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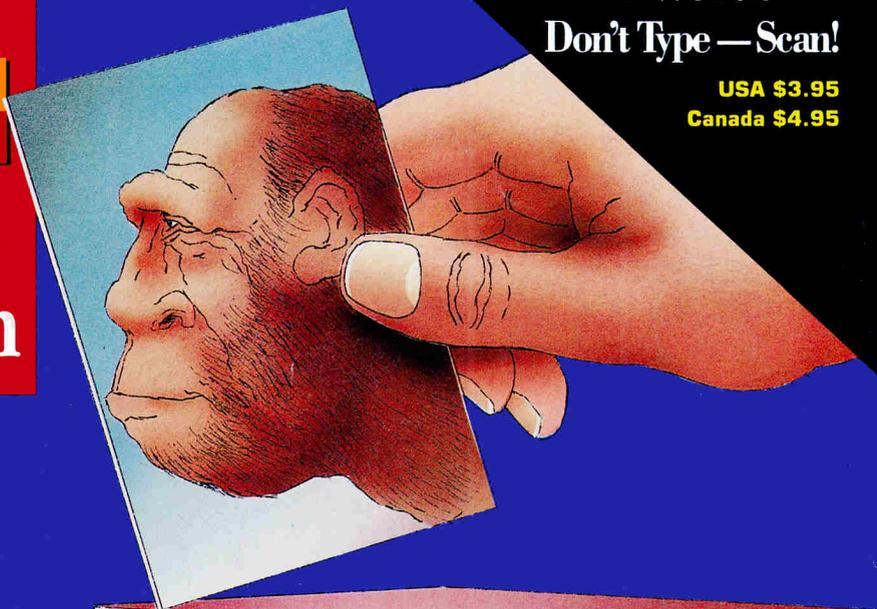
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**Apple II / Macintosh**



# **HYPERCARD**

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For the IIGS and Mac?**

**Plus— the 10 Best  
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**CD-ROM  
COMES OF AGE  
14 Discs Compared**

**GRAPHICS TIPS  
Getting Started**

**REVIEWS**

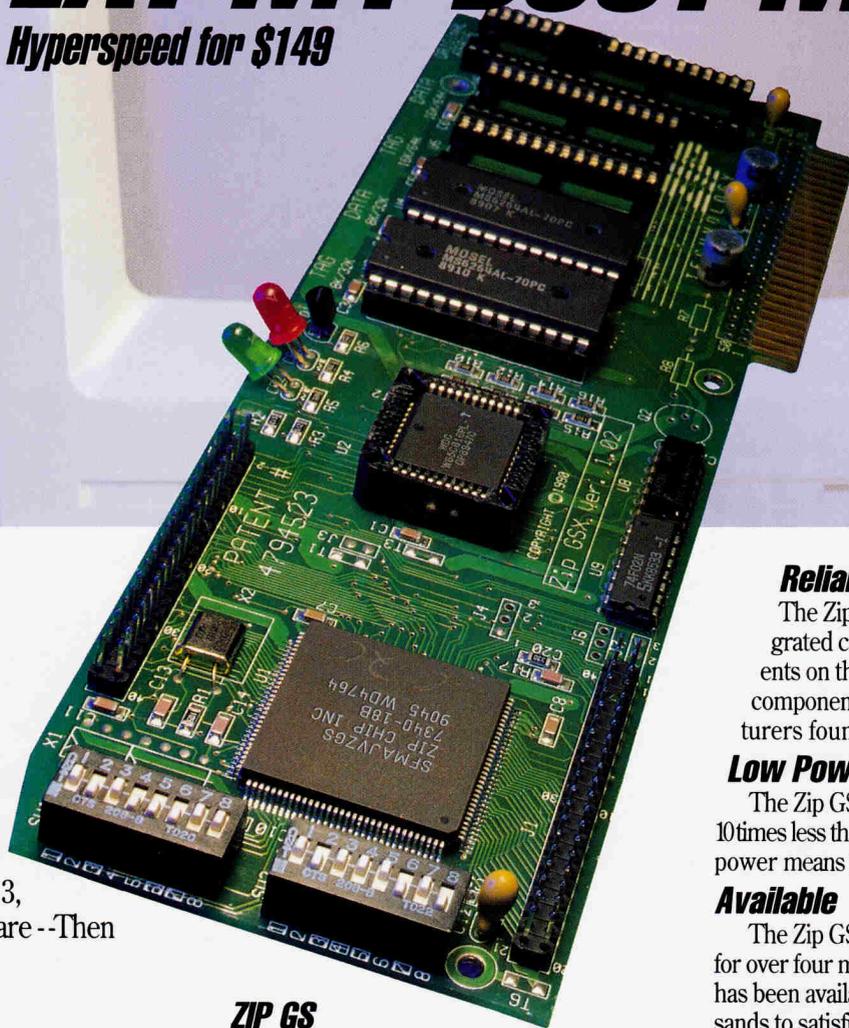
**Low-Cost 3.5-inch  
Drives Compared**



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GS+ Magazine



## If You Use...

- Appleworks GS
  - Managing your Money
  - Printshop GS
  - HyperCardGS
  - Springboard Publisher
  - DeluxePaint
  - Quicken • Publish it 3,
- or any other GS software --Then you need a Zip GS.

## Here's Why...

To use powerful programs you need a powerful computer. Apple Computer left one thing out of the IIGS when they designed it...speed. The Zip GS puts the speed back in. The Zip GS comes standard with 8 K cache memory and runs at a very speedy 7 Mhz. The Zip GS gives you all the speed you need now and in the future because it's expandable. You will never have to buy another accelerator card again. All upgrades are available now.

Can you imagine the time you will save having your GS running up to 10 Megahertz faster. Appleworks performs like you always thought it should, recalculations in the blink of an eye. Word processing faster than on the new line of Macintosh computers. Nibble magazine said it this way "Apple Computer take note: this chip makes a full featured GS word processor faster than several Macintosh word processors running on a monochrome display." (monochrome display is the fastest) Hallelujah! **ZIP GS DELIVERS!**

## ZIP GS

- Is very easy to operate.
- Needs no special boot-up.
- Provides Macintosh speeds for your GS
- Is compatible with all GS hardware and software.
- Uses 1/10 the power of competing boards.
- Address all memory.
- Upgradable to 64 K cache memory.
- 16 variable speeds at the touch of a key.
- 30 day money back guarantee and a 1 year warranty.
- Upgradable to 10 megahertz.
- Fully DMA compatible.

## Installation

Anyone can install the Zip GS in a matter of minutes. To help with the installation, we include an animated pictorial instruction manual which gives detailed instructions on installation and operation.

## Upgradable

The Zip GS can be upgraded at any time. Zip Technology has available upgrade kits that boost the speed to 10Mhz.! We will be happy to do the upgrade labor for free within 48 hours.

## Reliable

The Zip GS has only one custom integrated circuit. The other three components on the Zip GS are the same reliable components from the same manufacturers found in your GS Computer.

## Low Power

The Zip GS requires only 120 ma of power- 10times less than other accelerators. The low power means it will always run cool.

## Available

The Zip GS has been available and shipping for over four months. In the short time that it has been available, we have delivered thousands to satisfied customers around the world.

## Special Introductory Offer

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#### CONTENTS OF SOFTDISK G-S # 13

**REFLEXION** — Send your Alcorian Hyper-Marbles across the grid of Time and find the mysterious objects in Three-Space! A puzzle game with clean graphics and fun sounds.

**PS VIEWER-IMAGES** — This month's Print Shop Graphics features school images and some cool aliens.

**HACK ATTACK LEVEL SET** — Here's a new load of bricks to blast on your way to Doh! Load it into Arkanoid II and try to beat it!

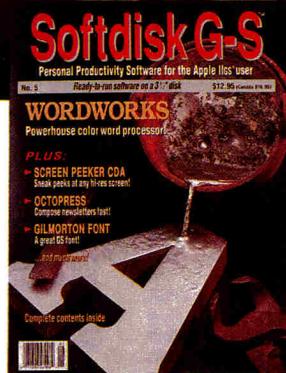
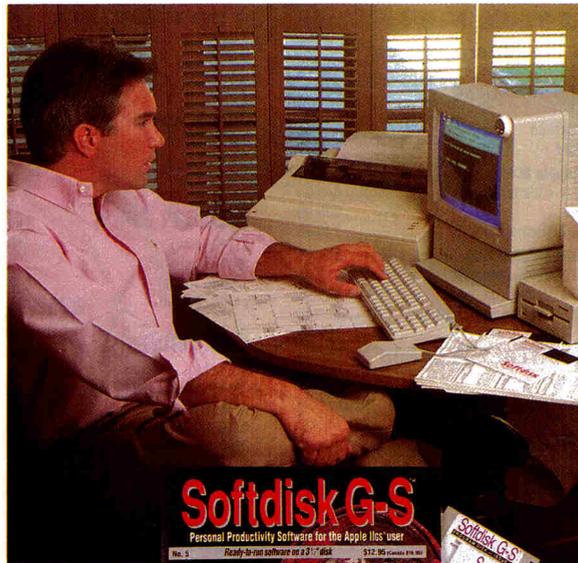
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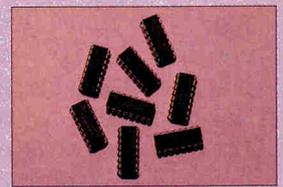
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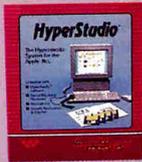
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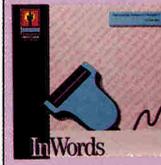
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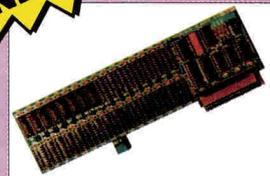
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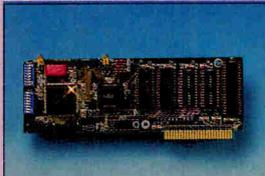
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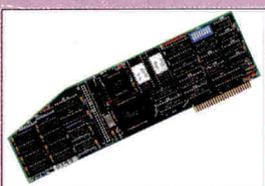
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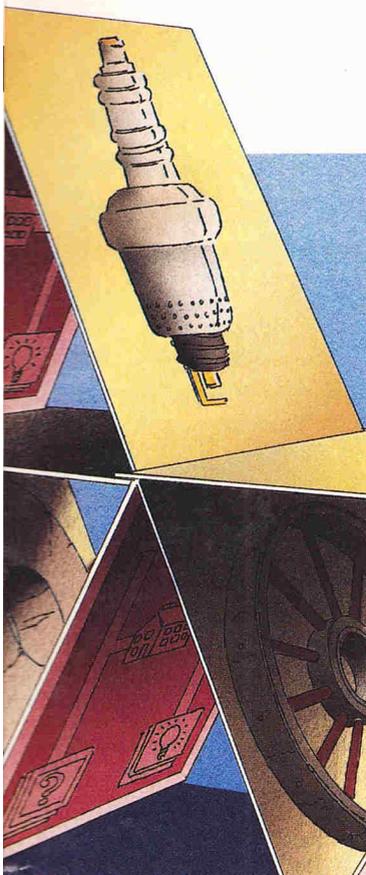
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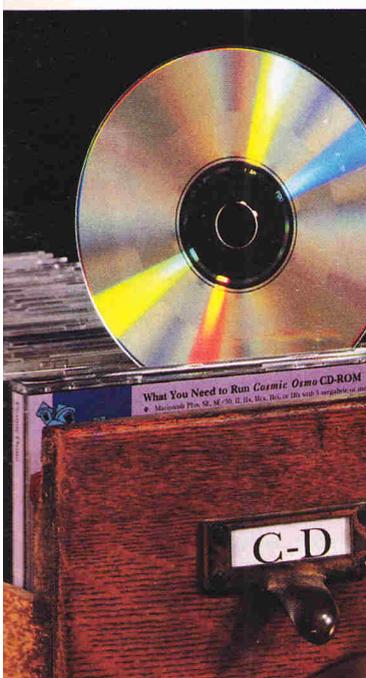
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Students and teachers have used the Mac-based HyperCard software system to produce astounding multimedia results — and the GS version promises to open the door to still more kids and educators who want to try their hand at this new kind of creative programming.

### 40 **Hyperstacks Done Dirt Cheap**

The hypermedia revolution puts the power of programming into the hands of Apple users at all levels of experience. *inCider/A+* presents a sampling of shareware applications for HyperStudio and Mac HyperCard, available from user groups, BBSes, on-line services, and disk houses. Explore an exciting new dimension in teaching, learning, and entertainment.

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**INCIDER'S  
VIEW**

## WHAT'S NEW

By **DAN MUSE** \* EDITOR IN CHIEF

**W**e're left  
with one question  
for HyperCard  
and CD-ROM  
developers:  
Why ignore  
the IIGS?

WHEN DOES SOMETHING NEW STOP being new? To some people, a new car stops being new when you stop inspecting it for the smallest ding before you drive it. After you wear a new tie once, it's old. A new dog becomes old when you can no longer teach it new tricks. And to many, a new technology ceases to be new only when you can actually use it productively.

Weary computer users tend to run when they hear "new" and "technology" mentioned in the same sentence — and with good reason. If you can't rely completely on the hardware and software you use in your home, school, or office, how valuable can it be?

This month, *inCider/A+* explores two new technologies. But in this case, new doesn't mean unproven. HyperCard and CD-ROM (compact-disc read-only memory) have been evolving for years; it's just their adoption by educators, and computer users in general, that's new.

In fact, CD-ROM is probably the computer industry's oldest new technology. CD-ROM has been looking for an application for more than five years. At first, CD-ROM appeared headed for business, where large databases that had traditionally lived on mainframe and mini-computers could move to a PC-based CD-ROM drive. What has legitimized CD-ROM, however, — and what we think will drive it in the future — are education and entertainment products.

The other "new" technology we cover this month is HyperCard. In many ways HyperCard and CD-ROM were made for each other. CD-ROM discs can store hundreds of megabytes' worth of graphics and text, and HyperCard provides an intuitive interface that makes it easier to access that data. To really put the power of HyperCard to good use, you need a large storage capacity. For example, HyperCard is perfect for tracing the events of the Civil War. But how creative can developers get with sound, graphics, and text when they're limited to floppy disks? A marriage between the two technologies is natural.

We're impressed by both HyperCard and

CD-ROM, but we're left with one question for developers: Why ignore the IIGS? As author Carol Holzberg prepared her list of discs to review, the lack of Apple II products was staggering. Apple's CD SC drive is a SCSI (small-computer-systems interface) device, so it works with an Apple II and SCSI card. And it should go without saying that the II is still the most widely used computer in schools. So what's the problem?

We're also anxious to see HyperCard IIGs take off. As Gregg Keizer discovered, teachers around the country are doing some amazing things with HyperCard on the Mac. As we've reported in the past, they're also producing some stunning stacks with Roger Wagner's HyperStudio. We're hoping HyperCard IIGs finds its niche — a niche that seems fairly well defined already. Teachers who know how to use HyperCard on the Mac can jump right into HyperCard IIGs. With a million GSeS out there, there's certainly an installed base to sell to. Even if the Mac LC does what Apple hopes it will do in the classroom, the GS has a hefty head start.

HyperCard IIGs isn't for the thrifty GS owner, though. And that causes Apple a bit of embarrassment. The standard IIGs with one megabyte of RAM (random-access memory) and no hard-disk drive can't run HyperCard IIGs. For that reason, Apple doesn't include HyperCard IIGs with every GS, unlike the Mac version. In addition to buying HyperCard IIGs, you'll need to add a hard-disk drive and extra memory — the more the better — to use HyperCard IIGs. You should probably have an accelerator, too.

HyperCard and CD-ROM offer both educators and parents a rare combination of power, ease of use, and creativity. Judging from the number of HyperCard stacks and CD-ROM discs available, software publishers have recognized that fact. What they apparently fail to see is what they'll miss if they don't include the Apple II in the new-product picture. Apple IIGs owners have the technology; all they need are the products. □

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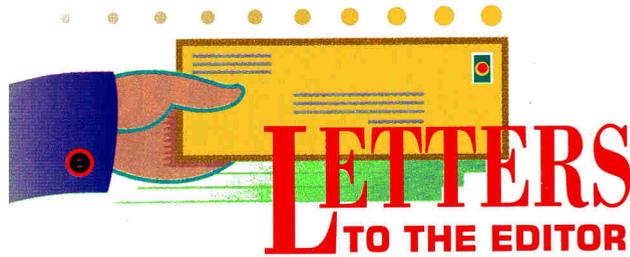
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## HYPERBIAS

I'VE BEEN AN APPLE II USER SINCE 1978. I've also been a Mac user since 1985. I've used both for multimedia for many years; therefore, I read with interest Roger Wagner's letter in the February issue. (See "The Apple IIGs: What the Mac LC Should Have Been?" p. 13.) I've observed the progress of Mr. Wagner and his company for many years and I respect him a great deal, so I was surprised by the inaccuracy and bias I found in almost all his arguments.

Mr. Wagner states that the Apple IIGs is superior because it can be connected to a monitor or TV, and that to do the same with a Macintosh would cost \$2000 or more. This isn't true. There are NTSC converters for the Macintosh priced under \$500, and Apple itself provides (but doesn't warrant or support) the cheapest option — the Apple Video Card Utility, which is free. This software, combined with a cable you can make for under \$15, lets you display Macintosh video on a classroom monitor. You can use any TV by adding a \$10 RF modulator or connecting through a VCR, which in many schools is already attached to the TV cart. And, you can then record the output with the VCR. I've used the Video Card Utility with HyperCard stacks and it works amazingly well.

Mr. Wagner also claims that "to just draw a line or two in color you'll need a IIGs with HyperCard or HyperStudio." I find it hard to believe that he's never heard of SuperCard, PLUS, AuthorWare, or Macro-mind Director, all of which provide multimedia support with color graphics, and run rings around HyperStudio and HyperCard IIGs.

He alleges that to use the microphone on the LC you must leave HyperCard and

run a separate program. The Audio Help Stack, which comes on the hard disk of every LC, lets you record and even edit sounds without leaving HyperCard. You can incorporate those sounds into your stack with a single command.

I can only partially refute his last point — that stack building on the IIGs is easier. Obviously, stack building with HyperCard on the IIGs is the same as it is on the Mac. It may be easier with HyperStudio, but only because HyperStudio can't do as much, therefore limiting the choices and skills required.

I agree wholeheartedly that the IIGs isn't outdated technology and that it's a terrific multimedia computer. Its graphics screens are adequate, its sound capabilities are awesome, and the Apple II Video Overlay Card is a steal at \$500. But as an open-minded and devoted supporter of both the Apple II and the Macintosh, I felt that Mr. Wagner's lopsided comparison begged a rebuttal. The Mac LC may be more expensive, but its multimedia capabilities exceed those of the IIGs.

**Jim Taylor**  
Manager  
Microcomputer Support for Curriculum  
Brigham Young University  
69 South 400 East  
Orem, UT 84058

## RESPONSIBILITYWARE

AFTER READING SO MUCH ABOUT the work of Brian Greenstone and Dave Triplett in your magazine, I decided to purchase a couple of their shareware games, including Cosmocade. When I got it up and running, I saw their message to the people who use their games and don't send in the shareware fee;

they say that they didn't finish Cosmocade and aren't going to do any more work for the GS if they don't get some real support.

To all readers: If you own an Apple, you probably have a copy of at least one shareware product. Why haven't you sent in your money? Apple users are always crying for support, but when we finally get it, we're willing to let it slide down the drain because we're too cheap to part with a measly \$15. If you never use a shareware program, fine; throw it out or pass it on to someone else. But if you're using shareware without paying for it, don't complain when there isn't any software around anymore. It's your own fault.

**Ruel Smith**  
Cincinnati, OH

*We couldn't have said it better ourselves. — eds.*

## WHERE CREDIT IS DUE

AS THE PRESIDENT OF PELICAN Software, I want to thank you for the excellent review of SuperPrint II, distributed by Scholastic Inc. (See October 1990, p. 32.)

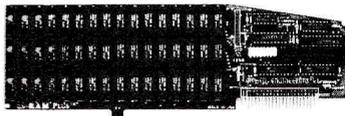
Pelican welcomes all reviews — the ones that point out flaws in our programs (nah, we never have any flaws), the ones that keep us on our toes, and the ones that are so positive I buy tons of copies of *inCider/A+* to give to our friends and family. Traditionally, though, software reviews ignore the developers of the product and mention only the publishers.

My staff — Susan Swanson, Ken Grey, Lester Humphrey, and all our wonderful artists — are the force behind the concept, interface, look, and feel of SuperPrint. I believe that software products should be reviewed as if they were movies. Academy Awards aren't given to a film's distributor; ↵

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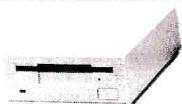
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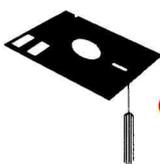
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# LETTERS TO THE EDITOR

they're given to the actors, directors, producers, and so on. Thanks again for your kind review.

**Joel Fried**  
**President**  
**Pelican Software**  
**768 Farmington Avenue**  
**Farmington, CT 06032**

*Let's have a hearty round of applause for all the unsung developers out there. Where would publishers be without products?* — eds.

## DESKTOP VIDEO

**A**FTER MONTHS OF READING every article you had that mentioned the Apple II Video Overlay Card, I decided to get one and breathe the new life into my VCR Companion software. Unfortunately, I discovered my Apple IIe wasn't "Revision B" and that the Overlay Card wouldn't work. I still want to overlay some basic things on video and to move up into more varieties of such software. Should I get a IIgs or should I go ahead and get a Macintosh? How cheaply can I get into desktop video on the Mac?

**Clarence E. Mosley**  
**4314 N.W. 9th Avenue #140**  
**Pompano Beach, FL 33064**

*For basic video editing and creation, it's less expensive to buy an Apple IIgs than a Mac, primarily because the IIgs has composite output (via RCA plug) built in. In a word, you can't get into desktop video cheaply on a Mac.* — eds.

## FOREIGN-LANGUAGE DIFFICULTIES

**F**ROM READING THE LETTERS TO the Editor in your December 1990 issue, I can see why more teachers haven't gotten involved with foreign-language word processing. The need for configuring AppleWorks with special add-on programs has always made me feel as though I had to pay electronic dues to word-process in another language. It simply shouldn't have to be that way. The simplest program I've found to do foreign-language word processing is Classroom News International, by Educational Activities (\$65; 1937 Grand Avenue, Baldwin, NY 11510). It's effective enough to quickly take care of my tasks as a foreign-language/ESL director and easy enough to use with students to create classroom newspapers. The program simply doesn't require that you have a specific level of computer knowledge to be able to accomplish your tasks.

**Lynda Hamlett**  
**Foreign Language/ESL Director**  
**Amityville Schools**  
**Long Island, NY**

## QUALITY SERVICE

**D**URING MY CHRISTMAS VACATION from teaching high school, I tried to install a Q-Drive and EasyDrive that I had purchased at Quality Computers' open house in December. I had a lot of

## CORRECTIONS

In our February issue (p. 96), we incorrectly implied that our Editors' Choice, Pipe Dream, was available only for the Apple IIgs. Pipe Dream is 8-bit software and will run on earlier versions of the II as well.

In "A New Approach to Personal Finance" (March 1991, p. 66), the update price for TaxCalc-90 on 5.25-inch disk by Perfect Solutions Software was priced incorrectly as \$44.95; it should be listed as \$24.95. In addition, the information on Sierra On-Line's

Smart Money program contains inaccuracies. According to a spokesperson for the company, Sierra On-Line is discontinuing its productivity product line; 8-bit Apple IIe/IIc and 16-bit IIgs versions of Smart Money are still available while supplies last. Sierra On-Line has never offered a Macintosh version of Smart Money.

Frontier Technologies ("Apple II to Mac and Back," March 1991, p. 77) has a new address: 2128 Scotten, Detroit, MI 48209-1667.

trouble, so I called the company and talked to a service representative named Walker Archer. We determined that my EasyDrive software was defective. He said that he'd send me a new copy.

Within a week I received the new software and again tried installing it. Again, I had problems, so I called and spoke to someone named Steve who spent 30 minutes on the phone with me, but we never got my drive running.

On January 11th, I called again to see if the company was open on Saturday and to ask if I could bring in my computer and drives and have someone install EasyDrive for me. I spoke to Mr. Archer, and when he found out I lived in Westland, he said, "I'm coming to Livonia tomorrow. I'll bring some tools and visit you." I couldn't believe my ears. He arrived with a new Apple SCSI card to try first, and sure enough, my SCSI card was defective. He replaced it and did some double-checking, and my Apple has been running smoothly ever since. Quality Computers means quality service, and Walker Archer has proven that to me.

**George Calder**  
P.O. Box 2306  
Livonia, MI 48151-0306

*This must have been Quality Computers' month. We received several letters praising the company's customer service, but this one was the most unusual. Well done!* — eds.

## DARE WE SAY CONNECTIVITY?

IN A SIDEBAR IN YOUR DECEMBER issue, you mentioned that Pam Michaelson used her Apple IIe with Ultra-Macros to do her word processing, and then transferred those AppleWorks text files to her Mac for desktop publishing with PageMaker. (See "Connecting in the '90s," p. 72.) Last year, my high-school publications staff and I decided to produce our yearbook, newspapers, and literary journal on the Mac. The only hangup was that we had only one Mac and one LaserWriter to use. We overcame that by doing all our word processing in AppleWorks, then taking those text files from IIes to the school's only IIGs so that we could get them onto a 3.5-inch disk for the Mac. We

processed more than 500 text files though Apple File Exchange. It was a logistical nightmare, but in just two class periods a day and some hard work after school we produced four large newspapers, a good-looking literary magazine, and a 232-page yearbook.

In the process, we saved almost \$1000 on the production of the yearbook and cut newspaper production costs in half with camera-ready copy, and the literary magazine almost paid for itself. We also received generous donations of peripherals and software from Claris, MegaGraphics, Altsys, Cal-Comp, and Irwin Magnetics totaling nearly \$5000 in retail value to help us with our desktop-publishing venture.

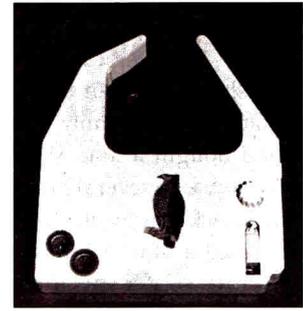
In January, our school district is setting us up with some Mac Classics and we'll become a primarily Macintosh-based publications staff. So far this year, however, we've continued to rely on Apple IIs to do our word processing, and I've no doubt that we'll continue to use them frequently. AppleWorks is a tremendous program that works flawlessly and can be learned quickly. Nothing on the Mac works as easily with students. On the other hand, nothing on an Apple II can compare to Pagemaker for desktop publishing. A smart teacher draws on the strengths of all available resources.

The Mac and the Apple II are perfect classmates. Your publication — and only yours — acknowledges that. Perhaps you're simply the first to declare a truce in the Cold War between the two branches of the same Apple tree. I agree with your contention that there's room for both machines in schools, and that a decision to use one and exclude the other is foolish. Congratulations on your new stance, and I once again look forward to seeing issues of *inCider/A+* in our library.

**Martin Fullington**  
Publications Advisor  
21 Forest Ridge Drive  
Arden, NC 28704

## CUSTOMER SUPPORT

I FOUND YOUR DECEMBER 1990 issue of *inCider/A+* most interesting. I started off with a IIGs and have since jazzed it up with all the goodies I could plug into the slots — increased memory, modems, internal/external hard drives,

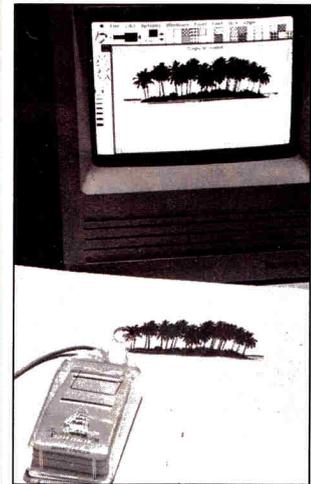


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and so on. This is truly an all-purpose machine that meets my family's needs.

Last year I bought a Mac SE/30, and have since purchased several peripherals and software packages for it. Now that I have a IIGs and a Mac, I find that I'm better able to assign a specific task to whichever machine is more efficient at it. Don't throw out your old computer — use it next to your new one!

Primarily, though, I want to say that the treatment I got from dealers and developers of IIGs products affected my Macintosh purchasing decisions. The companies that gave me good on-line support in the past got my orders for new hardware and software. As far as my money is concerned, the companies that made me listen to elevator muzak or a busy signal, or fight my way through a phone-mail system, can go to the Nintendo market.

I'd like to remind dealers and developers (especially mail-order houses) that we computer users like to talk about you, and

bad news tends to go around much faster than good. Developers also need to remember that a company that fails to offer continuing support (or at least inexpensive upgrades) for an older product will leave us wondering what will happen when its latest offering reaches its second or third birthday.

**Daniel J. Kenny**  
1522 North Lantana Street  
Camarillo, CA 93010

**FAMILY COMPUTING**

I SUPPOSE I WAS MEANT TO BE A Macintosh user — young urban professional, three children, fast-paced life, and so on. My son, however, is visually impaired, and a graphical user interface is no friend to those without excellent sight. Thus, we made the somewhat anachronistic purchase last year of an Apple IIc Plus with a Street Electronics speech synthesizer.

The pleasant surprise has been the use-

fulness of the computer and the fun it has brought to our home. All of our children, even the 2-year-old, use it daily. My wife, an avowed computerphobe, keeps all her small-business records on it. And I'm convinced that operating in a text-based environment with AppleWorks and Proterm is simply the fastest, easiest, most user-friendly solution to all my computing needs.

I use PCs and a DEC system at work, and often fool around with Macs at friends' homes, but I've yet to find anything to top my two favorite programs on my IIc Plus. And, now that I have a 32K memory-expansion card in my ImageWriter, I can really produce!

**Bruce Williams, M.D.**  
7 Manning Street  
Lexington, MA 02173

*The American Printing House for the Blind (APH, Box 6085, Louisville, KY 40206, 502-895-2405) is another excellent source of materials for the visually impaired.* — eds.

*"My own favorite simulator...is Design Your Own Train (he was comparing Railroad Tycoon, PC-Railroad, and Design Your Own Train). I like laying out the road without having to worry about costs and grades and bridges, and I love switching trains around tracks and stations without regard to economic factors. I'm totally enthralled by railroad collisions..." Don Trivette, PC Magazine, Nov. 27, 1990*

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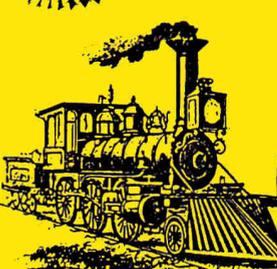
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**IN SEARCH OF CD-ROMs**

I'VE INSTALLED GS/OS SYSTEM 5.0.4 on my hard disk and have discovered that it contains a CD-ROM interface. I haven't seen any ads for CD-ROMs for the IIGs and am wondering what's available and where I can get them. Also, can I add a CD-ROM player as part of a SCSI daisychain?

**John Croft**  
60 Verde Drive  
Santa Cruz, CA 95060

*CD-ROM technology for the Apple IIGs is currently limited to developer technical-support mailings and two commercial discs. To answer your second question: Yes, you can use a CD-ROM player as part of a SCSI daisychain. See "CD-ROMs Come of Age" in this issue, p. 44, for details on hardware options and disc products available for the Macintosh and the IIGs.* — eds.

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# WHAT'S NEW



edited by Paul Statt

## APPLE ROLLS OUT!

**W**e're especially excited about the Macintosh LC," said Bernard Gifford, Apple Computer's vice president of education, at a recent **Apple Education Solutions Forum** in Tampa, Florida, "because [the Mac LC] represents a new horizon in education and incorporates many features that educators have long been asking for."

The capabilities of the Mac LC were the center of attention in every city where the Apple Education Solutions Forum stopped, strutting its stuff in San Francisco, Long Beach, Tampa, New York, and Chicago. "With the LC now shipping," Gifford said, "we thought it was extremely important to 'hit the road' so our customers could see for themselves the results of their input."

Evidently Apple's customers have been asking for better sound input and output, better color graphics, more multimedia applications, including CD-ROMs and videodiscs, foreign-language software, integrated learning

systems for AppleTalk networks, administrative tools, and problem-solving software.

Apple also announced two new software guides for educators, which are available at no charge to teachers and administrators. The **Macintosh Educational Software Guide 1991** reviews more than 450 titles in business and vocational training, early learning, fine arts, foreign language, language arts, math science, and social studies. It also includes articles on the use of Macintosh computers in special education, bilingual education, multimedia,

networking, and integrated learning systems. The smaller **Macintosh Administrative and Teacher Productivity Guide** describes 250 programs for people who work in schools. You can order either guide

by writing to Macintosh Educational Software Guide

1991 or Macintosh

Administrative

and Teacher

Productivity

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Computer,

20330

Stevens

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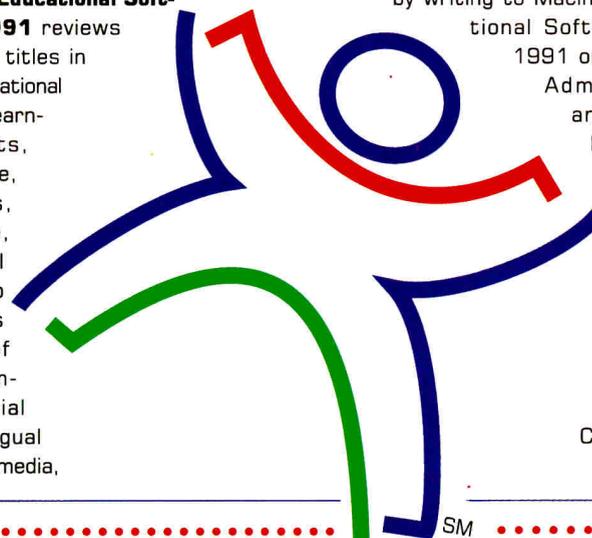
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Cupertino,

CA 95014.

— P.S.



### You Can't Beat This Offer!

**R**oger Wagner Publishing has an unbeatable offer for any school that has an Apple IIgs and wants to see what all the talk about "multimedia" means: a complete **Multimedia Test Drive Kit** you can try at no charge, including copies of the company's HyperStudio software, with microphone and audio-digitizing software. The publisher is also working with manufacturers of such multimedia hardware as touch-window screens, scanners, videodisc players, and video digitizers to lend teachers all the equipment they need. The Multimedia Test Drive Kit also includes a 50-page workbook for conducting a one- or two-day workshop. Roger Wagner, president of the company, wants the world know that "the tools for the effective use of hypermedia are available right now. The only remaining obstacle is a simple lack of information and experience. We're happy to provide this package as a significant breakthrough in giving teachers an immediate and hands-on way to find out about hypermedia." For details, contact Della Smith at Roger Wagner Publishing, 1050 Pioneer Way, Suite P, El Cajon, CA 92020, (800) 421-6526.

### THE FRENCH CONNECTION

The quality of French software for the Apple IIgs is undisputed: Programs such as Photonix and Modulae are public-domain stars in this country. But now a new company called ToolBox — ironic, because most French software for the GS eschews the use of Apple's tools — will be selling some of these popular programs retail.

The first title from ToolBox (6 Rue Henri Barbusse, 95100 Argenteuil, France, telephone 0 11 33 1 30 76 18 64) will be PHOTONIX II, priced at \$45, plus \$5 for airmail shipping. Toolbox describes it as "that crazy copy program" you

may have seen duplicating disks at lightning speed using a witty, unique "spaceship" interface. The Photonix II package now includes written instructions in English and can copy Macintosh disks, too. It's been upgraded to work with any Apple IIgs, and can be copied easily to a hard-disk drive.

