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## Apple II / Macintosh

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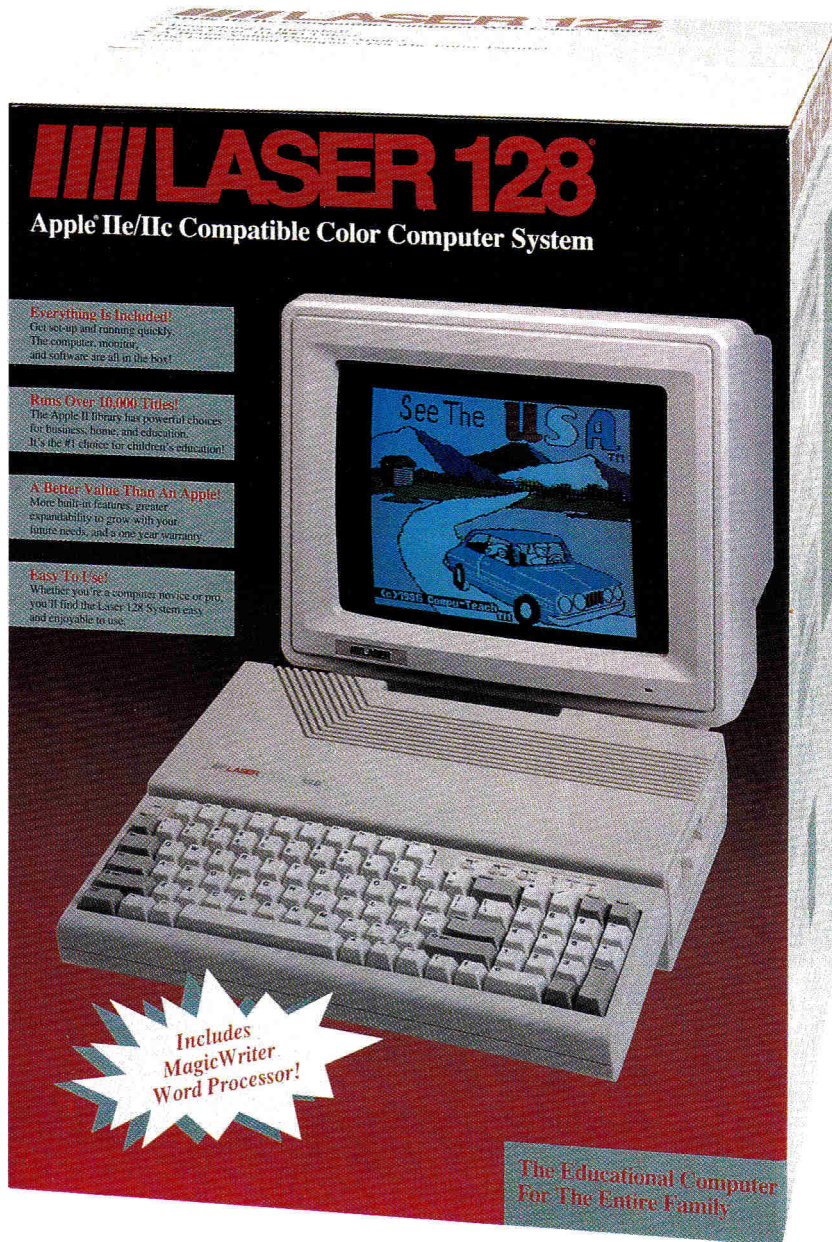
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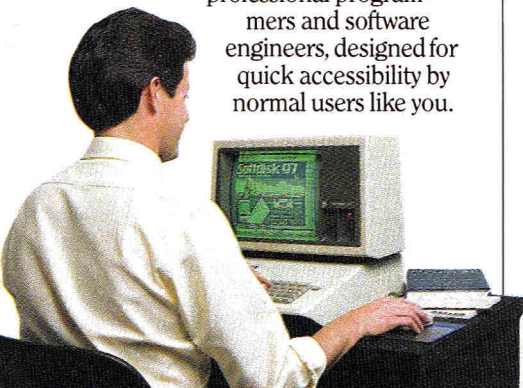
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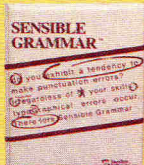
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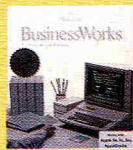


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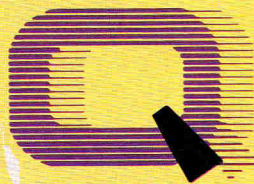
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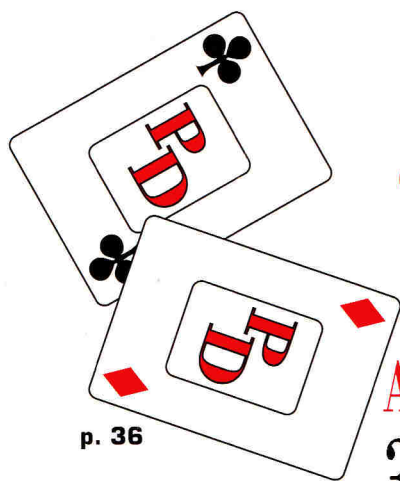
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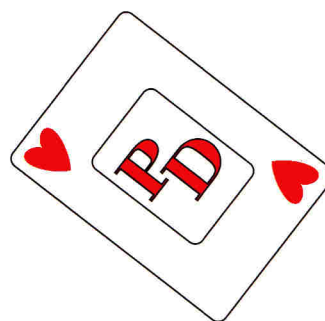


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### 42 Take My Software — Please!

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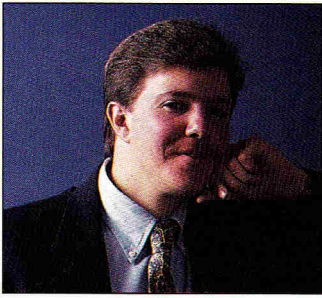
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## INCIDER'S VIEW

**Good business sense and a focus on profits should ensure the future support of the Apple II line.**

# MORE TO COME

By DAN MUSE \* EDITOR IN CHIEF

*... a profession whose business it is to explain to others what it personally does not understand.*

I DON'T NECESSARILY AGREE WITH THIS assessment of journalism offered by Lord Northcliffe, an early-20th-century newspaperman. There are some rare occasions, however, when we must explain situations we don't understand completely. This is one of them.

In late February, members of the Apple II Developers Association met with several key Apple managers to discuss the future of the II. While more than 20 of us *listened* to the same conversations and arguments, it's clear that we *heard* different messages. What followed the meeting was an exchange of electronic mail among members in hopes of reaching a consensus on what happened that Monday at Apple headquarters. You've probably guessed that we haven't come to an agreement.

Tom Weishaar of A2-Central and Barney Stone of Stone Edge Technologies — two respected leaders in the II community — offer varying perspectives. Tom sees the II glass as half full; Barney sees it as half empty.

In the April *A2-Central*, Tom writes, "My view of what happened is that Apple's people demonstrated they need continuing Apple II sales to meet the growth goals they have set for themselves. And they understand that to achieve those sales they will have to do a better job of communicating their Apple II commitment to their customers. They are planning how they will accomplish this right now and they asked for our reaction to some proposals."

What Barney inferred from the meeting wasn't as optimistic: "Overall, I felt that Apple was genuinely interested in our suggestions and feedback on smaller issues . . . The big picture, however, was a foregone conclusion. We didn't have anything to say that Apple had not heard before, and hearing it once again was not going to convince anybody at Apple that they had made any wrong decisions."

The funny thing is that I don't disagree with either report. I agree with Tom that Apple sincerely wants to support Apple II users. Apple people did seem to be open to suggestions on how to serve the installed base best. I think the key is that Apple is dedicated to supporting the millions of II users, not to the proliferation of the II line. I agree with Barney that the "big picture" — we have seen the future and it is Macintosh — wasn't open for discussion.

My own revelation involved more what Apple *is* than what it *said*. What I saw in that Cupertino conference room on February 26, 1990, was a computer company. Apple Computer is a *business* — not a lifestyle, not a counterculture, not a user group. Its final responsibility is to its shareholders. Good business sense dictates that high-quality products, good support, and reasonable prices lead to brand loyalty and repeat customers. If Apple is to be successful, it will take those factors into account. It must have profitability in mind, however, with every decision it makes. And that's not a bad thing.

Ironically, good business sense and a focus on profits should ensure the future support of the II line. Apple sees only two markets: business and education. Any mythical home-computer market exists only as an extension. Apple may *want* the Mac to make it big in business, but it *knows* the II still rules in education. If Apple wants to keep its market share in education — and keep making money — the II had better figure into its plan.

In closing his discussion of the developers meeting, Tom Weishaar said, "I left the meeting feeling that I . . . would be able to continue making a living in the Apple II market for years to come." In closing his report, Barney said, "If you want 'the very edge of technology,' I'm afraid you'll have to buy a different computer." Again, I wouldn't disagree with either comment.

The only thing that's not arguable is that Apple has no immediate plans to "kill" the II line. Any meaning beyond that is unclear. □



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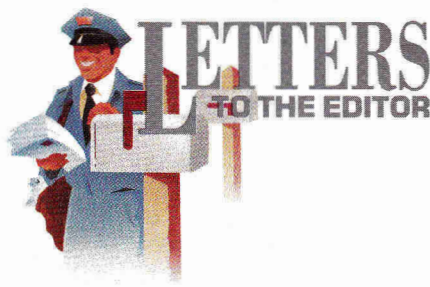
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## APPLEWORKS IDEAS

**I** TEACH AN "INTRODUCTION TO AppleWorks" course to high-school students using *AppleWorks Made Easy* by Carole Matthews. I need some ideas for projects my students can do; are there any texts or periodicals that have such activities for the AppleWorks database manager, spreadsheet, and word processor?

**Joseph Graham**  
125 Middletown-Lincroft Road  
Lincroft, NJ 07738

*The best source we know of is the AppleWorks Resource Guide from Claris Corp. (\$12.95); still another possibility is The AppleWorks Educator (\$25 per year), Association for the Advancement of Computing in Education, Box 60730, Phoenix, AZ 85082. Also try the Teachers' Idea and Information Exchange, P.O. Box 6229, Lincoln, NE 68506.* — eds.

## ON THE HIGH SEAS

**S**OFTWARE PIRACY IS ALIVE AND well in the United States military. Not unlike the rest of society, our sailors and soldiers often don't respect copyright laws. Cassettes, videos, and software programs are routinely copied and sometimes sold. At one installation with 32 computers, only 50 percent of the software is authorized; the rest was acquired illegally.

This creates serious problems for the military. Documentation is in short supply; in some cases it's impossible to recover from hard-disk crashes. Copied software also invites viruses, which have appeared on both unclassified and top-secret systems, on personal systems, and even on display models at the Navy Exchange.

Until now this problem has attracted little attention. It's easier to look the other way, especially when the solution requires spending more money.

While software piracy may never be completely stopped, it shouldn't be tolerated at any government agency. Pressure will have to come from higher levels of the government. Congress, if necessary, may have to prod military commands into taking responsibility for their computers and personnel.

**James W. Metzler**  
Intelligence Department  
USS Blue Ridge  
FPO San Francisco, CA 96628-3300

## RECLAMATION PROJECT

**I**'M A PUBLIC-SCHOOL TEACHER and dedicated Apple II user writing to express my concern for the future of the Apple II line of computers.

After years of watching my students learn the advantages of Apple II computing, I bought an Apple IIGs last year. I find the machine's capabilities and user friendliness a distinct advantage over MS-DOS and in many ways equal or superior to Apple's more heavily marketed Macintosh. My school district remains committed to the Apple II, despite aggressive proposals from IBM and Tandy.

I remain somewhat uneasy over the direction Apple is headed, however. Its marketing is overwhelmingly directed toward the Mac. I believe Apple is losing millions in potential sales by neglecting the II, sales that have gone to IBM clones and Amigas. (Witness the highly visible Amiga commercials; that same market could be buying GSeS.)

The base of Apple II users continues to

grow, despite a lack of strong support from Apple Computer. With more aggressive marketing, Apple could reclaim the home-computer market that has been lost to the competition.

**Frank Wells**  
3542 Carfax Avenue  
Long Beach, CA 90808

## ALL IN ONE

**I**'M A REPRESENTATIVE FOR A truck-body manufacturer and make sales in two states. I've used Apple IIs since 1984. I use my IIC Plus when traveling to prepare quotes, pull up records, and telex letters to my office. At home, I use my GS to handle heavy-duty computing chores, accounting, and entertainment.

My IIC Plus is currently equipped with a 1-megabyte Applied Engineering Ram Express, a C-Vue LCD screen, and a Prairie Power case. My Apple IIGs system has a 4-megabyte Applied Engineering GSRam-Plus, an AST VisionPlus card, the new Apple II Video Overlay Card, a TransWarp GS, a 1-megabyte RamFactor, a 20-meg SCSI hard drive, an Apple 3.5 drive, a Conserver, an ImageWriter II, an X-10 Powerhouse, an Edmark TouchScreen, an Apple RGB monitor, a ThunderScan, and a 2400-baud modem.

I mainly use the following software: GS/OS v.5.0.2, AppleWorks GS, PaintWorks Gold, AppleWorks 3.0, ProSel, Deluxe-Paint II, MouseTalk, SoftSwitch, HyperStudio, Dollars & Sense, SHR Convert, DBack v.2.0, ShrinkIt, and ReadyLink, plus BusinessWorks, Beagle Draw, and the TimeOut series.

I'm not bragging; rather, the list shows the incredible range Apples offer. I can't think of anything I want to do on my GS

that I can't. Imagine a machine that supports three worlds: 8-bit, 16-bit, and MS-DOS (the GS can).

Imagine speeds approaching that of the Mac SE or the IBM AT. Imagine running AppleWorks with all the TimeOut modules, plus the selection of software mentioned above and all the hardware options the Apple world offers. That's what I call productivity.

The Apple II isn't dead; all this makes it impossible to kill it. Even if nothing new were to come out between now and the year 2000, I'd still have plenty of applications to run.

The only problem is that Apple has gone blind. Its pricing on the II is ridiculous. Its lack of support is even more ridiculous. A spin-off company to handle the II (something like Claris) would be very welcome.

The next few years could be very interesting. Money is getting tighter. Even overpriced, the II offers a lot for your buck. The low-end Mac is a joke: It's like buying a Corvette cheap and having the salesperson say, "You want a frame, body, and wheels to go with that motor? It'll cost you more." Prepare for the comeback of the Apple II.

**S. Bradley Martin**  
**RR 3 Box 133**  
**Monmouth, IL 61462**

## UPDATE

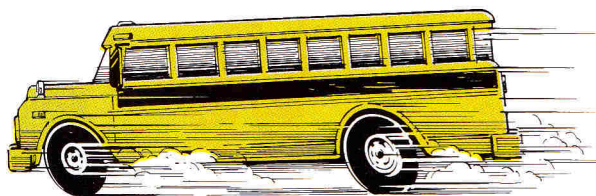
Micro-Peripherals Engineering has moved to Humble, Texas; the company's new phone number is (713) 446-8658.

## CORRECTION

Three errors appear in our January 1990 Applesoft Adviser column ("Teacher's Tutor"). In Listing 4 (p. 89) line 2415 should contain P1/2\*P1/2: (not simply P1/2:); the print statement in line 2430 should state: "RADIUS (WHICH IS 1/2 THE DIAMETER) SQUARED"; and line 2455 should also state: PRINT "3.1416\*"P1/2\*"P1/2.

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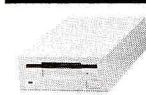
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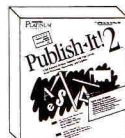
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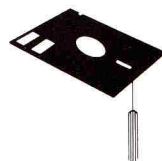
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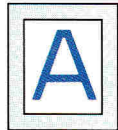
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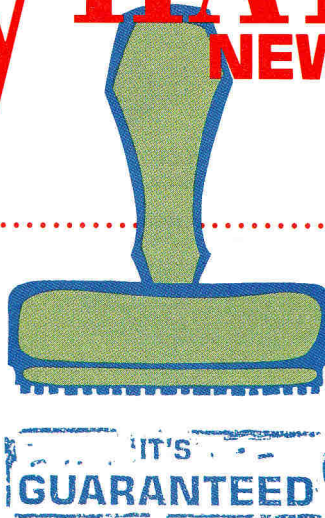
# WHAT'S NEW

edited by Paul Statt



Apple computers bought after January 1, 1990, are now covered by a one-year limited warranty. Apple announced its new warranty policy in March, after much criticism from user groups, on on-line services, and in magazines. The warranty period had been only 90 days. Apple also extended warranty coverage to provide for service from any authorized Apple reseller worldwide; previously service had been available only from domestic (United States) resellers.

Any owner of an Apple system purchased before January 1, 1990, can now obtain an extended AppleCare service plan at a reduced rate, before May 31. The promotional price lets users buy 12 months of AppleCare for the price of six; for example, one year of AppleCare for a IIe with a color monitor and



an ImageWriter II costs only \$90, according to Apple. This special AppleCare is available to owners of all Apple computers built since 1978. Prices will vary.

"Although customers and resellers recognize that Apple makes quality products, we know they want the additional value and protection that the new warranty represents," said Morris Taradalsky, vice president of customer service and information-

services technology at Apple. "It's good and bad," says Jeff Cable, one of the country's most successful Apple II GS salesmen (Wolf Computer, Los Gatos, CA) and *inCider's* West Coast editor. "Good, because it will help sales—it's been stupid to have a 90-day warranty when the competition offered a year—and bad, for the dealers, because we loved to sell those service contracts." —P.S.



okay—it's *not* a faster version of the 65816, but Apple's recent introduction of the **Apple II High-Speed SCSI Card** is another step toward making the Apple II—and the GS in particu-

lar—a little faster. Apple claims a speed increase of more than ten times the previous version. The secret lies in Apple's implementation of DMA (direct memory access). As the name implies, DMA lets the SCSI card operate more efficiently by bypassing the CPU (central-processing unit) and accessing your Apple's memory directly.

With the new SCSI card, GS users can expect a maximum data throughput of 1 megabyte per second. Hard drives and other Apple-compatible hardware will work about half as fast on the IIe—511K per second, to be exact.

If you're using your hard-disk drive to store AppleWorks and a few other programs, you probably won't notice a dramatic speed increase. If your hard drive's stuffed with programs, desk accessories, fonts, and so on, though, you may think you've died and gone to SCSI heaven.

At a press briefing in late February, product manager Rajiv Mehta demonstrated the performance increase on a GS and an Apple hard drive packed with more than 30 megabytes of digitized images from the movie *Star Wars*. Next to the GS with the new SCSI card was a GS with the previous version of the card. The difference between the two was

## NEW SCSI CARD



HARDWARE

nothing short of astounding. While the images from the hard drive using the older SCSI card appeared slowly on screen one at a time, the images transmitted via the new card flowed so smoothly it looked like a video instead of digitized pictures.

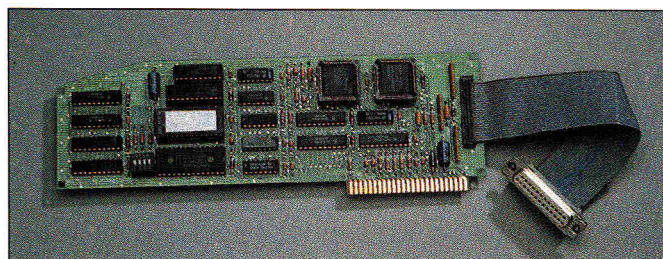
After the oohs and ahs came the obvious question: How many Apple II users have more than 30 megabytes of digitized images on their hard-disk drives? The greater the demand, the greater the performance increase, is the answer. Regardless of how you use your computer and your hard-disk drive, you'll notice a speed improvement.

Remember, too, that the benefits of the new SCSI card aren't limited to hard-disk drives. The Apple II High-Speed SCSI Card also provides access to other Apple SCSI devices—CD-ROM players, laser printers, scanners, tape-backup systems, and so on.

The retail price of the Apple II High-Speed SCSI Card remains \$129 and includes a 3½-inch disk with utilities and device drivers for the GS and the IIe, a 5¼-inch disk with utilities for the IIe, and the *Apple II High-Speed SCSI Card Owner's Guide*. To use the card, you need either a GS or a IIe with a 65C02 (that is, any enhanced IIe, or any IIe produced in 1986 or later).

Next month, look for *inCider's* benchmark tests comparing Apple SCSI drives (using the new card) with hard-disk drives using third-party proprietary interface cards.

—D.M.



Apple's new SCSI card—up to 10 times faster.



## IN FROM THE COLD

W

ith Eastern Europe opening up, the Cold War thawing, and peace breaking out all over, spy novelists Robert Ludlum, Frederick Forsyth, and Tom Clancy are looking for other venues for thrillers. But Cold War or not, Accolade has started shipping its graphics adventure **The Third Courier**.

The game casts you as Moondancer, master spy, in search of the "third courier" on both sides of Berlin. (There used to be a wall.) Super-top-secret NATO defense plans, previously carried by three couriers, are missing; two of the couriers are dead, and the third is headed for Moscow. That's where you come in.

You have seven days to scour the streets of Berlin to find the third courier and recover the three components of the stolen defense plans. You can use four different "cover" identities to help with your search, plus an arsenal of high-tech weapons and spy gadgets that would make James Bond envious. Other than that, however, you're on your own. You'll have to rely on your wits to save the free world. Bribe or



### GAMES



Accolade's **Third Courier** turns you loose in Berlin on a hunt for stolen NATO documents.



Play some of the Golden Bear's favorite links with Accolade's **International Course Disk**.

threaten information out of everyone you meet and don't trust anyone. You'll live much longer that way.

Along with **The Third Courier**, Accolade has added a few courses to your golf game. The **International Course Disk** for Jack Nicklaus' Greatest 18 Holes of Major Championship Golf takes you around the world: Play at the Australian Golf Club in Kensington, the Saint Creek Golf Club in Nagoya, Japan, and the St. Mellion Golf & Country Club in Cornwall, England. Naturally, all courses were designed or redesigned by the Golden Bear.

Both releases are for the Apple IIGS. **The Third Courier** costs \$49.95; the **International Course Disk**, which requires the Jack Nicklaus' Greatest 18 Holes of Major Championship Golf game disk, costs \$21.95. Either game is cheaper than plane fare to Europe, Japan, or Australia. For more information, contact Accolade at 550 South Winchester Boulevard, Suite 200, San Jose, CA 95128, (408) 985-1700, or circle number 351 on the Reader Service card. —L.L.

## BASEBALL SEASON

A

t press time, the strike/lockout in major-league baseball might make a fantasy of the 1990 season. But fantasy baseball, also called rotisserie-league baseball, is real.

Fantasy baseball is a game played by fanatic followers of the summer game who know how to build teams better than the major-league managers. To prove their expertise, fantasy managers cre-

ate teams by choosing players from the active rosters of the major leagues. Over the course of the real major-league season, the fantasy team's performance is calculated by a strict formula according to the performances of the real players.



### SOFTWARE

It's a very serious game. All those calculations take a lot of the fun out of it—at times fantasy baseball can seem like fantasy arithmetic class.

Some fantasy managers hire statisticians to keep track, but if you use AppleWorks, there's a better way.

*SportsWorks Fantasy Baseball* makes AppleWorks do all the work. These 14 templates for AppleWorks 2.0 or higher include all the rules of fantasy baseball and all the calculations you'll need to run your own team. If the fantasy captures your imagination, *SportsWorks* is a painless way to get started. It costs only \$39.95, from T+M Enterprises, P.O. Box 195, Staten Island, NY 10307, or circle number 353 for more information. —P.S. ▶

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\*Requires Print Shop™ IIgs to use.

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- GS150 Romulan.GS: 18 games, Worm, Shooting Gallery, more! (SHAREWARE) . . \$9
- GS151 Orbizone—like Asteroid™, and Othello, (REQ. SYSTEM 5.02) (SHAREWARE) . . . \$9

### Music

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WHAT'S  
NEW

# HYPertext

The idea behind **Nexus** was an electronic encyclopedia, according to its author, Tracy Valleau: He wanted to be able to click his mouse on each boldface cross-reference and see that article immediately. Better than Apple's HyperCard, Nexus works with existing text files and standard graphics files.



SOFTWARE

Valleau, author of the ThunderScan GS software, has created a simple program—it has only two commands—of incredible power. In each of as many as 1000 files, you simply point and click on the words or pictures you want to link, then choose the file to which you want to link them. Nexus doesn't change the text file or picture; you can edit as you did before.

As is typical of "hypermedia," the possibilities are limitless. But because Nexus works with plain text files, it can turn all your files, from whatever source, into a "free-form database" with almost no limits on file size, number of records, or number of categories.

Nexus isn't copy-protected; it requires GS/OS 5.02 and 1.25 megabytes of memory and costs only \$59.95, from datasmith, P.O. Box 834, Pacific Grove, CA 93950, (408) 372-4155. Circle number 354 on the Reader Service card for more information.

—P.S.

●Applied Engineering (Carrollton, TX) has dropped the price of its **PC Transporter** again to \$399. This popular piece of hardware allows Apple IIe or GS users to run MS-DOS software.

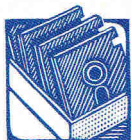


UPDATES

●The **VidClip**, a handy VCR controller that works with the GS, is now available only as a "developer's toolkit" for \$89. Mark Abate at Video Production Controls (Boston, MA) says most customers wanted the developer's kit anyway, and that he expects commercial products that use the VidClip to combine computers and VCRs soon. Call (617) 236-7006.

●If you've ever wondered just what a computerized robot can teach you, take a look at **fischer america's** (Modesto, CA) free 14-minute videotape. A two-hour training tape that teaches you how to put fischertechnik robots to work in the classroom costs only \$29.95; to order either tape, call fischer america at (201) 227-9283.

# DB Master for Everyone



## SOFTWARE

If you think there's no such thing as affordable productivity software, Stone Edge Technologies, Inc., has the program for you. The Maple Glen, Pennsylvania-based software company recently announced that DB Master Version Five—the relational version of its Apple II database manager—is now available as shareware.

