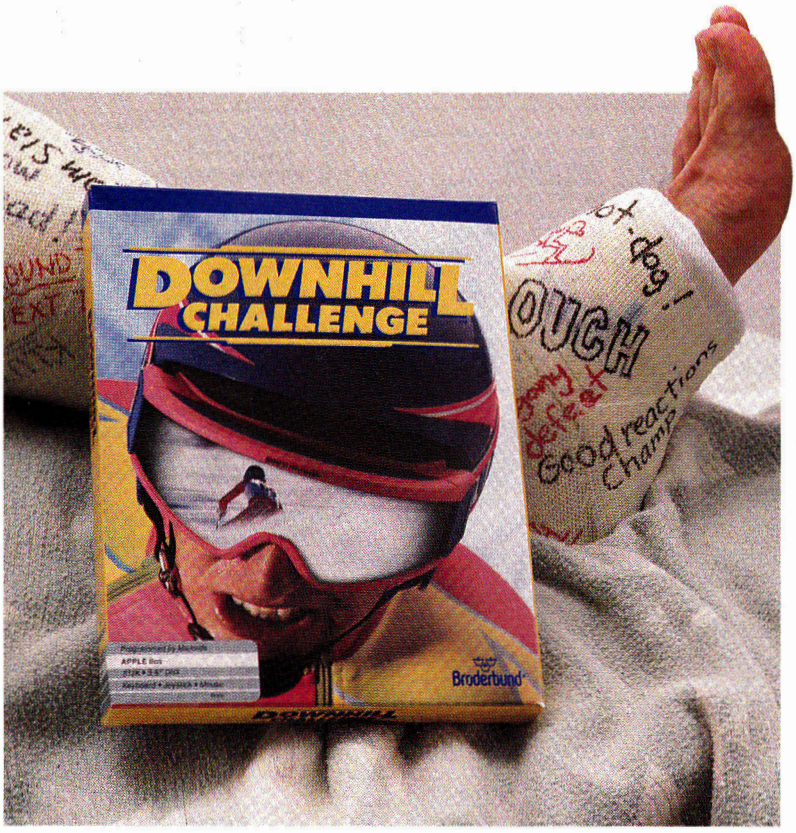


DOWNHILL CHALLENGE

Broderbund Software,
17 Paul Drive, San Rafael, CA 94903,
(800) 527-6263, (415) 492-3500

Skiing simulation;
512K Apple IIGS; joystick and color monitor recommended; $29.95

Rating: ❖ ❖ ❖ ❖

The best computer simulations—of whacking a golf ball or piloting a jet fighter—make me want to go out and do the real thing. A realistic simulation, then, is paradoxically a poor substitution. If it's that good it reminds me how much I enjoy the live sport. I haven't enjoyed downhill skiing for years. What once was thrilling now seems just dangerous. But Broderbund's Downhill Challenge took my breath away. It made me recall the sensation of throwing myself off a mountain with two boards strapped to my feet. What a panic—just like real skiing.

Downhill Challenge simulates ski racing. I raced mostly against the clock, but you can also compete with a friend. The animation is smooth and fast, so the game calls for total concentration. It's a simple simulation; you control your speed and direction, with the help of gravity. The challenge is that you can't judge how fast you should be skiing or in what direction. You always have to look down the course, anticipating what you'll do around the next bend or over the next mogul.

You can ski Downhill Challenge with the keyboard, joystick, or mouse. The joystick was the equipment of choice among *inCider* staff members, but you have to use the mouse between runs to select courses, check your scores, and take care of other business. That's like skiing into a patch of slush.

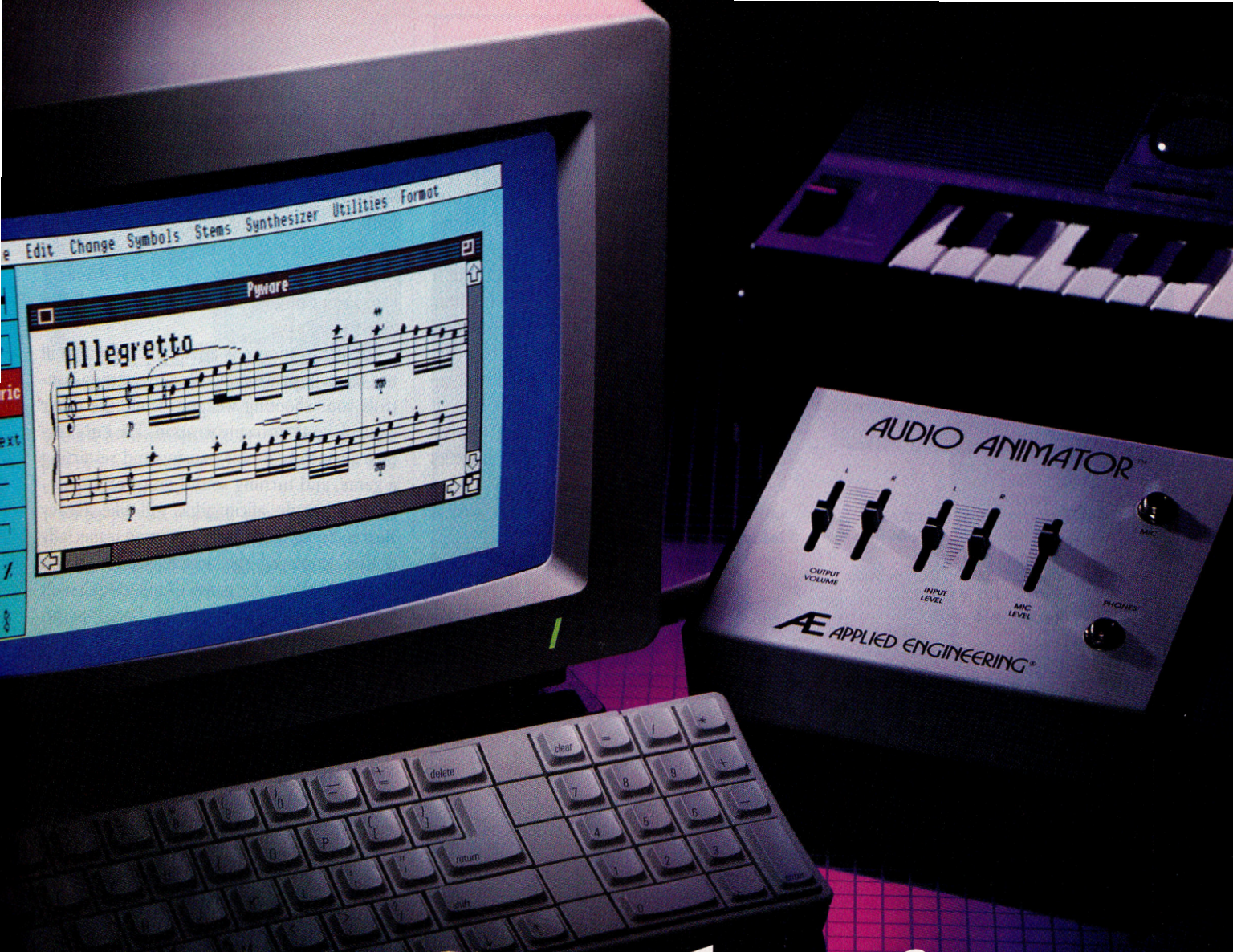
It's not hard to imagine a Downhill Challenge in which the mouse was the only interface; it would be a better game. I'm afraid that the selection of input devices, necessary in a simulation that runs on several different computers, doesn't help the game. A company called Microids wrote Downhill Challenge; if it follows up with a motorcycle game for the Apple IIGS, say, I hope it improves the interface.

After you conquer the downhill, slalom, and giant-slalom runs, the only remaining challenge is ski-jumping. This somewhat-misplaced Nordic event is the weakest part of Downhill Challenge—although you can have some spectacular crashes. What else can you do for excitement? Try a TransWarp accelerator card. It's like skiing on an icy cliff—it's fast and fun, but you'll probably die. If you're into that, it's a great challenge.

Broderbund could learn from Accolade's golf simulations and create "mountain" disks with some of the world's fastest, most difficult ski runs. And if Broderbund doesn't do that, I'll have to stand in lift lines again this winter, because Downhill Challenge has reminded me how much I like skiing.

Paul Statt
***inCider* staff**

Photography • Ed Judice



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512K Apple IIGS joystick and RGB monitor recommended; $49.95

Rating: ❖ ❖ ❖ ❖

Aliens, bugs, and monsters—they're everywhere. A race of *xenomorphs* (don't you just love that word) has invaded the three moons of Talos IV, and, naturally, it's up to you to get rid of them.

Although Xenocide's premise may not win any awards for originality, wait 'til you see it and hear it. Xenomorph is an impressive graphics and sonic achievement. (What I really mean to say is that it looks and sounds fantastic.)

There are four levels for each of three moons you must destroy. On the first, you guide your hovercraft over the alien-infested surface of the moon as you pick up ammunition canisters and destroy or dodge aliens along the way. When you reach the docking bay, you descend to cave level 1, where you fly throughout a cavernous maze to pick up five bombs you'll need later.

On cave level 2, you're underwater and need only find the keys that will let you through enough doors to get to the last level. Then in the bio lab, you plant the five bombs you picked up on level 2. Once that's done, activate the teleporter and get the heck out of there because three seconds after the teleporter zaps you out, all those bombs you planted go boom. If for some reason you don't make it into the teleporter on time, you'll have worse things to worry about than xenomorphs.

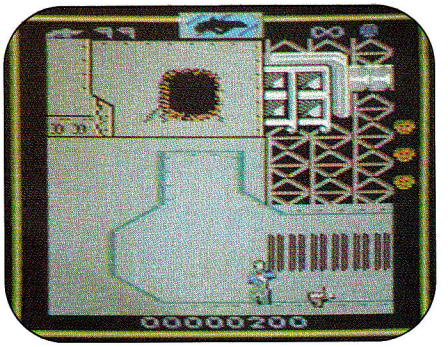
The hovercraft level's my favorite. Because that's the first level, it was naturally the one I played the most. The animated view through your windshield is amazing. You zip forward and backward dodging aliens and rock formations while the next moon looms over the horizon.

Your hovercraft is armed with missiles and fireballs, by the way, in case you don't feel like dodging whatever gets in your way. You can also just run into those pesky aliens, but I wouldn't recommend doing that too often. Besides beating on your hovercraft, you also get xenomorphs splattered all over your windshield, which makes it quite difficult to see where you're going.

Xenocide will keep you hooked. If the arcade action doesn't get you, the crisp graphics and dizzying animation will.

Lafe Low
***inCider* staff**

HEAVY BARREL



DATA EAST,
470 Needles Drive, San Jose, CA 95112,
(408) 286-7080

Arcade action;
128K Apple IIe, IIc, IIGS, joystick required; $34.95

Rating: ❖ ❖ ❖

Terrorists have taken over a nuclear missile site, and it's up to you to stop them. It won't be easy—they have the missile site's defenses at their disposal. The only weapon that can stop them is scattered in pieces across the complex, and you have to get the keys to assemble it and save the world. Sounds like a long night ahead as you play Data East's newest game, Heavy Barrel.

To stop the terrorists, you'll have to fight your way through 12 levels of enemy forces who attack with super weapons and vehicles. You can pick up additional firepower along the way by gathering keys from terrorists you've killed and opening locker chests placed throughout the game.

The graphics screens in Heavy Barrel have been improved over those in previous Data East titles, but not by much. The men are larger, but many of the weapons are small and hard to distinguish. The action is a little quicker. When a lot is happening on the screen, however, things slow down dramatically. You can get stuck and find yourself unable to move.

Joystick response is adequate, but can still use some improvement. One fire button controls your shooting weapon, while the other controls your throwing weapon. The only keyboard controls are for pausing and restarting a game, and turning sound on or off.

True arcade aficionados will like Heavy Barrel. Some may be disappointed, especially if they've played the arcade version. Even though some of the game's limitations result from limitations of the machine, Data East can still make some improvements—especially if the company wants Apple II game players to believe the slogan "Data East brings arcade realism home." Right now, I'll still travel to the arcade.

Tim Moore
Metairie, LA

NEUROMANCER GS

INTERPLAY,
1575 Corporate Drive, Costa Mesa, CA 92626, (714) 545-9001

Science-fiction adventure;
512K Apple IIGS; $49.95

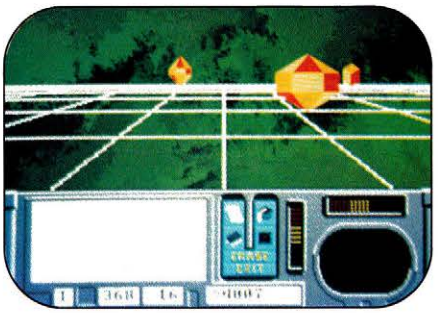
Rating: ❖ ❖ ❖ ❖

Better get your deck out. It's time to jack into cyberspace.

Interplay's Neuromancer is labeled as a "cyberpunk role-playing adventure." It draws much of its story from the novel of the same name by William Gibson. The game features a neat introductory sound track by Devo, good graphics, and quick animation.

You start off in Chiba city in the year 2058. Several people have disappeared, and you feel the answer lies in an area called "cyberspace," a dimension generated in your brain by your "deck," a futuristic portable computer. Private, corporate, and government information systems are hidden from common citizens in cyberspace and are heavily protected by special programs that keep electronic intruders out.

You begin the game by getting your deck back from the pawn shop, then accessing some ►



Descend into cyberspace with Neuromancer.

of those information systems. Talk to everyone you meet—you never know where you'll find valuable information.

Some people will sell you things such as skill chips, which plug into your skull and provide you with new abilities. (Where were they when I was in school?) Other people will return borrowed items or exchange software with you.

Money is an important commodity in the future, and you'll need plenty of it; a special computer chip records credits from your bank account. Credits are the new form of currency; you use them to buy things, pay bills, and use your deck. Yes, every time you use your deck to enter the information systems in cyberspace, credits are deducted from your chip. Didn't they say nothing in life was free?

Game play is smooth and the action is fast and colorful. You move around and activate various options with the mouse and keyboard commands. Icons (Disk, Inventory, PAX, Talk, Skills, and ROM Construct) are small and sometimes hard to distinguish, but after you've played a few times, you'll become familiar with each one.

Other icons tell you the time, date, number of credits you're carrying, and your constitution level—sort of a health meter. (When it reads zero, you're dead.)

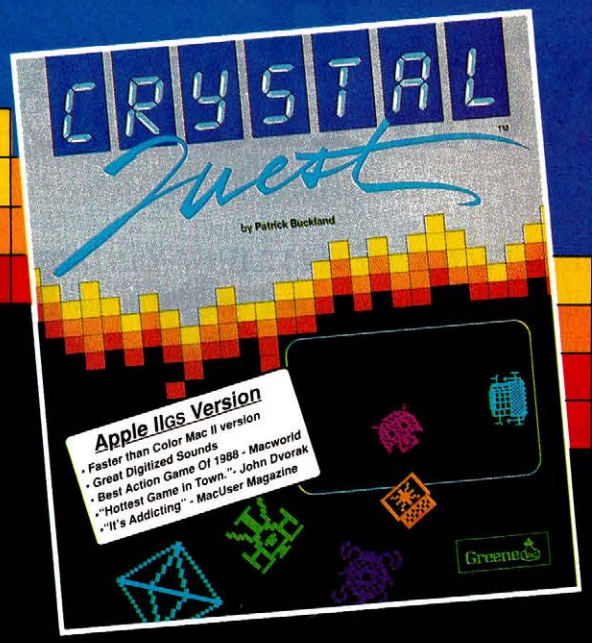
The program disk itself is noncopy protected, but the game uses a code wheel as protection. The reference card provides some interesting reading, but it's sometimes difficult to understand because of heavy use of terminology from the novel.

Overall, Neuromancer is excellent. Graphics screens are great and the animation is smooth. GS owners and science-fiction adventurers won't be disappointed. Delve into a futuristic cyberpunk world and put your computer skills to the test. See you in cyberspace.□

Tim Moore
Metairie, LA

NEW! for the IIGS

Hottest Game in Town!



Crystal Quest is the fast-moving, adrenaline-boiling Arcade Game that is driving everyone Crystal crazy. Crystal Quest has incredible digitized sounds. Your job is to collect all the crystals while avoiding mines, bullets, and 12 different kinds of nasties which chase you through more than 40 different waves! There are nasties that hide in corners and gush bullets like a hail storm. There are nasties that bob around quite harmlessly as long as you keep moving—but if you stop, they come at you like a cruise missile. There are nasties that can't be killed, but just hibernate for a while when shot. That's not very fair you say? That's right. It *is* a very nasty game!

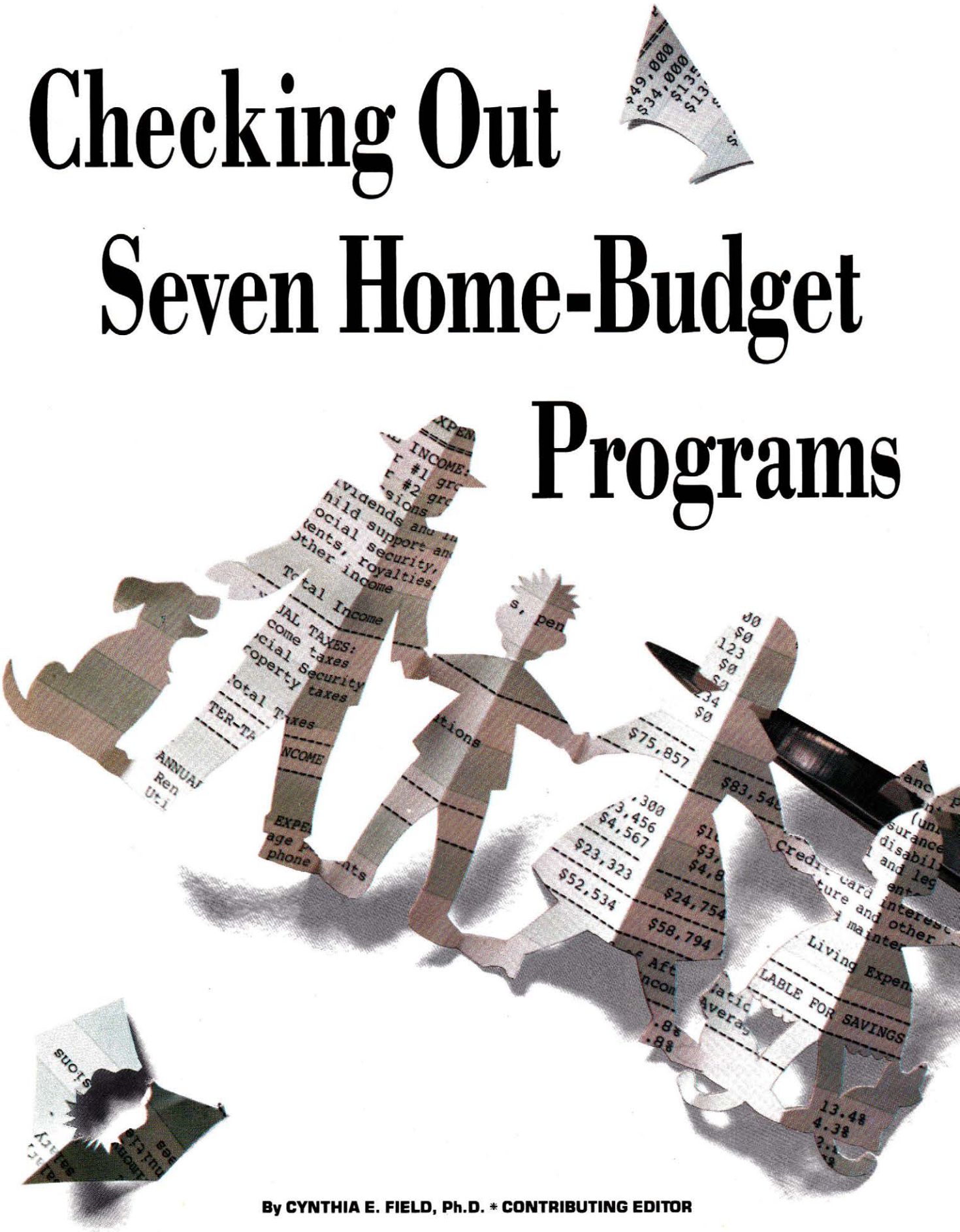
Available Now
Crystal Quest $49.95

Casady & Greene, Inc.
P. O. Box 223779, Carmel, CA 93922

information & orders
(408) 624-8716
orders only
(800) 359-4920

Circle 81 on Reader Service Card.

Checking Out Seven Home-Budget Programs

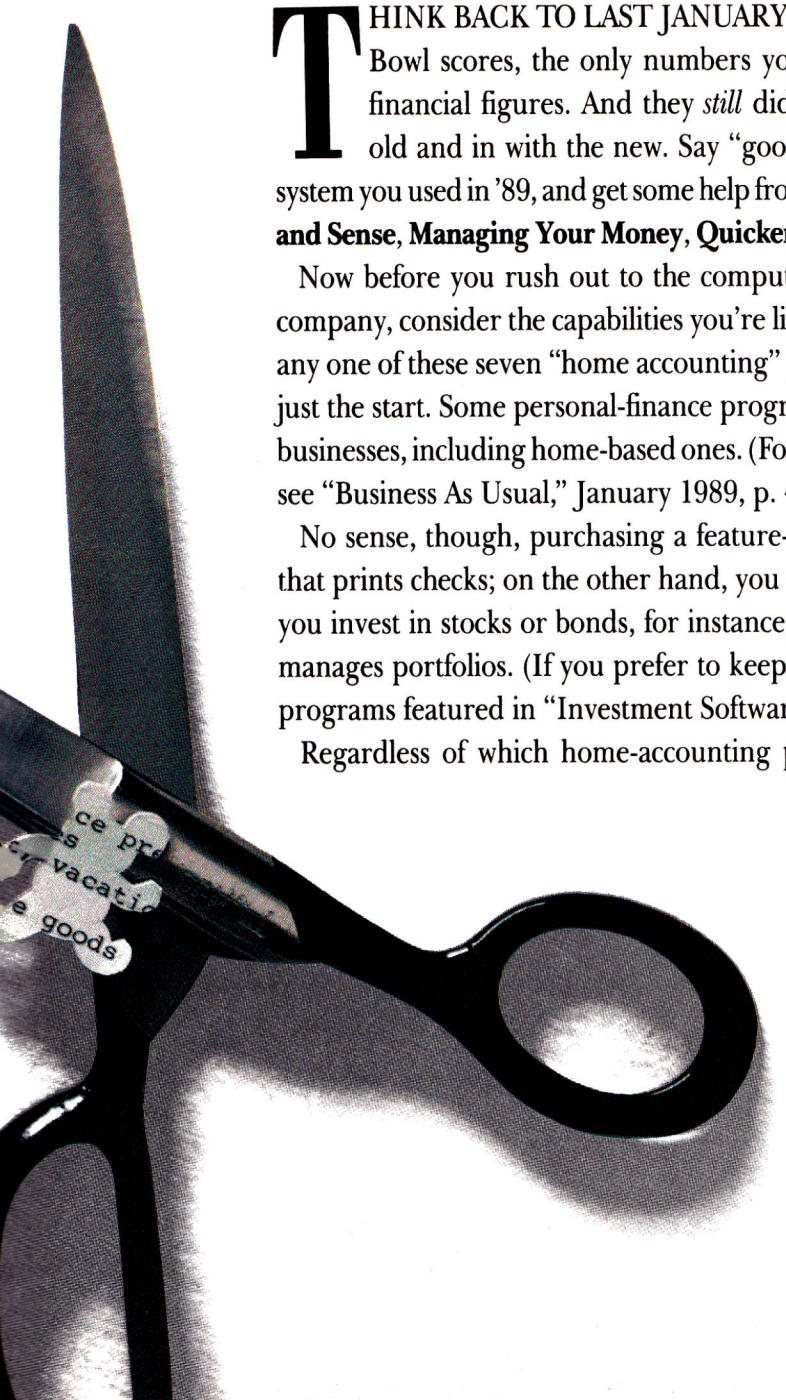


By CYNTHIA E. FIELD, Ph.D. * CONTRIBUTING EDITOR

FOCUS ON

FAMILY FINANCE

Get rid of those money-management headaches—if your monthly bank statement is always a surprise and your records are turning into a mountain of paperwork, invest in an Apple II personal-finance program.



THINK BACK TO LAST JANUARY. WHILE EVERYONE WAS TALKING ABOUT SUPER Bowl scores, the only numbers you were looking at were those endless columns of 1988 financial figures. And they *still* didn't make sense. This January, though, it's out with the old and in with the new. Say "good riddance" to the inefficient manual cash-management system you used in '89, and get some help from Apple II programs such as **Personal Accountant, Dollars and Sense, Managing Your Money, Quicken, Alpha Check, On Balance,** and **Smart Money GS.**

Now before you rush out to the computer store or dash off a check to your favorite mail-order company, consider the capabilities you're likely to need in a home-finance package. Not surprisingly, any one of these seven "home accounting" packages can help you balance your checkbook, but that's just the start. Some personal-finance programs are both capable and flexible enough to use in many businesses, including home-based ones. (For a look at accounting programs that are "strictly business," see "Business As Usual," January 1989, p. 40.)

No sense, though, purchasing a feature-laden product when all you want is an electronic ledger that prints checks; on the other hand, you want to steer clear of any program you might outgrow. If you invest in stocks or bonds, for instance, you may need a personal-accounting program that also manages portfolios. (If you prefer to keep separate tabs on investments, consider one of the dozen programs featured in "Investment Software," January 1988, p. 42.)

Regardless of which home-accounting program you select, plan on whiling away a few hours exploring its options. Most packages offer either interactive or printed tutorials, as well as on-line help if you reach an impasse. (In addition, none of the seven products reviewed here is copy protected.) Rest assured that if you continue to use the software, your financial fluency will improve with each passing week, as your Apple helps you pay bills, modify budgets, and track savings and investments.

FISCAL FITNESS

A central function of most personal-finance programs is checkbook management. These products adroitly post and sort transactions such as deposits, checks, ATM (automatic teller machine) fees, and bank service charges. Home-finance programs not only ►

can reconcile a checking (or savings) account with a bank statement, but can just as quickly tally annual heating costs.

The best financial-management programs do even more. Set up a custom chart of accounts and you'll be able to track not just income and expenses, but assets and liabilities, as well. These sophisticated programs let you create flexible budget reports (sometimes with bar graphs) and provide net-worth statements automatically. Best of all, checking, accounting, and budgeting capabilities are all integrated.

A majority of the programs reviewed here can create tax reports to help you get organized before April 15th, too. These reports summarily dismiss the shoebox and manila-folder methods of tax accounting, but they *don't* prepare your tax return. (For a look at a dozen programs that do, see "Tax Time: It's Closing

Feature-comparison chart for seven Apple II personal-finance programs

Y = yes; N = No.

	Alpha Check	Dollars and Sense 2.0	Managing Your Money 4.0	On Balance	Personal Accountant 2.0	Quicken	Smart Money GS 1.5
Operating System	ProDOS 8 1.4	ProDOS 8 1.5	ProDOS 8 1.5	ProDOS	ProDOS 1.1.1	ProDOS 8	ProDOS 16
Memory required	128K	128K	128K	128K	128K	128K	512K
Package disk size	5¼" or 3½"	3½" (5¼" hard-disk loader available)	5¼" & 3½"	5¼" & 3½"	5¼"	5¼"	3½"
Required	AppleWorks 2.0 or above	3½" or hard drive	2 drives	—	—	—	—
Recommended or optional	—	second drive, mouse, color monitor	—	mouse	mouse	—	768K RAM
Interface	"AppleWorks" file cards	traditional menu list	traditional menu list with open-apple-key selection	Mac-like pull-down menus	MouseText pull-down menus	"Apple-Works" file cards	"GS" Apple Human Interface pull-down menus
On-line help?	Y	Y	Y	Y	N	Y	Y
Data-entry method	single	single	single	double or single	double or single	single	double
Number of checkbooks	unlimited	12	varies with disk space, 10 typical	unlimited	unlimited	unlimited	unlimited
Number of accounts	varies with memory	120	varies with memory, 100 typical	200 maximum in 23 groups	—	unlimited	245
Number of transactions	varies with memory, 900 on 56K desktop	4000	varies with RAM and disk space, 308 "uncleared" transactions	850 per month	"thousands"	1000	—
Split transactions?	Y	Y	Y	Y	N	Y	Y
Tax deductions flagged?	Y	Y	Y	Y	Y	Y	Y
Income statement/ net worth?	Y/N	Y/Y	Y/Y	Y/Y	Y/Y	Y/N	Y/Y
Prints checks/ vouchers?	Y/Y	Y/Y	Y/Y	Y/Y	N/N	Y/N	Y/Y
Budget analysis/ bar graphs?	N/N	Y/Y	Y/N	Y/Y	N/N	N/N	Y/Y
Tax reports/ forecasting?	Y/N	Y/N	Y/Y	Y/N	Y/N	Y/N	Y/N
Loan & investment calculators?	N	N	Y	N	Y	N	Y
Portfolio & investment managers?	N	N	Y	N	N	N	Y
Insurance planner?	N	N	Y	N	N	N	N

In," March 1989, p. 50.) What else do the most full-featured—though not necessarily most expenisve—finance programs offer? About half the products tested provide calculators to help you assess, among other things, the-long term effects of refinancing your home or setting up an annuity. One program even projects your life expectancy and dispenses insurance advice.

Despite their differences, virtually all the programs mentioned here can print checks for you. Program developers know it's impractical to cart an Apple II to the grocery store, so these programs let you write checks manually and record them later on your computer. Likewise, you can print an individual check. Generally, though, it's a lot easier to schedule weekly bill-paying sessions and let the printer spew out checks in batches.

Most finance packages further automate the bill-paying process by eliminating some otherwise tedious data-entry steps. For instance, several programs look up the date (if your computer has a clock) or remember the date you typed at the beginning of the session. You may never have to type in a longhand amount, either—only the numerical one.

Get cozy with a program's "automatic transaction" feature so you won't have to type a payee's name or address again. Set up *recurrent bill* files, and the program will not only remember the information, it will remind you when payments come due.

MouseText-based interface, with program options listed in pull-down menus. You can use either the keyboard or the mouse. The program's default method of data entry is a modified double-entry system that tends to be confusing despite the short tutorial.