In France, ToolBox produces a GS publication called "ToolBox Mag" — in French only — and has just released a book called "Le IIgs Épluché" ("Peeled" or "Examined Closely"). Look for American versions of Tarot, Bouncing Bluster, and Space Shark soon. — P.S.

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# + = MATH ÷ SOFTWARE

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Math teachers with Macs don't have to master Mathematica, the high-powered, high-priced program that's changing the way colleges and universities teach "the queen of sciences." But even Mathematica is now available in a less-expensive basic version that may be more suited for secondary-school math teachers. The **MATHEMATICA STUDENT VERSION** for the Macintosh costs only \$139, from Wolfram Research. For more information, contact the company at P.O. Box 6059, Champaign, IL 61826, (217) 398-0700, or circle number 352 on the Reader Service card.

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**G**eometry is the visual side of mathematics, so **The Geometer's Sketchpad**, from Key Curriculum Press, is a natural for the Mac. It does for geometry what the calculator did for arithmetic: It's a tool for constructing geometric figures on the computer, which the student or teacher can then manipulate. It offers tools for locating and labeling points, constructing circles, and drawing lines. Using these basic tools, you can manipulate and measure almost any geometric figure. The Geometer's Sketchpad is designed for use in grades 8 through 12, and is filled with lesson plans and ideas for teachers. It's priced at \$169.95. For more information, contact Key Curriculum at P.O. Box 2304, Berkeley, CA 94702, (800) 338-7638, or circle number 353 on the Reader Service card.

\*Algebra teachers may take more comfort from **Algebra Xpresser 1.1**, \$149 from William K. Bradford. It's a symbolic manipulator and graphing program that expands, calculates, simplifies, solves, and charts algebraic expressions. It's combined with Bradford's **Graph Wiz 1.2** (a \$99 value), a powerful function and relation plotter that illustrates graphs of algebraic and trigonometric equations and inequalities. For more information, contact the company at 310 School Street, Acton, MA 01720, (508) 263-6969, or circle number 354 on the Reader Service card.

\*Another use for the Mac during or

after algebra class is **Missing Link Software's Algebra I Homework Tutor**, a program that walks students through the solution, simplification, and factorization of equations, inequalities, and expressions. Homework Tutor helps in any of three ways: by checking each step of the student's work, by showing similar examples, or by actually telling the student what to do at each step of the problem. The effortless way in which it catches careless errors in arithmetic or punctuation and prints neat results without crossing out makes it popular even among the best students. Algebra I Homework Tutor costs \$120 from Missing Link, 67 Pupek Road, South Amboy, NJ 08879, (201) 721-2569. Circle number 355 on the Reader Service card for more information.

\*A teacher who's just looking for a good way to draw graphs need look no further than **GrafEq**, a full-featured equation grapher from Pedagogy Software. GrafEq is sold as a school site license for \$200; each student can then buy a copy for only \$20. GrafEq draws just about any graph you might need in high-school math classes: polynomials and trigonometric, with Cartesian or polar coordinates, as well as some "precalculus" graphs such as derivatives. It offers outstanding control of the size, shape, and scale of the finished graph, and flexibility in printing. For more information, write Pedagogy at 4446 Lazelle Avenue, Terrace, BC V8G 1R8, Canada, or circle number 356 on the Reader Service card.

## GS GAMES ARE GREAT!

**T**he Apple IIcs continues to attract game developers. Strategic Studies Group and Victory Software are two such companies that have released new titles.

SSG's **PANZER BATTLES** is a vivid re-creation of armored warfare on the Russian Front in World War II. That front, between Nazi Germany and the Soviet Union, was probably the greatest concentration of military armor the world has ever known. Panzer Battles uses SSG's land-combat system to simulate six famous struggles: the encirclement at Minsk, 1941; the Gates of Moscow, 1941; Prokhorovka, 1943 — probably the greatest tank battle ever; Kanev, 1943; and Korsun, 1944.

Panzer Battles illustrates the freewheeling attacks and counterattacks of the elite German SS and Army Panzer Divisions and the Russians' Siberian Shock Troops and Guards Tank Army. Panzer Battles requires a GS with 1 megabyte of RAM and at least one 3.5-inch disk drive; it's not copy protected, and it sells for \$45.

For more information, contact the company at 1747 Orleans Court, Walnut Creek, CA 94598, (415) 932-3019, or circle number 350 on the Reader Service card.

Victory Software promises that **2088: THE CRYLLAN MISSION: THE SECOND SCENARIO** will be "completely different, and the ending will be shocking!"

But it isn't only the plot of this completely independent game (you don't even need to know what the first Cryllan Mission was) that's new. The computer/player interface has been enhanced: Most frequently used menu options are displayed as easy-to-use buttons. Interactive conversation with characters has been added, and movement has been accelerated more than 80 percent, resulting in faster, more rewarding play.

Like the original Cryllan Mission, **The Second Scenario** begins on the planet Crylla with the bad news that the crew of the USS Houston is missing. The resemblance ends there, however: Victory Software has redesigned the planet and added five new lands, as well as redrawn all the dungeons and monsters — and there are twice as many monsters.

If you played and conquered the first Cryllan Mission, you'll enjoy this new challenge. If you're a fan of role-play multiplayer adventures, you shouldn't be a stranger to Crylla — don't wait — visit it today.

For more information, contact Victory Software, P.O. Box 821381, Houston, TX 77282-1381, (713) 493-3232, or circle number 351 on the Reader Service card.

— P.S.

## ▼ NOTES from the AppleWorks Programmers Association

### Users & Programmers Sharing the Power to Create

**AW Tip:** Speed up AppleWorks! Users with a 128K single or dual 5.25-inch disk-drive system can eliminate much of the disk swapping necessary with AppleWorks 3.0 by creating **specialty AppleWorks disks**, containing only the program segments required for the word-processor, database-manager, or spreadsheet module you're accessing. Make a separate specialty disk for each module. You'll find instructions in the AppleWorks 3.0 reference manual (Appendix B).

Another suggestion: **Create a boot disk** including ProDOS 1.9 (for an earlier version of ProDOS patched with Bird's Better Bye) together with Basic.System and a one-line BASIC STARTUP program: 10 PRINT CHR\$(4);"BYE". Remove the ProDOS file from the specialty disk to gain just enough disk space to install TimeOut UltraMacros. Then start AppleWorks from the boot disk, remove the boot disk, insert the specialty disk, press the tab key twice, and choose ULTRA.SYSTEM from the ProDOS selector menu. Do all your system and enhancement configuration on your AppleWorks disks (backups, of course) before creating a specialty disk.

**Adding a 3.5-inch disk drive or hard disk** to your Apple II system lets you place all your AppleWorks program files into one directory (folder); this eliminates disk swapping and enhances ease of operation and speed. Recent SCSI hard-drive systems will dramatically increase access speed. These larger storage devices are especially desirable when adding TimeOut and other enhancements to AppleWorks. (For more information, see the "Hard-Disk Drives Made Easy" series beginning in the January 1991 issue.)

**Increasing the amount of random-access memory (RAM)** available to your Apple II will also enhance AppleWorks' operation and speed. Increased memory provides for larger desktops and file size. (Various **add-on memory cards** are available from several vendors; call for advice on size and installation.) AppleWorks 3.0 preloads into this expanded memory; if enough is available, the entire program preloads and the need for later disk access is eliminated. The APA suggests at least 1 megabyte of memory for most serious AppleWorks users.

Another hardware answer for improving AppleWorks' performance is to increase your computer's processing speed by **adding an accelerator card or chip to your system**. Speeds of up to eight times the standard 1 megahertz are possible. Spreadsheet users might also investigate the advantages of speeding up calculations with a math coprocessor board.

How about software solutions? A program called **AppleWorks 3.0 Companion** from Beagle Bros includes a patch to reduce the 9999-row spreadsheet to a faster-calculating 999 rows. **SpellCopy** from Jem Software can speed up the AppleWorks spell checker by moving its dictionaries to a RAM disk. **TimeOut UltraMacros** from Beagle Bros can save considerable time by automating routine keyboard input, navigation, and more. **SuperPatch 7.0** from Q-Labs offers "hotkey" and other patches that eliminate routine keystrokes.

Speeding up AppleWorks' operation by one or more of the suggested methods outlined above promises to increase productivity and make the program even more enjoyable; it's especially cost effective for small-business applications. With the proper enhancement, Apple-

Works has the speed and productivity to serve almost every home, school, and small-business need.

**AW Enhancements: Patcher 1.5** is freeware created by the staff members of Beagle Bros. It's a menu-driven program that fixes several annoying bugs in AppleWorks 3.0. Patcher is compatible with virtually all AppleWorks enhancements. What kinds of bugs are we talking about?

- In the AW word processor, Control-C, Control-N, Control-P, and Control-R make the cursor jump to the top of the file.
- In the word processor, you can't clear a tab ruler in a header/footer after you use it.
- The database manager can't print multiple copies of a report.
- The spreadsheet adjusts formulas incorrectly when you delete more than 255 rows.
- Deleting the default printer creates problems adding a new printer.
- Text-file importing to the database manager is flawed.
- OA-Right Arrow locks up both the database manager and the spreadsheet, with the cursor jumping out of the work area.
- The AW database manager behaves erratically when you use the open-apple key in combination with the period or greater-than sign as a command to go to the last category.
- Saving to an existing file you've

locked doesn't work properly: The temporary AWTEMP000 file isn't removed.

Patcher 1.5 fixes these bugs among others, plus some problems with earlier Patcher versions. You can get a copy from most Apple user-group disk libraries, your local club's Beagle Buddy, or on line. Patcher is also included in the monthly APA disk prepared for this column as described below.

**AW Macros:** Here's one (see box below) that spell-checks an entry in the AppleWorks database manager. Invoke the macro with Solid apple-V within any entry in multiple- or single-record layout in a database.

**APA maintains files, templates, patches, and information that are available to AppleWorks Classic users. If you have questions or requests, call or write the Pro-APA BBS. Templates, macros, and detailed documentation for items described in this column are available on 5.25-inch disk for \$4 shipping. Include the inCider/A+ issue date with your request. For information contact the AppleWorks Programmers Association, 6531 Lexington Avenue, Los Angeles, CA 90038, modem apa@pro-apa.cts.com (213) 463-9289, or voice (213) 469-9916. The AppleWorks Programmers Association is registered with the Apple User Group Connection.**

#### Setup

```
V:<adb : display #off : Status = peek $8520 : if S = 82 goto ba-v :  
endif : Direction = peek $851d : if D = 68 rtn up : endif : if D = 82 rtn  
oa-tab : endif : oa-z goto ba-v>!
```

#### From single-record layout (called by SA-V)

```
<ba-v>:<all : rtn : up : cell : q = peek $0c54 : oa-Q esc rtn>3<rtn :  
rtn>xx<rtn : oa-o>1m<rtn>0<rtn>rm<rtn>0<rtn esc : print "| PRESS  
ESCAPE WHEN SPELLCHECK COMPLETE |" : rtn rtn : print $0 :  
display #on : oa-V rtn : msg " PRESS ESCAPE WHEN SPELLCHECK  
COMPLETE " : keyto 27 : msgxy 0,0 : msg chr$ 3 : msgxy 4,4 : msg &C&  
: msgxy 0,128 : display #off : oa-q rtn : poke $0c6c,0 : cell :  
esc>4<rtn rtn : oa-Q : print q : rtn : oa-y print $0 : rtn up : if S = 47  
oa-z : endif : oa-q : display #on rtn>! :
```

# We don't recommend plucking your Vulcan™ off a table and dragging it along the ground. But it's nice to know you could.

October 30, 1990

Gentlemen:

*I use my Apple IIGS with a Vulcan and an AE A/D converter at professional waterski tournaments to measure jump distances. I wish to commend you on the durability of your Vulcan Hard Drive.*

*I was using the computer at the U.S. National Waterski Championships in August when a gust of wind picked up the canopy under which we were operating. Wires running to my system were attached to the canopy and when the canopy blew away, it pulled the computer with the Vulcan off the table and onto the ground, dragging it along the ground some twenty feet. I was actually in the process of writing data to the hard disk at the time.*

*Even though the incident pulled many of the attaching wires out of the computer, no damage occurred to the computer or the hard drive. I subsequently verified all of the data on the hard drive and found no errors and no bad or damaged blocks in either ProDOS or MS-DOS (I use half my storage for my PC Transporter's MS-DOS files and half for ProDOS).*

*Needless to say, I am very grateful for a soundly built and well-engineered product.*

*Sincerely yours,  
Roger Dilling  
Milledgeville, Georgia*

**We hope you never** drag your hard disk through the dirt, but can appreciate the engineering required to make the above letter possible. Until recently, if you wanted a hard disk for your Apple, you had to add an outdated, external box to your desktop clutter. Now, with Vulcan™ on the scene, you have an internal to consider. One that's lightning fast, clean, powerful and affordable.

**A glance at the other** computer manufacturers; IBM, Compaq, Dell, Mac, tells



you something. They're all very different systems, but all come with internal hard disks (it's hard to even find a Mac these days without an internal hard disk). The reason? Internals are the latest advance. The modern storage solution. They become a transparent part of your system, and in the case of Vulcan, actually enhance the rest of your system.

**Enhancing the rest of your system.** Many feel Apple's standard power supply is insufficient. Add a Vulcan and you make a significant improvement to the rest of your system. The high efficiency power supply in Vulcan is rated in excess of 70 watts, nearly double the capacity of Apple's standard power supply and that of other drives. Vulcan power supply components are heatsinked to the aluminum case for cool operation and long life. And we added an ultra-quiet, flush-mounted cooling fan to keep things cool inside. Vulcan actually beefs up your power supply. External hard disks drain it.

**Ease of use.** Most hard disks are pretty intimidating. It's frustrating to bring home a new hard disk, only to discover you've got to spend a lot of time setting up for your particular operating system, partitions and formatting. Vulcan comes pre-formatted, pre-partitioned and includes the latest Apple Operating System. You'll be using your Vulcan within minutes. Just pull out your old power supply, plug the Vulcan in it's place, insert the card and turn on the computer. Vulcan will boot to your familiar Apple Finder in a few seconds. Now *that's* ease of use.

**Incider/A+ Magazine put it simply** in their "Best of the Best" Holiday Shopping Guide: "*The best internal hard disk is the Vulcan from Applied Engineering - you can use it with DOS 3.3, ProDOS or GS/OS, and it comes with its own fan and power supply*". Vulcan incorporates the most popular standard protocols for a hard disk and includes an ultra-fast 16-bit data bus controller, not

the less expensive 8-bit others use. And since Vulcan is fully compatible with our PC Transporter, you can create ProDOS or MS-DOS storage space, in addition to GS/OS, DOS 3.3, CP/AM or Pascal 1.3. No



other hard disk works with all these operating systems.

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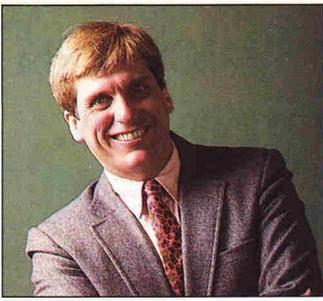
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STATUS  
REPORT

# DARWIN AND THE COMPUTER

By PAUL STATT \* SENIOR EDITOR

**D**oes the game represent *Darwin's* dilemma — as if the old naturalist himself were the driving force behind the process of evolution?

DARWIN'S DILEMMA (\$49.95, INLINE Design, 5 West Mountain Road, Sharon, CT 06069, 203-364-0063) is an intelligent game for the Apple Macintosh, but its name is inept. The game owes nothing to Charles Darwin, author of *The Origin of Species* (1859), and much to Brad Wilhemsen, creator of I.O. Silver (1984), an arcade classic from Beagle Bros for the Apple II (still available from JEM Software, 7578 Lamar Court, Arvada, CO 80003, 303-422-4856, for \$20).

Like all great games — chess, Tetris, and so on — Darwin's Dilemma is simple to play, but difficult to master. All you do is move icons. You decide which icons to merge to create higher orders of life — combining worms to make fish, fish to make reptiles, reptiles into birds, birds into mammals, and so on up the evolutionary ladder. You push these beings around a rectangular grid on the screen of your Mac. But you can't mimic evolution that way.

In its earlier incarnation — as I.O. Silver — the point of Darwin's Dilemma was to combine computer chips into memory boards, then boards into computers, and finally computers into supercomputers. Time was limited, and you lost immediately if you ran over.

The Beagle Bros version of this game was more challenging, if less visually appealing, and lacked the pseudo-scientific claim to be "loosely based on the ideas of evolution." If Darwin's Dilemma is based on evolution, so is *TV Guide*: Both *TV Guide* and evolution presuppose that time passes.

Darwin's Dilemma, the game, offers a neat answer to the question: Does life on earth mean anything? It's a big question, if you dare to ask it. Not many people do. The game gives up its solution slowly but surely — if not as slowly as life. The goal is to create Man — or Man and Woman, in this politically, if not scientifically, correct game — who represents the "end" of evolution. Real-life evolution, on the other hand, hides no agenda. We people, who happen to be living today, are not the point.

The name troubles me: Does this game represent *Darwin's* dilemma — as if the old naturalist himself were the driving force behind the process of evolution? I guess InLine Design couldn't very well have named the game "God's Dilemma" — the creationists would have had a fit. Natural selection is automatic and nondeliberate.

Darwin's Dilemma has nothing to do with natural selection or Darwin's theory of evolution. Don't get me wrong: I enjoyed the hours I spent playing the game. You should play Darwin's Dilemma. If you don't have a Mac, you can play I.O. Silver on any Apple II. But I'd hate to see a teacher inflict this pseudo Darwinism on unsuspecting students.

If you're sincerely interested in natural selection, and have a Macintosh (or MS-DOS computer), spend your money at a bookstore on Richard Dawkins' *The Blind Watchmaker* (W.W. Norton, New York, \$9.95) and its accompanying software (\$10.95 when you buy the book). Dawkins' book attempts to show "why the evidence of evolution reveals a universe without design," so I can't recommend it to readers who think P.T. Barnum invented dinosaurs.

But *The Blind Watchmaker* tries to solve what was indeed a serious dilemma for Darwin: the so-called "argument from design." If all the world's living creatures evolved by chance out of mud, 19th-century creationists asked, how is it possible that every complex creature has turned out so well? Could as intricate an organ as the human eye have happened by chance? Dawkins' book, and especially his software, use the power of the Macintosh to prove that given enough time, chance can accomplish miracles.

Speaking of dilemmas, I'm reminded of the paleontologist and writer Stephen Jay Gould's response to those who fear the moral vacuum of a world without extrinsic purpose: "The answers to moral dilemmas are not lying out there, waiting to be discovered. They reside, like the Kingdom of God, within us — the most difficult and inaccessible spot for any discovery or consensus." □

# Preferred Products, Preferred Prices

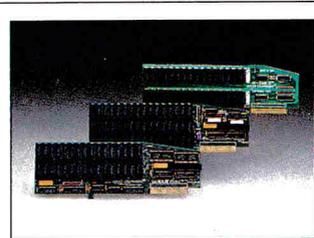
## Storage Devices

**Applied Engineering**  
Vulcan Hard Drives include controller card (specify machine).

Vulcan 20 Meg .....	\$499
Vulcan 40 Meg .....	\$639
<b>New!</b> 3.5" 1.6 Meg (GS) .....	\$248
3.5" 800k (GS,IIe,IIc+) .....	\$189
3.5" Controller card (IIe,II+) .....	\$65
5.25" disk drive (all Apple IIs) .....	\$124
5.25" Controller Card (IIe,II+) .....	\$55

**AMR**  
A5.D 5.25" drive (GS,IIe,IIc) ..... \$139 |

**Apple**  
High Speed SCSI (GS,IIe) ..... \$109 |



The best memory expansion cards you can buy for your Apple IIGS computer. GS-Ram II low-cost expansion up to 4 meg. GS-Ram Plus offers expansion up to 6 meg on one board and GS-Ram Ultra offers expansion up to 4 meg using 256k x 4 bit chips. See line listing for prices.

## Memory Expansion

**Applied Engineering**

GS-Ram II 1 Meg (GS) .....	\$147
GS-Ram II 2 Meg (GS) .....	\$219
GS-Ram II 4 Meg (GS) .....	\$366
GS-Ram Plus 1 Meg (GS) .....	\$205
GS-Ram Plus 2 Meg (GS) .....	\$292
GS-Ram Ultra (GS) .....	\$Call
RamWorks III 256k (IIe) .....	\$139
RamWorks III 1 Meg (IIe) .....	\$227
RamFactor 256k (IIe,II+) .....	\$175
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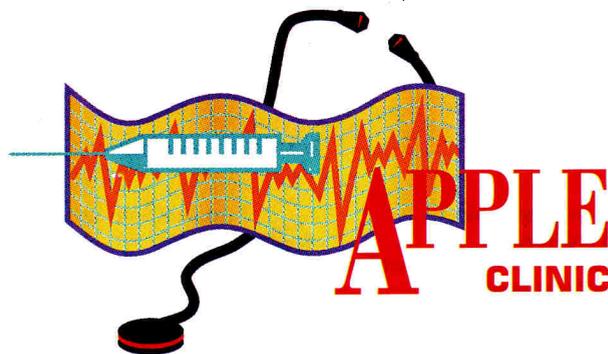
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# APPLESOFT BASIC WORKS

Use your word processor to create  
EXECable text files — but watch out  
for those gremlins.

By CECIL FRETWELL

## EDITING BASIC WITH APPLEWORKS

WHEN I TYPE A PROGRAM INTO AppleWorks Classic and save it as an ASCII text file, I can't get Applesoft to accept it. All I get are beeps and syntax errors. What's wrong?

Corwyn Y. Miyagishima  
Highland Park, NJ

Corwyn, you're using AppleWorks in a way most people, even programmers, don't know about. You can EXEC the ASCII text files that AppleWorks "prints" to disk from BASIC just like regular sequential text files. If you're not careful, though, you'll undoubtedly hear a lot of beeps and get some syntax errors in the process. You may even lose part of your program.

If you're using AppleWorks Classic, the errors are probably caused by the carriage returns that the program inserts at the end of every text-file line it writes. For instance:

```
1351 PRINT D$;"PR#4": PRINT CHR$(1);  
PRINT D$;"PR#0": PRINT D$;"IN#4"
```

This may look fine in Applesoft BASIC, but when AppleWorks Classic writes this to a text file, it'll insert a carriage return somewhere in the middle of the last PRINT D\$. The result?

When Applesoft is EXECing the file, it finds incomprehensible garbage like NT D\$;"IN#4" strewn about and complains — vehemently.

You can do one of two things. Either edit the AppleWorks file to keep the lines from being split (in other words, make the lines shorter than the width established by your margins, and add line numbers as needed), or upgrade to AppleWorks 3.0. When this version converts a word-processing file to text, it presents the option of not inserting the extra carriage returns.

Even if you upgrade to AppleWorks 3.0, don't forget another Applesoft gotcha: The EXEC process likes lines of 255 characters or fewer. Give it more than 255 characters and you'll be serenaded again.

## CONVERT WORD PROCESSING

I OWN AN 128K APPLE IIe AND have recently purchased a Smith Corona word processor (PWP-85LT). The Smith Corona outputs data to a printer via an RS232 port.

Is there any way to dump the Smith Corona files to my Apple? Common sense tells me that because the Smith Corona can send output to a printer, I should be able to make it "print" to my Apple II.

Peter A. Stinson  
Kingston, PA

The answer is to make your Apple II think it's receiving data from a modem.

- Connect the Smith Corona's printer cable to a serial card on the Apple II. You may need a null modem adapter, depending on the pin assignments for the connectors.

- Run a terminal program, such as Beagle Bros' Point-to-Point (\$129; 6215 Ferris Square, Suite 100, San Diego, CA 92121, 619-452-5500), on the Apple II to capture the file as it prints. The Smith Corona thinks it's talking to a printer; the Apple II thinks it's talking to a modem and capturing a text file.

- Check your printer manual to make sure the printer understands XON/XOFF protocol. It must understand this protocol so that the printer will wait when the terminal program has to write to disk.

Thanks to Jim Shapiro for his help answering this question.

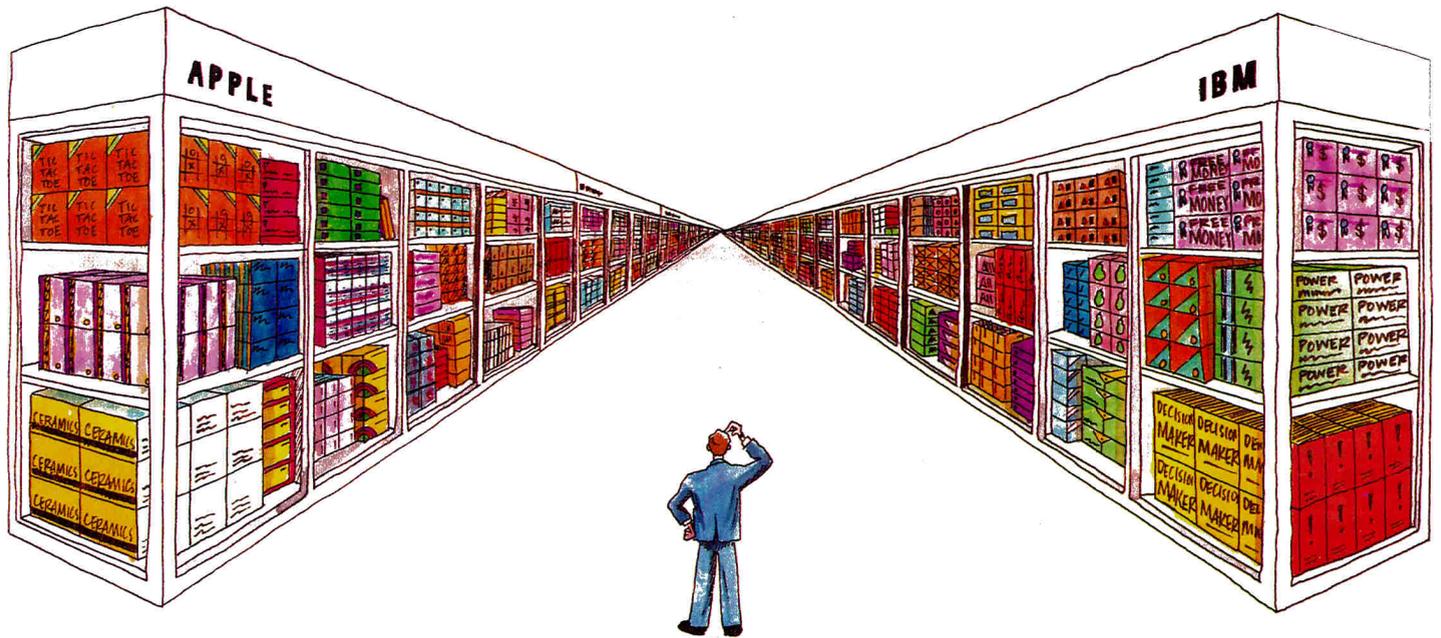
## WHAT'S BETA TESTING?

I'VE OFTEN SEEN THE TERM "BETA testing." What separates this from other kinds of testing? The term "beta" implies only the second round of tests, yet there seems to be a great deal of excitement when a product reaches this stage.

Harold Rothschild  
Leverton, OR

A "second round" is a good way to think about beta testing, Harold. Once vendors have written and checked their software to the best of their ability, they send the product to a selected number of people for testing. These people may be new to the product or they may be existing customers using an older release of the software.

The idea behind beta testing is that an objective observer will often catch errors that the developers might miss. An outside person in the



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## APPLEWORKS CLINIC

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### MAILING LABELS

#### How can I create mailing labels in AppleWorks Classic?

The best way is to print a labels report from a database file:

1. Press Open-apple P (OA-P) to go to the Report Menu.
2. Select "Create a New Labels Report," choose "From Scratch," and name your report. You'll see all the categories that you created in your database.
3. Now hide the categories you won't need for your labels report. For example, if you don't want to print the Invoice Number category, select it and type OA-D. (Don't press Return.) Keep in mind that you're only hiding this category, not throwing it away.
4. Tractor-feed labels usually measure 1 or 1.5 inches from the top of one label to the top of the next. Therefore, if your printer normally prints six lines to the inch, 1-inch labels accommodate six lines and 1.5-inch labels accommodate nine lines. Move your cursor to the blank line below your categories and press OA-D or the down-arrow key to decrease or increase the number of lines that each record will print. If you can't decrease the number of lines without deleting a category, you must rethink your label.
5. Place your cursor on one of the category names, hold down the open-apple key and press the right-arrow key. The category name will move to the right. Use the open-apple key in combination with the appropriate arrow key to arrange the category names as you want them to appear on your label.
6. Change the paper length (PL) to 1 inch by typing OA-O and adjusting the PL to 1. You'll also want to adjust your printer margins in this same screen to match the width of your labels. Also, make sure that Print Report Header is set to NO.
7. When you have everything adjusted properly, save your work and print.

If AppleWorks keeps asking you to press the spacebar after each label, go to Change Printer Information from the Other Activities menu and set Accepts Top-of-Page Commands to NO.

### HOW DOES IT FIGURE?

#### I recently upgraded from AppleWorks 2.0 to 3.0, but have since been unable to configure my KXP 1091 Panasonic printer. Do you have any suggestions?

If you're using Orange Micro's 9-pin Grappler card, set AppleWorks printer information for an Epson RX. Be sure the switches on the Grappler are set to off, on, on, on.

Don't remove the ImageWriter printer driver that's shipped with AppleWorks. If you've done so already, recopy AppleWorks 3.0 from your original disk and configure your Panasonic as the second printer. If you have an Apple IIe, don't forget to set the proper interface-card code as listed in your interface-card documentation. (AppleWorks 3.0 ships with a database file that contains the printer-interface codes for the most common interface cards. You can find this file under the Advanced subdirectory.)

### NUMBER'S UP

#### How do I make AppleWorks generate page numbers beyond the limitation of 511 pages?

1. Issue an OA-K command to find out the location in the text that page 511 ends. End of Page 511 will appear below the last line of the text for that page.
2. Create a new word-processing file with a different name and move everything below the page-511 break to the new file.
3. Create a page header at the beginning of the new file. Be sure that this new page header is identical to the first one. Position a cursor at the location you want the page number to appear and enter a 5. Then use the OA-O options to insert the command.
4. From the Options menu (OA-O) issue a page-number command and designate the first page as page 12.

Now the first part of your document will end on page 511 and the second part will print beginning with page 512. (The computer will think it's printing pages 12, 13, and so on.) You'll need to repeat this procedure for each 100-page range.

### WHAT'S THE CODE?

#### I have an Apple IIe and I've changed the control code to match my interface card. The printout still shows ON at the top. What could be the problem?

Check to see if the characters JN appear in your printer code. If they do, try removing them. If that doesn't work, try calling the card's manufacturer for technical support.

In general, before any change can take effect, you must turn the printer off and then on again to clear the previous information from the printer's memory.

### PRINT IRREGULARITY

#### Sometimes when I print a document it comes out fine; other times the second page has a large top margin and the print runs over the end of the page. The print looks okay, it's just in the wrong place on the paper. There doesn't seem to be any pattern to the malfunction. What's going on?

When you turn on the printer, it assumes that the paper is positioned with the top edge just under the paper bail. As long as you leave your printer turned on, it remembers this position as the top of the page. It may be that you've turned the platen by hand while the power is on.

If you want to change the location at which the page break occurs, follow these steps:

- Switch off the printer.
- Turn the platen knob to advance the paper to the top of the first page.
- Switch on the printer.

This procedure will register the position as the top of your page and will advance your page breaks properly.

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normal course of using the program may press the wrong keys or make other mistakes and thereby test more thoroughly a program's error-handling routines.

Optimally, beta testing resembles day-to-day use of the package. Beta testers also try to look at the software from the untutored end user's point of view and ask such questions as "Is the system user friendly?" or "How can we improve the documentation?" or "Are there any features the developers could add to make the software more powerful or easier to use?"

Beta testing is usually done on a volunteer basis. In return for testing, a beta "site," as a tester is called, will often receive future releases of the software free of charge.

## PROBLEMS WITH GET IN BASIC

I'M WRITING A PROGRAM IN Applesoft and I need it to check to see if the end user has pressed a key — while the rest of the program keeps running. Then I need the program to find out which key the user pressed — even if it was a control character or an arrow key. I can't use INPUT because I don't want the user to have to keep typing RETURN. I can't use GET because then the entire program stops and waits.

**Jennifer Pike**  
San Jose, CA

Instead of the GET statement, try this:

```
110 IF PEEK(-16384) < 128 THEN 110
120 X = PEEK(-16384)
130 POKE -16368,0
```

Line 110 places the program in a loop as it waits for the end user to press a key. Line 120 retrieves the decimal ASCII code for the character. Use PRINT CHR\$(X) to see the actual character. Line 130 is very important; it clears the strobe that indicated a key was pressed. Omit it and your program will always think a key is pressed when none has been.

This logic has only one potential headache. When you loop through this subroutine, the cursor disappears until the end user presses a key. (When a cursor vanishes, many people become nervous because they think the system has crashed.) If you want a cursor, you must

provide one. A crude but effective way to create a cursor is to add 100 PRINT CHR\$(255);CHR\$(8); to the above code.

This line creates a rectangular inverse character — CHR\$(255) — on screen, then moves the regular cursor back to its original location — CHR\$(8). Although the cursor doesn't flash, it's more user friendly.

If you want to echo the typed character back to the user, add 140 PRINT CHR\$(X);. This will let your user see what he or she is typing and will also overwrite the cursor you produced.

## MOUSE SUPPORT IN BASIC

I KNOW THAT TEXT MENU-driven software isn't always user friendly. I really like the way the mouse makes using GS/OS much simpler to use than ProDOS. I'd like to offer that same level of simplicity in my programs. Can I incorporate mouse support using Applesoft BASIC? If so, what commands are involved?

**Kenneth Richardson**  
Maple Glen, PA

You're in luck, Ken. Just skip over to "While the Cat's Away" in this issue's Hints & Techniques section (p. 90) and learn how Associate Editor Cameron Crotty captures and tames the wild Apple mouse.

## WHERE'S THE MINI-ASSEMBLER?

I HAVE EXPLORING THE APPLE IIGs by Gary B. Little, published by Addison-Wesley Publishing Company (Reading, MA); on the second page it says that the Apple IIGs has a built-in mini-assembler. How do I get to the mini-assembler? How do I use it?

**Mike Wilson**  
Auburn, CA

The mini-assembler has actually been around for years. The original Apple IIGs had it installed in their Integer BASIC ROMs (read-only memory). Apple chose not to install the mini-assembler in the II Plus and IIe, but it has since included it in the enhanced IIe and the IIGs.

Activating the mini-assembler is easy. First, enter the monitor from BASIC (CALL -151). With the monitor prompt active, type an exclamation mark (!) followed by the return key, and the prompt changes to the exclamation mark — you're now in the mini-assembler. From here, you may enter assembly-language statements, such as JSR, \$F0DC, or LDA #1. Note this is an absolute assembler; you must know the exact target address for instructions such as JSR, LDA, and so on, rather than being able to assign a name to an address as you can with a full-fledged compiler. The mini-assembler, therefore, isn't meant to replace powerful assemblers, such as Byte Works' ORCA/M (\$69.95; 4700 Irving Blvd. NW, Suite 207, Albuquerque, NM 87114, 505-898-8183) or Roger Wagner's Merlin (\$124.95; 1050 Pioneer Way, Suite P, El Cajon, CA 92020, 619-442-0522).