DB Master Version Five lets you create records with up to 200 fields, with up to 250 characters per field.

It can work with files up to 10 megabytes in size and includes most of the report-generation features of the more powerful DB Master Professional, which Stone Edge will continue to distribute through retail and mail-order channels.

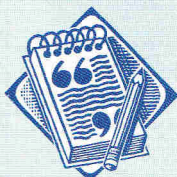
"Once they see how easy it is to use, and how much more you can do with a real database manager and a powerful report generator, we believe many people will upgrade to the full relational power of our main program, DB Master Professional," said Barney Stone, president of Stone Edge Technologies.

If you like DB Master Version Five or want to purchase it directly from the publisher, Stone Edge asks a shareware fee of \$45 (the previous price was \$179). You'll receive the latest revision of the program, an instruction manual, and special offers for DB Master Professional. Technical support is available to registered users for an annual fee or on a pay-per-call basis.

DB Master Version Five requires an enhanced 128K Apple IIe, IIc/IIc Plus/IIgs, or Laser 128 and two 5.25-inch disk drives, one 3.5-inch disk drive, or a ProDOS-compatible hard-disk drive. You can install the software on a hard disk or a 512K RAM disk. For more information, write to the company at P.O. Box 3200, Maple Glen, PA 19002, or call (215) 641-1825 between 9:00 a.m. and 5:30 p.m. (EST).

**"By sticking with the Apple II, an obsolete museum piece, as its prime educational product, Apple is losing its dominance in schools and colleges."**

—Brit Hume and T.R. Reid,  
in their syndicated computer column



## QUOTES

Hume and Reid are at it again. (See "Journalist, Teach Thyself," *inCider's View*, January 1990, p. 8.) This time the two amateur computer experts are arguing that the Apple II is somehow to blame because Apple has been unable to convince schools to buy Macintoshes they can't afford—the real reason Apple is losing its dominance. Somebody really ought to straighten these guys out.

—eds.

**Brit Hume**  
ABC News  
Washington Bureau  
1717 DeSales Street NW  
Washington, DC 20036

**T.R. Reid**  
*The Washington Post*  
Rocky Mountain Bureau  
1228 15th Street  
Suite 210  
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## Seatbelts Suggested

Buckle your seatbelts for TransWarp III. More than eight times as fast as the IIe's native speed, with upgradeability to more than twelve times as fast! Frankly, we're obsessed with keeping your Apple II going at maximum speed and TransWarp III for the Apple IIe, II+ and II is the latest result.

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Vulcan high-speed internal hard disks for the IIGS, IIe, II+ and II, combine a wide range of upgradeable sizes with the speed and power lacking in other systems. The result? A quantum leap forward into the Apple II future. A reliable and affordable way to store massive files while speeding up booting time.



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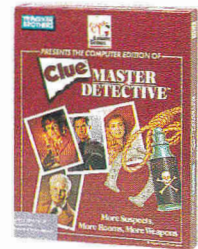
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**STATUS  
REPORT**

# SUPPLY AND DEMAND

By **PAUL STATT** \* SENIOR EDITOR

**A**pple has to  
listen to the  
market. Save your  
postage stamps —  
vote with your  
wallet.

READERS CALL ME ON THE PHONE TO report breathlessly that “Apple’s going to stop supporting the Apple II!” I’m tempted to repeat Dorothy Parker’s flippant response to the news that Calvin Coolidge had died: “How did they know?”

How will you know when Apple stops supporting the Apple II? Is Apple going to stop answering your technical questions when you call? Stop writing Apple II software? You can’t stop what you’re not doing. Apple has stopped supporting the Apple II already. Perhaps you want Apple to support the Apple II the way it supports the Mac — with a new machine or a new operating system twice a year, and all the attendant compatibility headaches.

No, I guess people worry that software and hardware developers will stop creating new products, depriving Apple II users of a regular opportunity to part with their hard-earned money. That’s a reasonable concern. Even editors at *inCider* worry that the month will come when nobody will have anything to sell to Apple II users and therefore no reason to buy an advertisement.

Believe it or not, software companies don’t decide which computers to develop programs for by drawing names out of a hat. They don’t do what Apple tells them to, either. Software companies write the software that sells best, and Apple II software doesn’t sell best.

Charlotte Taylor, public-relations manager at Accolade, estimates that 10 percent of the company’s market share is Apple II software; 60 percent is MS-DOS. Broderbund says its Apple II software sales show “a significant drop from what they were a year ago,” according to Bill McDonagh, executive publisher for entertainment and education. These businesspeople aren’t making up these figures because their companies want to create MS-DOS software; they write MS-DOS software because that’s the reality of the market.

While my concerned callers have mapped out

great strategies to save the II — a pen-pal campaign directed at John Sculley, a firebomb in the stockholders’ meeting, the abduction of Steve Wozniak and his forced repatriation back to Cupertino — I have a better plan.

It’s a poison pill you’ll have to swallow, one I’m loathe to prescribe: You must buy every piece of Apple II software and hardware you can afford. Every text adventure, every Hebrew word processor, several hard-disk drives, and a handheld bar-code reader. You can’t afford to buy only the stuff you need if you expect the Apple II to live forever.

The more software you buy, the more software will be developed. More games at the last Consumer Electronics Show were written for MS-DOS machines than for the Apple II — not because that’s the wave of the future, but because every smart business markets the products that sell best.

But where can I buy Apple II software, you ask? That’s a problem. Most computer/software stores I’ve seen in the United States and Canada stock less and less Apple II software all the time — not, I repeat, because they think the Apple II is old-fashioned or the Mac is sexy, but because they sell more Mac software.

When even the Communists in Poland, Hungary, East Germany, and Red China are learning that the “free market” works, why does it come as such a surprise to Apple II users? Demand creates supply. If there were a demand for Apple II software, companies would make it.

So buy all you can. I know there are problems, that Steve Jobs once shoved Macintoshes down developers’ throats with the “invisible hand” of the free market tied behind his back. But Apple’s not as rich or as cocky as it was in 1983, and I think it’s going to have to listen to the market. Save your postage stamps — vote with your wallet. It’s the only way to “save the Apple II,” and even if we don’t save the II, you’ll at least have a good supply of software laid by for a rainy day. □



***“Elegant, innovative, flexible and in all aspects the leader of the field.” — Incider Magazine***

**Accolades** continue to pour in. Vulcan hard drives were recently awarded FIVE stars by Incider Magazine, a rating reserved for products judged “excellent and remarkable”. Incider went on to say, “*The Vulcan sets a new performance standard for hard drives . . . Applied Engineering has done it again.*”

Hard drives tremendously boost your productivity. The Apple II’s operating system, hardware and memory-gobbling software take on a new agility and finesse with the addition of a hard drive.

**Speed?** The IIGS Buyer’s Guide put it this way, “*Everything this drive does is fast. TimeOut modules, installed in AppleWorks and configured as disk-based, came up as fast as if they were memory-based. Graphics load almost immediately. Even that damnable lie, ‘One Moment Please’ suddenly delivers its promise. We recommend the Vulcan wholeheartedly.*”

And Incider said, “*The Vulcan walks all over the competition. Twelve seconds to the GS Finder; 10 seconds to AppleWorks GS. Sounds good doesn’t it? It is. That sizzling speed is achieved thanks to a high-quality internal tracking unit.*” Vulcan incorporates an ultra-fast 16-bit data bus controller, not the less expensive 8-bit others use.

**Features?** As Nibble Magazine said, “*AE drives support more operating systems and have more features in the supporting software.*” And Incider added, “*Applied Engineering has put together the most complete set of utilities to date for an internal hard drive that leads the market.*” And since Vulcan’s made by Applied Engineering, you’re assured of full compatibility with current and future AE products.

**Power?** Vulcan’s high-efficiency power supply is rated in excess of 70 watts, *nearly double* the capacity of other hard drives. The power supply components are heatsinked to the aluminum case for cool operation and long life. To harness all that power, Vulcan incorporates an ultra-quiet, flush mounted cooling fan, keeping the temperature inside the Vulcan, and inside your Apple lower than before.

**Flexibility?** Choose a Vulcan from 20, 40, 100 — all the way to 200 MEGs. Upgradeable Vulcan 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.

Only Vulcan lets you 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.

**Ease of Use?** Incider says, “*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 that any of its current competitors.*” 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.

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# PATCHING THINGS UP

**I'm willing to try just about anything once, but I still can't recommend modifying your UniDisk — you might destroy your drive.**

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

## OPERATING ON THE UNIDISK

I'VE RECENTLY UPGRADED TO AN Apple IIGs from a IIe. I had purchased two UniDisk 3.5 drives for my older system, which I simply attached to the new one. I now envy GS owners who use the Apple 3.5 Drive, because of their ability to initialize disks with the faster 2:1 interleave instead of the 4:1 allotted for the UniDisk.

I recall seeing an article or tip sometime back that described how to modify the UniDisk 3.5 to operate with a Macintosh as a bare-bones Apple 3.5 Drive. Does that modification work with the GS?

Also, why do the UniDisk drives keep clicking on and off when I start up my GS with the GS/OS Finder? Can I stop that chatter?

**Michael Sneider**  
East Lansing, MI

*I've gotten many similar inquiries in the past, Michael, but I've hesitated responding to them until now because I haven't been able to get a straight answer from any of my technical gurus. The matter remains unresolved.*

*Some of my sources say you can modify the UniDisk 3.5 by simply moving an internal cable. Others say it doesn't work. Still other people tell me the modification may eventually*

*destroy your UniDisk's delicate circuitry.*

*I've tried the modification: First you have to nearly disassemble the UniDisk down to its bare components to expose the interface-cable connector and a ribbon cable that jumpers the lower and upper circuit boards.*

*After unplugging the interface cable from the lower circuit board and the jumper cable from its socket on the upper board, you then reconnect the interface cable into the upper circuit board and let the jumper cable dangle.*

*The result isn't pretty, particularly if you can't fit the drive components all back together again. When connected to a GS, my modified UniDisk simply sputtered — constantly trying to spit out a disk, real or imaginary.*

*I can only guess that Apple has changed the UniDisk's drive mechanism. The described modification might (or might not) work with older versions.*

*I'm willing to try just about anything once, but I still can't recommend modifying your UniDisk. There's that very real possibility you'll destroy your drive in the process. Sorry.*

*I'm particularly sorry because the UniDisk is clearly slower than its cousin, the Apple 3.5 Drive, despite its greater "intelligence" — not because of interleaving, as you imply, even though interleaving contributes to the problem.*

*Rather, the UniDisk contains an extra logic board that does much of the data-transfer work for the IIc or IIe, but isn't required for the GS' system.*

*Additional manipulations of data take time, so UniDisk reads and writes take longer than those using the bare-bones, data-direct Apple 3.5 Drive.*

*For instance, it takes almost twice as long to start up a GS into the GS/OS Finder from the distributed version 5.0.2 System Disk if you're using a UniDisk 3.5 instead of an Apple 3.5 Drive.*

*Altering the disk interleave helps ameliorate those data-manipulation delays. In general, your file is broken up into discrete packets of data before being stored ultimately on a disk "sector."*

*Sectors are read or written one at a time; in between, your Apple and your drive need some processing time. That processing time is longer than the time required for the next sector to spin under the read/write head in your drive, but usually much shorter than the time required for the disk to make a complete revolution.*

*The GS and the Apple 3.5 Drive are ready to read/write every other sector; hence, a 2:1 interleave is optimal. Because of the longer processing time, the UniDisk operates optimally with a 4:1 interleave.*

*For example, that same System Disk mentioned earlier, when copied to a 4:1 interleave disk, takes just some 30 percent longer to boot into the Finder from a UniDisk. So continue using the 4:1 interleave to format your UniDisk-bound 3.5-inch disks, and, whenever possible, copy your favorite applications to similarly formatted disks.*

*The UniDisk's constant chatter when using GS/OS bothers me, too. According to Apple's technical-support people, GS/OS "polls" the UniDisk every two seconds or so to determine whether you've removed the current manually or inserted a different volume.*

*I'm not convinced that an application's need to "know" whether you've switched disks outweighs the probability of physical damage to the UniDisk 3.5 from starting and stopping its*



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mechanism incessantly. Unfortunately, there isn't much you can do about it except to replace your disk drive.

**RETURN OF THE FRANKLIN**

**I**N YOUR FEBRUARY 1989 APPLE Clinic, you published a "Quickie" tip about booting ProDOS on a Franklin 1000. (See p. 25 of that issue for details.) The fix works fine for early versions of

ProDOS. Do you have the patch addresses for later ProDOS versions?

**Richard Downe**  
**Augusta, ME**

*Stephen Craft of West Berlin, New Jersey, sent us that "Quickie," Richard. I've included the patch addresses he suggested, as well as those for the latest versions of ProDOS, in the accompanying Table.*

*If you recall, Stephen suggested you watch your monitor carefully to see the ProDOS*

**Table.** Patch addresses for insertion of two NOP (\$EA) commands to boot ProDOS on Franklin 1000.

ProDOS Version	Patch Address (hexadecimal)
1.0	2647
1.0.1	265B
1.1	264D
1.1.1	269E
1.2	275B
1.3 — 1.7	282B
1.8	2836

version number of the boot disk. After your Franklin 1000 "freezes up," press Control-Reset to enter the monitor, enter two NOP (hexadecimal \$EA) commands at the address specified in the Table, and then restart ProDOS. For example, using ProDOS version 1.8, enter the following line (except for the asterisk, which indicates monitor mode), and press Return when you're finished:

\*2836:EA EA N 2000G

You might also modify ProDOS on your boot disk(s) permanently. Start up your Franklin with ProDOS BASIC and load ProDOS from the disk you want to modify:

BLOAD PRODOS,A\$2000,TSYS

Now CALL -151 to enter the monitor, alter the appropriate addresses according to the Table, and then save that modified version:

BSAVE PRODOS,A\$2000,TSYS

For example, after loading ProDOS 1.1.1:  
]CALL -151

\*269E:EA EA

\*BSAVE PRODOS,A\$2000,TSYS

Of course, your modified disk may or may not boot on an Apple II or other compatible system.


**TEXT-PAGE PROTECTION**

**I**'VE WRITTEN A NUMBER OF DOS 3.3 Applesoft programs that save and reload full screens of lo-res graphics using the following command:  
BSAVE graphic.name,A\$400,L\$400

These same programs, though, don't work under ProDOS; I get a "No buffers available" error. What's up?

**James Pfaffly**  
**Guttenburg, IA**

*As I've discussed in previous Apple Clinics ("No-Buffers Blues," March 1989, p. 22),*



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Circle 103 on Reader Service Card.

"No buffers available" is a "catch-all" ProDOS error message. In your case, however, the message is correct: The memory associated with page 1 of low-resolution (lo-res) graphics (\$400 through \$7FF) is protected by ProDOS and, thus, unavailable for read/write modifications.

ProDOS protects itself and other important portions of memory from inadvertent modification by referring to a system bit map before loading or saving data. That bit map is a 24-byte region beginning at memory location (hex) \$BF58 (48984 decimal). Each bit per byte represents the protected status of each of the 48K RAM "pages" (256 bytes) in your Apple. Bits 3, 2, 1, and 0 of location \$BF58, for

example, control the protected status of pages 4 through 7 (\$400 through \$7FF) — memory your Apple uses for text or lo-res graphics.

You can remove protection by setting the appropriate system map bits to zero. In my version of ProDOS, \$BF58 (48984) contains \$CF (207), which means that pages 0 and 1 and 4 through 7 are protected; 2 and 3 aren't. Hence, to load or save data from the text or lo-res screen, first use the following command to "deprotect" only the screen region:

POKE 48984,192

or from the monitor:

\*BF58:C0

To reprotect that area, type the following:  
POKE 48984,207 (\*BF58:CF)

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## QUICKIES

To simplify number-base conversion, divide the number by the radix (base) until the remaining dividend is smaller than that radix. The list of remainders in reverse order is the converted number. For example, 1990 decimal (base 10) conversion to hexadecimal (base 16):

1990/16 = 124 remainder 6

124/16 = 7 remainder 12 (C in hex)

7/16 = 0 remainder 7

Hence, 1990 base 10 = 7C6 base 16.

— Stephen Phillips  
Oak Harbor, WA

Here's an update for converting the 1982 version DOS 3.3 System Master Renumber program to ProDOS: Delete Renumber's line 1230; relocate the machine-language code specified in "ProDOS Renumber" (Apple Clinic, September 1989, p. 25) to \$AEA (formerly \$AE7), and byte \$C4 to \$1088 (formerly \$1085).

— Frank Blaser  
Muncie, IN

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— Neil Ungerleider  
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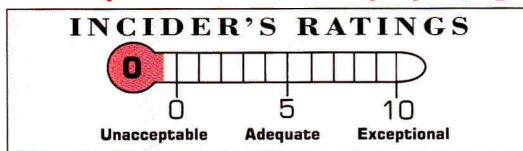
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# REVIEWS



## READYLINK

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Telecommunications software;  
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More and more people these days are using telecommunications to share information and ideas, so the demand for powerful yet easy-to-use communications software is growing. Applied Engineering has responded to this expanding audience with ReadyLink.

ReadyLink (formerly EasyLink) lets you enter the vast realm of on-line services and bulletin-board systems (BBSes) with ease.

### SETTING UP

When you run ReadyLink the first time, you'll have to configure the program to

work with your system. The manual presents the simple setup procedure in clear, step-by-step instructions. In addition, the disk contains a READ.ME file that describes revisions to the program or manual. The package includes instructions for viewing and printing the file.

### COMMAND PERFORMANCE

ReadyLink can work with almost any modem; it supports 300, 1200, or 2400 baud and works with or without a mouse. A command line across the top of the screen lets you get at the program's options through standard pull-down menus — File, Edit, View, Option, and Macros.

You can activate most of the commands with open-apple key combinations, as well, or redefine many of these key commands to suit your preferences. The ReadyLink command set is straightforward. Beginners will enjoy the simple default commands, while advanced users will appreciate the flexibility of the program's commands and options.

### DEMANDS OF PROTOCOL

File transfer is one of ReadyLink's nicest features. When uploading or downloading, the program uses the currently selected protocol setting. If that isn't the correct setting, ReadyLink works its way down the list of various protocols automatically until it finds the right one to make the transfer.

When using Ymodem protocol, ReadyLink displays a window letting you know how the transfer is going. A thermometer display fills up as the transfer progresses — similar to the thermometer bar you see when loading the Apple IIcs desktop. You can also see the number of blocks and bytes ReadyLink has received and transmitted so far. It's an excellent

feature, as you can tell how far into the transfer you are and how much time is left. Budget-conscious users can combine this feature with the rate option, which tells you how much a particular session is costing. An elapsed-time option shows how long you've been on line.

## AUTOMATE IT

Another superb feature is the program's macro capability. *Learn Macro* records your log-on sequence as a macro; once saved, you can call it up and have ReadyLink log on for you automatically.

You can even set up ReadyLink to go to specific areas, get messages and files, then quit all on its own — a lazy person's dream. Power users will be able to set up macros to handle specific tasks, regardless of how simple or complex.

Other features of ReadyLink's macro language include the ability to acknowledge specific keypresses, wait for certain responses from a BBS, upload files automatically, and manipulate the program's main screen display.

ReadyLink also features a solid text editor, good terminal emulation (including VT52 and 132-column VT100), split-screen chat mode, resizable windows, and text-file capture. ReadyLink's host of commands and features can make it do just about anything your heart desires.

## GONE MISSING

For the most part, the manual is good, but it's not without minor annoyances. Although it explains each command, it includes few examples of the corresponding action. For instance, after reading the manual you wouldn't know that when you're transferring a file a window pops up to show you a thermometer with block-and-byte-transfer information.

One item noticeably absent from the program is an automatic scrollbar buffer to save all incoming text in a RAM area you could access while on line. You can use the *Capture Text* option to save incoming material in a file you can view and edit on line, but you must remember to set this option each time you log on to a system. Adding scrollbar capability and revising the manual would make ReadyLink pretty hard to beat.

## LOG ON

ReadyLink is a superbly easy-to-use telecommunications package that includes

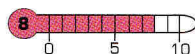
the many powerful features and options you'll need for today's on-line services and bulletin-board systems. It all adds up to a solid program. If you're ready for telecommunications, you're ready for ReadyLink.

**Timothy Moore**  
**Metairie, LA**

## MULTI-KACHE DISK ACCELERATOR

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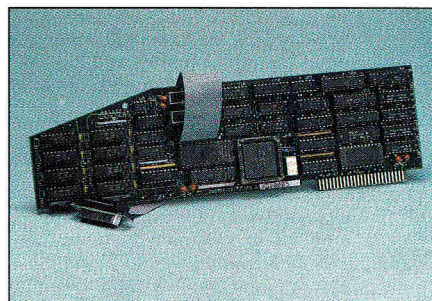
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Apple II performance has taken a step forward with the Multi-Kache accelerated disk-controller card. The Multi-Kache suspends the laws of the Apple II by accelerating the speed of your external disk drives — an unlikely undertaking that manages to succeed, although it occasionally struggles with its own cleverness.

## SPEEDING UP

The Multi-Kache card resides in one of your Apple II's internal expansion slots.



Cache as cache can . . .

Many such boards are plug-and-play, but this one takes a bit of patience. Difficulty of installation varies with each computer, depending on what other enhancements you've made.

The Multi-Kache card accelerates your Apple II in three ways — disk reads and writes are eight to ten times faster than those of a standard Apple II; the main Apple logic chip is relieved of a lot of its internal drudgery; and a fast RAM cache reduces the number of disk reads — each of which still takes some time.

The Multi-Kache uses a quicker read/write mechanism along with a DMA

(direct memory access) controller, which frees the machine from having to move blocks of memory around. It also uses a bank (either 256K or 1 megabyte) of high-speed RAM to cache frequently used data.

Caching just means that instead of being forgotten immediately, some information — such as a data file or the catalog of a subdirectory — is kept in memory awhile in case it's needed again. You can also configure the card to keep its cache full by performing background reads — which is sort of an anticipated caching scheme.

All of this gives you a dramatic increase in performance, but at the price of potential trouble. DMA — an idea only recently borrowed from the PC world — is particularly chancy. You're likely to have some conflicts if you already use a traditional accelerator (such as the Zip Chip, Rocket Chip, or TransWarp, which themselves use DMA), almost any one of the GS memory cards on the market, or certain third-party floppy drives.

You still can use the Multi-Kache in these situations; you'll just have to change a few things. You can tell it not to use DMA, which slows it down only by about a third. If you have an early TransWarp GS, you can upgrade it to live in harmony with other DMA devices. (Most of Applied Engineering's memory cards already can. The GS Juice Plus and the newest Apple cards are also fully compatible with the Multi-Kache.)

## FASTER FLOPPIES

The Multi-Kache is the best thing to ever happen to floppy drives, particularly with today's large applications; AppleWorks GS, for instance, runs up to ten times faster. The Multi-Kache can support two old-style Apple Disk IIs plus a chain of SmartPort drives for a total of eight devices. Realistically, however, more than two floppy drives may overburden your power supply. Another limitation you'll encounter when adding drives is that you can't daisy-chain a DuoDisk from a Unidisk 3.5.

You can use any expansion slot for the Multi-Kache, but ProDOS 8 wants the card to be in slot 5 if you have more than two drives connected. If slot 5 is unavailable and you want more than two drives ready for ProDOS 8 applications, you can purchase the Disk Expander option from OKS for \$35. It's a second board that plugs into a peripheral slot to fool the operating system into reading all available drives. ▶

# REVIEWS

If you have a GS, using the Multi-Kache will prevent access to any ROM or RAM disks, because they're accessed through slot 5. The RAM disk is no big deal — the Memory Manager is more efficient anyway. If you've been enjoying the speed of a ROM disk, however, remember that a SCSI hard drive controlled by a Multi-Kache is nearly as fast and in some cases faster than a ROM drive.

As far as your operating system goes, the Multi-Kache supports ProDOS 8, GS/OS,

DOS 3.3, Pascal 1.3, and UniDOS Plus. By putting the card into dormant mode, you can also use some older operating systems. Moving to dormant mode makes the Multi-Kache function like a standard floppy controller.

Advanced mode activates acceleration, caching, and DMA. You make the switch — which will ostensibly let you run any foreign operating system — by issuing a command at the BASIC prompt. Unfortunately, however, any subsequent access to

your ProDOS application will reinstall advanced mode. That brings us to a problem area — copy protection, essentially a foreign operating system.

The real problem is the copy protection itself, which is an immature treatment of a maturing audience. The symptom, however, is that you won't be able to run your copy-protected disks with the Multi-Kache. The very definition of copy protection is a scrambling of file structures so that you can't read them in any standard fashion.

The final word on floppy drives concerns the configurations in which the Multi-Kache is sold. The 256K model is sufficient if you use 5.25-inch disks or if you're primarily interested in the SCSI option. If you use 3.5-inch disks, you'll probably prefer the 1-megabyte configuration.

A 1-megabyte Multi-Kache card is sufficient to keep one 3.5- and one or two 5.25-inch disks — the most common floppy configuration today — completely loaded into the background cache, so all access to your floppy disks will be nearly instantaneous. (You can upgrade the Multi-Kache 256K card to 1 megabyte for \$160.)

## QUANTUM LEAPS

How fast is fast enough? In the past, hard drives were considered the definitive answer to slow disk access. The Multi-Kache SCSI option, however, gives even hard drives a run for their money.

Before we look at the specifics, we need to look carefully at the big picture. Hard-drive access is measured in milliseconds, with an average hard drive having an effective access time of anywhere from 68 to 120 milliseconds. The best units — high-end SCSI drives of 60 megabytes or more — get it down to 28 milliseconds. Multi-Kache comes in at around 12 milliseconds.

Just what is a millisecond? It's a very small measure of time — so small that there's a real question about whether it's worth the money to go from 68 to 12. For most hard-drive operations, it's a difference of only a few seconds.