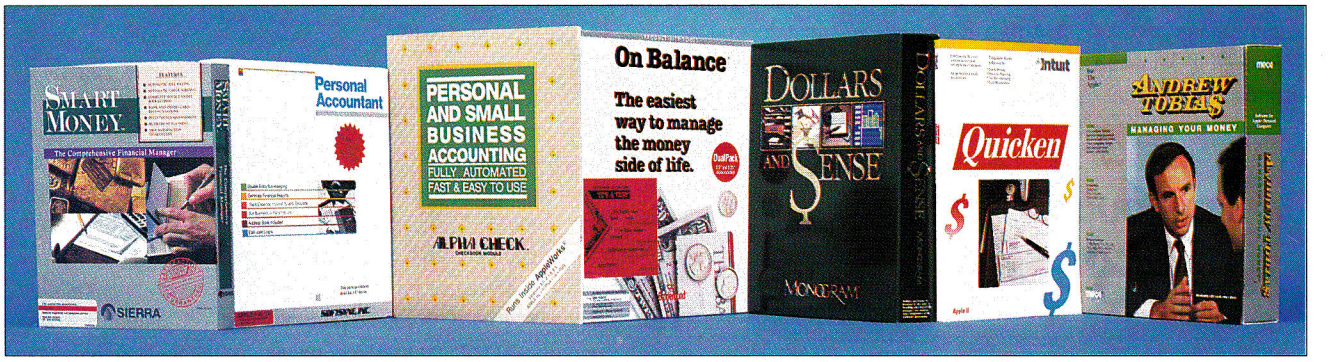
Personal Accountant is neither a complete checkbook manager nor a powerful investment adviser. It's a straightforward *accounting* program. If you want to track accounts (income, expense, loan, equity, and deposit) and generate standard reports, Personal Accountant may suit you. But if you want a program that among other functions prints checks, this one doesn't add up.

DOLLARS AND SENSE

This program's traditional menu-driven interface has one decidedly modern twist: the mouse as (optional) menu selector.

Although definitely beyond the basics, and not as intuitive as programs that comply with Apple Human Interface standards, Dollars and Sense isn't difficult to learn. The program provides general and specific levels of help on line, displays prompts at the bottom of the screen, and sports mnemonic open-apple commands. It also contains such extras as displaying and printing bar graphs and printing checks with vouchers (stubs) attached.

Homegrown financiers who want to get up and running right away will like the program's three ready-to-customize charts of



An Apple II personal-finance program can broaden your money-management options and simplify every aspect of home accounting.

We dare you—just once!—to print checks by computer (printer alignment tests are usually built into the software) and not be hooked. Ordering continuous-form checks is no more difficult than buying regular ones. Finance programs contain sample voided checks as well as an order form for authentic checks imprinted with your name, address, and account number. And bill paying isn't as painful, it seems, when you simply sign those checks and tuck them into double-window envelopes—one window displays your name and return address; the other window, the payee's name and address. Figure on springing about $55 for 250 checks and envelopes.

Not unexpectedly, each personal-finance program has its own style. The following capsule reviews are intended to help you gain insight into each program's significant, extraordinary, or unique capabilities. Find the program that appeals to you, then browse through the accompanying product-comparison **Table** to learn more about specific features.

PERSONAL ACCOUNTANT

Arguably one of the least sophisticated of the seven programs reviewed here, Personal Accountant nevertheless has an appealing

accounts: Household, Business, and Tax Preparation. Account categories include both numeric and alphabetic designations. Numbers help the program sort categories properly during report generation; plain-English names help you remember the accounts with which you're working.

MANAGING YOUR MONEY

In a class by itself, Managing Your Money probably performs every financial function you're likely to need—ever. Powerful features include checkbook maintenance with automated check printing, budget design and analysis, complete financial reporting, insurance assessment, and stock-portfolio management. There's also real-estate investment analysis, loan projection, and tax forecasting.

Not surprisingly, Managing Your Money's a little pricey. But the benefits—an easy-to-use, menu-driven interface with apple-key commands, ready-to-run examples in all program modules, and Andrew Tobias' expert knowledge (and refreshing sense of humor)—make the program a steal for wealthy-wannabees who intend to use most, if not all, of the program's features. And as if to sweeten the deal, Managing Your Money also ►

throws in an electronic to-do pad and the computer equivalent of a Rolodex-type file.

QUICKEN

Any individual or business owner looking to automate a checking account with the least fuss should put Quicken to the test. This popular program displays menus that look like AppleWorks filecards, and check facsimiles that look like the real thing. "Write" a check, press a few keys, and voilà—a batch of checks to sign.

Quicken, like other checkbook managers, is essentially a "smart" file cabinet. Depending on the entry you store in the check's "memo" section (and Quicken can memorize both often-used memos and recurring transactions), you can quickly prepare reports that track budget categories, monitor business expenses, and even organize information for your income-tax return. Like the other half-dozen programs reviewed here, Quicken can also convert check-register information to a form compatible with the AppleWorks spreadsheet.

ALPHA CHECK

A relative newcomer to the Apple II finance genre, Alpha Check is a lot like Quicken, but with one blow-your-socks-off difference: Alpha Check doesn't just transfer data to AppleWorks—it works *within* **AppleWorks**.

Alpha Check's gusto derives from the **TimeOut UltraMacros** programming language on which it's based. Fortunately, you don't need to know an iota of computer code, or even own the UltraMacros program for that matter, to enjoy Alpha Check.

PRODUCT INFORMATION

Alpha Check 3.0, $49.95
requires AppleWorks 3.0
update from Alpha Check 2.0, $7.50 plus $2.50 shipping and original program disk
Alpha Check 2.5, $39.95
requires AppleWorks 2.0 or 2.1
ACTAsoft
19700 Wells Drive
Woodland Hills, CA 91364
(818) 996-6731
(818) 786-9730

AppleWorks 3.0
Claris Corp.
5201 Patrick Henry Drive
P.O. Box 58168
Santa Clara, CA 95052-8168
(408) 727-8227
$249

Dollars and Sense 2.0
Monogram Software
531 Van Ness Ave.
Torrance, CA 90501
(213) 533-5120
$119.95

Managing Your Money 4.0
MECA Ventures
327 Riverside Ave.
Westport, CT 06880
(203) 222-9150
$149.95

On Balance
Broderbund Software
17 Paul Drive
San Rafael, CA 94903-2101
(800) 521-6263
(415) 492-3500
$59.95

Personal Accountant 2.0
Softsync, Inc.
162 Madison Ave.
New York, NY 10016
(212) 685-2080
$49.95

Quicken
Intuit
540 University Ave.
Palo Alto, CA 94301
(415) 322-0573
$59.95

Smart Money GS 1.5, $79.95
Smart Money, $79.95
128K IIe/IIc
Sierra On-Line
P.O. Box 485
Coarsegold, CA 93614
(209) 683-4468
(209) 683-8989

TimeOut UltraMacros
Beagle Bros
6215 Ferris Square
Suite 100
San Diego, CA 92121
(619) 452-5500
$59.95

Because this program is so intimately associated with AppleWorks, you can use familiar commands to get the job done, whether you're paying a stack of bills or monitoring your company's general ledger. Simply choose from options displayed in the AppleWorks-style stacking file-card menus. Writing checks is as easy as filling in the look-alike on screen—or zooming out to enter information directly into the check register.

Alpha Check prints check stubs and is compatible with checks you may have already purchased for use with other programs. Switch to Alpha Check and you won't have to trash your unused inventory. See? Already you're saving money.

ON BALANCE

With pull-down menus, dialog boxes, mouse input, and a black-on-white screen display, On Balance is an unusually flexible Mac-like program that manages to perform admirably and look good at the same time. No other program offers the freedom of choice On Balance provides. You can use the keyboard instead of the mouse, change screen appearance, use double- or single-entry bookkeeping methods, and name accounts whatever you like. The program also lets you group accounts and customize reports to suit your style. There's more: On Balance offers password protection, a four-function calculator, and a split-screen option for displaying bar graphs along with data. On Balance isn't fussy about your Apple II system, either, as the package includes both 5¼- and 3½-inch disks.

SMART MONEY

The only ProDOS 16-based program in the bunch, Smart Money is authentic *GS*. (An Apple IIe/IIc version is also available.) The program features seven pull-down menus: Apple, File, Edit, Data, Reports, Planning, and Miscellaneous. Use the mouse to select menu options, scroll through directories, or click on radio buttons. Alternative mnemonic open-apple or control-key commands also elicit quick responses when you want to display accounts (Open apple-A) or toggle to the overstrike cursor (Control-C), for instance.

A demonstration file, together with a 54-page tutorial booklet, introduces you to the Smart Money school of finance. The program's predefined—but easily edited—chart of accounts helps you get organized in short order. Smart Money GS offers a number of special features, including a four-function calculator, bar-graphing capability, check-voucher printing, investment/retirement planning—and a 30-day money-back guarantee.

WOE BEGONE

Having trouble balancing your checkbook or keeping to a budget? Worrying whether you can afford a college education for your kids or a vacation home for your retirement? Think back again to last January and learn from the pros. Take a time-out, review your software library, and plan a new strategy. Depending on your preferences, any one of the seven products reviewed here can help you on your way to a prosperous 1990.□

CYNTHIA E. FIELD IS A FREE-LANCE JOURNALIST. SHE'S A CONTRIBUTING EDITOR AND THE AUTHOR OF PRESS ROOM, *INCIDER*'S COLUMN ON DESKTOP PUBLISHING. WRITE TO HER AT 60 BORDER DRIVE, WAKEFIELD, RI 02879. ENCLOSE A SELF-ADDRESSED, STAMPED ENVELOPE IF YOU'D LIKE A PERSONAL REPLY.

FOR THE COMMODORE 64/128® AMIGA® AND ATARI ST®

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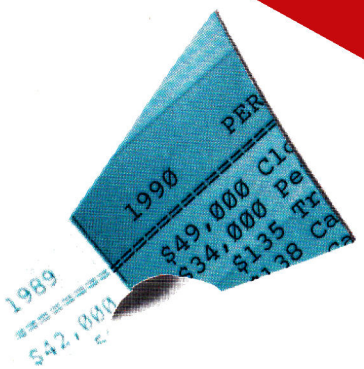
DC DATA EAST

Circle 268 on Reader Service Card.

Do-It-Yourself AppleWorks Checkbook



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

HERE'S TO THE DO-IT-YOURSELFER. IF you'd like to realize a greater return on your AppleWorks investment before springing $50 or more for a stand-alone finance program, this checking-account template may suit you to a T-bill!

Clearly, this electronic checkbook doesn't do it all. The features of any homegrown template are limited by the inherent capabilities of its host program, in this case the AppleWorks database. Our checkbook, for example, doesn't offer advanced accounting functions, nor does it print checks or display bar graphs.

DEFINING THE DATABASE

Start up AppleWorks and select *Add files to the Desktop* from the Main Menu. Make a new file for the database from scratch, and name it **CHECKBOOK**.

At the Change Name/Category screen, press Open apple-Y to erase the nondescript *Category 1* title. Next, type the categories, or field names, you want to include in your database. Begin by typing the following, and press Return after each name:

Date
Check #
Deposit
Service Charge
Payee
Amount
Memo 1
Memo 2

These categories parallel the information you usually include in your handwritten check register. Until you become confident using an electronic checkbook, it's a good idea to continue maintaining a manual register. When you finally abandon it, be sure to keep a backup copy of your data disk.

If you'd like to track budget categories in your database, add those now. For a personal checking account, you might want to include fields such as the following (specifics depend on your lifestyle):

Mortgage/Rent
Food
Electricity
Heating Fuel
Telephone
Cable TV
Medical/Dental
Insurance
Entertainment
Auto Expense
Credit Cards
Donations
Gifts

If you're setting up a small-business checking account, you could define just one field in this section of your database and call it **Account**. Then, with the AppleWorks word processor, create a printed chart of accounts that specifies each one and its numeric or alphabetic code. Most accountants prefer numeric codes, but letter codes seem easier to remember. Try using **FT** for federal income tax, **SP** for supplies, **AU** for auto expenses, and so on.

For personal use, you may want to include categories for tagging tax-deductible expenses and for helping you organize tax information at the end of the year. Name three fields **Tax Deductible**, **Tax Category**, and **IRS Schedule or Form**. If you'd like your AppleWorks checkbook to help with monthly reconciliation of your figures with your bank's, create a category named **Cleared**.

Reserve remaining categories (of the 30 total that AppleWorks allows) by typing any character. An **X** or an asterisk works just

Start saving money—with AppleWorks!

Create your own checkbook template that'll figure your bottom line without adding to your software expenses.

fine. You may not need these categories now, but they'll be available if and when you do. Just rename them with AppleWorks' Open apple-N command.

As with most AppleWorks functions, you can usually figure out what to do by reading the prompts on screen or by referring to the AppleWorks user's manuals.

After you've set up your categories, the completed checkbook database template should look something like **Figure 1**. Place a formatted data disk in the active drive, and save your template by pressing Open apple-S. If you don't have a data disk, use the *format* option in AppleWorks' Other Activities menu to create one.

```
File: CHECKBOOK                CHANGE NAME/CATEGORY     Escape: Review/Add/Change


Category names
=============================================================================
Date                    Insurance
Check #                 Entertainment          Options:
Deposit                 Auto Expenses
Service Charge          Credit Cards           Change filename
Payee                   Donations              Return      Go to first category
Amount                  Gifts
Memo 1                  Tax Deductible
Memo 2                  Tax Category
Mortgage/Rent           IRS Schedule or Form
Food                    X
Electricity             X
Heating Fuel            X
Telephone               X
Cable TV                X
Medical/Dental          Cleared
-----------------------------------------------------------------------------
Type filename:  CHECKBOOK                                        1082K Avail.
```

Figure 1. Checkbook database setup.

NAMING YOUR CHECKBOOKS

When prompted, press the spacebar to enter Insert New Records mode. Press Escape once, then use Open apple-N and rename the file currently on the Desktop to **Check.Personal** or whatever seems appropriate. Remember, your original template remains undisturbed on your data disk. Press Escape, then the spacebar when you're ready to begin entering information.

If you want to set up more than one checkbook file, load the template from your disk as many times as necessary in succession, and give each version a unique name such as Check.Kathy, Check.Condo, Check.League, Check.Business, or Check.Payroll. AppleWorks' desktop lets you keep as many as 12 checkbook files available in memory during a single work session.

ENTERING DATA

Thanks to AppleWorks' friendly interface, entering information into your checkbook on the Review/Add/Change screen couldn't be easier. For a deposit, enter the date in the Date field as, say **1/24**, and press Return; AppleWorks converts the expression automatically to *Jan 24*. Move to the Deposit field (use the Tab key or the down-arrow key) and check it off with an **X** or any other character you prefer. Enter the amount of the deposit in the Amount field. (See **Figure 2**.)

```
File: CHECKBOOK              REVIEW/ADD/CHANGE              Escape: Main Menu
Selection: All records

Record 1 of 17  (17 selected)
=============================================================================
Date: Jan  1                          Insurance: -
Check #: -                            Entertainment: -
Deposit: X                            Auto Expenses: -
Service Charge: -                     Credit Cards: -
Payee: -                              Donations: -
Amount: 1018.23                       Gifts: -
Memo 1: Paycheck                      Tax Deductible: -
Memo 2: -                             Tax Category: -
Mortgage/Rent: -                      IRS Schedule or Form: -
Food: -                               X: -
Electricity: -                        X: -
Heating Fuel: -                       X: -
Telephone: -                          X: -
Cable TV: -                           X: -
Medical/Dental: -                     Cleared: -
-----------------------------------------------------------------------------
Type entry or use @ commands                                  @-? for Help
```

Figure 2. Deposit record.

For a check, enter the Date, Check #, Payee, and Amount. For debits (money taken out of your checking account as a service charge or a check) be sure you enter amounts as *minus* (or negative) values as shown in **Figure 3**. Check off the appropriate budget category and tax-deductible status if you like. Press Open apple-Down arrow to add a new record. Enter the next deposit ►

or check. After every few transactions, press OA-S to save your database to the current data disk.

So far you've been using AppleWorks' single-record layout to

```
File: CHECKBOOK                REVIEW/ADD/CHANGE              Escape: Main Menu
Selection: All records

Record 6 of 17  (17 selected)
------------------------------------------------------------------------------
Date: Jan  1                          Insurance: -
Check #: 1849                         Entertainment: -
Deposit: -                            Auto Expenses: -
Service Charge: -                     Credit Cards: -
Payee: Leukemia Society of America    Donations: x
Amount: -20                           Gifts: -
Memo 1: -                             Tax Deductible: x
Memo 2: -                             Tax Category: charitable
Mortgage/Rent: -                      IRS Schedule or Form: A
Food: -                               X: -
Electricity: -                        X: -
Heating Fuel: -                       X: -
Telephone: -                          X: -
Cable TV: -                           X: -
Medical/Dental: -                     Cleared: -
------------------------------------------------------------------------------
Type entry or use @ commands                                    @-? for Help
```

Figure 3. Check record.

create a separate record for every transaction, much as you would if you were noting each one on its own index card. To view the complete check register, press Open apple-Z to switch to AppleWorks' multiple-record layout. Your list should look something like **Figure 4**.

MANAGING INFORMATION

In multiple-record layout you can easily arrange (Open apple-A) information to your liking. Sort transactions by date, by num-

```
File: CHECKBOOK                REVIEW/ADD/CHANGE              Escape: Main Menu
Selection: All records

Date          Check #         Deposit         Service Charge  Payee
============  ==============  ==============  ==============  ==============
Jan  1        -               x               -               -
Jan  1        1845            -               -               Narragansett El
Jan  1        1846            -               -               VISA
Jan  1        1847            -               -               Reader's Digest
Jan  1        1848            -               -               Heritage Cablev
Jan  1        1849            -               -               Leukemia Societ
Jan  1        -               x               -               -
Jan  6        -               -               x               -
Jan  6        1850            -               -               American Expres
Jan  6        1851            -               -               Boston Five Cen
Jan  7        -               -               -               Dr. Moore
Jan  8        1852            -               -               Mobil
Jan  8        1853            -               -               N.E. Telephone
Jan 15        -               x               -               -
Jan 16        1854            -               -               AARP
------------------------------------------------------------------------------
Type entry or use @ commands                                    @-? for Help
```

Figure 4. Check register.

ber, or alphabetically by payee. Use Open apple-F to find specific information: check #1845, or all payments made to the electric company, for instance. When the list of "matches" appears, press Open apple-Z to zoom in for a closer look at each selected record. Press Open apple-Down arrow (or -Up arrow) to move to the next (or previous) record.

Use Open apple-R to perform single-, double-, or triple-level searches: deductions reported on Schedule A of your tax return; medical payments exceeding $50; or business gifts of $25 or less made at Christmas.

STAYING SOLVENT

Neither single- nor multiple-record layout provides an automatic running balance each time you write a check, but it's easy to design a simple AppleWorks database report that does.

Press Open apple-P and select *Create a new tables format* named **BALANCE**. Using the tab key (or the right- and left-arrow keys) and the Open apple-D command, delete all categories from this report *except* Date, Check #, Deposit, Service Charge, Payee, and Amount. Use the open-apple key in conjunction with the left- and right-arrow keys to shorten the headings, so that the complete layout spans no more than 79 columns. Press Open apple-T—AppleWorks' Totals command—to add up the Amount category and give you a running balance. (See **Figure 5**.)

Whenever you want to view your checkbook transactions and current balance (you'll see an asterisk) press Open apple-P and

```
File:   CHECKBOOK                                                    Page 1
Report: BALANCE.SHEET                                  30 September 1989
Date     Check  Deposit  Service Charge  Payee                      Amount
-------  -----  -------  --------------  -------------------------  ---------
Jan  1                x                                            1018.23
Jan  1   1845                           Narragansett Electric        -76.93
Jan  1   1846                           VISA                        -300.00
Jan  1   1847                           Reader's Digest              -14.68
Jan  1   1848                           Heritage Cablevision          -6.36
Jan  1   1849                           Leukemia Society of Ame      -20.00
Jan  1                x                                             525.00
Jan  6                        x                                      -9.85
Jan  6   1850                           American Express             -20.84
Jan  6   1851                           Boston Five Cents Savin    -1176.53
Jan  7                                  Dr. Moore                   -150.00
Jan  8   1852                           Mobil                         -6.05
Jan  8   1853                           N.E. Telephone               -56.75
Jan 15                x                                            1018.23
Jan 16   1854                           AARP                         -12.50
Jan 20   1855                           Stop & Shop                 -100.35
Jan 24   1856                           Port of Harborside Cond     -115.00
                                                                     495.62*
```

Figure 5. Checkbook balance.

print the report to *The screen*. For a hardcopy of this report, select your printer instead. Careful—a negative balance means your account's overdrawn!

RECONCILING YOUR BANK STATEMENT

When your bank statement arrives, mark the checks you've paid and the deposits the bank has credited by entering an **X** or some other character in the Cleared field on each affected record.

For service charges, add a new record to your database. Check off the Service Charge and Cleared categories. Enter the value as a negative figure in the Amount field.

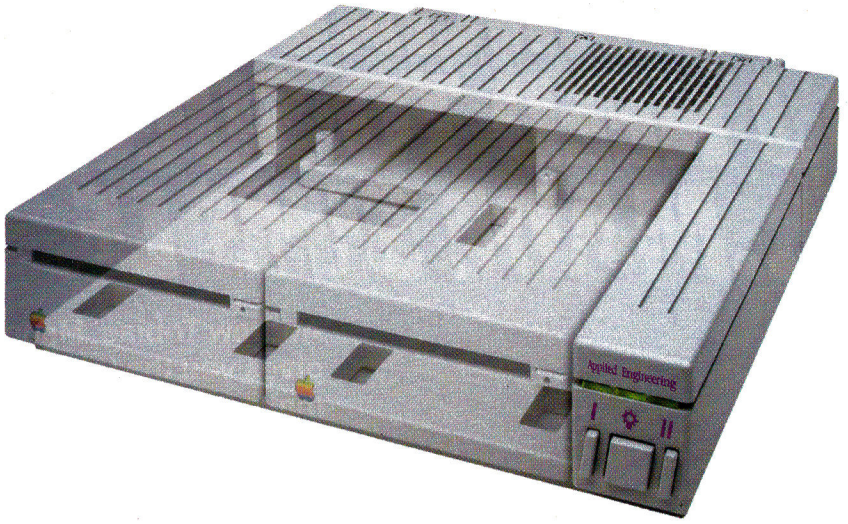
Press Open apple-P and select the BALANCE report. First you want a list of outstanding checks, so press Open apple-R and create a search selection rule: where *Cleared is blank* and *Check # is not blank*. Press Open apple-P and print the total amount from outstanding checks. Jot down this figure, or get a quick printout (Open apple-H). Next you need to know the total amount of money deposited that the bank hasn't yet credited to your account. Press Open apple-R and define the search selection rule: where *Cleared is blank* and *Deposit is not blank*. Press Open apple-P to get this amount and jot it down.

With a desktop calculator (even better, use the AppleWorks spreadsheet and print to a DIF file on disk), take the bank's reported balance, add the deposits as yet uncredited, and subtract your unpaid (outstanding) checks. The final calculated amount should agree with the current checkbook balance your AppleWorks database indicates. Before using Open apple-P to get the current balance, press Open apple-R and select *all* records.

HAVING IT ALL—ALMOST

This AppleWorks checkbook doesn't pretend to rival the programs reviewed in the accompanying article. But despite its lack of sophistication, this template can help you manage your finances better—and expand your AppleWorks know-how while you're at it!□

WRITE TO CYNTHIA E. FIELD AT 60 BORDER DRIVE, WAKEFIELD, RI 02879. ENCLOSE AN SASE IF YOU'D LIKE A REPLY.



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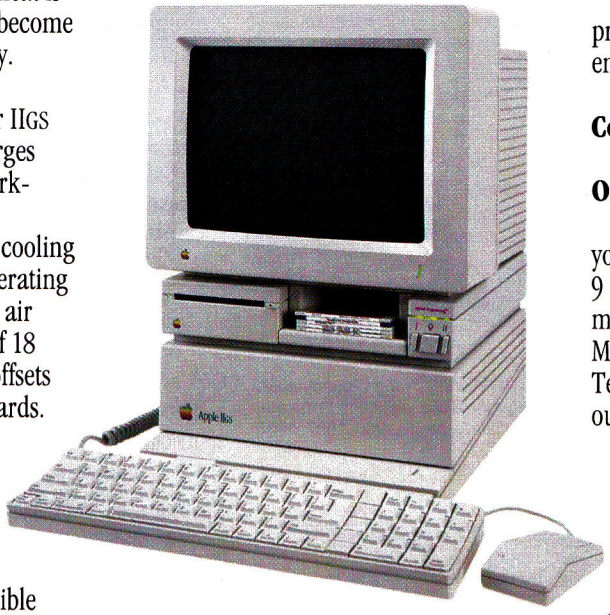

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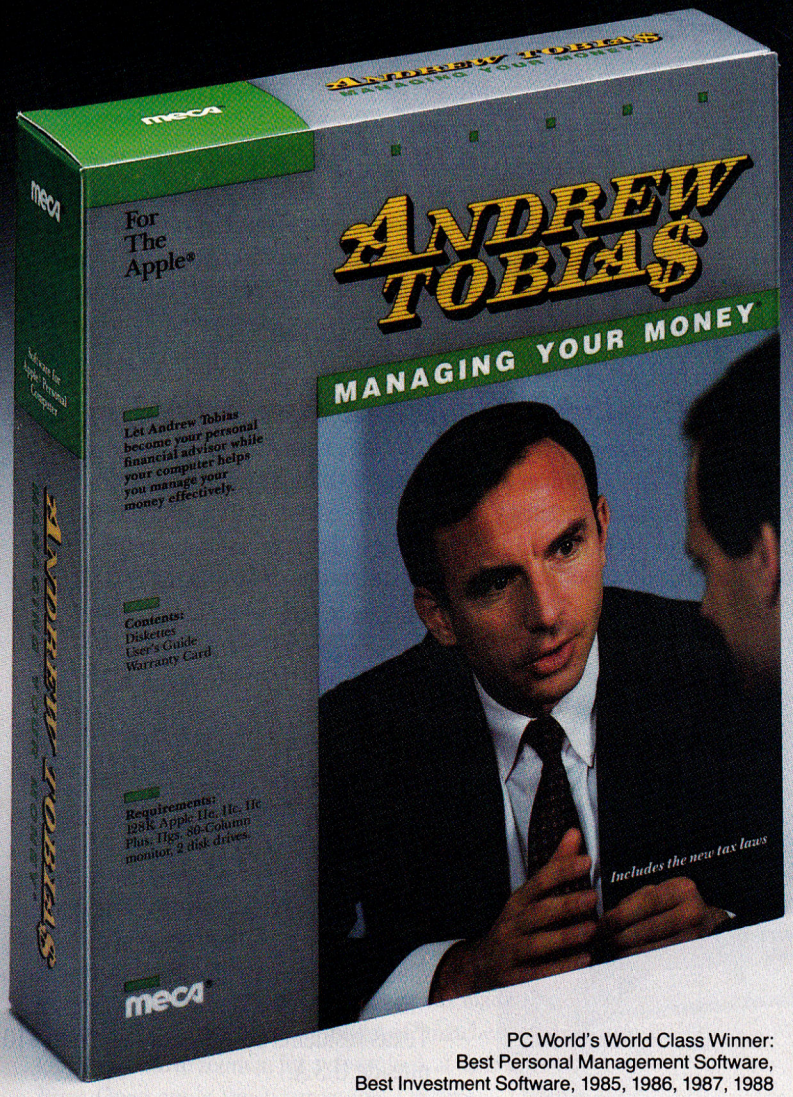

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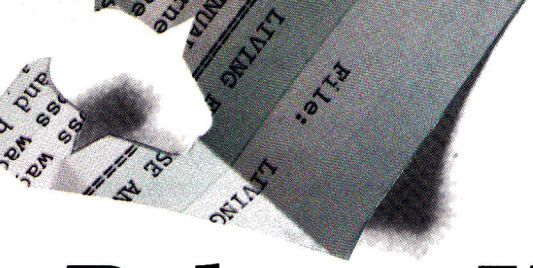
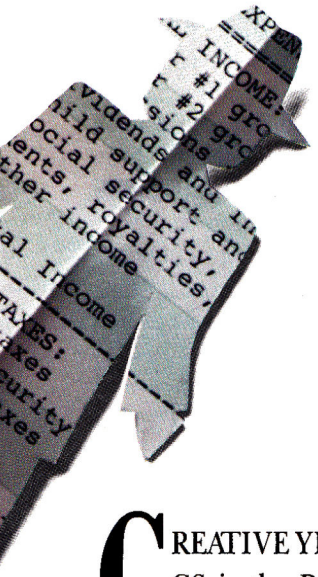
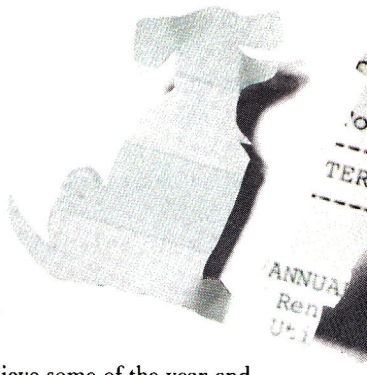


FOCUS ON FAMILY FINANCE

Balance Your Books with AppleWorks GS



Design a foolproof checkbook with the AppleWorks GS database. It's easy to read and simple to use—accounting's gone from stuffy to stylish!



CREATIVE YET PRACTICAL, APPLEWORKS GS is the Renaissance person's dream program. With this 16-bit six-part package you can express your artistic vision, compose a technical report, organize your electronic file cabinet, download timely information, design an advertising campaign, and crunch numbers *ad infinitum*. Is it any wonder, then, that the AppleWorks GS database has a flair for tracking finances?

To prove it, let's design a computerized checkbook that not only substitutes for the handwritten variety but also helps you corral expenses and gear up for IRS Day.

DEFINING SPECS

First, be sure you have a formatted data disk on which to store this checkbook template and file. Next, start up AppleWorks GS (AWGS) and load the database module by double-clicking on the file-cabinet icon.

Don't touch that mouse! Instead, think about the categories of information you should include in this "intelligent" checkbook. Certain kinds of data are *de rigueur* even in electronic check registers: **Date**, **Deposit**, **Service Charge**, **Check #**, **Payee**, **Amount**, and **Memo**. Suppose you want to generate budget reports or an income statement. You may want a separate category called **Account** to track budget items such as food, or business accounts such as FICA.

This AWGS checkbook can even relieve some of the year-end drudgery associated with preparing your tax return, if you take steps to flag tax-deductible expenses as they accrue. Add the fields **Tax Deductible**, **Tax Category**, and **IRS Schedule or Form** to your database design.

LABELING CATEGORIES

Unlike AppleWorks Classic, AWGS won't let you get away with merely labeling database categories. For each data label, you must define a database field consistent with its anticipated contents: date, text, or numeric, among others.

Begin by "rubber-banding" labels: Holding down the button, drag the mouse first across the blue background of the form-definition screen, then downward to draw a small rectangular box about an eighth of an inch high and an inch wide. Release the button; a dialog opens automatically. Click on the *Label* box in the upper right-hand corner.

Press the delete key, and type in the name of the database category. The *Text* radio button is the default; leave it selected for this and all other labels you'll create for this checkbook project.

Now press the return key. Grab one of the label's four corner selection "handles" and shrink or enlarge the label until it's sized appropriately.

If you want to move a label, place the mouse pointer on top of the label, press the mouse button, and drag the label into its new position. Release the mouse button to drop the label into place. This flexibility in database design is undoubtedly one of ►

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

AWGS' most appealing features.