Explaining how to use the mini-assembler is beyond the scope of this column, so I'll refer you to some books:

- Roger Wagner's Apple IIGs Machine Language for Beginners (chapter 3, p. 39), published by Compute! Publications, Inc. (Greensboro, NC).
- Lon Poole's Apple II User's Guide, Second Edition (p. 316), published by Osborne/McGraw-Hill (Berkeley, CA).
- Apple Computer's Apple IIGs Firmware Reference (p. 51), published by Addison-Wesley Publishing Company (Reading, MA).

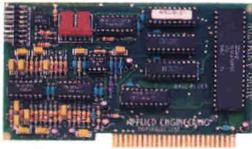
## SAVING GRAPHICS IMAGES

IF YOU'RE USING A MAC LC IN Apple IIe mode with the Apple IIe card, can you transfer an Apple IIe screen image to the Mac clipboard — say, for importation into a Mac DTP program such as PageMaker?

**Phil Shapiro**  
Washington, D.C.

According to Apple Computer's Matt Gulick, the "father" of the SCSI card, press Shift-Command-3 to save a PICT image of the current screen in IIe mode, just as you would if you were running a Mac program.

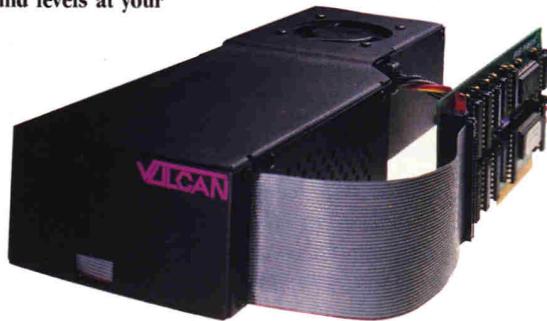
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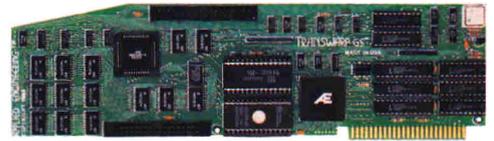
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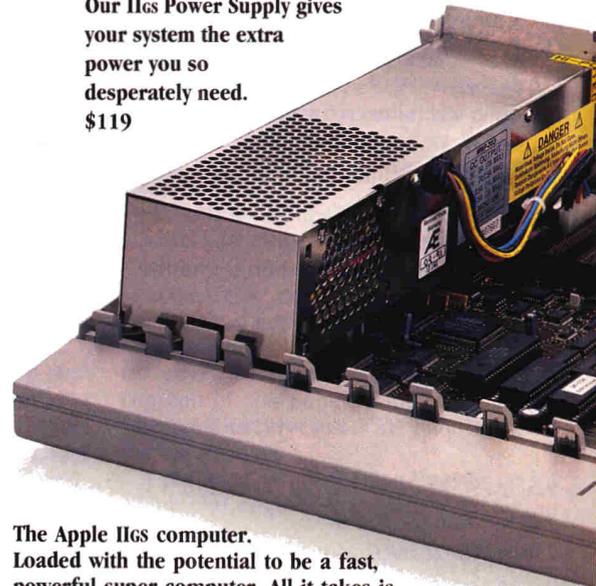


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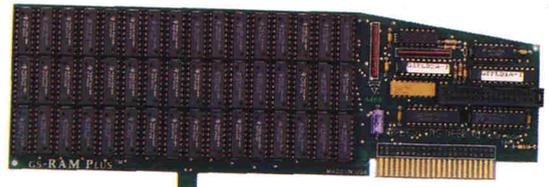
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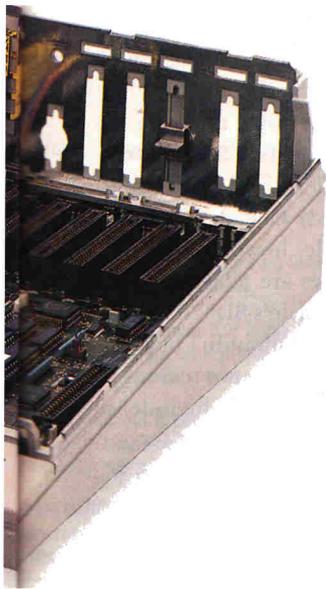
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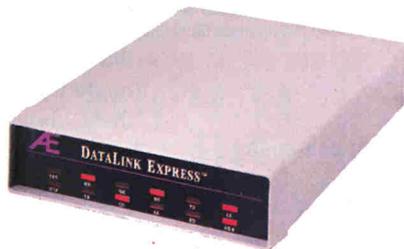
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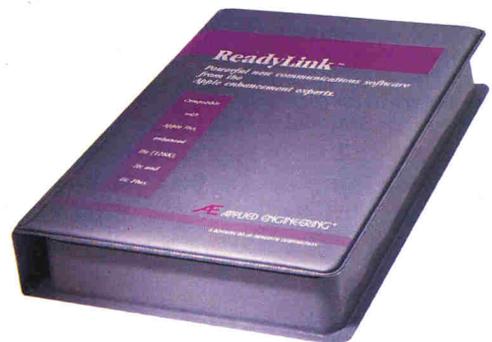
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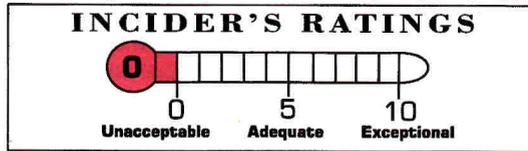
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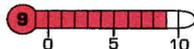
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## APPLIED ENGINEERING HD vs. SPRITE SD340

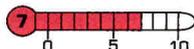
APPLIED ENGINEERING, P.O. Box 5100, DALLAS, TX 75208-9100, (214) 241-6060

AE HD, \$339



SPRITE, INC., 1120 STEWART COURT, SUITE G, SUNNYVALE, CA 94086-3918, (408) 773-8888

SD340, \$279



If you're a Mac owner who's been thinking about purchasing Apple's external SuperDrive, but who shivers at the thought of paying a premium for the company's multicolored logo, take heart. Two third-party manufacturers have come to the rescue with their own versions of 1.4-megabyte, 3.5-inch floppy drives — and these products carry significantly

lower price tags. Offering essentially the same features as their Apple counterpart, the Applied Engineering HD drive has a suggested price of \$339, while the Sprite SD340 lists for \$279.

All Macs since the IIx come standard with at least one SuperDrive, sometimes called the FDHD (floppy disk, high density — pronounced "fudd-hudd"). Compatible

with the older 400- and 800-kilobyte Mac formats, the SuperDrive stores up to 1.4 megabytes on special high-density floppies and can use the Apple File Exchange utility provided with each Mac to read from and write to 3.5-inch 800K Apple II ProDOS or GS/OS disks, as well as 720K and 1.4-megabyte MS-DOS or OS/2 disks created by IBM PC compatibles. Remember, we're talking about swapping data files, not running programs from other computers.

Although designed primarily as Mac alternatives to the SuperDrive, the Applied Engineering and Sprite high-density drives also work in 800K mode on any Apple II that supports 3.5-inch drives (currently the Apple IIcs, IIc Plus, and IIe with controller card). Cheaper 800K-only drives are available, however (AE's Mac and Apple II drives are \$289 and \$279, respectively, and Sprite's SD320 is \$249), and Apple II owners shouldn't buy more than they need. There are two reasons you might want to splurge on the high-density drive, though. For one thing, it's a good buy if you anticipate purchasing a Mac eventually. The second reason is that newer models of the Applied Engineering HD drive come with a special GS/OS driver that lets standard IIcs programs use high-density disks with a proprietary 1.6-megabyte format. (If you already have AE's 800K drive, the company can upgrade your system to an HD drive for \$79.) You won't be able to swap high-density disks with friends unless they too own an Applied Engineering drive, but you may find the high-capacity format useful when you back up your disks.

Both third-party drives are based on Sony mechanisms, but not the same ones found in Apple drives. Applied Engineering uses a stock Sony model F17W-5PF, whereas Sprite uses the Sony F17-10 with a custom disk-eject motor. One feature

# Public Domain Software



**GS117 Star Trek Classic GS:** This shareware game by Joe Jaworski is a remake of one of the earliest computer games ever written. Fire your photon torpedoes and laser, do short range scans and use your warp drives to defeat Klingon and Romulan star ships. It requires 1.5 Megs of RAM and System 5.0.4.

## IIGS Games

**GS110 Milestones 2000:** This reliefware game by Dr. Ken Franklin is great for younger children. Based on an old French card game, you have to play mileage cards to advance your own auto while stalling your opponent with flat tires and accidents.

**GS105 Space Clusters:** This game is a clone of Galaxian. Use a joystick to shoot the invaders before they can swoop down and destroy your ship.

**GS118 Memory Card Game:** This disk contains a full-color GS version of the classic card game called Concentration. It's great for young children. Also included are Hearts and Wisconsin Rummy games.

**GS103 & GS104 Cosmocade:** On the first disk, you must Journey to Callibus in a fast-paced arcade style game. Part two is called Naxos. A joystick and 768K is required. This is a shareware game.

**GS88 PicMix:** This program turns any SHR graphic into an on-screen jigsaw puzzle.

**GS119 Columns Version 2.0:** In this game which is similar to Tetris, you arrange falling blocks so that colors line up. Includes rock music background.

**GS112 Arkanoid II Levels & Cheat:** This disk contains several new levels and a super cheat program for use with Arkanoid II by Taito.

**GS72 Cartus Primus Card Game:** This disk contains card games for cribbage, pinocle, gin rummy, hearts, pitch, euchre and sheephead.

## IIGS Sound & Music

**SL01 MiidiSynth™ Jukebox:** This program is the hottest music program available for the IIGS. Full orchestral sounds with unbelievable quality. You won't believe your ears!

**SL02, SL03 & SL04 MidiSynth Song Disks:** Three full disks for MidiSynth songs for Jukebox program.

**GS94 Modulæ:** If you liked Nucleus, then you'll love this sound and graphic demo program which really shows off the IIGS.

**GS63 HyperStudio Sound Effects:** A collection of sounds in ACER format which are just right for use with *HyperStudio*.

## HyperCard GS Stacks

All *HyperCardStacks* require Apple's *HyperCard GS* program and 1.5 Megabytes of RAM.

**HC01 HyperCard Starter Pak:** A sampling of the first stacks created for this great program.

## HyperStudio Stacks

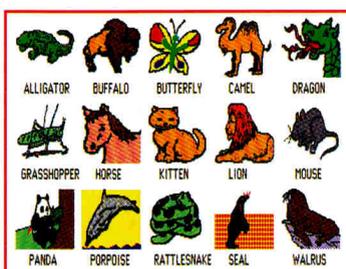
All *HyperStudio Stacks* require Roger Wagner's *HyperStudio* program version 2.1.

**HS30 thru HS35 Star Trek Stack:** A six-disk complete encyclopedia of facts about Star Trek: The Next Generation TV series. Includes sound effects, animations and database of facts.

**HS26 & HS27 Civil War Stack:** Learn about the causes, the personalities and the history behind the U.S. Civil War. Great graphics & sound effects.

**HS20 & HS21 Dinosaur Stack:** Learn all about dinosaurs with this excellent two-disk stack. For each type of dinosaur this stack shows the relative size, a map showing the geographic distribution, some textual info and three scanned pictures.

Only \$3.50  
per disk  
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**GS123 Animal Print Shop GS Graphics:** An all-new collection of over eighty multicolor graphics for use with Print Shop GS. All of the graphics are of animals. This disk is shipped with a sheet showing all the graphics on the disk. Copyright (c) 1991 Big Red Computer. Only \$3.50.

## IIGS Graphics

**GS07, GS08, GS29, GS35, GS77 & GS78 Graphics, Fonts and Borders for Print Shop GS:** Six completely different disks for use with *Print Shop GS*. Each disk contains at least 72 graphics and all but GS35 also contains borders and fonts. A sheet showing what is on each graphic is shipped with the disk. Each disk is only \$3.50.

**GS100 Holiday Print Shop GS Graphics:** Our best selling multi-color graphic disk for use with Print Shop GS. Contains Santas, Easter bunnies, Valentines and much more.

**GS107 Yet Another Fractal Program:** This program allows you to create Mandelbrot, Julia, Dragon or Biomorph fractal graphics. It is very easy to use and contains many help screens. You can limit the size of the fractal to be generated and the number of iterations so that full-color fractals can be generated in as little as 15 minutes. There are also many pre-generated graphics on the disk so you can see how they look.

**GS122 Fkt Graphics:** This program can be used to draw graphs of functions of the type f(x). You can use sin, cosine, tangent, etc. The computed graphs are SHR pictures which can be imported into DTP programs like *AppleWorks GS*.

**GS48 GIF Graphics:** 75 colorful graphics in GIF format plus an all-new IIGS graphic utility program to view or convert them.

**GS124 Dinosaur Clip Art:** Black and white clip art (640 mode) of dinosaurs which we have converted from the Mac. It's great for use in GS programs such as *AppleWorks GS*, *HyperStudio* or *HyperCard GS*.

**GS59, GS64, GS67, GS73, GS74, GS86, GS87 & GS98 Super Hi Res Clip Art:** These 8 disks contain clip art graphics that we either converted from the Mac or scanned in on the IIGS. They're great for use with *AppleWorks GS* or *HyperStudio*.

**GS40 Fractals & Animations:** This disk contains 11 programs that create animated computer graphics or fractal displays.

**GF02 Display Fonts:** A collection of GS-type fonts for use with most GS programs and *SuperFonts*. These are medium-sized fonts which work great for desktop presentations.

**GS32 FontAsm:** This is the best shareware GS-font editor available. Plus it comes with several new fonts.

## IIGS Utilities

**GS120 Icon Mania:** Everything you need to add new icons to the IIGS desktop. Two icon editors and hundreds of pre-drawn icons you can use.

**GS121 HoroscopeGS:** A desktop program to generate birth horoscopes. You enter your date of birth and the longitude and latitude of your place of birth. A horoscope will be drawn which represents astronomical information such as the positions of the planets at the time of birth. Many people believe that a person's character is affected by planet positions and such.

**GS47 GS/OS Goodies:** Our all-time best selling disk. This disk contains over 20 brand new desk accessories including D.T. Painter, Screen Saver & GS Catalog.

**GS83 Customize GS/OS:** Load fonts and desk accessories on the fly, plus A2.FX, Instant Icon, Finder.Patcher, and RunQ.

**GS99 Twilight Screen Saver:** This shareware CDev is a completely modular screen saver which operates under the Graphic Control Panel. This is a must-have program for all IIGS owners.

**GS76 Productivity Disk:** This disk is loaded with useful tools including Write-It!, a desk accessory which is a complete word-processing program.

**GS93 IIGS Telecommunications:** If you own a modem, you need this disk. It contains the GS-version of Shrink-It plus a host of other telecomm programs.

**K301 DB Master 1.0.1 3.5" Version:** A complete shareware database management system for the Apple IIe, IIc or IIGS. Great for a small business. You can create files and forms in just minutes.

**GS62 Desk Accessories:** Included on this disk are DA's that allow you to format a disk, copy and view files, control an ImageWriter printer, preview fonts and locate files on your hard disk. Plus a Tetris-like NDA game.



**Taito Closeout:** We've purchased the remaining inventory of Apple II games from Taito and are offering them at special reduced prices. This includes Arkanoid II: The Revenge of DOH. In Arkanoid, you use energy balls to break down force barriers to advance on to more levels. There's even an editor so that you can design your own levels. Here's your last chance to purchase these great Apple II games.

- TA61 Arkanoid II: DOH GS ..... 15.00
- TA60 Qix GS ..... 5.00
- TA06 Renegade for Apple IIe/IIc ..... 5.00
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# REVIEWS

exclusive to the Apple mechanism is automatic "inject," which sucks the disk in when it's partially inserted. With the Applied Engineering and Sprite drives you must push disks into the drive manually.

As far as speed is concerned, all of the drives take the same amount of time (1 minute, 25 seconds) to format a 1.4-megabyte high-density disk, but when it comes to formatting a double-density disk as either 400 or 800 kilobytes, the Apple drive is 10 percent slower than the others; the third-party drives have faster stepping motors moving the read/write heads over the surface of the disk.

In our tests initializing high-quality, name-brand disks, the Applied Engineering and Sprite drives failed to verify the media half the time, but proceeded smoothly on subsequent attempts. The Apple drive also had trouble initializing disks occasionally, but the failure rate was far below 50 percent. High-density disks have less tolerance for error because they utilize weaker currents to change the magnetic state of the disk coating. Regardless, once formatted, none of the disks exhibited any problems in real-world daily usage, and according to an Applied Engineering representative, "[on the AE HD, the disk's] field-failure and return rates are extremely low."

The AE drive has a unique dual-mode LED (light-emitting diode) on the front that turns red when the drive writes to disk, and green when it reads. Neat, but not a necessity. The Sprite drive also has an access LED, but it doesn't distinguish between writing and reading.

Both drives have eject buttons on their front panels, but the Sprite works only if a disk fails to mount properly on the Finder's desktop. Furthermore, both drives have a small hole on the front into which you can insert a straightened paper clip to remove a disk manually. The Sprite drive spits disks clear of the drive and onto your desk — a humorous idiosyncrasy at first, but one that soon becomes annoying. Early units from Applied Engineering had the same problem, but the current model features a hinged door that prevents the drive from ejecting the disk fully, keeps out dust, and makes the drive somewhat quieter.

By just looking at Applied Engineering's drive you could easily mistake it for a bona-fide Apple product — the case consists of

platinum-colored plastic and has the same lines as Apple's drive. The Sprite drive, on the other hand, has a more industrial look with its unadorned metal case. By the time this review appears in print, Sprite plans to be shipping its drive in a plastic case, which, incidentally, may prevent disks from ejecting all the way out of the drive.

Unlike the Sprite drive, the back of the Applied Engineering drive sports a solid plastic loop through which you can thread an antitheft cable, available from Kensington Microware. Although both drives have DB-19 connectors on their rears, the Mac supports a maximum of one external floppy, so you can daisy-chain additional drives only when you attach them to an Apple II.

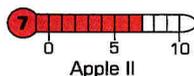
From a purely functional standpoint, the Apple SuperDrive is a bit more robust and reliable than the less expensive AE and Sprite high-density floppy drives. Of the latter two, I think the Applied Engineering HD drive is the better buy, despite the fact that it lists for \$60 more than the Sprite SD340. After all, Applied Engineering is a proven company and its drive has many extras, such as a proprietary 1.6-megabyte Apple IIgs format, dual-mode LED, operational eject button, attractive case design, and security anchor. The Sprite SD340 is a fine drive in its own right, but it just doesn't stack up well to the competition.

**Owen W. Linzmayer**  
**San Francisco, CA**

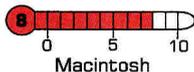
## TIMELINER

**TOM SNYDER PRODUCTIONS, 90 SHERMAN STREET,  
CAMBRIDGE, MA 02140, (800) 342-0236**

Customized time-line program; 64K Apple IIe, IIc, IIgs, includes 3.5-inch and 5.25-inch disks, \$59.95; 1-megabyte Macintosh Plus, SE, Classic, II, \$69.95



Apple II



Macintosh

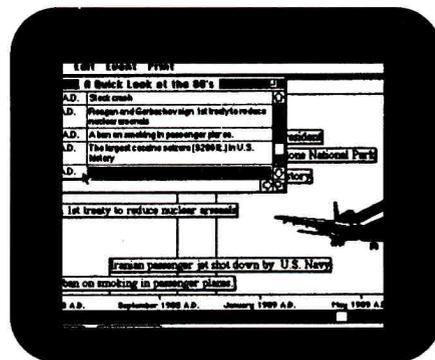
When it's important to be in the right place at the right time, Tom Snyder's TimeLiner may be just the design tool to give you "perspective." This application lets you create and print proportionally correct time lines for quick reference, or prepare a variety of wall

displays to supplement classroom instruction. Teachers will find TimeLiner charts helpful to students trying to remember historical events, but you can also use the product to chart contemporary or future chronologies, plan project schedules, and sketch comparisons for items such as weight, speed, length, or temperature.

TimeLiner is available for Macintosh and Apple II computers, and both applications are easy to operate. Each comes with a comprehensive guide for teachers featuring detailed operating instructions and suggestions for on-line activities.

The program lets you build time lines spanning a day, a week, a year, or many years. You can even use the Merge function to combine two time lines into one, making it easier to compare them.

Enter data in any order because TimeLiner automatically sorts the entries chronologically, then saves time lines to disk, prints them, or loads them into memory for editing. If you're stuck for ideas, boot up the program's accompanying disks and take a look at several ready-



Put life in perspective with TimeLiner.

to-use electronic time lines. Print these templates as is, or modify them as needed.

### AN APPLE A DAY

If you have an Apple II, your version of TimeLiner comes with 3.5-inch and 5.25-inch floppies that include six sample time lines, a manual containing a helpful index for quick reference, and reproducible black-line student worksheets on topics such as daily activities, class schedules, family history, the Oregon Trail, and the Underground Railroad. Use these worksheets to chart chronological data about a topic, then launch the application to translate written data into electronic format. ➤

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 AE Vulcan HD/20 Mb ..... \$519  
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 Microtech Europa  
 20MB Hard Drive (Mac) ..... \$399  
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 PC Transporter 768K ..... \$269  
 IIGS Installation Kit ..... \$39  
 Iie Installation Kit ..... \$32  
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This drive offers all the reliability and performance of Apple's 3.5 drive but at a more affordable price. The 1.4 Mb upgrade allows for future enhancements & Mac compatibility. .... \$209  
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 Iie - \$475 Package #9172  
 Iie - \$529 Package #9173  
 (SMT Envoy interface card included)

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 Passport MasterTracks Pro GS .. \$245  
 Pyware MusicWriter Ltd GS ..... \$89

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TransWarp GS ..... \$269  
 Zip Chip Iie, Iic (8 Mhz) ..... \$145  
 Zip 1600 GSX Board ..... \$249

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 Kensington Turbo Mouse ..... \$108  
 Koala Pad Plus Tablet ..... \$89  
 Kurta 8.5 x 11 Tablet (GS) ..... \$319

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Ad #16-05

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Circle 9 on Reader Service Card.

# REVIEWS

This program will get your data noticed, too: TimeLiner lets you create large-print, banner-sized time lines up to 99 pages long. How's that for a bulletin-board display?

Even novices will find generating a perfect chronological chart easy. First-time users, though, must specify information about printer setup before constructing a time line. Once you've completed your printer configuration and saved your setup data to disk, TimeLiner's *Main Menu* appears on screen. You'll see options to build, load, merge, or erase your time line, change printer setup, or quit to ProDOS.

Using the program is simply a matter of following on-screen prompts. To create a new time line, select *New* from the *Main Menu* and pick a time interval, such as a day, a week, a year, or many years. A menu bar appears at the bottom of the screen with options that include *Add*, *Delete*, *Edit*, *Expand*, *Compress*, *Save*, and *Print*.

To enter a new event, select *Add*; a *When* prompt comes into view, requesting information about the date and time of the event. If you enter the wrong data, such as typing 1949 on a weekly time line, the program responds with 1949?. Type 1949 in a one-year time line and the program prompts you for more information about the month, day, and time. It couldn't be easier!

After completing the date and time, TimeLiner asks you to describe the event in entries up to 37 characters long. When you press Return, TimeLiner enters the information in the correct spot on screen. Add as many entries as you need. Move the cursor to a specific entry and press *E* to edit information. Choose *Xpand* from the menu to increase the distance between entries. Select *Cmpress* to eliminate unnecessary white space. A number in the lower-right-hand corner of the screen tells you the length of your printed time line. When you're ready to output hardcopy, choose *Print* and TimeLiner generates a printed version automatically.

You can merge two time lines of the same time interval, or modify time lines you save to disk by loading them into memory. Although TimeLiner for the Apple II doesn't offer much in the way of bells and whistles (you can't print single-page time lines, for example, or change fonts, type sizes, and type styles), the application generates proportionally correct

time lines without requiring you to read the accompanying manual.

## CHARTING COMPARISONS THE MACINTOSH WAY

Mac TimeLiner is a much more powerful application compared to its Apple II cousin. In addition to daily, weekly, annual, and multiyear time lines, the Macintosh edition lets you work with time lines that are as long as ten billion years. This option is especially useful if your class or child is learning about geology, evolution, or dinosaurs.

You can also spruce up a Macintosh time line with one or more bit-mapped graphics images imported from the *Scrapbook*. All you need do is position the artwork in the *Preview Window* by holding down the command key and dragging the graphics image to a desired location.

You can even generate three different time lines in a variety of fonts, type sizes, and type styles. If you want to grab attention with your chart's size, though, use the *Banner* option to print multipage time lines that are perfect for wall or bulletin-board displays. (Be sure to select the sideways orientation from the *Page Setup* dialog when you print, though.)

To generate single-page time lines, choose *Span* from the *Print* menu. If you prefer to print a time-line outline (with events in chronological order but without dates), choose *List* from the *Print* menu and you're on your way.

Mac TimeLiner isn't as easy to use as its Apple II counterpart, but if you work through the manual's tutorial, you'll be up and running with a minimum of effort. Unfortunately, the manual for the Mac edition lacks an index, so locating information on a particular program feature can be tedious. In addition, this manual doesn't include reproducible student worksheets, but it does contain several detailed suggestions for using the program in different curriculum areas.

Despite its documentation deficiencies, Mac TimeLiner lets you take advantage of the machine's desktop-publishing and graphics capabilities, and produce a number of time-line types and styles. If you have access to both a Mac and an Apple II, use the II version with young children so they can generate their own time lines. Older

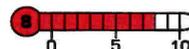
children (grades 5 and up) and adults will prefer the added power and flexibility of the Macintosh application.

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

## SALVATION-BAKKUP

VITESSE, INC., 13909 AMAR ROAD, SUITE 2,  
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Hard-disk backup program; 1-megabyte  
Apple IIgs; 3.5-inch floppy drive;  
hard-disk drive; \$49.95



In a perfect world there wouldn't be any need for nuclear weapons, the Red Sox wouldn't have choked in the '86 series, the *Police Squad* TV series would still be running, all computers would be compatible, and hard drives would never crash. Welcome to the real world.

Although you can't change the fact that your hard drive will crash someday, you can make sure you're prepared for this disaster. If you want to get ready for the inevitable, add Vitesse's Salvation-Bakkup to your software library. With this product by your side, you'll take a hard-drive crash in stride.

Backing up a hard disk consists of writing the disk's contents to another storage medium. The most common media for hard-drive backups are floppy disks and tape drives.

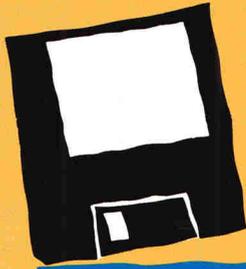
If your hard disk's capacity is less than 60 megabytes, you can use floppies as your backup. (For a 60-megabyte drive you'll need roughly 75 800K floppies.) For drives over 60 megabytes that you back up regularly, a tape drive becomes a necessity.

You back up a hard disk by writing consecutive blocks, not files, to a series of floppies. This procedure lets the backup program fill each floppy completely, so that you can avoid the problems caused by odd file lengths and complex directory structures, which can leave gaps in the disk record. The last floppy you write should be a catalog disk containing an index of all floppies written, so that you can restore files selectively.

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Continued on p. 84

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## HYPERCLASS

# INTERACTIVE MULTIMEDIA

**C**omputers that talk and sing. Computers that flash maps and detailed databases on screen for kids to pore over the way Columbus pored over his charts. Computers that show kids how to learn on their own, then how to teach others. And computers that make it easy to talk to other computers.

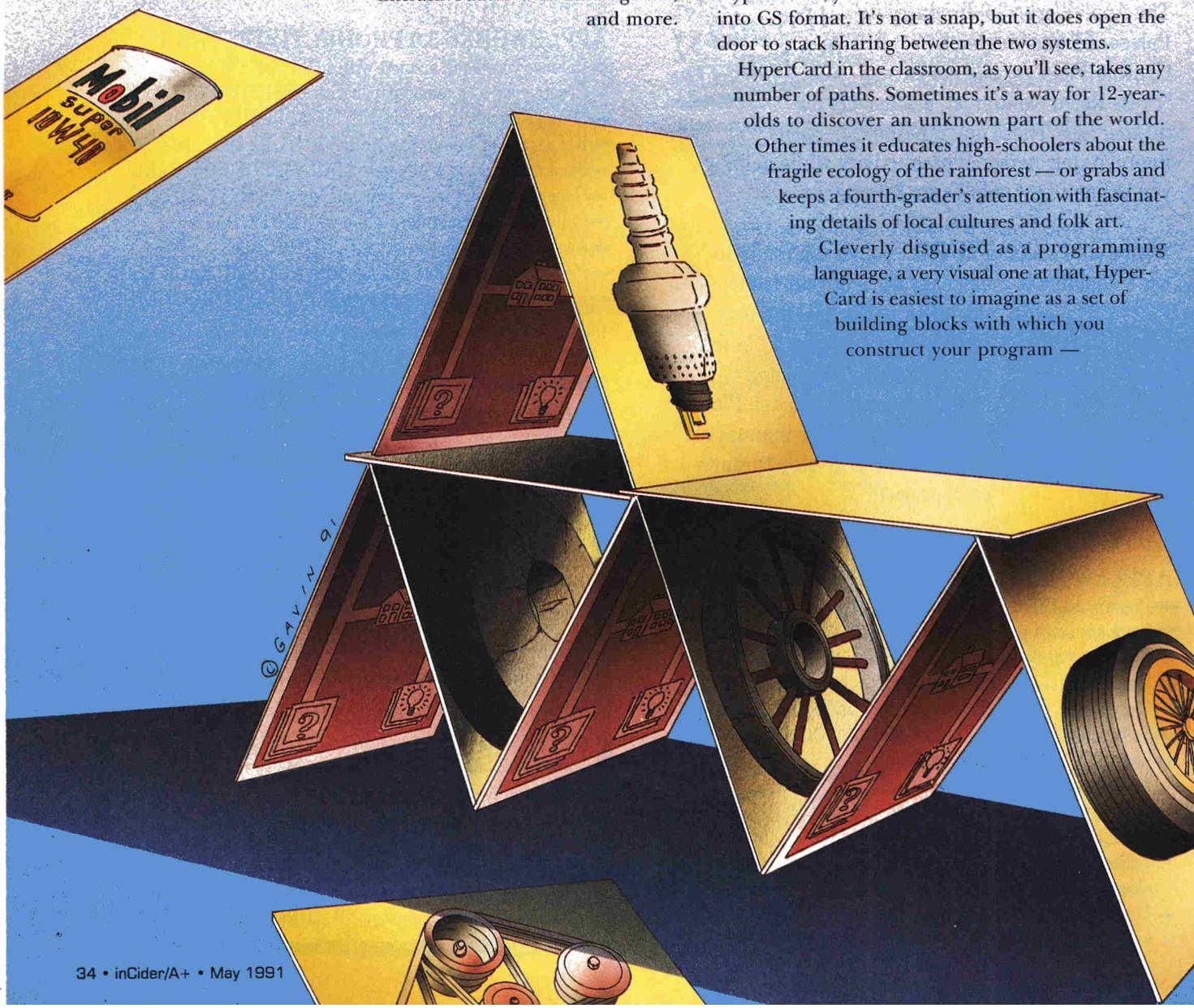
One piece of software lets your computer do all this. **HyperCard**, Apple's multimedia construction set, lets teachers and students produce dazzling reports, in-depth research projects, full-fledged curricula, interactive audiovisual extravaganzas, and more.

It may sound like science fiction, but classrooms have been using HyperCard for years to crank out some impressive, sophisticated courseware on the Macintosh. Now, with the recent introduction of **HyperCard IIGS**, the same potential is available to GS users.

Hypermedia may not be new to the GS (see the accompanying sidebar, "Been There — Done That"), but HyperCard IIGS is. The distinction is important, if not crucial. Although the Mac and GS versions of HyperCard differ in several areas, the programs are more alike than different. With a special stack called HyperMover, you can even translate Macintosh stacks into GS format. It's not a snap, but it does open the door to stack sharing between the two systems.

HyperCard in the classroom, as you'll see, takes any number of paths. Sometimes it's a way for 12-year-olds to discover an unknown part of the world. Other times it educates high-schoolers about the fragile ecology of the rainforest — or grabs and keeps a fourth-grader's attention with fascinating details of local cultures and folk art.

Cleverly disguised as a programming language, a very visual one at that, HyperCard is easiest to imagine as a set of building blocks with which you construct your program —



# REVOLUTIONIZES EDUCATION

a *script* in HyperCard parlance. Part data manager and information organizer, part programming language, part paint program, HyperCard hands you those blocks, called *cards*, *buttons*, *backgrounds*, and *fields*. You drag them together, putting buttons and fields on a background to build a card, then assemble collections of cards into stacks. And you've just written a script. This program tells the Macintosh or GS what graphics image to display, what sound to play, and what input — whether text or mouse clicks — to accept. (For more information and a detailed look at HyperCard IIGs and its object-oriented programming abilities, see "The Apple II Culture Reborn," February 1991, p. 37.)

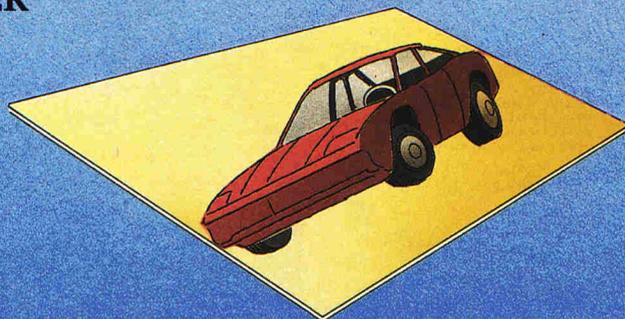
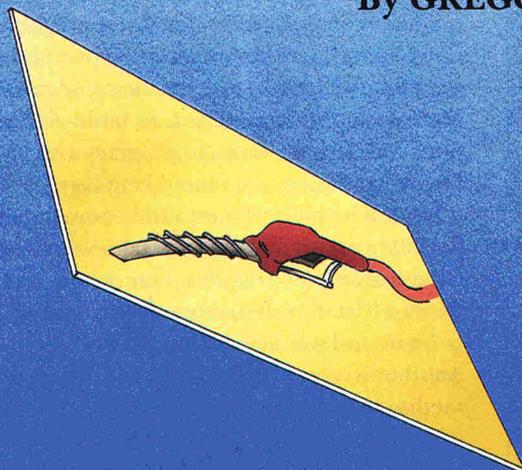
HyperCard 2.0 is the newest version for the Mac. Like all versions, 2.0 requires a "substantial" Mac to run smoothly. A Classic will do, but an LC

**Remember when  
"stacks" referred to  
wood? "Buttons"  
held your shirt  
together? And  
"cards" were  
something you bet  
on? Well, forget it —  
those words belong  
to HyperCard now.**

with its faster microprocessor speeds up HyperCard's card flipping, especially if you're running animated stacks. Most important, though, is a hard-disk drive. You can get by without one, but the ensuing disk shuffling stretches your endurance. HyperCard itself takes up nearly three megabytes of hard-disk space, and stacks can eat up even more room (some commercial stacks run as large as 5 megabytes), so consider at least a 40-megabyte hard-disk drive. Of course, you can also install HyperCard on an AppleTalk/AppleShare network — probably the best way to share expensive speed and hard-disk resources.