The secret, of course, is that if you put together enough milliseconds you're eventually going to come up with a performance bottleneck. That situation isn't going to occur if your needs are light — such as a 20-megabyte drive for home management — but it's certain to occur if

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The Multi-Kache SCSI option can support up to eight SCSI devices (most SCSI cards support only four), with up to 256 megabytes of total storage on line. That 256 megabytes, however, is the card's limit. The practical limit is the number of slots you have available, with each slot being able to handle two 32-megabyte volumes under GS/OS. Four such volumes is the usual practical barrier.

The Multi-Kache uses ANSI-standard partitioning, which means that if you have the Apple SCSI Revision C card you'll be fine. Otherwise, you'll have to reformat your hard drive. Even if you do have Apple's card, you'll probably still end up reformatting your drive to take advantage of Multi-Kache's support of 1:1 interleave. (Interleave refers to the way data are stored physically on a drive, and 1:1 is the fastest you can get. The lower the ratio, the faster you can access the drive.)

The Multi-Kache includes a software utility for formatting and partitioning drives, as well as toggling background reads and writes and DMA mode. There's also a custom driver to enhance the speed at which GS/OS communicates with your hard drive.

### SET YOUR SPEED

If you don't like the game, change the rules. That's what's going on here. Apple IIs are tied to their disk-drive interface — and that interface is tied to the past. Multi-Kache intervenes, but it does so on treacherous ground.

If every expansion card and every piece of software behaved the way they should, everything would be rosy. Because we're talking about the Apple II, though, almost nothing behaves. I eventually solved all the compatibility problems (except copy protection), but there was a point when I thought it wasn't possible. And if you're a speed demon with a dressed-out machine, you're going to run into some of the same problems. It's worth the trouble — just be prepared for it.

What you should do first if you're planning to enhance your Apple II? A hard drive should always come before an accelerator. A good-sized RAM disk — 512K for a IIe, 2 megabytes for a GS — should be

next; then an accelerator. An exception to the rule might be a business or school with dozens of data disks you don't want to spend the time moving to a hard drive. In that case, you might want to look first at the Multi-Kache.

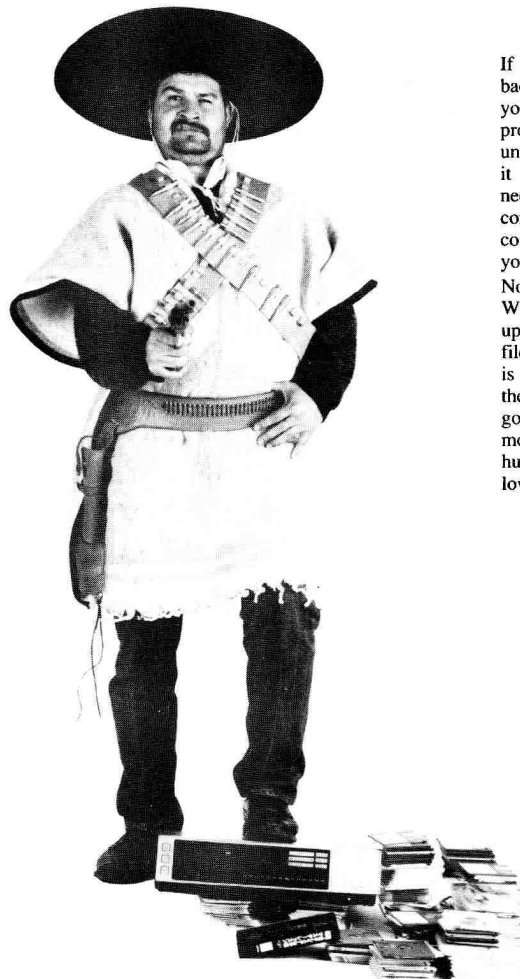
There's still room for confusion among accelerators. If you always have a spreadsheet on screen, a math coprocessor is probably best. If you're just bored with your computer's lethargic pace, a TransWarp will do the trick. If you're tired of

waiting for floppies, go with the Multi-Kache. It's also a good cure for overburdened hard drives, which is a very real problem these days.

The dream machine would be a GS with a TransWarp GS enhanced to 10 megahertz, a Floating Point Engine, and a Multi-Kache with SCSI controller. Then you can call your IBM friends while they're waiting for their machines. Sound like fun?  
**Joe Abernathy**  
**Houston, TX**

Continued on p. 76

# BACK UP!



If you have a hard drive then backing up should be a ritual for you. But like most of us, you probably seldom think about it until it is too late. Why? Because it tends to be a real pain in the neck. If there were just a convenient way to backup without costing too much you could save yourself a lot of grief.

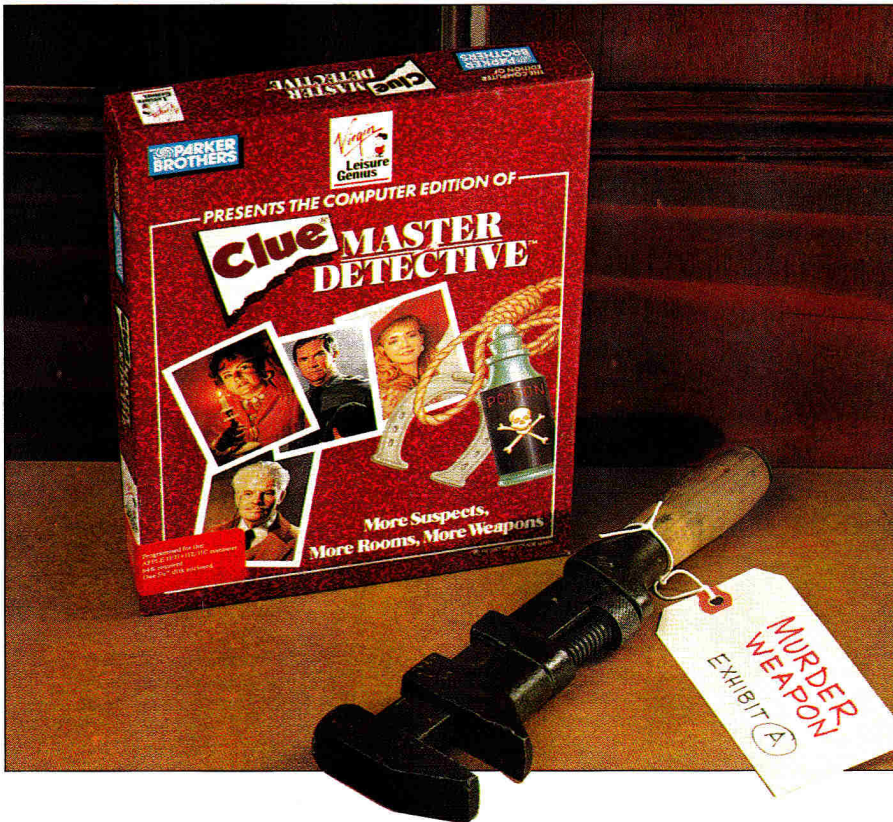
Now we have solved this problem. With VCR Backup you can Back up with any VCR (NTSC). File by file or image backup and restore. It is as simple as selecting record then pressing the return key. Then go and enjoy yourself. At 50 megabytes an hour you can store hundreds of megabytes on a single low cost video tape. **Only \$199**



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# GAME ROOM



## CLUE MASTER DETECTIVE

VIRGIN MASTERTRONIC INTERNATIONAL,  
18001 COWAN, SUITES A & B, IRVINE, CA 92715, (714) 833-8710

Strategy detective game;  
64K Apple IIe, IIc, IIc Plus, IIgs; 5.25-inch disk drive; \$39.99



You've played the board game. You've seen the movie — each of the four different endings. Now Virgin Mastertronic has brought Parker Brothers' famous game of whodunit to your computer screen, along with some twists to make the mystery even more challenging.

As in the original, you move from room to room in the late Mr. Boddy's mansion;

you try to discover by process of elimination which cards your opponents hold, until you think you know the three Case File cards — revealing the location of the murder, the murder weapon, and the identity of the murderer.

A number of new touches should keep *Clue* veterans on their toes. Sprinkled throughout the game board, for instance,

are Snoop spaces, marked by a small magnifying glass; pass over one of these squares and you get a free peek at one of your opponent's cards. You'll find more rooms to go through (including a carriage house, a trophy room, a gazebo, and a fountain) and several additional suspects.

Each suspect now comes with a brief biography explaining what that person is doing in the mansion and why he or she may be the murderer. For example, Mr Boddy's former secretary changed her name to Madame Rose and moved to Hungary to become a medium; in a trance, she "saw" a cloud descending on Boddy Manor. She didn't make it back before he was killed — or did she?

Instead of scratch pads to keep track of your guesses, you now use the Notebook



Whodunit? The computer game's afoot!

option to see a color-coded scorecard. You can look at it at any time, so you can eliminate choices one by one until you know that it was Colonel Mustard in the kitchen with the revolver.

Be careful, though — make an incorrect accusation and you lose. As with the original, each new game has a different solution. So if you're ready to test your powers of deduction, "the game's afoot!"

**Joe Fattori**  
inCider staff

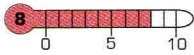


## ROBOCOP

DATA EAST USA,

1850 LITTLE ORCHARD STREET, SAN JOSE, CA  
95125, (408) 286-7080

Arcade-action game;  
128K Apple IIe, IIc, IIc Plus, IIgs; 5.25-inch disk  
drive, joystick; color monitor recommended;  
\$34.95



Crime — it's a part of society, and the situation doesn't appear to be getting any better. That's especially true in futuristic Detroit, now a haven for cop killers, drug pushers, and corrupt officials — and you have to fight back.

As Robocop, fearsome defender of justice, your directives are to serve the public trust, uphold the law, and protect the innocent. There's also a mysterious fourth directive, but you don't know what that is yet. To maintain law and order, you'll have to pull out all the stops. You'll slug it out and shoot it out with all sorts of Detroit thugs, ED-209s, and eventually Dick Jones — the ruthless O.C.P. (Omni Computer Productions) official himself.

Although the graphics images are small and sometimes hard to distinguish, game play is quite good. You move from left to right throughout most of the game, punching or shooting along the way. Sometimes you can pick up a weapon that fires in three directions, or ammunition



Law and order in futuristic Detroit.

that can pierce armor or kill tough thugs instantly. You'll need everything you can get ahold of.

When there's a lot happening, however — too many men on screen, for instance — the action can slow down considerably, making the game especially difficult when you're trying to shoot fast. Learn to recognize the patterns of characters as they come on screen and eliminate those closest to you as quickly as possible.

When you're standing next to boxes, it's

almost impossible to shoot directly above you. Try moving away and then fire at your target. By the way, the ED-209 isn't as tough as he looks. He's no wimp, though, so be careful when you meet him.

Overall, the animation is fairly good and reasonably quick. There's a lot of action, so you'll need to pay attention and respond quickly. Be sure to watch your health meter, and, as much as possible, avoid getting hit. It's not going to be easy.

I enjoyed Robocop and I'm sure many of you arcade aficionados will as well. It's certainly one of the better arcade-action games for the Apple II in quite a while. It may also rank as the best Data East title available, and it's been a long time coming. We knew you could do it, Data East.

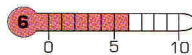
**Tim Moore**  
**Metairie, LA**

## BATMAN

DATA EAST USA,

1850 LITTLE ORCHARD STREET, SAN JOSE, CA  
95125, (408) 286-7080

Arcade-action game;  
128K Apple IIe, IIc, IIc Plus, IIgs; 5.25-inch  
disk drive, joystick; color monitor  
recommended; \$34.95



The Caped Crusader has made it to the Apple II. Now you can fight crime and match wits with the Penguin, the Joker, and their henchmen.

The Penguin is back in town and plans on taking over the world with an army of robot penguins. It's up to you to search the streets of Gotham City, find his master computer, and put a stop to his diabolical plan. Look out, though, because the Penguin's thugs are roaming the streets aiming to gun you down. You'll have to punch or kick your way through. And don't forget — if you have that lethal boomerang-style weapon known as the Batarang, you can use that as well.

As if this scenario weren't bad enough, after you've finished with the Penguin you face one of the Joker's greatest gags. He has kidnapped your super sidekick, Robin. It's up to you to rescue Robin from the Joker's fiendish fair.

To get there, you'll have to traverse the sewers of Gotham. Naturally, the Joker is ready for you. Not only are his minions lurking around every corner, but there are also several well-placed bombs. Robin's

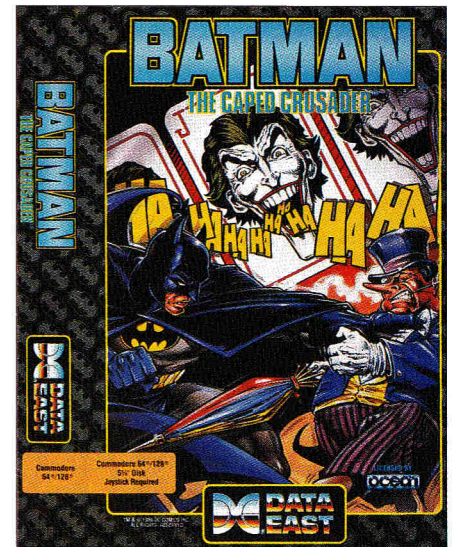
fate, as well as that of Gotham City, rests in your hands as you deactivate the bombs and save the Boy Wonder.

You'll need a joystick to play Batman. Unfortunately, though, the controls aren't too responsive. For instance, to make Batman kick left or right, you have to hold down the fire button and move the stick to the lower left or right corner. If you pull the stick straight down, however, you get the status screen instead of kicking a bad guy as you intended.

The status screen shows your current situation and provides you with options such as using objects you've acquired, eating something to replenish your energy (I've been unable to find any food and therefore keep dying), and turning the music on or off.

Another problem is the graphics. Mini-windows show you Batman's immediate surroundings. Because these windows are so small, the characters are tiny and the objects are hard to distinguish.

Registering a hit on an enemy is also difficult. You can be standing right next to him and miss; if you back off about one



Holy pixels, it's the Caped Crusader!

character width, though, you stand a better chance of connecting. By the way, a color monitor is a must, as it's difficult to make out objects on a monochrome screen.

Batman is a tough game to play, even more so because of the joystick problems and small images. I suppose we'll have to keep watching for the movie version, hoping that Data East adds better graphics and joystick controls. □

**Tim Moore**  
**Metairie, LA**



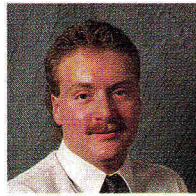
Marc Daniels



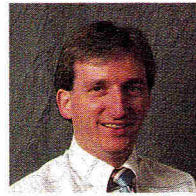
Michael Andersen



Paula Zeig-Gehl



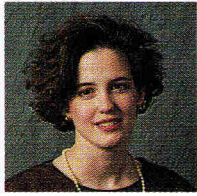
Ed Casey



Chuck Sullivan



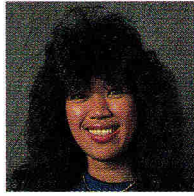
Kelly Warren



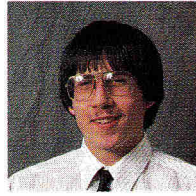
Barbara Gasparetti



Brian Hoppaugh



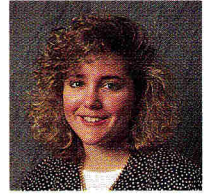
Ana Diaz



Chris Deschu



Carolyn Douglas



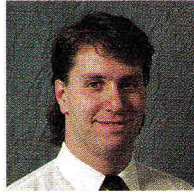
Tina Ferencic



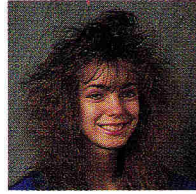
Robin McCreer



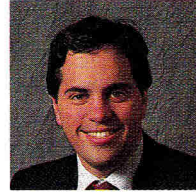
Lori Schaible



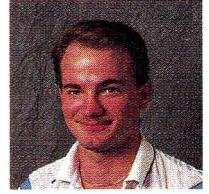
Gregg Gerchius



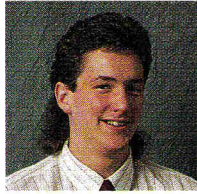
Denise Moran



Steve Peckman



Sherwin Miller



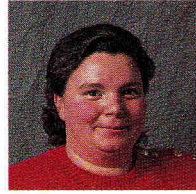
Joe Tolerico



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Vilma Urbanski



Betty Lou Schuyler



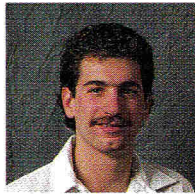
Glenn Stine



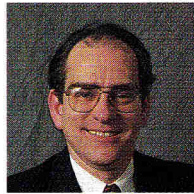
Susan Stough



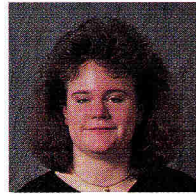
Sharon Daniels



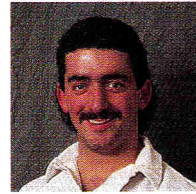
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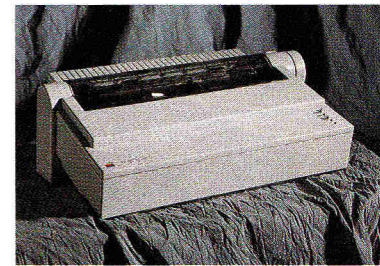
(IIe package includes the Grappler interface card)



Apple IIGS Computer



Apple IIc Computer



ImageWriter II Printer

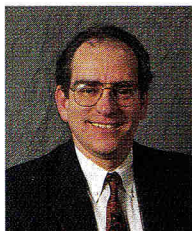


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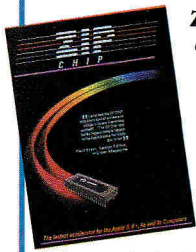
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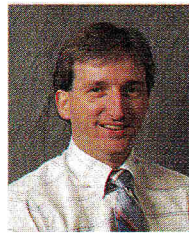
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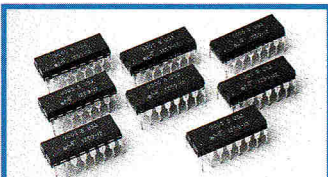
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Timeout QuicksPELL (3.5/5.25)	\$38
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### Berkley Software

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### Britannica

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Where in Time (5.25)	\$27
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### Claris

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AppleWorks GS	<i>see feature</i>

### CompuTeach

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Premium (GS)	\$25
Joshuas Reading Machine	
Apple (5.25)	\$25

### DataEast

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### DataSoft

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Math Blaster Plus (5.25)	\$26
Talking Reading & Me	\$26
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Word Attack Plus (5.25)	\$29

### ECLAT

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Fractal Explorer (GS)	\$28

### Funk

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### Greatwave

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### Interactive Learning

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SAT (5.25)	\$34

### Intuit

Quicken (3.5/5.25)	\$36
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### Lawrence Productions

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### Learning Company

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Reader Rabbit (5.25)	\$34

### Manzanita

BusinessWorks Bundle	\$267
BusinessWorks Payroll	\$109

### MicroIllusions

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### MECA

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### MicroRevelations

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### Mindscape

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Balance of Power (5.25)	\$24

### Melbourne House

Risk (5.25)	\$25
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### Nolo Press

Will Maker (5.25)	\$35
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### Orange Cherry

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### Sierra Online

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### SirTech

Wizardry Trilogy	\$31
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### Taito

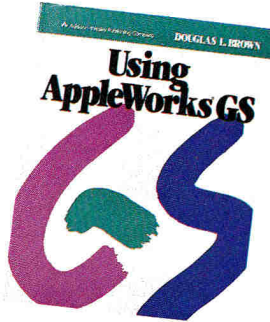
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Renegade (5.25)	\$19

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### Hint Books for

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Apple IIGS	\$12.95
AppleCare Manual	
Diagnosing & Maintaining Your	
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1001 Things to do with Your	
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**Design Your Own Home Architecture by Abracadata** draw floor plans, & side views in a flash with architectural scales, grids, & overlays..... \$65



**TimeOut TeleComm by Beagle Brothers** links AppleWorks directly to your modem, dials & offers you the ability to store commonly used phone numbers in AppleWorks .... \$39



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Fax # (201)832-9740

# PICK A WINNER

The Best of Public-Domain Software

“You can always eat your betting money, but never bet your eating money.”  
— on the wall of “The Frenchman’s Kitchen,” Belmont Park, Elmont, NY

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





**I**F THE PROSPECT OF GETTING SOMETHING for nothing seems like too much of a gamble — or maybe even not quite kosher — you can stop reading right now. Odds are you'll miss out on some of the best software deals around — but, then again, there's no such thing as a free lunch, right?

Wrong. From productivity to entertainment to education, public-domain software, or *freeware* as it's sometimes known, consists of programs that altruistic Apple II users have created and then given away. (*Shareware* is another story; see "Take My Software — Please!" p. 42, for details.)

What gives? Over the past ten years or so, a number of enterprising computer buffs have set up shop for the express purpose of providing low-cost distribution of public-domain programs to the rest of us. Note the important distinction: Programs are free, but distribution isn't. And distribution charges vary considerably.

But acquiring a copy of a public-domain program by mail from a library such as one of those listed in the accompanying "Product Information" box often costs less than \$5. And, generally speaking, the values will be even more tempting if you order a whole batch of programs at one time. Moreover, taking a membership in one of these libraries may bring further price reductions and other benefits, as well, including timely newsletters, technical support, and discounts on commercial software or other computer products and accessories.

If you're in a hurry and don't want to wait for the mail, a modest investment in computer hardware (namely, a modem) and communications software will let you interact with on-line services or BBSes (bulletin-board systems) to obtain free software by "downloading" it. Once you're on line (sign-on procedures vary), call up the public-domain catalog and look through it. Then select the program you want, insert a data disk, and within seconds or minutes the program you've ►

chosen will be written to that disk. It's a quick way to get the programs you need without paying for copying, labeling, packaging, and postage.

Sometimes you have to be careful, though. Certain "underground" BBSes let you download commercial software that's been pirated (stolen). And that's definitely not kosher. If you download from a commercial service, such as America Online, CompuServe, Delphi, or GENie (see "Product Information" for details), you can probably be sure the public-domain software is "legitimate." Your membership fee, as well as "connect time" and possible long-distance telephone charges, will tend to lighten your wallet a bit, however.

Undoubtedly one of the best (and cheapest) ways to build a public-domain library is to join a local users' organization. (Call Apple Computer's User Group Connection at 800-538-9696 for details about clubs in your area.) As a user-group member, you can usually obtain copies of public-domain products for just a couple of dollars, if not free. (You may have to provide the blank disks.) More importantly, you can often get informal "reviews" from other club members, who are indisputably among the best software critics around.

Public-domain programs run the gamut from top-notch to bottom-of-the-barrel and worse.

Let's take some of the guesswork out of starting or adding to your library. Listed below are nearly two dozen public-domain programs for your consideration. Many of them run on virtually any Apple II, but some work only on the GS. Most are stand-alone products, but a few are templates (data files) or utilities ("house-keeping" and file-manipulation routines) that require a "host" program such as AppleWorks 3.0.

For each public-domain program discussed we provide a known source for the product and, if available, a catalog number. Remember — thanks to "public domain" status, the same program may be available from more than one library (all offer free or inexpensive catalogs of their holdings), from an on-line service or BBS, or from your local user group.

Skeptics who warn that you get what you pay for probably haven't surveyed the public-domain software scene lately. Just invest a few dollars in some of these programs and see for yourself. If the two dozen products reviewed here are any indication, you'll get much more than you'd expect. You can bet on it.

## FROM THE TOP OF THE DECK

### **Mystery House** Computer Budget Shopper

This high-resolution graphics adventure game started life as a commercial product, but was released to the public domain by its publisher, Sierra On-line, in 1987 to celebrate the software-company's seventh anniversary.

Here's the scenario: Night is falling when you find yourself standing outside an abandoned Victorian house. Seven people await you in the entry hall. In time, all seven disappear into other rooms in the house — and end up dead. You must find the killer before you, too, meet your demise.

### **Mineral Identifier** Christella Enterprise

Amateur rock hounds and professional mineralogists alike will

appreciate this impressive database, designed, compiled, and donated to the public domain by Jim Hebden.

The file consists of more than a dozen properties for each of 420 minerals. (You can edit or add to the database, if you like.) Enter designated codes for such properties as color, hardness, specific gravity, and tenacity, and the program finds matching minerals. Extensive documentation and a menu-driven interface make Mineral Identifier easy to use.

### **Quadronome** Florida PC Library

Quadronome brings you racquetball without the safety goggles — or the sweat. This 3-D game for the Apple IIGs sports super-hi-res graphics and sound. Choose the "practice" option and watch an unlimited number of balls whiz by!

In "play" mode, you can either go it alone for points or play with a friend: You use the mouse; your opponent, a joystick; or vice versa.

This entertaining diversion, created by the talented team of Brian Greenstone and Dave Triplett, is about as intellectually unchallenging as it gets — it's perfect for one of those Friday afternoon or late-evening "attitude adjustment" sessions.

### **The Rat Race** Florida PC Library

This preschool game by David Harris manages to be educational and show off the GS' digitized sound capabilities at the same time.

The object: to help a rodent find his way through a maze and get the wedge of cheese. As your child presses the I key, the



mouse moves in a northerly direction and the GS says, "North." Press J for west, K for east, and M for south; the GS responds in kind. For consistency's sake, parents should probably make some stick-ons for the JKLM keys so that their directions match those on the compass rose that appears to the right of the maze.

## Double-Hi-Res Clip Art

BRCC #H59

While virtually all public-domain sources offer disks of ready-to-use computer clip art for programs such as The Print Shop, this disk is one of the few we've unearthed that contains double-hi-res images that for the most part look terrific when imported into Publish It!

Some of the images on this two-sided disk, which features famous (or infamous) persons — from Groucho Marx to Jimmy Carter to Muammar el-Qaddafi — don't fit completely on the Publish It! cropping screen, but those that do are of outstanding quality.