Below the completed label, rubber-band another. Check the *Label* box in the dialog, and name the category. Resize and reposition the label as desired. Continue until you have a label for every category you want to include in your database. If you've made an error and want to delete a label, select it and press Open apple-X, or press the delete key.

DEFINING AND FORMATTING FIELDS

Next, rubber-band and define a field for each category you've already labeled. Don't click on the *Label* box; type each field's name. For simplicity's sake, use the same name you decided on for its label.

Selecting a field type is relatively easy most of the time. The Date label requires a date field; the Check # label requires a numeric field; the Payee label requires a text field. Categories such as Account, however, can pose problems, because you have to decide early on whether your chart of accounts will consist of numeric or alphabetic codes. Don't fret too much at this point; if you make a mistake, or simply change your mind, pull down the Edit menu and select *Field Definition*.

While you're at it, rubber-band a label and a text field named **Cleared**. That way, when your bank pays a check or credits a deposit, you can simply mark the field with an **X** or some other token.

This AWGS checkbook doesn't provide a running balance as

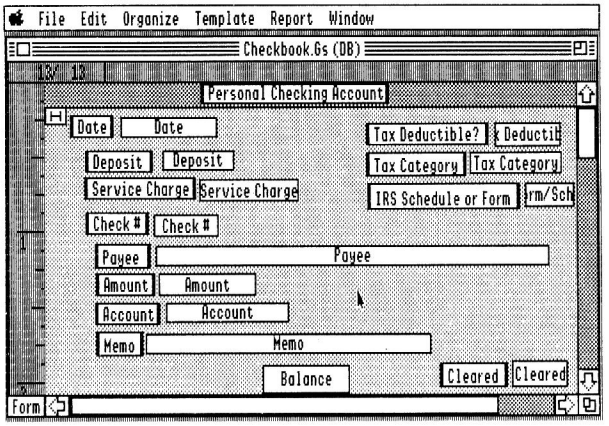


Figure 1. Checkbook form-definition screen.

it records each transaction. Shortly you'll design a report that does, so create a numeric field named **Balance**. You don't need to rubber-band a label to accompany this field. Balance is a formula field that tracks the net effect of each database record by changing the sign for debited items to minus. With Balance selected, choose *Field Formula* from the Edit pull-down menu. In the ensuing dialog, double-click on fields and operations in the following sequence to create the formula: [*Deposit*]−[*Service Charge*]−[*Amount*].

When you've finished creating, naming, and defining labels and fields, the form-definition screen will look something like **Figure 1**.

AWGS affords ample choices for formatting fields. Double-click on a field or select it and choose *Field Format* from the Edit pull-down menu. Date fields can appear in any of three different formats, with or without named days. To simplify data entry later on, select *Auto-Stamp* from the *Format Date Field* dialog; AWGS reads the date from your computer's internal clock. You can enhance dates by selecting any of three type styles, adding borders, setting justification, and displaying one of 16 colors.

Numeric fields can exhibit not only style, justification, and color, but a predetermined number of decimal places and form of expression (*General*, *Fixed*, *Scientific*, *Percent*, or *Dollar*). Capturing an accounting metaphor on screen is a snap with RGB color: Display deposits in black; service charges, check numbers, and disbursements in red!

When checkbook form definition is completed, pull down the Template menu and save the setup as **CHECKBOOK.GS**. Begin with this file whenever you want to create new checking-account databases.

ENTERING AND VIEWING DATA

Like AppleWorks Classic, AWGS lets you deal with data on individual forms or in lists containing multiple records. Form mode (**Figure 2**) is best for data entry, but List mode (**Figure 3**) is best for data analysis.

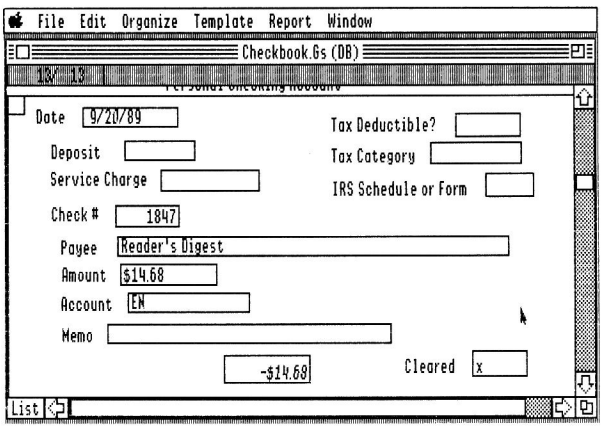


Figure 2. AWGS Form mode.

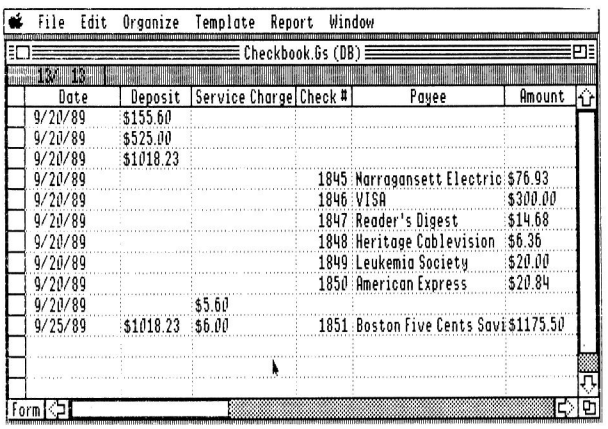


Figure 3. AWGS List mode.

Data entry couldn't be simpler. Click on the *Form* box in the lower left-hand corner of the form-definition screen and, with the mouse, select the field where you want to type information. Double-click on a Date field to date-stamp it automatically. When you're finished with a record, press the tab key to move to the next field, or press Return to move to the beginning of the next

record. (Don't press Return until you've finished with the record on which you're working.)

View your check register anytime by clicking on the *List* box in the lower left-hand corner of the screen. Run through the check register with the vertical or horizontal scroll bars or the arrow keys. If fine-tuning's required, click on a cell (the intersection of a column and a row, where AWGS stores information) and edit its contents on the spot.

Besides re-arranging the order in which categories appear, AWGS can alter the list layout in many ways. Refer to your AWGS user's guides for more information on features too numerous to describe here.

Return to Form mode at will by clicking on the *Form* box in the lower left-hand corner of the List screen. Incidentally, you can press Open apple-P to print database information displayed in either Form or List mode.

Enter some initial data and save your file by selecting *Save As* from the File menu or by pressing Open apple-A. Name the file Check.Jim, Check.Business, or whatever suits you. Later on, you can quick-save the file from time to time during data-entry sessions by pressing Open apple-S.

Options listed in the Organize menu help you sort data, search for specific information, and determine ground rules for reports. Arrange transactions by account code or use *Find* to help you locate all payments to the telephone company. Invoke the *Match Records* feature (**Figure 4**) to set up selection rules for more

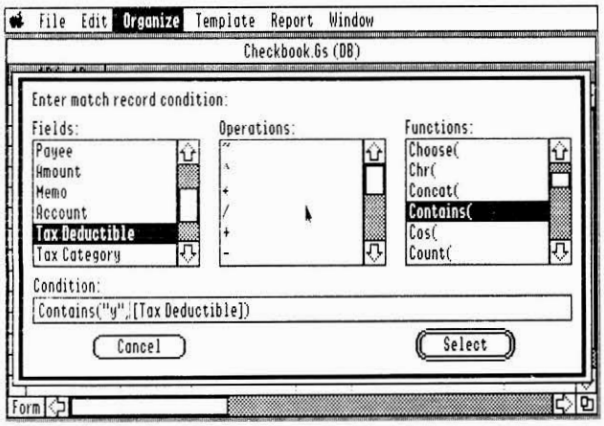


Figure 4. AWGS Match Record dialog.

complicated searches. Don't be put off by the odd syntax of some AWGS search selection rules. While *[Payee]=Heritage Cablevision* may be nearly intuitive, *Contains("y",[Tax Deductible])* may seem quite foreign.

AppleWorks GS can transform database reports automatically into word-processing documents. Let's create a report now that shows not only the current checking-account balance, but tallies deposits, service charges, and disbursements, as well.

Switch to List mode if you're not already there, and one by one select, mark, and hide the following categories: Date, Check #, Payee, Account, Memo, Tax Deductible, Tax Category, IRS Schedule or Form, and Cleared. Select a category by clicking on it with the mouse. Mark and hide it by selecting *Mark Fields* (Organize menu). Make sure *Display Marked Fields* (Organize menu) is turned off.

Pull down the Report menu and select *Format*. The names of the four unmarked database categories—*Deposit*, *Service Charge*, *Amount*, *Balance*—appear in a scrolling directory. Select them one by one and for all but *Balance*, click on the *Count* radio button. For all four, click on the *Sum* radio button. In the *Subtotal Break After* directory leave the *Totals Only* selection as is. Click on *OK*. In the Report menu select *Summary Only*, then choose *Create Report*.

Within moments, a word-processing window opens to display your account balance, as well as the number of deposits, service charges, and checks *and* their subtotals (**Figure 5**). Print the window's contents, or jot down the balance. Remove the window by clicking on its close box.

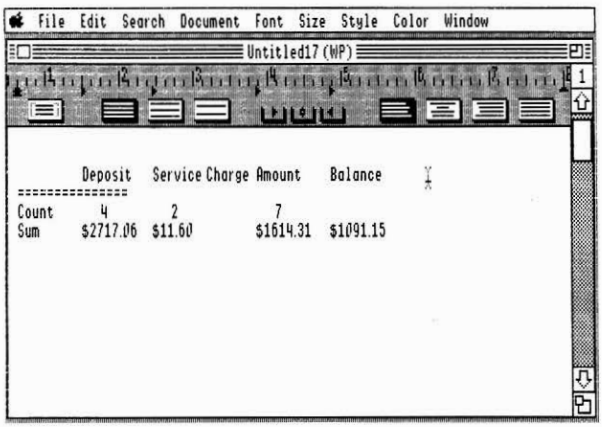


Figure 5. AWGS checking-account balance report.

If you want to re-enter the database to record additional transactions, turn on *Display Marked Fields* (Organize menu) before proceeding in Form mode. Whenever you want to see the account balance, turn off *Display Marked Fields* and create a new report.

Coaxing your account to jive with the bank's monthly report isn't complicated. Denote each recorded transaction with an *X* in its Cleared field. *Match Records* with the selection rule *IsBlank([Cleared])*. Turn *Display Marked Records* off and *Hide Unselected Records*.

Generate a report that totals these outstanding checks and uncredited deposits. With a hand-held calculator (or a pencil and paper) add the deposit subtotal to your bank balance, and subtract the check subtotal. This final tally should agree with the AWGS check-register balance.

NOT JUST ANOTHER PRETTY FACE

AppleWorks GS seems as much at home handling the fine points of your checking account as it does nurturing your artistic talent. At first blush it may not seem as fast or as "serious" as AppleWorks Classic, but one thing's for sure: The AppleWorks GS database can help you manage even life's rather mundane affairs with more pizzazz than you've ever imagined.□

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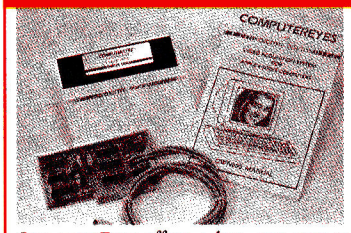

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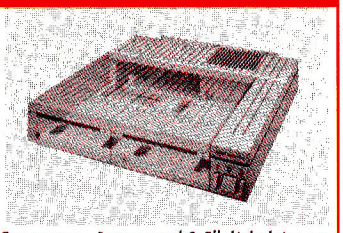

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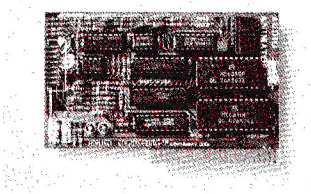

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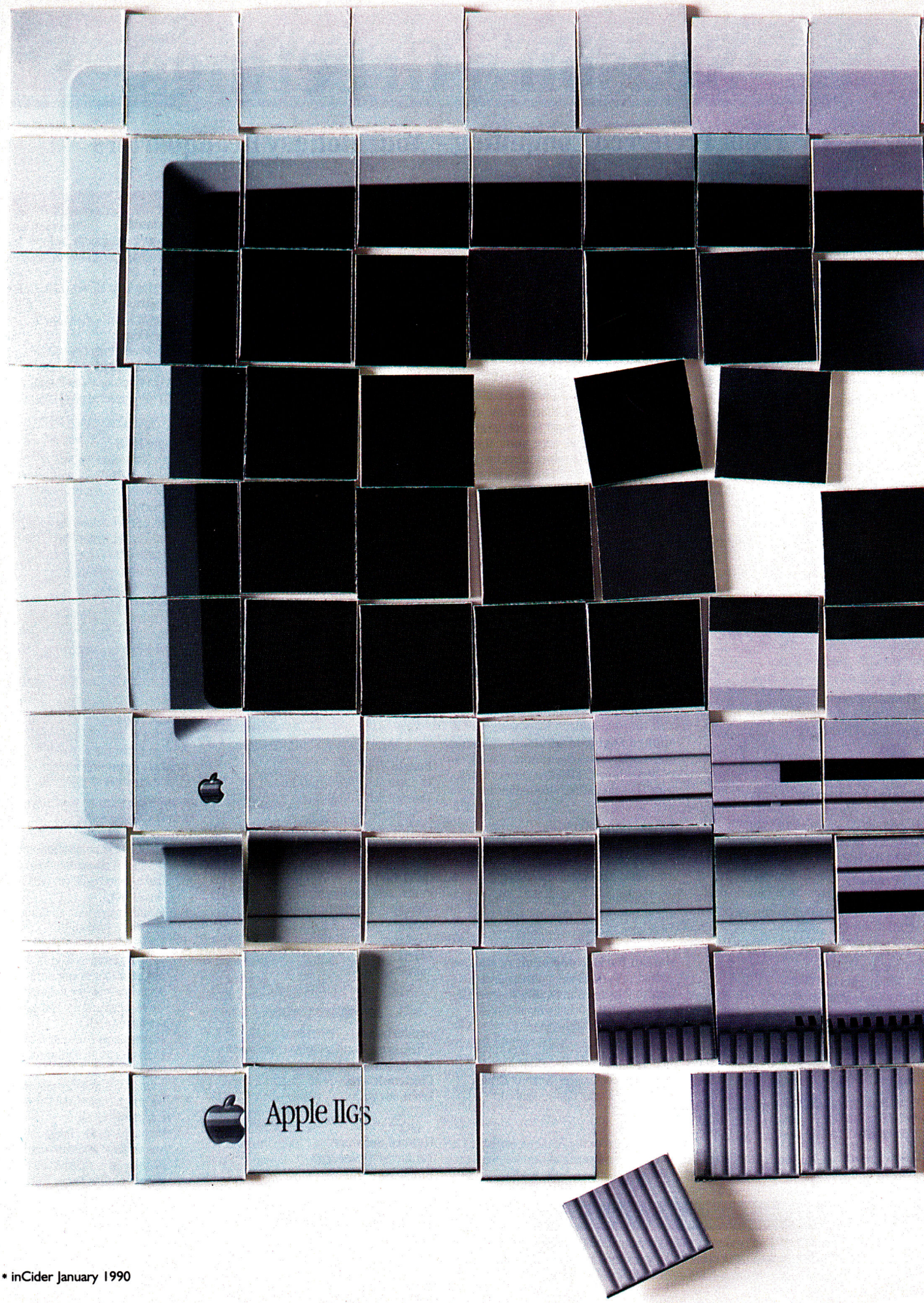
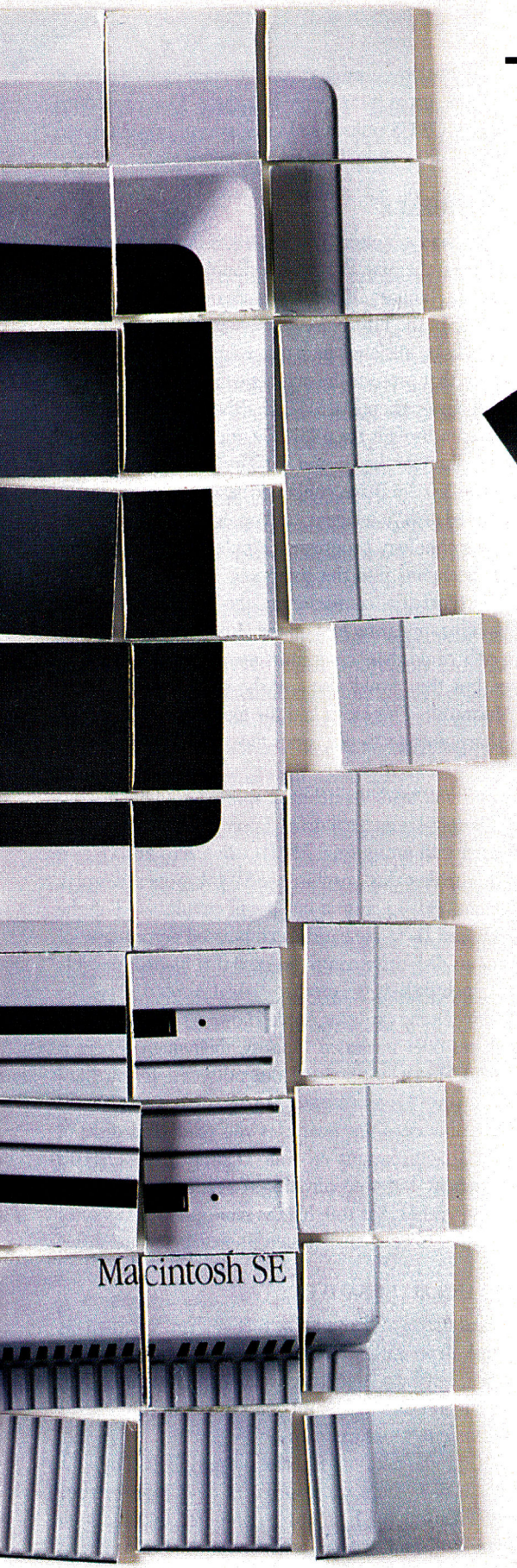

Apple IIGS



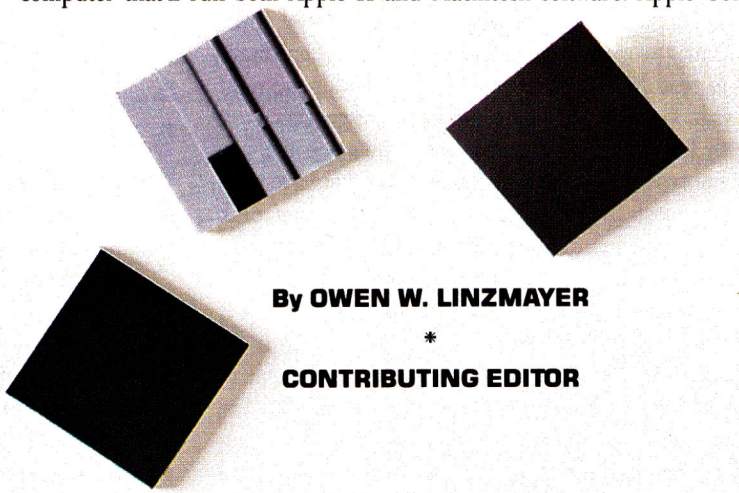
THE II/MAC CONNECTION:

Bit by Bit

As the II and the Mac share more features, home, school, and small-business users reap the benefits of those technological advances.

AS A RULE, APPLE II OWNERS RESENT THE MACINTOSH; Mac owners barely recognize the II's existence. Sometimes it seems as though the computers are manufactured by separate companies. They look different. They have incompatible operating systems. One's the talk of the town, the yuppie's choice for "in" computing. The other's a workhorse with a proud history of durability and flexibility—and a dubious future. But beneath the marketing hype of the Mac, and the lack of marketing for the II, are these two computers really that different?

For years the rumors coming out of Silicon Valley have speculated about a "bridge" computer that'll run both Apple II and Macintosh software. Apple Computer, of ►



By OWEN W. LINZMAYER

*

CONTRIBUTING EDITOR

Photography * Ed Judice

course, steadfastly refuses to make any public comment on this, or any other, unannounced product.

While it's impossible to know Apple's plans, after examining the company's product introductions over the last couple of years one conclusion seems likely: Engineers at Apple have been deliberately working toward bringing the two computer families closer together in both hardware and system software. Most of the foundation is already in place for the long-awaited "bridge," but if and when it'll arrive is anybody's guess. As we wait, though, Apple II and Mac users continue to benefit from the evolving technology.

Despite the growing sentiment that Apple's been treating II owners like second-class citizens lately, many of the technology transfers between the two siblings haven't been hand-me-downs from the Mac. On the contrary, some of the more important concepts and products that have helped make the Mac successful originated on the Apple II. The Mac didn't really take off, for example, until its architecture was "opened up" with NuBus slots, much like the expansion slots in the original Apple II. Conversely, Apple II owners continue to reap the real-world rewards of Mac research and development. It's this two-way relationship that has fostered many significant technological advances for Mac and Apple II users.

SHARE AND SHARE ALIKE

One of the most recent signposts on the road to connectivity is **System Disk 5.0**, also known as GS/OS, which Apple released last August. (See "System 5.0: From a Trot to a Gallop," November 1989, p. 64.) Finally, IIGS owners have a true 16-bit operating system, based on the popular Macintosh desktop metaphor, that can recognize an AppleShare file server on the AppleTalk network. And that file server, which appears on the Finder's desktop and is handled as if it were a hard-disk drive, can contain Apple II, Mac, and IBM programs and data files. With System Disk 5.0, you can copy Mac applications and data files from the server to a local GS disk.You can't use any but the most rudimentary data files, and you can't run Mac applications. The server eliminates the disk-format barrier between the II and the Mac, but you'd need a Mac-specific logical data interpreter to run Mac programs and read Mac data files.

You can use Apple II files on the Mac, however. COMPUTER:applications' software emulator **II in a Mac** lets you run certain 8-bit Apple II programs on the other machine. In addition, Apple includes a free program called Apple File Exchange on Mac system disks. This program converts data files among Apple IIs, MS-DOS machines, and the Mac. There's no reason why Apple can't release a similar program for the Apple II, as the GS' hardware has the ability to read Mac-formatted disks; it just needs the right software to drive it. Roger Wagner's **Graphics Exchange**, which can read files directly from 3½-inch Mac disks, proves it's possible.

While GS/OS incorporates some neat Mac features that have been around for years, such as the Control Panel NDA (new desk accessory), scrollable menus, resource forks, and pop-up menus, Apple has also announced that the next revision of the Mac's system software will take a cue from the II. For instance, installing fonts and desk accessories on the Mac currently requires you to use a utility called Font/DA Mover. With System 7.0 you'll soon be able to drag these files into folders just the way you do under GS/OS. The new Mac system should also contain an extended implementation of its External File System, which will let you insert ProDOS and MS-DOS disks into the drive and perform file-maintenance tasks at the Finder's desktop, just as if they were Mac disks. That procedure is similar to the way GS/OS utilizes FSTs (file-system translators) to let you use ProDOS disks and CD-ROM.

HIGH-CAPACITY STORAGE

The original Mac had a built-in 3½-inch, 400K floppy-disk drive. When Apple released the Mac Plus with a double-density, double-sided 800K drive in January 1986, it was clear that the 3½-inch floppy was the wave of the future.

These compact disks, enclosed in a rugged plastic shell, have a spring-loaded door that protects the magnetic medium when not in a drive. With such obvious benefits, 3½-inch drives migrated quickly to the Apple II, even though the 143K, 5¼-inch floppy continues to be a popular medium for the IIe and IIc. The first of these smaller units, the Apple UniDisk 3.5 Drive, contained its own microprocessor and was thus referred to as "intelligent," although it was incompatible with the Mac. As technology progressed, Apple came up with the idea of putting the brains into the computer, not the drive. The result was the SmartPort drive connector and the Integrated Wozniak Machine (IWM) chip, appearing first on the IIGS, then on a revision of the IIc. Not only could these computers use the old 5¼-inch and UniDisk drives, but they could also use the same 3½-inch 800K drives as the Macintosh. This move laid the foundation for the two computers to share storage media, swap files, and eventually run each other's programs.

When the Mac SE/30 made its debut, it sported a 1440K FDHD (floppy-disk, high-density) internal drive. Every new Mac since then has come standard with an internal FDHD drive, also known as a SuperDrive. What makes this possible is a SWIM (Super Wozniak Integrated Machine) chip, a custom integrated circuit based on the IWM. The SWIM and IWM are basically chip-based descendants of Wozniak's ingenious disk-drive controller card that made it possible to use 143K, 5¼-inch disk drives on the original Apple II.

Is an FDHD drive in the cards for Apple II owners? Probably not. While FDHD drives offer increased capacity, their main benefit is that they can read MS-DOS-formatted disks directly. If you want this capability on your II, investigate Applied Engineering's **PC Transporter**. Not only does this board let you read IBM disks, it also lets you run IBM programs on your II. And if the FDHD's 1.44-megabyte capacity has you salivating, consider purchasing a hard-disk drive for your II. For roughly the same amount of money as a SuperDrive, you can get a much faster 20-megabyte hard drive.

SCSI DEVICES—AND ALTERNATIVES

Speaking of hard drives, did you know that you can use virtually any Mac hard-disk drive with your Apple IIGS or IIe? Because of economies of scale, buying a Mac drive is sometimes cheaper than getting one that's tailored to the II. All you need is an Apple-SCSI (small-computer-systems interface) card.

SCSI defines a standard way of interfacing peripherals to your computer; you can daisychain up to seven SCSI devices to your Apple. The Mac Plus was the first Apple computer to come with a SCSI port standard, and every Mac since has one, too. If you want to add SCSI capability to the Apple IIe or IIGS, though, you need to buy a SCSI interface card and plug it into one the IIe's or GS' expansion slots.

Although you hear of SCSI hard-disk drives most often, there are other types of SCSI devices. Apple's CD-ROM drive is one example, but it doesn't come highly recommended. Apart from being slow, there are virtually no Apple II applications currently available on compact disc. If it's any consolation, the situation isn't much better in the Mac market.

A SyQuest drive is a much more prudent investment. Popular in the Mac community, this drive is essentially a 44-megabyte hard disk in a removable cartridge. SyQuest drives are great for archival purposes, and you can add as much capacity as you need. Also, you can keep valuable information secure by storing the cartridges in a safe. Because SyQuest drives are slightly more complicated to use than regular hard disks, you're better off dealing with one of the companies that actively service the Apple II market, such as CMS Enhancements, First Class Peripherals, or American Micro Research.

SCSI tape drives are also making their way to the Apple II market as a convenient method for backing up large hard disks. First Class Peripherals is currently the only third-party firm that offers such a device. Another option is to purchase a DC 2000 minicartridge tape drive through a mail-order house. For this, you'll need the appropriate driver software, **HDTape**, available as shareware from Tim Grams. Currently HDTape supports only 40-megabyte DC 2000 minicartridge drives manufactured by 3M. It's conceivable, though, that someone could write drivers for DC 600 cartridge drives, as well as TEAC tape drives. These latter drives are capable of storing 60 to 150 megabytes on a single cassette the size of a standard audio tape.

Similarly, a lack of software is the only obstacle preventing Apple II owners from using the **Apple Scanner**; this SCSI device currently works only on the Mac. Place a photograph or other flat document in this scanner and minutes later a digitized rendition appears on the Mac screen in up to 16 levels of gray. Until someone writes the necessary driver software, Apple II users must content themselves with Thunderware's **ThunderScan**, a popular optical digitizer (for both the Mac and the II) shaped like a ribbon cartridge. Plug ThunderScan into an ImageWriter, and it scans anything you can fit into the printer's platen.

PRODUCT INFORMATION

Apple Scanner, $1799
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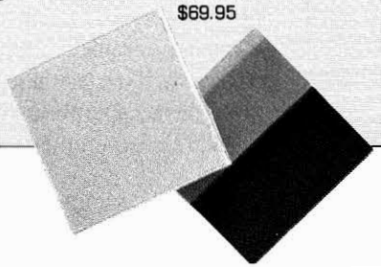

BUS IT

The Apple II's keyboard has come a long way since its all-uppercase past. Over the years the layouts of keyboards for the Mac and the II have become indistinguishable. Look inside the IIGS keyboard and you'll find the same components as in the standard Mac keyboard, so you can switch one keyboard to the other computer.

The technology making this possible is the Apple Desktop Bus (ADB), which first appeared on the IIGS and later migrated to the Mac. ADB is much like SCSI in that it defines a standard way of daisychaining up to 16 devices to a single computer. Input devices such as keyboards, mice, joysticks, and graphics tablets are the ADB's primary users. Because the ADB exists on both the GS and all Macs since the SE, these systems can easily share peripherals. Also, non-ADB mice, like those used on the IIe and IIc, will work on the original Mac and the Plus.

SERIAL CONNECTIONS

The Apple II and the Mac have long been able to share serial devices. The original Mac sported two serial interfaces (one for printers and another for modems) with DB-9 connectors, while the slots in the IIe allow for up to six serial cards. Taking an external modem, for example, from a II and connecting it to a Mac was simply a matter of switching cables to accommodate each machine's different connectors. Data communication was possible thanks to the compatibility between the Mac's RS-422 protocol and the II's RS-232 standard. All that was missing was a common connector.

Enter the 8-pin mini-DIN (Deutsche Industrie Normal) connector, two of which have been standard equipment on every Mac since the Mac Plus. Soon after they appeared on the Plus, they showed up on the IIGS, and more recently, on the IIc Plus.

Mini-DIN connectors are nice because of their small size—barely thicker than the cable—and a slotted "key," which prevents mistakes when plugging in equipment. Now that the two lines of computers share the same physical connectors, you can move serial peripherals (such as printers, external modems, and AppleTalk devices) between them easily.

WISH LIST

A number of useful Macintosh peripherals could work easily on the Apple II; all that's missing is someone to write the necessary drivers, and that should be Apple. The difficult and expensive part—designing and manufacturing the hardware—is already done. All Apple needs to do is write and release the appropriate software, so that you can use these devices on the Apple II family. It's up to you, Apple II users, to remind Cupertino of the II's versatility and to point out that you're ready to put to good use several products currently available only to Mac users.□

OWEN W. LINZMAYER IS AN ASSOCIATE EDITOR AT *MACUSER*. WRITE TO HIM C/O *INCIDER*, 80 ELM STREET, PETERBOROUGH, NH 03458.

Editor's note: For a more detailed look at the Apple Desktop Bus standard and the world of shared input devices for the II and the Mac, watch for "The ADB Connection" in next month's issue.

ONE FOR THE MONEY

Compare your spending habits with the national average, and see how you measure up.

By RUTH K. WITKIN

MARLEY'S GHOST IN *A CHRISTMAS Carol* conjured up Christmas past, present, and future. The spreadsheet in this month's column evokes money past: You'll discover how the ghost of money past (what you've already spent) measures up to the way other people spend their money.

LIFESTYLES

If you live life to the hilt with nary a care for tomorrow, you're not alone. On the other hand, if you routinely squeeze every penny before letting go, you've got plenty of company.

The spreadsheet in **Figure 1** lets you compare your spending habits with everyone else's by referring to the national averages shown in column D.