HyperCard for the Mac has some definite advantages over the GS edition. The most important is the Mac version's longtime presence on thousands of hard-disk drives. Hundreds of public-

**By GREGG KEIZER**



# HYPERCLASS

domain and shareware stacks exist for Macintosh HyperCard, while only a handful are available for

HyperCard IIGs. Teachers and students have put time into HyperCard on the Mac, and in some cases have several years' experience working with the program. The result is a group of sophisticated classroom HyperCard users and programmers.

But HyperCard 2.0 doesn't have it all. Even 2.0 doesn't offer color, a nagging omission for anyone who's spent the money for an LC or a IISi. And network use is still limited to one person per stack, unless you're only viewing it, in which case several people can browse through it simultaneously.

## LIVING COLOR

HyperCard IIGs demands even more from the computer's basic hardware. You'll need a GS with at least 1.5 megabytes of RAM, preferably a full 2 megabytes (although you can run HyperCard and some small stacks with only 1.25 megabytes). If you're not using HyperCard IIGs on a network, you'll also need a hard-disk drive. And because HyperCard IIGs and most stacks put a strain on the computer's modest processing power, you'll get much better results if you accelerate it with something like Trans-Warp GS or Zip GS.

Color comes to Apple-brand classroom hypermedia with HyperCard

IIGs. The program's other strengths are its association with its Macintosh cousin and its ability to bring scripting (something not found in Roger Wagner's **HyperStudio**, for all its graces) to the GS. You can also use the well-stocked Mac HyperCard library with the GS version of the program once you've translated your

applications with HyperMover, the translation stack Apple plans to make available to developers and user groups (but not, alas, to end users or educators).

The biggest drawback to HyperCard IIGs is Apple's selfish attitude toward Mac stacks. Ideally, you'd be able to save a stack created on a Macintosh to an AppleShare file server, then call it from a GS and run it as is. Without the ability to share Mac stacks this way, HyperCard IIGs is stack-poor, at least for the moment. And though the GS excels at sound and music, HyperCard IIGs' sound abilities are no stronger than the Mac version's. Apple has stated that it wanted to maintain compatibility between the two versions, and so decided against powerful GS sound functions, a strange case to make when stacks now move only in the Mac-to-GS direction.

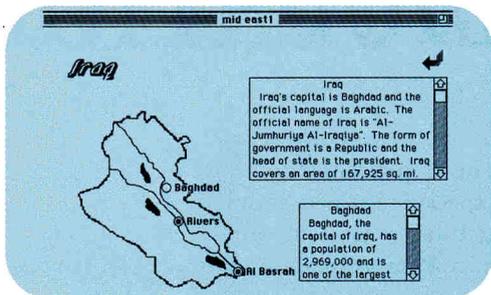
Together, HyperCard for the Mac and HyperCard IIGs bring hypermedia abilities to most classrooms and schools with Apple hardware. The Apple IIe and IIc families are left outside the hyperclass (Techware's Tutor-Tech and Scholastic's HyperScreen, both 8-bit programs, can help fill that gap), but the two most powerful desktop computers in Apple's educational inventory are covered. A limited compatibility exists between HyperCard and HyperCard IIGs, but it's far from perfect. (See the accompanying sidebar, "Move That Stack!") Still, HyperCard IIGs and HyperCard for the Mac can accomplish the same tasks. Both can turn the modern classroom into a learning laboratory where the real limits are kids' imaginations and teachers' enthusiasm.

## HYPERCLASS IN ACTION

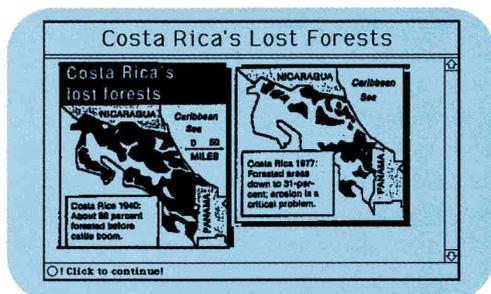
Some schools have invested stunning amounts of time, energy, and resources in HyperCard. They've gone to great lengths to teach their students to use the Macintosh and HyperCard, to build stacks of their own, and, in some cases, to program with HyperTalk, HyperCard's object-oriented language.

Schools invest in HyperCard because it pays off. Its flexibility means that different schools can use HyperCard for different reasons. One school may want to create a friendly software interface to insulate students from an awkward telecommunications procedure. Another may want to replace textbooks with multimedia curriculum materials.

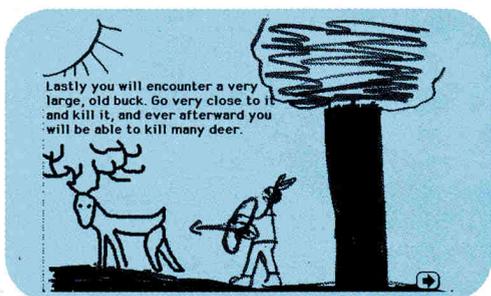
By virtue of its time in the classroom, Mac HyperCard is education's most proven hypermedia tool. Existing hypermedia applications — hundreds of them — run on the Mac. But because HyperCard IIGs is so much like the Mac version — from its scripting language to the way graphics, text, and sound are integrated into stacks — you can expect that many of the same applications will come to the GS. If you can do something with HyperCard on the Macintosh, you should be able to do it with HyperCard IIGs on the GS, too.



At Meigs Middle Magnet School, HyperCard is used both to teach HyperTalk programming and to produce social-studies research projects, such as this stack on the Middle East.



Produced by a teacher and student at Forest Hills CHS, this stack makes extensive use of scanned images. Here, "before" and "after" maps illustrate the extensive deforestation that's taken place in Costa Rica over the last 40 years.



At Abita Springs Elementary, HyperCard is used to collect folk tales, traditions, and customs of the many cultures in Louisiana. HyperCard's paint tools make it easy for children to draw pictures and integrate them into stacks.

To give you an idea of the kinds of things you can do with HyperCard IIGs, take a look at what these four schools are doing with HyperCard on the Macintosh. Take notes. There won't be a quiz — but you can apply these lessons to your own forays into HyperCard IIGs and HyperCard for the Mac.

## HYPERECOLOGY

In one Grand Rapids, Michigan, school, HyperCard is an integral part of how teachers teach. At Forest Hills Central High, technology, hypermedia, and multimedia combine to replace traditional textbooks in social studies and, to a lesser degree, in science, math, and language arts. HyperCard is a vital part of Forest Hills' move to 21st-century teaching tools.

Implementing HyperCard in nearly every subject area in the school, teachers and students use the software to produce projects in everything from U.S. history to biology. Even more impressive, teachers and student/teacher teams have created in-depth stacks on topics ranging from the world's rainforests to Chinese culture; they've even authored videodiscs.

Steve Williams, the school's coordinator of technology, cites examples. "All seniors take world studies," he explains. "They're required to do a multimedia project. Many of them are opting to use HyperCard; they're able to get it done faster with HyperCard than any other way."

Some of the stacks these high-school students build are striking. One that steps through the U-2 shoot-down of 1960 offers digitized speech, scanned photographs, and a detailed account of the international incident. Another uses music of the decade to back up a blow-by-blow outline of the 1968 Democratic Convention, complete with factual tidbits ("What was the most-watched TV show of the year?"), photos from the period, and even some political analysis.

But it's the rainforest and China stacks that demonstrate HyperCard's power and ease of use. Marcie Beck, a social-studies teacher at Forest Hills, authored the rainforest stack (in conjunction with Dan Ledrick, a student) within a month of first turning on the Mac. Within six months she was creating her first HyperCard stack/videodisc combo, using slides she took while in China on a scholarship — proof positive of HyperCard's gentle learning curve.

"We're looking at those same kinds of projects in the middle schools," where GSeS dominate, says Williams. "Our ultimate vision is to have teachers and students redesign their curricula every year."

## DOWN ON THE BAYOU

Fifty miles north of New Orleans, at Abita Springs Elementary School in St. Tammany Parish, young children are using HyperCard to compile an electronic

## Move That Stack!

Translating a HyperCard stack from its original Mac format to something HyperCard IIGs can use is a magic trick worthy of Penn & Teller — and about as complicated.

HyperMover, a two-stack combo, is Apple's stack-translation workhorse. You won't find HyperMover included with HyperCard IIGs — it's to go to developers and user groups only — but it's too valuable a resource to keep under wraps for long.

Here's how HyperMover works: From the Mac, you run HyperMover, then select the stack to disassemble. A slew of options let you export graphics, backgrounds (as either gray-scale images or line art), icons, and sounds selectively. HyperMover then pulls apart the stack, saving its script as a text file and the graphics and icons in separate files.

The best way to move these files to a GS is via an AppleTalk network, where you simply save the files to the server, then retrieve them from a GS workstation. The second-best solution is to compress the files, then send this smaller archived file to the GS via an on-line service. At the GS end, you run HyperMover to rebuild the stack. Again, you can choose to import graphics, backgrounds, sounds, and icons selectively, as well as watch the stack as it's converted. Stack to stack, from Mac to GS, not only takes several steps, but takes time as well. A moderate-sized stack can take hours to translate and transfer.

In one test, I used a Mac LC and an unaccelerated GS to convert a small (13K) HyperCard 1.2.5 stack with 30 cards. The LC took 18 minutes to dismantle the stack. Another 18 minutes were eaten up in using America Online to up- and download a compressed file (37K) from the Mac to the GS. The GS spent another 19 minutes re-creating the stack. Even then, it was far from perfect. Some icons didn't transfer, the cards' opaque graphics images hid the background, and I never got the sound to work. Expect to put in some cleanup time whenever you move a stack. HyperTalk scripting expertise is mandatory in all but the simplest cases.

HyperMover is only a partial solution to the connectivity problem. What's needed is a transparent translation, something similar to Claris' XTND technology that works so well in saving and retrieving word-processing files. (See "Swap 'Til You Drop,"

Bridging the Gap, March 1991, p. 100, for more information.) Until then, GS owners will be strapped for stacks.

— G.K.



# HYPERCLASS

folk encyclopedia that highlights the many diverse cultures that cross and intermingle in Louisiana. "HyperCard's a great way to see how connections are made," says Kathleen Duplantier, the Abita Springs teacher who guides her small charges through multi-

media stack creation on the Macintosh.

Each month, the children at the Abita Springs school study another culture from their local area in Louisiana.

For instance, last October they spent time with a Choctaw artist in residence, who showed them how his people had once built dwellings from palmetto leaves and wood.

Not only did the children actually re-create a Native American dwelling on school grounds, but they took notes and photos as well, then incorporated those images and impressions into a 20-card HyperCard stack.

"Within what I call the mega-stack, there's information about cooking, hunting, basket weaving, and animated folk tales," explains Duplantier. "By next year we'll have enough stacks to set up a computer in the library for the kids to view the stacks."

Fourth-graders at Abita Springs have built Macintosh HyperCard stacks on alligators; kindergartners' artwork and writing has found its way into a King Cake stack (a traditional cake baked during Mardi Gras); and Duplantier is planning to introduce HyperCard's database capabilities to her school through a gumbo stack. "There are as many different ways to make gumbo as there are towns in Louisiana," she says.

Duplantier is evaluating HyperCard IIGs; students already use the GS to do much of the writing that ends up in their Mac stacks. She notes that only the teachers with Macs in their classrooms have built stacks on their own. Getting HyperCard on the IIGs, the machine most common in Abita Springs' classrooms, may be just what's needed to convince other educators of the computer's power. "HyperCard is a wonderful tool,"

Duplantier adds. "If you put it in the classroom, they're going to use it."

## OBJECT LESSONS

HyperCard is a programming language at heart, so it's no surprise that many schools teach the intricacies of HyperTalk, HyperCard's language. Object-oriented HyperTalk differs dramatically from more traditional languages such as BASIC, Logo, and Pascal.

Says Mike Smith, computer coordinator at Nashville's Meigs Middle Magnet School, "So much of it [programming] is done for them in HyperCard. They don't get bogged down in the mundane details. [HyperTalk's object-oriented approach] frees kids to turn up their creative juices."

Smith teaches a 12-week HyperCard programming course at Meigs, a school wired with enough Macintosh, Apple IIGs, and AppleTalk hardware to make a mid-sized business envious. Each of the school's 125 seventh-graders takes the class, which integrates HyperCard programming techniques with a social-studies research project. This year's spotlighted the Middle East.

"The first six weeks I show them how to program in HyperCard," says Smith. "They start with the fundamentals: buttons, linking buttons, grabbing icons, creating fields. Then they go through the process of some simple scripting: fades, venetian-blind effects, that sort of thing. I try to do things that create excitement in the kids."

During the second half of the course, the 12-year-olds produce a stack based on their out-of-class research. Digitized photos, hand-drawn maps, and pop-up text fields are mandatory, as are animation and sound. The results range from crude to creative. One boy's stack displays the American flag and plays *The Star Spangled Banner* when you click on the Saudi/Iraqi border. Another stack tosses out facts on rivers, cities, and counties with an almost-expert air. "One girl was actually capturing information from CompuServe each night as she did her research," says Smith, then integrating it into her stack creation the next day at school.

"I'm not turning out programmers," admits Smith. "Far from it. But the kids get very, very excited about HyperCard. They really enjoy it. In fact, it's sort of a letdown for them when we move to Pascal."

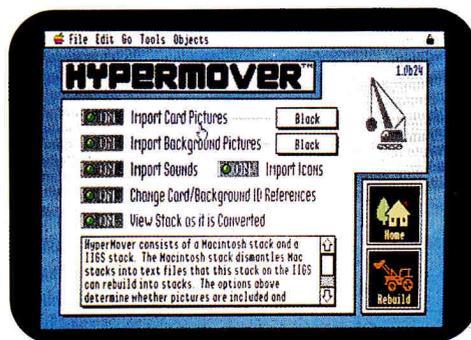
## THE FRONT

At Jenks High School near Tulsa, Oklahoma, students can hit the books courtesy of HyperCard. That's because the school library features networked computers offering links to the card catalogs of both the Tulsa city library and the University of Tulsa library. HyperCard helps the kids get on line.

"We take advantage of a dial-up capability at the public and university libraries," says Linda Gann, Jenks' own library director. "We've made a HyperCard



**Apple's release of HyperCard IIGs shows there are still signs of Apple II life within the company. While it demands a rather elite hardware configuration, HyperCard IIGs is a programming coup.**



**HyperMover is the bridge on which Mac HyperCard stacks cross over to your Apple IIGs. It's a difficult bridge to navigate — but you won't have to worry about it, as the software is available only to developers and user groups.**

front end so that when they turn on the machine, it takes them to a screen that highlights their options." One cluster of options relates to the card catalogs. "Click the right button and the computer logs you onto the card catalog." Once in the card catalog, though, the student must use its commands. "The libraries don't use HyperCard," Gann notes wistfully.

HyperCard also fronts as a program launcher, letting kids get right to work, without forcing them to learn the Macintosh's Finder and folder structure. "They click on a button in HyperCard to use Microsoft Works, to use SuperPaint, that sort of thing," says Gann. "HyperCard makes it very easy for any student to start up any application. The button approach, with groupings of similar functions, lets them easily see what they want to run. And it lets kids who aren't computer literate operate the machines without much help from the library staff."

Gann would like to integrate her GSeS into the system with HyperCard IIGs. "Kids who come from the middle school use the GS the first year they're here. They're just more used to them," she explains. "Maybe we could set up the same HyperCard front end on the GSeS with HyperCard."

## LESSONS TO LEARN

HyperCard IIGs may be brand new, but its HyperCard ancestry and the GS' prevalence in the classroom make it instantly appealing to educators. The lessons learned, and the lessons created, with HyperCard translate to HyperCard IIGs intact, or nearly so. With minor exceptions, any of the HyperCard applications at Abita Springs Elementary, Meigs Middle School, and Forest Hills and Jenks High Schools can be duplicated on the GS. The teachers involved with HyperCard now, and who include Apple IIGs computers in their inventories, think it's inevitable.

HyperCard IIGs isn't perfect. On an unaccelerated GS it's slow. HyperMover isn't the ideal way to transport stacks from the Mac to the GS. And there's currently no way to share GS stacks with the Macintosh. But HyperCard IIGs extends the reach of hypermedia into more classrooms, and gives more students the tools they need to create exciting presentations and to start programming. For that reason alone it's a significant product. It's one piece of software that should be available to every GS user in every school. □

GREGG KEIZER WAS THE FOUNDER AND EDITOR OF *COMPUTE!'S APPLE APPLICATIONS*, A BIMONTHLY PUBLICATION, AND IS CURRENTLY THE AUTHOR OF BRIDGING THE GAP, *INCIDER/A++'S* COLUMN ON MAC/APPLE II CONNECTIVITY. WRITE TO HIM AT 614 LINDEN STREET, SHREVEPORT, LA 71104. PLEASE ENCLOSE A SELF-ADDRESSED, STAMPED ENVELOPE IF YOU'D LIKE A PERSONAL REPLY.

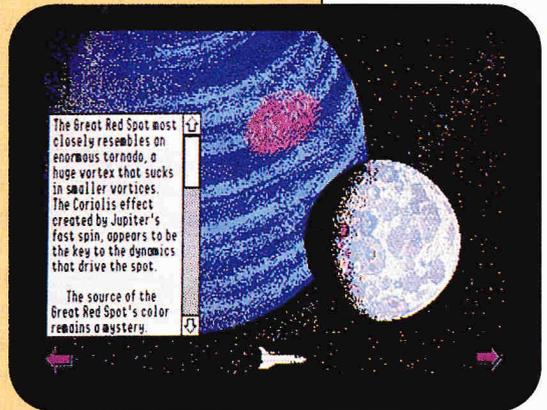
## Been There — Done That

HyperStudio beat HyperCard to the Apple IIGs by more than two years, so it's no surprise that HyperStudio stacks far outnumber those for HyperCard IIGs. (For details, see "Hypertext for Your GS," *Editors' Choice*, August 1989, p. 108; "Does HyperStudio Stack Up?" September 1989, p. 44; "Exploring HyperStudio," March 1990, p. 56; "Exploring Hypermedia," November 1990, p. 36; and "Shareware Solutions," *What's New*, February 1991, p. 20.)

HyperStudio makes less-expensive demands on your hardware budget — it runs on a 512K Apple IIGs equipped with only a 3.5-inch disk drive. A hard drive isn't required. Other HyperStudio advantages let you easily import sound into stacks (the bundled microphone helps) and share stacks with GS users who don't have a copy of HyperStudio themselves.

But HyperStudio doesn't build stacks with a language, as HyperTalk does for HyperCard IIGs. It relies completely on the construction-set metaphor: You build Studio stacks by pointing and clicking, assembling objects, and typing in text — no scripting involved.

Depending on your purpose, Studio is either more than enough or sorely lacking. "I'd actually like to have both [HyperStudio and HyperCard IIGs]," says Mike Smith of Meigs Middle Magnet School. "Each program has its strengths. For teachers producing reports and presentations, HyperStudio is wonderful." HyperCard IIGs may have the Apple name, and blessing, but unless Mac stacks get easier to use, it presents no immediate danger to HyperStudio's livelihood. — G.K.



**Roger Wagner's HyperStudio has momentum, quality, and ease of use going for it. It also benefits from a generous pool of shareware and public-domain stacks. The stack above covers the Space Shuttle and space exploration.**

## PRODUCT INFORMATION

**HyperCard IIGs**  
Apple Computer  
20525 Mariani Ave.  
Cupertino, CA 95014  
(408) 974-1010  
requires 1.5M  
and hard disk  
\$99

**HyperCard 2.0**  
Claris Corp.  
P.O. Box 58168  
5201 Patrick Henry Drive  
Santa Clara, CA 95052  
(408) 727-8227  
\$199 development kit  
\$49 upgrade to 2.0

**HyperStudio 2.1**  
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El Cajon, CA 92020  
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\$149.95  
\$10 demo disks

# HYPERSTACKS DONE DIRT CHEAP

## HYPERSTUDIO/APPLE IIgs

BEAM ME UP, JEAN-LUC

Is there anyone with a personal computer at home who hasn't loved at least a few *Star Trek* episodes on TV? Those who follow the exploits of the U.S.S. *Enterprise* and her crew in the show's latest incarnation, *Star Trek: The Next Generation*, have a special treat in store for them when they discover Scott Evert's special stack.

Evert arranged to offer the information contained in Jim Lyon's materials for the Enterprise America club in this new format.

This special GS HyperStudio version includes, among other useful items, descriptions of each TV episode, an encyclopedia of terms and names, and a guide to the allies and enemies of the *Star Trek* universe — not only great reference material for fans, but an interesting and exciting way to check out HyperStudio's IIgs text windows and the various graphics effects that make text in this terrific stack simple to find and easy to understand.

Additions are planned for future versions, including demonstration sounds and complete biographies of all the numerous *Star Trek* characters.

### NOT JUST MICKEY MOUSE

Fans of Mickey Mouse and his animated pals and anyone who's been enchanted by one of Walt Disney's Magic Kingdom theme parks should enjoy the **Once Upon a Time** stack from the Mouse Ears BBS group. It's a history of Disney, it's a guide to Disneyana, it's a Disney trivia storehouse.

The history of Disneyland is introduced by Walt Disney's own digitized voice; the accompanying graphics illustration is divided into four timelines you can explore individually. The *Who's Who in Disneyland* section features great background music (including the original tunes from old Mickey Mouse cartoons) and lets you choose to read "biographies" of many of the various Disney characters — from widely known folks like Mickey and Donald to lesser lights such as Foulfellow (from *Pinocchio*) and Perla (the seamstress mouse in *Cinderella*).

The only features lacking in this stack are actual images of the cartoon characters. Because Disney's licensing department is world-famous for protecting those images, though, we'll just have to rely on fond memories.

### MANIFEST DESTINY

When it's well designed, computer-assisted instruction can present factual information in new ways that make learning fun. Mike O'Donnell's **Expansion of the United States of America** stack is a prime example.

Mike has used a series of colorful maps that detail how the various states were admitted to the Union, and how the USA grew into the major power it is today. HyperStudio layers the maps so that you can view this representation of our country's growth as an animated sequence. Each map has an accompanying text window as well, explaining the material shown and associated historical events. The concept of "Manifest Destiny" has never been so well presented.

If memorizing names, dates, and places bored you in high school, this stack will give you a new perspective — and show you why history can be a living, exciting area of study — both in school and at home.

### HECK, THIS ONE'S PRETTY GOOD, TOO!

Clive Barker is a world-renowned author of horror fiction — second only to Stephen King in bookstore popularity these days. If Barker's world of libidinous monsters and psychologically twisted "heroes" can keep even the most stalwart fan awake nights, imagine what fully illustrated versions of his works can do to you! That's what Epic Comics did, and the result is

The hypermedia revolution

puts the power

of programming

into the hands

of Apple users at

all levels of experience.

Explore an exciting

new dimension

in teaching, learning,

and entertainment.

By NEIL SHAPIRO

Clive Barker's *Hellraiser* horror anthology in graphics-novel format. To publicize it, the company created a HyperStudio stack like no other.

The *Hellraiser* stack uses professional artists such as Ted McKeever, whose graphics talent meshes nicely with Barker's literary vision, to explain the concept behind the anthology. It's one of the best examples of using HyperStudio to publicize an offering in another medium (in this case, print). Many of the graphics format's most haunting and wrenching imagery is captured and presented here. When you explore this stack, you'll want to leave the room lights on!

#### BLAST OFF!

Jim Hirsch's *HyperShuttle* stack examines the mission of Space Shuttle *Atlantis STS-34*, which launched the *Galileo* unmanned spacecraft to Jupiter. Beautiful, artistic renditions of the planets and outer space combine with lucid explanations of the mission and its goals. The *Galileo* space-probe mission and its associated experiments are examined in critical depth. For anyone interested in space exploration, this stack is a magic-carpet ride. You don't have to be an astronomer or a physicist — thanks to HyperStudio, the information is presented in a structured framework.

#### CRYSTAL CLEAR

Dave Trapp's *Crystal Lattice* stack uses HyperStudio to explain brilliantly one of the most difficult concepts of molecular physics — how crystals are formed by stacking molecules in layers. For years teachers and students have fumbled with awkward models and ill-designed textbook graphics while the simple beauty of this physical phenomenon remained elusive. But Trapp's stack uses full animation to show how molecules unite in three-dimensional patterns and how one crystal form can build on the shapes of others. Rotating crystals on screen is so much fun you don't even care that you've managed to learn one of the hardest concepts of basic physics, to boot.

At press time, Trapp had sold exclusive rights to *Crystal Lattice* to the *Journal of Chemical Education* (University of

Wisconsin, 1101 University Avenue, Madison, WI 53706). Look for the product to be offered by the *Journal's* software department as one of a number of programs (possibly non-shareware) on disk later this year.

#### AFTER THE RED BARON

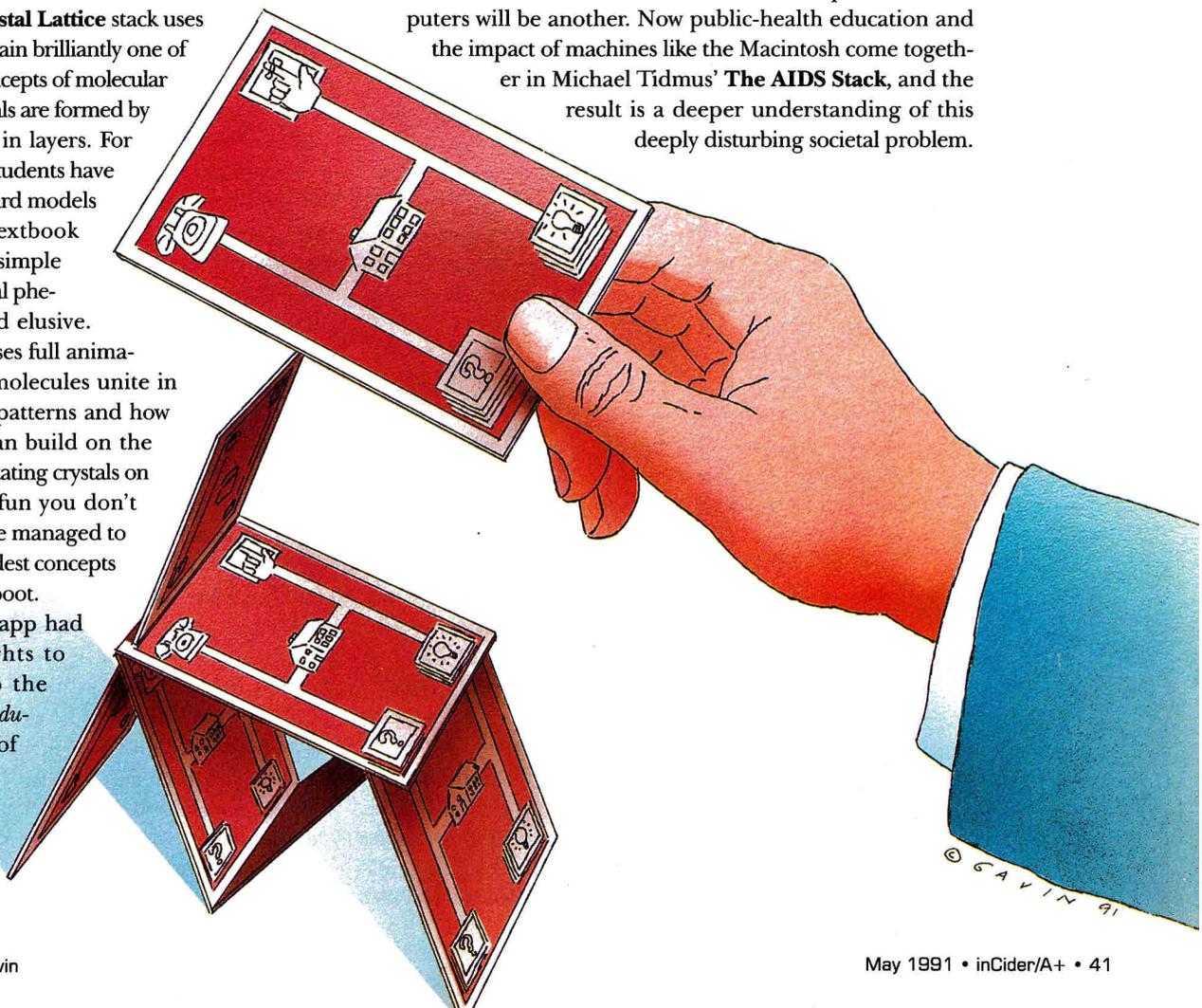
Everything you always wanted to know about Messerschmidt aircraft in World War II — but didn't know enough to ask — is packed into Rock Roszak's first in a projected series of stacks on *Classic Aircraft*. This HyperStudio tour is a flying buff's dream.

Every variation of the Messerschmidt from every theater of the war is shown in detail. Stack format makes it simple and easy to browse through the various markings that indicate the areas where the plane served, as well as to study the specifications of the machinery. The Messerschmidt was one of the things that made the Luftwaffe so feared, but this stack is one of the reasons HyperStudio is so admired.

#### HYPERCARD/MACINTOSH KNOWLEDGE IS EMPOWERING

When the history books of the next century are written, there's no doubt that the AIDS epidemic will be seen as one of the most critical factors of this age we live in.

There's also no doubt that the advent of personal computers will be another. Now public-health education and the impact of machines like the Macintosh come together in Michael Tidmus' *The AIDS Stack*, and the result is a deeper understanding of this deeply disturbing societal problem.



# HYPERSTACKS

The AIDS Stack uses HyperCard's formidable management capabilities to index data intuitively and to present a variety of information about this terrible viral syndrome. One section, for example, answers some of the most commonly asked questions in a professional, forthright manner. Still another offers statistical tables and charts in easy-to-understand format. But few presentations are as powerful as the AIDS Clock section, which demonstrates statistically and in real time

that the number of deaths is rising dramatically: The AIDS Stack is a perfect tool for anyone — young people and adults alike — who is trying to study and understand this disease.

## TAKING THE CURE

People aren't the only beings who get ill — sometimes even your computer can catch a virus. While nowhere near as tragic, of course, the results can still be devastating to your work. The national media have exaggerated the computer-virus scare to some extent, but it's true that viruses are out there, and sooner or later you might have to know how to combat them.

The **Eduvirus 2.0** stack runs the gamut — from understanding what viruses are and how they work and spread, to fighting them with antiviral programs —

and along the way offers a number of clues and techniques for avoiding them in the first place. The stack covers viruses such as "Scores," "Nvir," "ANTI," "Macmag," "INIT 29," "Dukakis," "ZUC," "WDEF," "MDEF," "Frankie," "CDEF," and others in depth.

You never may get a virus — in fact, you can expect not to, statistically speaking. But this stack is a good way to prepare for any problems, and studying these little monsters is interesting in itself.

## WHAT'S UP, DOC?

Guess what you can buy for \$32,500? Give up? An old comic book! That's the latest price on *Action* number 1. Of course, a number 1 *Batman* will set you back only \$14,500 — and you could latch onto a number 1 *Donald Duck* for a trifling \$2300. There's gold in them thar' pulp magazines, and the best way to track them is Mike Ashley's **Comic Collector's Inventory Stack**.

You can locate comics by title, by story, or both. And if a story is continued in a comic of a different title (usually as a marketing ploy for the weaker title), this stack will track the story's continuity for you. One of the

nicest features is that you can also get an instant read-out on the current worth of your collection (based on figures you input for each book). Now that's something even Uncle Scrooge would be proud to own!

## STARS IN YOUR EYES

Astronomy buffs won't want to miss Jeremy Haile's stack **Our Galaxy, The Milky Way**. This one features some of the best astronomy artwork you've ever seen, plus interesting charts and text files.

More advanced amateur astronomers will appreciate such items as *H&R Diagram* charts, which provide information on types of stars in the Milky Way. But even a novice will enjoy using HyperCard's find feature to type in the name of a constellation and then read all about it and where to find it. There's even an automatic-formula area wherein calculation of the moon's age is fully explained and carried out in a flash.

This professionally produced, mind-stretching stack won first place at the 1989 *Dallas Morning News* Regional Science Fair for its author — who was just 14 years old at the time.

## DATABASE RECORDS

If your record or compact-disc collection is like most people's, it probably drives you nuts when you want to hear a favorite selection. What album is it on? Who's the performer? Where is it anyway?

Dean Wette's **The Albums Stack** comes to your rescue with the best way yet invented to track your collection. Each card in the stack is cross-filed by composer or performer and allows searching — on the title of the album itself and on the publisher's label as well as the catalog number. Complete comment fields let you fill in titles of selections and details on individual performances. While this stack isn't as graphics-oriented as certain others of the same type, it's the easiest to use and is among the more powerful ones. With this stack at your fingertips, you won't be singing the blues next time you're looking for a hot platter.

## WHO SAID THAT?

Do you invite your Mac to your parties? Pick up **Computer Mad Libs** and it may prove to be a very popular guest and a lot of fun besides.

This stack lets you compose stories in which you leave out key phrases or words. When your reader runs the stack, it prompts him or her for a word to fit the type the story demands. The reader doesn't get to see the complete story until after he or she has input all the words, however. With a little imagination on your part, Mad Libs can result in some hilarious party games and jokes. Of course, with too much imagination you might find yourself missing a few friends, but, hey, no one ever said computing was going to be easy!

Mad Libs doesn't provide the name of its author, but

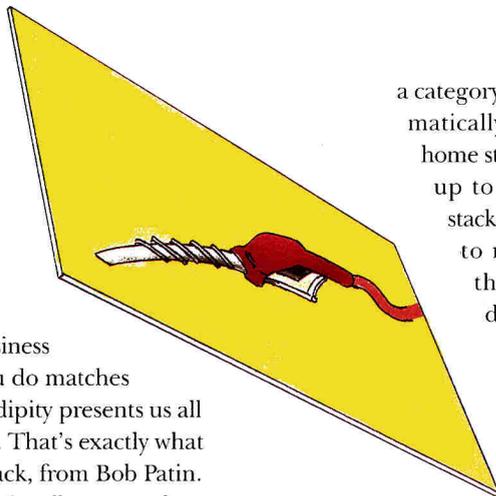
Share the wealth —  
*inCider/A+* presents  
a sampling of  
shareware applications  
for Mac HyperCard  
and the Apple IIGS  
program HyperStudio,  
available from  
user groups, BBSes,  
on-line services,  
and disk houses.

the stack is available from most on-line services and many user groups. (See the accompanying "Sources" box.)

### DIALING FOR \$

One of the great advantages of HyperCard is that it lets you computerize various aspects of your business yourself. And when something you do matches what many other people do, serendipity presents us all with a wonderful piece of software. That's exactly what we have in the **Business Phone** stack, from Bob Patin.

With Business Phone you can organize all your numbers by category and search either by category or by inputting the name of the contact. You can view all numbers within



a category, and you can even dial automatically (if you have a HyperCard home stack and your equipment is set up to support this feature). The stack even lets you schedule alarms to remind you when to make those important calls. If you depend on the telephone, investigate this Mac stack before you waste another minute searching through those piles of business cards. Get organized! □

NEIL SHAPIRO IS A FREE-LANCE COMPUTER JOURNALIST. WRITE TO HIM AT P.O. BOX 520, BETHPAGE, NY 11714. ENCLOSE A SELF-ADDRESSED, STAMPED ENVELOPE IF YOU'D LIKE A PERSONAL REPLY.

## SOURCES

Stacks mentioned in the accompanying article are available from a number of user groups; many are also available on line from bulletin-board systems and commercial information services, some of which are among the sources listed below. On CompuServe, for instance, try the Macintosh HyperCard Forum (GO MACHYPER) and the HyperStudio section of the Apple Programmers Forum (GO APPRO). To find the computer club closest to you, call Apple's User Group Locator at (800) 538-9696.