## Games

BRCC #GS52

The three public-domain games on this disk (it also contains some shareware programs) were "ported" (translated) to the GS. **The Colossal Cave Text Adventure**, **The Castle of Metacus**, and **Beyond the Tesseract** betray their Apple II origins and lack super-hi-res color, Apple Human Interface pull-down menus, and digitized sound.

That's not to say that the games aren't engrossing. Colossal Cave, originally designed by Willie Crowther and adapted for the GS by Doni G. Grande, is a classic treasure hunt. Castle of Metacus, by Jason Smart, is

somewhat more "otherworldly": Your goal, despite threats from dragons and ogres, is to find the axis of power hidden within the castle.

David Lo calls his text adventure, *Beyond the Tesseract*, "abstract," which is putting it lightly.

For example, if you find yourself "in a set of all sets that's not a member of itself," don't bother looking around: All you'll see is "an infinite improb-ability." When in doubt, pop a Z-pill or use your Space-Time Activated Continuum Key.

## Big Red Juke Box

BRCC #N29

Here's a software variant of those super deals from K-Tel: 69 songs programmed and ready to play on your Apple II. Among the selections are themes you've heard in the movies (Star Wars, Ghostbusters), on TV (The Addams Family, Jeopardy), even in church (Amazing Grace, Rock of Ages). But wait, there's more! (Christmas songs, too.) To get this amazing disk, who ya gonna call? Big Red Computer Club, that's who.

## Wheel of Fortune Yahtzee

PDE #GS86

Vanna admirers everywhere can now enjoy Wheel of Fortune on their GSeS whenever they like, thanks to Timely Publications, developers of this appealing rendition of the famous TV game show. The computer version closely resembles the original: Spin the wheel, guess a consonant (or buy a vowel), and watch Vanna waltz across the screen and turn puzzle letters.

For the mathematically gifted or those who simply enjoy number games, try David W. Buell's version of Yahtzee for the GS. Rules

are somewhat complicated, but the idea is to roll five dice and score their values in 13 categories, which range from "fives" to "four of a kind," and so on. You can challenge the computer or as many as three other players. The Yahtzee super-hi-res screen looks great!

## Lunar Lander

PDE #GS149

Based on an original 1978 Apple-soft BASIC program, Joe Jaworski's Lunar Lander for the GS has literally come a long way. Your mission, should you choose to accept it, is to touch down on the surface of the moon at a speed of no more than 3 feet per second. To succeed, you need to consider distance, velocity, and fuel stores and then adjust thrust accordingly. If you fail, you break up into smithereens. But don't worry — the dialog box claims that "NASA will pay funeral expenses."

## Monopoly

PDE #814

Thanks to Tim Taylor, you and up to three other players can enjoy this all-time-favorite game on your Apple II. Roll the dice to advance on the graphics Monopoly board. Don't be surprised if, just like some real-life financiers, you buy real estate during one turn — and end up in jail in the next!

## Newton's Apple Selections

PDE #879, 880, 882

These programs are based on the popular TV series. **Cavities: The "Hole" Story** (PDE #879) uses a landlord/tenant metaphor (evict the bacteria!) and is geared

toward younger students.

**Cocaine** (PDE #880), on the other hand, takes a no-nonsense approach to the effects of this drug on the human brain. **Tension and Compression** (PDE #882) helps older students learn about the impact of these forces on bridge design.



**Follower.GS**

PDE #GS116

C.K. Haun, creator of this GS program, says it's "an infuriating little game to keep your mind

working on those late nights." The program flashes colored boxes randomly and plays a musical tone for each one. Memorize this graphics/sound pattern and try repeating it by clicking on boxes in proper sequence.



**Dictionaries**

National AppleWorks Users Group

AppleWorks 3.0 fans (or those who use AppleWorks 2.0/2.1 with TimeOut QuickSpell) enjoy the convenience of the program's

built-in spelling checker. Problem is, technical terms aren't included in the main dictionary and creating a custom dictionary can be time-consuming if your word list numbers in the thousands.

Thanks to the National AppleWorks Users Group (NAUG) and generous contributors like Dr. John Larkin, Dr. Charles Hogar, and David Stachowski, you can acquire ready-made dictionaries for specialties such as microbiology (5085 terms based on Bergey's Manual of Systematic Bacteriology), biology (3600 words from aardvark to zymogen), and speech pathology (800 terms). If you're a yachting

## PUBLIC-DOMAIN PRODUCT INFORMATION

### Big Red Computer Club Games

(BRCC #GS52)

requires GS

### Big Red Juke Box

(BRCC #N29)

### Double-Hi-Res Clip Art

(BRCC #H59)

Big Red Computer Club

423 Norfolk Ave.

Norfolk, NE 68701

(402) 379-4680

\$19.95 yearly membership

U.S./Canada

includes newsletter and

product discounts

\$35 foreign countries

\$3.50/disk members only

quantity discounts available

3.5- or 5.25-inch

Christella Enterprise

### Mineral Identifier

Christella Enterprise

P.O. Box 483

St. Clair Shores, MI 48080

\$2/disk 5.25-inch

\$2.50/disk 3.5-inch

plus \$4 shipping (\$6 Canada)

\$2 catalog with demo disk

Computer Budget Shopper

### Mystery House

Computer Budget Shopper

2203 Park Ave.

Suite 17

Cheyenne, WY 82007

\$3.95/disk 5.25-inch

quantity discounts available

plus \$4 shipping

\$2 catalog

Florida PC Library

### Quadronome

requires GS

### The Rat Race

requires GS

Florida PC Library

P.O. Box 1070

Leesburg, FL 34749

(904) 787-1741

\$4.50/disk 3.5-inch

\$3/disk 5.25-inch

quantity discounts available

plus \$5 shipping

free catalog

\$20/year Shareware Plus

monthly newsletter

National AppleWorks

Users Group (NAUG)

### Biological Dictionary

requires AppleWorks 3.0

or 2.0/2.1 with TimeOut

QuickSpell

### Microbiology/Micro-

chemistry Dictionary

requires AppleWorks 3.0

or 2.0/2.1 with TimeOut

QuickSpell

### Nautical Dictionary

requires AppleWorks 3.0

or 2.0/2.1 with TimeOut

QuickSpell

### Speech Pathology

Dictionary

requires AppleWorks 3.0

or 2.0/2.1 with TimeOut

QuickSpell

### Members Helping

Members

requires any version of

AppleWorks

### Forms Works 1

requires any version of

AppleWorks or AW GS

### Forms Works 2

requires any version of

AppleWorks or AW GS

### Home 01

requires any version of

AppleWorks or AW GS

### AppleWorks 3.0

### Patch Disk

requires AppleWorks 3.0

National AppleWorks

Users Group (NAUG)

Box 87453

Canton, MI 48187

(313) 454-1115

\$29 yearly membership

includes newsletter, product

discounts, unlimited access

to 24-hour BBS

\$4/disk 5.25-inch

\$6/disk 3.5-inch

plus \$2/order shipping

\$5 catalog

Public Domain Exchange

### Monopoly

(PDE #814)

### Newton's Apple:

Cavities

(PDE #879)

### Newton's Apple: Cocaine

(PDE #880)

### Newton's Apple:

Tension & Compression

(PDE #882)

### Follower.GS

(PDE #GS116)

requires GS

### Wheel of Fortune

### and Yahtzee

(PDE #GS86)

requires GS

### Lunar Lander

(PDE #GS149)

requires GS

Public Domain Exchange

2078C Walsh Ave. #668

Santa Clara, CA 95050

(800) 331-8125 (orders)

(408) 496-0624 (orders CA)

(408) 496-6439

(customer support)

\$20 yearly membership

includes yearly magazine

subscription, discounts,

public-domain-software book

\$5/disk 5.25-inch

\$3.50/disk members

(minimum order 10 disks)

\$9/disk 3.5-inch

\$5.83 members

(minimum order 6 disks)

plus \$4 shipping

\$3 P.D.E. magazine

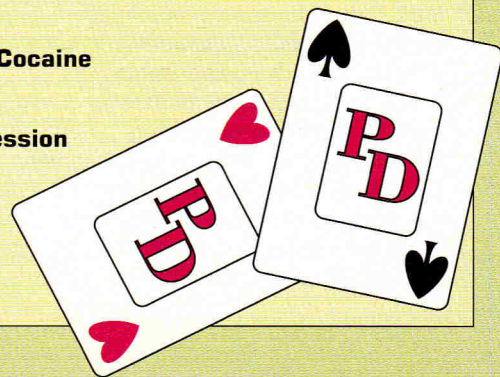
\$9.95 plus \$2 shipping

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Domain Software

\$4.95 plus \$2 shipping

All That GS Jazz!



fan, you'll want Bruce Condit's 1600-word nautical dictionary.

## **AppleWorks 3.0 Patch Disk**

National AppleWorks  
Users Group

This popular NAUG menu-driven utility fixes nine bugs in AppleWorks 3.0, including its inability to print multiple reports from the database manager. This and eight other bugs repaired by the patch disk are described in the February issue of **AppleWorks Forum**, a top-quality monthly newsletter sent free to NAUG members.

## **Members Helping Members**

National AppleWorks  
Users Group

Perhaps one of the most valuable NAUG disks, and one that works with the AppleWorks database

module, is Members Helping Members.

This database contains the names and phone numbers of dozens of volunteer consultants who are ready, willing, and able to answer your questions — not just about AppleWorks, but about program enhancements, computer hardware, and even related programs — software such as AppleWorks GS, Publish It!, and Medley.

## **Forms Works**

National AppleWorks  
Users Group

This two-disk time and money saver contains some 100 professionally prepared legal forms. Although they are best suited to the small-business owner or real-estate investor, some of the word-processing templates on these disks are nevertheless valuable for anyone selling a car (or other high-ticket item), taking out a loan from a friend or relative, or needing some of those

"While You Were Out" telephone message forms.

## **Home 01**

National AppleWorks  
Users Group

Probably every Apple II owner knows that you can use your computer to help manage your finances and forecast federal-tax liability. But did you know that you can perform these tasks without leaving the public domain? With the templates on this double-sided NAUG disk, not only can you set up a monthly budget and forecast your 1990 taxes (payable April 15, 1991), but you can also play "what if" with loan payments, calculate your net worth, and organize your videotape collection. □

CYNTHIA E. FIELD IS 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.

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### **America Online**

8619 Westwood Center Drive  
Vienna, VA 22182  
(800) 227-6364  
\$5.95/month membership fee  
\$5 to \$10/hour connect time

### **AppleWorks 3.0**, \$249 **AppleWorks GS**, \$299

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

### **CompuServe**

5000 Arlington Center Blvd.  
Columbus, OH 43220  
(800) 848-8199  
\$39.95 membership fee  
includes \$25 usage credit  
\$6 to \$12.50/hour  
connect time

### **Delphi**

General Videotex Corporation  
3 Blackstone St.  
Cambridge, MA 02139-9998  
(800) 544-4005  
(617) 491-3393  
\$49.95 membership fee  
includes 2-hour usage credit  
and 300-page guide  
\$4.80 to \$17.40/hour  
connect time

### **Genie**

GE Information Services  
401 North Washington St.  
Rockville, MD 20850  
(800) 638-9636  
\$29.95 membership fee  
\$5 to \$18/hour  
connect time

### **Medley**

requires GS  
Milliken Publishing Co.  
1100 Research Blvd.  
P.O. Box 21579  
St. Louis, MO 63132-0579  
(314) 991-4220

### **Publish It! 3**

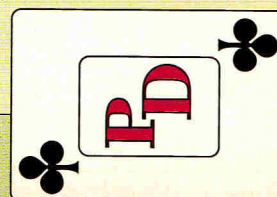
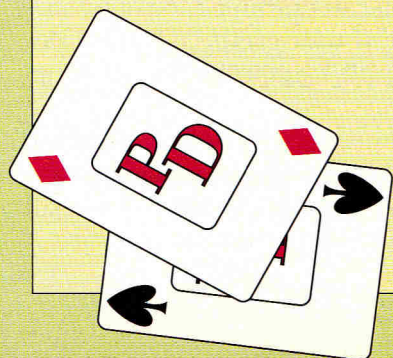
Timeworks Inc.  
444 Lake Cook Road  
Deerfield, IL 60015  
(708) 948-9200  
\$129.95

### **The Print Shop**, \$49.95

**The Print Shop GS**, \$59.95  
requires GS  
Broderbund Software  
17 Paul Drive  
San Rafael, CA 94903-2101  
(800) 521-6263  
(415) 492-3200

### **TimeOut QuickSpell**

requires AppleWorks  
2.0 or higher  
Beagle Bros  
6215 Ferris Square  
Suite 100  
San Diego, CA 92121  
(800) 345-1750  
(800) 992-4022 (CA)  
(619) 452-5500  
\$69.95



# TAKE MY SOFTWARE — PLEASE!

Through on-line services, computer clubs, and special distributors, authors and users are sharing a wealth of low-cost, high-quality Apple II software.

From productivity and entertainment to education, graphics, music, and utilities, “shareware” programs let you try before you buy.

By JOE KOHN

IMAGINE WHAT IT WOULD BE LIKE IF you could order a compact disc through the mail, play it a few times, and then decide whether or not you want to pay for it. Imagine further that the only thing standing between you and a free CD is your conscience. That's the basic concept behind *shareware*, a try-before-you-buy approach to software that's becoming more and more popular among Apple II users.

Shareware is a unique marketing method that bypasses all traditional channels, yet provides Apple II users with a large number of high-quality, low-cost programs to choose from. Unlike commercial software designers, shareware authors don't sell their programs in retail outlets, nor do they support large advertising budgets. They rely instead on individuals, user groups, on-line networks, and BBSes (bulletin-board systems) to distribute their software.

Although shareware is copyrighted, authors encourage you to copy their programs and to pass them around to friends. A shareware author grants a limited license that lets you try a program for a specified period of time, usually a week to a month. At the end of that trial period, the author expects you to either remit payment of a small shareware fee, usually \$5 to \$30, or to delete the program from disk. Upon payment of the registration fee, many shareware authors send printed

documentation, notices of updates, or samples of other shareware programs.

In theory, shareware is a wonderful system. You get to try a program before you buy it, and the asking price is usually only a fraction of the cost of a commercially available program. Authors can reach a large number of potential buyers at minimal cost. In reality, though, the success or failure of this type of distribution depends totally on the honesty of the user community. Imagine the leap of faith required to spend months writing a program, and then distribute it on the honor system. Shareware authors count on you to not betray their trust.

Shareware programs are available from a variety of sources. Three of the major on-line networks, accessible via modem and telecommunications software, include major sections devoted to the Apple II. **America Online** (formerly AppleLink Personal Edition), **CompuServe**, and **GENIE** all maintain large on-line libraries of shareware you can download to your computer, as do many Apple II user groups. (To find the club closest to you, call Apple Computer's User Group Locator at 800-538-9696.)

In addition, several companies, including **Big Red Computer Club** and **Public Domain Exchange**, distribute shareware through the mail. You'll pay a small fee, however, which assures you that the software is

legitimate shareware (not pirated) and that it's virus-free.

Regardless of where you get your shareware, remember that it's not free. If you don't use a program, don't feel obligated to pay for it. But if you find a piece of shareware useful, do your part — send in the requested fee.

Hundreds, maybe thousands, of high-quality shareware

programs are available. They come in an astounding variety of flavors, from arcade entertainment and utilities to adventure games and desk accessories, from AppleWorks templates and educational programs to paint software and music applications. Let's take a look at some of the best of both GS-specific and 8-bit shareware.

## FULL HOUSE

### GS SHAREWARE



#### SHRConvert

SHRConvert 2.1 is an indispensable GS graphics utility, written by CompuServe's Apple Forum sysop (system operator), Jason Harper. SHRConvert provides an easy method of converting hires, double-hi-res, and Print Shop files, as well as Atari ST, Commodore 64/128, and Mac graphics, to super-hi-res format for use with GS paint programs. It's the only GS program that also supports the graphics-interchange format (GIF file) that lets GS users access thousands of graphics created on other, generally incompatible computer systems. If you're interested in GS graphics, you should have SHRConvert in your collection. It requires 512K and carries a shareware registration fee of \$15.



#### Sound Smith

Sound Smith is a 14-track sequencer for creation and playback of synthesized music. Written by Huibert Aalbers, author of the games Laser Force and Jigsaw, Sound Smith takes full advantage of the GS's Ensoniq sound chip; the tonal quality is unlike that of any other music program available for the GS. Sound Smith uses synthesized

instruments in standard ASIF format, making it easy to create additional instruments in seconds with a digitizer such as Applied Visions' FutureSound.

The program employs a standard GS interface with pull-down menus. Load an instrument and a piano keyboard is displayed; click on it to play. Load a song and a graphics-based playback area appears, complete with animated VU meters. You can designate any four tracks for playback and use a variety of instruments in any song selection. Aalbers has also compiled five song disks for use with Sound Smith. The shareware fee for Sound Smith is \$20.



#### JumpStart

JumpStart, from Dave Hill's MaineFrame software, is a \$29.95 shareware alternative to the GS Finder. JumpStart functions as a customizable program launcher and contains a full set of utilities. If you use a hard-disk drive, you can create a run list, a user-defined menu of programs. You'll never again have to search through levels of folders and sub-directories to locate a program. And once you install JumpStart, you can launch any application with a single keypress.

The accompanying utilities let you read any ASCII text or AppleWorks word-processor document directly from JumpStart's colorful desktop, as well as create small text files, EXEC your files,

and launch binary files from the desktop. In addition, the program handles housekeeping functions such as copying or moving files and disks, formatting disks, and changing filetypes.



#### Cheap Paint

Cheap Paint, by Earl Gehr, is a 320-by-200-mode GS paint program. It compares favorably with commercial software; the only thing cheap about it is its \$10 shareware fee. Cheap Paint includes color-cycling animation and the ability to display 256 colors on screen at a time. You can load two graphics at the same time, cut and paste between the "canvases," choose from 12 brush shapes, create stencils, flip horizontally and vertically, and create graphics with all 16 palettes. Cheap Paint requires 768K. If you're interested in a 640-by-200-mode paint program, Gehr also offers Desk Top Painter, a public-domain NDA (new desk accessory).



#### Wood/Davies Card Games

No discussion of GS shareware would be complete without games. You'll find scores of them, but the series of super-hires, mouse-driven card games written by the team of Todd Wood and Doug Davies are an

exceptional buy at \$5 to \$10 apiece. They're fun, challenging, amusing, and addicting.

**Video Poker** is a replica of a Las Vegas machine; **Monte Carlo** is a variation of solitaire in which you remove adjacent pairs of cards; **Solitaire** is the traditional version; and **Pyramid** is another variation in which you remove cards that add up to 13. These games are destined to result in many a late-night computer session.

## 8-BIT SHAREWARE



**List**, by Stowe Keller, is a \$15 shareware utility that lets you view the contents of any ProDOS file. It's particularly useful for examining files that are too big to fit into any word processor. It's designed to handle file sizes up to the full 16-megabyte limit of ProDOS 8, and provides several display modes, scrolling by line or by page, and search options. You can print all or part of your file to disk or printer.

List also offers a configuration screen with save-to-disk capability and automatic loading of the file at startup. An on-screen disk/file-selection option lets you choose the file you want to view or type in the pathname. If you program or if you don't have an expanded-memory card, you'll find List useful.



A number of educational programs are available as shareware. One of the most popular was created by Phil Shapiro, president of Washington Apple Pi, a large Apple II user group. Joyreader functions as a speed-reading training center. Words scroll across the screen at varying rates, controlled by joystick. Questions to determine reading

comprehension appear at the end of each article. There are two versions of the program: One uses the standard text screen; the other uses large characters for the visually impaired. The shareware fee is \$12.



**Columnist**, by Karl Bunker, author of the classic shareware games Eliza\*Brat and Terminal Boredom, lets you easily output in two or three columns any ASCII text or AppleWorks word-processor document. It's ideal for database reports, three-up mailing labels, newsletters, and other desktop-publishing ventures. Columnist is completely menu driven and offers user-selectable column width and full justification. The shareware fee is \$15.



**FormWorks I**, by Jim Wellman, includes 19 AppleWorks templates providing computerized versions of common forms used at the office or at home — memo pads, message forms, action forms, to-do lists, appointment forms, routing slips, and so on. Forms are neat and attractive,

and look just like those you'd purchase at your local stationery store. The shareware fee is \$5.

Wellman also offers FormWorks II, which includes additional business forms in spreadsheet format that take advantage of some of the advanced features of AppleWorks 3.0. The centerpiece of FormWorks II is an automated invoicing system.



**Squirt**, written by Steve Stephensen of Checkmate Technology, is an excellent program selector. (It's also available in a 16-bit version for the GS.) Squirt patches ProDOS's quit command: When you leave a program, it polls all on-line volumes and displays their names as a menu, without the Enter Pathname of Next Application prompt. Choose a volume to display all SYS filetypes, and press one key to run. If you're uncomfortable booting ProDOS 8 programs from the Enter Pathname prompt, this \$7.50 gem will save you lots of wear and tear on your control and reset buttons. □

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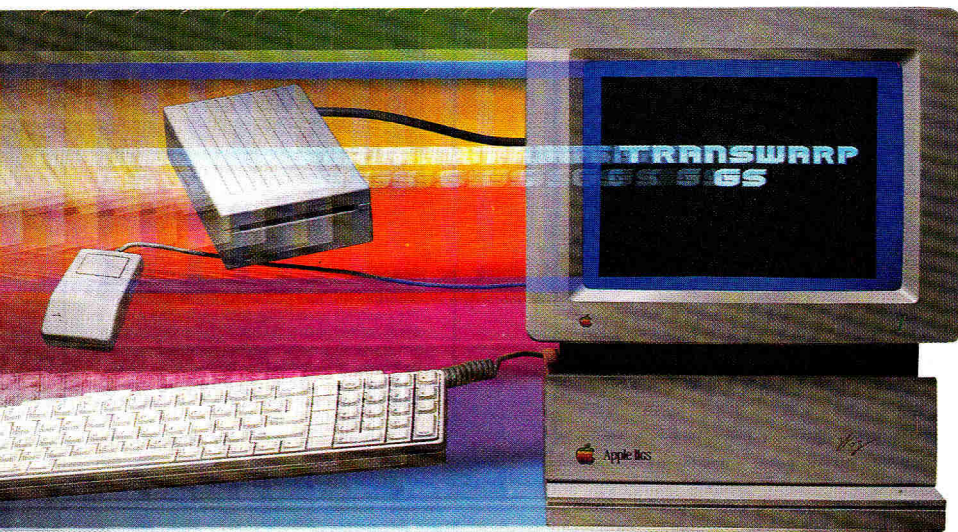
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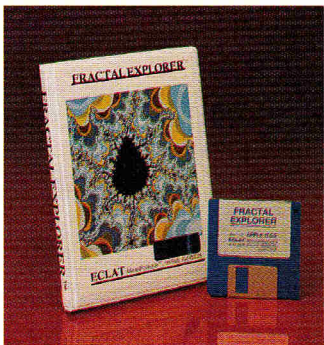
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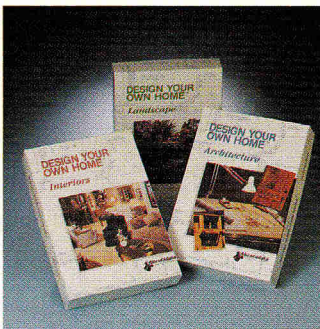
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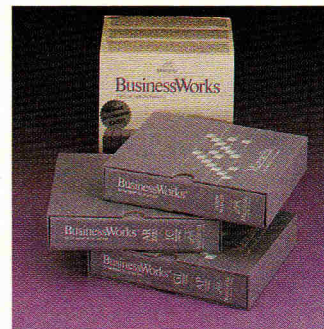
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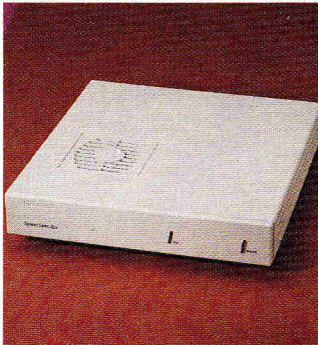
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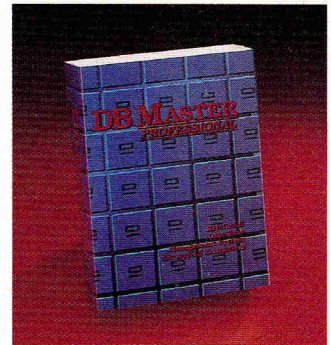
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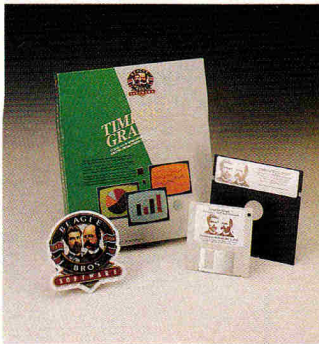
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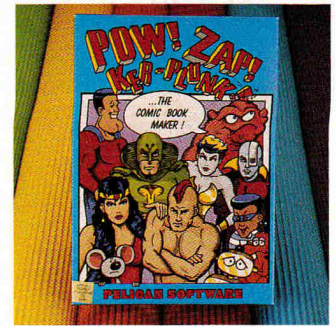
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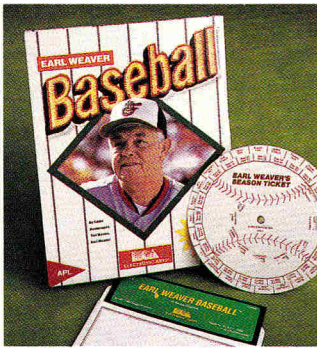
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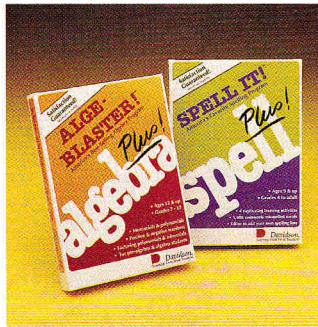
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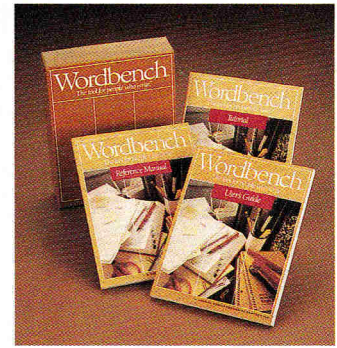
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# BREAKING THE PROGR



# AMMING CODE : PART 1

**Q:**

**How many computer programmers does it take to change a light bulb?**

**A:**

**None—that's a hardware problem.**

SOFTWARE IS SERIOUS BUSINESS. If the United States is to maintain its position as a world leader in technology, industry, and finance, software designers must give us the tools. On the small-business front, experts estimate that only one company in ten now uses computers; bringing the other nine into the 21st century is the challenge programmers face.