When you list your annual income, taxes, and living expenses, the formulas produce your total income and taxes, calculate after-tax income, figure out how much is available for savings and investments, and show each expense as a percentage of after-tax income (national averages courtesy of U.S. Bureau of Labor Statistics).

Create a new AppleWorks spreadsheet file and name it **LIVING**. You should now see the spreadsheet Review/Add/Change screen with the cursor in A1. Use the following summary to start the spreadsheet:

Long lines. Enter a double line in A2 through D2: Place the cursor on A2 and type quotation marks. Hold down the equal-sign key until the sign reaches the right edge of D2, then move the cursor to A14. Use a minus sign in the same way to enter a single line in A14 through D14.

Leave the cursor on A14 and copy the single-line row to the clipboard: Press OA-C to start the Copy command. Type **T** to select *To clipboard* and press Return once to confirm *rows* and again to confirm row A14–D14.

Now copy from the clipboard: With the cursor on A21, press OA-C and type **F** to select *From clipboard*. Now place the cursor on A23. Again, press OA-C and type **F**. Next, place the cursor on A50, press OA-C and type **F**. And finally, place the cursor on A52, press OA-C, and type **F**.

Column width. Each column is now nine characters wide. Use the Layout command (OA-L), *Columns*, and *Column width* to increase the column widths as follows: column A to 41 characters, column B to 10 characters, and columns C and D to 11 characters each.

Short lines. In B12, type quotation marks, press the spacebar once, type eight minus signs, and move the cursor to B19. Enter the same line in B19, then do it again in B48. In C26, type quotation marks and hold down the minus-sign key until the sign reaches the right edge of D26. In C48 and D48, type quotation marks, press the spacebar five times, and type five minus signs.

Labels and numbers. Referring to **Figure 2**, enter all labels and numbers. In A1, type quotation marks and press the spacebar 25 times before typing the spreadsheet title. In C24, type quotation marks before the percent sign. To indent a label under a general heading (such as *Earner #1 gross wages or salary* in A4 under *ANNUAL INCOME* in A3), type quotation marks and press the spacebar once. To indent a label that identifies a total (such as *Total Income* in A13), type quotation marks and press the spacebar twice.

Instead of pressing Return after typing a label or number, move the cursor to the next cell that needs an entry, and AppleWorks will enter what you just typed in its cell. After typing the last entry, hit Return.

Formats. Use the Value command (OA-V) to set a standard *Value format* of *Dollars* with zero decimal places. Use OA-L and *Block* to reformat the cells in columns C and D (rows 27 through 51) for Percent with one decimal place.

Right-align the labels in rows 24 and 25. Now press OA-S (AppleWorks' Save command) to store all your work on disk.

ENTERING FORMULAS

Formulas perform your calculations. First read how the formula works; then place the cursor on the cell receiving the formula. Move the cursor to the cell locations shown in the formula, and type everything else.

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

Each SUM formula (B13, B20, B49, and D49) includes the empty cell above the list of amounts and the dashed line below the list. That way, if you later insert rows for items not listed here, AppleWorks will adjust the formula to add the new entries. ►

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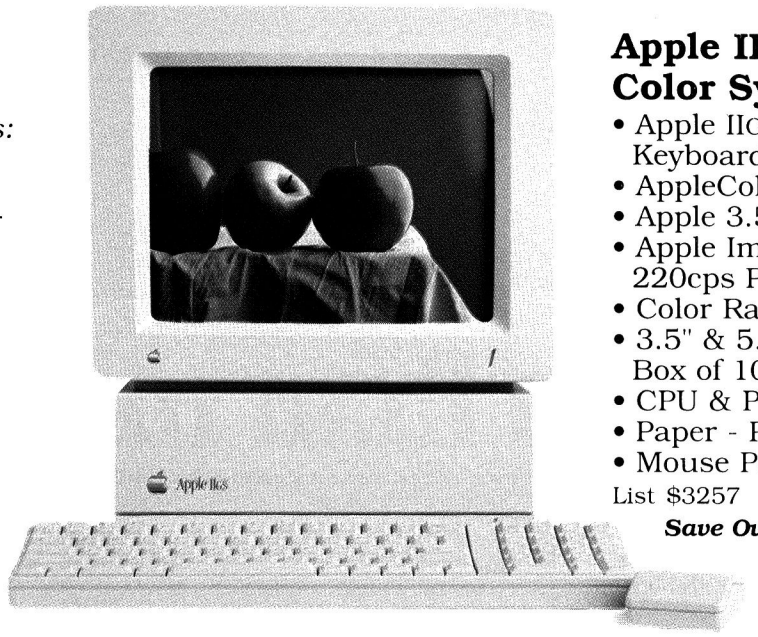

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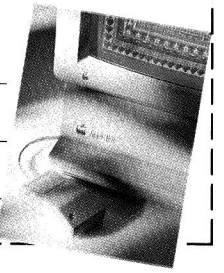

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FORMULA 1: TOTAL INCOME

Formula 1 adds each source of income (B4 through B11) to produce total income in B13.

Cell location: B13

Formula: @SUM(B12.B3)

Before continuing, protect Formula 1 against change: Leave the cursor on B13, press OA-L, and hit Return. Type **PN** (for *Protection Nothing*). As you create other formulas, protect each one the same way.

FORMULA 2: TOTAL TAXES

Formula 2 adds each type of tax (B16 through B18) to produce total taxes in B20.

Cell location: B20

Formula: @SUM(B19.B15)

FORMULA 3: AFTER-TAX INCOME

Formula 3 subtracts total taxes (B20) from total income (B13) to produce after-tax income in B22.

Cell location: B22

Formula: +B13−B20

FORMULA 4: TOTAL LIVING EXPENSES

Formula 4 adds the list of living expenses (B27 through B47) to produce total living expenses in B49.

Cell location: B49

Formula: @SUM(B48.B26)

Formula 4 can add the percentages in columns C and D, so copy it: With the cursor on B49, press OA-C, and hit Return twice. Move the cursor to C49, type a period, move the cursor to D49, and hit Return again. Both cell references are relative, so type **R** twice.

Okay, so there's a dollar sign in percentage cells C49 and D59. That's because copying the formula copied its standard dollar format, too. To correct matters, place the cursor on C49 and press OA-L.

Type **B**, move the cursor to D49, and hit Return twice. Type **P1** (for *Percent 1 decimal*) and hit Return again.

FORMULA 5: SAVINGS

Formula 5 subtracts total living expenses (B49) from after-tax income (B22) to produce the money available for savings and investments in B51.

Cell location: B51

Formula: +B22−B49

FORMULA 6: PERCENTAGE OF INCOME

Formula 6 divides rent or mortgage payments (B27) by after-tax income (B22) to show it as a percentage of after-tax income in C27.

Cell location: C27

Formula: +B27/B22

Now copy Formula 6 down the column: Leave the cursor on C27, press OA-C, and hit Return twice.

Move the cursor to C28, type a period, move the cursor to C47, and hit Return again. To tell AppleWorks that the first cell reference is relative and the second is absolute (no change), type **R** and press Return.

Copy Formula 6 again: With the cursor on C27, press OA-C and hit Return twice. Move the cursor to C51 and hit Return again. Type **R** and press Return.

Figure 1. Compare your expenses.

	A	B	C	D
1		LIVING EXPENSE ANALYSIS		
2				
3	ANNUAL INCOME:			
4	Earner #1 gross wages or salary	$42,000		
5	Earner #2 gross wages or salary	$33,500		
6	Commissions and bonus	$0		
7	Dividends and interest	$123		
8	Child support and alimony	$0		
9	Social security, annuities, pensions	$0		
10	Rents, royalties, fees	$234		
11	Other income	$0		
12		---		
13	Total Income	$75,857 [1]		
14				
15	ANNUAL TAXES:			
16	Income taxes	$15,300		
17	Social Security contributions	$3,456		
18	Property taxes	$4,567		
19		---		
20	Total Taxes	$23,323 [2]		
21				
22	AFTER-TAX INCOME	$52,534 [3]		
23				
24			% of After-Tax Income	National Average
25				
26	ANNUAL LIVING EXPENSES:			
27	Rent or mortgage payments	$8,800	16.8% [6]	13.4%
28	Utilities and phone	$2,500	4.8%	4.3%
29	Food	$7,824	14.9%	12.0%
30	Meals out	$4,370	8.3%	5.0%
31	Clothing	$3,950	7.5%	4.7%
32	Personal grooming	$425	.8%	1.4%
33	Transportation	$1,250	2.4%	3.3%
34	Car loan payments	$3,248	6.2%	3.1%
35	Car repairs	$230	.4%	1.7%
36	Car insurance premiums	$812	1.5%	.4%
37	Medical & dental services (unreimbursed)	$750	1.4%	9.8%
38	Medication (unreimbursed)	$125	.2%	1.0%
39	Health insurance premiums	$899	1.7%	.8%
40	Life and disability insurance premiums	$1,250	2.4%	1.2%
41	Financial and legal services	$525	1.0%	4.9%
42	Recreation, entertainment, vacation	$5,200	9.9%	6.3%
43	Credit card interest	$0	0.0%	3.0%
44	Furniture and other durable goods	$3,270	6.2%	4.5%
45	Household maintenance	$1,800	3.4%	2.6%
46	Tuition and day care	$0	0.0%	1.5%
47	Other expenses	$3,500	6.7%	10.0%
48		---	---	---
49	Total Living Expenses	$50,728 [4]	96.6%	94.9%
50				
51	AVAILABLE FOR SAVINGS AND INVESTMENTS	$1,806 [5]	3.4%	5.1%
52				

PRINTING THE SPREADSHEET

LIVING is 73 characters wide and prints at the standard 10 characters to the inch. Press OA-O to bring up the Printer Options screen. To position it properly on the page, set these margins: Type **LM** and press Return. Type **.4** and hit Return again.

Now type **RM** and press Return. Type **3** and hit Return again. And finally, type **TM**, press Return, type **.5**, and hit Return again. All other print settings remain at AppleWorks standards. Press OA-S to store the margin settings on disk and return the spreadsheet to the screen.

Now turn on your printer and get ready to ►

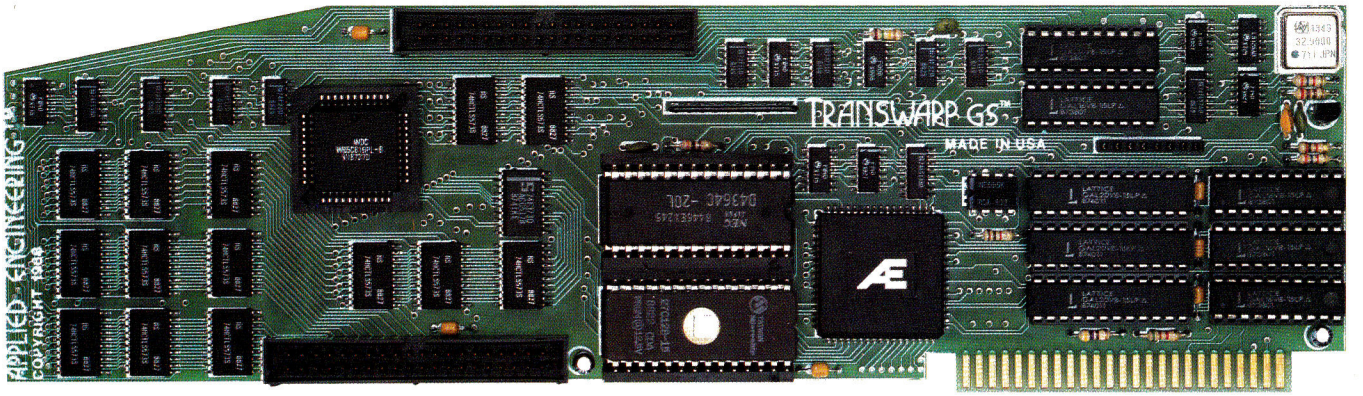

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Figure 2. Labels, lines, and practice entries.

```
                         A                    B          C          D
 1|                              LIVING EXPENSE ANALYSIS
 2|=============================================================================
 3|ANNUAL INCOME:
 4|  Earner #1 gross wages or salary                42000
 5|  Earner #2 gross wages or salary                33500
 6|  Commissions and bonus                              0
 7|  Dividends and interest                           123
 8|  Child support and alimony                          0
 9|  Social security, annuities, pensions               0
10|  Rents, royalties, fees                           234
11|  Other income                                       0
12|                                               --------
13|   Total Income
14|-----------------------------------------------------------------------------
15|ANNUAL TAXES:
16|  Income taxes                                   15300
17|  Social Security contributions                   3456
18|  Property taxes                                  4567
19|                                               --------
20|   Total Taxes
21|-----------------------------------------------------------------------------
22|AFTER-TAX INCOME
23|-----------------------------------------------------------------------------
24|                                                  % of After-National
25|                                                  Tax Income Average
26|ANNUAL LIVING EXPENSES:                           ----------------------
27|  Rent or mortgage payments                  8800                    .134
28|  Utilities and phone                        2500                    .043
29|  Food                                       7824                     .12
30|  Meals out                                  4370                     .05
31|  Clothing                                   3950                    .047
32|  Personal grooming                           425                    .014
33|  Transportation                             1250                    .033
34|  Car loan payments                          3248                    .031
35|  Car repairs                                 230                    .017
36|  Car insurance premiums                      812                    .004
37|  Medical & dental services (unreimbursed)   750                    .098
38|  Medication (unreimbursed)                  125                     .01
39|  Health insurance premiums                  899                    .008
40|  Life and disability insurance premiums     1250                   .012
41|  Financial and legal services               525                    .049
42|  Recreation, entertainment, vacation        5200                   .063
43|  Credit card interest                          0                    .03
44|  Furniture and other durable goods          3270                   .045
45|  Household maintenance                      1800                   .026
46|  Tuition and day care                          0                    .015
47|  Other expenses                             3500                     .1
48|                                           --------                 -----
49|   Total Living Expenses
50|-----------------------------------------------------------------------------
51|AVAILABLE FOR SAVINGS AND INVESTMENTS                                 .051
52|-----------------------------------------------------------------------------
```

print. Press OA-P to bring up the Print screen. Press Return to confirm your printer (or type a printer number, then Return). Type today's date and hit Return twice (the second time to confirm one copy). The printer whirs and here's your spreadsheet.

COMING RIGHT UP

Our next two columns will deal with something on everyone's mind this time of year—income taxes. I'll take you through a new 1989 version of last year's income-tax template, including how to calculate Alternate Minimum Tax (AMT).

A word to the wise: If you haven't upgraded to AppleWorks 3.0 yet, now is a good time to do it. The new features are great. Maybe more of an incentive is that I'll be speaking 3.0 language starting next month. Working with an earlier AppleWorks version could be a problem, so get crackin'.□

RUTH K. WITKIN IS THE AUTHOR OF THE POPULAR TEMPLATE/HANDBOOK SERIES *SUCCESS WITH APPLEWORKS* (*INCIDER*, IDG COMMUNICATIONS/PETERBOROUGH), *THE BEST BOOK OF 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 REPLY.

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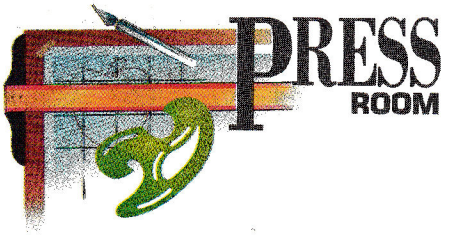

CALLING CARD

Begin 1990 on an entrepreneurial note—get your name in print with Publish It! and customized business cards.

By CYNTHIA E. FIELD, Ph.D.

INSTEAD OF RESOLVING TO LOSE weight (again) this year, why not make a New Year's pact that's guaranteed to succeed? Spend just a few hours with **Publish It! 2** and create a custom calling card.

CARDS FOR ALL REASONS

You don't have to be a whiz-kid entrepreneur to benefit from so-called business cards. Even if you're seventysomething, these 3½-by-2-inch cards are an inexpensive, convenient way to make all kinds of contacts—for your sports club, senior association, or investment group, for instance.

While you're at it, create a batch of more-or-less generic cards, carry a few in your wallet or purse, and hand them out to new friends and acquaintances. You won't have to interrupt conversation to write down your name, address, and phone number, and the folks you're talking to won't have to decipher your hurried scrawl on that used table napkin!

Truth is, if you're like Dennis Krill—an Apple IIc user and architectural designer from Bellefonte, Pennsylvania, and the creator of this month's template—you're probably involved in *lots* of activities and need a different card for each of the many "hats" you wear.

Krill's calling-card template lets you fit ten cards on a single 8½-by-11-inch page. You can create ten copies of a single design—or as many as ten *different* designs—all on one print master.

LINE IT UP

Amazingly, this template is composed of just nine straight lines and is a snap to create. Start up Publish It! and work in *Size to Fit* mode: Press Open apple-4 or pull down the Special menu. Overall, this project is compatible with any version of Publish It!; certain optional procedures may not be available, however, if you're using the program's original version.

Click on the line tool in the Publish It! tool box. Pull down the Objects menu and select *Set Line Weight*. Click on the radio button corresponding to the narrowest line thickness. (It may be selected already by default.)

Pull down the Objects menu again. This time select *Set Pen Pattern*. Click on the first pattern in the second row. Drawing with striped patterns, such as this one, creates dashed lines you can use later as cutting guides for separating your printed business cards.

With the line tool, draw six horizontal lines anywhere on the page. Remove the selection handles from the last line drawn by clicking off to its side. Now pull down the Objects menu and click on *Set Pen Pattern*. Select the last pattern in the second row. Draw three vertical ►

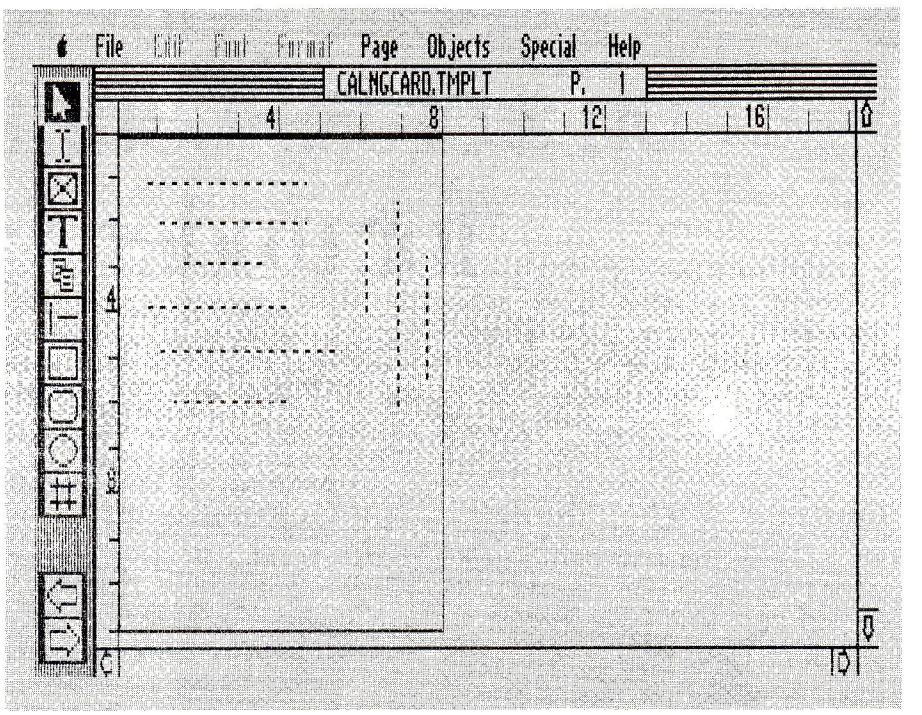

Figure 1. Nine lines for creating template.

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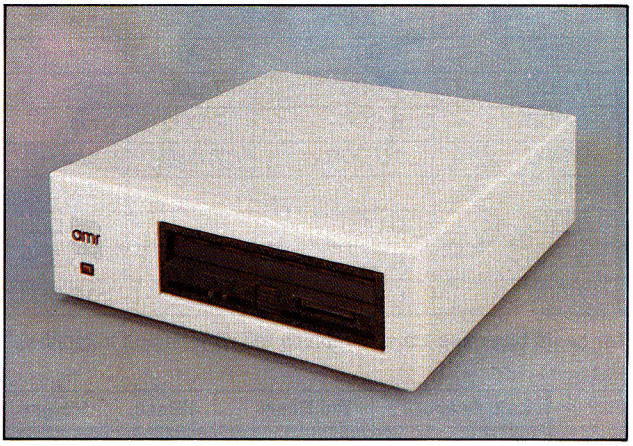
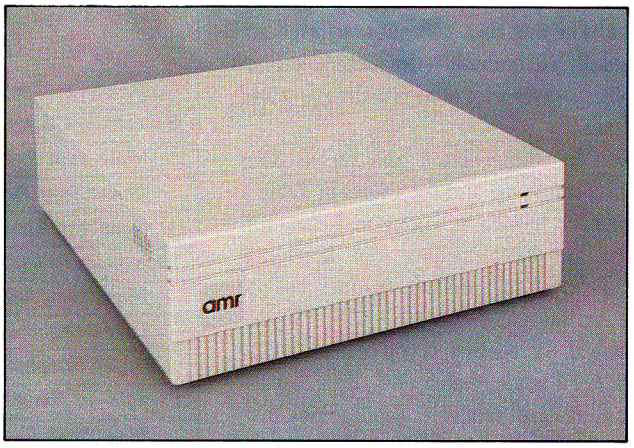


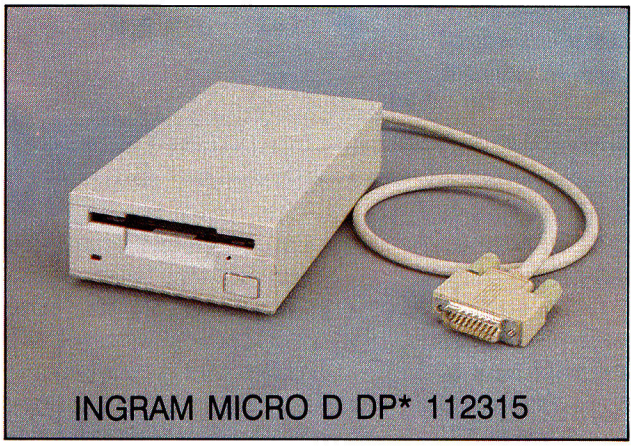
AMR 45MB REMOVABLE HARD DISK

- **Unlimited Storage**—just pop out one cartridge and plug in another; never fill up your hard disk again! Put business on one cartridge, education and games on another!
- **Incredibly Compatible**—works with an Apple IIe, IIGS, and Mac, works great with accelerator chips and boards, as well as cache cards!
- **Amazing as a Backup**—if you have a fixed hard drive use the removable as a backup, (instead of a tape backup), if your fixed hard drive breaks down you still have a fully functional removable hard drive!

MORE ON THE 45MB REMOVABLE

- **Inexpensive Expansion**—for about a hundred dollars buy another 44 megabyte cartridge. That's a little over two dollars per megabyte! Unbeatable!!!
- **Fantastic Features**—extremely fast 25ms access time, option of Apple SCSI or AMR SCSI cards, daisychainable with another removable hard drive or SCSI drives; built in termination switch; future 90meg cartridges planned; security feature of removing a data cartridge and locking it away.
- **Everything Included**—removable hard drive unit; SCSI card (specify type); cables; one 44 megabyte data cartridge; software; instructions and warranty.





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lines anywhere on the page. Your creation may look somewhat disjointed, like the one in **Figure 1**.

GET IT TOGETHER

To bring order to this seeming chaos, choose the pointer and click on the topmost horizontal line. If your aim is true, a selection handle appears at either end of the line. If you're having trouble selecting the line in *Size to Fit* mode, switch to *Show Half Size* or *Show Full Size* mode by pulling down the Special menu or pressing Open apple-3 or Open apple-1, respectively.

With the line selected, press Open apple-M or pull down the Objects menu and choose *Show Specifications*. At the dialog, enter the precise values for horizontal line 1 listed in **Table 1**. Press Return or click on the OK button. The line sizes and positions itself automatically. No question—this method of placing objects saves a lot of mouse dragging and eyestrain.

Select horizontal line 2 and use its *Show Specifications* dialog and the values in **Table 1** to size it and move it into position. Repeat this process for the remaining four horizontal lines. Proceed in the same manner for the three vertical lines.

That's all there is to it! If you're not working in *Size to Fit* mode, switch now. Your easy-as-pie calling-card template should look like **Figure 2**. Pull down the File menu (or press Open apple-A), and save this basic layout as **CALNGCARD.TMPLT**, or some other meaningful name.

CHOICES, CHOICES

The sky's the limit when it comes to designing your business card. Thanks to Publish It!'s free-form flexibility, you can place rules, pattern-filled shapes, text areas, or illustrations nearly anywhere within each card's boundaries.

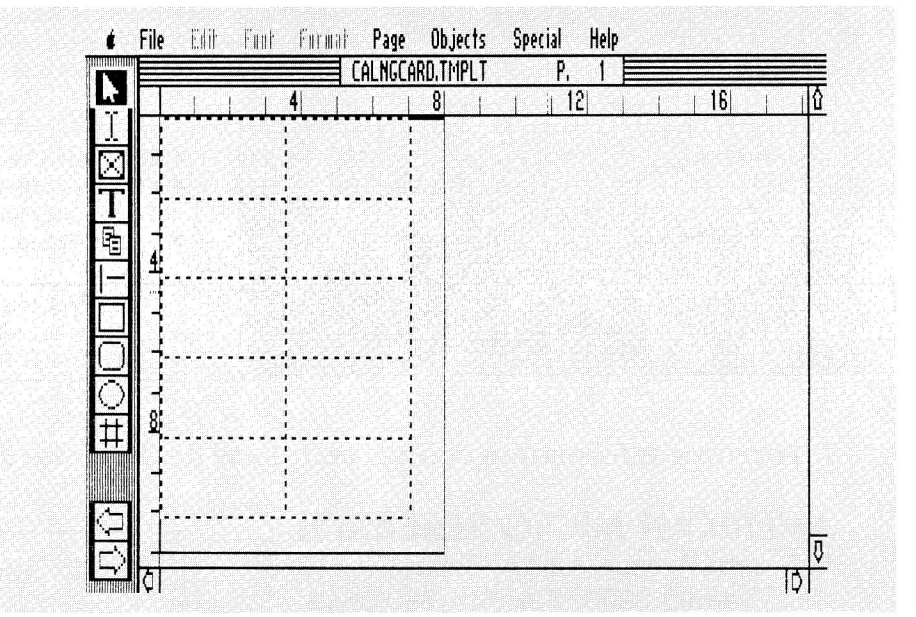
With upgraded versions of Publish It! you can directly import Print Shop graphics, hundreds of which are available at virtually no cost in the public domain. (See "Free for All," Field Trip, November 1989, p. 106, and "In Search of Software Treasures," June 1989, p. 47.) Moreover, with these newer versions you can enlarge or reduce illustrations until you've achieved the desired effect. Refer to **Figure 3** for four suggested layouts with completed examples created by our template designer, Dennis Krill. **Table 2** contains the

Objects	Left Start	Top Start	Width	Height
Horizontal Lines				
1	0.000	0.000	7.000	n/a
2	0.000	2.000	7.000	n/a
3	0.000	4.000	7.000	n/a
4	0.000	6.000	7.000	n/a
5	0.000	8.000	7.000	n/a
6	0.000	10.000	7.000	n/a
Vertical Lines				
1	0.000	0.000	n/a	10.000
2	3.500	0.000	n/a	10.000
3	7.000	0.000	n/a	10.000

Table 1. Specifications for basic business-card template (all dimensions in inches).

Objects	Left Start	Top Start	Width	Height
Sample 1: *Lighting Theatrics Associates*				
Main Text Area	1.119	0.202	2.241	1.704
Other Text Area	0.206	1.425	0.813	0.481
Graphics Area	0.202	0.184	0.815	1.184
Sample 2: *Click-Click-Click*				
Main Text Area	0.113	2.851	3.223	1.073
Other Text Area	0.095	2.111	1.351	0.629
Graphics Area	1.515	2.111	1.833	0.629
Sample 3: *Al Delah*				
Main Text Area	0.869	4.251	1.741	1.519
Left Graphics Area	0.220	4.250	0.500	1.500
Right Graphics Area	2.756	4.250	0.500	1.500
Sample 4: *Tim E. Gate*				
Main Text Area	0.129	6.147	3.277	1.777

Table 2. Specifications for sample business-card designs (all dimensions in inches).

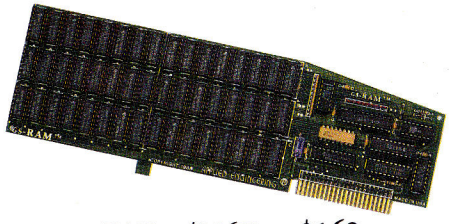


► **Figure 2.** Basic business-card template.

Three ways to grow a IIGS.

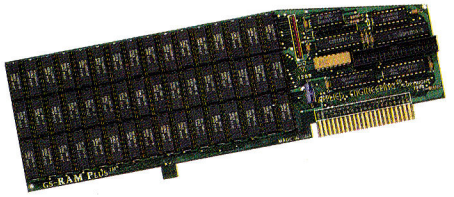
Applied Engineering makes three different memory cards for the IIGS because every IIGS owner is different. Each card was designed to suit specific needs:

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



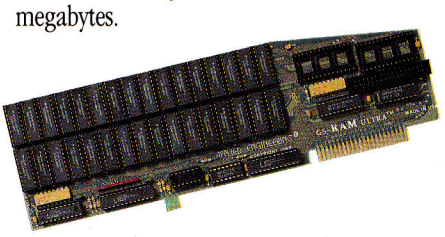
GS-RAM w/256K	**$169**
1 MEG	**$319**
1.5 MEG	**$419**

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



GS-RAM Plus w/1 MEG	**$379**
2 MEG	**$579**
3-6 MEG	**CALL**

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



GS-RAM Ultra 256K	**$229**
512K	**$279**
768K-4 MEG	**CALL**

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

Consider your needs.

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

Talk to us.

Your decision should be based on anticipated maximum memory need and growth path. Initially, it's less expensive to add 256K than 1 MEG, but buying a MEG at a time could save you money over the long haul. Call us. We'll be happy to discuss your particular applications.