Some stacks are also available directly from their authors; those names are listed below. Note that you must forward a disk and either return postage or a self-addressed, stamped envelope. In addition, a number of specialized companies distribute shareware through the mail. Remember that shareware is still copyrighted; after trying the application for a specified period of time, please remit payment of the requested fee (usually \$5 to \$30), or delete the program from disk.

#### The AIDS Stack

Being Alive  
P.O. Box 69523  
West Hollywood, CA 90069

#### The Albums Stack, \$25

Dean H. Wette  
921 DeMun Ave. 2N  
Clayton, MO 63105

#### America Online

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

#### Big Red Computer Club

423 Norfolk Ave.  
Norfolk, NE 68701  
(402) 379-4680  
\$19.95/year membership

#### Business Phone

Bob Patin  
Summit Software  
112 Hickory Park Lane  
Antioch, TN 37013

#### Classic Aircraft, \$5

Rock Roszak  
3731 Camelot Drive  
Annandale, VA 22003

#### Comic Collector's Inventory Stack, \$5

Mike Ashley  
12934-124 St.  
Edmonton, Alberta, Canada T5L 0P5

#### CompuServe

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

#### Computer Budget Shopper

2203 Park Ave.  
Suite 17  
Cheyenne, WY 82007

#### Crystal Lattice

Dave Trapp  
159 Holland Road  
Sequim, WA 98382

#### Delphi

General Videotex Corp.  
3 Blackstone St.  
Cambridge, MA 02139-9998  
(617) 491-3393  
\$49.95 membership  
\$4.80-\$17.40/hour connect time

#### EduVirus 2.0

CVIA BBS  
(408) 988-4004 modem

#### Florida PC Library

P.O. Box 1070  
Leesburg, FL 34749  
(904) 787-1741

#### GENie

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

#### Once Upon a Time

Mouse Ears BBS  
(714) 992-5341  
300, 1200, 2400 baud

#### Our Galaxy, The Milky Way

Jeremy Haile  
2801 North Britain  
Irving, TX 75062

#### Public Domain Exchange

2078C Walsh Ave. #668  
Santa Clara, CA 95050  
(408) 496-6439  
\$20/year membership

#### Star Trek: The Next Generation

Scott Everts  
P.O. Box 227  
Placentia, CA 92670

# C comes of Age

Is it time to take CD-ROM seriously? Drives are plentiful and affordable. A wide variety of software is also available, offering hundreds of megabytes of information on everything from Beethoven to world history.

By CAROL S. HOLZBERG, Ph.D.



CD-ROM, like local-area networking and on-line services before it, has long endured the tag of "technology with great potential." From the mid-'80s until now, CD-ROM offered great promise, but little punch in terms of products. CD-ROM has finally grown up, however, and is now coming into its own on the Apple desktop. Lower drive prices, more computers in schools and homes, and software

authoring systems such as HyperCard have led to the emergence of CD-ROM as something more than a curiosity.

## WHERE WERE YOU IN '88?

Most Apple II and Macintosh owners were excited when Apple introduced its CD-ROM (compact-disc read-only memory) player, the **AppleCD SC**, in March 1988. Who wouldn't be excited by the possibility of a drive that could read more than 550 megabytes — the

equivalent of about 14 40-megabyte hard-disk drives, or about 270,000 pages of information — of sound, graphics, animation, and text from a single disc? At last, there was a relatively low-cost alternative for space-intensive multimedia presentations, interactive training tutorials, and massive on-line reference works.

The initial excitement was dampened, though, by the "read-only" part of CD-ROM. You can neither write to

CD-ROM discs nor modify their data. And while the storage capabilities of CD-ROM discs are impressive, the speed at which your computer accesses that information isn't. CD-ROM drive access speeds vary from 350 milliseconds to 1500 milliseconds. By contrast, a typical hard-disk drive boasts an access speed of 18 to 26 milliseconds. And while the initial price of \$1199 may have been affordable for large libraries and Fortune 1000 companies, it was a little steep for parents and teachers.

Then, too, perhaps the biggest reason CD-ROM drives failed to capture Apple users' hearts in 1988 was lack of software. In short, you didn't have a lot of incentive to buy CD-ROM. Today, however, that's changed.

The CD SC now sells for the lower, if not quite bargain-basement, price of \$899. Also, the Apple-brand drive is no longer the only player in town. (See the accompanying "Hardware Product Information" box, p. 46.) In fact, you now have plenty of CD hardware options from which to choose.

## HARDWARE CONSIDERATIONS

Before you begin surveying our sample of CD-ROM discs, you need to decide which player to buy. CD-ROM drives vary in appearance; they all operate generally the same way, however. The typical player is a SCSI (*small-computer-systems interface*) device that connects to a Macintosh through the SCSI port at the back of the computer, or to an Apple II via a SCSI card you install in an unused slot. (See "The SCSI Side of Life," February 1991, p. 47, for more information on SCSI technology.)

While drive prices differ widely, cost may not be as important as versatility. If you want to use your CD-ROM drive on both a Macintosh and an Apple II, then the AppleCD SC is currently your only choice. The player ships with software for both Macintosh and Apple IIe/IIgs computers. With an appropriate SCSI adapter card (try Trantor Systems Ltd., 5415 Randall Place, Fremont, CA 94538, 415-770-1400) you can even connect an AppleCD SC to an MS-DOS computer.

For the flexibility of using one drive on all three systems, you may be willing to overlook the AppleCD SC's price and relatively slow 500-millisecond random-access speed.

If you decide to shop around, keep the following factors in mind:

- First, does the retail price include cables and software? Some CD-ROM drives may appear to cost less than others, but after you add a SCSI cable, a SCSI terminator, and software drivers, you may find it's not such a bargain after all.

- Most CD-ROM drives include software that plays conventional audio CDs. But can you listen to the music as you work on another application? Desk-accessory audio-playback utilities are more convenient than stand-alone programs, because you don't have to quit your current application to enjoy the sound of CD music.

- The physical size of the drive and its panel options are also important. Is the unit large (or small) enough to sit under (or on top of) your computer? CD-ROM drives with external power supplies usually have smaller footprints than units with built-in power supplies. The smaller size usually means that you'll have to contend with a bulky external "brick" of a power supply.

- Does the drive have two SCSI ports? If your CD-ROM unit has only one SCSI port, you must position it last in your SCSI-device chain. Remember, if you have more than one SCSI device attached to your computer, the SCSI I.D. number must match its place in the chain. For example, if your CD-ROM drive is last, its SCSI I.D. number must be 7 — so you should also consider how easy it is to change a drive's SCSI I.D. number if you run into a conflict.

- Check to see whether the unit comes with two RCA audio jacks, which let you connect left and right amplified stereo speakers easily. Is there a power-on light indicator, so that you can tell at a glance whether the unit is turned on?

- Lastly, make sure you know how long the warranty lasts.

Knowing the answers to these questions won't guarantee that you'll find the

perfect CD-ROM drive. But at least you'll keep surprises to a minimum.

## ON THE SOFTWARE SIDE

The CD-ROM software story is a good news/bad news situation. If you own an Apple II, the bad news is that there are only two products available for your computer. (If you know of other CD-ROM products that work with the Apple II, let us know.) The good news is that if you own or have access to a Mac, discs abound. In fact, it would be impossible to list every CD-ROM on the market. What follows is a sampling of products that are available for Apple owners.

### THE STRING QUARTET

**Warner New Media**  
3500 Olive Avenue  
Burbank, CA 91505  
(818) 955-9999

Macintosh Plus or later,  
1M of RAM,  
System 6.0.2 or higher,  
hard disk with at least 6.5M of free space,  
HyperCard 1.2.2 or higher  
installed on hard disk,  
Macintosh-compatible CD-ROM drive,  
audio-playback equipment  
(such as earphones or desktop speakers)  
Age Level: junior high school and up  
\$66

**W**arner New Media's Audio Notes presentation of Beethoven's *String Quartet No. 14* (Opus 131) offers a variety of entertaining ways to investigate this magnificent work. Pictures, supplemental audio examples, historical commentaries, and text annotations all richly enhance the musical presentation. The CD builds on a 1987 Teldec recording of Beethoven's work by the Vermeer Quartet.

If you're a Beethoven aficionado, you'll appreciate how easy it is to navigate, using HyperCard to access the disc's contents. Clicking on the *Index* calls up an alphabetized list of topics, any one of which you can select with the point-and-click of a mouse. There's even a glossary of musical terms, many with audio illustrations.

You can *Explore the Music* through the disc's full-length introduction. *Structural Analysis* offers real-time commentary on

## CD-ROM

musical forms as the quartet plays in the background. If you're interested in a detailed harmonic analysis, investigate the section on tonal elements.

The *Quartet Map* provides an in-depth look at the composition's seven movements. You can select *Timeline* for a brief examination of eight famous composers and the musical eras in which they lived. A section devoted to Beethoven himself provides details about the composer and his music. In an interesting option along educational lines, the CD concludes with a *Final Exam* to see how well you've mastered the material.

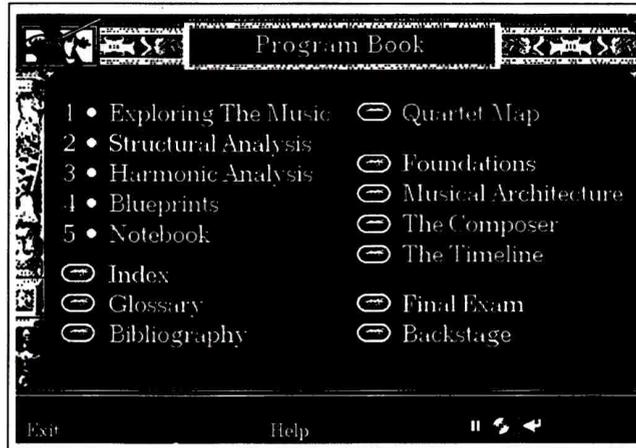
Warner New Media's latest *Audio Notes* offers something for everyone. This is one CD that's guaranteed to enrich your appreciation of Beethoven's genius.

### CD FUN HOUSE

**Wayzata Technology Inc.**  
P.O. Box 87  
16221 Main Ave. S.E.  
Prior Lake, MN 55372  
(800) 735-7321  
(612) 447-7321  
Macintosh with SCSI port,  
Macintosh-compatible  
CD-ROM drive  
Age Level: grade 4 to adult  
\$59

**CD Fun House** features more than 50 megabytes of public-domain, shareware, and freeware entertainment.

Each program on the disc is rated on a five-star scale. The disc also includes a copy of Disinfectant 2.2 (for virus



**Beethoven's String Quartet No. 14: disc table of contents.**

detection and cure) and a copy of HyperCard 2.0 for the Mac.

Programs are organized by topic into 11 categories for quick access. You'll find board games (*Games Parlour*), adventure programs (*AdventureLand*), simulations (*The Simulator*), educational titles (*The School House*), sports themes (*Sports Palace*), classic *Star Trek* offerings (*Star Fleet HQ*), and arcade-style shoot-'em-up games (*The Arcade*), plus games of skill and chance in *The Casino*, *Word Games*, and *Interesting Stuff*.

Operation is simple: Retrieve a program by clicking on its icon, or find out more about the game by searching the disc index.

Every title has a dedicated index card, listing game type, rating, shareware fee (if applicable), location on disc, contact information, and a brief description.

CD Fun House is a great product, guaranteed to stave off boredom during rainy days and television-rerun season.

### CIA WORLD FACTBOOK 1990

**Wayzata Technology Inc.**  
P.O. Box 87  
16221 Main Ave. S.E.  
Prior Lake, MN 55372  
(800) 735-7321  
(612) 447-7321  
Macintosh Plus or later, 1M of RAM,  
Macintosh-compatible CD-ROM drive  
Age Level: junior high school and up  
\$129

**The CIA World Factbook** contains details on 249 countries and territories around the world, compiled by the United States Central Intelligence Agency. Search for data by country, topic, word, or Boolean logical operators (such as *and*, *or*, *or not*, and *not*). Major categories include geography, people, government, economy, communications, and defense forces. The disc also contains several maps.

## Hardware Product Information

**AppleCD 8C**  
(500 msec)  
Apple Computer Inc.  
20525 Mariani Ave.  
Cupertino, CA 95014  
(408) 996-1010  
Macintosh or Apple II  
with SCSI card  
\$899  
cable \$50  
terminator \$30

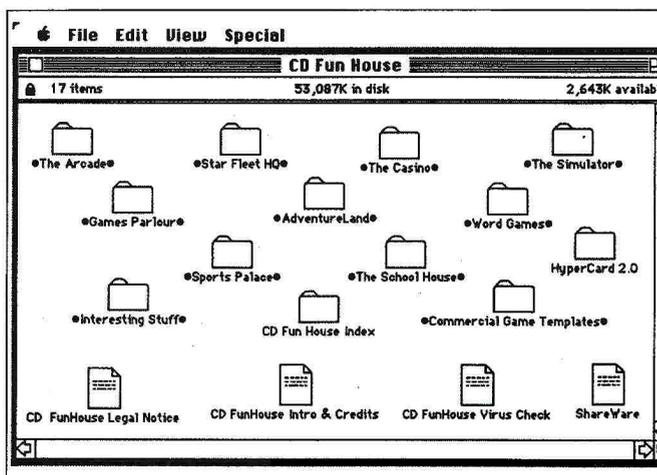
**CD Porta-Drive T3201**  
(350 msec)  
CD Technology  
780 Montague  
Expressway #407  
San Jose, CA 95131  
(408) 432-8698  
Macintosh  
with SCSI port  
\$895  
cable included  
optional terminator \$20

**CDA-431**  
(350 msec)  
Chinon America, Inc.  
660 Maple Ave.  
Torrance, CA 90503  
(213) 533-0274  
(800) 441-0222  
Macintosh  
with SCSI port  
\$795  
cable and terminator  
included

**DRD-253M**  
(400 msec)  
Denon America, Inc.  
222 New Road  
Parsippany, NJ 07054  
(201) 575-7810  
(800) 446-0062  
Macintosh  
with SCSI port  
\$940  
cable \$29

**CDR-10**  
(350 msec)  
Mirror Technologies  
2644 Tattton Road  
Roseville, MN 55113  
(612) 633-4450  
Macintosh  
with SCSI port  
\$697  
cable and terminator  
included

**CD Fun House:**  
disc contents  
showing major  
software  
categories.



You experience Osmo's animated galaxy by pointing and clicking on interesting objects on screen. Pilot a spaceship through an unfamiliar universe filled with endearing characters, amazing special effects, and terrific animations. You'll explore seven strange new interconnected worlds. Even young children will find it entertaining.

Cosmic Osmo is what interactive multimedia is all about. You play challenging games and delight your ears with more than 40 minutes of CD-quality music and 20 original songs. The original Cosmic Osmo floppy-disk version (1989) contained just 5 megabytes of code and music. The CD-ROM version tips the scales at more than 100 megabytes.

Treat yourself to an electronic extravaganza of whimsical sights and sounds — you'll be entertained for hours. Cosmic Osmo is the perfect excuse to buy a CD-ROM drive.

Each major data area is further divided into detailed subcategories. For example, *Economy* usually consists of a general economic overview, plus facts and figures on gross national product, inflation, unemployment, budget, exports, imports, external debt, and industrial production.

The *Government* category yields information on each country's capital city, administrative divisions, legal system, national holidays, leaders, and political parties. In *People*, you'll find population statistics as well as birth, death, and literacy rates, and data on ethnic divisions and national religions.

You can print both images and text. On-line help describes program features and assists with information search and retrieval. The CIA World Factbook is a great program for anyone who needs instant "encyclopedic" access to world information.

## COSMIC OSMO

**Cosmic Osmo**  
Activision  
P.O. Box 3048  
3885 Bohannon Drive  
Menlo Park, CA 94025  
(800) 227-6900  
(415) 329-0800

Macintosh Plus or later, 1M of RAM,  
Macintosh-compatible CD-ROM drive  
(1000 msec or faster recommended),  
HyperCard 1.2.5 (included on CD),  
System 6.0.4, 6.0.5, or higher  
Age Level: 7 to adult  
\$79.95

Welcome to Activision's CD-ROM solar system, "the worlds beyond the mackerel." Meet Osmo, the coolest shade-sporting alien ever to grace a Macintosh screen. Journey into hyperspace and boldly go where no CD-ROM has gone before. Exciting audiovisual surprises greet you every step of the way.

Don't worry about reading directions or memorizing command-key sequences.

## GEM/PUBLIC DOMAIN

**Wayzata Technology Inc.**  
P.O. Box 87  
16221 Main Ave. S.E.  
Prior Lake, MN 55372  
(800) 735-7321  
(612) 447-7321

Apple IIe/IIs, AppleCD SC (SCSI Revision C or later), amplifier, speaker or headset  
Age Level: grade 4 to adult  
\$119

**GEM** (for *Generous Efforts of Many*) contains megabytes of Apple II and IIGs software collected from user groups and on-line service libraries. It features share-

**CDR-35**  
(1500 msec)  
NEC Home Electronics  
1255 Michael Drive  
Wood Dale, IL 60191  
(312) 860-9500  
Macintosh  
with SCSI port  
\$599  
software driver \$99

**CDP-2A (Toshiba drive mechanism, 380 msec)**  
**CDP-1B (Sony drive mechanism, 380 msec)**  
Optical Media International  
485 Alberto Way  
Los Gatos, CA 95032  
(800) 347-2664  
(408) 395-4332  
Macintosh  
with SCSI port  
\$795 each  
cable, terminator extra  
\$39 software driver  
\$10 audio playback software

**DRM-600 CD-ROM Changer**  
(600 msec)  
Pioneer Communications of America  
600 East Crescent Ave.  
Upper Saddle River, NJ 07458  
(201) 327-6400  
Macintosh  
with SCSI port  
\$1295  
cable \$45  
software drivers \$100

**CDU-6211 (380 msec)**  
Sony Computer Peripheral Products Co.  
655 River Oaks Parkway  
San Jose, CA 95134  
(408) 432-0190  
Macintosh  
with SCSI port  
\$600-\$700, includes  
cable and terminator;  
purchase Macintosh  
software drivers  
elsewhere  
(Trantor Systems, Ltd.)

**XM-3201A1-MAC**  
(350 msec)  
Disk Products Division  
Toshiba America Information Systems  
9740 Irvine Blvd.  
Irvine, CA 92718  
(800) 456-3475  
(714) 583-3000  
Macintosh  
with SCSI port  
\$850  
cable and terminator included

## CD-ROM

ware and freeware, as well as demonstration versions of several favorite IIe/IIgs applications.

For instance, you'll find demos of HyperStudio, Beagle Bros classics, DB Master Professional (a relational database manager), Circulation Plus (for keeping tabs on library books), TIC (telecommunications), and Davidson educational software, to name just a few.

You'll also find files you can use with AppleWorks and AppleWorks GS, HyperStudio stacks, *Just Add Water* (Apple's guide to starting a user group), and *Technical Notes* (the complete collection of *Apple II Technical Notes* from November 1988 to January 1990). There's even a shareware CAD program for the Apple II.

Programs are organized into categories for easy access; separate folders are devoted to games, education, communications, fonts (TimeOut SuperFonts compatible), disk utilities (such as virus detection and elimination software, program selectors, and file-type changers), music, and development (programming utilities).

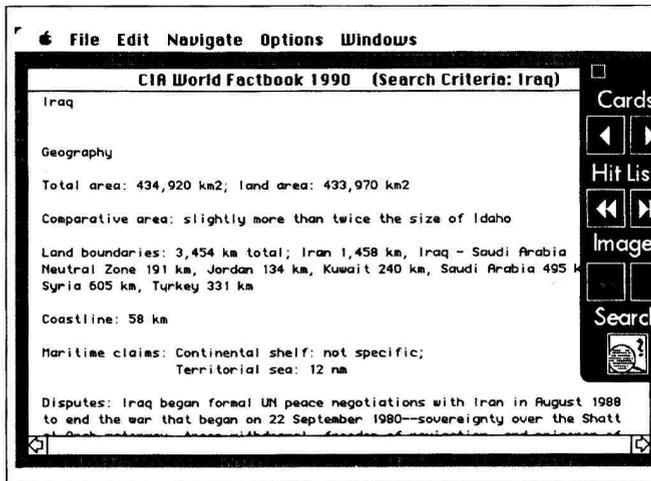
You'll also find NDAs (new desk accessories) and CDAs (classic desk accessories) for the GS, as well as digitized files of voices and sound effects.

The graphics directory contains a variety of images you can use with The Print Shop and GS paint programs, plus a shareware paint application called CheapPaint, a number of animation files, GS graphics application viewers, and a wide array of MacPaint files you can transfer to super-high-resolution format with the utility SuperConvert (also included on disc).

The project team responsible for this collection recommends that you copy a program from the CD to a ProDOS floppy disk before using it.

Note that several applications have been stored in compressed form to conserve space. You can unpack them with Andy Nicholas' ShrinkIt utility, which is also provided.

GEM represents an eclectic software collection for any Apple II library.



**CIA World Factbook:** portion of Iraq file data. Navigation controls visible on screen.

## IGOR STRAVINSKY: THE RITE OF SPRING

**The Voyager Company**  
1351 Pacific Coast Highway  
Santa Monica, CA 90401  
(213) 451-1383  
(800) 446-2001

Macintosh Plus or later, System 6.0.5 or higher, hard-disk drive, Macintosh-compatible CD-ROM drive, HyperCard 2.0 or higher, audio-playback equipment (such as earphones or desktop speakers)  
Age Level: junior high school and up  
\$99.95

Voyager's second release in its musical CD Companion Series presents Stravinsky's *Rite of Spring*, and should be available by the time this article appears in print. The package includes three floppy disks with HyperCard stacks, plus a high-quality recording of Stravinsky's score, performed by the Symphonique de Montréal, with Charles Dutoit conducting. HyperCard makes it easy to explore and learn more about the music.

The Rite of Spring CD is as entertaining as it is educational. The disc includes a glossary of musical terms, real-time commentary on the music (as it plays), biographical sketches of Stravinsky and the time period in which he lived, an exploration of a ballet production of the score, plus a challenging quiz that tests listeners with audio-based questions. In addition, you'll hear commentary and supplemental audio recordings of orchestral instruments. Voyager offers serious music lovers an entirely new way to appreciate Stravinsky's famous score.

## LEARN TO SPEAK FRENCH

**The HyperGlot Software Company**  
505 Forest Hills Blvd.  
Knoxville, TN 37919  
(800) 726-5087  
(615) 558-8270

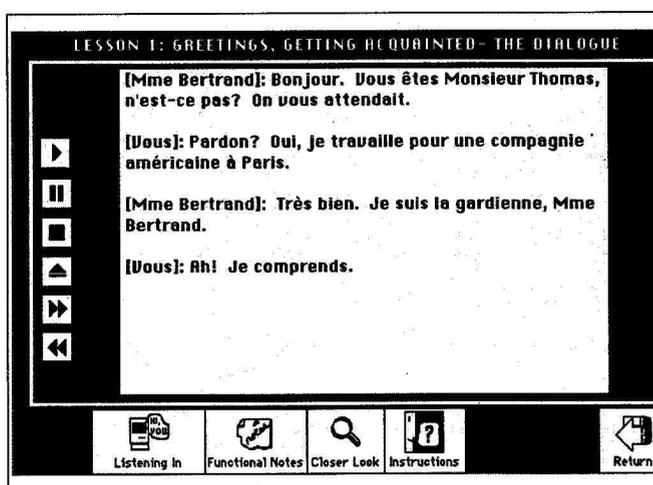
Macintosh Plus or later,  
Macintosh-compatible CD-ROM drive,  
hard-disk drive, HyperCard version 1.2  
Age Level: junior high school and up  
\$249.95 each

Brush up on your "parlez-vous français" — learn to speak like a native with this two-CD French course from HyperGlot Software. Disc 1 contains 36 HyperCard stacks designed to teach (or review) a wide range of expressions and prepare you for everyday situations, including greetings, directions, checking in at a hotel, taking the Paris metro, ordering a meal, and making purchases at a deli, bakery, grocery, or butcher shop. HyperCard lets you jump easily to any topic and move in any direction within a lesson.

Lesson stacks consist of eight parts (or cards). Each one begins with a *Setting*, which briefly summarizes the story or situation that follows. You can listen to or read settings in French (beginning with lesson 11) if you insert the second Learn to Speak CD.

From the *Setting* card, you move to the *Dialogue* card, which contains French vocabulary for the lesson. Clicking on the card calls up an English translation automatically. A *Functional Notes* button offers cultural commentary on contem-

**Learn to Speak French: dialogue card showing lesson vocabulary. Clicking on French text calls up English translation. Click on player controls to hear native speakers pronounce selected words.**



porary French lifestyles. Clicking on the *Play* button lets you listen to digitized pronunciations from the second CD automatically.

A *Listening In* card follows the *Dialogue* card. It tests your knowledge of French by asking you to type in missing words. You can click on the card's CD-player controls for an instant replay of spoken dialogue. A *Check* button calls up answers whenever you're ready.

The next three cards emphasize vocabulary and expressions, grammatical details, and language drills. The final two cards are reserved for testing. If you're planning a trip to France (or another French-speaking country), HyperGlott's CD will help you travel with confidence.

## THE NEW GROLIER ELECTRONIC ENCYCLOPEDIA

**Grolier Electronic Publishing, Inc.**  
**Sherman Turnpike**  
**Danbury, CT 06816**  
**(203) 797-3500**  
**(800) 356-5590**

Macintosh Plus or later,  
 1M RAM,  
 Macintosh-compatible CD-ROM drive  
 Age Level: grades 4 to 12  
 \$395  
 \$495 teacher's edition  
 with guide and student-activity materials

**G**rolier Electronic Publishing has released all 21 volumes of its *Academic American Encyclopedia* on a single CD-ROM disc, collapsing about 10,000 pages and two feet of shelf space into one

4.75-inch optical disc. More than 30,000 articles are available at the point-and-click of a mouse. The latest version adds thousands of detailed illustrations to the thoroughly researched text, as well.

You can search through The New Grolier Electronic Encyclopedia (NGEE) in any one of four distinct ways:

- \* A *Title Index* provides an alphabetical listing of all articles. To find an article, just type the title's first letter(s) and press Return. NGEE then highlights the closest alphabetical match. You can call up as many as ten articles to the desktop simultaneously.

- \* The *Word Index* contains an alphabetical listing of all discrete words in the encyclopedia. A fraction appears beside each word entry. The numerator represents the total number of times the word appears; the denominator refers to the total number of articles where the word can be found. Clicking on an *Index* word directs NGEE to display all article titles. You then can call up a title of interest.

- \* NGEE supports *Boolean* word-search techniques using partial words and word combinations, as well as complete word forms. You can hunt for synonyms and specify whether to search article titles, text entries, picture captions, bibliographies, or special fact boxes.

- \* Lastly, with the *Picture Index*, you can locate specific graphics images.

NGEE simplifies the task of library research by making articles and facts

instantly available. You can take notes in an electronic *Notepad*, place bookmarks in an article for quick and easy reference, save notepads to disk, and print them.

If you have children, Grolier's New Electronic Encyclopedia is a research tool that can't be beat.

## VIETNAM REMEMBERED

**Wayzata Technology Inc.**  
**P.O. Box 87**  
**16221 Main Ave. S.E.**  
**Prior Lake, MN 55372**  
**(800) 735-7321**  
**(612) 447-7321**

Macintosh Plus or later,  
 1M RAM,  
 Macintosh-compatible  
 CD-ROM drive  
 Age Level: junior high school and up  
 \$129

**V**ietnam Remembered focuses on the long, complex involvement of the United States government in the Southeast Asian conflict, from 1946 to 1976.

Compiled from both public and private information sources, this Wayzata compact disc offers a wealth of historical data and more than 200 graphics images to accompany it. Its database contains 119,597 words organized on 61,654 cards.

You'll find information on battles, equipment and missions, a detailed chronology of events, biographies of significant military and political personalities, a complete list of all names inscribed on the Vietnam Memorial Wall in Washington, D.C., and a glossary of pertinent terms.

There's also a notable section on the controversial defoliant chemical Agent Orange and its effects, plus a chronicle of the war's early years, a list of Medal of Honor recipients, and descriptions of certain postwar events.

You can search for particular words with Boolean operators or scroll through cards individually by clicking on the program's navigation arrows; you can also print documents for quick reference.

Wayzata's disc is a must for students and adults of any age interested in learning about the Vietnam War and our country's role in the conflict.

## CD-ROM

### SCARY POEMS FOR ROTTEN KIDS

Discis Knowledge Research Inc.  
5150 Yonge Street  
North York, Ontario, Canada M2N 6N2  
(416) 250-6537  
(800) 567-4321  
Macintosh Plus or later, 1M of RAM,  
Macintosh-compatible CD-ROM drive,  
8-bit color board  
Age Level: 4 to 8  
\$84.95

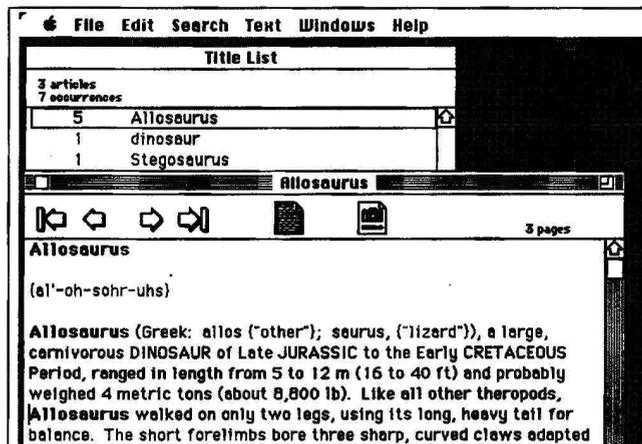
In this collection, Discis provides all the text and pictures of Sean O'Huigin's original *Scary Poems for Rotten Kids*, plus digitized speech, spoken help and instructions, upbeat musical accompaniment, and eerie sound effects.

The best part is that you don't even have to know how to read to enjoy a Discis book, so even preschoolers can enjoy it; youngsters can listen to portions read aloud when they click on the sentence speaker. Navigation's simple, too: Clicking on the dog-eared book corners advances the text forward (or backward) one page at a time.

Scary Poems offers several exciting features that aren't found in the conventional print version of O'Huigin's text. Children can learn more about any illustration, for instance, by pointing-and-clicking on the picture. The program identifies an illustration by speaking its name and placing its written form on screen.

It's similar with text: If kids point-and-click on a word in the text, Scary Poems reads it aloud. Double-clicking on a word directs the program to speak it and offer a definition. Pulling down the *Recall* menu shows all words selected since the child last opened the book.

O'Huigin's fun-filled, comic anthology contains 14 ghoulish poems, each one eerier than the next. One favorite is "The Day the Mosquitoes Ate Angela Jane." Several others are just as enjoyable. So the next stormy night (barring lightning, of course), cuddle up with your child in front of your Macintosh. The Scary Poems CD is an electronic experience not to be missed.



Entering "allosaurus" in word-search dialog calls up Title List, showing seven listings in three articles. Clicking on word in Title List calls up article. Camera icon indicates picture available.

### THE USA FACTBOOK 1990

Wayzata Technology Inc.  
P.O. Box 87  
16221 Main Ave. S.E.  
Prior Lake, MN 55372  
(800) 735-7321  
(612) 447-7321  
Macintosh Plus or later,  
1M of RAM,  
Macintosh-compatible CD-ROM drive  
Age Level: junior high school and up  
\$139

The USA Factbook from Wayzata Technology, updated annually, contains an abundance of information on the United States and its territories, with facts and figures on a wide variety of topics, as well as state maps, state seals, and important phone numbers.

It's organization at your fingertips: Calling up a particular state yields data on categories such as geography, people, government, economy, communications, and national monuments. Each topic is, of course, further divided into detailed subcategories.

Disc navigation is a breeze, but on-line help is instantly available if you need it. You can search the database by browsing through individual cards or issue a *Find* command and use Boolean operators to locate specific information. An array of extras help students and adults alike keep their research organized. For instance, you can print text, maps, and seals or copy them to the clipboard for use with other applications. If your kids or students need a better knowledge of the USA, this disc is a great place to start.

### TIME TABLE OF HISTORY: SCIENCE & INNOVATION 1990 EDITION

Xiphias  
8758 Venice Blvd.  
Los Angeles, CA 90034  
(213) 841-2790  
Mac Plus or later,  
Macintosh-compatible CD-ROM drive,  
1M of RAM  
(2 recommended),  
HyperCard 1.2.2 or higher  
Age Level: junior high school and up  
\$185

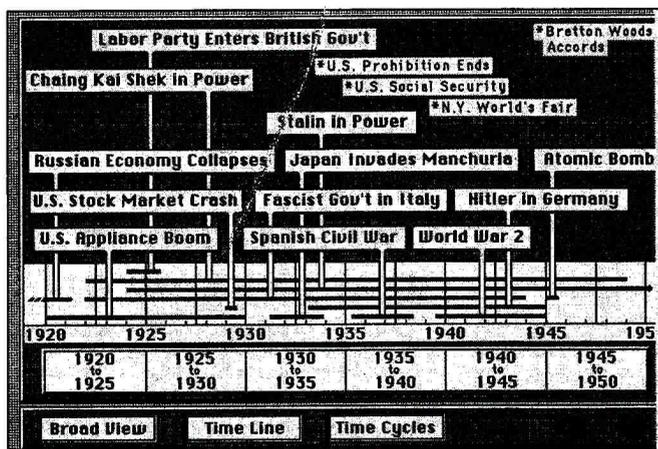
Time Table of History features more than 6000 stories detailing major technological and scientific achievements from 5000 B.C. to the present.

This Mac HyperCard-based CD uses digitized human voice, text compiled from several research sources, and illustrations to describe events in historical context. Story screens contain multimedia buttons that link text descriptions to special audiovisual effects.

You can explore historical events two ways: by *Time Line* or by *Time Table*:

\* Clicking on *Time Line* calls up a menu bar of eight historical periods (5000 B.C. to 600 B.C., 600 B.C. to 1800 A.D., 1800 to 1860, 1860 to 1900, and so on). Clicking on a particular time period initiates a search for all stories occurring during those years. In addition, every *Time Line* screen contains a *Time Cycles* button that brings up an image of Schumpeter's Theory of Economic Cycles. The accompanying illustration shows how scientific

**Time Table: Time Line** screen showing context and time-period buttons. Context buttons initiate voice-over descriptions of events; time-period buttons direct program to search for all stories falling between years indicated.



developments and technological innovations influence business trends.

\* Clicking on the *Time Table* button calls up a screen consisting of several windows. Each one is "hot-linked" to follow a hypertext path through history. For example, the title window briefly describes the subject of the article in the story window. Clicking on any of the title words directs the software to search for all other occurrences of that word. Similarly, the story window contains an article about the topic under investigation. Clicking on any word in the story window initiates a cross-search for all occurrences of that word in the Time Table database.

You can search for related stories by clicking on keywords in that window, or initiating a customized search by typing in look-up parameters in the *Xearch* window. You can consult bibliographies and view maps and animations.

Time Table also includes a periodic table of the elements, an electromagnetic spectrum, a powers-of-ten button illustrating distance from the earth, and a geological timeline showing the evolution of life on earth.

Xiphias' Time Table of History represents an exciting new way to look at science and technology. You can explore significant historical events in a nonlinear fashion, while digitized speech, sound effects, and animation make the presentation come alive. According to a company spokesperson, a Time Table of Business, Politics, and the Media is in the works.