But software can also be fun, and Apple II programming in particular has never been easier or more rewarding. Languages and tools are available for programmers at every level of skill, from the weekend explorer to the applications-design professional. Today's powerful, elegant utilities and development environments range from turbocharged Applesoft BASIC to multimedia authoring systems to the latest advances in object-oriented programming. There are languages to manage courses of instruction, language alternatives for business, languages that make Lego sets more fun, and languages that let you design classy software without writing one line of traditional code.

The best software is the expression of a good idea or a body of knowledge. For example, someone decides that AppleWorks could be more convenient and writes a utility program like **TimeOut UltraMacros** to save typing time by letting you substitute short sequences of keystrokes for longer strings. Or a schoolteacher designs a function-plotting routine in Logo for algebra class, or a Russian-language tutorial for HyperStudio—a program just made for self-paced learning.

To be a computer programmer, you have to decide what you want to say, plan the best way to say it, then choose an approach and an environment that matches your goals and abilities. That last step is crucial. Some environments deal readily with graphics and sound, others with data management, still others with telecommunications. If you want to write a game, for instance, chances are you should use assembly language, or perhaps Micol BASIC. But if you want to design a custom business system, use a database manager. Scientists and engineers should look to Forth, while Lisp lets you explore artificial intelligence. No one language is automatically superior to others.

Many Apple II programmers begin with Applesoft BASIC. Indeed, even the experienced programmer will often use Applesoft to “mock up” and test a new algorithm or concept. The reason is simple: Applesoft is built into every Apple II; you can start programming almost at the moment you start up the computer.

Applesoft is also easy to learn and use: As opposed to the commands you'll find

in other, more arcane programming languages, Applesoft's are written in English, and it's one of the very few *interpreted* languages available for the Apple II. Hence, the *source* code, your written version of the program, is also the executed, or *run-time*, code: Applesoft translates while executing each BASIC command, in order, into Apple II machine language. A *compiled* language, on the other hand, first translates the entire source code into a separate run-time program it then executes.

The main advantage of creating an interpreted (Applesoft) program versus a compiled one is the time it takes to test and modify the software. The source code for an Applesoft program is right there in memory as you type it, and you can run it at any time. You also can stop the program at any time, make whatever changes you need to, and run it again until you're satisfied with the results. In contrast, compiled languages normally don't retain a copy of your source code in memory; each change you make must be recompiled and possibly “linked” with other modules of the program before you can execute it. That edit, recompile, relink, re-execute sequence can be time-consuming if not outright tedious.

The disadvantages of Applesoft BASIC are many, however. Generally, interpreted code executes much more slowly than a compiled program, often by a factor of ten or more. Applesoft BASIC programs are *unstructured*, also—not divided into sections for individual tasks—making it next to impossible to create large programs, follow them logically, or maintain them.

Applesoft BASIC's real Achilles' heel, however, is that it hasn't been substantially updated since the days of the old Apple II Plus. Even a IIe owner—not to mention an Apple IIGS owner—is hard pressed to take advantage of the machine's features. You'll find on the third-party market, ►

By JOE ABERNATHY \* CONTRIBUTING EDITOR

however, a number of programming aids and utilities that make writing and editing Applesoft programs easier. Most are additional command sets that let you access those aforementioned features of the IIe and the GS, including tools for using GS graphics and sound from Applesoft BASIC.

A number of BASIC compilers are also available to let you step up to a more capable environment without having to learn a new and perhaps more difficult language. Compiled BASICs, besides translating your program into high-performance machine language before running it, also add *structure*—compartments set up according to procedure and function—so that it's easier to write a reliable program. On the GS, a compiler such as **AC/BASIC** lets you use Applesoft-type statements to design desktop programs that would be much more difficult—or impossible—to write in straight Applesoft.

Invariably, though, languages that insulate you from the hard parts also isolate you from the full power of your machine. **Micol BASIC** for the GS, by comparison, is full-powered, yet relatively easy to master.

#### **IMPOSING A STRUCTURE: APPLE II PASCAL**

Pascal was originally developed as a tool for teaching good programming, particularly structured programming. Pascal makes it easy to develop libraries of reusable functions; when something doesn't work right, isolating and fixing the problem are simple.

Of all the traditional languages, Pascal is perhaps the best choice to learn first, particularly since Applesoft is often accused, even by Apple's technical staff, of teaching bad programming habits and a lack of discipline.

Because of its structured approach to programming and its handling of specialized data structures (the way your data are arranged for use in a program), Pascal is also best suited for information processing, such as inventory, customer lists, and recordkeeping, although you're on your own as far as some of the more esoteric data structures are concerned.

Moreover, GS Pascals afford full Toolbox control, so you can access the variety of features and programming aids that are built into every GS.

#### **THE SOUND OF ASSEMBLY**

Assembly language, maligned for its difficulty, is still the choice for efficient performance. Using easily memorized (albeit esoteric) "mnemonic" commands, assembly-language programs need only minimal translation or compilation into machine language. Hence, they essentially "speak" directly to your Apple's microprocessor. Higher-level languages, such as BASIC or Pascal, are so called because they eliminate a lot of the menial programming details required by your computer system and therefore added by the programmer in assembly language. But they often do so at the expense of performance and, invariably, program size.



Programming-system details aside, however, it may surprise you that some of the latest assembly-language compilers may even be the fastest and most efficient way to accomplish many tasks. Assembly's speed and efficiency are ideal for

producing games, modem managers, or anything that does a lot of calculation, such as business software or visual math (fractals, for example). Assembly programs also provide full control over the computer, including the programmer's Toolbox built into the GS. It has some drawbacks, however: Assembly is still hard to learn; its portability to other systems is limited; and it's gradually getting left behind because of the difficulty of dealing with advanced data structures.

#### **C FOR CONCISE**

Programmers joke that C combines the power of assembly with the convenience of assembly. All kidding aside, it was created to accommodate what some language purists might call "dirty tricks": It has all the trappings of a high-level language in that it avoids getting in the way of the programmer, but it gets you almost as close to the computer as assembly language.

Designed at AT&T Laboratories, C is most at home in the creation of *system software*, such as the GS Toolbox. It doesn't assume a single thing: If you want to display a string of text, for example, you have to tell C how to find the end of the string, because it won't find it for you. C is structured, like Pascal, and its basic building block is the function, but, like assembly, it deals with data primarily in the machine's native language of 1s and 0s.

After you make it through a long, sharp learning curve, you'll find C's special beauty: You can design interrelations among data as complex as your ability to understand them, while even the most convoluted functions can be implemented concisely.

#### **LOGO FOR EVERYONE**

You won't turn to Logo to program a checkbook balancer or any other utilitarian task. Rather, Logo is a language whose mighty power and elegance are focused on moving a "turtle" pointer and drawing lines to the left, right, up, down, or diagonally around your Apple II screen, or on a large sheet of paper with a robotically controlled pen. Well, that's at least the impression most people have of Logo—but it's not quite as simplistic a programming language as it seems.

What you may not realize is that in its simple elegance, Logo is perhaps the best vehicle to teach reasoning and problem-solving skills. It's unique in that everyone—from the very young child to the college instructor—can use it. It has a place in the home, as well, whether for students or as a programming environment for those not technically inclined. Many people wouldn't be writing programs if it weren't for Logo.

This language—it's really more of a creativity tool—has been around for many years, improving steadily. Today's



Logos (there are three, including a GS-specific version) have enhanced the appeal of the original, becoming mature resources for teachers; besides official improvements in the Logo languages, the collected procedures and systems developed by teachers create a powerful second tier of support. You can now use Logo to explore art, robotics, probability, and the language arts.

Logo is a procedural, graphics-oriented language that was designed originally as a visual-mathematics tool. By writing procedures, you can add capabilities to those included with the environment, eventually building a set of tools suitable for high-level tasks. Although its principal device is the drawing turtle, Logo has been enhanced with sound effects, music, graphics, text, and the ability to create custom extensions in a traditional computer language such as assembly.

### GO FORTH

While long considered a language for science and engineering, Forth is capable of much more besides. Originally, it provided the structure missing in assembly and BASIC, along with more accessible extended-precision mathematics than that offered by assembly. Forth has never been highly popular for the Apple II, but at least one new version of the language demands serious attention.

Forth combines elements of BASIC, Pascal, Logo, and assembly. It's fully structured, with compartmentalized (reusable) procedures and advanced flow of control. It uses "words" rather than files as basic building blocks; that's similar to

Logo, which lets you build up a vocabulary of advanced tools in easily digested steps. From assembly it inherits direct manipulation of data, and you can actually mix assembly-language code into your Forth program.

### ALTERNATIVES

Modula/2 was supposed to be the real-world successor to Pascal as a learning language, but many Apple II people have migrated to C instead. Consequently, only one Modula/2 compiler is sold for the II.

An alternative language is Lisp, which can perform list handling in a concise fashion and supports robust numerics. Most popular in the artificial-intelligence community, Lisp lets you write some programs up to a dozen times more concisely than with a traditional language.

### OOPS

The C offshoot called C++ looms large in the near future of Apple II programming, particularly for the GS. It isn't the language that's important so much as the approach it's helping to establish: *object-oriented programming* ►

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(OOP). OOP extends the idea of traditional data structures by associating complex mixtures of data types and procedures (*objects*), which you can then manipulate with rather simple programming statements. *Behaviors* are thus attributed to manipulated objects; behaviors can also be *inherited* and extended or refined by further complex objects; they can *evolve*, or respond to an application's current environment.

Sound like Bio 101? It's supposed to. OOP attempts to emulate nature so that you don't have to reprogram an application each time a new or better operating system or computer is introduced. More importantly, OOP's objects can be inherited by many different applications, so that musicians, teachers, mathematicians, scientists, librarians, or anyone else who isn't necessarily a traditional programmer can capture their expertise in a computer program. The promise of OOP is an easing of the major impediment to progress in computers and computing: software.

Unfortunately, you'll just have to hang in there for the moment—there isn't an OOP language yet available for the Apple II. The shape of OOP on the Apple II is just now being defined, although developments in the Macintosh world, a year or two ahead of those in the II, lean toward

point-and-click interface design. Using OOP techniques, for instance, you might build a menu-bar option and associate it with a *method* of handling a custom menu response, such as *Choose Color*. Then you might add an *Open* item to a pull-down menu

and associate it with a file method. This combination might produce a standard dialog window for choosing a file and opening it, with an intelligent method that can play back a digitized sound, display a picture, perform animation, or open a text file into a word-processing window.

The closest we can get to OOP with our Apple IIs is through the extended languages, which are available now. (See the next section for more information.)

And, although they aren't yet being called *objects*, some development environments support similarly complex data structures called *resources*. You can also create custom data structures in Pascal and C to similarly implement object-like data structures of your own. A well-planned programmer's library of data structures and procedures, either purchased or individually created, can provide much of the functionality of the missing methods. So many of the underlying tools are available that you can expect to see some kind of full OOP extension for Pascal or C within a ►

## What's in a Name?

**Ever see your name written in different languages? Here's a sampling of how names and messages are displayed on your Apple's screen using some of the various programming languages discussed in the accompanying article. Note that these are source-code listings, so, in most cases, they must be compiled according to the conventions of the particular language you're using before they can be executed.**

### 6502 assembly language

```

COUT    EQU    $FDED
        ORG    $300
        LDX    #0
PUTNAME LDA    NAME,X
        BEQ    DONE
        JSR    COUT
        INX
        BNE    PUTNAME
DONE     RTS
NAME     ASC    "Someone's in the kitchen with Dinah"
        DFB    0
  
```

### 65816 APW assembly language

```

        KEEP PUTNAME
        MCOPY 2/AINCLUDE/M16.UTIL
MAIN     START
        PHK
        PLB
        WRITELN #Oh Suzanna!
        LDA #0
        RTL
        END
  
```

### Pascal

```

program WriteName;
begin
  Writeln('Davy, Davy Crockett');
  Readln
end.
  
```

### C

```

#include <STDIO.H>
main ()
{
  printf("Nothing could be finer than to be inCider");
  return 0;
}
  
```

### Applesoft BASIC

```

10 PRINT "Kilroy was here"
20 END
  
```



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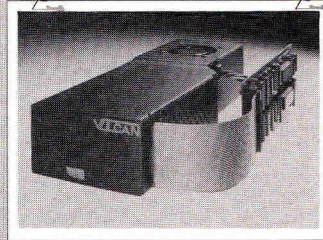
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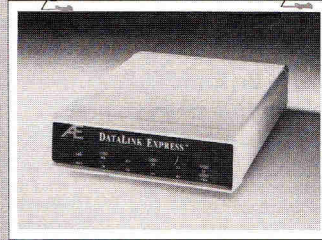
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year or so, and aspects of it are even filtering down into Applesoft.

#### FOR THE REST OF US

Some programming languages don't even look like languages. **DB Master** is advertised as a database manager, for instance, but it's widely used as a replacement for custom database programming. It's true that you get a relational database manager, in which one file can access and import information from other files, but you also control screen layouts, file parameters, and the program's very flexible report design. (See "In a Class by Itself," March 1989, p. 39, and "On the Pole in the Database Derby," Editors' Choice, July 1988, p. 96, for details.)

**HyperStudio** for the GS is another example. It's a great programming tool, but it's designed and marketed for people with no programming experience. "Authoring systems" like HyperStudio use sequences of graphics and text screens, combined with animation and sound, as building blocks to let nonprogrammers design interactive information systems. (See "Exploring HyperStudio," March 1990, p. 56; "In the Cards," Speaking of Graphics, October 1989, p. 94; "Does HyperStudio Stack Up?" September 1989, p. 44; and "Hypertext for Your GS," Editors' Choice, August 1989, p. 108, for details.)

**Tutor-Tech** and **Hyperscreen** for the IIe/IIc and HyperCard for the Macintosh are other examples of authoring systems. (See "Curing the 8-Bit Blues," September 1989, p. 48; "More Hypertext," What's New, April 1990, p. 20; and "On the Button," Editors' Choice, May 1990, p. 96, for more information.) Support for these authoring languages is slim, although you can write your own scripts (called *HyperTalk* in the Mac world) to enhance your application's behavior. There's no provision in authoring systems for inheritance, however, so one of the primary strengths of OOP is lost.

Authoring systems are new to the Apple II scene, but high-quality work is already being done. For example, some of the public-domain HyperStudio stacks include a talking Russian-language tutor, music lessons, a tour of the solar system, and a spelling lesson for grade-schoolers.

#### HELP IS ON THE WAY

Programming support is also evolving for the Apple II. The fastest and, for many topics, best source of Apple II technical knowledge is the *info-apple* discussion group, accessible through **Internet**, a loose network of some 10,000 computers. Special-interest discussions, or *feeds*, are held by people around the world on some 1200 topics.

There are dozens of feeds on programming in various languages, as well as more general discussions such as *info-apple*, a feed sponsored by Apple II Developer Technical Services (AIIDTS). A companion software feed delivers to your doorstep all the new Apple II shareware and public-domain programs as they're written, while file servers let you request file transfers from remote libraries.

Commercial networks such as **America Online**,



**CompuServe**, and **GENie** are other resources for programmers. Roundtable discussions with assorted experts are held on line, and you can download software and source-code listings. For \$50, you can learn to program the GS from

**The Byte Works**, the company that wrote the standard GS development environment. The course is offered by America Online and by mail from The Byte Works.

The **Apple Programmers and Developers Association** aims to be a thorough source for programming languages, books, and tools. **APDALog**, APDA's quarterly magazine, rounds up everything that's available, but it's actually a small subset of the market focusing on traditional language products. Most people turn to APDA for timely compiler updates when the system software changes and for the suite of technical reference manuals that document Apple II programming.

Other support provided by Apple includes the Associates and Partners programs. The first program, for \$350 a year, supplies you with monthly mailings that include technical notes and source-code disks, plus access to Apple's technical and marketing expertise. This status is often sought by schools and companies that do in-house software development. The Partners program, for \$600, adds the opportunity to buy equipment at reduced prices. (Generally, CPUs are half price, while peripherals average about a 20 percent discount.) Both programs require that you are a serious Apple software developer, although it need not be your only vocation. (See "Apple's New Relationship," What's New, May 1989, p. 18.)

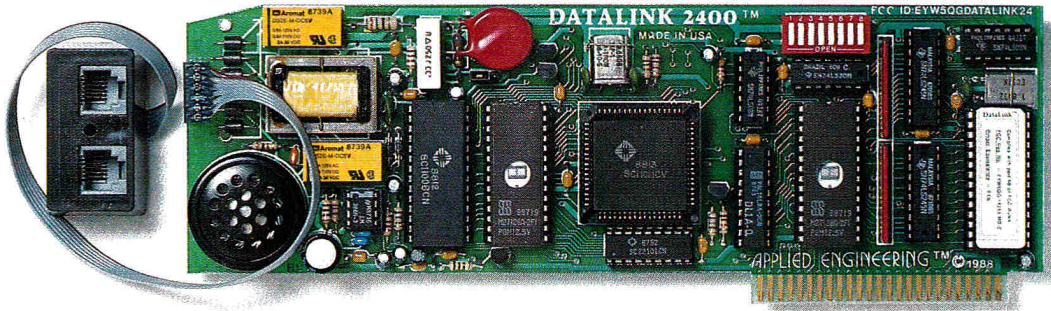
A broad network of user groups serves programmers of beginning to intermediate skills. Some well-established clubs even have special-interest groups from which the best programmers can benefit. In addition, user groups usually offer extensive public-domain libraries and discounts on new products. Contact AIIDTS for the phone number of the organization nearest you. (See "Pick a Winner," p. 36 in this issue, for more information on the user-group/public-domain connection.)

There are many books for programmers, on every topic from algorithms to zero flags. And because most languages now are highly portable, you can use a number of references not targeted specifically toward the Apple. You might walk into a bookstore and buy something like *Fractal Programming in C*—even though it was written by an IBM owner. Refer to the "Product Information" sidebar for details.

Next month, *inCider* surveys in detail brand-name Apple II languages and programming utilities. Whether you're into productivity, entertainment, graphics, music, or education, we'll help you choose the tools and tailor your selections to your own specific interests. Stay tuned. □

JOE ABERNATHY IS THE AUTHOR OF *INCIDER'S* BIMONTHLY PROGRAMMING COLUMN APPLE II GS BASICS. WRITE TO HIM AT P.O. BOX 66046, HOUSTON, TX 77098. ENCLOSE A SELF-ADDRESSED, STAMPED ENVELOPE IF YOU'D LIKE A PERSONAL REPLY.

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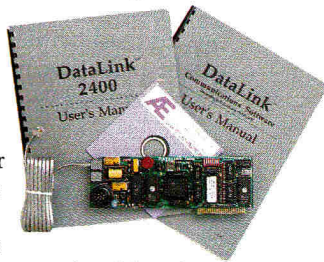


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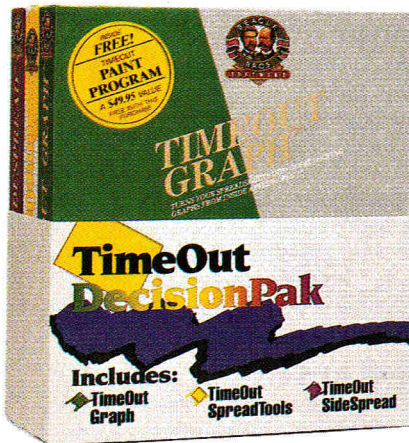
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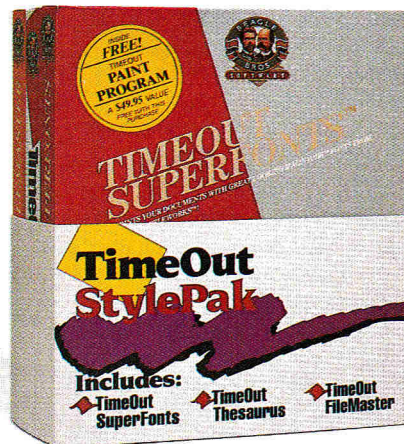
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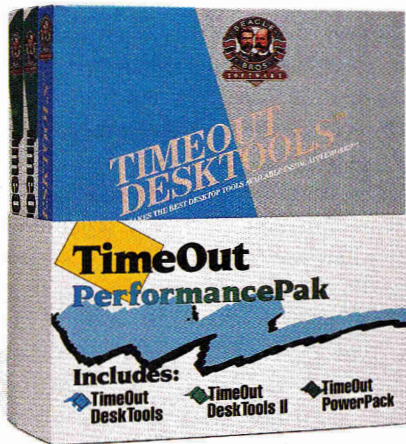
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# HIT THE ROAD I

Keep your car expenses under control—a clever spreadsheet tells you how much you're paying for repairs, gas, and maintenance.

By RUTH K. WITKIN

THIS TIME OF YEAR BRINGS A certain look to my eyes. I'm on the go. The weather turns perfect and I'm yearning to be out and on the road—new places to visit, new sights to see.

My major means of transportation—my car—is a major expense, as well. If you, like many people, have only a vague idea of how much you spend running your car, you'll love the spreadsheet in **Figure 1**, which will help you keep track of car expenses from the day you drive it off the lot.

In this session, the first of a two-parter, you'll set up the spreadsheet and enter formulas, many of which use text strings to make a cell look empty or communicate with you in plain English. Next month you'll find out how to use the spreadsheet on a day-to-day basis.

## A SPREADSHEET FROM SCRATCH

Load AppleWorks and create a new spreadsheet file named **CAR COST**. Now use the clipboard to enter long lines (row numbers may *not* necessarily agree with **Figure 1**): With the cursor on A2, type quotation marks, then hold down the equal-sign key until the sign reaches the right edge of G2. (You're stopping at G2 because AppleWorks won't let you fill H2 completely.) Move the cursor to H2 and

enter equal signs in only that cell, then press Return.

Now copy the line in row 2 to the clipboard: With the cursor on A2, press OA-C, type **TR** (for *To clipboard* and *Rows*), and hit Return. Move the cursor to A6 and copy from the clipboard: Press OA-C and type **F**. Copy from the clipboard to A20 and A24 the same way.

In row 8, create a line composed of minus signs the same way. Copy the line to the clipboard, then from the clipboard to A19 and A23. The lines should now match those in **Figure 1**.

Follow these instructions to set up the rest of the spreadsheet:

**Shorter lines.** In row 28, enter the lines in columns A through D and F through H; in rows 37 and 39, columns F through H; in row 52, columns F through H.

**Vertical line.** Enter the vertical character in E27, use OA-L and *Label format* to right-justify it, then copy it down to E52.

**Column width.** Use OA-L to change the width of columns A and H from the current nine characters to ten characters.

**Formats.** Use OA-V to set a standard *Value format* of *Commas* with zero decimal places. Use OA-L and *Value format* to override the standard value in H3 and H4 to show *Dollars* with no decimal places; *Gallons* (E9 through E25) and *MPG* (H9 through H25) to show *Commas* with one decimal

place (it doesn't matter if you include lines or labels in number formatting); and the following for *Commas* with two decimal places: *Cost* and *CPG* (F9 through G25), *Maint & Repairs* (D29 through D54); and *Fixed* and *Life-to-Date Costs* (H29 through H51). Use OA-L and *Label format* to right-justify cells D7 through H7 and C22 through H22; center B7 and C7.

**Short lines.** In H35, H43, and H46, type quotation marks and type nine minus signs each time. In D53, use eight minus signs. Now press OA-S to store the spreadsheet on disk.

## PRACTICE ENTRIES

**Figure 2** shows practice labels and numbers. The interest in H34 is based on a three-year, 9.9 percent auto loan. Cell H48 contains the length of time this car has been in use—two years and three months, shown as 2.25.

Now, referring to **Figure 2**, enter all labels and numbers. Before *1989 Marlin Mystic* in C3, type quotation marks. To get a better alignment with the numbers below, type a space *after* typing the labels in D7 through H7 and C22 through H22. When you're finished, press OA-S to store the spreadsheet on disk.

## ENTERING THE FORMULAS

**Figure 1** shows the locations of formulas on this high-performance spreadsheet. First, read how the formula works, then place the cursor on the cell receiving the formula. Move the cursor to cell locations shown in the formula and type everything else.

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

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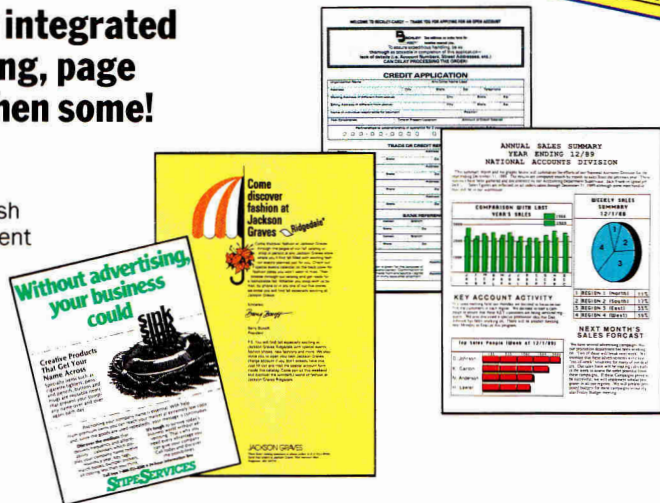
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Protect each formula immediately after creating it: With the cursor on the formula cell, press OA-L and hit Return to confirm Entry. Type PN to select *Protection Nothing*.