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

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Still more:

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

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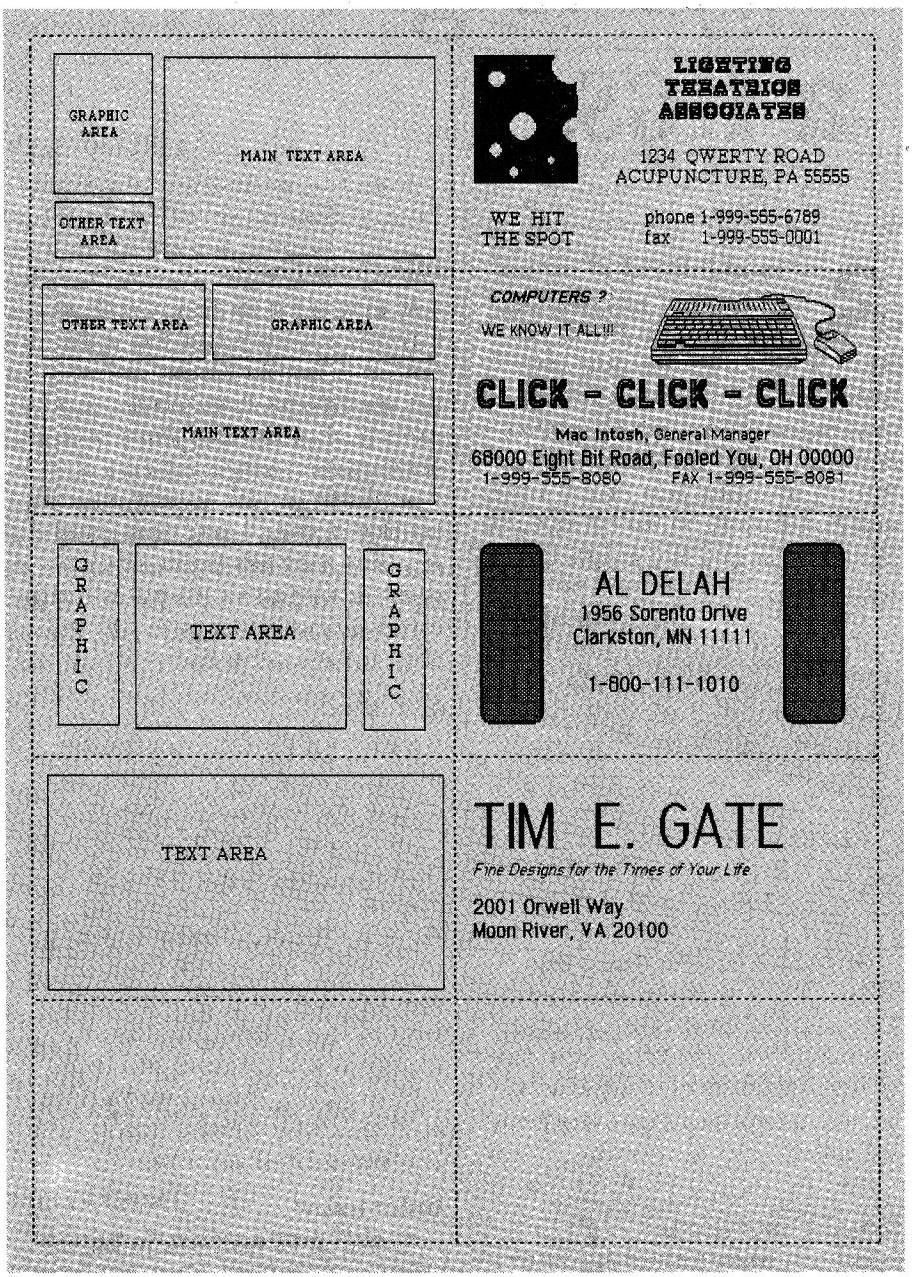

Figure 3. Sample business-card designs.

specifications for the objects in the suggested layouts.

Notice that these examples accommodate the "who, what, where trio," as Krill calls these vital pieces of information. Perhaps more importantly, each offers the visual impact that's crucial to good design. As Krill asserts, "Receivers of cards see hundreds of them every year.... An elegant layout or a catchy graphic can influence a reply.

"My architectural work requires that several design options be offered to clients," Krill adds, "so I try to provide card variations for the business-card purchaser. Once a design is selected, we go back into the file and copy the choice to the other fields."

DUPLICATING EFFORTS

One you've created your final design in one prototype card area, use the pointer to select objects and copy/paste them to the remaining nine card areas on the page. Begin with illustrations and graphics elements—rules and shaded rectangles, for instance. Select an object with the pointer. Press Open apple-C to "copy" a picture of the object into your Apple's memory. Then press Open apple-V to paste a duplicate on screen. Drag the copy into place in the second business-card area. Press Open apple-C and Open apple-V, then drag the next copy onto the third "card," and so on.

Now copy text areas. Initially the copies are devoid of text, but we'll correct this situation shortly. First select the text area. Press Open apple-C, then Open apple-V. Drag the text area into place on card 2. Continue pasting copies of the text area (Open apple-V) onto the remaining business cards.

To transfer the text to these now-empty text areas, scroll back to card 1, place the I-beam within the text area and drag it across all text. Here you have two options: Press Open apple-E, or pull down the Edit menu and choose *Select All*. Either action selects a range of text and inversely highlights it.

Press Open apple-C. Move the I-beam to the empty text area on card 2. Press Open apple-V, and the text should flow into place. Sure beats typing, huh? Now insert the I-beam into card 2 and press Open Apple-V. Continue with this procedure until the text areas on all ten business cards are filled appropriately with information.

Unfortunately, pasting text this way sometimes disrupts formatting options, such as centering, which you may have defined on your prototype card. To correct situations like these, select the text, pull down the Format menu, and reaffirm your choices in the *Justification* dialog.

A LITTLE BACKGROUND

Design options for business or calling cards abound. "Maps (created with Apple's **MousePaint** or another paint program) can add an extra dimension to common name/address/phone-number cards," Dennis Krill suggests. "A simple map background with cleverly placed text can help others find your place of business."

Ralph Tolbert, an Apple IIGS user and computer teacher at Niles (Ohio) High School, notes that "using **ThunderScan**, your supply of DHR (double-high-resolution) graphics is unlimited. For our school newspaper we scan original cartoon sketches of students, teachers, and sports players."

Another Tolbert technique is digitization of the high school's logo; he alters the shading of the black-and-white scan via ThunderScan software filters, then imports the logo into Publish It! and overlays the graphic with copy contained in a transparent text area. ►

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Luckily you don't have to use accessory programs or extra hardware to flex your design muscles. Here's a simple method for creating custom patterns with Publish It! alone.

Onto a business-card area on the template you just created, rubber-band (press the mouse button and drag) a rectangle, round rectangle, or circle with the appropriate shape tool. Pull down the Special menu and select *Define Pattern*. At the dialog, select the rightmost pattern displayed. In the enlarged "sketchpad" area, click each black pixel "off" to erase it, creating a blank 8-by-8-pixel canvas in the process.

Now click pixels "on" to create a custom design or logo. **Figure 4** shows a pattern composed of uppercase *F*s. You can construct any letter of the alphabet—or any small symbol or icon—just as easily. And editing is a breeze: Erase unwanted pixels by clicking on them. When you've finished your pattern, click on the OK button or press Return.

Select the shape you drew previously on your business card, pull down the Objects

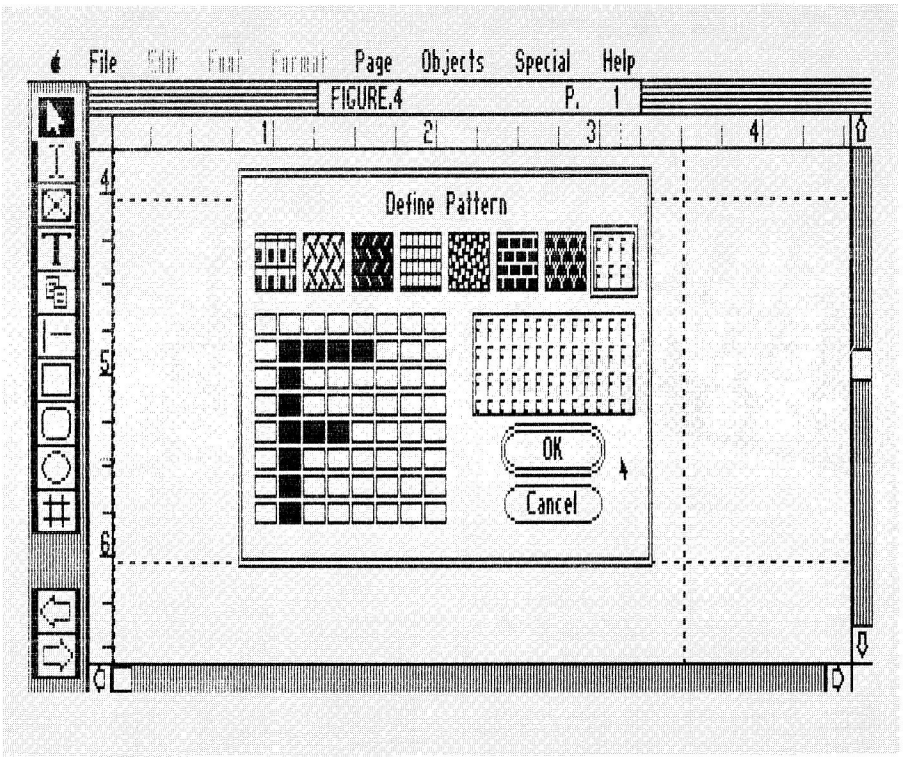

Figure 4. Creating custom background pattern.

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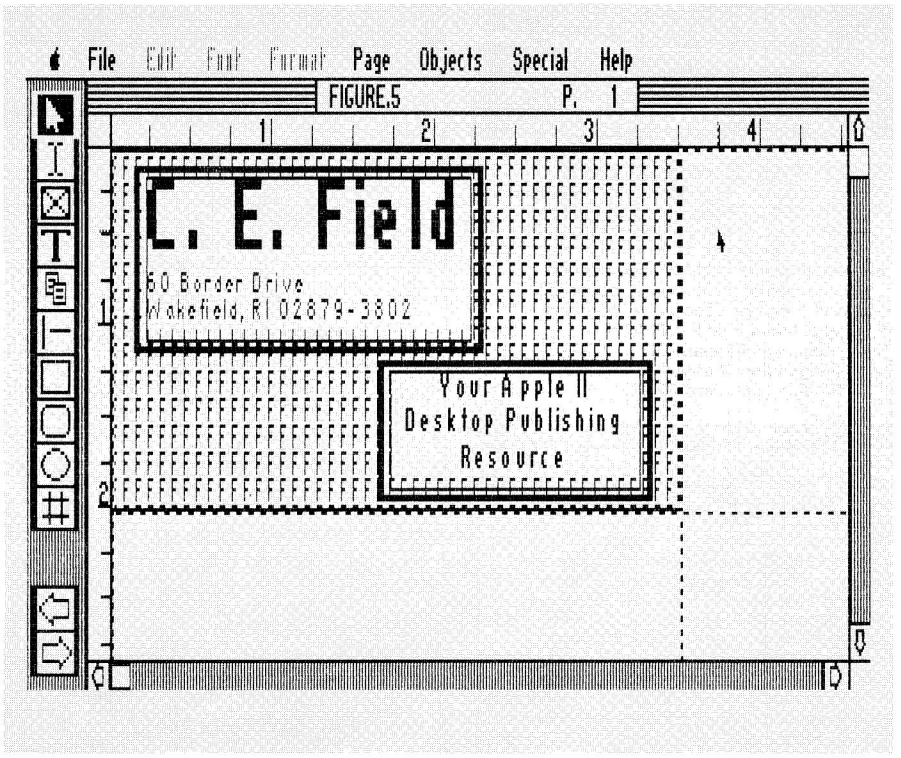

Figure 5. Sample business card with custom background pattern.

menu, and choose *Set Fill Pattern*. Select the design you created; it's in the lower right-hand corner. Click on *OK*. The shape on your business card—or in any publication you're designing—fills with the new, tailor-made pattern.

ON THE BORDERLINE

With the text tool, overlay one or more text areas onto the pattern-filled shape. Place the I-beam into these text areas, and type business or club information. Place a border around the text area by pressing Open apple-M and clicking on the *Frame Border* radio button.

To adjust the thickness of the border and the offset (the margin between the border and the text), pull down the Page menu and select *Frame Borders*. At the dialog, select the line thickness and the amount of offset you want. See **Figure 5** for a hypothetical layout using my custom pattern with bordered text areas superimposed on it.

Whoa! Before you get carried away trying out these ideas, remember to save your designs frequently. Use a filename that differs from ►

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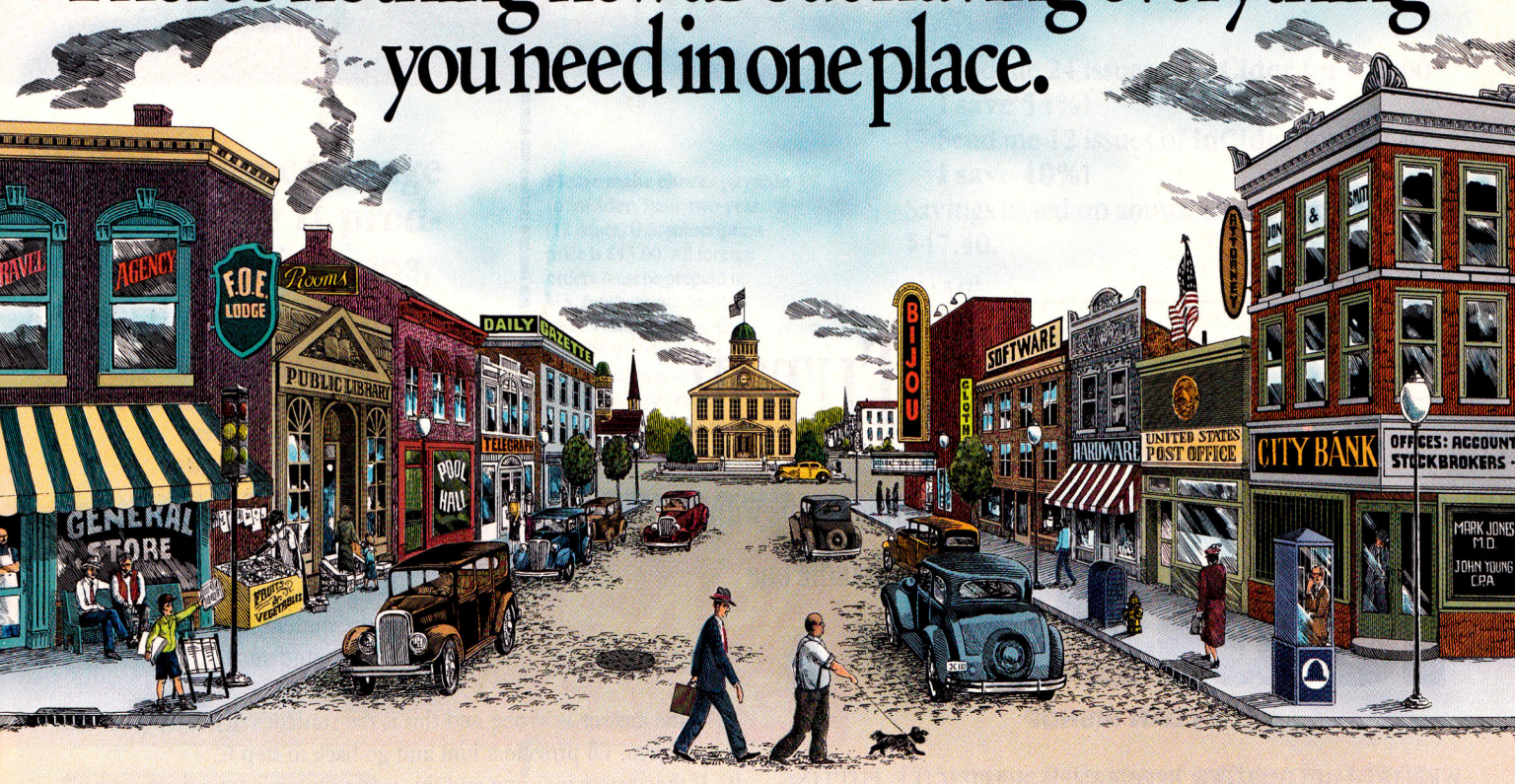

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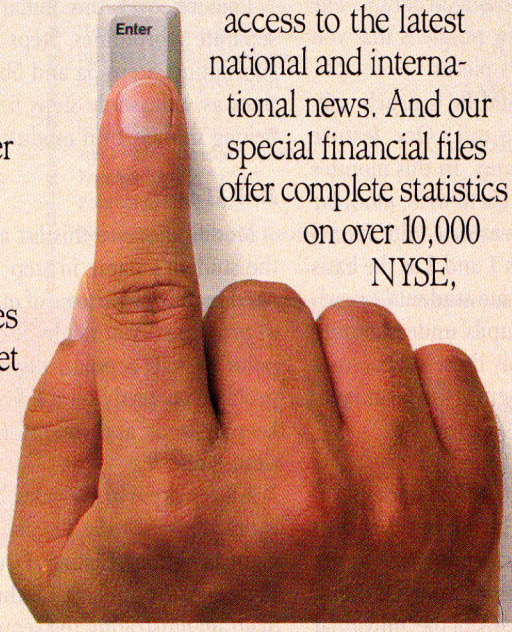

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TEACHER'S TUTOR

Writing a well-designed program begins with a series of subroutines that handle one specific task at a time.

By DAN BISHOP

WRITING A COMPUTER PROGRAM IS A LOT LIKE PUTTING together a jigsaw puzzle. First you break down every task you want the computer to perform into several smaller tasks; then, when you've identified and written all the pieces (*subroutines* in BASIC), you must still put them together to form the complete, functioning program. The advantage of programming over arranging a jigsaw puzzle is that you can control the shapes and sizes of your program's pieces.

Each section, or subroutine, in a program should be a nearly self-contained module that accomplishes one specific task. One feature common to most well-designed programs is *modularity*. In this month's column, I'll show you how important—and easy—it is to write modular programs. You can use the example I've chosen—a basic educational program—in a variety of applications. Use **Listings 1** and **2** as the basis for programs that test math or English skills; evaluate students' knowledge of astronomy, history, or chemistry; or check pupils' understanding of concepts such as auto mechanics or welding. Only those subroutines that deal with the specific subject material of the program will be unique.

DESIGNING THE PROGRAM

Suppose you've decided to write a program to tutor students in calculating simple geometric areas and volumes. Having decided *what* you want the program to do, you now need to determine *how* to get the program to do it. One easy approach is to imagine yourself doing the same tasks you want the program to perform. Think of the individual events and steps, and write them down in the order in which they occur.

For example, your list might look like the following:

1. Student arrives at my desk.
2. I greet the student.
3. I ask the student if he/she wants to work an area or a volume problem, or let me decide.
4. The student answers my question.
5. Depending on the student's answer, I:
   a. make up an area problem
   b. make up a volume problem
   c. toss a coin, and then do either 5a or 5b
6. Present the problem to the student.
7. Obtain the student's answer.
8. Evaluate the answer and either:
   a. praise the student for a correct answer
   b. inform the student that the answer is wrong
9. If the answer is wrong and this is the student's first attempt at this problem, I'll provide a hint and go back to step 6.
10. If the answer is wrong and this is the student's second attempt, I'll show the student the solution to the problem.
11. Now I'll go back to step 3.

Looking over this initial list reveals specific tasks that belong in separate subroutines. Steps 3 and 4 look like a menu (choice selection) subroutine. Steps 5a and 5b are likely candidates for separate subroutines as well, while steps 6 through 10 are clearly defined tasks that belong in their own modules.

MAP IT OUT

Modifications to this list also come to mind. You might want to get the student's name in step 2 along with the greeting. In step 3, you need to offer the choice of quitting the program, and add step 5d, "End of program." You might also want to keep score. You could give a full point or half a point, depending on whether the student solves the problem correctly on the first or second try. This requires some bookkeeping steps, and you must add a scoreboard-display module between steps 8 and 9.

A list, written in everyday English and describing the program's steps, is called *pseudo code*. The list above is a pseudo-code description of the main program (**Listing 1**) used with this article. The accompanying **Figure** is a flowchart of this program and serves as a roadmap or diagram illustrating the sequence of steps outlined in the pseudo code. The flowchart can reveal problems in a program's logic more readily than pseudo code and aid in devising solutions to those problems.

ADDING MENU ITEMS

Listing 1 contains references to ten subroutines. If you run **Listing 1** by itself, the program will crash, because it can't execute any GOSUB commands. This program is completely generic, however, for any ►

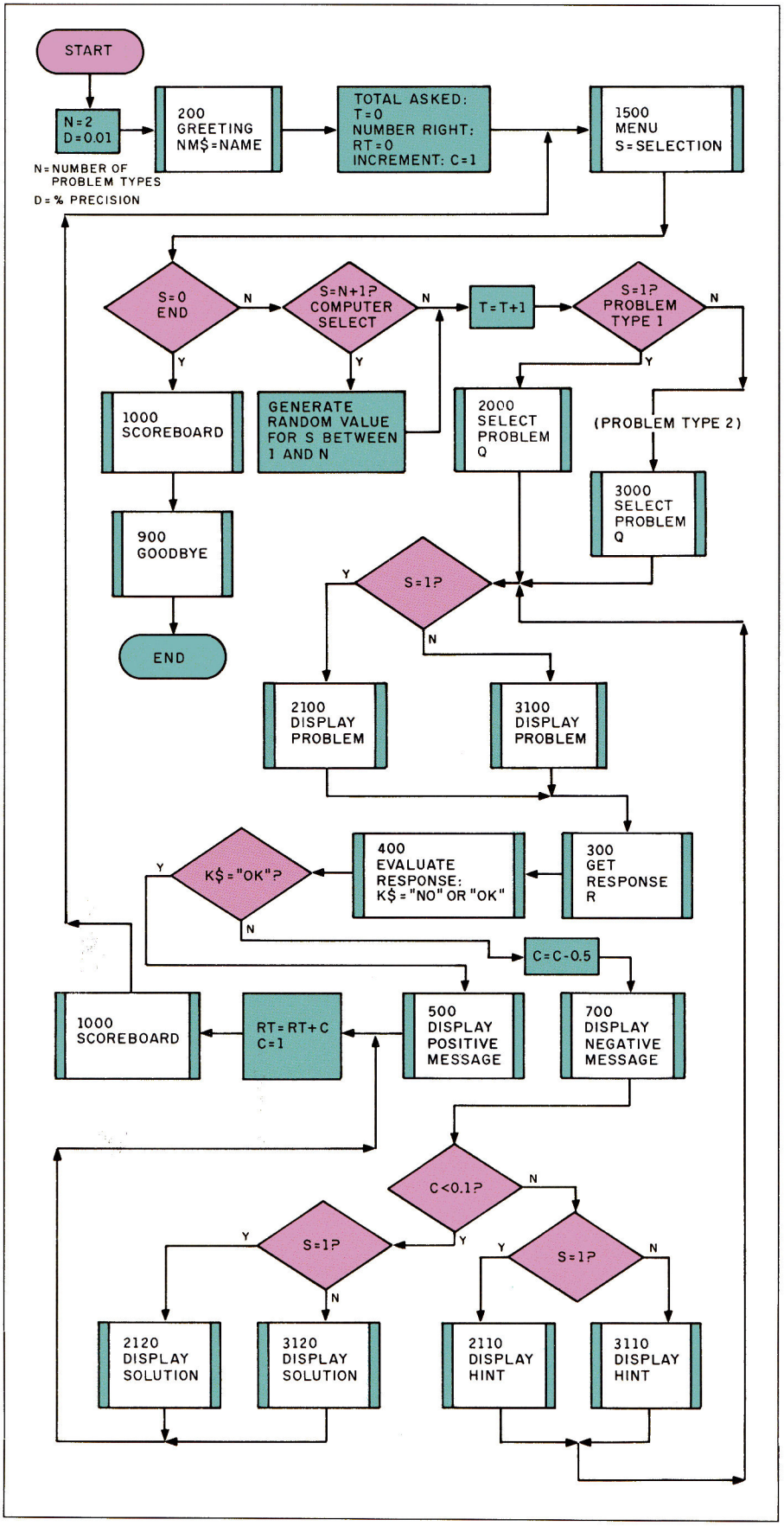
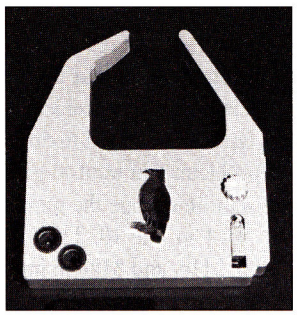


Figure. Flowchart of program logic for Listing 1.



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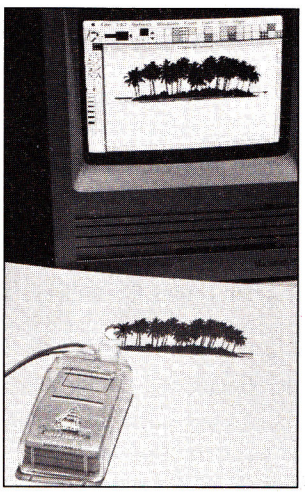

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educational application that presents a menu with four choices: end, select problem-type 1 or problem-type 2, or let the computer select the problem type. All you need to do is add subroutines appropriate to the types of problems you want to generate.

If you want to change the number of problem types to one, change N=2 to N=1 in line 10. Then delete the references to subroutines 3000, 3100, 3110, and 3120 in lines 45, 50, 80, and 90. These changes modify the main program to handle one problem type. To change the main program to handle more than two problem types, change N in line 10 to equal the number of problem types. Then add appropriate subroutine references to the end of the subroutine lists in lines 45, 50, 80, and 90.

SUBROUTINE ORGANIZATION

Of the 12 subroutines the main program calls, all those with line numbers below 1500 can remain unchanged, no matter how many problems types you generate. The only requirement is that you express menu responses and problem answers as numbers (including multiple-choice selections). These all-purpose subroutines include the greeting, input and evaluation of the student's answer, the computer's positive and negative responses, the scoreboard, and the goodbye message. **Listing 2** contains these seven subroutines.

The remaining five subroutines include the menu (see **Listing 3**), two subroutines used to pick the specific problem to be displayed, and two subroutines that contain the actual problems. **Listing 4** contains the code for these problems.

HOW THE PROGRAM WORKS

The main program sets D (line 10) to 0.01. D is the +/− percentage of the actual answer that defines the range within which the student's answer must fall. This percentage comes into play for math problems. For example, if D=0.01 and the math problem's solution is 5.83, then the program counts the student's answer correct if it falls within the range 5.83 +/− 0.0583. Line 405 (**Listing 2**) shows how the program uses this.

If the absolute value of the difference between the solution and the student's answer is less than D times the solution, then the student's answer is correct. This subroutine passes K$ back to the main program as either *OK* or *NO*, indicating whether or not the student solved the problem correctly.

The scoreboard routine (line 1000) uses T, RT, and C, which the main program initializes and uses in lines 20, 40, and 95. T is the total number of different problems worked, and RT is the number of problems worked correctly.

Each problem worked correctly on the first attempt adds one point to RT. If the student works the problem successfully on the second try, after the hint, the program increases RT by 0.5. C is the increment for RT.

MESSAGE BOARD

Before each new problem, the program assigns a value of 1 initially to C. C then decreases to 0.5 after the program displays a hint and to 0.0 if, after two unsuccessful attempts, it must display the problem's solution. You can use the value of C in the program to determine the stage of this process the student has reached for the current problem (line 75).