## WEBSTER'S NINTH NEW COLLEGIATE DICTIONARY

**Highlighted Data**  
4350 North Fairfax Drive  
Suite 450  
Arlington, VA 22203-1620  
(703) 516-9211  
Mac Plus or later,  
2M of RAM  
and hard-disk drive recommended,  
Macintosh-compatible CD-ROM drive  
Age Level: kindergarten to adult  
\$199.95

At last — an on-line dictionary that literally speaks for itself. Webster's Ninth New Collegiate contains the full text of the print version, plus optional 18-point (large text) display, point-and-click access to cross-references, and digitized speech. You can hear a word pronounced simply by calling it up with the *Find* command or clicking on it in the *Word* window. You can copy definitions, as well as illustrations, to the clipboard and paste them into other applications.

The CD dictionary is a stand-alone application that contains almost 160,000 entries and 200,000 definitions. Unfortunately, you can't access it while working in another program unless you're running under MultiFinder. Nevertheless, it's a useful electronic reference tool.

In addition to word definitions and etymologies (showing the history of a word by tracing its development from the earliest recorded occurrence), Webster's contains a *Handbook of Style* with pertinent information about punctuation, italicization, capitalization, and pluraliza-

tion, as well as several tables and a dictionary of abbreviations.

You can call up a list of colleges and universities (with addresses), plus a list of foreign words and phrases, complete with definitions.

You'll also find interesting essays on language usage, the history of the English language, spelling, pronunciation, and more.

If you're in the market for a dictionary to help your children or students with spoken English, the electronic Webster's has something to say to you.

## YOURWORDBOX!

**The WordBox! Company**  
P.O. Box 1115  
Belmont, CA 94002  
(415) 592-5447

Apple IIGs,  
1.5M of RAM,  
color monitor (RGB preferred),  
AppleCD SC  
(SCSI Revision C or later),  
amplifier, speaker or headset  
Age Level: 4 to 7  
\$169

YourWordBox! teaches preschoolers how to use language — how to read and understand the rules of grammar. It teaches the way kids learn naturally, by hearing a large number of different kinds of sentences. (The company calls it "learning in context.") The computer focuses the learning (by repeating grammatically related sentences — not a random sampling, as TV or a parent might use); the CD-ROM disc broadens it.

CD-ROM makes this method reasonable because it can store thousands of sentences, pictures, and digitized recordings. A 3.5-inch disk accompanying the CD includes software lessons you can use with the program's thousands of words and graphics. Lessons include animated stories that will enhance the magic as much as hearing them. The graphics images are clear and designed to appeal to young children. The female voice sounds natural — it is, after all, a digital recording.

Volume I includes 701 lessons on the parts of speech. Future volumes may include different lessons or new words and pictures. WordBox! says that a Mac version is also under consideration. □

# Programs, Peripherals



**HOME DESIGNER'S DREAM**  
**Design Your Own Home Architecture, Landscape or Interiors by Abracadata.** Now you can have a designer home with a most prestigious name: yours. Draw floor plans, elevations, structural details the way you want them. Build interior and landscape designs with separate packages. All packages come with pre-drawn shapes.  
 Suggested Retail GS .....\$89.95  
**Programs Plus Price.....\$47.**  
 Suggested Retail .....\$69.95  
**Programs Plus Price.....\$37.**

## ACCELERATORS / RAMCARDS

<b>American Micro Research (Micro Sci)</b>	
80/64E 80 Column 64K Card (Ile only) .....	49.
<b>Apple Computer</b>	
Apple Ile Enhancement Kit .....	58.
Apple Ile Extended 80 Col. Card. ....	89.
<b>Applied Engineering</b>	
GS-Ram Plus 1MG .....	199.
GS-Ram Plus 2MG .....	293.
GS-Ram Plus 3MG .....	379.
GS-Ram II 1MG .....	142.
GS-Ram II 2MG .....	219.
GS-Ram II 4MG .....	369.
GS-Ultra 1MG .....	212.
GS-Ultra 2MG .....	279.
GS-Ultra 512K .....	159.
PC Transporter (768K) .....	255.
PC Transporter Installation Kit GS .....	37.
PC Transporter Installation Kit IIE .....	29.
Ram Express II 1024K .....	174.
Ram Express II 256K .....	141.
Ram Express II 512K .....	156.
RamFactor 1MG .....	229.
RamFactor 512K .....	189.
RamWorks III 1MG .....	220.
RamWorks III 256K .....	133.
RamWorks III 512K .....	160.
TransWarp Accelerator (GS) .....	260.
TransWarp Original Accelerator .....	88.
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Z-Ram Ultra 2 1MG .....	277.
Z-Ram Ultra 2 256K .....	191.

Z-Ram Ultra 2 512K .....	220.
Z-Ram Ultra 3 1 MG .....	292.
<b>Chips</b>	
Chips Set 256K 120 or 150 NS .....	19.
<b>CV Technologies</b>	
GS Memory Board .....	89.
<b>Harris Labs</b>	
GS Load 256K (3 pack) .....	69.
GS Sauce 1MG .....	132.
GS Sauce 2MG .....	169.
GS Sauce 4MG .....	307.
GS Sauce Card "0" K (GS) .....	75.
<b>Zip Technology</b>	
Zip Chip 4 MHZ .....	98.
Zip Chip 8 MHZ .....	139.
Zip Chip Model 1600 (GS) <b>SPECIAL</b> .....	249.

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<b>Advanced Gravis</b>	
Advanced Gravis' Joystick (AP & GS) .....	39.
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<b>Apple Computer</b>	
Apple Mouse Ile .....	118.
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Extended Keyboard ADB .....	175.
Video Overlay Card .....	428.
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Audio Animator (GS) .....	155.
Conserver (GS) .....	73.
High Output Power Supply .....	59.
IIGS Heavy Duty Power Supply .....	77.
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TimeMaster .....	77.
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<b>CH Products</b>	
Flight Stick .....	46.
Mach III Joystick .....	29.
Mach IV Joystick .....	62.
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<b>I/O Design</b>	
Imageware II Case Black, Navy, Platinum .....	45.
<b>ICMS, Inc.</b> MousePen ADB .....	89.
<b>Kalmar</b>	
Kalmar Roll Top 3.5 (holds 135) .....	26.
Kalmar Roll Top 3.5 (holds 45) .....	14.
Kalmar Roll Top 3.5 (holds 90) .....	21.
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Apple Security System .....	33.
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Mouseway (MousePad) .....	8.
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Universal Printer Stand .....	19.
<b>Koala Technologies</b>	
Koala Pad Plus w/Graphics Exhibitor .....	79.

**Check our low prices. Most of our prices are the lowest in this magazine. If we don't already have the lowest price, WE WILL TRY TO MATCH AND BEAT ANY ADVERTISED PRICE\***

\* "Advertised price" does not include typographical errors on the part of other vendors or prices that do not reflect higher shipping costs, credit card charges, or membership fees. Final judgement remains with the manager on duty.

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Lynn Products Cables (Specify) .....	13.
Lynx Computer Turbo Trackball (GS) .....	59.

### Maxell

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Maxell 5.25 DS/DD .....	9.

### Mouse Systems

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Littlemouse ADB .....	78.

### Moustrak

MousePad 7"x9" Size .....	8.
MousePad 9"x11" Size .....	9.

### Northgate Computer Systems

OmniMac Ultra Keyboard (IIGS) .....	94.
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### Orange County Speaker

OCS 2-40 (Stereo Amplifier) .....	125.
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### RC Systems Double Talk

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### Ribbons

ImageWriter Ribbons available in orange, purple, black, blue, brown, green, red, yellow or silver .....	4.
ImageWriter II-4 Color Ribbon .....	9.
ImageWriter Rainbow Pack (6 Colors) .....	19.
ImageWriter Ribbon-Black (6 pack) .....	19.
<b>Sony</b> Sony 3.5 DS, DD (10) .....	12.

### Sopris

Imagewriter II Case Navy, Platinum .....	42.
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### Street Electronics

Echo II (AP & GS) .....	99.
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<b>Targus</b> Imagewriter II Case Black .....	44.
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## APPLE COMPATIBLE COMPUTERS

### Apple Computer

IIGS Computer 1MG CPU .....	799.
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### Laser Computer Inc.

Laser 128 800K 3.5" Drive w/Controller .....	199.
Laser 128 Cables (Parallel, Serial, RGB or Modem) ..	13.
Laser 128 Computer .....	325.
Laser 128 Mouse .....	44.
Laser 128 System w/Amber Monitor .....	380.
Laser 128 System w/Color Monitor .....	490.
Laser 128EX Computer .....	369.
Laser 128EX II Computer (3.5) .....	429.
Laser 128EX II Computer (5.25) .....	399.
Laser RGB Monitor .....	215.

## BACKUP UTILITIES

<b>Alpha Logic</b> LockSmith v6.0 .....	33.
<b>Apple Computer</b> GS/OS v5.0.2 (GS) .....	39.
<b>Central Point Software</b> Copy II Plus v9.0 .....	24.
<b>Glen Bredon</b> Dos.Master .....	23.
Pro Command .....	23.
ProSel 16 (3.5) .....	53.
ProSel 8 (5.25) .....	36.

**INDEPENDENCE™**

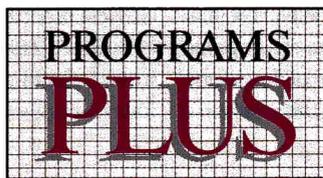
**Seven Hills**

Software

Now you can produce stunning 300 dot-per-inch text and graphics at a fraction of the cost of expensive laser printers. Independence supports Hewlett-Packard DeskJet and LaserJet printers plus fully-compatibles. Works with AppleWorks GS, GraphicWriter III, Platinum Paint, SuperConvert, and most other GS/OS software. Includes an extra font disk. Printers connect to the IIGS serial port (cable required.)  
 Suggested Retail .....\$39.95  
**Programs Plus Price .....\$23**

# Programs Plus

# 1-800-832-3201



Fax: 203-381-9043  
 Inquires: 203-378-3662  
 Canada: 1-800-344-7753  
 75 RESEARCH DRIVE  
 STRATFORD, CT 06497

# & Phenomenal Prices

## Vitesse, Inc.

Salvation: Deliverance (GS)	29.
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Salvation: Backup (GS)	29.
Salvation: Renaissance (GS)	29.
Salvation: Supreme Pack	125.
Salvation: Wings (GS)	49.

## BUSINESS SOFTWARE

<b>Abracadata</b> Everybody's Planner	49.
<b>Actsoft</b>	
Alpha Check Plus	34.
Alpha Check v3.1	26.
<b>Beagle Brothers</b>	
AW v3.0 Companion	23.
Beagle Bros. Clip Art 1 (GS)	26.
Beagle Bros. Desk Accessories (GS)	36.
Beagle Write	45.
Beagle Write Desk Accessories	
or Font Pack 1 or 2	26.
Beagle Write Font Lib. 1 (GS)	31.
Beagle Write Picture Manager	25.
Beagle Write (GS)	57.
GS Font Editor or Program Writer	29.
Outliner for Appleworks 3.0	41.
Superfonts Activity Guide	29.
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Timeout Graph	49.
Timeout MacroEase	23.
Timeout Performance Pak (DeskTools I, II & PowerPack)	65.

Timeout QuickSpell	40.
Timeout ReportWriter	42.
Timeout SideSpread, FileMaster, or DeskTools	30.
Timeout Style Pak (SuperFonts, Thesaurus & FileMaster)	79.
Timeout SuperForms	40.
Timeout SuperForms	39.
Timeout TextTools	29.
Timeout Thesaurus, DeskTools II or PowerPack	29.
Timeout UltraMacros or SpreadTools	34.

## Big Red Software

Labels, Labels, Labels	22.
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## Broderbund

Bank Street Writer Plus (AP or C+)	47.
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## Claris

Apple Works v3.0	168.
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Apple Works (GS) v1.1	192.
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Intuit Quicken v1.0	37.
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## Manzanita

BusinessWorks Bundle AP & GS	
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(Sys. Manager, G/L, A/P, A/R, Inventory)	248.
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BusinessWorks Payroll (AP & GS)	98.
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## Meca Software

Managing Your Money	
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v4.0 (AP & GS)	88.
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## Micca Soft

Invoicer w/A/R & Sales	
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Tracking/Inventory	125.
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Milliken Publishing Medley (GS)	74.
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Nolo Press Will Maker v3.0	33.
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## Seven Hills Software

Graphicwriter III (GS)	72.
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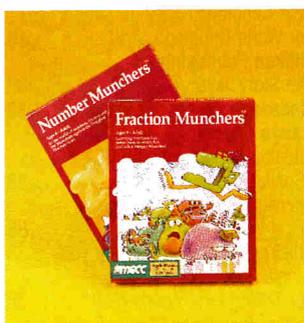
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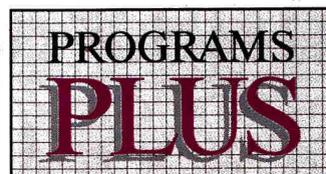
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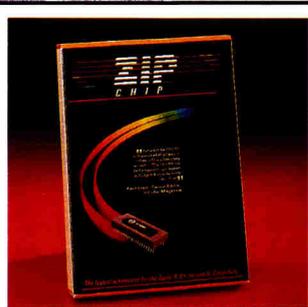
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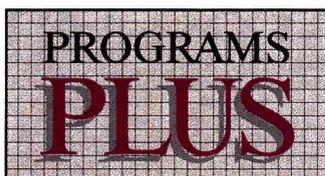
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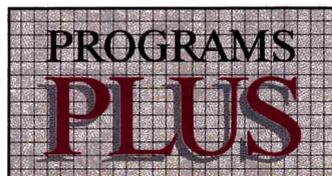
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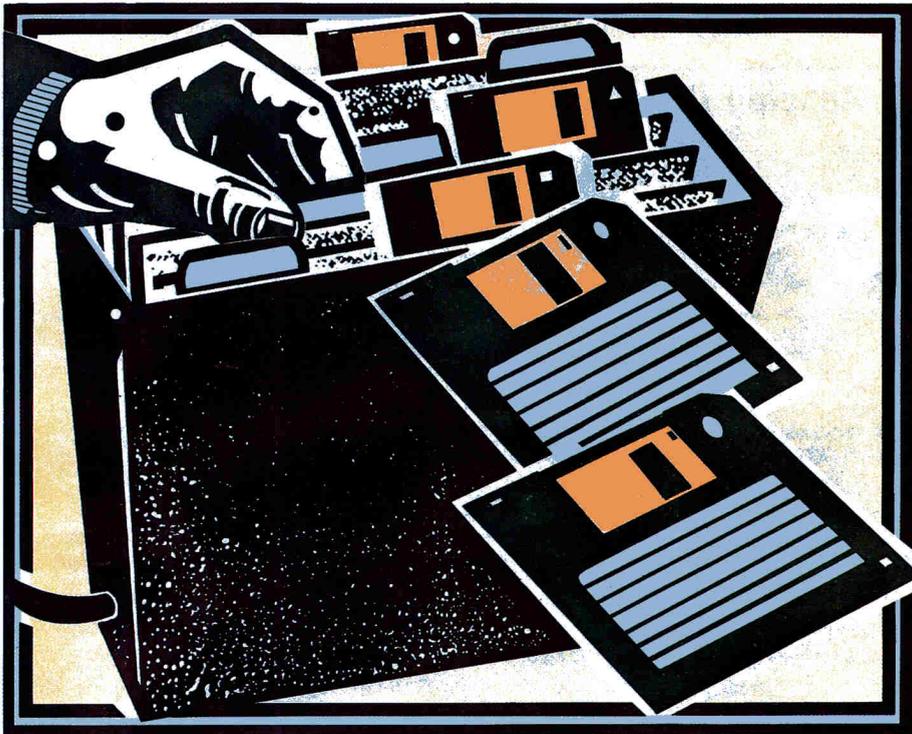
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# IT PAYS TO BE ORGANIZED



Don't let your hard drive's speed and convenience go to waste — follow your operating system's own file structure to manage your data effectively and efficiently.

By Gary R. Morrison  
and Walker Archer

**N**o doubt about it — a hard-disk drive represents no small investment of your hard-earned cash. Getting more for your money isn't just a matter of careful bargain hunting, though. Once you take that hard drive home, making your venture pay off may depend on how well you understand the way ProDOS or GS/OS — your computer's *operating system*, or *system software* — organizes your program and data files on disk. If you ignore the system software's *hierarchical file structure* (HFS), you'll use only a fraction of your hard disk's storage capacity.

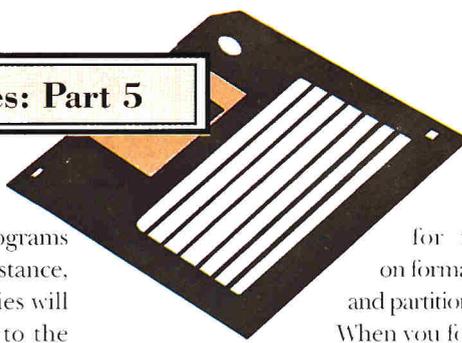
If you've installed GS/OS on your hard drive (see "The Wizard of OS," April 1991, p. 53, for details) and used the Finder to examine the contents of your disk, you've probably noticed a number of file-folder icons on screen. (Or if you're familiar with the Macintosh, you know that machine's operating system is similar in form and function. See "Family Ties: A Striking Resemblance in System Software," February

1991, p. 52.) So the HFS concept isn't new, really — it's analogous to an older method of organization that's quite familiar to all of us. After all, you wouldn't stuff papers randomly into a file drawer. You'd sort them first — alphabetically, or by topic — in separate folders so that you could find them easily again. GS/OS uses this metaphor to illustrate its organizational system. (ProDOS' system is similar; ProDOS files are grouped under subdirectory names instead of file-folder icons.) Just as a file cabinet can contain several folders organized by topic, a hard drive can store information in subdirectories (ProDOS) or folders (GS/OS) containing similar files grouped together.

### A PATH TO YOUR DOOR

GS/OS and ProDOS disks, both floppy and hard, are also known as *volumes*. If you've subdivided your hard drive, each partition is a separate volume, as well. When you format a disk, you give it a name. Each volume is identified by a beginning slash — /APPLEWORKS, /DICT, /PAINT, for example. If you don't choose ◊

## Hard-Disk Drives: Part 5



a name, most drive-formatting programs will assign one as a default. For instance, the GS/OS Advanced Disk Utilities will assign the name /UNTITLED1 to the first partition of any drive for which you neglect to specify a name. (See part 3, "Off the Beaten Track," March 1991, p. 88.

for more on formatting and partitioning.) When you format a disk, the operating system also sets aside an area on the disk for the volume's *directory* — a listing of names and

sizes of files stored on disk. GS/OS and ProDOS store data on any disk according to a filename that is at least one letter long and can have as many as 15 letters, numbers, or periods (just as long as it starts with a letter). If you've ever created a new file with AppleWorks, for instance,

## Getting Around in GS/OS

### /SYSTEM.DISK

#### PRODOS

Similar to 8-bit ProDOS (P8 below) only in that it's the first file executed when you boot GS/OS. Unlike ProDOS 8, this file is only a small part of the operating system — it merely starts things off.

#### BASIC.LAUNCHER

Used by the Finder to launch ProDOS 8 BAS or BIN files from GS/OS.

#### BASIC.SYSTEM

Run to access the Applesoft BASIC interpreter. Contains only a small part of the language; the rest resides in ROM (read-only memory). Primary function is to provide a file I/O (input/output) interface between ProDOS and BASIC. Without this file in memory you can't use file I/O commands such as CATALOG and OPEN.

### /SYSTEM.DISK/SYSTEM

#### START.GS.OS GS.OS GS.OS.DEV

Contain the primary routines GS/OS uses. START.GS.OS is second part of GS/OS bootstrap process; called directly by PRODOS file. You can launch START.GS.OS directly from ProDOS 8 to get into GS/OS (not recommended). When GS/OS boots it assumes the computer is either being reset or powered on; if any interrupt processes are still installed when GS/OS starts up, the result could be a crash with dire consequences.

#### ERROR.MSG

Contains GS/OS error messages.

#### EXPRESSLOAD

Contains additional routines for fast loading of disk files.

#### START

Finder program. When GS/OS starts up, it looks for any S16-type (GS/OS system file) program named START in this subdirectory. If it finds one it will automatically launch it at boot time.

#### P8

ProDOS 8 PRODOS file; launches ProDOS 8 applications.

**/SYSTEM.DISK/SYSTEM/FSTS/** Contains file system translators. GS/OS can't perform lower-level operating-system tasks, such as reading from and writing to disks itself. Instead it looks for driver and FST programs to do the work for it. GS/OS includes an FST that can read and write ProDOS disks, as well as one that can input from and output to any device that deals with data character by character, such as a printer or modem. A GS running GS/OS could write to or read disks for any operating system, if someone would write a Mac or MS-DOS FST, or send to and receive information from any kind of device. An FST that retrieves data from a CD-ROM disc in standard High Sierra format is already available.

#### PRO.FST

ProDOS file system translator.

#### CHAR.FST

File system translator for character devices, such as modems and printers.

**/SYSTEM.DISK/SYSTEM/DRIVERS/** Contains drivers for specific devices; takes care of the low-level requests from GS/OS, such as reading and writing blocks to and from disk. Drivers describe to GS/OS exactly how to use the particular device for which they were written. Modular driver design lets you connect many different kinds of computer equipment to GS; any software that makes standard GS/OS calls can use it.

#### APPLEDISK3.5

Apple 3.5-inch disk driver.

#### APPLEDISK5.25

Apple 5.25-inch disk driver.

#### CONSOLE.DRIVER

Text screen and keyboard driver.

#### IMAGewriter

ImageWriter printer driver.

#### MODEM

GS modem-port driver.

#### PRINTER

GS printer-port driver.

#### PRINTER.SETUP

Default settings for GS/OS print manager.

### /SYSTEM.DISK/SYSTEM/SYSTEM.SETUP/

Contains files for initialization (preparing computer for GS/OS) at boot time.

#### TOOL.SETUP

Loads tools that patch ROM for different GS computers.

#### TS2

Tool patches for ROM 01 computers.

#### TS3

Tool patches for ROM 03 computers.

you'll recall typing in a filename, which ProDOS then used to identify the file when storing it on the disk drive and finding it later when you wanted to load it again.

A *pathname* is a complete listing of the volume name and subdirectories that

lead to a particular file. Pathnames are similar to the directions you might give for finding the local post office — left on Main Street, two blocks to Second Street, then left on Lincoln. If you're using a ProDOS-based application such as AppleWorks, you may need to type path-

names during operations such as printing files to disk or creating a word-processor (or spreadsheet or database) file from an ASCII file. If you're running 16-bit programs on your GS, you're somewhat more insulated from subdirectory names and pathnames because of

**RESOURCE.MGR**

Contains GS/OS routines for handling new forked file resource format. Must be located here or GS/OS will fail to boot.

**SYS.RESOURCES**

Contains resources used by GS/OS tools and desktop-based Control Panel.

**CDEV.INIT**

Installs the CDEVs used by desktop control panel (utilities for desktop accessed via Control Panel).

**/SYSTEM.DISK/SYSTEM/DESK.ACCS/** Contains desk-accessory utilities you access within applications: CDAs (classic desk accessories), text-based utilities accessed from any program via Open apple/Control/Escape key sequence; and NDAs (new desk accessories), graphics-based utilities accessed only within programs adhering to desktop interface via Apple menu.

**CTLPANEL.NDA**

Allows access to Control Panel CDEVs.

**/SYSTEM.DISK/SYSTEM/TOOLS/** Contains disk-based tool sets in addition to GS ROM tool sets; used to program pull-down menus and windows. With code to produce windows and menus provided by Apple, developers can utilize a standard user interface without writing it themselves.

- TOOL014** Window-manager tool.
- TOOL016** Control-manager tool.
- TOOL019** Print-manager tool.
- TOOL021** Dialog-manager tool.
- TOOL023** Standard-file tool.
- TOOL026** Note-sequencer tool.
- TOOL028** List-manager tool.

- TOOL015** Menu-manager tool.
- TOOL018** QuickDraw auxiliary tool.
- TOOL020** Line-edit tool.
- TOOL022** Scrap-manager tool.
- TOOL025** Note-synthesizer tool.
- TOOL027** Font-manager tool.
- TOOL034** Text-edit tool.

**/SYSTEM.DISK/SYSTEM/CDEVs/** Contains Control Panel devices for standard GS features; used by CTLPANEL.NDA to provide graphics interface to Control Panel.

- |   |  |
|---|--|
| <ul style="list-style-type: none"> <li><b>ALPHABET</b> Sets language for display.</li> <li><b>GENERAL</b> Sets general system features.</li> <li><b>MODEM</b> Sets modem-port parameters.</li> <li><b>MOUSE</b> Sets mouse parameters.</li> <li><b>RAM</b> Sets RAM-disk and disk-cache sizes.</li> <li><b>SOUND</b> Sets volume and pitch parameters.</li> <li><b>CDEV.DATA</b> List of Control Panel parameters.</li> </ul> | <ul style="list-style-type: none"> <li><b>DIRECTCONNECT</b> Selects direct-connect printers.</li> <li><b>KEYBOARD</b> Sets keyboard parameters.</li> <li><b>MONITOR</b> Sets monitor parameters such as colors.</li> <li><b>PRINTER</b> Sets printer-port parameters.</li> <li><b>SLOTS</b> Sets slot parameters.</li> <li><b>TIME</b> Sets internal clock.</li> </ul> |
|---|--|

**/SYSTEM.DISK/SYSTEM/FONTS/** Contains all system fonts available when using desktop-based programs.

- NNN.10** Example: NNN is name of font family; number is point size.
- FASTFONT** Contains routines to speed up normal text drawing on machines with more than 512K of RAM.
- FONT.LISTS** List maintained by GS/OS at boot time; lets fonts load into memory fast.

**/SYSTEM.DISK/ICONS/** Contains all icons used by Finder.

- FINDER.ICONS** Minimum set of Finder icons.
- FINDER.ICONS.X** Additional Finder icons when system has more than 512K of RAM.
- FTYPE.MAIN** Minimum set of filetype names used by Finder.
- FTYPE.MAIN.AUX** Additional filetype names used by Finder when system has more than 512K of RAM.

**/SYSTEM.DISK/APPLETALK/** Contains no files currently; can contain files to let GS/OS use AppleTalk network.

## Hard-Disk Drives: Part 5

the system's simple mouse-controlled iconic interface — with much more pointing-and-clicking than typing — but you may still need to be aware of pathnames when using a disk-management program such as EasyDrive or ProSel.

Let's look at the GS/OS system disk itself, or your hard drive if you've already installed GS/OS, to see a good example of hierarchical file structure in action. (If you compare the GS/OS files with the ProDOS system disk, you'll be amazed at the difference: ProDOS consists simply of the files ProDOS and BASIC.SYSTEM.)

Figure 1 shows the GS/OS system disk's main volume directory and subdirectories. (See the accompanying side-

bar, "Getting Around in GS/OS.") Apple could have designed

the operating system with all files in the System subdirectory. Imagine how confusing your drive would be with all the font files and desk-accessory files, for instance, grouped together. By placing all fonts in one subdirectory and desk accessories in another, you can easily add or delete files of each kind without searching through a long listing of all types of system files.

Note that the full pathname for the Start file on the system disk is /System.Disk/System/Start. Because /System.Disk

is the first name in the path and begins with a slash, you can identify it as the name of the volume directory. From the volume directory, you enter the System subdirectory; lastly you see the name of a particular file, Start. Similarly, the full pathname for the 10-point Times font is /System.Disk/System/Fonts/Times.10. Each pair of names (remember, subdirectories follow all filename rules) is separated by a slash. Each time you open a folder with the Finder, you add a subdirectory's name to the pathname.

As you can see, those "directions" can get pretty lengthy. A *prefix* is a way of getting around typing in a file's full pathname. It's similar to a prefix in the phone system. In New Hampshire, for example, the area code is set to 603, so that you don't need to enter 603 before dialing another New Hampshire number.

Similarly, you can set a prefix to represent a partial pathname, such as /System.Disk/System/, making it easier to access files on disk. How so? When you use a hierarchical file system such as ProDOS or GS/OS, you use only one group of files at a time. That is, you may be working currently on the files in the /System.Disk subdirectory, perhaps in the /System.Disk/System subdirectory, or even in the /System.Disk/System/Drivers subdirectory. The active pathname is called a prefix because the operating system assumes automatically that part of the pathname is at the beginning of any filename you type.

Under ProDOS, you can tell what the active prefix is by typing PREFIX at the BASIC prompt, or you can set the prefix yourself — to /Pathname, say — by typing PREFIX /PATHNAME. When you boot your Apple II under GS/OS or ProDOS, the operating system uses the pathname of the boot disk as the current prefix.

If you're using a GS and type CATALOG at the BASIC prompt after you boot from the system disk, you'll see this short listing:

```
BASIC.LAUNCHER
PRODOS
APPLETALK
ICONS
SYSTEM
BASIC.SYSTEM
```

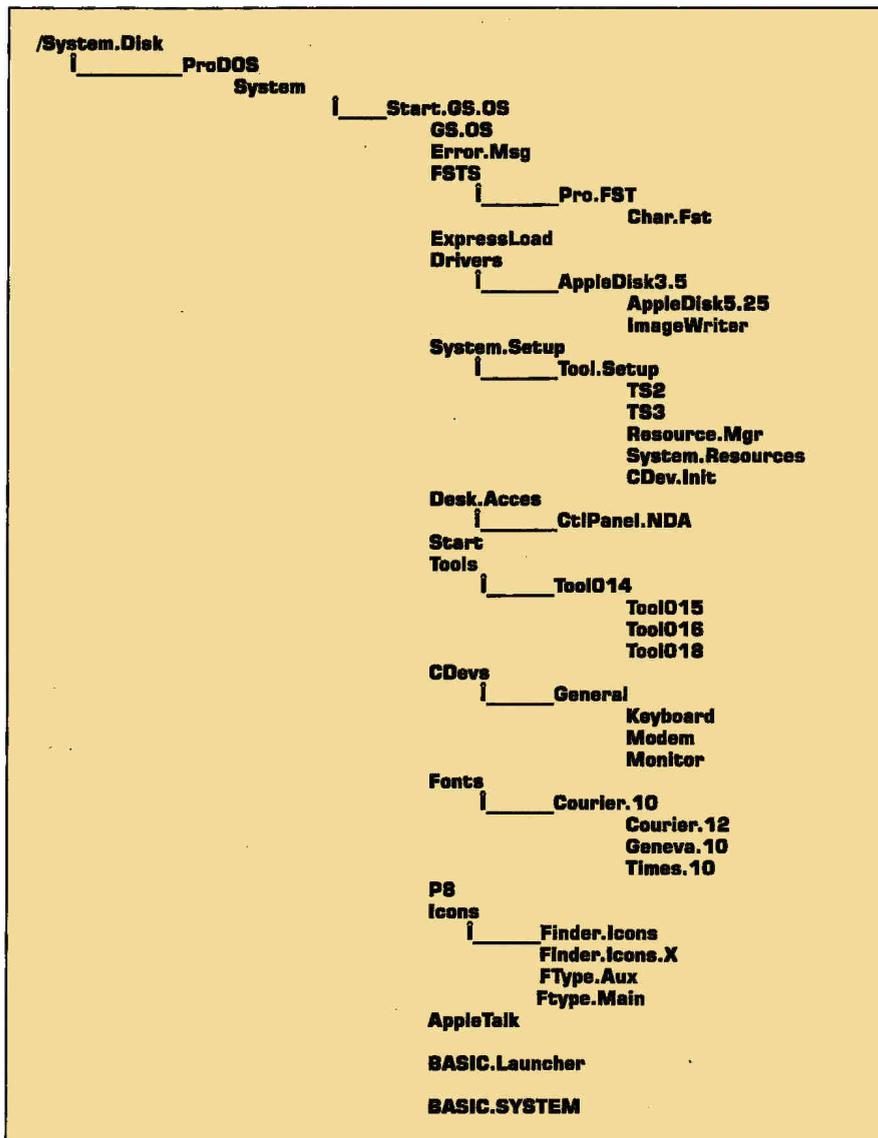


Figure 1. GS/OS system-disk file structure (partial listing).

```

/System.Disk/System
Start.GS.OS
GS.OS
Error.Msg
FSTS
ExpressLoad
System.Setup
Start
Tools
CDevs
Fonts
PB

```

Figure 2. Files in System directory.

To see the longer listing in **Figure 2**, for example, first type PREFIX /SYSTEM.DISK/SYSTEM to set your active prefix to that subdirectory. To see a list of fonts, make the path to the Fonts file your active prefix by typing PREFIX /SYSTEM.DISK/SYSTEM/FONTS, then CATALOG.

You can use the prefix more liberally in GS/OS, compared with its limited role in ProDOS, but you can't control prefixes from BASIC as you can in ProDOS. GS/OS refers to as many as 33 different pathnames by a numeric shorthand: Each is tagged with a number from zero to 32, or the asterisk character. The asterisk always refers to the pathname of the boot disk: /System.Disk/System if you boot from a floppy, perhaps /Harddisk /System if you boot from your hard drive. Prefix /0 is the default prefix, like the single active pathname prefix in ProDOS. Prefixes /1 and /9 identify the pathname of the current application, and certain others are reserved, as well. So it's best not to mess with prefix numbers, which you can't do from BASIC anyway. (You'd have to use the GS/OS machine-language interface.)

You can't follow it from BASIC, but GS/OS also keeps track of the various devices available — such as hard, floppy, and CD-ROM drives — by assigning each a number when GS/OS is booted. You can find the device number of any drive on the *Where* page of the *Icon Info* window in GS/OS: Just highlight a disk or file in the Finder and press Open apple-I. You can also see the full pathname of any file, with subdirectory names separated by colons.

## THE OUTER LIMITS

So just how does HFS protect your investment in mass storage?

Initially, your system software sets aside

enough space to store information for only 51 filenames or subdirectory names. This area, a subdirectory in itself, is usually called the *volume directory*, or *root directory*. As a result, if you have a 20-megabyte hard drive and store 51 AppleWorks word-processing files, you'll "fill" the drive (even if each file is only one page long) — but not because all the space on the hard drive is gone. Your hard disk is full only because you've taken up all the space the operating system has allowed for filenames.

Fortunately, HFS and its subdirectory scheme provide a way to use all the space on your drive. Unlike a volume, a subdirectory can hold an unlimited number of filenames or additional subdirectories, subject only to the maximum total storage capacity of your hard disk. (And you can even create one or more subdirectories in the volume directory to go beyond its 51-file limit.) You'll then be storing your files in subdirectories (ProDOS) or folders (GS/OS) instead of the volume directory.

For example, you might use subdirectories to separate different kinds of programs on your hard drive: One might be GAMES, while another might be named BUSINESS. You might also use separate subdirectories to organize data files produced by different programs. It might be a good idea to keep correspondence created in AppleWorks in a subdirectory named AW.LETTERS; within it you might have additional subdirectories for business, home, and Christmas letters.

Subdirectories are easy to set up for your own program and data files. If you're using a ProDOS-based program, it probably includes an option like AppleWorks' *Create Subdirectory* under the *Other Activities* menu; in 16-bit GS programs, look for an option to create a new folder from the Finder.