### FORMULA 1:

#### INITIAL STARTING MILEAGE

Formula 1 starts the new period where the last period left off by copying the number in the prior life-to-date mileage cell (D24) to the starting cell (B9).

Cell location: B9

Description: +D24

### FORMULA 2: SUCCESSIVE STARTING MILEAGE

Formula 2 copies the ending amount in B10 or makes its cell look empty. The Test statement checks to see if C9 is greater than zero, meaning you've entered ending mileage at a gas fill-up. If this is so, the Then statement copies the ending amount into B10. If C9 is empty, the Else statement (" ", double quotation marks) makes B10 look empty. This technique keeps unnecessary zeros from cluttering the spreadsheet.

Cell location: B10

Description: @IF(C9>0,C9," ")

Be sure to protect Formula 2. Now copy Formula 2 down the column: With the cursor on B10, press OA-C and hit Return twice. Press Down Arrow, type a period, move the cursor to B18, and hit Return again. Press OA-R to tell AppleWorks both cell references are *relative*. Move the cursor to B14. Though it seems empty, on the cell-contents line you can see a formula waiting for you to enter a number in C13 that it can copy.

### FORMULA 3: MILES TRAVELED

Formula 3 calculates number of miles between gas stops or makes its cell look empty. The Test statement subtracts starting mileage (B9) from ending mileage (C9). If the result is greater than zero, the Then statement enters the result of the subtraction. If the result is less than or equal to zero, the Else statement enters the invisible double quotes.

Cell location: D9

Description: @IF(C9-B9>0, C9-B9," ")

Now copy Formula 3 down the column: With the cursor on D9, press OA-C and

**Figure 1.** Completed spreadsheet with sample entries.

7	DATE	START	END	MILES	GALLONS	COST	CPG	MPG	
9	May 2 90	21,320	21,671	351	16.0	16.60	1.04	21.9	
10	May 11	21,671	21,948	277	15.0	15.50	1.03	18.5	
11	May 19	21,948	22,288	340	17.5	18.00	1.03	19.4	
12	May 27	22,288	22,571	283	15.0	15.35	1.02	18.9	
13	Jun 3	22,571							
20	CURRENT PERIOD			1,251	63.5	65.45	1.03	19.7	
24	PRIOR PERIODS	120	21,320	960.0	1,286.40	.94		22.2	
25	PRIOR+CURRENT	124	22,571	1,023.5	1,351.85	.99		21.0	
27	MAINT & REPAIRS (3/23/90 to 3/22/91)					FIXED COSTS FOR 1990			
29	Mar 30 90	Tune-up		65.83	Driver's License			8.00	
30	Mar 30	Oil change & lube		32.66	Car Registration			46.75	
31	Apr 21	Wash and wax		12.00	Insurance			658.00	
32	May 23	New tires (2)		202.00	Inspection			12.50	
33	May 23	Brakes relined		83.42	Auto Club			45.00	
34	Jun 3	Oil-1 quart		2.23	Loan Interest			587.00	
35					Total Fixed Costs			1,357.25	
40						LIFE-TO-DATE CAR COSTS			
41						Gas Costs			1,351.85
42						Fixed Costs			3,702.25
43						Maint & Repairs			1,632.14
44						Operating Cost			6,686.24
45						Depreciation			8,300.00
46						Adjusted Cost			14,986.24
47						Years in Use			2.25
48						Cost per Year			6,660.55
49						Cost per Month			555.05
50						Cost per Mile			.66
51						Year-To-Date			398.14

hit Return twice. Press Down Arrow, type a period, move the cursor to D18, and hit Return again. Press OA-R.

### FORMULA 4: COST PER GALLON

Formula 4 produces the cost per gallon (CPG) of gas or makes the cell look empty. The Test statement looks at the number of gallons in E9. If E9 is greater than zero (meaning you've entered the number of gallons), the Then statement divides gas cost (F9) by number of gallons (E9) and enters the result in G9. If E9 is less than or equal to zero (the cell is empty), the Else statement enters the invisible double quotes.

Cell location: G9

Description: @IF(E9>0,F9/E9," ")

You'll copy Formula 4 along with Formula 5 after you enter Formula 5.

### FORMULA 5: MILES PER GALLON

Formula 5 calculates miles per gallon (MPG) or makes the cell look empty. The Test statement checks to see if E9 is greater than zero. If true, the Then statement divides number of miles (D9) by number of gallons (E9) and enters the result in H9. If E9 contains an amount less than or equal to zero, the Else statement enters the invisible quotes instead.

Cell location: H9



**Figure 2.** Practice entries in Car Cost spreadsheet.

7	DATE	START	END	MILES	GALLONS	COST	CPG	MPG
9	May 2 90		21671		16	16.6		
10	May 11		21948		15	15.5		
11	May 19		22288		17.5	18		
12	May 27		22571		15	15.35		
13	Jun 3							
20	CURRENT PERIOD							
22	LIFE-TO-DATE		STOPS	MILES	GALLONS	COST	CPG	MPG
24	PRIOR PERIODS		120	21320	960	1286.4	.94	22.2
25	PRIOR+CURRENT							
27	MAINT & REPAIRS (3/23/90 to 3/22/91)					FIXED COSTS FOR 1990		
29	Mar 30 90	Tune-up		65.83	Driver's License 8			
30	Mar 30	Oil change & lube		32.66	Car Registration 46.75			
31	Apr 21	Wash and wax		12	Insurance 658			
32	May 23	New tires (2)		202	Inspection 12.5			
33	May 23	Brakes relined		83.42	Auto Club 45			
34	Jun 3	Oil-1 quart		2.23	Loan Interest 587			
36						Total Fixed Costs		
38	LIFE-TO-DATE CAR COSTS							
40	Gas Costs							
41	Fixed Costs							
42	Maint & Repairs							
44	Operating Cost							
45	Depreciation							
47	Adjusted Cost							
48								2.25
49	Years in Use							
50	Cost per Year							
51	Cost per Month							
52	Cost per Mile							
54	Year-To-Date							

Description: @IF(E9>0,D9/E9," ")

Now copy Formulas 4 and 5 down their respective columns: Place the cursor on G9, press OA-C, and hit Return. Move the cursor to H9 and hit Return again. Press Down Arrow, type a period, move the cursor to G18, and hit Return. Press OA-R to tell AppleWorks all cell references in both formulas are *relative*.

Row 20 also needs these formulas, so copy them again: With the cursor on G9, press OA-C, hit Return, move the cursor to H9, and hit Return again. Move the cursor to G20, hit Return, and press OA-R. Despite that empty look, both formulas are in their cells.

#### FORMULA 6: GAS STOPS (CURRENT PERIOD)

Formula 6 counts entries in the ending-mileage column (C18 through C9) to produce number of stops at the gas pumps in C20. It includes the lines in C19 and C8.

Cell location: C20

Description: @COUNT(C19.C8)

#### FORMULA 7: TOTAL MILES TRAVELED (CURRENT PERIOD)

Formula 7 adds number of miles traveled during the current period (D18 through D9) and enters the result in D20.

Cell location: D20

Description: @SUM(D19.D8)

This formula can also add number of gallons in column D and costs in column F, so copy it: Leave the cursor on D20, press OA-C, and hit Return twice. Now press Right Arrow, type a period, press Right Arrow again, and hit Return. Press OA-R.

Reformat E20: Press OA-L, hit Return twice, type C1, and hit Return. Now reformat F20: Press OA-L, hit Return twice, type C2, and hit Return again.

#### FORMULA 8: GAS STOPS

Formula 8 adds number of gas stops in the current period (C20) and prior periods (C24) and enters the total in C25.

Cell location: C25

Description: +C20+C24

Copy Formula 8 into the cells to the right: With the cursor on C25, press OA-C and hit Return twice. Now press Right Arrow, type a period, press Right Arrow twice, and hit Return. Press OA-R.

As you did a moment ago, reformat E25 for *Commas* with one decimal place, and F25 for *Commas* with two decimal places.

#### FORMULA 9: AVERAGE COST PER GALLON

Formula 9 produces a close approximation (not a weighted average) of the cost per gallon (CPG) of gas during the life of the car. The Test statement looks at CPG in the current period (G20). If G20 contains a number greater than zero, the Then statement averages costs per gallon in the current period and prior life-to-date cells (G20 and G24) and enters the result in G25. If G20 is equal to or less than zero (that is, at the start of a new period), the Else statement copies the number in G24, the prior life-to-date cell.

Cell location: G25

Description: @IF(G20>0,@AVG(G20,G24),G24)

Copy Formula 9 to H25 (all cell references are *relative*), then reformat H25 for *Commas* with one decimal place. Now press OA-S to store your work so far on disk.

#### FORMULA 10: MAINTENANCE & REPAIRS

Formula 10 adds maintenance and repair costs (D29 through D52) and enters the result in D54. The formula includes the lines in D53 and D28; that way, if you ►

later insert rows—most likely below row 53—AppleWorks will adjust the formula to account for the new entries.

Cell location: D54  
Description: @SUM(D53.D28)

**FORMULA 11: FIXED COSTS FOR 1990**

Formula 11 adds the entries in H34 through H29 (including the lines in H28 and H35) to produce the total fixed costs for 1990 in H36.

Cell location: H36  
Description: @SUM(H35.H28)

**FORMULA 12: GAS**

Formula 12 copies gas costs in prior and current periods (F25) and enters this amount in H40.

Cell location: H40  
Description: + F25

**FORMULA 13: FIXED COSTS**

Formula 13 adds historical fixed costs to 1990 fixed costs (H36) and enters the result in H41. As an example, the formula assumes prior fixed costs of \$2345. At the

start of each year, substitute your end-of-year number.

Cell location: H41  
Description: 2345 + H36

**FORMULA 14: MAINTENANCE & REPAIRS**

Formula 14 adds historical maintenance and repair costs to current maintenance and repair costs (D54). The formula assumes prior maintenance and repair costs of \$1234. Replace this number with your number later.

Cell location: H42  
Description: 1234 + D54

**FORMULA 15: OPERATING COST**

Formula 15 adds gas costs (H40), fixed costs (H41), and maintenance and repair costs (H42) and enters the result in H44.

Cell location: H44  
Description: @SUM(H43.H39)

**FORMULA 16: DEPRECIATION**

Formula 16 calculates depreciation or wholesale value as listed in the *N.A.D.A.*

*Official Used Car Guide* or *Kelly Blue Book*.

Cell location: H45  
Description: + H3 - H4

**FORMULA 17: ADJUSTED COST**

Formula 17 adds operating cost (H44) and depreciation (H45) and enters the result in H47.

Cell location: H47  
Description: + H44 + H45

**FORMULA 18: COST PER YEAR**

Formula 18 divides adjusted cost (H47) by the number of years you've owned your car (H48).

Cell location: H49  
Description: + H47/H48

**FORMULA 19: COST PER MONTH**

Formula 19 divides the car cost per year (H49) by 12 and enters the result in H50.

Cell location: H50  
Description: + H49/12

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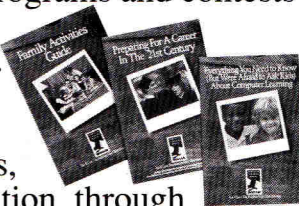
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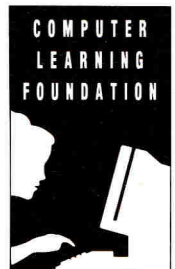
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**APPLEWORKS**  
IN ACTION

**FORMULA 20: COST PER MILE**

Formula 20 divides adjusted cost (H47) by total number of miles (D25) to produce the cost per mile in H51.

Cell location: H51  
Description: +H47/D25

**FORMULA 21: STATUS REMINDER**

Formula 21 is a fun formula that returns one of two text answers. The Test statement looks at H18, the last cell in the entry area. If H18 contains a number greater than or equal to zero, meaning the last cell is filled, the Then statement displays *START ANEW*. If H18 is empty, the Else statement displays *OKAY*. The quotation marks still remain invisible, while the text between them manifests itself boldly. To keep *OKAY* from overhanging the numbers in the cells above the formula, leave a space after the word.

Cell location: H5  
Description: @IF(H18>=0,"START ANEW","OKAY ")

Use OA-L and Label format to right-justify H5.

**PRINTING THE SPREADSHEET**

Car Cost prints at the standard 10 characters per inch. To position it well on the printed page, change the margins: Press OA-O to bring up the *Printer Options* screen. Type **LM** (for *Left Margin*) and hit Return. Type **.3** and hit Return again. Next type **RM** (for *Right Margin*) and hit Return. Type **.3** and hit Return again. And finally, type **TM** (for *Top Margin*) and hit Return. Type **.3** and hit Return. Press OA-S to store the spreadsheet on disk and return it to the screen.

Now turn on your printer. Press OA-P to start the *Print* command, confirm *All*, confirm the printer or type your printer number, then hit Return. Enter today's date or, if your computer has a clock, type @ (the "at" sign) and hit Return twice. And here's the sample spreadsheet. Press OA-S to store it on disk. Be sure not to change anything on this spreadsheet between now and next time. You can make a copy, however, and play around with that one. □

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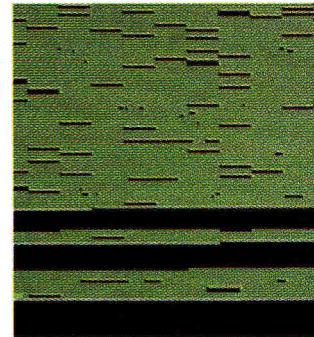
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# AT YOUR COMMAND

**Having a hard time remembering all those program commands? Put them at your fingertips with templates that fit right on your keyboard.**

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

SURELY ONE OF THE PREVAILING side effects of living in the Information Age is a tendency toward information overload. For better or worse, filling our heads with all that knowledge leaves little room for memorizing the dozens of computer commands we need to know to process words, design newsletters, or even play games.

Thank goodness there's a cure — or at least a palliative — and it's as close at hand as your desktop-publishing program. This month we'll use **Publish It!** to create keyboard templates, or what some might refer to as "cheat sheets." Keyboard overlays literally put program commands at your fingertips.

We'll begin by designing an overlay to fit the Apple IIgs keyboard; later on, you'll learn how to create a template for the IIc Plus. With little effort, you should be able to modify our procedure to use Publish It! or nearly any other desktop-publishing program to create custom overlays for other Apple IIs.

## MEASURING UP

First take a close look at your computer keyboard's overall design. A keyboard overlay should be conveniently located and steer clear of keys and cooling vents.

Perhaps the best place to fit an overlay on the GS is the "dead space" between the reset key and the right-hand ADB (Apple Desktop Bus) port, where you plug in the mouse (if you're right-handed) or the keyboard (if you're a lefty). Notice, too, that there's some unused territory between the standard QWERTY keyboard and the numeric keypad. Let's exploit both regions to develop a more or less T-shaped template, as shown in **Figure 1**.

## GS TEMPLATE

Start up any version of Publish It! and select *Size to Fit* mode (Special menu or Open Apple-4). Click on the text tool and "rubber-band" a horizontal text area (press the mouse button, drag, and release)

approximately 1 inch high and 7 inches wide anywhere on the page. Use the program's screen rulers as guides.

As always in Press Room, we remove some of the drudgery from creating useful publications by providing a **Table** of specifications for each page-layout object you need to create. That way, all you have to do is draw the object and use the **Table** to make the object's size and placement match ours.

For example, make sure that the text frame you just created is selected. If it is, it will show four corner "handles"; if not, choose the pointer tool and click on the text frame. Pull down the Objects menu and select *Show Specifications*, or press the Open apple-M key combination.

Edit your object's specifications by typing in the values given in the **Table**. While you're in the *Show Specifications* dialog box, click on the *Frame Border* radio button. Press the return key.

With the text tool, rubber-band a second area and use *Show Specifications* and the **Table** to create the vertical text area. Save (File menu or Open apple-A) the template-in-progress on a data disk as KEYBD.GS or some other meaningful name. ►

	Left Start	Top Start	Width	Height	Frame Border?
<b>GS OBJECTS</b>					
Horizontal text area	0.240	0.638	7.563	1.250	yes
Vertical text area	5.888	1.890	0.680	3.750	yes
Long rule #1	0.238	1.388	7.563	n/a	n/a
Long rule #2	0.238	1.741	7.563	n/a	n/a
Short rule #1	5.888	2.640	0.681	n/a	n/a
Short rule #2	5.888	3.390	0.681	n/a	n/a
Short rule #3	5.888	4.140	0.681	n/a	n/a
Short rule #4	5.888	4.890	0.681	n/a	n/a
<b>IIc PLUS OBJECTS</b>					
Large area	1.111	1.405	6.000	1.000	yes
Small area	0.361	2.410	7.500	0.250	yes

**Table.** Specifications for keyboard templates (inches); n/a = not applicable.



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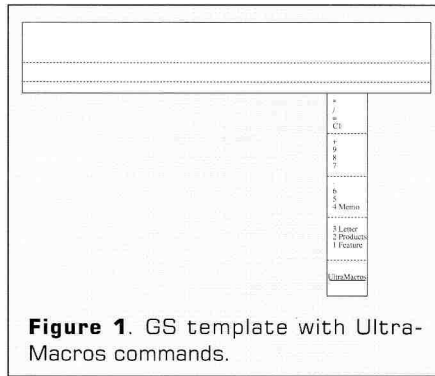


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The blank template can be used "as is," but we've added a few embellishments. First, to simplify folding the template prior to securing it in place on the GS keyboard, incorporate two dashed lines: long rule #1 and long rule #2. To create a dashed line for this or any other project you're working on, first select the line tool and rubber-band a straight line anywhere on the page.

With the line still selected, pull down the Objects menu and choose *Set Pen Pattern*. Counting from left to right, pick the eighth pattern displayed by clicking on it. The pattern is composed of a series of vertical stripes, but when used with a narrow line weight (use *Set Line Weight* from the Objects menu to select the thinnest line), the pattern creates dashed lines.

Next, use the line tool to create the short rules defined in the **Table**. These dashed lines are handy if, among other things, you've reprogrammed the keys on the numeric keypad with **TimeOut UltraMacros** commands defined for **AppleWorks 3.0** (8-bit AppleWorks Classic). The dashed rules help to visually separate the



**Figure 1.** GS template with UltraMacros commands.

rows on the numeric keypad. Save the template (File menu or Open apple-S).

Because the areas on the template are text frames, you can easily print on them. Create individual templates for your home-accounting program, your word processor, and your desktop-publishing program. You can print a custom template for each employee in your office.

Teachers and computer-lab directors can use templates to identify a school's equipment or to provide steps for basic operations. Warnings about not drinking or eating can also be helpful.

Whatever the message, simply select the I-beam and insert it by clicking on one of the two text frames you created. Choose a font (Font menu or Open apple-W) and type away.

Because my UltraMacros template is constantly evolving, I print the macros I've already defined and save the template as KEYBD.GS.UM.

On a day-to-day basis, as I define new macros I pen them in manually on the large horizontal text area. When it's time to print a revision, I use Publish It! 2 to create a more presentable version of my template.

**IIC PLUS TEMPLATE**

Creating a keyboard overlay for the IIC Plus is somewhat easier. Rubber-band two text areas according to values in the **Table**. The template, shown in **Figure 2**, fits between the volume slider and the disk-use LED on top of the keyboard.

Customizing the IIC Plus template is a snap: Insert the I-beam into the large text area and type the information you want.

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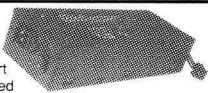
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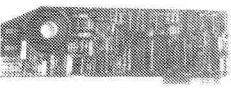
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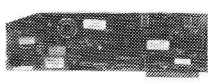


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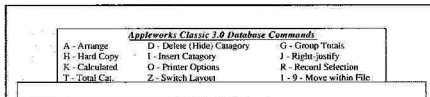
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For example, this template contains AppleWorks 3.0 commands.

### MAKING IT STICK

Use Publish It!'s double-strike mode to print the overlay on plain or colored paper.



**Figure 2.** IIC Plus template with AppleWorks 3.0 commands.

You can cut the template with scissors and use it as is, but your creation may be too flimsy to last. Instead, use a glue stick to attach the printout to a piece of card stock. Let the glue dry thoroughly and then cut out the template with scissors, a paper cutter, or an X-acto knife.

For the GS template, score and fold along the two long horizontal rules. For the IIC Plus template, fold at the intersection of the two text areas.

In either case, the template may get jostled unless you secure it somehow. We've

found that "tacky tape" works fine. The permanent side of the tape adheres to the back side of the template; the repositionable side adheres to the keyboard. We've found that removing the template is a cinch, and we're able to clean up any tape residue by first spritzing a cotton swab with WD-40 lubricant and then carefully rubbing the area. Super Glue Corporation of Hollis, New York, makes one type of repositionable tape. It's called **Handi-Tacker** and retails for \$9.99. You should be able to purchase it in an office-supply store.

Adapting our technique, you can create templates for any piece of equipment. How about a crib sheet for programming your

VCR? Or a memory jogger for microwaving favorite recipes?

Whatever the application, just follow these two steps: Measure as precisely as you can the area where your template should fit, then create bordered text areas to accommodate the information you want to include on the overlay.

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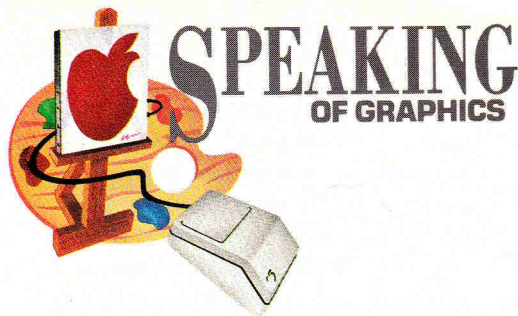
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NEXUS was written by the same people who brought you ThunderScanGS and Look Up, so you can be sure of quality. Requires GSOS 5.0.2 and 1.25 megabytes of memory.





# ANIMATED ANTICS I

Create your own characters and turn 'em loose—  
find out how specialized animation software and  
your Apple II can bring your graphics to life.

By **ROBERTA SCHWARTZ**  
and **MICHAEL CALLERY**

WHAT MAKES SUPERMAN SOAR? What gives Jessica Rabbit her wiggle? What makes Fritz the Cat a *very* naughty boy?

It's the optical illusion we call *animation*—a series of still pictures, or *frames*, flashing in front of our eyes so fast that our brain blends the images together as if they were moving.

## COMING TO YOUR SCREEN

Your Apple II and special software can make you an animator, too.

This month we'll cover the fundamentals of computer animation—define some terms and discuss the four basic types you can try on your Apple II.

In upcoming issues, we'll cover animation programming with Applesoft BASIC (the language built into every Apple II) and Broderbund's software package Fantavision.

## HOLY PIXELS, BATMAN!

There are four common types of animation; the most widely known is *cel animation*—the kind you see in Disney, Warner Brothers, and Hanna-Barbera cartoons.

In cel animation, the components of

each frame are drawn on sheets of clear acetate, or *cels*. The animated characters in any particular frame are drawn on separate cels, which are then layered over a background (painted on another cel) and photographed. New cels for each of the characters' movements are drawn and placed on the background, and the scene is again photographed.

In film, there are 24 frames per second, and in video there are 30 per second; you can imagine how tedious it is to create a lengthy animation.

The computer analog of this process is called *block animation*, the type of animation created by programs such as **Take One!** from Baudville, **Animate** from Broderbund, and **Art & Film Director** from Epyx.

With these programs, you draw the different stages of your animated character in small blocks of pixels. The program then overlays these blocks on your background image and cycles through them to achieve the illusion of movement. (See "Desktop Video: Making Movies with Your Apple II, Part 1," April 1990, p. 44, plus reviews in April 1987, p. 30, and July 1989, p. 28, for more information.)

All these programs contain the essential tools you'll need to produce effective animations, but be aware that good tools don't *guarantee* good results. Animation is

difficult, especially animation that strives to appear realistic. (*Disney Animation: The Illusion of Life*, by Frank Thomas and Ollie Johnson, Abbeville Press, New York, 1984, contains many secrets of Disney's master animators.)

## FLIP IT

*Page-flip animation*, a simple variant of cel animation, is a second type you can produce on your computer. Your Apple II has two standard hi-res graphics *pages*, or screens; you can have two different images in memory at the same time and switch between them to create an animation.

One of our favorite page-flip animations was created by a student who drew the character E.T.: In one image E.T.'s finger was orange; in the other, his finger was white. With page flipping, E.T.'s finger flashed much as it did in the movie.

To give you an idea of how page flipping works, take a look at the short Applesoft routine in the accompanying **Program listing**.

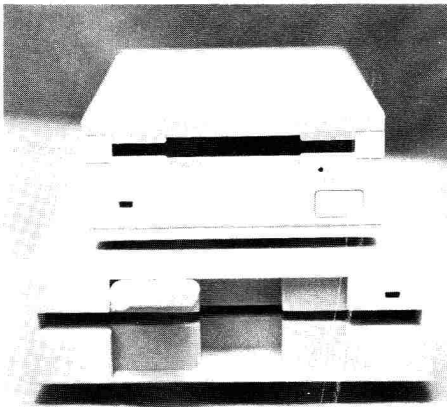
Note that if you're working in Apple's 80-column screen, this program won't work. Applesoft won't "page flip" in 80-column mode, so switch back to 40 columns before trying this program out.

You can modify the program to flip between two pictures you've created in a standard hi-res painting module by **BLOAD**ing one graphic to page 1 and the other to page 2. Just delete lines 40–90 and insert the following lines:

```
40 PRINT CHR$(4); "BLOAD  
    PICTURE1, A$2000"  
50 PRINT CHR$(4); "BLOAD  
    PICTURE2, A$4000"
```

Be sure to replace *PICTURE1* and *PICTURE2* with the names of your two images.