Listing 1. Main program segment for Teacher's Tutor.

```
1  REM  EDUCATIONAL PROGRAM SKELETON  [5740]
2  REM  INCIDER'S APPLESOFT ADVISOR  [5614]
3  REM  JANUARY, 1990  [2986]
4  REM  DAN BISHOP  [2132]
5  REM  ************************  [4085]
6  REM  [186]
10 D = 0.01:N = 2  [1345]
15  GOSUB 200: REM  GREETING  [1200]
20 T = 0:RT = 0:C = 1  [1614]
25  GOSUB 1500: REM  MENU  [1339]
30  IF S = 0 GOTO 110: REM  END  [1514]
35  IF S = N + 1 THEN S =  INT (N *  RND (1) + 1)  [2342]
40 T = T + 1  [633]
44  REM  GENERATE PROBLEM OR SELECTION  [5963]
45  ON S GOSUB 2000,3000  [1370]
49  REM  DISPLAY PROBLEM  [3135]
50  HOME : ON S GOSUB 2100,3100  [2758]
55  GOSUB 300: REM  GET RESPONSE  [1671]
60  GOSUB 400: REM  EVALUATE  [1512]
65  IF K$ = "OK" THEN  GOSUB 500: GOTO 95  [1833]
70 C = C - 0.5: GOSUB 700  [1808]
75  IF C < 0.1 GOTO 90  [1541]
80  ON S GOSUB 2110,3110: REM  HINT  [1788]
85  GOTO 50: REM  TRY AGAIN  [1553]
90  ON S GOSUB 2120,3120: REM  SOLUTION  [2715]
95 RT = RT + C:C = 1  [1287]
100  GOSUB 1000: REM  SCOREBOARD  [2012]
105  GOTO 25  [736]
110  GOSUB 1000: GOSUB 900: REM  GOODBYE  [3587]
115  END  [358]
```

Listing 2. Generic subroutines for Teacher's Tutor.

```
145  REM  [180]
146  REM  ***************  [482]
147  REM  PAUSE SUBROUTINE  [1138]
148  REM  ***************  [548]
149  REM  [188]
150  HTAB 1: VTAB 23  [702]
155  PRINT "*************************"  [771]
160  INPUT "PRESS RETURN TO CONTINUE...";Z$  [2519]
165  RETURN  [185]
195  REM  [308]
196  REM  ***************  [1876]
197  REM  GREETING  [947]
198  REM  ***************  [1878]
199  REM  [316]
200  HOME  [295]
205  PRINT "WELCOME TO COMPUTER QUIZZER"  [2003]
210  PRINT  [314]
215  PRINT "PLEASE TYPE YOUR NAME AND PRESS RETURN:"  [2924]
220  PRINT  [322]
225  INPUT "     ";NM$  [1344]
230  PRINT : PRINT  [644]
235  PRINT "GLAD TO MEET YOU, ";NM$  [1834]
240  GOSUB 150  [601]
245  RETURN  [313]
295  REM  [194]
296  REM  ******************  [3184]
297  REM  GET RESPONSE  [2709]
298  REM  ******************  [3184]
299  REM  [202]
300  PRINT : INPUT "     YOUR ANSWER?  ";R$  [1622]
305 R =  VAL (R$)  [624]
310  RETURN  [189]
400 K$ = "NO"  [801]
405  IF  ABS (R - A) < (D * A) THEN K$ = "OK"  [2640]
410  RETURN  [197]
495  REM  [306]
496  REM  ********************  [2133]
497  REM  POSITIVE MESSAGE  [1250]
498  REM  ********************  [2135]
499  REM  [314]
500 M =  INT (5 *  RND (1) + 1)  [2084]
505  ON M GOSUB 520,530,540,550,560  [3516]
510  GOSUB 150  [658]
515  RETURN  [185]
520  PRINT "THAT'S CORRECT."  [3167]
521  PRINT "GOOD WORK, "NM$"."  [3598]
525  RETURN  [205]
530  PRINT "BULLSEYE. YOU'RE RIGHT ON THE MARK!  [7388]
535  RETURN  [193]
540  PRINT "CORRECT!  KEEP UP THE GOOD WORK, "NM$"."  [7944]
545  RETURN  [181]
550  PRINT "GOOD GOING, "NM$".  YOU"  [5289]
551  PRINT "ANSWERED THAT CORRECTLY."  [5377]
```

Continued

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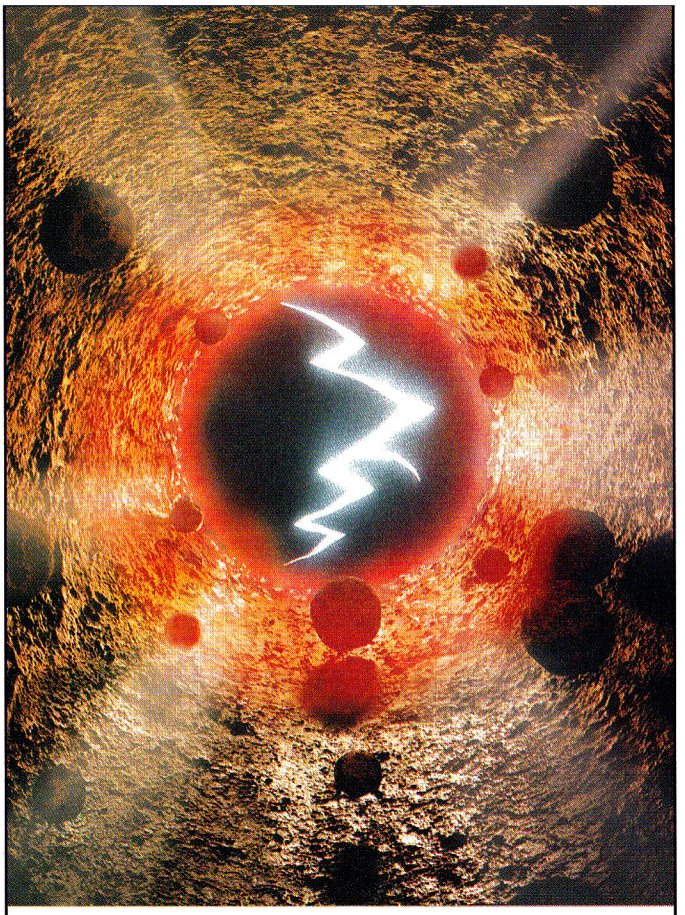
Continued

```
555  RETURN   [201]
560  PRINT "RIGHT ON!  "  [2859]
561  PRINT "YOU'RE ON A ROLL."  [3940]
565  RETURN   [189]
590  RETURN   [305]
695  REM   [196]
696  REM  ********************  [648]
697  REM   NEGATIVE MESSAGE  [1094]
698  REM  ********************  [738]
699  REM   [204]
700 M =  INT (5 *  RND (1) + 1)  [2182]
705  ON M GOSUB 720,730,740,750,760  [3589]
710  RETURN   [321]
720  PRINT "THAT'S NOT CORRECT."  [1633]
725  RETURN   [317]
730  PRINT "NOPE.  YOU MISSED THAT ONE."  [2243]
735  RETURN   [305]
740  PRINT "SORRY, "NM$".  THAT'S NOT"  [1921]
741  PRINT "THE RIGHT ANSWER."  [1705]
745  RETURN   [325]
750  PRINT "WRONG.  BUT KEEP TRYING."  [1929]
755  RETURN   [313]
760  PRINT "YOU MISSED THAT ONE, "NM$"."  [2157]
761  PRINT "BUT PRACTICE MAKES PERFECT."  [1973]
765  RETURN   [333]
895  REM   [178]
896  REM  ********************  [967]
897  REM    GOODBYE  [799]
898  REM  ********************  [1057]
899  REM   [186]
900  HOME   [151]
905  PRINT "THANKS FOR WORKING WITH ME, ";NM$  [1879]
910  PRINT   [188]
915  PRINT "PLEASE COME BACK SOON!"  [1434]
920  PRINT   [188]
930  RETURN   [185]
995  REM   [314]
996  REM  ***********************  [2775]
997  REM   SCOREBOARD  [804]
998  REM  ***********************  [2681]
999  REM   [322]
1000  HOME   [359]
1005  HTAB 1: VTAB 10  [1205]
1010  PRINT "    YOUR SCORE: "  [1541]
1015  PRINT "***************************"  [2686]
1020  PRINT "  TOTAL      NUMBER    PERCENT"  [2088]
1025  PRINT "  ATTEMPTS   CORRECT    SCORE"  [5536]
1030  PRINT "-----------------------------"  [5398]
1035  PRINT "    "T"        "RT"         ";  [5684]
1040 PC = 100 * RT / T  [1602]
1045 PC =  INT (10 * PC + .5) / 10  [1860]
1050  PRINT PC  [621]
1055  PRINT "***************************"  [4844]
1060  GOSUB 150  [689]
1065  RETURN   [201]
```

Listing 3. Menu subroutine for Teacher's Tutor.

```
1495  REM   [330]
1496  REM  *************************  [2561]
1497  REM      MENU  [632]
1498  REM  *************************  [2563]
1499  REM   [306]
1500  HOME   [343]
1505  PRINT : PRINT "        PROGRAM MENU"  [4879]
1510  PRINT "*************************"  [3164]
1515  PRINT "PLEASE ENTER YOUR CHOICE:"  [1973]
1520  PRINT   [324]
1525  PRINT "    0 - END THE PROGRAM"  [1916]
1530  PRINT   [324]
1535  PRINT "    1 - AREA CALCULATIONS"  [5043]
1540  PRINT "    2 - QUESTION POTPOURI"  [4824]
1545  PRINT "    3 - COMPUTER SELECTION"  [5122]
1550  PRINT   [194]
1560  INPUT "         SELECTION...";S$  [4624]
1565 S =  VAL (S$)  [624]
1570  IF S < 0 OR S > N + 1 GOTO 1500  [1969]
1575  RETURN   [201]
```

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Listing 4. Two problem blocks.

```
1995  REM   [306]
1996  REM  ************************  [2372]
1997  REM  MATH PROBLEM SELECTOR  [1728]
1998  REM  ************************  [2476]
1999  REM   [314]
2000 Q =  INT (4 *  RND (1) + 1)  [1883]
2005 P1 =  INT (12 *  RND (1) + 1)  [2351]
2010 P2 =  INT (12 *  RND (1) + 1)  [2237]
2015  RETURN   [317]
2095  REM   [188]
2096  REM  ************************  [3770]
2097  REM  MATH PROBLEMS  [2768]
2098  REM  ************************  [3770]
2099  REM   [196]
2100  ON Q GOTO 2200,2300,2400,2500  [2365]
2110  ON Q GOSUB 2220,2320,2420,2520  [1143]
2115  GOSUB 150: RETURN   [1303]
2120  ON Q GOSUB 2250,2350,2450,2550  [1085]
2125  PRINT "THE CORRECT ANSWER IS "A  [5262]
2130  GOSUB 150: RETURN   [1316]
2200  PRINT   [186]
2205  PRINT "WHAT IS THE AREA OF A SQUARE THAT "  [2385]
2210  PRINT "MEASURES "P1" INCHES ON A SIDE?"  [2452]
2215  PRINT :A = P1 * P1: RETURN   [1543]
2220  PRINT "HINT: THE AREA OF A SQUARE IS FOUND BY"  [2856]
2225  PRINT "MULTIPLYING THE SIDE MEASUREMENT BY"  [2578]
2230  PRINT "ITSELF."  [739]
2235  RETURN   [309]
2250  PRINT "THE ANSWER IS FOUND BY SOLVING"  [2515]
2255  PRINT P1" X "P1"."  [909]
2260  RETURN   [329]
2300  PRINT   [450]
2305  PRINT "WHAT IS THE AREA OF A RECTANGLE THAT"  [7316]
2310  PRINT "MEASURES "P1" INCHES BY "P2" INCHES?"  [7667]
2315  PRINT :A = P1 * P2: RETURN   [1694]
2320  PRINT "HINT: THE AREA OF A RECTANGLE IS FOUND"  [7486]
2325  PRINT "BY MULTIPLYING THE WIDTH AND HEIGHT"  [7331]
2330  PRINT "MEASUREMENTS."  [3131]
2335  RETURN   [193]
2350  PRINT "THE ANSWER IS FOUND BY SOLVING"  [6291]
2355  PRINT P1" X "P2"."  [2769]
2360  RETURN   [305]
2400  PRINT   [316]
2405  PRINT "WHAT IS THE AREA OF A CIRCLE THAT"  [7179]
2410  PRINT "HAS A DIAMETER OF "P1" INCHES?"  [6739]
2415  PRINT :A = 3.1416 * P1 / 2: RETURN   [2330]
2420  PRINT "HINT: THE AREA OF A CIRCLE IS FOUND BY"  [8129]
2425  PRINT "MULTIPLYING PI (3.1415) BY THE CIRCLE'S"
      [3112]
2430  PRINT "RADIUS (WHICH IS 1/2 THE DIAMETER)."  [2534]
2435  RETURN   [201]
2450  PRINT "THE ANSWER IS FOUND BY SOLVING"  [2483]
2455  PRINT "3.1416 * "P1" /2."  [1299]
2460  RETURN   [185]
2500  PRINT   [324]
2505  PRINT "WHAT IS THE AREA OF A TRIANGLE THAT HAS"
      [2872]
2510  PRINT "A BASE MEASUREMENT OF "P1" INCHES"  [2344]
2515  PRINT "AND A HEIGHT OF "P2" INCHES?"  [2024]
2516  PRINT :A = P1 * P2 / 2: RETURN   [1916]
2520  PRINT "HINT: THE AREA OF A TRIANGLE IS FOUND "  [3247]
2525  PRINT "BY MULTIPLYING ITS BASE BY HALF ITS"  [2479]
2530  PRINT "HEIGHT."  [1109]
2535  RETURN   [305]
2550  PRINT "THE ANSWER IS FOUND BY SOLVING "  [2182]
2555  PRINT P1" X "P2" /2."  [3600]
2560  RETURN   [197]
2995  REM   [202]
2996  REM  ************************  [828]
2997  REM  MULTIPLE CHOICE SELECTOR  [2019]
2998  REM  ************************  [2756]
2999  REM   [306]
3000 Q =  INT (5 *  RND (1) + 1)  [1900]
3005  RETURN   [321]
3095  REM   [180]
3096  REM  ************************  [4242]
3097  REM  MULTIPLE CHOICE PROBLEMS  [4475]
3098  REM  ************************  [4242]
3099  REM   [188]
3100  ON Q GOTO 3200,3300,3400,3500,3600  [2749]
3110  ON Q GOSUB 3220,3320,3420,3520,3620  [2736]
3115  GOSUB 150: RETURN   [875]
3120  ON Q GOSUB 3250,3350,3450,3550,3650  [2778]
3125  PRINT "THE CORRECT ANSWER IS "A  [5210]
3130  GOSUB 150: RETURN   [1272]
3200  PRINT   [194]
3205  PRINT "WHEN AN AIRCRAFT'S NOSE IS RAISED TOO"  [2495]
3206  PRINT "HIGH, WHAT HAPPENS FIRST?"  [1599]
3210  PRINT " 1) A SPIN    2) A STALL   3) A DIVE"  [2908]
3211  PRINT " 4) A CRASH   5) NOTHING"  [1788]
3215  PRINT :A = 2: RETURN   [808]
3220  IF R = 1 OR R = 3 THEN  PRINT "THAT MIGHT OCCUR
     FOLLOWING THIS EVENT.": RETURN   [9198]
3221  IF R = 4 THEN  PRINT "WITH PROPER CONTROL, THER
    E IS NO DANGER OF A CRASH!": RETURN   [11645]
3222  IF R = 5 THEN  PRINT "YOU BETTER BELIEVE SOMETH
```

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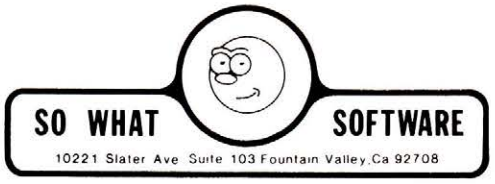

Continued

```
    ING WILL HAPPEN": RETURN   [8965]
3225  RETURN   [185]
3250  PRINT "A STALL IS THE FIRST THING THAT HAPPENS.
    "  [2512]
3255  PRINT "RECOGNIZING A STALL AND QUICK RECOVERY"  [2735]
3260  PRINT "CAN AVOID BOTH DIVES AND SPINS."  [2524]
3265  RETURN   [329]
3300  PRINT   [314]
3305  PRINT "WHAT IS THE CAPITOL OF NORTH DAKOTA?"  [2634]
3310  PRINT " 1) ST. PAUL   2) FARGO   3) RAPID CITY
      4) BISMARK   5) NONE OF THESE"  [5135]
3315  PRINT :A = 4: RETURN   [1274]
3320  IF R = 1 THEN  PRINT "ST. PAUL IS THE CAPITOL O
    F MINNESOTA.": RETURN   [3805]
3321  IF R = 2 THEN  PRINT "FARGO IS IN NORTH DAKOTA,
     BUT IS NOT ITS CAPITOL.": RETURN   [4371]
3322  IF R = 3 THEN  PRINT "RAPID CITY IS IN SOUTH DA
    KOTA.": RETURN   [3365]
3323  IF R = 5 THEN  PRINT "THE CORRECT ANSWER IS ONE
     OF THESE      CITIES.": RETURN   [4413]
3324  IF R = 5 THEN  PRINT "THE CAPITOL OF NORTH DAKO
    TA IS IN THIS  LIST OF CITIES.": RETURN   [4964]
3325  RETURN   [449]
3350  GOSUB 3320  [795]
3355  PRINT "BISMARK IS THE CAPITOL OF NORTH DAKOTA."
      [8218]
3360  RETURN   [201]
3400  PRINT   [324]
3405  PRINT "WHAT IS THE MAXIMUM SPEED LIMIT ALLOWED"
      [7991]
3406  PRINT "ON OPEN HIGHWAYS THAT ARE NOT INTERSTATE
     HIGHWAYS."  [10566]
3410  PRINT :A = 55: RETURN   [1297]
3420  IF R > 65 THEN  PRINT "YOU ARE NEVER ALLOWED TO
     DRIVE THIS FAST": RETURN   [4066]
3421  IF R > 55 THEN  PRINT R" IS ONLY ALLOWED ON INT
    ERSTATE          HIGHWAYS, WHERE POSTED.": RETURN
      [5337]
3422  IF R < 55 THEN  PRINT "IF POSTED, YOU CAN GO FA
    STER THAN "R".": RETURN   [3521]
3423  RETURN   [329]
3425  RETURN   [333]
3450  RETURN   [189]
3500  PRINT   [188]
3505  PRINT "WHO RECENTLY WAS BARRED FROM PROFESSION-
    "  [2576]
3506  PRINT "AL BASEBALL FOR BETTING ON HIS"  [1908]
3507  PRINT "OWN TEAM?"  [969]
3510  PRINT " 1) PETE ROSE   2) JOHN ELWAY"  [2661]
3511  PRINT " 3) LEE TREVINO 4) JIMMY CONNERS"  [2800]
3515  PRINT :A = 1: RETURN   [1153]
3520  IF R = 2 THEN  PRINT "JOHN PLAYS FOOTBALL.  HE
    IS QUARTERBACK FOR THE DENVER BRONCOS.": RETURN   [13804]
3521  IF R = 3 THEN  PRINT "LEE PLAYS GOLF, NOT BASEB
    ALL.": RETURN   [7439]
3522  IF R = 4 THEN  PRINT "JIMMY CONNERS PLAYS TENNI
    S.": RETURN   [7006]
3525  RETURN   [309]
3550  GOSUB 3520  [729]
3555  PRINT "PETE ROSE WAS ALLEGED TO HAVE BET ON HIS
     OWN TEAM, BOTH AS A PLAYER AND AS A    TEAM MANA
    GER."  [6225]
3560  RETURN   [313]
3600  PRINT   [194]
3605  PRINT "WHICH OF THE FOLLOWING COMPOUNDS IS A"  [7737]
3606  PRINT "CARBOHYDRATE?"  [3181]
3610  PRINT " 1) ASPIRIN   2) SUCROSE   3) GLYCERIN"  [8005]
3611  PRINT " 4) MONOSODIUM GLUTAMATE"  [5003]
3612  PRINT " 5) SODIUM CHLORIDE"  [3977]
3615  PRINT :A = 2: RETURN   [864]
3620  PRINT "HINT: SUGARS BELONG TO THE CARBOHYDRATE
    FAMILY.":  [9797]
3625  RETURN   [189]
3650  PRINT "SUCROSE, A SUGAR, IS A CARBOHYDRATE."  [7734]
3655  RETURN   [313]
```

After each student response, the program displays a randomly selected message from one of two lists (subroutines 500 and 700). The first line in both subroutines selects a random number between 1 and 5. The second line uses this number, M, to go to the selected message routine, display the message, and return to the pause subroutine (line 150) before returning to the main program. You may change these messages to anything you like.

If you want more messages, include them after line 565 (or 665), being sure to end each new message with a Return. Then change the 5 in line 500 (or 700) to the number of messages you're using, and add the appropriate new line numbers in the ON M GOSUB list in line 505 (or 705).

GIVE ME A HINT

For this example, two different problem types are available. Lines 2000–2990 contain the code for math problems, which can use randomly generated numbers. This lets you create many different problems with a minimum of code. Lines 3000–3990 contain a set of multiple-choice problems. With this type of problem, you must write out each individual question completely within the program.

The subroutines at lines 2000 and 3000 generate a random number to select the question from the set of problems contained between lines 2200–2990 and 3200–3990. If the exercises are math problems, this subroutine also generates the random numbers they use.

Each problem in the 2200–2990 and 3200–3990 blocks is totally self-contained. First come the lines of code used to display the problem, followed by Return. Then come the lines containing a hint or partial solution to the problem, followed by Return. Last are the lines containing the complete solution to the problem, again followed by Return.

PROBLEMS AND SOLUTIONS

The main program calls line 2100 to display the problem. Because Q, the problem number, already has an assigned value (subroutines 2000 and 3000), lines 2100 and 3100 use an ON Q GOSUB command, directing the program to the appropriate line number to display the problem.

Similarly, when the program must display the hint or solution to problem Q, it calls line 2110 (or 3110) or line 2120 (or 3120). These lines also contain an ON Q GOSUB command, directing the program to display the hint or the problem's solution.

TAILOR IT

Follow this same general pattern for the specific problems you write into the program. Be sure to change the problem-count value in the random-number generator from 4 (line 2000) or 5 (line 3000) to the appropriate value for your problem set.

If you have more than two problem sets, put the additional block(s) of lines at intervals of 1000, and pattern them after those in the 2000–2990 or 3000–3990 blocks.

LEARNING PROCESS

Although this program may lack fancy graphics and bells and whistles, its simplicity makes it easy to duplicate and tailor to the field of study you indicate. Its modularity makes it easy for the more advanced programmer to add those extra frills.

The program lacks two important features. As written, it can't handle problems that require text-string input for answers. It also can't keep track of which problems it's already asked. Because of this, a given problem may appear more than once during a tutorial session. My next column will address both of these difficulties.

I'll be happy to send you a disk copy of this program (with the next installment's enhancements included, along with several additional program-type examples) for $12. Please send an initialized disk, and indicate whether it's formatted in DOS or ProDOS.□

DAN BISHOP IS AN ASSOCIATE PROFESSOR OF CHEMISTRY AT COLORADO STATE UNIVERSITY, AND ALSO OWNS AND OPERATES A MICROCOMPUTER CONSULTING BUSINESS. WRITE TO HIM AT 4124 BEAVER CREEK DRIVE, FORT COLLINS, CO 80526. ENCLOSE A SELF-ADDRESSED, STAMPED ENVELOPE IF YOU'D LIKE A PERSONAL REPLY.

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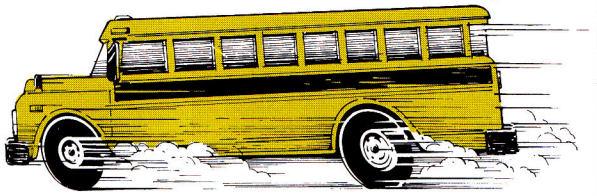

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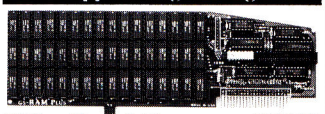

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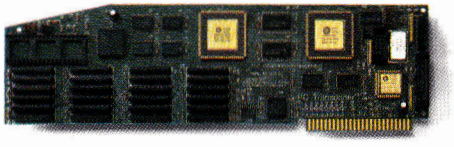

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PC Transporter taps into the world's largest software library. Now your Apple can run most of the software you use at work. And it opens a new world of communications programs, games and bulletin boards.

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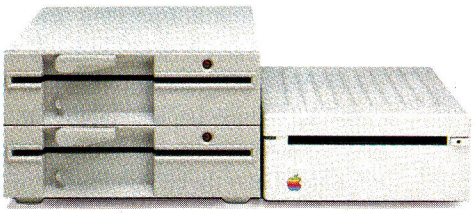

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Note: 768K RAM in Apple mode translates to 640K RAM in the IBM mode because PC Transporter uses 128K for system memory.

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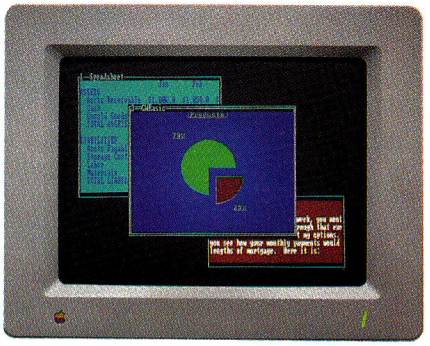

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SPEAKING OF GRAPHICS

SHRINKING MARKETS

Why aren't more programmers writing more software, especially in the field of Apple II graphics? Today the only outlets for the small developer are on-line services.

By ROBERTA SCHWARTZ and MICHAEL CALLERY

"WHAT ARE YOUR FAVORITE PAINT PROgrams?" During our presentations at AppleFest and other computer shows, we often pose that question to our audience. The answers come rapidly: Dazzle Draw, Paintworks Gold, 816/Paint, DeluxePaint, and so on. But asking, "Who wrote these programs?" almost always brings silence.

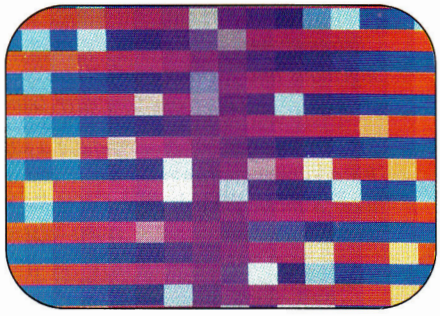
Imagine where we'd be without these software authors! But who are they? Why aren't more programmers writing more software, especially in the field of Apple II graphics? Perhaps they are, and perhaps they're facing the same frustrations Mike MacDonald has experienced.

IF AT FIRST YOU DON'T SUCCEED

In 1979 Mike MacDonald, manager of a finance company's data-processing group, developed Apple II loan-negotiation software for independent finance companies. It was relatively successful, and Mike formed his own company, Mint Software, to market the program. He soon realized that selling, training, and support took him away from doing what he did—and enjoyed—best: creating software. So when he couldn't find an Apple II program that would let him present data graphically, he designed one; this time, though, he let an established software company handle the business end of the operation.

Sensible Software marketed **The Graphics Department**, one of the first and finest Apple II business-graphics programs. Mike wrote release 2 shortly thereafter, but ProDOS-based release 3, with USA mapping and 3-D bar charts, never reached the public. Why? Despite rave reviews, Graphics Department sales weren't high enough to justify skyrocketing advertising costs, especially because the Apple II was losing its position as a choice business computer.

Undaunted, Mike developed **Graph Art I**, a portfolio of graphics images with a picture-management program that interfaced with the Graphics Department. To Mike's dismay, the only people who knew Graph Art I existed were those who found a promotion inserted into the newer copies of Graphics Department.



Changing patterns continuously, this screen created with Supergraphix 256 displays many more than the official 16 colors of the GS.

Sensible Software, according to Mike, never advertised the program publicly.

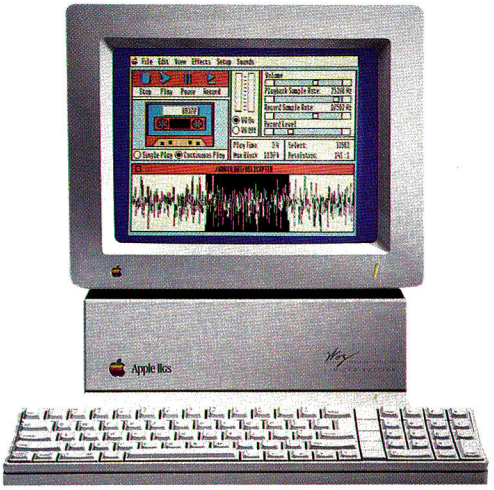
Through the years, Mike continued experimenting, exploring, and creating. His last projects, **The Scribe** and **Stretch-a-Sketch**, are clip-art-type programs that'll probably interest most readers.

As you know, most graphics programs store images pixel by pixel (bit mapping). These images look okay in their original sizes or reduced, but when enlarged they get the jaggies. Mike's images, produced on a digitizing tablet with a resolution of 1000 dots per inch, avoid this effect. The Scribe uses 11 graphics fonts and Stretch-a-Sketch uses more than 100 line pictures. The programs are available in standard-hi-res or double-hi-res versions. You can load a graphic you've created with a paint program into either of these applications and place any of their line fonts or pictures on your graphic. When you rotate, move, or scale these images, they retain their integrity and print at your printer's resolution.

TRY, TRY AGAIN

A popular "magazine on disk" was supposed to offer Stretch-a-Sketch as a bonus disk for new subscribers, but the company went into receivership and the deal fell through. Then a major software company worked out a deal with Mike whereby he'd sell exclusive rights to his art library and the technique he used. The company postponed working out the details until it began a new project that was in the planning stage at that time. That project never came to be. Other promising offers also fell through.

Like us, you may remember when someone could write a program, advertise it in one—or several—Apple II publications, and if the program was good, reap the rewards of a job well done. Today the only outlets for the small developer are on-line services. And although there's little money to be made from share- ►



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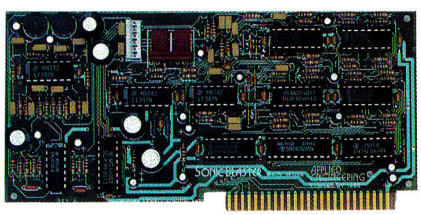
Kick back with your favorite computer game and immerse yourself in a roomful of sound effects. Create strange answering machine messages. Drop an interesting background sound into your phone conversations (we provide 17 to get you started). Change screen colors with a virtually infinite pallette of color.



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

Use your own equipment.

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

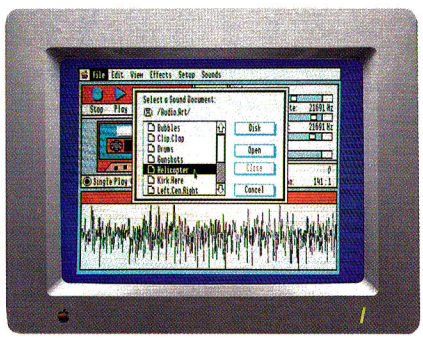
We designed Sonic Blaster to be complete. Here's a quick tour of part of the software screen:

The Buttons

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

The Sound Graph

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



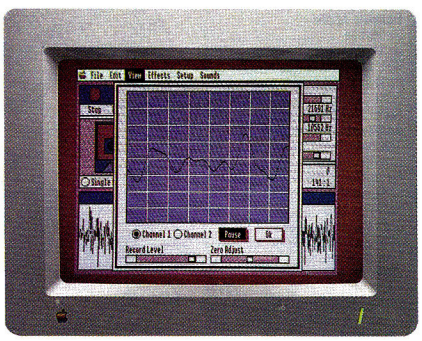
Seventeen sound effects to get you started. Add your own collection of sounds.

The Bars

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

The Blocks

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



"See" the sound on the oscilloscope.

The Oscilloscope

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ware, these authors can at least have the satisfaction of knowing others are using and appreciating their efforts.

Mike has decided to follow that route. CompuServe, GEnie, and America On Line (formerly AppleLink) will be offering the single-hi-res version of both Stretch-a-Sketch and The Scribe, along with a limited library of sketches and fonts. The double-hi-res versions of these programs, with full library and printing capabilities, are available directly from Mike.

The next time you wonder why someone hasn't written an application that does what you need, or why an author hasn't upgraded an application to include new features, think about this column—and think about Mike MacDonald. If you're interested in contacting Mike, enclose a self-addressed, stamped envelope with your letter, and he'll be happy to provide a personal reply.

PRODUCT INFORMATION

Graph Art I
Stretch-a-Sketch
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standard-hi-res versions
available through CompuServe,
GEnie, AppleLink
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Mint Software
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NEW PRODUCTS

Let's not finish this column on a down note; there are still new products to be had. Lynx Computer Products' **Supergraphix 256** is a programmer's utility for GS graphics. Unlike **Iconix**, a similar utility from So What Software, Supergraphix 256 doesn't require you to use PEEK and POKE commands. Instead, it uses the Applesoft ampersand command to tap the GS' graphics power. Supergraphix 256 adds 35 graphics commands and a number of sound commands to Applesoft and lets you do just about anything you might want with the super-hi-res screen.

We haven't put the program through its paces yet, but it looks as though it delivers on its promises. If you want to program super-hi-res graphics, but are intimidated by the complexities of Apple IIGS toolbox routines, you might find a save haven here.

Along with Supergraphix 256 came a blurb announcing a product that's still in development. **Color It!** is a paint program that uses the Supergraphix 256 routines and features extensive control of the GS screen. With Color It!, you can use all 16 palettes on the super-hi-res screen. You can also control the resolution of each line of the screen, using 640 mode for part of the screen and 320 mode for the remainder. We haven't seen a finished product, so we must reserve judgment, but it looks like an interesting product.

A small booth tucked away at AppleFest/San Francisco last September offered a promising product. SYNnovation, Inc., showed a prototype of a new display adapter, **Turborez GS**, for the IIGS. When added to your system, this board ups the available colors to 256 per line, making it possible to have all 4096 colors on screen at once—on the standard GS RGB monitor, no less. With Turborez GS, the screen image is almost photographic. The product is still very early in its development. SYNnovation is showing it to interested parties to "test the waters" and see whether it can drum up support for software companies from GS owners. You can bet we're going to keep our eyes on this company!□

WRITE TO ROBERTA SCHWARTZ AND MICHAEL CALLERY C/O *INCIDER*, 80 ELM STREET, PETERBOROUGH, NH 03458.