Apple's innovative hierarchical file structure gives you the means to stay organized with very little effort — and helps ensure that in terms of speed, convenience, and storage capacity, your well-considered purchase will soon pay for itself. □

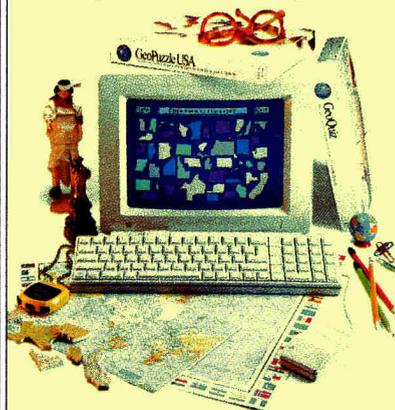
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# VIVE LA DIFFÉRENCE

**Fear of the blank screen is often the most difficult hurdle for computer artists to overcome — but seeing things in a different light is the key to getting started.**

**By DEBORAH GREH, Ed.D.**

THERE ARE VERY FEW GENIUSES IN this world — artistic or otherwise. Like all new techniques, using the computer as a graphics tool requires practice. But the most difficult task facing you may simply be overcoming your fear of creating an image that fails.

Do you know what it is you want to do? Or is the problem more that you don't have a clue as to how to do it? As we discussed in the December and January Graphics Gallery columns ("Play's the Thing," p. 78, and "Artist, Inspire Thyself," p. 70, respectively), the first step is to visit a museum or look at art books, photos, and even advertisements for inspiration and ideas. Then sit down at your computer and start drawing — sketch freehand or experiment with your geometric-shape tools to "build" an image. (See the accompanying box for one such

exercise.) Try some contour drawing, too — by hand and at the computer — as described in the "Hands On" sidebar in January (p. 72) to learn how to study an object's outlines and "inlines" and sketch what you see, not what you think you know.

If you're stuck, we'll give you a couple of ideas, plus instructions on how to get started. One piece of advice: Wherever you decide to begin, don't take yourself or your artwork too seriously at first. One of the the most important aspects of drawing and painting, with or without a computer, is simply that you see things differently.

## THE EYES HAVE IT

People are fascinated by eyes; William Blake called them "the windows of the soul." When beginning artists first attempt

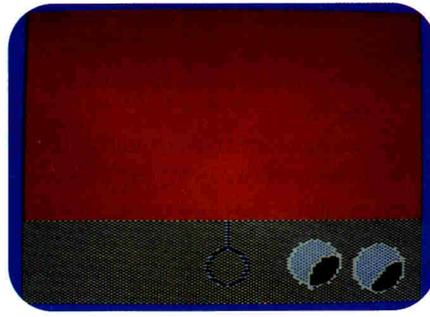
sketching the face they often focus on the eyes. Is that bad? Not always, but it can present a number of problems.

For instance, although the eyes are the most dominant part of the face — what we look into when we talk to each other and the feature we remember most clearly — you have to consider them within the context of the head. When students draw the eyes first, disregarding the rest of the head, the proportions of the face are usually "off." The eyes will often seem too high on the face, too large, or drawn from the wrong angle.

So what's an aspiring artist to do? Do a rough sketch of the entire face, getting the nose, mouth, and eyes in correct relation to one another. It's not easy. Again, the real key to drawing is seeing; that's where the



D. Polhemus, Union Catholic High, Scotch Plains, NJ. KoalaPad, MicroIllustrator.



J. Rizzolo, Brunner School, Scotch Plains, NJ. KoalaPad, MicroIllustrator.



Cut, paste, and flip options created a forest for Advanced Ideas' Grizzly Bears.

contour-drawing exercise mentioned above comes in handy — for developing control and enhancing your visual skills. When you study something inside out, upside down, backwards and forwards, even the most mundane object begins to take on a new life.

Another approach is to focus on the eyes and disregard the rest of the face entirely, with an emphasis on a “cartoon” look. Cartooning loosens you up: The images are supposed to be funny, and you can make any “mistake” work for you.

Look at some of your favorite comics and see how the artist has made simple lines work; details are limited to the bare essentials.

And who says art has to look exactly like the object represented, anyway? Picasso, for example, had a great feel for interpretation and simple lines — look at *Les Femmes d'Alger* and *Guernica*.

So start by drawing one eye and then try using your program's cut and paste options to do a second one. Just for fun, you might also try “flipping” the eyes so they look in different directions. Now incorporate what you're doing into a head if you like. Want to go on? Capture the

head (if your graphics program supports this feature), shrink it, and add a body.

### CAN'T SEE THE FOREST?

Most of us enjoy landscapes; they're inviting and restful. Try drawing your own. For inspiration, check out the impressionists and postimpressionists, including Monet, Van Gogh, and Cezanne.

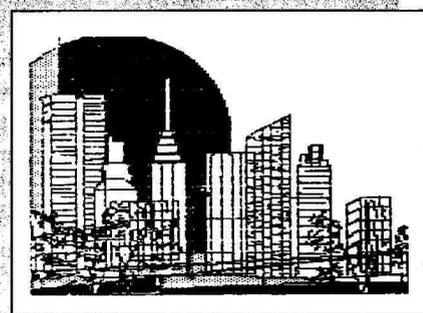
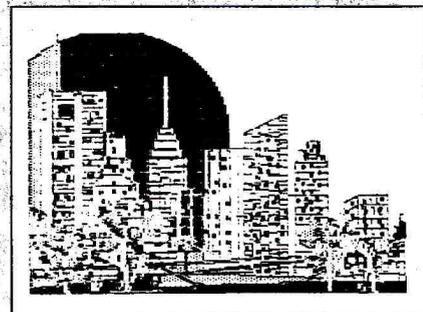
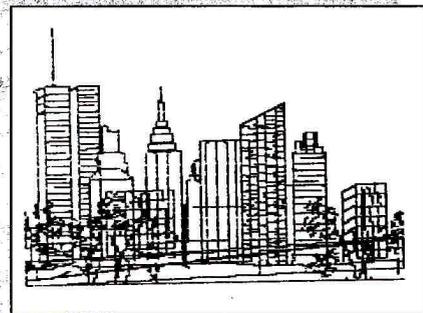
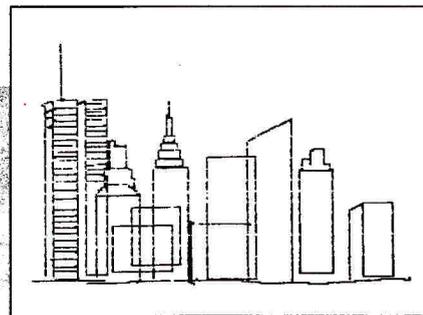
Start by drawing a simple tree — trunk and branches first, then up and out to add the foliage. Note that from a distance we don't see individual leaves, but rather masses of leaves, with only a few leaves delineated against the sky.

Alternate your tools, media, and background color. Try creating a tree with the spray-paint command, or select a wide brush stroke or a different brush shape — a slanted or vertical line perhaps. Draw or paint with a texture rather than a solid color to open the tree up and make it look airy. Every tool has its own unique characteristics. Part of the fun of working with a computer is exploring its potential (and limitations).

Now cut and paste to create a forest. If you can create one tree, why not use it like a stamp? Flipping the tree left to right will also add variety. Go back and make some trees fuller, others thinner. Don't be afraid to make a mistake. You can always use the undo command if you don't like something; and if you save your image in stages, you can return to an earlier incarnation of your work. And if you don't have a color printer, use an old ribbon and fill in with crayons, colored pencils, or markers.

Be patient — an important part of any art form is practice in developing and perfecting skill, and that takes time. But the only way you'll enjoy the time you spend is to do something you want to do — so look for ideas, and when you find some, see each image's contours, shapes, colors, and textures. Draw — practice — and have fun. □

WRITE TO DEBORAH GREH AT 516 FARLEY AVE., SCOTCH PLAINS, NJ 07076. ENCLOSE AN SASE IF YOU'D LIKE A REPLY.



**Step-by-step sample of New York skyline. Screen dumps show progression of preliminary drawings; KoalaPad input, with Microllustrator software. Various textures and patterns fill in buildings. Freehand tool suggests trees in foreground.**

### LOOKING FOR IDEAS?

**Ancient Art of War** series, Broderbund  
**Art Gallery** forum, CompuServe  
**Carmen Sandiego** series, Broderbund  
**Computer Art** forum, CompuServe  
 Edwards, Betty. **Drawing on the Right Side of the Brain.** J.P. Tarcher Inc.  
 Edwards, Betty. **Drawing on the Artist Within.** Simon & Schuster  
 Gardner, H. **Art Through the Ages: 6th edition.** Harcourt Brace Jovanovich  
 Greh, D. **Computers in the Artroom.** Davis Publications  
 Janson, H.W. **The History of Art: 3rd edition.** Prentice Hall  
**King's Quest** series, Sierra Online  
**The New Print Shop,** Broderbund  
**School Arts** magazine, Davis Publications  
**Space Quest** series, Sierra Online  
**Stickybear** series, Weekly Reader/Optimum Resource  
 Truckenbrod, J. **Creative Computer Imaging.** Prentice Hall



# CRYSTAL GAZING

**With proper retirement planning  
and an AppleWorks spreadsheet,  
your vision of the future can come true.**

By **RUTH K. WITKIN**

IF I HANDED YOU A CRYSTAL BALL and said you could gaze into your retirement future, would you do it? You bet you would! Like many of us, you probably look ahead with uncertainty and apprehension to the years when, in all likelihood, your income will be less than it is now. Because the independence of your life tomorrow will be affected by your actions today, using every means available to assess your financial future makes good sense.

The spreadsheet in **Figure 1** is a crystal ball of sorts. You need enter only an amount already invested for retirement, average annual interest rate, number of compound periods per year, regular monthly contribution until retirement, years until retirement, regular monthly withdrawal after retirement, and assumed annual rate of inflation. The formulas then produce effective annual yield, regular annual contribution, and regular annual withdrawal based on your numbers.

But that's not all. You also get a year-by-year accounting of the starting amount, interest earned, contribution, total before withdrawal, withdrawal that keeps pace with the assumed rate of inflation, and even amount remaining after each annual withdrawal.

There's even more. One formula (called

"what-if look-see") copies the calculation of another formula further down the spreadsheet, so that you don't have to scroll up and down over and over to see the result as you enter new numbers.

## A SPREADSHEET FROM SCRATCH

Create a new AppleWorks spreadsheet file named **EARNCONDRAW**. You should now see the spreadsheet *Review/Add/Change* screen with the cursor in cell A1. Use the following instructions to start the spreadsheet.

**Long lines.** Enter a double line across row 2 in columns A through G: Place the cursor on A2 and type quotation marks. Hold down the equal-sign key until the sign reaches the right edge of G2 and then hit Return.

Leave the cursor on A2 and copy the row to the clipboard: Press Open apple-C (OA-C) to start the *copy* command, type T to select *To clipboard*, press Return to confirm *Rows*, and hit Return again. You need the same line in rows 10 and 15, so copy from the clipboard: Place the cursor on A10, press OA-C, and type F to select *From clipboard*. Do the same in row 15.

Next, enter a single line across row 18 in columns A through G: With the cursor on A18, type quotation marks, hold down the minus-sign key until the sign reaches the right edge of G18, and hit Return.

**Column width.** Each column is now nine characters wide. Use the *Layout* command (OA-L) to change the widths: Move the cursor to the column you want to change, press OA-L, press C for *Columns*, hit Return at the prompt to highlight columns, and press C for *Column width*. Then use OA-Right Arrow or OA-Left Arrow to expand or contract the width, and hit Return. You need to reduce column A by five characters (to four characters); increase columns B, C, E, and F by three characters (to 12 characters); and increase columns D and G by two characters (to 11 characters).

You can widen columns B and C in the same step. From column B, press Right Arrow once at the prompt to highlight columns; from column C, press Left Arrow. The same applies to columns E and F.

**Labels and numbers.** **Figure 2** shows the labels and practice numbers in the spreadsheet. Before you start typing, read the following instructions.

Indent the spreadsheet title, *INTEREST EARNED/CONTRIB/WITHDRAW CALCULATOR*, by placing the cursor on B1, typing quotation marks, and pressing the spacebar ten times. Then type the title. Several labels have what I call "outdents," which push the labels to the left (instead of to the right as indents do). By outdenting, you can align labels and numbers on the right with those above and below. To create an outdent, type the label, then press the spacebar the specified number of times. Give a one-character outdent to these labels in rows 16 and 17: B16, C16, D16, G16, G17, E17, and D17. Give a two-character outdent to labels in B17 and C17. You'll see the effect when you right-justify them later.

In F17, type quotation marks before the

label +*Inflation* (short for “plus inflation”), so AppleWorks knows the plus sign is a label, not an arithmetic operator.

Now go back through the instructions and type the labels. Don't bother to press Return after typing each entry; moving the cursor to the next cell serves the same purpose. When you're finished, press Return. Next, type the numbers (and remember the lonely 1 in A19).

**Formats.** Most of the numbers are dollar amounts, but dollar signs will only crowd the columns. Instead, use the *Value* command (OA-V) to set a standard *Value format of Commas* with no decimal places. Next, use the *Layout* command to reformat the following cells for *Dollars* with no decimal places: F3 (*amount already invested*), F6 (*regular monthly contribution*), F8 (*regular monthly withdrawal*), and F12 through F14 (*regular annual contribution, regular annual withdrawal, what-if look-see*).

For the individual cells, press OA-L, Return to confirm *Entry*, and Return to confirm *Value format*; then specify *Dollars* and no commas. For block F12 through F14, place the cursor on F12, press OA-L, type **B** for *Block*, press Down Arrow twice to highlight the block, and press Return for *Value format*. Then specify *Dollars* and no commas.

Reformat F4 (*assumed annual interest rate*) for *Commas* with 2 decimal places, and F11 (*effective annual yield*) for *Percent* with 2 decimal places. And finally, use OA-L, *Block*, and *Label format* to right-justify the headings from B16 through G17. Now press OA-S to store all your work on disk.

In the next step, you'll enter the spreadsheet's formulas. AppleWorks routinely calculates formulas by column — from top to bottom of the first column, then from top to bottom of the second column, and so on. Because of the way the formulas are laid out in this spreadsheet, have AppleWorks calculate by rows: Leave the cursor where it is and press OA-V to bring up the *Standard Values* screen. Type **R** to select *Recalculate*, hit Return to confirm *Order*, and hit it again to confirm *Rows*.

## ENTERING FORMULAS

Next, enter the formulas that perform the calculations. You can see their locations in the unshaded areas in **Figure 1**. First, read how the formula works, then place

the cursor on the cell receiving it. Move the cursor to the cell locations shown in the formula and type everything else. When the formula is complete, compare each character on your screen with the way it appears here. If everything agrees, press the return key. If something's amiss, press the escape key and start again.

**FORMULA 1: Effective Annual Yield.** Formula 1 divides the interest earned in the first year (C19) by the amount already invested (F3) to produce the effective annual yield in F11, assuming the money is invested for one full year.

Cell location: F11

Formula: +C19/F3

Cell C19 is empty right now, so AppleWorks will produce 0.00% in F11.

**FORMULA 2: Regular Annual Contribution.** Formula 2 multiplies the regular monthly contribution until retirement (F6) by 12 to produce the regular annual contribution in F12.

Cell location: F12

Formula: +F6\*12

**FORMULA 3: Regular Annual Withdrawal.** Formula 3 multiplies the regular monthly withdrawal after retirement (F8) by 12 to produce the regular annual withdrawal in F13.

Cell location: F13

Formula: +F8\*12

**FORMULA 4: What-If Look-See.** Formula 4 lets you see the effect of your what-if assumptions (trial inputs) on the amount in the ending cell (G43) without having to scroll down the spreadsheet. If you want to keep the contents of another cell visible, you can change the formula later.

Cell location: F14

Formula: +G43

**FORMULA 5: Year Numbers.** Formula 5 adds 1 to the number in the cell above (A19) to start the sequence of year numbers in A20.

Cell location: A20

Formula: 1+A19

You'll copy Formula 5 down its column after you enter the rest of the formulas.

**FORMULA 6: Starting Amount (Year 1).** Formula 6 copies the amount already invested for retirement (F3) to B19, the starting-amount cell for Year 1.

Cell location: B19

Formula: +F3

**FORMULA 7: Starting Amount (Year 2).** Formula 7 copies the amount at the end of

Year 1 (G19) to B20, the starting-amount cell for Year 2.

Cell location: B20

Formula: +G19

**FORMULA 8: Interest Earned.** Formula 8 calculates interest earned on the starting amount in B19. It converts the annual interest rate (F4) to a percentage, divides the result by the number of compound periods (F5), raises that result to the power of the number of compound periods multiplied by the starting amount (B19), then reduces that result by the starting amount.

Cell location: C19

Formula: +B19\*(1+(F4/100/F5)  
^ F5)-B19

**FORMULA 9: Regular Annual Contribution.** Formula 9 either copies the regular annual contribution (F12) to D19 or enters a zero, depending on the year number. The *Test* statement checks the year number in A19. If it's less than or equal to the number of years until retirement (F7), the *Then* statement copies the contribution. If the year number is greater than the number of years until retirement, meaning no more contributions, the *Else* statement enters a zero.

Cell location: D19

Formula: @IF(A19<=F7,F12,0)

**FORMULA 10: Total Before Withdrawal.** Formula 10 adds the starting amount (B19), interest earned (C19), and regular contribution (D19) to produce the total amount before withdrawal in E19.

Cell location: E19

Formula: @SUM(B19.D19)

**FORMULA 11: Withdrawal Plus Inflation.** Formula 11 enters one of four answers: regular annual withdrawal (F13), annual withdrawal including assumed rate of inflation (F9), total before withdrawal (E19), or zero. It's truly a powerhouse.

The *Test* statement checks to see if the number of years until retirement (F7) plus one year equals the year number (A19). If they match — meaning the first year of retirement has arrived — the *Then* statement enters the lesser of the regular annual withdrawal (F13) or the total before withdrawal (E19). Because you can't take out more than you have, the MIN function prevents a negative number exceeding the total before withdrawal from appearing on the spreadsheet.

If there's no match — meaning the year number is before or after retirement —

INTEREST EARNED/CONTRIB/WITHDRAW CALCULATOR							
3	Amount Already Invested for Retirement					\$215,000	
4	Assumed Annual Interest Rate (%)					9.00	
5	Times Compounded Annually					365	
6	Regular Monthly Contribution Until Retirement					\$908	
7	Years Until Retirement					10	
8	Regular Monthly Withdrawal After Retirement					\$3,800	
9	Assumed Annual Inflation Rate (%)					4	
11	Effective Annual Yield				9.42%	1	
12	Regular Annual Contribution				\$10,900	2	
13	Regular Annual Withdrawal				\$45,600	3	
14	What-If Look-See Cell				\$959,971	4	
17	Year	Starting Amount	Interest Earned	Regular Contrib	Total Before Withdrawal	Withdrawal +Inflation	Ending Amount
19	1	215,000	20,245	10,900	246,145	0	246,145
20	2	246,145	23,178	10,900	280,222	0	280,222
21	3	280,222	26,386	10,900	317,509	0	317,509
22	4	317,509	29,897	10,900	358,306	0	358,306
23	5	358,306	33,739	10,900	402,945	0	402,945
24	6	402,945	37,942	10,900	451,787	0	451,787
25	7	451,787	42,541	10,900	505,228	0	505,228
26	8	505,228	47,573	10,900	563,701	0	563,701
27	9	563,701	53,079	10,900	627,681	0	627,681
28	10	627,681	59,104	10,900	697,684	0	697,684
29	11	697,684	65,695	0	763,380	45,600	717,780
30	12	717,780	67,588	0	785,367	47,424	737,943
31	13	737,943	69,486	0	807,430	49,321	758,109
32	14	758,109	71,385	0	829,494	51,294	778,200
33	15	778,200	73,277	0	851,477	53,346	798,131
34	16	798,131	75,154	0	873,285	55,479	817,806
35	17	817,806	77,006	0	894,812	57,699	837,114
36	18	837,114	78,824	0	915,938	60,006	855,932
37	19	855,932	80,596	0	936,528	62,407	874,121
38	20	874,121	82,309	0	956,430	64,903	891,527
39	21	891,527	83,948	0	975,475	67,499	907,976
40	22	907,976	85,497	0	993,473	70,199	923,274
41	23	923,274	86,937	0	1,010,212	73,007	937,205
42	24	937,205	88,249	0	1,025,454	75,927	949,526
43	25	949,526	89,409	0	1,038,936	78,964	959,971

Figure 1. AppleWorks retirement-planning spreadsheet, showing how money grows and goes.

INTEREST EARNED/CONTRIB/WITHDRAW CALCULATOR							
3	Amount Already Invested for Retirement					215000	
4	Assumed Annual Interest Rate (%)					9	
5	Times Compounded Annually					365	
6	Regular Monthly Contribution Until Retirement					908.33	
7	Years Until Retirement					10	
8	Regular Monthly Withdrawal After Retirement					3800	
9	Assumed Annual Inflation Rate (%)					4	
11	Effective Annual Yield						
12	Regular Annual Contribution						
13	Regular Annual Withdrawal						
14	What-If Look-See Cell						
17	Year	Starting Amount	Interest Earned	Regular Contrib	Total Before Withdrawal	Withdrawal +Inflation	Ending Amount
19	1						

Figure 2. Labels and practice numbers in retirement-planning spreadsheet.

the *Else* statement enters a zero in each year before retirement and, in each year after retirement, the lesser of the total before withdrawal (E19) or the prior withdrawal (F18, the dashed line) plus

assumed inflation (F9). Again, the MIN function prevents a negative number from appearing if the withdrawal amount plus inflation exceeds the total before withdrawal. Whew!

Cell location: F19

Formula: @IF(F7+1=A19,  
@MIN(F13,E19),  
@MIN(E19,F18\*(F9/100+1)))

**FORMULA 12: Ending Amount.** Formula 12 subtracts the withdrawal-plus-inflation amount (F19) from the total before withdrawal (E19) to produce the ending amount in G19.

Cell location: G19

Formula: +E19-F19

Now copy Formulas 8 through 12 (C19 through G19) down one cell: Place the cursor on C19, press OA-C, and hit Return. Press OA-Right Arrow to highlight the other formulas in row 19, and hit Return again. Press Down Arrow to highlight C20, and hit Return once more. Then you'll see Formula 8 on the edit line with a highlight on cell reference B19. You're about to tell AppleWorks which cell references in each formula are *No change* (press Return) and which are *Relative* (type R or press OA-R) by hitting the following keystrokes in this exact sequence:

**Formula 8:** Type R, press Return three times, type R.

**Formula 9:** Type R, press Return twice.

**Formula 10:** Type R twice.

**Formula 11:** Press Return, type R, press Return, type R three times, press Return.

**Formula 12:** Press OA-R.

## PROTECTING FORMULAS

You'll soon copy these formulas down their respective columns, but protect them first, so AppleWorks can copy both the formula and the protection and save you time: Place the cursor on A19 (the number 1 — clearly not a formula, but no matter). Press OA-L and type B (for *Block*). Press OA-Right Arrow, then Down Arrow to highlight both rows, and press Return. Type PN (for *Protection Nothing*).

Now place the cursor on A20 and copy the formulas in row 20: Press OA-C and hit Return. Press OA-Right Arrow to identify row 20 as the source, and hit Return again. Press Down Arrow, type a period, and press OA-Down Arrow. Use Down Arrow to move the highlight to row 43 and hit Return again.

Tell AppleWorks which cells are *No change* and which are *Relative* with the following sequence of keystrokes: Type R three times, hit Return three times, type R

twice, hit Return twice, type **R** twice, hit Return once, type **R** once, hit Return once again, type **R** three times, hit Return, and type **R** twice more.

When calculation stops, your spreadsheet should look like the one in **Figure 1**. Press OA-S to store it on disk.

Now protect the formulas in F11 through F14: Place the cursor on F11 and press OA-L. Type **B**, move the cursor to F14, hit Return, and type **PN**.

**PRINTING YOUR SPREADSHEET**

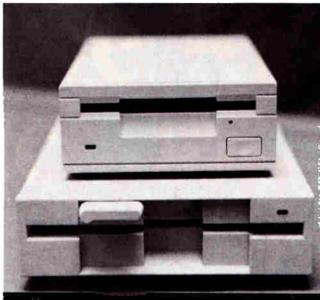
This spreadsheet is 74 characters wide and prints at 10 characters to the inch. To position it well on the printed page, change the margin settings: Leave the cursor where it is and press OA-O to bring up the *Printer Options* screen. Type **LM** (for *Left Margin*) and press Return, then type **.3** and hit Return again. Now type **RM** (for *Right Margin*), press Return, type **.3**, and hit Return again. Finally, type **TM** (for *Top Margin*), press Return, type **.5** and hit Return again. All other print settings remain at AppleWorks standards. Press OA-S to store this final version on disk and return the spreadsheet to the screen.

Now turn on your printer and run out your spreadsheet: Leave the cursor where it is, and press OA-P to bring up the *Print* screen. Hit Return to confirm *All*. Press Return to select the printer (or type a printer number, then Return), type today's date (or, if you have a computer clock, type @, the *at* sign, to have AppleWorks enter the date for you), and hit Return twice to confirm one copy. The printer will click away and there's your spreadsheet.

**NEXT MONTH**

With summer soon upon us, next month we'll create a spreadsheet to calculate your vacation travel expenses. See you then. □

CONTRIBUTING EDITOR RUTH K. WITKIN IS THE CREATOR OF THE *SUCCESS WITH APPLEWORKS* TEMPLATE SERIES (INCIDER/A+, IDG COMMUNICATIONS) AND *RUTH WITKIN'S BEST NEW APPLEWORKS TEMPLATES* (QUALITY COMPUTERS). SHE'S ALSO THE AUTHOR OF *THE BEST BOOK OF APPLEWORKS* (MACMILLAN PUBLISHING COMPANY) AND *PERSONAL MONEY MANAGEMENT WITH APPLEWORKS* (JOHN WILEY & SONS). WRITE TO HER AT 5 PATRICIA STREET, PLAINVIEW, NY 11803. ENCLOSE A SELF-ADDRESSED, STAMPED ENVELOPE IF YOU'D LIKE A REPLY.



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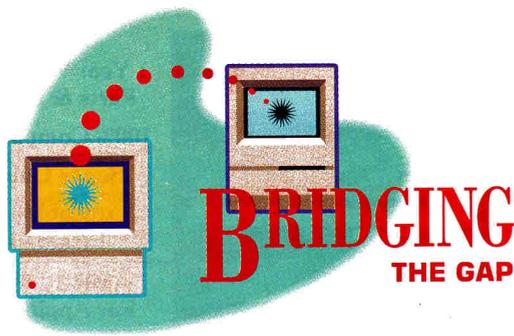
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# PRINTER POLYGAMY

**You don't have to cut corners to cut costs. Share a laser printer among your Macs and Apple IIs and you'll produce high-quality printouts with half the hassle.**

By **GREGG KEIZER**

IF PRINTERS DON'T TRY OUR SOULS, they at least try our patience. Getting a printer to work with your software, even getting it to work at all, often seems like a task worthy of Job. I've unpacked, unwrapped, installed, and insulted more printers than I care to remember. Each time I naively believe that the installation will go smoothly, and that the 15 minutes I've allotted will be more than enough. Call me an optimist.

When you start mixing machines — an Apple IIGs here, a Macintosh IIsi there, a Mac LC around the corner — things get even trickier. Computers and printers mate

for life in a monogamous relationship — one printer to one computer. That means a different printer for each computer and even more chances for things to go wrong. Well, put your wallet away. Why not share one printer among several computers? That may be printer polygamy, but it can save you the frustration of managing multiple printers *and* save you money.

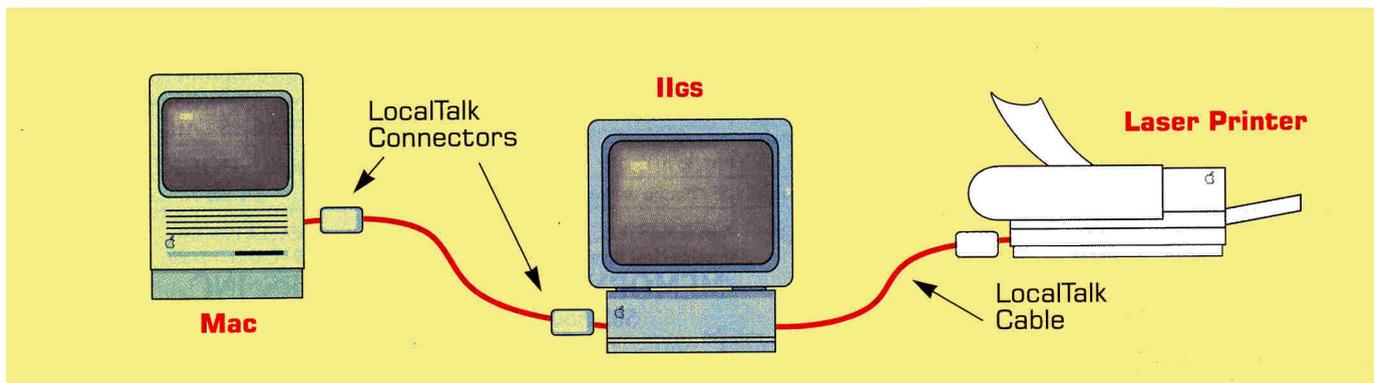
Besides, if your computers share, you can spend more on a printer and still come out ahead. If you're splitting the high cost of a printer among several machines, you can afford to pay for high-quality print. Sharing an expensive laser printer makes perfect sense in a mixed-up Apple II-and-Macintosh environment.

Without a printer beside every computer, you've got to take a few more steps to retrieve your documents. If you're willing to put up with this minor irritation (among a few others), you're a candidate for printer polygamy.

## APPLES SHARE WITH (AND WITHOUT) APPLETALK

Apple II and Macintosh machines have a built-in printer-sharing capability that other computers — even those that cost thousands of dollars more — lack. That capability is *AppleTalk*, the network specifications that link Apple IIs, Macs, and their peripherals. All Apple IIGs and Macintosh computers come equipped to handle this protocol.

Don't let the word *network* scare you. An AppleTalk network doesn't demand that you set up a file server (a computer/software combination that lets you share files and programs on a hard disk) and multiple workstations. You can create a simple kind of network just by linking an Apple IIGs and Macintosh to a printer via a **LocalTalk Connector Kit**. Just plug connector boxes into the two computers'



**Figure 1.** Snap together a simple two-computer/one-printer AppleTalk network in 15 minutes.

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LocalTalk ports and trail cable from computer to computer. Then run another cable to the printer's LocalTalk port. Depending on the distance between the machines, a simple two-computer/one-printer AppleTalk network might snap together in under 15 minutes. (See **Figure 1.**) If you just share a printer, you don't need to mess with **AppleShare**, the file-sharing software you run on a dedicated Mac to send files from Apple IIs to Macs.

When several computers use one laser printer, there's a chance that more than one will send a document to the printer simultaneously. AppleTalk handles this potential jam-up adequately, if not elegantly, by simply stacking the print requests as they come in. If you're trying to print from your Apple IIGs, for instance, and a Macintosh LC is hogging the printer, you'll have to wait. An on-screen message keeps you informed about print progress.

What if you have a Iie? Most laser printers come equipped with a LocalTalk port and also include parallel and serial ports. An Apple Iie typically prints via a serial card. You can attach a Iie to the printer's serial port if the printer offers emulation that your 8-bit Apple II software supports — your laser printer must be compatible with serial transmission from 8-bit Apple Iie software and the 8-bit software must support the laser printer.

To share a printer such as the Okilaser 840, which has three ports — LocalTalk, serial, and parallel — with both a Macintosh Classic and an Apple Iie, for example, you'd use appropriate cable to connect the Mac to the printer's LocalTalk port, and the Iie to the printer's serial port. (You don't connect the two computers.) To print, you'd simply use front-panel LED controls to switch the printer's active port and its emulation from serial (Iie) to AppleTalk (Mac) and back — from Diablo 630 (Iie) to PostScript (Mac) and back.

## POSTSCRIPT GETS PERSONAL

Until recently, PostScript laser printers were simply too expensive for most homes, home offices, and classrooms — even if

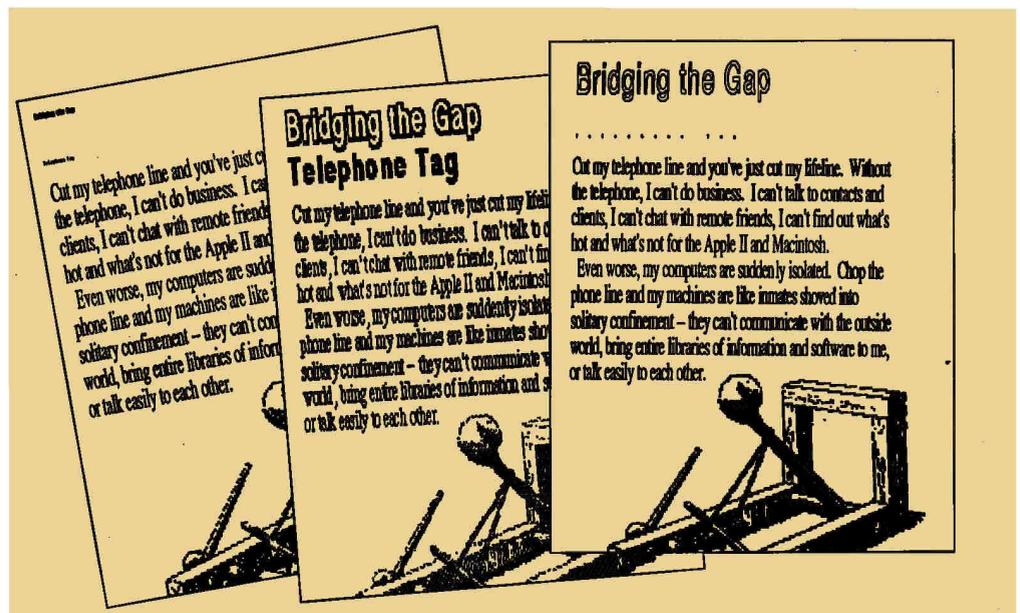
you shared them between machines. With the appearance of several affordable, but still capable, personal printers, nearly any multiple-machine scene justifies a PostScript laser printer.

PostScript, the page-description language used extensively by Macintosh and Apple IIGs applications, translates a program's print instructions to build a page's text and graphics images inside a laser printer. Most Apple LaserWriter printers include PostScript. Fortunately for your budget, many non-Apple laser printers do, too.

Two PostScript laser printers — neither from Apple — stand out when it comes to

automatically. In other words, data coming into any of the three ports is received, examined, and then sent through the correct page-description language, all on the fly. Because of this outstanding feature (all printers should include this automatic switching capability) the QMS 410 is a terrific network printer for a small office or classroom, especially if you're mixing Macintosh and Apple IIGs (and even MS-DOS) computers.

Texas Instruments' Microlaser PS35 is a compact PostScript printer that offers the same 35 PostScript fonts you'll find in the Apple LaserWriter NT — for less money. This printer features the same three ports



**Figure 2.** Left to right, compare copy and graphics images created with Independence at 300 dots per inch, and Harmonie at 75 and 300 dots per inch.

splitting time between computers. The **QMS 410** and Texas Instruments' **Microlaser PS35** both excel at providing good print at a good price. Each works out well as a shared printer, but for quite different reasons.

The QMS 410 is a relatively slow (four pages per minute) laser printer based on the same Canon print engine that's inside the **Apple LaserWriter NT**. At the side of the printer you'll find serial, parallel, and LocalTalk ports, so you won't have trouble connecting it to almost any computer in your inventory. What makes the QMS 410 special is its capability to keep all those ports "live" at the same time. The printer also switches emulation (from PostScript to Hewlett-Packard LaserJet II and back)

as the QMS, but doesn't offer automatic emulation switching. You do that yourself by pressing keys on the front control panel. It's inconvenient, but if you're sharing the printer among several computers in an office, den, or classroom, it's just irksome, not impossible. The PS35 is considerably faster than the QMS 410, spitting out six pages of text in a minute. Its paper tray holds five times more than the 410's, and its *footprint*, the desktop space it occupies, is only half the size.