We'll show you another use for page ►



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**Program listing.** Page-flip animation.

```

10 HOME
15 REM Set time delay and set count to 0
20 T=500: COUNT=0
25 REM Set hi-res graphics, page 1 and show full screen
30 HGR: POKE -16302,0
35 REM Draw figure
40 HCOLOR=1: HPLOT 31,30 TO 51,0 TO 51,160
45 HPLOT TO 31,160 TO 71,160
50 HCOLOR=Z: FOR I = 0 TO 160: HPLOT 140,I TO 200,I: NEXT I
55 REM Set hi-res graphics, page 2
60 HGR2
65 REM Draw figure
70 HCOLOR=2: HPLOT 140,30 TO 160,0 TO 180,0 TO 200,30
80 HPLOT TO 200,50 TO 140,130 TO 140,160 TO 200,160
90 HCOLOR=1: FOR I = 0 TO 160: HPLOT 31,I TO 71,I: NEXT I
95 REM Show page 1 and delay for a count of T
100 POKE -16300,0: FOR D = 1 TO T: NEXT D
105 REM Show page 2 and delay for a count of T
110 POKE -16299,0: FOR D = 1 TO T: NEXT D
115 REM Increment count and check to see
    if it has reached 200
120 COUNT=COUNT+1: IF COUNT > 200 THEN GOTO 200
125 REM Loop back to line 100
130 GOTO 100
195 REM End gracefully
200 TEXT: HOME: END

```

flipping next month when we explore Apple shape-table animations.

**IN BETWEEN**

Another popular type of animation, seen in most flight-simulator programs, is *vector animation*, in which the animated figure is described by lines rather than a block of pixels. The computer must translate these lines into pixels to display your image, of course, but the screen image isn't what the machine is animating.

Suppose you wanted to create an animation of a square turning into a circle. Using block animation, you'd have to draw the square, the circle, and each intermediate figure—and the more intermediate figures, the smoother the transition. With vector animation, you'd draw just the square and the circle; the computer, through mathematical calculations, can create the intermediate figures. (This process is also known as *tweening*.)

The most popular vector-animation program is Broderbund's **Fantavision**. (See Editors' Choice in February 1986, p. 120, and February 1988, p. 120.) When

we first saw this program, we were amazed by the exciting—and profoundly simple—sample animations included. If you don't believe a couple of lines and dots can become a polar bear, you're in for a surprise.

If you want to achieve realistically rendered animations, Fantavision will frustrate you. Remember, you're working with lines. With Fantavision you create images that are more symbolic than realistic—stick figures are the rule rather than the exception. An extra bonus, however, is that Fantavision is fabulous for learning the essentials of animation technique (more on this in a future column).

**COLOR IT**

The final type of animation you can perform easily with your Apple II is *color cycling*. It isn't true animation. In color cycling, the palette (or color lookup table) is switched so quickly that objects drawn in red, for example, can change to blue instantaneously. Used creatively, cycling can create the illusion of movement. Color cycling has been used extensively in the last decade or so for TV weather

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**Animate**, \$69.95  
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graphics—we've all watched the eastward flow of the jet stream cross that giant map.

Color-cycling animation is limited to the GS, because other models of the Apple II have fixed palettes. It's such an appealing feature that all major super-hi-res paint programs offer it.

**REEL TO REEL**

Other types of animation, such as Claymation (of California Raisins fame), aren't applied as easily to computers. You could use a video digitizer such as **ComputerEyes** (review, July 1988, p. 33) to import an image of a three-dimensional figure, save it, move it, and digitize again. Ending up with a series of still frames, you'd really be doing a cel animation.

Whether it's by block, by vector, or by cycle, your Apple can animate your graphics for fun, colorful graphics creativity. In our next column we'll talk about Applesoft BASIC in animation. Hollywood, here you come! □

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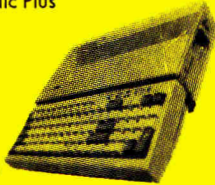
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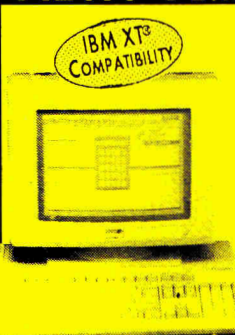


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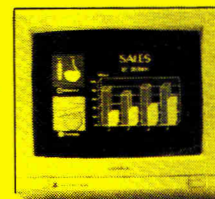
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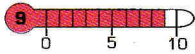
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Spelling is a paradoxical subject: It should be easy to teach, yet it's actually quite difficult. Our language is

such a potpourri of so many others, our spelling rules contain so many exceptions, and our phonetics are nebulous at best — these factors make spelling bewildering.

I'm an English teacher and a software reviewer, but I'm also an atrocious speller. Perhaps that weakness comes from having seen words spelled incorrectly by my students so often that I'm not sure of the correct spelling myself anymore. After 19 years of teaching, I've finally decided that spelling is simply a matter of memorizing

through repetition, augmented by understanding the basic rules. Davidson seems to agree, though Spell It Plus also stresses syllabication, suffixes, and prefixes.

**FIRST WORD**

Spell It Plus is much more than just an update of an old program; it's a substantial improvement of its award-winning predecessor, Spell It. The new version features pull-down menus, recordkeeping, certificate design, foreign-language fonts, and a greatly enhanced, easier-to-use editor.

Spell It Plus divides 1000 of the most commonly misspelled words into groups of 20. Any appropriate spelling rules that fit each group of words are listed as well. You can use five different learning activities to help master the words in each list.

The main tutorial activity is called Study It. Within Study It, you can choose from three different segments — See Word, Finish Word, and Flash Word — for spelling practice.

See Word shows you a correctly spelled word at the top of the screen, any applicable

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**Deciphering tricks of English spelling.**

spelling rules, and the syllabication of the word (the word divided into syllables). Below, there's a sentence with a blank space, and the program asks you to type the word into the blank. The word disappears as soon as you type the first letter, requiring you to type it from memory. If you make a mistake, the correct spelling reappears and you get a second chance.

Finish Word shows you a word, asks you to type it, and then displays the word again — this time with some letters removed. Then you type the word again. If you do so correctly, the word appears for a third time with even more letters gone. That pattern repeats itself three to five times.

A strong point of this activity is that the

missing letter clusters aren't chosen completely at random. Instead, the clusters of letters removed are significant combinations, such as *sh*, *ch*, *ie*, and *ei*, that are frequently the cause of spelling errors.

The last activity in Study It is Flash Word — just what it sounds like. Words flash briefly on screen, and you then type them into a sentence within the proper context. You can adjust the flash speed yourself; when a student makes three consecutive spelling errors, the program adjusts the flash automatically to a slower speed.

### GIVE ME A LETTER

The other four Spell It Plus activities are simply reinforcement and amusement activities. That's not a criticism of the program, just an observation; the most intense learning phase of Spell It Plus is the Study It activity.

Decode It, the second activity, lists four words at a time, each one with a letter missing. Under these words is a mystery message. Each time you type the missing letter into one of the four words, that letter also appears in the appropriate blanks in the message at the bottom of the screen.

Once you've spelled the four words in the list correctly, four more words appear. This process continues until all letters in the mystery message are filled in or until you think you know the message, when you may go to the message and type in the remaining letters. The earlier you guess the mystery message and spell correctly the words comprising it, the more bonus points you earn. Decode It not only gives you another opportunity to practice the spelling words in a given list, it also develops inference skills.

The third activity is called Correct It, an exercise that lets you edit text for misspelled words and any other errors. Again, besides practicing your spelling, you also get the benefit of seeing the word used in context.

Unscramble It, the fourth activity, is a basic scrambled-word game you play like tic-tac-toe. You can do this one by yourself or with a friend. The goal is to claim a square by unscrambling a word and spelling it correctly. As in tic-tac-toe, you complete three squares in a row to win and any others to block your opponent from doing the same thing.

The last activity, Spell It, is an unadulterated spelling game. A frog runs around a track, jumping hurdles as he goes. Words appear above the hurdles, some correct and some incorrect. You designate which words you want the frog to zap with his tongue, and then make him do so by pressing Return (or clicking on the Eat box with the mouse pointer). The game is more difficult than it appears; especially when you play at the highest of the three levels available. It requires instant recognition of

words, which can be a real challenge when using the Grand Master lists.

The five activities are all relatively interesting, and all contain some identifiable and legitimate objective in addition to simple spelling practice. Spell It Plus offers much more than a way to make rote learning more entertaining, though.

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# REVIEWS

save their scores and keep cumulative progress records; you can view those records on screen or send them to your printer; you can see detailed lists of words they've mastered, words they've missed, the percentage they got correct, and the word lists.

You may also print the scoreboards and the word-search puzzles, using words entered from the editor or from the original Spell It Plus lists.

## CARTOONS FOR LITTLE ONES

Younger students get a few bells and whistles, too. You can print All-Star Speller Certificates when kids score 100 percent during one of the tutorial lessons in Correct It, Decode It, or Flash Word.

Amusing animated sequences also give kids instant positive feedback at various points during the lessons. Initially, my reaction to the cartoonish animation was negative — a definite turn-off for older students and adults who could certainly benefit from Spell It Plus. Davidson circumvents any such criticisms, however, by

including options in the pull-down menus that let you turn off graphics and sound.

## IN YOUR OWN WORDS

Spell It Plus includes an impressive number of words, but the package's value is immeasurably enhanced by the powerful editor. You can include any word up to 14 letters long in your own word list. There are six easy steps to adding a word to your list: Enter the correctly spelled word; enter the word with a space between the syllables; enter a sentence with a blank for the word; enter three misspellings of the word; select *Add* from the pull-down menu to go to the next word; and select *Save* from the pull-down menu. You may also add rules to coincide with your list of words.

The ability to create your own list of words increases the program's range considerably. You could construct lists of specialized words that pertain to a certain field or endeavor (medical or legal terminology, for instance), or you could create lists made up of the words you most often misspell as shown by the reports created

with Spell It Plus. The possibilities are many and they make Davidson's program timeless.

Spell It Plus is an impressive package considering the features already mentioned. Three other items add to the program's overall value, however. First, Davidson includes a Foreign Language Font Editor within Spell It Plus, so that you can enter Spanish, French, and German characters and words.

The editor allows for accent marks, the Spanish tilde, and so on. Next, Davidson throws in a bonus data disk containing spelling words appropriate for students aged 6 to 9. Davidson also recognizes its previous supporters who purchased the original Spell It, so all data disks created for use with the original can be converted for Spell It Plus.

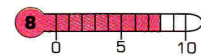
The program offers a wide range of options and as much entertainment as you could reasonably expect when dealing with a subject like spelling. Whether you have trouble with tricky word combinations (such as *their*, *there*, and *they're*) or words that are maybe just plain tough (such as *narcissistic*), Spell It Plus can teach you to spell more better. Now does Davidson have a grammar-correction program?

**Jim Trunzo**  
Leechburg, PA

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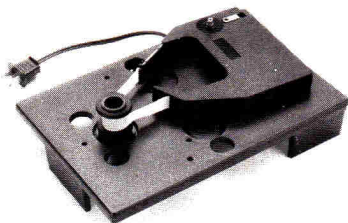


Can you name the planets in our solar system in their proper order outward from the sun? Do you know which constellation includes part of the Big Dipper? Can you tell the difference between Jupiter and Saturn? Does the name *Mars* conjure up visions of chocolate and caramel instead of outer space? If questions like these space you out, Stars & Planets may be just the thing to improve your celestial I.Q.

Actually, Stars & Planets is an early-level skill builder rather than an astronomy program. It includes six multilevel activities

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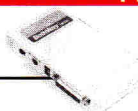
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designed to help children aged 3 to 6 master elementary skills while they explore the solar system. The program encourages kids to think by challenging them to remember numbers and patterns. The games emphasize shape and color matching, counting from 1 to 10, sorting, and sequencing.

As youngsters complete the activities, they learn facts about the solar system — such as the names of the planets, their positions relative to the other planets, and their distances from the sun. They also learn how to identify six of the more popular constellations.

The main menu for Stars & Planets is icon driven; kids don't need to know how to read to be able to select activities, and they can move through the program's options with the arrow keys and press Return to make selections. Because there are no on-screen instructions, each activity encourages youngsters to explore interesting objects and experiment with keyboard commands.

The program provides audiovisual rewards in response to correct answers — the screens come alive with animation and music, and sound effects abound. Nothing happens when children answer incorrectly, so there isn't any negative feedback to discourage them.

The activities are sequential — each one builds on previously learned skills. The first two games are suitable for very young children. The last two use words, so they're more appropriate for beginning readers. Several of the activities offer multiple difficulty levels to help maintain children's interest as their skills develop.

#### PICK A PLANET

Youngsters begin with Planet Matching, which has kids match a planet to its twin. This game introduces youngsters to the nine planets in our solar system and encourages them to recognize that each has a distinct position relative to the sun.

In Space Station, the second activity, youngsters scroll through a collection of rocket ships and planets. They choose one they want to build and direct a friendly robot to pick out the appropriate parts. Constructing a rocket is simpler than building a planet because kids have to remember only two attributes — color and

shape. Building a planet is a bit more difficult; they'll have to remember three attributes: color, surface pattern, and ring type. While the instruction manual also mentions that you can "design and build" your own rocket or planet in this activity, I wasn't able to get this option to work.

The third activity, Moon Rocks, offers three levels of counting practice. In level 1,



Starry, starry night . . .

children count from 1 to 3; in level 2, from 1 to 5; and in level 3, from 6 to 10. In all other respects, the three Moon Rocks levels are identical.

The opening Moon Rocks screen shows a rocket orbiting the moon. It sends a radio signal to a lunar lander, causing a number to be displayed on screen. An astronaut emerges from the lander driving a lunar buggy. Children direct the astronaut to pick up the specified number of moon rocks and place them in the buggy.

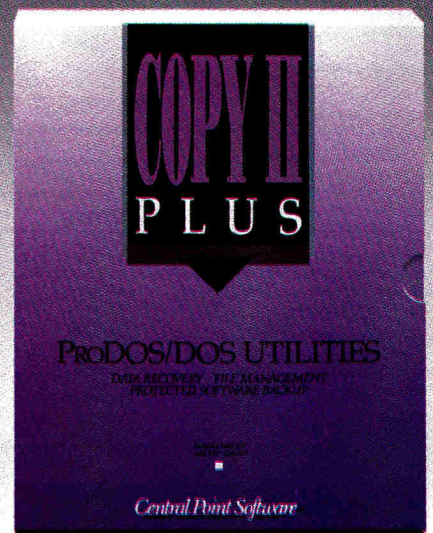
If youngsters make the astronaut retrieve more rocks than necessary, the extra rock will return to its original position. After five successful rock-collecting missions, the astronaut drives the buggy back to the lander and takes off into space.

Planet Sequencing, the fourth game, challenges youngsters to build on their knowledge of planets introduced in the first activity. Kids must return planets that have been removed from orbit to their rightful positions. They can play Planet Sequencing at three difficulty levels — the higher the level, the more planets they must return.

In Constellations, the fifth activity, your budding astronomers match groups of stars with their graphics representations. ▶

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# REVIEWS

Stars & Planets focuses on six of the constellations, including Ursa Major (whose seven brightest stars are called the Big Dipper), Canis Major (which contains Sirius, the brightest star in the southern sky), and Taurus the bull.

Matching becomes more difficult at each successive level, because the hint lines connecting the stars are removed. At the highest level (level 4), youngsters must simply match the constellation with its name.

Planet Naming, the program's final activity, requires children to learn the names of all nine planets in our solar system. A space station appears on screen and launches a rocket trailing a planet name.

Youngsters then direct the rocket to the appropriate planet. If they choose the correct planet, the rocket returns to the home space station, leaving the name beside that planet. After they've correctly named all planets, they receive positive audiovisual reinforcement and the activity starts over.

Most of the Stars & Planets activities are intuitive, but the manual contains detailed

instructions just in case. A glossary defines certain terms and includes suggestions for ten noncomputer activities — including a recipe for an "astronaut snack." There's a bibliography of books for children and reference reading for teachers and parents, plus a coloring book with pictures and information about rockets, planets, and constellations, and five colorful rocket stickers for young star gazers.

## THE FINAL FRONTIER

Stars & Planets is both educational and fun. The activities strengthen basic math and language skills, while encouraging kids to appreciate the celestial bodies in our solar system; graphics screens enhance the game throughout.

I have only three minor concerns. First, for some inexplicable reason, the program hung up twice during testing. Each time, I had to reboot to get going again.

Also, there's no way to adjust the volume from within the program. Although going to the GS Control Panel works fine, youngsters will need adult assistance to do

that, and that restricts their independence.

Finally — and perhaps this is the most disappointing thing — Stars & Planets is a GS program, yet it doesn't accept mouse input. Kids can select and complete activities only with keyboard control.

Those minor concerns notwithstanding, Stars & Planets is a real show stopper. It can meet a variety of needs both at home and in school.

The program's graphics screens are delightful, and the animation, sound, and music add sparkle to the overall presentation. The interactive quality of the program encourages kids to explore, become involved, and think for themselves.

As an added and much appreciated bonus, the 3.5-inch program disk isn't copy-protected. You can make an archival backup for everyday use while stashing the original for safekeeping.

All things considered, Stars & Planets underscores the value of computer-assisted instruction and is well worth its price. □

**Carol S. Holzberg, Ph.D.**  
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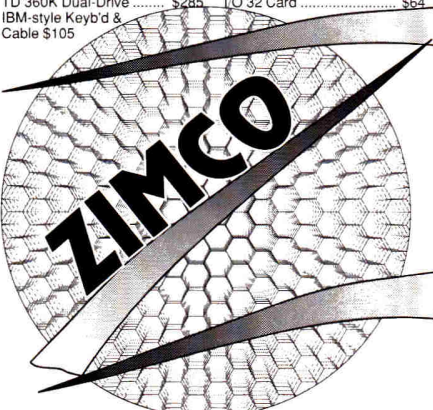
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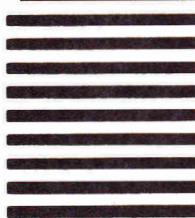
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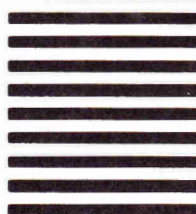
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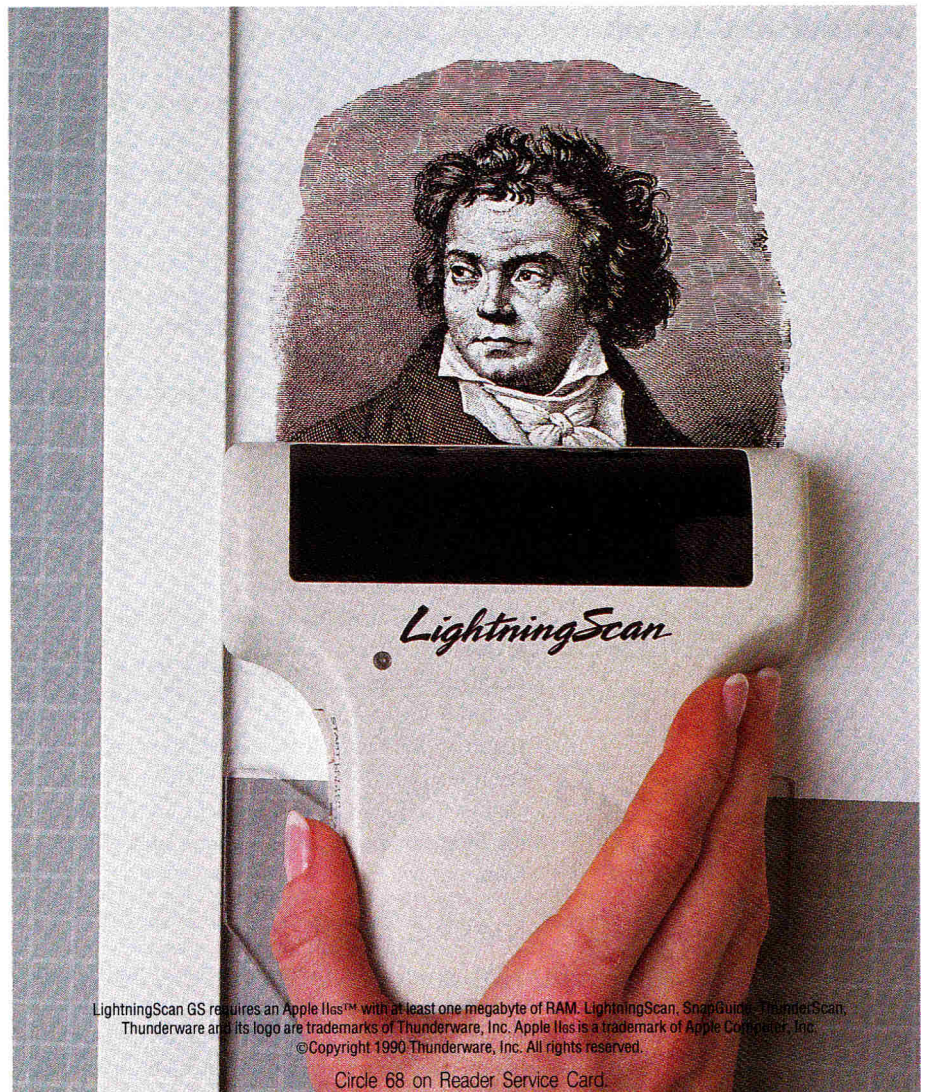


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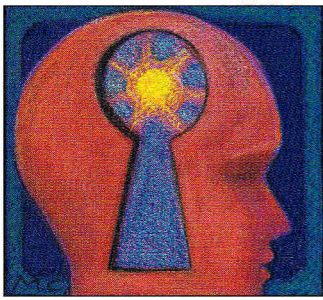
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LEARNING  
CURVE

# GLUED TO THE SET

By DAVID D. THORNBURG, Ph.D.

**A**n Apple II can  
free the human  
mind to do what it  
does best — to  
wonder and to ask,  
“What if . . . ?”

ONE OF THE PLEASURES OF WRITING A monthly column is hearing from readers. Of all the columns I've ever written, the February 1990 Learning Curve article (“The Art of Mathematics,” p. 84) has stimulated the greatest response. That piece explores the beautiful patterns arising from the *Julia set*, the boundary of the set of points that escape to infinity upon repeated iteration of a given function.

February's Julia set examines the behavior of a very simple function:  $F_c(z) = z^2 + c$ , where  $z$  and  $c$  are both complex numbers (numbers that can be expressed in the form  $z = x + iy$ , where  $i$  is the square root of -1.)

If you choose a value for the complex constant  $c$  and a starting value for  $z$ , repeated iterations of the function produce one of two results: The function either grows larger with each iteration (escapes) or converges to zero. Plotting a color on your computer screen at coordinates corresponding to the starting values of  $x$  and  $y$  produces beautiful patterns when the color corresponds to the number of iterations it takes for the function to escape.

In the simplest case, you can plot white if the function escapes and black if it doesn't after a certain number of tries. **Figures 1, 2, and 3** show some of the patterns that result from different values of the complex constant,  $c = c_1 + ic_2$ . It's easy to see shapes that look like tree branches, spiral galaxies, lightning bolts, and other complex patterns from nature.

## NATURAL BEAUTY

Perhaps it's the blend of nature, math, and aesthetic beauty that makes Julia sets so interesting. Several readers suggested ways to “map” the entire domain of possible pictures

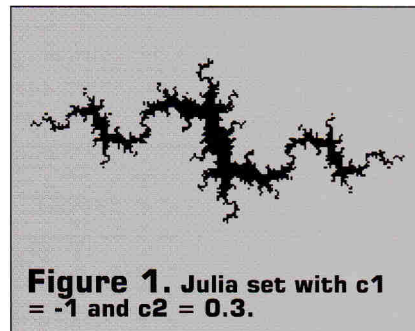
you could obtain from this simple function. This month we'll look at one way to catalog the entire Julia set of  $z^2 + c$  by exploring a related function — the *Mandelbrot set*.

The IBM mathematician Benoit Mandelbrot is credited with the discovery of the branch of mathematics called *fractal geometry*. Fractals are self-replicating functions, portions of which can be blown up to create copies of the whole function. Many of the Julia-set pictures have this property.

One of Mandelbrot's ideas was to take the function  $z^2 + c$  and restrict his interest to only one set of starting values:  $z = 0$ . Instead of plotting the results for different values of  $x$  and  $y$ , he chose to plot the results for different values of  $c_1$  and  $c_2$  — the  $x$ - and  $y$ -values of the complex constant  $c$ . The resulting picture has become one of the most reproduced pieces of computer graphics ever created.

As with the Julia set, the color at each point is determined by the number of iterations taken before the function in question escapes. The accompanying **Program listing** is an Applesoft BASIC program that generates the Mandelbrot set. It creates a plot for values of  $c_1$  ranging from -2 to 2, and for values of  $c_2$  from -1.5 to 1.5. To change the plotted range, adjust the value of  $M$  in line 35 and the center coordinates  $XC$  and  $YC$  in lines 20 and 30.