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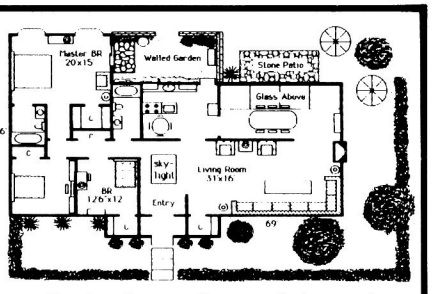

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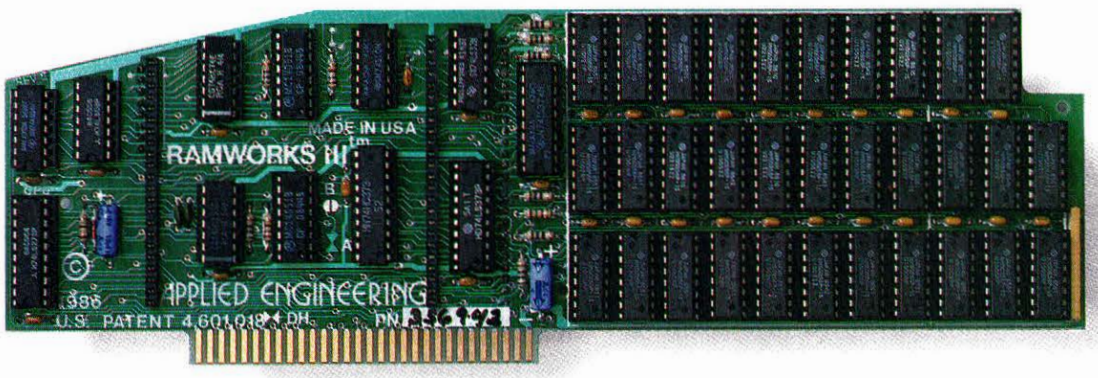

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The AppleWorks Amplifier.

While RamWorks III is recognized by all memory intensive programs, NO other expansion card comes close to offering the multitude of enhancements to AppleWorks that RamWorks III does. Naturally, you'd expect RamWorks III to expand the available desktop, after all Applied Engineering was a year ahead of everyone else *including Apple* in offering more than 55K and we still provide the largest AppleWorks desktops available. But a larger desktop is just part of the story. Look at all the AppleWorks enhancements that even Apple's own card does not provide and *only* RamWorks III does. With a 265K or larger RamWorks III, *all* of AppleWorks (including printer routines) will automatically load itself into RAM dramatically increasing speed by eliminating the time required to access the program disk drive. Switch from word processing to spreadsheet to database at the speed of light with no wear on disk drives.

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RamWorks, nothing comes close to enhancing AppleWorks so much.

The Most Friendly, Most Compatible Card Available.

Using RamWorks III couldn't be easier because it's compatible with more off-the-shelf software than any other RAM card. Popular programs like AppleWorks, Pinpoint, TimeOut series, HowardSoft, FlashCalc, ProFILER, Managing Your Money, SuperCalc 3a and VIP Professional to name a few (and most hardware add on's like ProFile and Sider hard disks). RamWorks is even compatible with software written for Apple cards. But unlike other cards, RamWorks plugs into the IIe auxiliary slot providing our super sharp 80 column text (U.S. Patent #4601018) in a completely integrated system while leaving expansion slots 1 through 7 available for other peripheral cards.

RamWorks III is compatible with all Apple IIe's, enhanced, unenhanced, American or European versions.

Highest Memory Expansion.

Applied Engineering has always offered the largest memory for the IIe and RamWorks III continues that tradition by expanding to 1 full MEG on the main card using standard RAMs, more than most will ever need (1 MEG is about 500 pages of text)...but if you do ever need more than 1 MEG, RamWorks III has the widest selection of expander cards available. Additional 512K, 1 MEG, or 2 MEG cards just snap directly onto RamWorks III by plugging into the industry's only low profile (no slot 1 interference) fully decoded memory expansion connector.

It Even Corrects Mistakes.

If you've got some other RAM card that's not being recognized by your programs, and you want RamWorks III, you're in luck. Because all you have to do is plug the memory chips from your current card into the expansion sockets on RamWorks to recapture most of your investment!

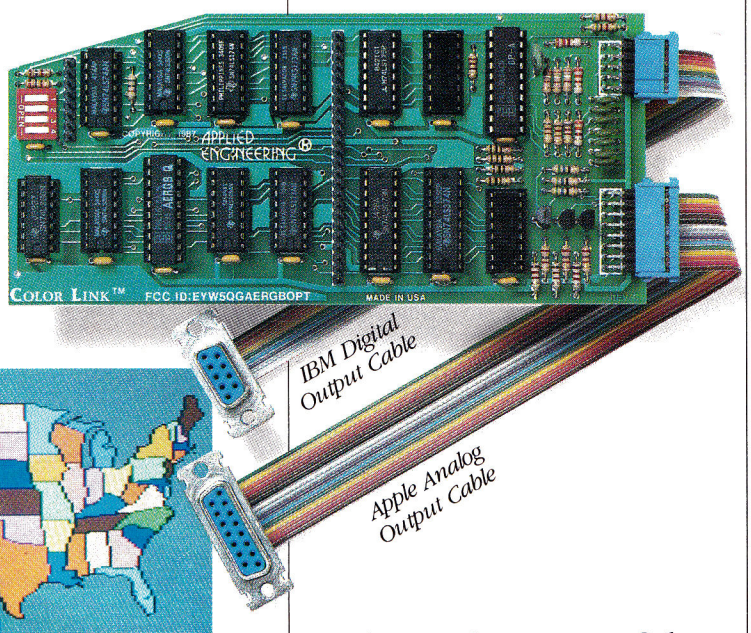
The Ultimate in RGB Color.

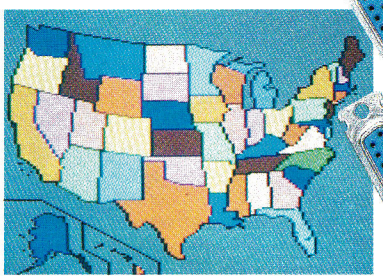
RGB color is an option on RamWorks and with good reason. Some others combine RGB color output with their memory cards, but that's unfair for those who don't need RGB *and* for those that do. Because if you don't need RGB Applied Engineering doesn't make you buy it, but if you want RGB output you're in for a nice surprise because the RamWorks RGB option offers better color graphics plus a more readable 80 column text (that blows away any

RamWorks III and ColorLink are trademarks of Applied Engineering. Other brands and product names are registered trademarks of their respective holders.

composite color monitor). For only $129 it can be added to RamWorks giving you a razor sharp, vivid brilliance that most claim is the best they have ever seen. You'll also appreciate the multiple text colors (others only have green) that come standard. But the RamWorks RGB option is more than just the ultimate in color output because unlike others, it's fully compatible with all the Apple standards for RGB output control, making it more compatible with off-the-shelf software. With its FCC certified design, you can use almost any RGB monitor because only the new RamWorks RGB option provides both the new Apple standard analog and the IBM standard digital RGB outputs (cables included). The RGB option plugs into the back of RamWorks with no slot 1 interference and remember you can order the RGB option with your RamWorks or add it on at a later date.

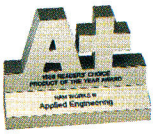
ColorLink™ RGB Option





True 65C816 16 Bit Power.

RamWorks III has a built-in 65C816 CPU port for direct connection to our optional 65C816 card. The only one capable of linearly addressing more than 1 MEG of memory for power applications like running the Lotus 1-2-3™ compatible program, VIP Professional. Our 65C816 card does not use another slot but replaces the 65C02 while maintaining full 8 bit compatibility.



Endorsed by the Experts.

A+ magazine said "Applied Engineering's RamWorks is a boon to those who must use large files with AppleWorks...I like the product so much that I am buying one for my own system." inCider magazine said "RamWorks is the most powerful auxiliary slot memory card available for your IIe, and I rate it four stars...For my money, Applied Engineering's RamWorks is king of the hill."

"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

Apple experts everywhere are impressed by RamWorks' expandability, versatility, ease of use, and the sheer power and speed that it adds to any IIe.

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- Automatic AppleWorks expansion up to 3017K desktop
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- Built-in AppleWorks printer buffer
- 100% compatible with all standard IIe software
- RamDrive™ and ProDrive™ the ultimate emulation software included free
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- Self diagnostics software included
- Lowest power consumption (U.S. Patent #4601018)
- Takes only one slot (auxiliary) even when fully expanded
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Continued from p. 41

content of each data field; you must indicate whether data should be taken from a file, a calculation, or the keyboard. Defining a field also specifies format (justification, fixed, dollars, commas, percentage, and so on) and data type (numeric, text, date, or time). After configuring the report fields, press Open apple-G and ReportWriter pulls the required information and saves your reports as text files.

ReportWriter includes several features that facilitate report generation. You'll be able to round numbers, find an inverse, calculate a square root, capitalize the first letter of every word in your text, convert all letters to upper- or lowercase, find specified data, import selected paragraphs from designated files, carry out arithmetic operations on dates, insert current time, and perform many other helpful functions.

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ReportWriter isn't easy to learn. Although several of the keyboard commands are exactly like those within AppleWorks, others are much less intuitive. For example, if you select Open apple-P—the AppleWorks command to print—you'll get a report showing the definition rules for each field within every record of the report. To get a conventional relational report, you must exit to the ReportWriter main menu and select option 3—*Print text (ASCII) files*—which lists all text files currently on the data disk. Select the appropriate ReportWriter file and the program will print your report.

ReportWriter comes with both 3½- and 5¼-inch disks. You won't need any additional hardware to run it, but—as with all applications in the TimeOut series—you can minimize disk swapping by installing it on a 3½-inch AppleWorks disk or a hard disk.

ReportWriter adds power and sophistication to your everyday AppleWorks capabilities. Its relational report-generation features and special math and string functions help you perform calculations and text manipulations that weren't possible before. Combined with ReportWriter and the other TimeOut applications, it's no wonder AppleWorks continues to breathe life into the 8-bit Apple II.

Carol S. Holzberg, Ph.D.
Shutesbury, MA

MASTER TRACKS PRO GS

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Rating: ❖ ❖ ❖ ❖ ❖

In the old days—we're talking early 1980s here—if you wanted to make music with your computer, the Apple II was the only game in town. Then came synthesizer cards, electronic keyboards, and MIDI—the *musical-instrument digital interface* that forever changed computer music—and with that Passport Designs' first MIDI sequencers, simulating four- and eight-track tape recorders. They faithfully reproduced what you played on your synthesizer—mistakes and all. Editing was a matter of redoing part of a track by "punching in," a method of overdubbing on the fly. Punching in required tremendous coordination and nerves of steel: You had to hit the correct computer key and a split second later the right keys on your synthesizer or all was

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lost. These days, though, the Apple II is a more proficient maestro, thanks to Master Tracks Pro GS.

When you start the program, the first thing you see is a black-and-white graphics screen with just a touch of color. There's a reason for that: Master Tracks Pro GS is a translation of Passport's highly acclaimed Macintosh sequencer. The differences are slight. The Mac version can send system-exclusive messages to a synthesizer; the GS version can't, owing to current limitations of the computer. Unlike many GS-specific programs, however, this one's fast. Files load quickly, screens redraw promptly, and control-button responses range from reasonably fast to instantaneous.

The main screen is divided into the Track Sheet, Song Editor, Conductor, and Transport.

The Track Sheet in the upper left-hand corner of the screen lets you record up to 64 tracks of music. Chances are you won't use that many, but they needn't go to waste. Unused tracks make a handy notepad for sequencer settings, reminders, and so on. The Track Sheet allows for a variety of solo and ensemble playbacks, track looping (continuously playing a short passage such as percussion or bass), and channel or program (synthesizer voice) allocation.

The beat goes on, thanks to Master Tracks.

The Conductor window in the lower left corner of the screen shows the current values for tempo, beat, and meter, which you set on a special Conductor track. You can use this feature to change tempo quickly, although more sophisticated tempo and meter settings are handled in the Change Conductor window. You can also make changes in the Conductor Edit window.

In the lower right corner of the screen you'll find the Transport window, which resembles the controls of a tape recorder. Here you can play, record, pause, fast-forward, and reverse. To help you locate a passage precisely, Master Tracks Pro includes both a measure counter—which includes MIDI clock settings—and an elapsed time counter. You can play back or record at any point in your song.

You can also "punch in" to edit any section you want. There are two ways to do this—double-click on *Punch* to bring up a dialog box that lets you assign in and out locations, or select an area for editing from the Song, Edit, or MIDI data windows.

You don't have to punch in and out to edit unless you want to. If you're a consummate Apple IIGS musician, you can record your entire piece in real time and bask in the glow of success. If you're fallible like the rest of us, however, there are other ways to handle MIDI. You can record a piece at a slower tempo, then play it back faster; you can also try note-by-note entry. If you prefer, you can ►

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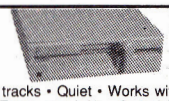

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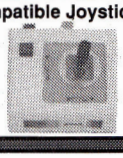

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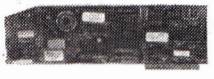

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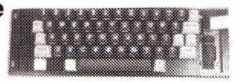

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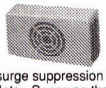

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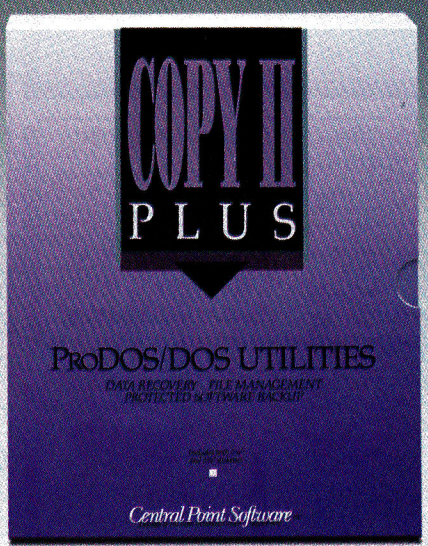

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even "draw" the notes in the Step Editor.

You'll do the majority of your editing with the Song Editor, which displays every track of your piece in the upper right-hand portion the screen. Select the areas you want to edit with the mouse, then cut, copy, and paste sections from a single track or an entire sequence. You can insert empty measures, renumber measures, and place song markers, which let you skip instantly to that part of a song.

Song markers have another function, as well. You can combine a number of completed sequences into one large file and insert a marker with the title of the song and any pertinent notes at the beginning of each piece. Depending on the amount of memory in your computer, Master Tracks Pro can play dozens—even hundreds—of sequences as if they were a single song. For selective playback, you can use the markers to tab different sections.

A quick way to get acquainted with the Master Tracks Pro sequencer is to record a simple musical phrase, then play with it. Once the melody is on track 1, go to the Song Editor, copy the track, and paste it to tracks 2 and 3. Now insert two blank measures at the beginning of track 2, and four blank measures at the beginning of track 3. You've just created three-part harmony.

Paste three more tracks into the song. Open Quantize and slide one track 48 clocks to the right for a quarter-note delay. Now you've got an echo. Assign a wispy little synthesized voice to that one. Slide another track six clocks to the right for a reverb. Give that one a rich lead voice. Transpose another track down two octaves and assign a bass voice to it.

Now you're ready to play it back. Does it need more dynamics? No problem—open the Change window and select *velocity*, the control that makes a synthesizer play more loudly or softly. You can make changes by measure, by phrase, or throughout an entire piece.

Want to change voices in the middle of a measure? Open the Program Change window—a few mouse clicks and it's done. Now try drawing a few slides in *Pitch Bend*. If you don't like the way it sounds, click on *Undo*. Make all the changes you like. Master Tracks Pro does windows—lots of them. In addition to the ones already mentioned, there's a window for channel pressure, key pressure, modulation, and MIDI controllers.

If you think your creation is sounding pretty

good, try selecting *Humanize* to make it sound less like a machine and more like a live performance. *Humanize* lets you randomize start times, durations, and velocities. Tiny increments—shifting a clock or two—work best here, and the results are amazing.

Master Tracks Pro GS accepts input from other sequencers, and allows data stripping and "unmerging." It's also compatible with external SMPTE-to-MIDI sync devices, which let you synchronize music with videotape or film.

So how long will it take you to learn this program—weeks, maybe months? The learning curve is surprisingly easy. Master Tracks Pro GS is intuitive and the manual is clear and concise. My only quibble with the documentation is the lack of an index.

If you've never used a sequencer before, you should be up and running in a day or two, and up to speed within a week. If you're familiar with sequencers, you'll be recording within minutes.

Master Tracks Pro GS is the premier sequencer for the Apple II. Its ease of use and multitude of professional features are unexcelled. If you're serious about your music, this is a must buy.

Sharon Webb
Blairsville, GA

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Rating: ❖ ❖ ❖

Landscape is to property planning what a spreadsheet is to financial forecasting: It lets you see the way your home would look within any of the infinite number of landscape you can design. A selection of 46 different tree and shrub icons; special icons representing fences, fountains, and so on; and powerful drawing and painting modules for creating steps, sidewalks, and flower beds give you complete freedom of design.

Landscape for the GS is another conversion from the Design Your Own Home series originally produced for the Apple IIe and IIc. Once again, the upward move to the GS has brought an increase in speed, more options (including color printing), and a friendlier interface.

Anyone familiar with the Design Your Own Home series will know what to expect when they start up Landscape. The package includes more than two dozen sample plans featuring a variety of home styles, such as Spanish, contemporary, traditional ranch, colonial, and Victorian.

If you'd rather start from scratch, however, the process is pleasant, simple, and intuitive. Begin by creating an outline of your house as it would appear from above. This top view is basically a rectangle in the appropriate size and shape. Add windows and doors in corresponding locations. After completing the rough draft of your house, move outside and plant trees, shrubbery, sidewalks, steps, and flowers. Add finishing touches, such as different plant colors, textures, or sizes, and modify the house itself.

Modifications are usually simple because Landscape GS uses an object-oriented interface activated by a combination of keyboard ►

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and mouse commands. You can call up every icon in Landscape by pressing a single letter key by itself or with the option key. Once you get them on screen, you can activate and manipulate icons with the mouse.

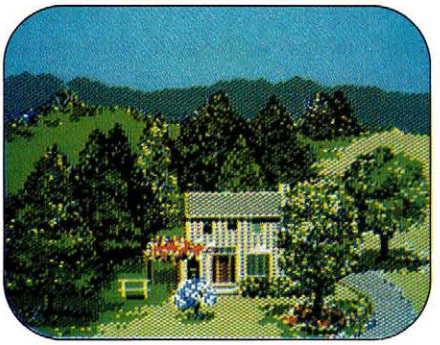
During any stage of creation, you can view your landscape from five perspectives—north, south, east, west, and above. Selecting the viewing perspective is simply a matter of clicking on the directional arrow icon. Landscape automatically reorients your design.

All tree and shrub icons are sized to indicate a plant at half its mature age. Whenever you select a plant with the mouse, an Age window appears, complete with scroll bar. By adjusting the scroll bar in either direction, you can make the plant younger or older. The icon will adjust its size accordingly.

Landscape also features some impressive printing options. You can use an ImageWriter or a LaserWriter and select sizing, quality, orientation, and several special options. You can assign and print unique identification numbers that correspond to a plant information list—each plant's name, number reference, and size.

Even the best-laid plans require some fine-tuning. Landscape provides ten powerful editing commands, accessible from pull-down menus at the top of the screen. Three commands in particular provide extra versatility and editing ease.

Select All lets you choose every object in the drawing. For example, if you want to provide yourself with another ten yards of front lawn,



Landscape designs for the years to come.

you might use the *Select All* command in conjunction with the measuring devices and distance finder on screen, and move all objects back 10 yards. What if you want to move 75 percent of the objects? Before using *Select All*, choose the *Lock* command to anchor the objects you don't want to move.

Another command that comes in handy is *Change House*. You can create an entire landscape around one type of house and then see how another home would look within the same design. You can still edit a substitute house, just as if you had drawn it originally.

Other editing options let you group and separate objects, and cut and paste objects on screen. A program like this wouldn't be complete without some way to provide labels, as well. You can use six different fonts, any of six type styles, and a variety of type sizes to label elements of your design.

The program's Arrange function simplifies your text placement. Simply choose your options from the horizontal and vertical boxes that appear in the *Arrange Text* window and Landscape does the rest. You can leave your text as is, or place it automatically to the left, center, right, top, or bottom of your page. You can display or hide rulers; display measurements needed for calculations; scale and rescale objects or entire screens; even change the slope of the ground by up to 30 degrees.

You can further enhance Landscape's versatility by adding Abracadata's Regional Image Libraries, five add-ons containing region-specific trees and other landscape items.

If there's anything disappointing about Landscape, it's the relative simplicity of the home drawings in the sample plans. Considering that Landscape is GS-specific, you might expect highly detailed, colorful images. What you get is more akin to a collection of bland stick drawings. For those who don't have the inclination to use the powerful House Painting program included with Landscape, the pre-drawn illustrations might be a letdown. On the other hand, the unadorned sample homes are perfect for someone who wants to create an exact replica of his or her existing home or a dream home without having to undo someone else's idea.

Landscape will appeal to both casual and professional designers. It's simple enough for novices and powerful enough if you're serious about landscape design.□

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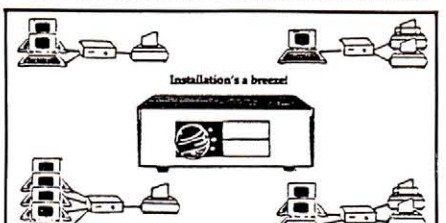

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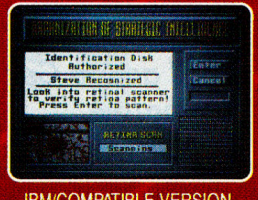

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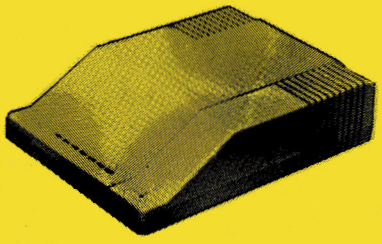

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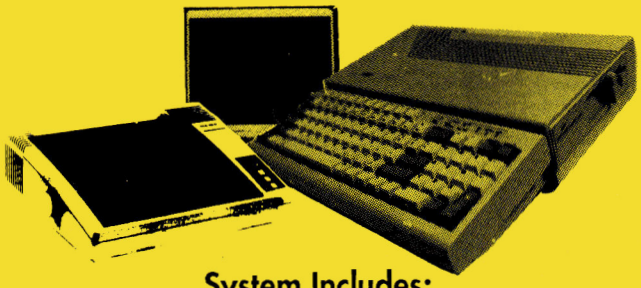

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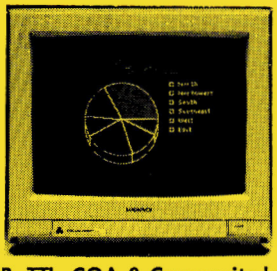

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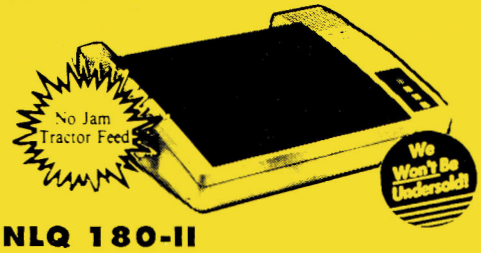

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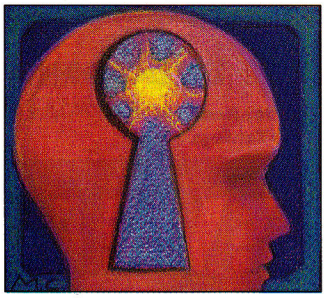


LEARNING CURVE

RENAISSANCE IN EDUCATION

By DAVID D. THORNBURG, Ph.D.

We have the technology and the software to heal a broken curriculum. Do we have the courage to use them effectively?

ONE OF THE BYPRODUCTS OF THE assembly-line model of education is one fiction with tremendous negative impact: the idea that knowledge can be divided into neat, distinct classifications called "subjects"—math, history, language arts, and so on.

Each one is often presented as if it were isolated from the others. It's as if education had gathered up the fabric of human existence and shredded it into small pieces, with no hint as to how the student is to reassemble those parts into the wholeness of life.

NATURAL ORDER

Fortunately, some teachers realize the danger of this artificial separation and go out of their way to make sure they point out relationships whenever possible.

For example, an astute biology instructor might ask students to examine the spiral patterns of pine cones. Each cone has two sets of spirals running in opposite directions; by counting in each direction, students might find that one cone has three left-handed and five right-handed spirals. Still another might have five left and eight right.

The biology teacher might then point out that the two numbers are adjacent Fibonacci numbers from the series 1, 1, 2, 3, 5, 8, 13, and so on. Furthermore, students might discover that the ratio of these number pairs approaches the Golden Mean as the numbers increase. The teacher could also use other plants with spiral patterns, such as sunflowers and artichoke hearts, to extend this exercise, bringing the beauty of mathematics into the study of biology.

PUTTING IT ALL TOGETHER

Activities like this, and the joy they bring to teacher and student alike, help heal the rift in an educational process that has reflected for more than a century a philosophy of separation.

Current educational buzzwords, such as *whole-language approach*, on the other hand, reflect recent attempts to rebuild a holistic framework for knowledge. Unlike Humpty Dumpty, we *can* put the pieces together again—and the computer can be our ally.

TRAVELS WITH MY APPLE

A year or so ago, I had the pleasure of visiting Venice, where I spent hours photographing the floor of St. Mark's Cathedral. If that seems like a strange way to spend time, you need to know that I love geometry, and the tile patterns on that floor are spectacular.

As I looked at those intricate geometric wonders, I wished I had some students with me—we could travel through Italy and study history, art, math, science, and music without thinking about where one subject ended and another began. I had visions of us sitting in the plaza outside the cathedral, using Logo on our laptop Apple IIs to re-create the tile patterns we'd seen.

Some students would be capturing their impressions of the city in poetry, while others would be creating a database on the Renaissance. On their return home, they'd put together a multimedia presentation that would teach what they'd learned to those who hadn't been able to be there in person.

That sort of adventure isn't available to most students, but let's not abandon the underlying idea. Any teacher with an Apple II and a desire to design an integrated educational program can do it. The rich variety of software available today can make education whole again—in a way that's limited only by the teacher's imagination.

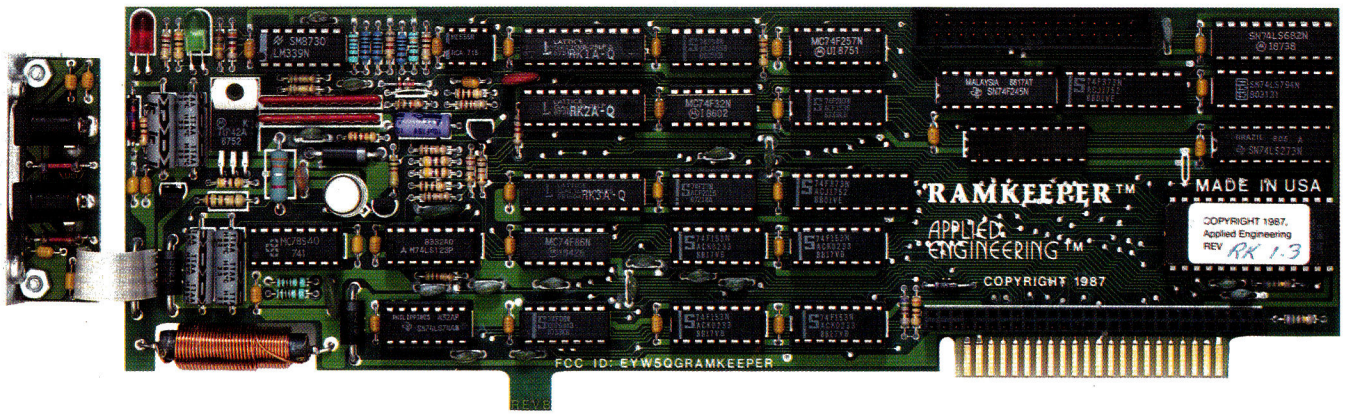
IMAGINE

For example, suppose you're exploring California in social-studies class. One way to do that is to present your students with material right from the textbook. That approach can make even fascinating topics boring, and your students will say, "Who cares?"

On the other hand, a teacher who really cared about the subject could take a different tack. After exploring California's location on the planet and talking about the geologic upheavals that created ►

Illustration • Marilyn Cathcart

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



Certainly the second.

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

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

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

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

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

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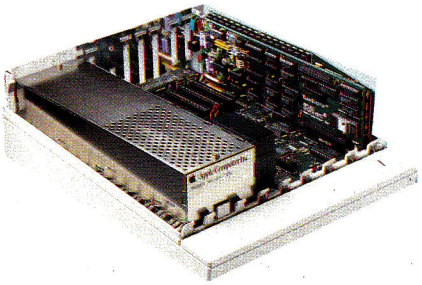
RamKeeper powers up to two memory boards simultaneously, even when your computer is turned off. What's more, the stored programs are protected against power outages by the reliable Gel/Cell battery we include. Startup checksums are employed to verify that no data was lost



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

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

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

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

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its spectacular landscape, he or she might encourage students to imagine themselves as members of an ancient tribe of Native Americans—the Ohlones, for instance. Student research on this tribe would allow them to think about the rich civilization these people enjoyed during the period when the pyramids were being built halfway around the world in Egypt.

IN THE WILD

As they learned more about this ancient people, students might also learn how to identify animals from their tracks.

The program **Animal Trackers**, for instance, from Sunburst Communications (39 Washington Avenue, Pleasantville, NY 10570, 914-769-5030, $65), provides clues from which students must identify a particular animal.

Because the program supports databases for grasslands, deserts, and wooded areas, you can use it all over the country.

Each clue offers information of a different sort—habitat, nesting habits, food, and footprint. After working with the program awhile, students learn a great deal about animals as well as hone their higher-order thinking skills.

This activity provides an opportunity for the teacher to integrate science and social studies.

EXPLORATION

As the year proceeds, students might come to see a new animal—the Spanish explorers on horseback—through different eyes, as strange creatures with two heads and six legs.

At this point, some students might want to retain the Native American perspective, while others might join forces with Portolá or Father Serra during the colonization of California.

Later on in the course, the teacher might show the film *Dream West*, a dramatization of the life of John Charles Frémont as he explored the continent and paved the way for the United States to expand its boundaries.

At this point, students could use the simulation program **Oregon Trail**, from MECC (3490 Lexington Avenue North, St. Paul, MN 55126, 612-481-3500, $59 school, $39.95 home), to see how well they might fare in their own journey across the country in a covered wagon.

The software not only reflects the tremendous challenge of such a trip, but hones problem-solving skills, as well, as each player makes life-or-death decisions regarding food, camping locations, travel during inclement weather, dealing with hostile environments, and so on.

A PROCESS OF HEALING

The personal computer running simulation programs can be a wonderful tool for healing a broken curriculum. We have the technology and the software; do we have the courage to use them effectively? It's up to you.□

DAVID D. THORNBURG IS INVOLVED IN THE CREATIVE USES OF COMPUTERS IN EDUCATION. PRINCIPALS OF SCHOOLS WITH STUDENTS IN GRADES K–6 ARE INVITED TO WRITE TO HIM REGARDING A SCHOOL DONATION PROGRAM HE HAS ESTABLISHED WITH ROYALTIES FROM THE AUDIO TAPE *SUNSHINE THOUGHTS*, PRODUCED BY THE THORNBURG CENTER FOR PROFESSIONAL DEVELOPMENT, P.O. BOX 1317, LOS ALTOS, CA 94023-1317.