There are only two major differences between this program and the listing we printed in February: First, the starting values of  $x$  and  $y$  are set at zero; second, the values of  $c_1$  and  $c_2$  change with each plotted point, and plot coordinates correspond to the values of  $c_1$  and  $c_2$ , not the values of  $x$  and  $y$ . The program steps through a range of values for  $c_1$  and  $c_2$ . ▶



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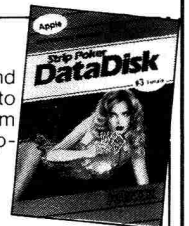
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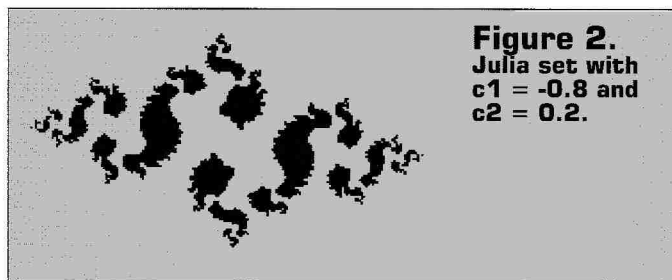
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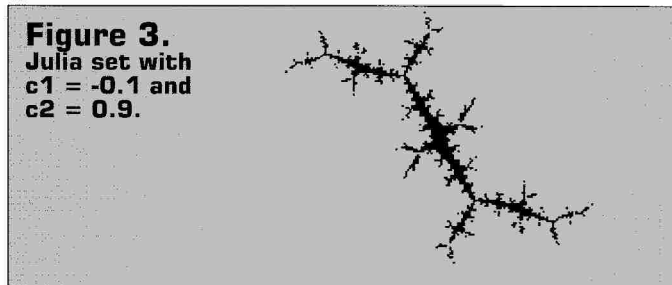
## LEARNING CURVE



**Figure 2.**  
Julia set with  
 $c_1 = -0.8$  and  
 $c_2 = 0.2$ .

To show the escape behavior in some detail, the plotted color shifts from white to black every time the number of iterations to

converges. You can improve the accuracy of the plot by increasing the number of iterations you're trying. For example, the

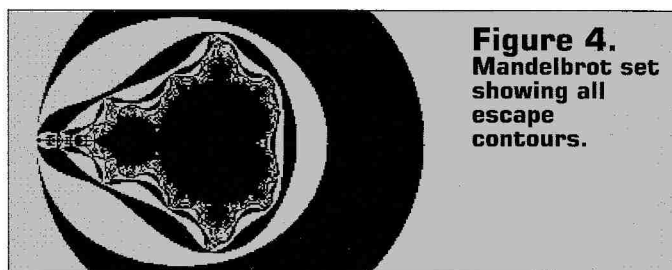


**Figure 3.**  
Julia set with  
 $c_1 = -0.1$  and  
 $c_2 = 0.9$ .

escape changes. This zebra-like pattern is quite pretty in its own right, as you can plainly see from **Figure 4**.

pattern in **Figure 5** was generated with 30 iterations.

If you want a more accurate plot (and have a lot of time) you can increase the number of iterations to any value you want.



**Figure 4.**  
Mandelbrot set showing all escape contours.

line 160 to read as follows:

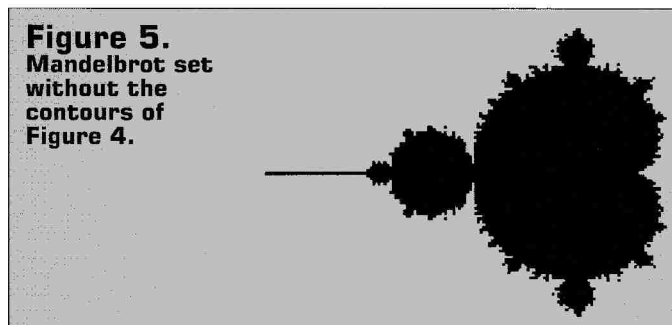
```
160 IF K < 11 THEN  
    HCOLOR = 3
```

This change will plot white for all values of  $c_1$  and  $c_2$  for which the function escapes and black for the values where it

For example, to set the value at 100 tries, change line 37 to read as follows:

```
37 II = 100
```

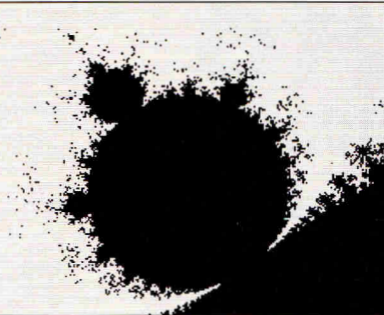
**Figure 6** shows a 25x blowup of one of those small bulbs attached to the large central



**Figure 5.**  
Mandelbrot set without the contours of **Figure 4**.



**Figure 6.**  
One of the  
small bulbs in  
Figure 5  
magnified 25x.



heart-shaped bulb. As you can see, this figure reveals a lot of fine detail you can examine in greater depth.

As with the Julia set of  $z^2 + c$ , the Mandelbrot set can provide many hours of fruitful exploration for anyone interested in the beauty of mathematics. But you can also use it as a tour guide of the Julia set that serves as its base.

For example, if you've been playing with the Julia-set program, you've probably noticed that some starting values of  $c_1$  and  $c_2$  produce blank screens

— a frustrating situation, as each picture can take quite a long time to compute. By limiting your experiment to only the values of  $c_1$  and  $c_2$  that plot black on the Mandelbrot set, you're guaranteed to get a picture when you use these values with the Julia-set program.

As you try it, however, notice that there are many lovely Julia-set pictures that don't have a point at  $z = 0$ . You'll find them at values of  $c_1$  and  $c_2$  that are close to the boundary of the Mandelbrot set.

#### WHAT IF?

There's surely nothing more heartening than seeing a young mind excited to learn. Programs of this type demonstrate the perfect partnership of computers and education. Without the computer these pictures would be hard to create — it's unlikely that anyone would have the patience to do the calculations by hand. But with an Apple II at your fingertips, you can free the human mind to do what it does best — to wonder and to ask, "What if . . . ?" □

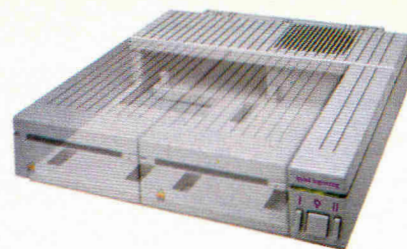
DAVID D. THORNBURG IS INVOLVED IN THE CREATIVE USES OF COMPUTERS IN EDUCATION. A MORE DETAILED PUBLIC-DOMAIN COPY OF THE PROGRAM PRESENTED HERE, WHICH ALLOWS THE GENERATION OF MAGNIFIED VIEWS CENTERED AT ANY LOCATION AND PROVIDES A MOVABLE CURSOR WITH A READOUT OF COORDINATES, IS AVAILABLE FROM THE AUTHOR. SPECIFY 5.25- OR 3.5-INCH FORMAT AND SEND \$5 TO D. THORNBURG, JULIA DISK, P.O. BOX 1317, LOS ALTOS, CA 94023-1317.

#### Program listing. Generating the Mandelbrot set.

```

10 HGR : HOME : VTAB (21)
20 XC = 0
30 YC = 0
35 M = 60
37 I1 = 30
40 FOR J = 0 TO 180
50 YO = (90 - J) / M + YC
60 FOR I = 0 TO 240
70 XO = (I - 120) / M + XC
80 X = 0: Y = 0
90 FOR K = 1 TO I1
100 X1 = X * X - Y * Y + XO
110 Y = 2 * X * Y + YO
120 X = X1
130 Z = X * X + Y * Y
140 IF Z <= 4 THEN NEXT K
150 HCOLOR= 0
160 IF K < I1 AND K < > 2 *
    INT (K / 2) THEN
    HCOLOR = 3
190 HPLOT I, J
200 NEXT I
210 NEXT J
220 END

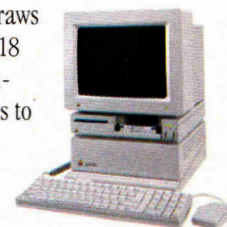
```



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# ON TIME

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.

## APPLEWORKS CALENDAR

By Michael R. Seifried

HERE'S AN EASY WAY TO INSTALL a memory-resident appointment calendar in AppleWorks without buying any additional software—you can make one with an AppleWorks database file.

The idea is to construct a database file with one record for each day of the year. Each record contains the date, the day of the week, and several blank categories labeled with the hours of the working day to fill in with appointments.

To avoid the tedious job of keying in the day and date for 365 records, type in and save the short Applesoft **Program listing** presented here, called Datemaker. When you run it, the program asks for the year and the day of the week that January 1 falls on; it then generates and saves to disk an ASCII text file with the day and date for each day of the year selected. If it's a leap year, the program will automatically give February one extra day.

Once the program creates the ASCII file *Dates*, you can set up your AppleWorks appointment calendar as follows:

1. Boot up AppleWorks as usual. When the main menu appears, choose the first option, *Add files to the Desktop*.
2. From the *Add Files* submenu, choose

- option 4, *Make a new file for the Data Base*.
3. From the *Data Base* submenu, choose option 2, *From a text (ASCII) file*.
4. AppleWorks asks you to designate the number of categories per record. Enter 2.
5. Next, AppleWorks asks for the complete ProDOS pathname of the text file. Your answer should be in this form: */Your.Disk /Dates*.
6. AppleWorks then reads the text file and asks you to supply a name for the database

file. Choose any name you like—maybe something like *Calendar*.

7. The database screen will appear in multiple-record format. *Category 01* will list the days of the week; *Category 02* will list the dates beginning with January 1.

8. The next step is to rename the first two categories and append additional categories for the hours of the day. Type *Open apple-N (OA-N)* to get the *Change Name/Category* screen. Press *Return* once to confirm the name you've chosen for the database file, and the cursor will move to *Category 01*.

To change the name of *Category 01*, type *Control-Y*, then the new name of the category: *Day*. Using the same procedure, rename *Category 02*: *MM-DD*.

Finally, add other categories for the hours of the day according to the following format: 8A, 9A, 10A, 11A, 12N, 1P, 2P, 3P, 4P, 5P, 6P, 7P, 8P. ▶

### Program listing. Datemaker.

```

1  REM  DATEMAKER  [2043]
2  REM  by Michael Seifried  [3788]
3  REM  Copyright 1990, inCider  [4833]
10 D$ =  CHR$ (4): PRINT D$;"PR#3": HOME : TEXT : PRINT
    [3121]
20 DIM DY(12)  [1145]
30 FOR J = 1 TO 12: READ DY(J): NEXT  [1937]
40 DATA  31,28,31,30,31,30,31,31,30,31,30,31  [5697]
50 FOR J = 1 TO 7: READ DW$(J): NEXT  [1781]
60 DATA  "Sun","Mon","Tue","Wed","Thu","Fri","Sat"  [8255]
70 VTAB 2: HTAB 25: PRINT "AppleWorks Appointment C
    alendar"  [7613]
80 VTAB 4: HTAB 31: PRINT "Datelist Generator"  [5260]
90 PRINT : PRINT : PRINT : INPUT "Enter year: ";Y  [2106]
100 IF Y / 4 = INT (Y / 4) THEN DY(2) = 29  [2579]
110 PRINT : PRINT : PRINT "What day of the week doe
    s Jan. 1 fall on:"  [8997]
120 PRINT : PRINT "1) Sun, 2) Mon, 3) Tue, 4) We
    d, 5) Thu, 6) Fri, 7) Sat?"  [4564]

```

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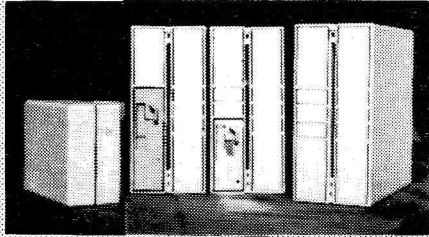
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## HINTS & TECHNIQUES

Continued

```
130 PRINT : INPUT "Your answer: ";C [3497]
140 VTAB 22: HTAB 1: PRINT "Please wait..." [1590]
150 PRINT D$;"OPEN DATES": PRINT D$;"CLOSE DATES": PRINT
    D$;"DELETE DATES" [5955]
160 PRINT D$;"OPEN DATES": PRINT D$;"WRITE DATES" [4621]
170 FOR J = 1 TO 12 [858]
180 FOR K = 1 TO DY(J) [1027]
190 K$ = STR$(K): IF LEN(K$) < 2 THEN K$ = "0" +
    K$ [4087]
200 GOSUB 270 [596]
210 PRINT " ";J;"-";K$ [1070]
220 NEXT K [335]
230 NEXT J [376]
240 PRINT D$;"CLOSE DATES" [1127]
250 VTAB 22: HTAB 15: PRINT "Done! Textfile 'DATES
    ' has been created." [4564]
260 END [138]
270 IF C = 8 THEN C = 1 [1012]
280 PRINT DWS(C) [1400]
290 C = C + 1 [619]
300 RETURN [201]
```

9. The last step is to modify the layout for easy readability. Begin by typing OA-L to get the *Change Record Layout* screen. Then, use OA-Left Arrow to reduce the width of the first category column to three characters. Using the same procedure, make the second column seven characters wide and all remaining columns four characters wide. Press Escape, then Return, to get back to the *Review/Add/Change* screen.

That's all there is to it. In multiple-record format, you can view 15 days at once and see your scheduled activities instantly. To add appointments or view a given day in detail, place the cursor on the day in question and press OA-Z. Press OA-Z again to toggle back to multiple-record format.

As the year goes on, you may want to change the record-selection rules so that only the current and future months appear on screen. To select all days after May 31, for example, press OA-R, place the cursor over the second category (MM-DD), press Return, select *is greater than*, and enter 5-31. Note that AppleWorks treats the month-day combination in the second category as a numerical value, not a date. Renaming the second category *Date* won't alter the situation.

**Write to Michael R. Seifried at 6406 South Queensway Drive, Tampa, FL 33617.**

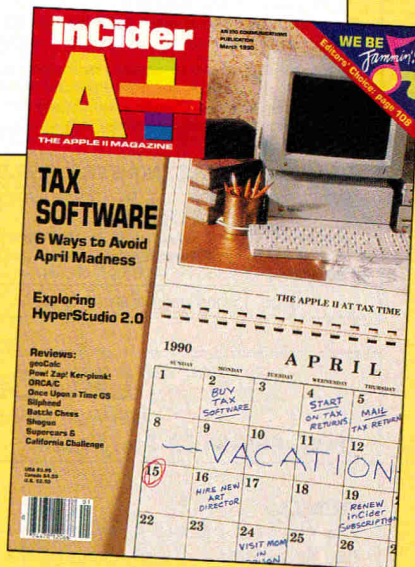
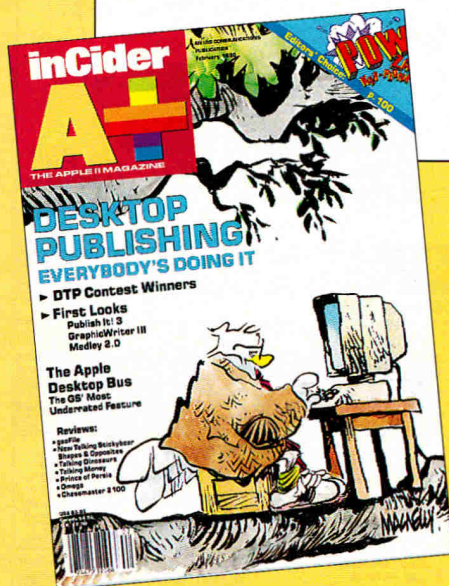
**To change your GS' Applesoft BASIC cursor, press Control-6, then the character you want as the new cursor.**

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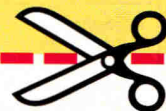
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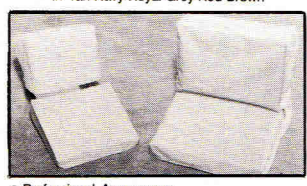
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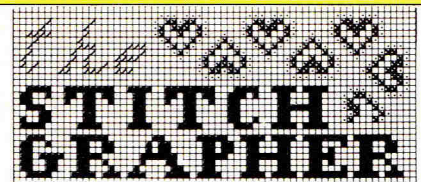
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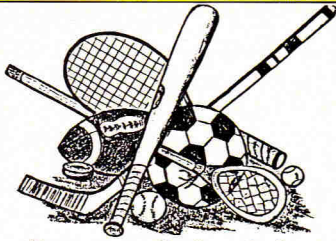
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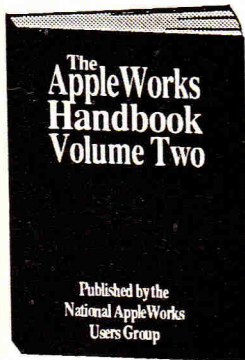
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Over 600 disks, packed, organized and MENU-DRIVEN with only the best PD and Shareware. Our library is continually updated and now includes many of the latest releases for the Apple IIGs! We emphasize quality and service and provide NEXT DAY shipping. Our disks are only \$1.00 each and include all categories (Utilities, Education, Business, Games, PRINTSHOP GRAPHICS, Religion, Appleworks templates, Pascal, Eamon, and more). Programs available in 5.25 and 3.5 format. BLANK DISKS, RIBBONS, and more also available at discount prices. No membership fee! Send \$2.00 for a descriptive catalog and demo disk to:

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# DEEDS TOOL

PUTTING WORDS AND pictures together is the thing to do with your computer these days. With the explosion in the popularity of desktop publishing, a whole slew of new ways to do just that keep cropping up. If your artistic ability is somewhat lacking, if you're bored with commercial clip art, if you can't afford an expensive scanner, Vitesse's **Quickie** may be just what you've been looking for.

The Quickie is a hand-held scanner that reads images or text and saves them as graphics files you can use with any Apple IIGS desktop-publishing or paint program. You get four resolution levels—100, 200, 300, and 400 dpi (dots per inch); the higher the resolution, the larger the image will appear on screen and the more memory your scanned image will require.

You can adjust the Quickie for photos or text, and a dial on the side of the unit compensates for the density of your original. For instance, most newspaper photographs are fairly dark; set the Quickie for a lighter scan, and the result will be clearer. In addition, a light on top of the unit indicates optimal scan speed as you draw the Quickie down over your original. When it's on steadily, you're doing fine. When it flickers, you'll need to slow down; when the light goes out, you're moving too fast and missing portions of the original.

Accompanying software lets you manipulate your image. You can choose from black-and-white or gray-scale; you can show the image as it's scanned (except in 400 dpi) or get audio feedback (also an indicator of your scan speed); you can toggle the 10-second timeout—an energy saver that preserves the scanner's LEDs by shutting the scan down if the unit's picked nothing up in that length of time. You can even adjust line length; the line length and the dpi you select will determine the size of the resulting

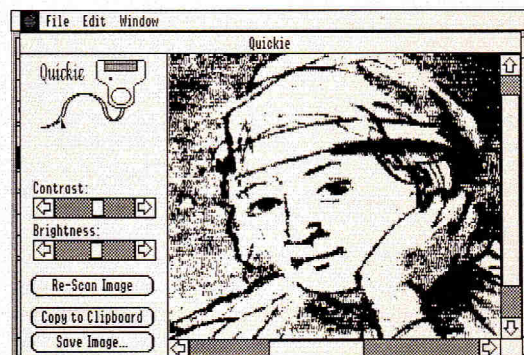
EDITORS' CHOICE



*Quickie*

image. After your scan is complete, you can change the contrast and brightness of the image, as well.

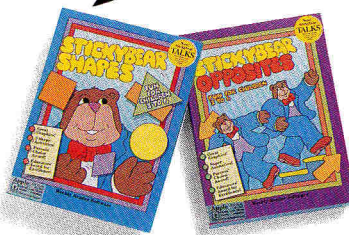
The Quickie requires a GS with at least 1 megabyte of RAM and GS/OS 4.0 or later. Plug in the interface card, connect the Quickie, boot up the software. It's well named—it's quick and easy to operate. Start scanning with a Quickie for \$299, from Vitesse, Inc., 13909 Amar Road, Suite 2A, La Puente, CA 91744-1669, (818) 813-1270. Don't miss it. □



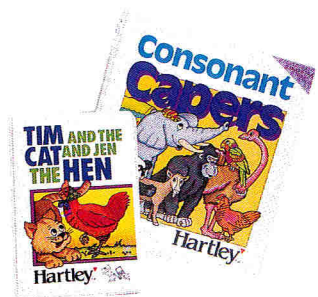
# These Terrific Programs All Talk With An ECHO.<sup>®</sup>



 **Houghton Mifflin**  
(617) 252-3000



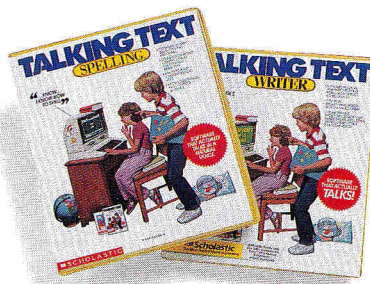
  
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 **Hartley**<sup>®</sup>  
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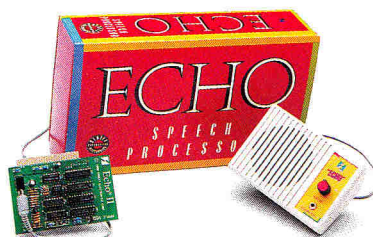
 **SCHOLASTIC**  
(800) 541-5513



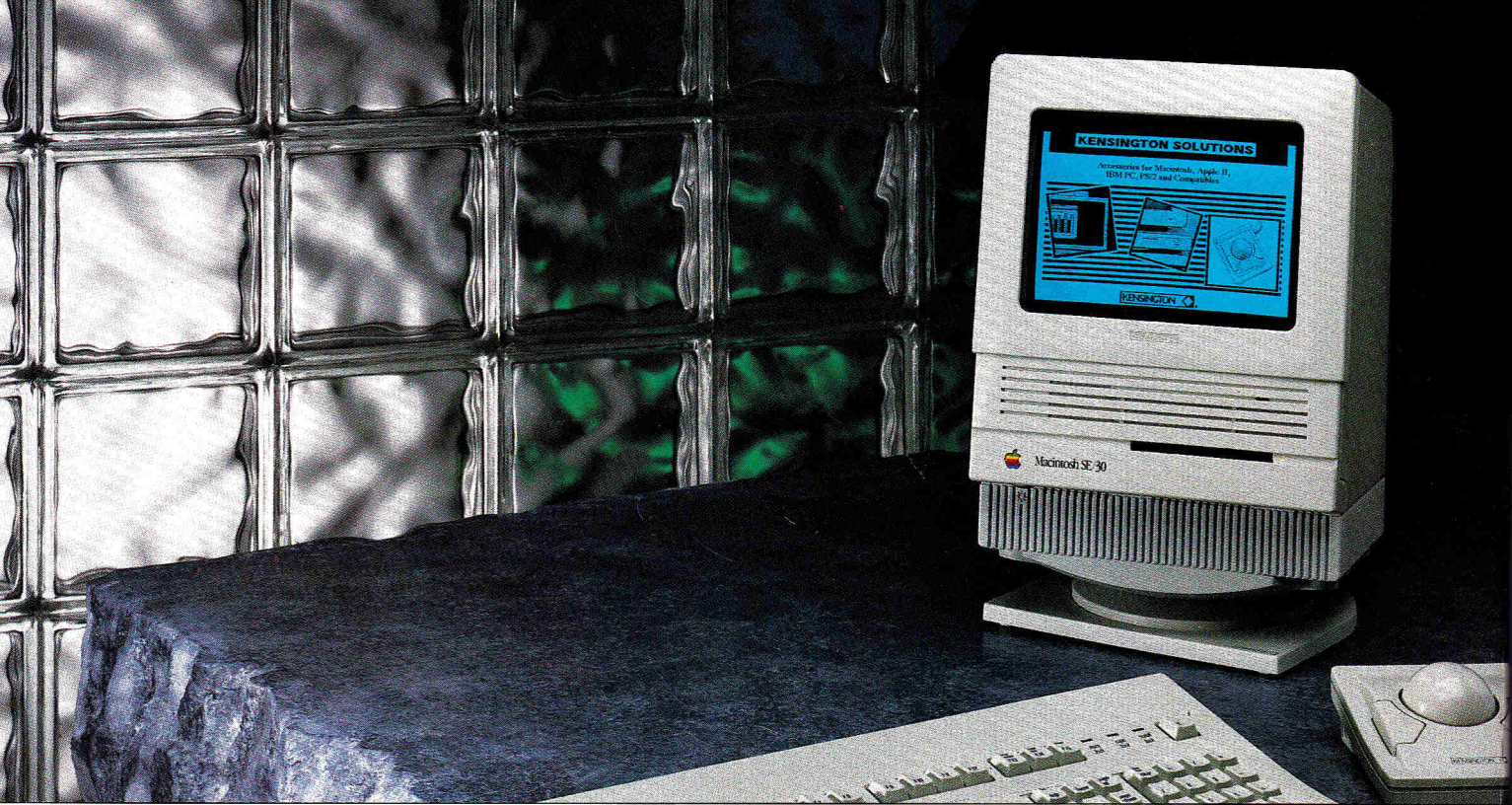
 **edmark** corporation  
(800) 426-0856

While there are a few programs that use the Apple IIIGS<sup>®</sup> 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<sup>®</sup> become the voice standard for educational computing. Call the telephone numbers listed above to find out more about these great programs.



Circle 92 on Reader Service Card.



# EYESORE VS. EYE PROTECTION

As today's monitors get bigger and brighter, anti-glare filters become less of an option and more of a necessity.

The right filter can combat eye fatigue, help eliminate headaches, even reduce overall body stress.

Yet, the irony is that something so good for your eyes can be such an eyesore.

In fact, most filters look like they belong to someone else's system.

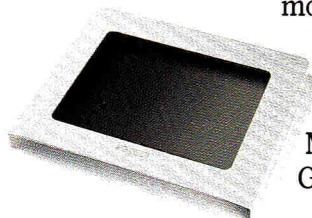
The fit is sloppy. The colors don't match. The materials are different.

Kensington has a different idea.

Instead of making a filter that will fit on any monitor, we make filters

that will only fit a *specific* monitor.

An example is our Maccessories® SE Anti-Glare Filter.



It looks so much a part of the SE, you would think it was designed by the same people who designed the SE.

The styling is complementary. The color identical. Even the same material is used.

And unlike generic filters, the fit is perfect. So light passes through the filter, never around it.

Kensington uses only optical quality glass with a ceramic anti-reflection and scratch-resistant coating.

The result is a 96% reduction in glare. And an improvement in contrast and clarity of up to 20 times.



In short, the most advanced eye-protection system you can find today—it even filters out VLF and ELF radiation and dissipates static.

Kensington has custom designed screens for the Mac, Mac Plus, Mac SE, Apple IIGS, as well as for the entire Mac II family of large screen monitors.

For a free brochure, and the dealer nearest you, call 800-535-4242. In New York call 212-475-5200.



**KENSINGTON** 