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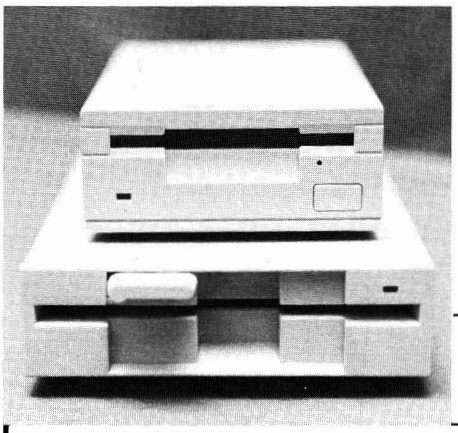

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MAKE UP YOUR MIND

Apple users know 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. Bracketed numbers in program listings refer to *inCider*'s Applesoft Proofer Program. For your copy send a self-addressed, stamped envelope to Proofer, c/o *inCider*, 80 Elm St., Peterborough, NH 03458.

DECISION MAKER

By David Leithauser and Sandra Jones

SOME DECISIONS IN LIFE ARE SIMPLE, SUCH AS chocolate ice cream versus vanilla. Others, such as right from wrong, are much more complicated. Decision Maker can help you determine the correct path to follow, whether simple or complex.

Type in the accompanying **Program listing** and SAVE it as Decision. Maker. When you RUN it, the program first asks you to state your question: "Which vacation spot?" for instance. Then Decision Maker asks the number of choices you have, and prompts you to label each one.

Let's say you're interested in vacationing in Florida, New Zealand, or Peoria. In this instance you'd type *3*. The program then asks the number of pertinent factors that will determine your decision. In this example, time, expense, and fun might figure into it. Decision Maker then groups these criteria into two types: costs and benefits. Time and expense might be your two cost criteria, while fun is a benefit.

Decision Maker lists all the determinants and prompts you to list the most important one. You then rate all other criteria on a scale of 1 to 100. For example, if expense is the most important criterion here, the program rates it as 100 automatically. Deciding that the fun factor is about half as important as expense, you'd give it a rating of 50. Travel time might not be very important, so it would earn a rating of 10.

Finally, Decision Maker asks you to enter criteria values for each choice. Some will be actual, such as the cost of traveling to each of the three vacation spots; others will be subjective or relative, such as those you assign for fun. If you decide that Florida's the most enjoyable spot, for instance, give it a fun value of 100. If you don't consider Peoria very exciting, assign a fun value of 25.

After you've entered all your information, the program takes that big step you've been avoiding—making a decision. It does so by analyzing ▶

Program listing. Decision.Maker.

```
10  REM  Decision.Maker  [2865]
20  REM by David Leithauser  [3875]
30  REM  and Sandy Jones  [3062]
35  REM  Copyright 1989, inCider  [4880]
40  HOME : VTAB 5:S$ = "Decision Maker": GOSUB 50000:
    PRINT  [5061]
42 S$ = "by David Leithauser": GOSUB 50000: PRINT  [5561]
44 S$ = "and Sandy Jones": GOSUB 50000: PRINT  [4720]
50  PRINT : PRINT : PRINT : GOSUB 51000  [913]
90  HOME : CLEAR : DIM CH$(20),C2$(20),E$(20),B$(30),
    V(20,50),VT(20),PC(50)  [11414]
100 CL = 6  [574]
110  PRINT :S$ = "Input the name of the decision": GOSUB
    50000:S$ = "you want to make": GOSUB 50000:S$ = "
    (for example: What car to buy)": GOSUB 50000  [11710]
120  PRINT : INPUT ND$: IF ND$ = "" THEN 120  [2878]
130  PRINT : PRINT  [372]
205  INPUT "How many choices are there? ";NC: IF NC <
    2 THEN  GOSUB 59000: GOTO 205  [4978]
210  FOR X = 1 TO NC  [939]
220  PRINT "Name of choice #";X;: INPUT CH$(X): IF CH
    $(X) = "" THEN 220  [4382]
225  IF  LEN (CH$(X)) > CL THEN CL =  LEN (CH$(X))  [4328]
230  NEXT X  [390]
240  PRINT "How many criteria for making the choice"  [2883]
245  INPUT "are there?";CR: IF CR < 2 THEN  GOSUB 590
    00: GOTO 240  [3851]
250  HOME : PRINT  [683]
```

Continued

```
252  PRINT "  Some of the "CR" criteria are probably
    "  [3038]
254  PRINT "what we call cost criteria.  This means"  [3233]
256  PRINT "anything that we want to minimize, such"  [7823]
258  PRINT "as expense, time required to do"  [6642]
260  PRINT "something, etc.  Some of the criteria"  [7678]
262  PRINT "are what we call benefit criteria. This"  [8164]
264  PRINT "means anything we want to maximize,"  [7434]
266  PRINT "such as how much we get paid, comfort,"  [8038]
268  PRINT "how much we enjoy something, etc."  [6877]
270  PRINT : PRINT "How many of the criteria are cost
    "  [2696]
275  INPUT "criteria? ";CC: IF CC < 0 OR CC > CR THEN
    GOSUB 59000: GOTO 270  [5694]
280 CB = CR - CC  [810]
300  IF CC = 0 THEN 400  [1284]
310  FOR X = 1 TO CC  [1105]
320  PRINT "What is the name of cost criteria": PRINT
    "#";X;: INPUT E$(X)  [8744]
325  IF E$(X) = "" THEN 320  [2166]
330  NEXT X  [421]
400  IF CB = 0 THEN 500  [992]
410  FOR X = 1 TO CB  [786]
420  PRINT "What is the name of benefit criteria"  [2749]
425  PRINT "#";X;: INPUT B$(X): IF B$(X) = "" THEN 42
    0  [3182]
430  NEXT X  [337]
```

Continued

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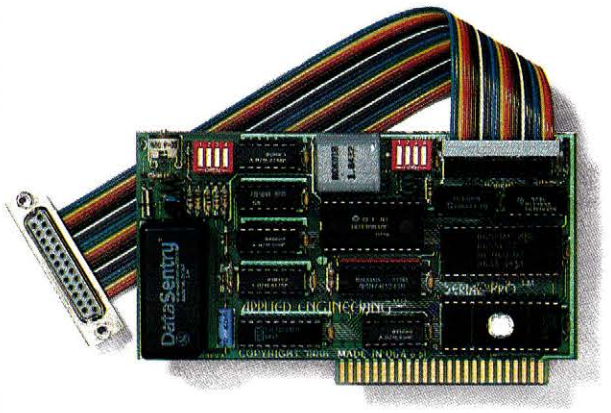

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```
500  HOME :S$ = "Your criteria for making a choice ar
     e:"  [8271]
505  GOSUB 50000: PRINT   [1187]
510  IF CC > 0 THEN  FOR X = 1 TO CC: PRINT X") "E$(X
     ): NEXT X  [3208]
515  IF CB > 0 THEN  FOR X = 1 TO CB: PRINT X + CC")
     "B$(X): NEXT X  [3615]
520  PRINT :S$ = "Which of these is most important": GOSUB
     50000:S$ = " (input number)?": INPUT X: IF X < 1 OR
     X > CR THEN  GOSUB 59000: GOTO 520  [10124]
530  IF X <  = CC THEN T$ = E$(X): GOTO 540  [2692]
535 T$ = B$(X - CC)  [1608]
540 PC(X) = 100  [994]
550  HOME : PRINT : PRINT :S$ = "The criteria:gosub 5
     0000  [2700]
552 S$ = T$: GOSUB 50000  [1611]
554 S$ = "has now been assigned an importance": GOSUB
     50000  [7593]
556 S$ = "rating of 100.  You must now rate the": GOSUB
     50000  [8371]
558 S$ = "other criteria on a scale of 1 to 100": GOSUB
     50000  [8908]
560 S$ = "compared to": GOSUB 50000:S$ = T$: GOSUB 50
     000  [4700]
562 S$ = "For example, if": GOSUB 50000  [3909]
600  IF X <  > 1 AND CC THEN T2$ = E$(1): GOTO 620  [3439]
605  IF X <  > 1 AND CC = 0 THEN T2$ = B$(1): GOTO 62
     0  [2997]
610  IF X = 1 AND CC > 1 THEN T2$ = E$(2): GOTO 620  [3693]
612  IF X = 1 AND CC THEN T2$ = B$(1): GOTO 620  [2849]
615 T2$ = B$(2)  [1307]
620 S$ = T2$: GOSUB 50000  [1210]
622 S$ = "is half as important as:": GOSUB 50000:S$ =
     T$: GOSUB 50000  [7396]
624 S$ = "then the rating of": GOSUB 50000  [4574]
630 S$ = T2$: GOSUB 50000:S$ = "is 50.": GOSUB 50000  [3237]
640  GOSUB 51000  [307]
700  HOME :S$ = "compared to": GOSUB 50000:S$ = T$  [4199]
705  GOSUB 50000:S$ = "which has a value of 100,": GOSUB
     50000  [7410]
706 S$ = "how important is": GOSUB 50000  [3205]
710  PRINT : IF CC = 0 THEN 750  [1945]
720  FOR X = 1 TO CC  [947]
730  IF PC(X) > 0 THEN 740  [1164]
732  PRINT E$(X);: INPUT PC(X)  [1925]
734  IF PC(X) < 1 OR PC(X) > 100 THEN  GOSUB 59000: GOTO
     732  [4136]
740  NEXT X  [390]
750  IF CB = 0 THEN 1000  [1291]
760  FOR X = 1 TO CB  [914]
770  IF PC(CC + X) > 0 THEN 780  [1819]
772  PRINT B$(X);: INPUT PC(CC + X)  [2440]
774  IF PC(CC + X) < 1 OR PC(CC + X) > 100 THEN  GOSUB
     59000: GOTO 772  [4019]
780  NEXT X  [369]
1000  HOME : PRINT   [681]
1002  PRINT "   Now you must input the values of"  [2893]
1004  PRINT "each criteria for each choice. If there"
      [2996]
1010  PRINT "is an actual value, such as dollars or"  [2987]
1012  PRINT "hours, you may input this value."  [2389]
1020  PRINT "If there is no numerical value, you man"
      [2966]
1022  PRINT "assign arbitrary values.  For example,"  [8216]
1024  PRINT "if you like one color twice as much as"  [7852]
1026  PRINT "another, you could input a value of 10"  [7874]
1028  PRINT "for the color you like most and 5 for"  [7587]
1030  PRINT "the one you like less."  [4808]
1040  GOSUB 51000  [937]
1100  FOR X = 1 TO CR  [1206]
1110  HOME :S$ = "for the criteria:": GOSUB 50000  [3634]
1120  IF X <  = CC THEN S$ = E$(X): GOTO 1125  [3046]
1122 S$ = B$(X - CC) + ","  [2157]
1125  GOSUB 50000  [1470]
1130 S$ = "What is the value for": GOSUB 50000: PRINT
      [5403]
1200  FOR Y = 1 TO NC  [813]
1210  PRINT CH$(Y);: INPUT VT(Y): IF VT(Y) = 0 THEN  GOSUB
     59000: GOTO 1210  [4888]
1220  NEXT Y  [293]
1290  IF X > CC THEN 1500  [1771]
1300 VM = 1E + 30  [1021]
1310  FOR Y = 1 TO NC  [1099]
1320  IF VT(Y) < VM THEN VM = VT(Y)  [2180]
1330  NEXT Y  [472]
1340  FOR Y = 1 TO NC  [1215]
1350 V(Y,X) = VM / VT(Y)  [1463]
1360  NEXT Y  [442]
1370  GOTO 1900  [1244]
1500 VM = 0  [726]
1510  FOR Y = 1 TO NC  [971]
1520  IF VT(Y) > VM THEN VM = VT(Y)  [2388]
1530  NEXT Y  [416]
1540  FOR Y = 1 TO NC  [1097]
1550 V(Y,X) = VT(Y) / VM  [1866]
1560  NEXT Y  [383]
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```
1900  NEXT X  [525]
1990  HOME :VM = 0  [894]
2000  FOR X = 1 TO NC  [953]
2010 VT(X) = 0  [1367]
2020  FOR Y = 1 TO CR  [930]
2030 VT(X) = VT(X) + PC(Y) * V(X,Y)  [3258]
2040  NEXT Y  [416]
2045  IF VT(X) > VM THEN VM = VT(X)  [2727]
2050  NEXT X  [354]
2060  FOR X = 1 TO NC:C2$(X) = CH$(X):VT(X) = 100 * V
    T(X) / VM: NEXT X  [5166]
2100  FOR X = NC TO 1 STEP  - 1  [1619]
2110 Z = 0  [554]
2120  FOR Y = 1 TO X  [1026]
2130  IF VT(Y) =  > VT(Y + 1) THEN 2140  [3497]
2135 Z = VT(Y):VT(Y) = VT(Y + 1):VT(Y + 1) = Z:S$ = C
    2$(Y):C2$(Y) = C2$(Y + 1):C2$(Y + 1) = S$:Z =  -
    1  [8914]
2140  NEXT Y  [521]
2150  IF Z = 0 THEN 2170  [1496]
2160  NEXT X  [532]
2170 S$ = "For the decision": GOSUB 50000  [2641]
2180 S$ = ND$: GOSUB 50000  [1836]
2200 S$ = "The following is a list of your": GOSUB 50
    000  [4352]
2202 S$ = "Choices, and their point values:": GOSUB 5
    0000  [3695]
2204  PRINT : PRINT "Choice"; TAB( CL + 2);"Points"  [4353]
2210  FOR X = 1 TO NC  [843]
2220  PRINT C2$(X); TAB( CL + 10); INT (VT(X))  [3123]
2230  NEXT X  [350]
3000  PRINT :S$ = "Do you want hard copy": GOSUB 5200
    0: IF YN = 0 THEN 4000  [6836]
3001 S$ = "Printer card slot (1-7)": GOSUB 50000: GET
    PS$: IF PS$ < "1" OR PS$ > "7" THEN S$ = AI$: GOTO
    3001  [6978]
3002 PS =  VAL (PS$)  [1848]
3003 S$ = "Prepare printer.": GOSUB 50000: GOSUB 5100
    0: PR# PS  [4713]
3010  PR# 1: PRINT "For the decision ";ND$  [5284]
3020  PRINT "The following is a list of your"  [2396]
3025  PRINT "Choices, and their point values:"  [2499]
3027  PRINT " ": PRINT "Choice";: FOR Z = 1 TO CL + 5
    : PRINT " ";: NEXT Z  [5203]
3028  PRINT "Points"  [903]
3030  FOR X = 1 TO NC  [957]
3040  PRINT C2$(X);: FOR Z = 1 TO CL + 10 -  LEN (C2$
    (X)): PRINT " ";: NEXT Z  [4518]
3045  PRINT  INT (VT(X))  [1833]
3050  NEXT X: PR# 0  [766]
4000 S$ = "Run Decision Maker over": GOSUB 52000: IF
    YN = 0 THEN 9000  [4126]
4500 S$ = "Repeat same decision": GOSUB 52000: IF YN =
    0 THEN 90  [3660]
4600 S$ = "Please wait a few moments.": GOSUB 50000  [6865]
5000  FOR X = 1 TO 20:VT(X) = 0:PC(X) = 0: FOR Y = 1 TO
    50:V(X,Y) = 0: NEXT Y: NEXT X: GOTO 500  [6869]
9000 S$ = "End Decision Maker": GOSUB 52000: IF YN =
    0 THEN 4000  [6972]
10000  END  [238]
50000  IF  LEN (S$) < 39 THEN  PRINT  TAB( (40 -  LEN
    (S$)) / 2);S$: RETURN  [3901]
50010  PRINT S$: RETURN  [1229]
51000  HTAB 1: VTAB 20:S$ = "Press Space Bar to Conti
    nue.": PRINT : GOSUB 50000  [4338]
51010  GET S$: IF S$ <  > " " THEN 51010  [3041]
51020  RETURN  [437]
52000 YN = 0:S$ = S$ + " (Y/N)? "  [2092]
52010  IF  LEN (S$) < 39 THEN  PRINT  TAB( (40 -  LEN
    (S$)) / 2);S$;: GOTO 52030  [5419]
52020  PRINT S$;  [405]
52030  GET S$: IF S$ <  > "Y" AND S$ <  > "y" AND S$ <
    > "N" AND S$ <  > "n" THEN 52030  [5845]
52040  PRINT S$: IF S$ = "Y" OR S$ = "y" THEN YN =  -
    1  [3668]
52050  RETURN  [457]
54000  IF  LEN (S$) < 39 THEN  PRINT  TAB( (40 -  LEN
    (S$)) / 2);S$: RETURN  [4626]
54010  PRINT S$: RETURN  [813]
59000 S$ = "Invalid answer": GOSUB 50000: RETURN  [4157]
```

all criteria and giving each choice a point score from 1–100. It then prints your choices on screen in descending point-score order, so the advice will be clear. (In this case, Peoria wins.) And you can also print a hardcopy of that decision to prove the results to all interested parties.□

Write to David Leithauser and Sandy Jones at 4649 Van Kleeck Drive, New Smyrna Beach, FL 32169.

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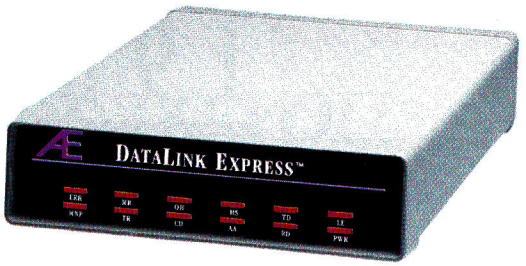

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inCider

1989 INDEX

When did Ruth Witkin publish that AppleWorks tax-preparation spreadsheet? In which issue did Cindy Field compare all those geography programs? When did that feature about the best of public-domain software appear? *inCider*'s 1989 Index can answer all your questions about your favorite authors and articles.

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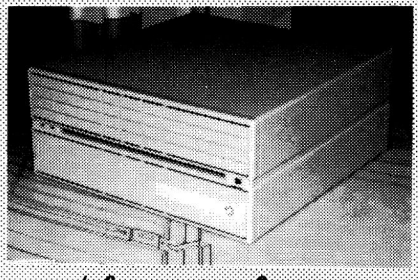

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Hometown, U.S.A.	Webb	Aug	38
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Iconix	Wallace	Mar	80
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EasyDrive 1.5	Abernathy	Apr	94
Iconix	Wallace	Mar	80
MacroMate	Tighe	Aug	30
OfficeWorks	Glau	Nov	102
RepairWorks	staff	Oct	124
TimeOut MacroTools & MacroTools II	Tighe	Oct	100
TimeOut SpreadTools	Glau	Nov	38

VIDEO SOFTWARE

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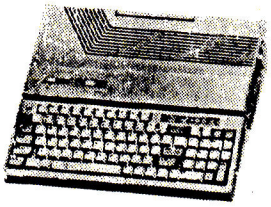

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B. Paid and/or Requested Circulation 1. Sales through dealers and carriers, street vendors and counter sales	21,104	19,735
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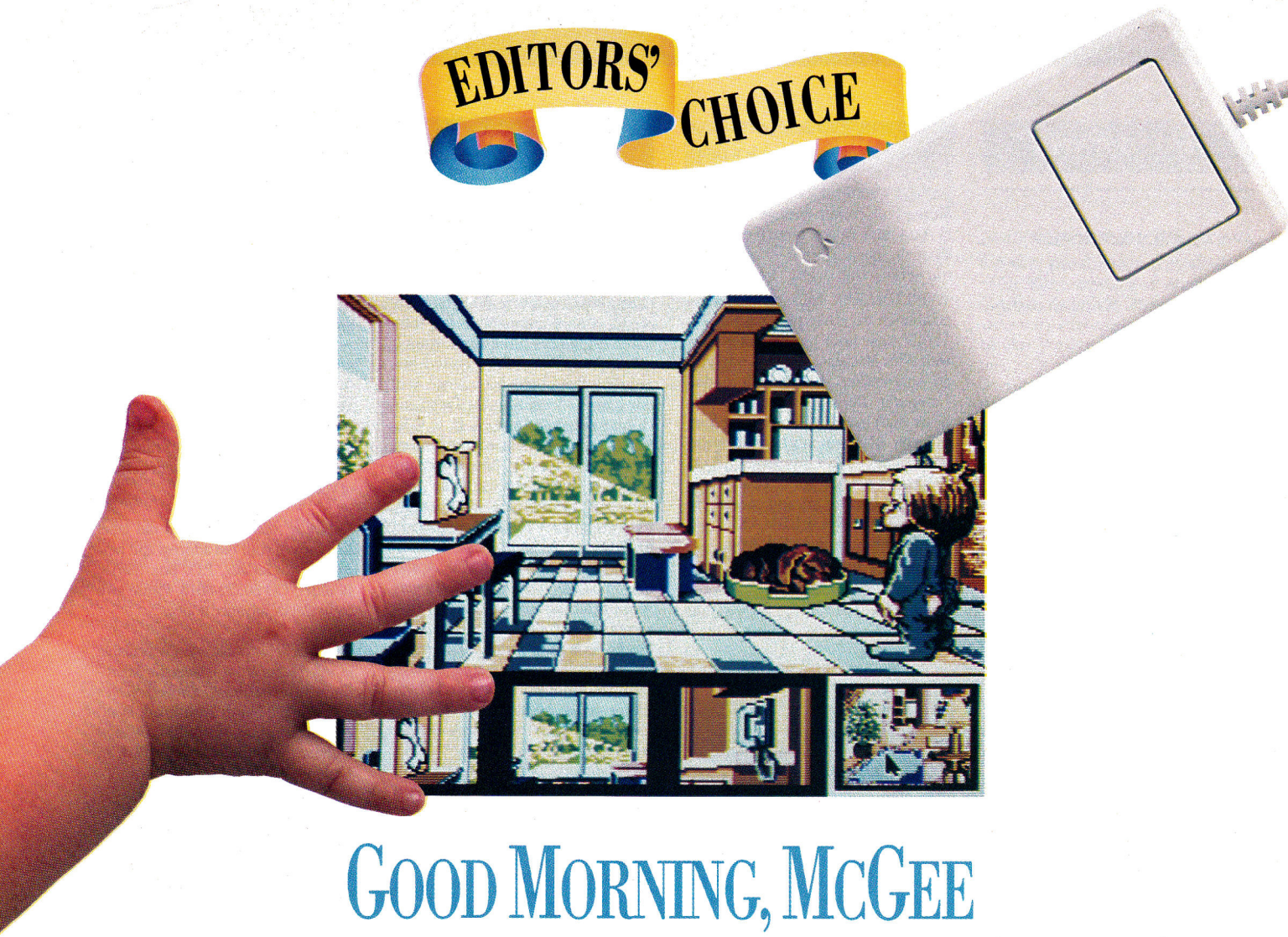

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McGee has no menus or words—nothing that could intimidate a child. When it's time to insert the program's second disk, McGee's cherubic little voice asks you to "please put in disk 2." The disks are clearly labeled with the numerals *1* and *2*, so most kids should be able to make the right selection. If yours needs a little help, you can color the disk labels.

There's no winning or losing in McGee, no points or time limits to worry about. Your child simply takes mouse in hand and guides McGee about the house to examine whatever he or she desires. In the quality of its exploration, McGee's similar to Activision's CD-ROM product Manhole. Click on what you want to investigate, then just keep looking around. It's a refreshing, noncompetitive approach to software.

"At AppleFest in San Francisco, there were kids at the Lawrence Productions booth showing their parents how to explore the world of McGee," says Review Editor Lafe Low. "They were having a blast.

"For something as simple as McGee," Low adds, "the benefits are plentiful. Kids will feel a sense of accomplishment being able to use the computer; they'll get a charge out of exploring the house; and they'll develop some eye/hand coordination by using the mouse. Most of all, they'll have fun. That's the all-important part."

"The only good thing about being a yuppie is that everything I do turns out to be a trend," says Paul "Poppa" Statt. "Just about the time my wife has a baby, I start to see great software for preschoolers—and McGee goes to the head of its class. It's simple; it's fast; the pictures and sounds are great. I can't imagine a kid not liking McGee."

McGee comes on two 3½-inch disks. It runs on an Apple IIGS with 512K and sells for $39.95, from Lawrence Productions, 1800 South 35th Street, Galesburg, MI 49053-9687, (800) 421-4157.

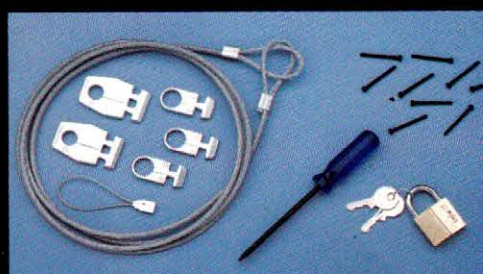
EDITORS' CHOICE SINGLES OUT ONE PRODUCT EACH MONTH THAT THE *INCIDER* EDITORS FEEL IS A SIGNIFICANT ADDITION TO THE APPLE II FAMILY. PRODUCTS EVALUATED MAY NOT BE AVAILABLE YET FOR RETAIL DISTRIBUTION.

System Saver IIGS, $99.95

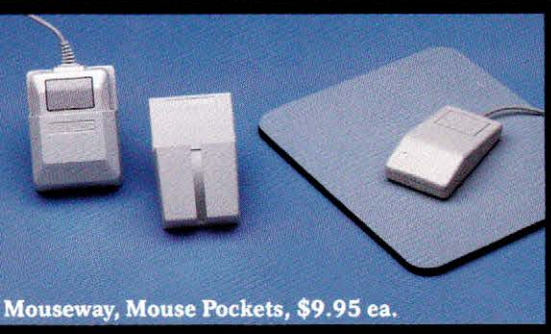
"If it didn't say Kensington on the front, you might think it came from Cupertino."

Editors' Choice
inCider magazine

System Saver®, $89.95



Apple® Security System, $49.95

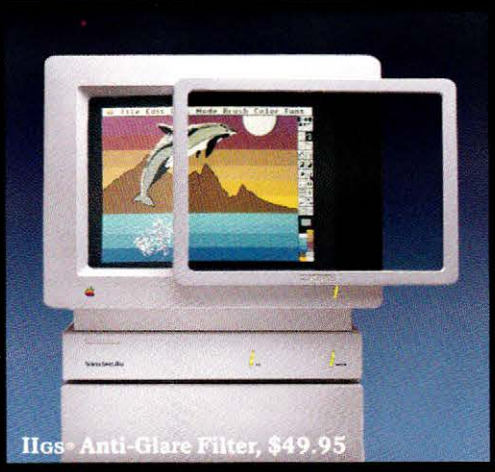


Mouseway, Mouse Pockets, $9.95 ea.

Copy Stand, $29.95

Printer Muffler® 80 and Stand, $69.95 and $29.95

Universal Printer Stand, $24.95



IIGS® Anti-Glare Filter, $49.95

Turbo Mouse® ADB, $169.95

Dust Covers, $9.95 to $24.95

That's why inCider magazine named System Saver IIGS Editors' Choice for March '88.

They were impressed at how well its styling blends in with the IIGS. They appreciated the convenience of its front-mounted switches. And they loved the way it offers surge suppression, extra outlets and a cooling fan, all for $99.95. In summary, they thought it went "a long way toward making the computer easy to use."

Of course, we were delighted with their reaction. After all, making the Apple II easier to use is something we've been working on for the last seven years. In fact, we've figured out so many ways to do it, we can't fit them all on one page.

That's why we've also made it easy for you to get more information. Just call the toll-free number below, and we'll send you a free 20 page brochure. Or write to us at Kensington, 251 Park Ave. S., NY, NY 10010. (212) 475-5200.

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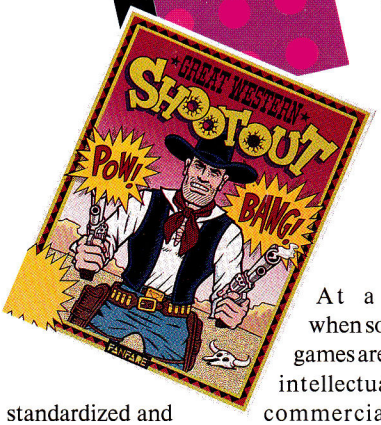
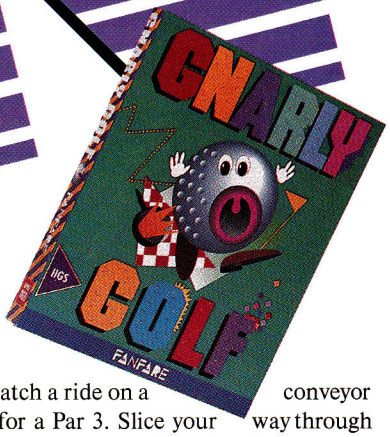
A word about our IIGS games:





At a time when so many games are being intellectualized, standardized and commercialized, FANFARE takes you back to basics – with good old-fashioned fun.

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This is some of the root 'n tootinest, bangin'est, shootin'est, arcade action you'll ever put your trigger-happy fingers on.

You're "The Law" – armed with a six-shooter that doesn't quit. And you're out to git them outlaws – and they're everywhere.

They're holding up the hotel. Busting the bank. And shooting up the saloon.

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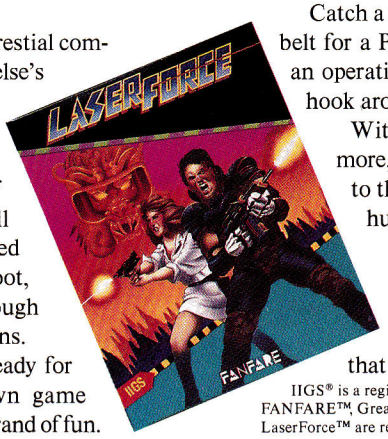

GNARLY GOLF

18 of the most outrageously gnarly holes you'll ever sink a ball into.

Catch a ride on a conveyor belt for a Par 3. Slice your way through an operating room for a Par 4. Or plant a hook around a hamburger for a Par 6.

With inclines, bridges, catapults and more, Gnarly Golf puts all your senses to the test – especially your sense of humor.

Once you get your hands on our new games, you'll instantly see why there's only one word that describes them.

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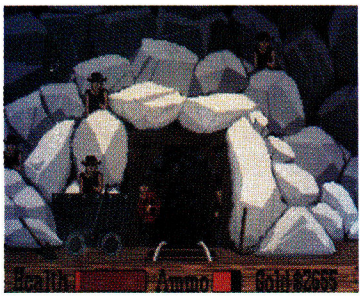
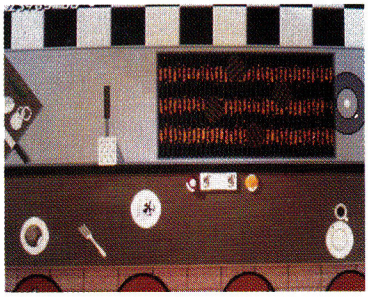


Great Western Shootout 512K $29.95

Laser Force 1.2 Meg. $29.95



Gnarly Golf 512K $29.95

Look for all three Fanfare titles in software stores near you. Or call us at 800/572-2272 (in CA: 415/546-1866).

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