Plan on spending less than \$2000 for either of these printers. Although their list prices are considerably higher, you won't have much trouble finding the QMS 410 for around \$1950 and the Microlaser for around \$1700 if you shop in a computer

superstore such as CompuAdd or Software Warehouse, or if you buy from a mail-order dealer. The QMS is my pick for the home, home office, or classroom in which Macintosh, Apple IIGs, and MS-DOS computers hang out. In a busy classroom or office, though, you'll need to spend yet another \$150 or so for the optional 250-page paper tray. The Microlaser PS35 fits in the tiniest space, and provides printer punch with a little less convenience. If your home or home-office setup is tight for room, choose the PS35.

Connect four computers to either of these printers and you've lowered the per-computer cost to around \$450. That's less than what you'd pay for an Apple ImageWriter II dot-matrix printer. The difference? Type that makes you look good.

#### BARGAIN-BASEMENT TYPE

Even at these prices, a PostScript printer may be beyond your means. Apple II and Mac owners who look for bargain-basement prices, but want better quality than the 9-pin ImageWriter II can deliver, need to steal a glance at the MS-DOS world.

The *de facto* standard for PC laser-model printers carries the Hewlett-Packard name. Capitalizing on a reputation for good (if not exceptional) quality at a reasonable (if not rock-bottom) price, Hewlett-Packard printers sit on more desktops than any other brand. If a piece of PC software supports only one laser printer, it's the LaserJet II.

Especially attractive is Hewlett-Packard's LaserJet IIP, a compact personal laser printer that sells for as little as \$900. This four-page-per-minute printer may be slow, a bit noisy, and hold a puny amount of paper, but it pumps out quality type. With three resident fonts (Courier 10, Courier 12, and Lineprinter 8.5) and the capability to use Hewlett-Packard font cartridges, the IIP is a good choice for the budget conscious.

But what can a Macintosh or Apple II owner do with a IIP? How can you share this printer with your Mac and IIGs when older versions of the IIP don't come equipped with PostScript? (Hewlett-Packard's newest printer sports PostScript and a LocalTalk port, and may be available by press time.) Hire an interpreter, that's

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how. You need a tool to translate the Mac's or Apple IIGs' printing instructions into something that the IIP can understand. Not an easy task, but several companies provide such decoders.

On the Mac side, Orange Micro has been helping users connect to non-Apple printers for years. The company's **Grappler LX** printer-interface box (the Grappler name should be familiar to long-time Apple II owners) links a Mac's printer port with the parallel port on the IIP. You don't print with Apple's fonts; instead you use the five fonts Orange Micro bundles with the interface. If you desktop publish, though, this limited number of fonts may cripple you, but if most of your printer time is spent cranking out word-processing documents, you shouldn't need more fonts.

Insight's **MacPrint** takes a different approach. It hands you screen fonts for every Hewlett-Packard-resident and cartridge-based font, so that you can use the IIP's internal fonts (or those available on any font cartridge plugged into the printer). Printing is fast, but to retain that speed you're limited to the printer's Courier fonts or forced to spend money on additional cartridges.

Two printer-driver products arm the Apple IIGs with IIP compatibility. Vitesse's **Harmonie** and Seven Hills' **Independence** both let you print to the IIP from an Apple

IIGs. Installation is straightforward for both: Apple's Installer copies the required files to the system folder, you select the proper printer from the Control Panel, and then select *Print* from the Apple menu of almost any IIGs application.

Harmonie and Independence share several traits, ranging from selectable resolution (75-300 dots per inch) and printer support (LaserJet IIP and III, DeskJet, DeskJet Plus, and DeskJet 500) to the ability to print using true GS fonts. Harmonie, which Vitesse will upgrade soon to version 2.0, has the edge in features. You can compress the data sent to the printer for faster results, choose the number of shades of gray, and even change the contrast and brightness of the graphics images. Most important to IIP users, though, is Harmonie's capability to utilize the printer's internal fonts (but it can't use any from an installed font card). If you print with the IIP's internal Courier fonts you may not get dazzling pages, but you'll get them fast.

Neither Harmonie nor Independence wins points for speed. With Harmonie's IIP driver, an AppleWorks GS page-layout document showing 12-point Times text, several draw objects, and two 640-mode graphics images took over 15 minutes to print at 300 dots per inch (dpi). Independence fared better: The same page rolled out of the printer two minutes faster. With-

out question, the results were stunning. (See **Figure 2**.) But the thought of tying up the IIGs for hours printing an eight-page document isn't pretty.

At 75 dpi, both Harmonie and Independence popped pages from the IIP every 90 seconds. Print quality is comparable to ImageWriter II output, except that blacks are full black, not the washed-out shade you see from even a slightly used ribbon.

The LaserJet IIP isn't the perfect polygamous printer, even with interpreters such as Grappler LX, MacPrint, Harmonie, and Independence. But at a price about half that of the least expensive PostScript printer, it makes some sense in home and home-office setups in which Macs and Apple IIGs congregate.

### SPEND SOME, GET SOME

Apple preaches a philosophy of shared peripherals — printers, keyboards, mice, and hard-disk drives that can flip from Macintosh to Apple and back. Making your system work with a printer can be a snap or a slugfest, depending on how much money you spend.

If you can afford one, a PostScript printer should be your first choice. Connecting this laser printer to several IIGs and Macintosh machines takes but a few minutes. Pages fly out of the printer and type looks sharp.

If money is no object, pick the QMS 410 laser printer and plug an AppleTalk network into its LocalTalk port. You may want to attach a PC to the parallel port while you're at it.

Money is the object for many of us, though, so the LaserJet IIP, tortoise-like printer drivers and all, gets the nod. As slow as it is, it still prints cleaner text and sharper graphics images than any dot-matrix printer.

Bridging the gap may be the best way to avoid printer envy, the best way to keep quality up and costs down. And maybe, just maybe, it'll mean I've unpacked and installed my last printer. □

GREGG KEIZER HAS BEEN USING APPLE IIS SINCE 1983 AND WAS THE FOUNDER AND EDITOR OF *COMPUTE!'S APPLE APPLICATIONS*, A BIMONTHLY PUBLICATION. WRITE TO HIM AT 614 LINDEN STREET, SHREVEPORT, LA 71104. ENCLOSE A SELF-ADDRESSED, STAMPED ENVELOPE IF YOU'D LIKE A REPLY.

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(714) 779-2772  
\$199

### Harmonie

Vitesse, Inc  
13909 Amar Road  
Suite 2  
La Puente, CA 91746  
(818) 813-1270  
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\$29.97 each for 5  
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\$24.98 each for 25 or more

**ImageWriter II**, \$595  
**LaserWriter II NT**, \$4499  
**LocalTalk Connector Kit**, \$75  
Apple Computer, Inc.  
20525 Mariani Avenue  
Cupertino, CA 95014  
(800) 776-2333

### Independence

Seven Hills Software Corp.  
2310 Oxford Road  
Tallahassee FL 32304-3930  
(800) 627-3836  
(904) 575-0566  
\$3995

### LaserJet IIP

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Hewlett-Packard Inquiries  
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Cupertino, CA 95014  
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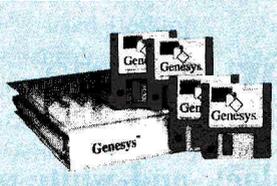
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For small press runs consider generating color printouts on an ImageWriter II. After all, you can get a lot of mileage out of a \$6 four-color ribbon. If drawbacks inherent in this method — pokey speed and distracting noise levels — turn you off, use your desktop-publishing (DTP) program's best-quality printing method to create a full-color master. Then take the master to a quick-print shop offering color photocopying services.

### STATE OF THE ARTIST

At a dollar or so apiece, color photocopies aren't cheap, but the excellent quality copies we've gotten from a local shop's Kodak color unit should please all but the most finicky recipients. We wouldn't

hesitate to pay for a couple dozen full-color photocopies of a poster or a one-page production, but if you're publishing a multipage newsletter, this method could become pricey. You may want to restrict color to the cover and use ordinary black toner to photocopy other pages.

You also could generate photocopies with single-color toner other than black. Many quick printers can make photocopies in blue, red, green, or brown. One shop in our area promotes color copying on selected days: blue on Monday, green on Wednesday, and so on. Each copy made with single-color toner costs just a couple cents more than one that's printed in black.

Another colorful method that's suitable for small press runs is manual foil stamping, a technique that fuses the color from a sheet of film to a black-

and-white photocopy. (See "Living Color," August 1990, p. 48, for our description of three do-it-yourself products.) Based on price and performance, we prefer Letraset's **Color-Tag** system. Begin with a laser-printed original or a black photocopy, then overlay selected text or graphics areas with a piece of colored film — it's available in nearly four dozen hues in matte, metallic, and glossy finishes.

Now rub the heated hand-held applicator over the film the same way you'd run a flatiron over a piece of clothing. The heat and pressure fuse the film's color with the underlying toner particles.

Adding color with film can be fussy work and the procedure requires a bit of patience, but the results are well worth the effort. Business-report covers, especially, look attractive when you enhance them this way.

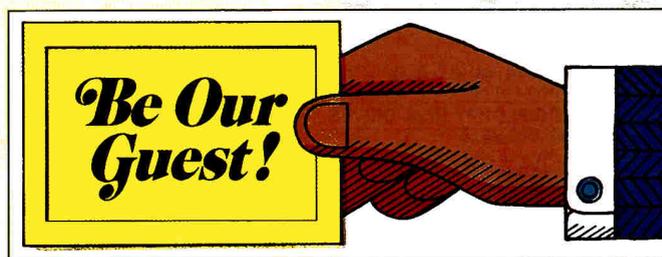


Figure 1. Idea Art stationery.



Figure 2. Print Shop letterhead for Show Window document.

Truth is, though, you may have purchased your Apple II to speed up the publishing process — not slow it down with manual enhancements such as ColorTag. If you want to mass-produce a publication, but still offer some color, simply photocopy or offset-print the original onto any of the hundreds of colored papers available.

#### PAPER CHASE

And where can you find special stock? For in-house use, we buy from PaperDirect, a mail-order firm specializing in a unique variety of paper sold in reasonably small quantities. The company sells a **PaperKit** that includes samples of its paper and envelopes; the \$20 price tag is refundable with your first order. If you're convinced that neon orange paper would help your publication draw attention, fear not: PaperDirect has it.

Besides ordinary colors and an assortment of parchments, PaperDirect sells classy paper that looks like granite or marble. We've also created a host of great-looking desktop publications with the company's *Gradations* stock. Perhaps unequaled in attractiveness is the company's **Desktop Design** line. This stock — including *Ambassador*, *Deco*, *Bouquet*, *Hole in One*, *Dollars and Sense*, and *Red, White and Blue* — sports striking preprinted full-color borders. We've used Desktop Design papers to print genealogy charts we framed and gave to friends and relatives in lieu of birthday cards. In January's Press Room ("Desktop Genealogy," p. 78) we describe the templates we designed to create these charts.

PaperDirect isn't the sole source of illustrated papers, though. Alvin and Company markets a **DECAdry Print** line of papers, with preprinted background designs rang-

ing from a bombs-bursting fireworks display to a placid tropical-island scene. A third company, **Idea Art**, sells a complete line of handsomely illustrated papers. The company's full-color catalogue provides a storehouse of ideas you can implement at home, in school, or at work. Whether you want to promote a special sale or get an early start on your 1991 Christmas greetings, the Idea Art catalogue is an excellent place to begin.

Just last fall we used one of the company's preprinted letterhead papers with AppleWorks 3.0 to create a promotional letter for a Cape Cod motel. (See the heading design in **Figure 1.**) We typed the letter with the AppleWorks 3.0 word processor. At the top of the page we reserved space for the stationery's preprinted *Be Our Guest* illustration by pressing Open apple-O (OA-O) to access the *Printer Options* menu. We set the top margin (TM) to 3.7 inches. ↪

#### PRODUCT INFORMATION

**AppleWorks 3.0**, \$249  
**AppleWorks GS**, \$299  
 Claris Corporation  
 5201 Patrick Henry Drive  
 P.O. Box 58168  
 Santa Clara, CA 95052-8168  
 (415) 987-7000

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#### QUICK TIPS FROM PRESS ROOM READERS

- Sam B. Hughey, a member of the Tarrant Apple Group in Hurst, Texas, needed to incorporate a long quotation from one issue of his **Publish It!**-designed newsletter into another. That wouldn't have been a problem — except that Hughey's original **AppleWorks 3.0** word-processing file had somehow self-destructed! As you know, you can import AppleWorks 3.0 word-processing files into Publish It! via the File menu, but the DTP program offers no reciprocal **exporting feature**. Hughey's solution? Use **TimeOut FileMaster** to convert the Publish It! newsletter file to ASCII format. Hughey also points out that Publish It! 2 fans can expand their typeface repertoire by employing TimeOut FileMaster to **convert public-domain fonts** to Publish It! 2-compatible format.

- Speaking of fonts, reader Jim Meece has this bit of advice for **Publish It!** users with **single 5.25-inch disk drives**. On a backup copy of the original program disk, delete the file DTP.HELP. Then copy the fonts you commonly use from the **Fonts** disk to the modified program disk to alleviate the constant disk swapping required during printing. According to Meece, you should be able to fit about nine selected font files into the space taken up originally by the on-line help file. On-line help will no longer be available, but you can refer to the program's manual or reference card instead. If you're involved in a variety of projects, Meece suggests that you create a number of program disks, each with a different font mix.

Idea Art's illustrated letterhead papers, which cost about ten cents per sheet, work especially well with the company's line of **Show Window** envelopes. Available in white, tan, blue, green, yellow, and red, these envelopes sport panoramic windows through which the letterhead graphics illustrations appear. At about 14 cents apiece, the envelopes are fairly expensive, but offer considerable benefit. According to Alicia Orr in the August 1990 issue of *Target Marketing*, "The cold-hearted truth is you have about three seconds to make recipients open your envelope and get to your offer."

**PICTURE WINDOWS**

If you use a full-featured DTP program, you can enjoy the best of all worlds: Just combine your custom illustrated piece with a Show Window envelope. Designing your own stationery not only saves money, but helps you exercise your creativity as well. Whether you use Publish It!, AppleWorks

GS, or another DTP program, all you have to do is reserve the top 3.75 inches or so of the layout page for the graphics image or message that will later show through the envelope's panoramic window. For best results, also leave a .5-inch margin on the left- and right-hand sides of the page.

With earlier versions of Publish It!, use the program's text tool and *Show Specifications* feature (OA-M) to create a dummy text box delineating this top work area. With Publish It! 3, you can specify *Custom Guides* from the *Special* menu instead. Cordoning off the top section of a page is a snap with either GraphicWriter III or AppleWorks GS. Simply drag custom guides into place on the program's vertical and horizontal screen rulers.

With this top area of the page reserved, you're ready to create the graphic and text that will appear in the Show Window envelope. Use the rest of the page to incorporate additional text and graphics elements

to help communicate your message. Also, full-panel letterhead graphics (**Figure 2**) provided with The Print Shop IIgs and The New Print Shop work well with Show Window envelopes.

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Whether you prefer to prepare a publication with a traditional word-processing program or a full-fledged DTP program, illustrated papers such as those offered by Idea Art are a perfect way to add impact to your message. No matter the program, just insert the finished piece into a matching Show Window envelope. When seconds count, you can be confident that recipients will put your publication into the "must read" pile — not the circular file. □

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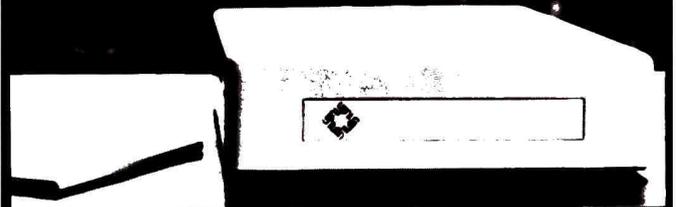
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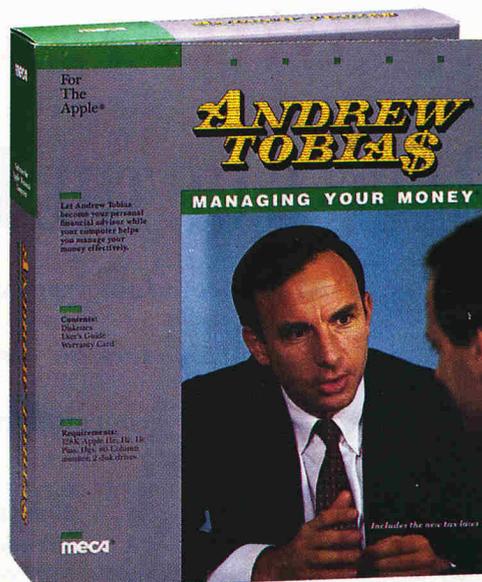
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# BATTLE OF THE LANGUAGES

**Find out from four leading developers  
which languages do what best for  
your next programming project.**

**By RON LICHTY**

EVER WONDER WHICH LANGUAGE to choose for your next programming project? Or which language you should learn first — or next? In May 1989, and again in September, four preeminent language developers came together at two consecutive AppleFests to debate the merits of the four leading languages on the Apple IIGs.

Apple II programming pioneer and Merlin assembler publisher Roger Wagner argued the merits of assembly language. ORCA languages publisher Mike Westerfield supported Pascal. APW languages product manager Tim Swihart made the case for C. And BASIC book author and *A2-Central* newsletter publisher Tom Weishaar defended BASIC.

Mike Westerfield, in organizing the panel, chose the participants for their senses of humor and their technical expertise. He asked me to moderate — specifically, to keep the commercials infrequent, the jargon low, and the repartée snappy.

As I pointed out to our audiences, if you consider that programmers become very religious about their choice of language, these panelists represent four of the leading religious leaders of our time. Here's our dialogue.

**Ron Lichty:** First, let's have our panelists introduce their languages.

**Roger Wagner:** Before we begin talking about assembly language, you must realize that assembly-language programmers help maintain the myth that it's difficult to learn. On the Apple IIe, though, you only need to learn roughly 50 assembly-language commands — half as many commands as in BASIC. (If word got around that you need so few commands, we assembly-language programmers would be out of our jobs!)

So, you're asking yourself, why should I program in assembly language? Well, there are a couple of key reasons. One is that assembly language will give you the best conceptual understanding of the machine. You have direct contact with the concept of memory, for example, when you have to grab a byte from one memory location and put it in another. If you type PRINT HELLO in BASIC and the word HELLO appears on screen, you've accomplished your job, but you've no concept of how it happened.

Inevitably, all languages run in assembly language. What they create is machine-language code that the computer's microprocessor executes. All high-level languages have provisions for incorporating machine language, real-

izing that's really where the action is at.

In assembly language it's also easier to extrapolate into those areas where you don't have the information you need. If your reference books aren't 100 percent complete, assembly language lets you see every single thing that the processor is doing at the most fundamental level.

Assembly language isn't the same as machine language. With machine language, you literally poke little numbers into memory manually, which, deservedly, has a bad reputation. Assembly language merely uses an *assembler* — a word processor of programming — to let you order the instructions before they get stuck in memory.

**Mike Westerfield:** I've written commercial programs in every language represented here, and I can tell you flat out that the language I pick most often to write high-level programs is Pascal. I even write our C compiler in Pascal with assembly-language subroutines.

After Nicholas Wirth introduced Pascal as an educational language, almost every university-level textbook on algorithms switched over from ALGOL to Pascal. The only time you find the other languages is when someone is trying to teach them to you. Pascal is that good.

Roger's right — you should learn assembly language eventually if you're going to be a professional programmer. But I compare using assembly language to write big programs to a cook deciding to create a meal by going in after the individual atoms — he'd finish the meal more quickly if he started off with a few canned preparations or maybe a plant or two.

Pascal had a bad reputation in the 8-bit world of the Apple II because it was slow. BASIC had the same rap, and it was justi-

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fied on the Apple II. Assembly language was the only language that would run quickly on the Apple II, making an entire generation of programmers come over to the Apple IIgs with the idea that they could write a good program only in assembly language.

I'd like to give you some brief numbers to try to convince you that this idea is hogwash. According to *Byte* benchmarks, if you use an Apple II in assembly language you could do the *Sieve of Eratosthenes* (a method of obtaining all the primes in a segment of natural numbers) in about 13.5 seconds. In BASIC, it took several minutes to run. Even in Pascal it was up around three minutes. Those who cared about speed would perform this mathematical operation in assembly language. If you program on the Apple IIgs, a machine that represents all these languages fairly well, you'll find that Pascal will do the *Sieve* in about seven seconds. Assembly language can do it in about half that time, but most often, that time difference isn't long enough to matter; therefore, you should use Pascal instead of assembly language.

Unfortunately, I don't know what Tim's going to say, so it's kind of hard to get after him. But I'd point out that I've never understood the reason people use a language as dangerous as C to write commercial code. Although this language is flexible, when you work with C you work without a safety net. If you pass it two integers and the subroutine expects three integers, the compiler can't tell you about your mistake. Even its results are unpredictable.

I'm not going to tell you not to use C. You can use it as a tool when Pascal's type-checking gets in the way and you're trying to get a job done without having to go to assembly language. But C shouldn't be your first language; understanding it is difficult because it's a write-only language. (You write it and you can't read it later.) C is Pascal with the meaning removed. I'd recommend learning assembly language before you learn C. In fact, I've never met a good C programmer who didn't know assembly language.

I guess the best comment I have on BASIC is that it's free on the Apple II — and you get what you pay for.

**Tim Swihart:** Most programmers learn to program on their Apple IIs in BASIC because, like Mike said, it's free, and they don't have to worry about syntax because BASIC almost doesn't have one. BASIC is interpreted so that you can enter commands one at a time until you get them right, then put them in your program. It's a great place to start — until you're ready to show it to your friend who'll kind of snicker and go away laughing.

So your next step is usually assembly language, because everybody says, "Gee, that's where the speed's at." Assembly is really nice, Roger — instead of typing two characters at a time in machine language, you get to type three characters at a time with such descriptive, word processor-like readability as *MVP* and *MVN*. That's not *Most Valuable Player* and *Most Valuable Number* — that's

## THE PEOPLE BEHIND THE IDEAS

**Roger Wagner** was teaching school when he bought his first Apple II in 1978. Since then, he's been a regular columnist for one or another of the Apple II magazines for almost a decade (currently he appears in *Nibble*), and he wrote *Assembly Lines* and *Apple IIgs Machine Language for Beginners*. His company, Roger Wagner Publishing, Inc., has published BASIC language add-ons, the popular Merlin assembler, the MouseWrite word processor, and the runaway best-seller *HyperStudio*.

**Mike Westerfield** learned BASIC in high school and ALGOL in college, but didn't intend a career in programming until the Air Force ignored his master's degree in physics and sent him to mainframe assembly-language school in Denver. Not long after, he sold his car to buy an Apple II. When Apple needed a development system for the IIgs, it called on Mike and his company, The Byte Works, to turn his ORCA development environment into APW, the Apple IIgs programmer's workshop that supports assembly, C, and Pascal. The Byte Works produces ORCA-environment assembly, C, and Pascal language translators. Mike was a regular columnist for the late *Call-A.P.P.L.E.* and *8/16* magazines, and has developed beginning programming classes for America Online. He also writes talking children's software books.

**Tim Swihart** first learned FORTRAN on a mainframe, which he describes as "kind of like hacking pebbles with a very large bulldozer." He then learned BASIC, but says, "I was able to recover through the therapy of assembly language and later C." Tim was working for a Texas defense contractor when Apple Computer wooed him away to product-manage APW, as well as Apple's own Macintosh-to-IIgs (MPW IIgs) cross-development system. He had already made a name for himself

in the Apple IIgs world as Apple II Languages Forum sysop for GENie, as a writer for *Call-A.P.P.L.E.*, and as a developer of the shareware and freeware programs *Two Apples* and the C cross-reference utility. He has since written extensive desk-accessory programming tutorials for magazines and on-line services.

**Tom Weishaar** first learned BASIC on an Apple II in 1980, and followed that with assembly language. But, he says, "I've never been smart enough to learn how to program in C or Pascal, which is why they let me talk about BASIC." He founded the major Apple II newsletter *A2-Central* (originally *Open-Apple*), after writing a magazine column and several computer books, including *Your Best Interest: A Money Book for the Computer Age*, *The DOSTalk Scrapbook*, and *ProDOS Inside and Out*. He also runs the Apple II areas on GENie. *A2-Central* sponsors the *A2-Central Summer Conference* for Apple II developers (nicknamed *KansasFest*), "where developers come and actually duke it out in shorts in Kansas in the summertime!"

**Ron Lichty**, the panel's moderator, started programming in 1980 for fun, and taught himself BASIC, then assembly language from books. He spent the next seven years writing programs to run electronic door locks; word-process and spell-check on the Apple II, IBM PC, and Macintosh; and for the Apple IIgs Sales Demo Program. In his free time, he co-authored *Programming the 65816* and *Programming the Apple IIgs in Assembly Language*. (For copies visit your local bookstore or send \$32 to Ron Lichty, P.O. Box 27262, San Francisco, CA 94127.) Three years ago, he moved to Apple to manage the Apple II development-tools product group, then the Macintosh object-oriented tools product-marketing group, before becoming lead engineer on the Apple IIgs Finder in December 1989.

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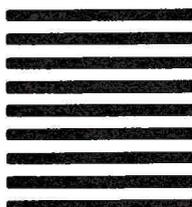


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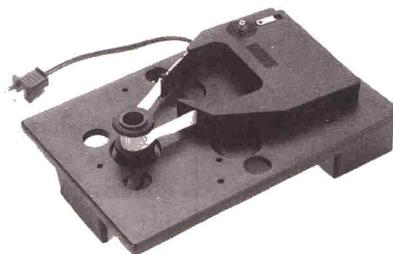
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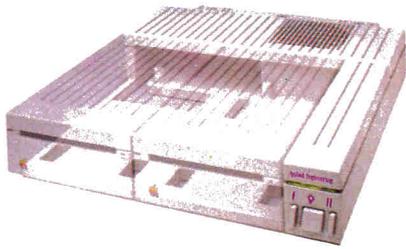
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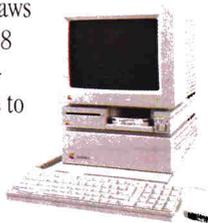
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## APPLE IIgs BASICS

*Move Memory Positive* and *Move Memory Negative* — figure that one out. Assembly language is for bit bangers who like to have fun typing incredible amounts of source code just to get a few bytes of executable image.

From assembly, most people move on to Pascal because they want something that's more like English. Programming in Pascal is a lot like programming in C — only with your mother-in-law looking over your shoulder. Yes, the compiler catches everything you could possibly do wrong. It also makes you eat your peas.

**Mike Westerfield:** But your mother was right.

**Tim Swihart:** The programmers who designed C took the best of both worlds. They grabbed an assembler, gave it a high-level pseudo interface, macro support, and loops and floating point, and they called it C, because they didn't even want a long name on their language.

C is a little on the dangerous side. It's not for the meek, timid, or light of heart. It's for programmers who want the speed, power, and flexibility of assembly without the cryptic op codes and syntax. Try doing floating point in assembly. Better yet, just try adding two numbers in assembly in one line of code. Assembly is pretty darn verbose. So let's pass it on. C people like to keep it brief.

**Roger Wagner:** Modern-day assemblers typically have a fairly advanced macro ability that lets you add numbers in a single statement. A good assembler lets you create macros that look like high-level language, make a floating-point calculation, do a disk access, and so on. Some languages, though, let you code assembly language in the middle of the high-level language. The point is that the languages start blending together at some point.

**Tom Weishaar:** The great advantage of BASIC, of course, is that it comes with the computer and it's free. I mean, what more do you want? The other big advantage, of course, is that dummies like me can learn how to program in it. You can write programs that are nice, short, capable of running — and that you don't have to compile. *BASIC* stands for *Beginners' All-purpose Symbolic Instruction Code*. The word "beginners" is important. That's what BASIC is all about.

One of the big raps that BASIC gets is that once students have learned how to program in BASIC, they're "ruined" for any other language. But according to *Classroom Computer Learning*, March 1989, in "But What Does the Research Say?" which summarizes some educational research, this theory isn't valid. [See the box on p. 83 for an excerpt from this article.]

Applesoft is a nifty, programmable, calculator-type language. I don't recommend it for writing 3000-line programs because it has some limitations (It doesn't have a program editor, for example.) But in an earlier conference I actually heard someone say that he keeps an Apple II over in the corner and whenever he wants to test an algorithm or do a table, he goes over and writes a ten-line program in Applesoft.

I even recently watched Roger Wagner write a program in Applesoft for the HyperStudio kiosk to calibrate its touch screen.

## Programming in BASIC: Bad News or Good News?

Although BASIC is the language most often taught in K-12 programming classes, some college computer-science faculty have attacked the language. Among them is Edsger Dijkstra of the University of Texas, who feels that "it is practically impossible to teach good programming to students who have had prior exposure to BASIC; as potential programmers, they are mentally mutilated beyond hope of regeneration." Those are strong words particularly when his is an opinion rather than a conclusion based on solid research.

To understand better the implications of teaching BASIC as a first computer language, researchers Janet McDonald and Phyllis Yudikaitis examined the performance of students at the University of New York at Albany in an introductory Pascal course. Interestingly, they found a significant positive correlation between knowledge of BASIC and grades in the Pascal course. Apparently prior BASIC experience actually helped instead of hindering student performance. In addition, 45% of students without training in BASIC dropped the course, while only 24% of those with BASIC training dropped. And finally, interviews with a random sample of students indicated that those with BASIC experience felt it helped them in the Pascal course.

There are a number of ways these results could be interpreted. None, however, involves a conclusion that learning to program in BASIC is "mentally mutilating."

— "But What Does the Research Say?"  
*Classroom Computer Learning*,  
March 1989

It was a two-line program and it was wonderful. And he didn't use assembly language! Our own Roger Wagner!

The advantage and the beauty of Applesoft in particular is that it's always handy and it's easy to write short programs that really do things.

Applesoft does have its limitations, and there are other, more advanced versions of BASIC that run on the GS that solve some of them. If you already know Applesoft, the other versions are quite easy to learn. There's no reason to ever have to learn anything else.

That's it: BASIC is for beginners. Let's go for it. □



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drive, the program claims a maximum 1-megabyte-per-minute backup speed. It took me 36 minutes to back up 2460 files totaling about 17,400K to 22 data disks and one catalog disk. This works out to just under half a megabyte per minute, but I imagine one of the newer, faster SCSI cards would improve performance. You control the product through a standard Apple desktop interface, and you'll need the manual only occasionally as a reference.

Salvation-Bakkup offers several different settings such as *Verify* and *Interleave* that can affect the speed and reliability of your backups. Verification will slow the process by about 15 percent, and a 2:1 interleave will increase the speed of a GS/OS floppy backup. The program also gives you control over the files and/or drives you want to back up. For instance, the *Group Select* command lets you stipulate file types, dates, and/or unarchived files. Once you've selected your devices (including

RAM or ROM drives) and files, it tells you the number of disks the backup will require. You can then write to a 3.5- or 5.25-inch drive, or a GS/OS pathname. Writing to a 5.25-inch drive isn't recommended — unless you're protecting a small volume and have a lot of patience.

Small touches, such as a progress thermometer during the backup operation and the option to abort and resume later, make Salvation-Bakkup a friendly program. You can print a list of your completed backup files for reference, or even save your file and device selections as a macro for future use. Vitesse also includes most file/device selection features, such as the option to save your choices as a macro with the *Restore* command.

One weak point is that the product doesn't include a file-compression option, which many backup packages for other hardware platforms offer. It'd be nice to see this feature included in the next update.

Salvation-Bakkup is one of only two

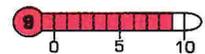
major commercial products capable of backing up a resource fork, the file structure used by GS/OS 5.0.2 and later. For this reason alone, Salvation-Backup is a welcome addition to any software library.

**Garry Howard**  
Calgary, Alberta, Canada

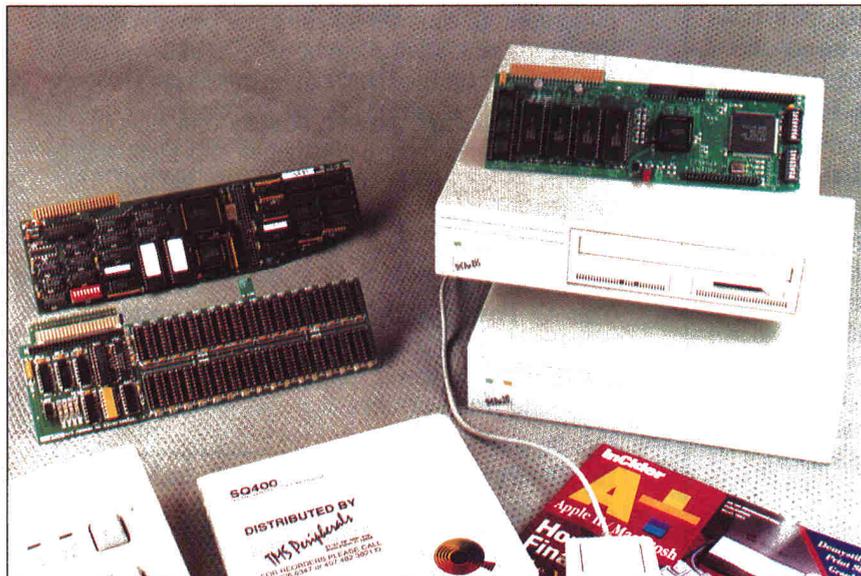
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which your beloved master calls for help telepathically. Your task awaits: You're his last and best hope.

#### NEW CLASSIC

The Immortal, released by Electronic Arts for the Apple IIGs, is a sophisticated arcade-adventure game that surpasses similar entries with its graphics images, variety, animation, and challenge. Avid gamers will agree that The Immortal contains the ingredients of a classic; its programmers didn't forget the importance of balancing arcade-like challenges with adventure.

Quick reflexes are a must as you fight off trolls, spiders, and goblins, dodge poisonous arrows and flaming balls of fire, and evade deadly pits and flying bats. The Immortal places a wide variety of deadly obstacles in your path as you travel throughout the 50-plus chambers that make up the eight levels leading to the cavern that holds Mordamir prisoner.

#### THE INTELLECTUAL ELEMENT

The game isn't just a matter of fighting and jumping out of harm's way, though. You must solve puzzles, find allies, and discover magical objects.

Every level has its own twists and turns, as well as at least one major challenge. By varying the emphasis from combat to conundrum, the game keeps your interest from level to level.

The Immortal handles magic nicely, too. You encounter the necessary but somewhat mundane fireballs, as well as the more exotic magic spells that make you change shape, shrink, and fly. The program doesn't spell out the function of the various items you find in the chambers: You need to experiment with them to discover their special powers. This element of the unknown sets the stage for mystery and suspense.

#### INTO THE FRAY

This product's graphics images rival the best found in the arcade-game market. The characters and monsters beneath the ruined city are large and well defined. Some full-screen shots in The Immortal are worth capturing and sending to the printer. Animation is impressively smooth and produces an almost cinematic effect that heightens both the vicarious dangers and triumphs within the adventure.

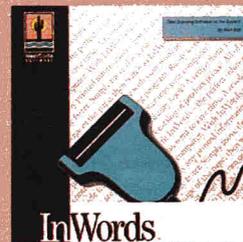
The game mechanics are simple, consisting of joystick movement and button pressing. (The software doesn't support the keyboard or mouse, though.) Combat, for example, comes in two forms of attack — the jab and the slash — and one form of

the strength of your youth. As you stare at the ruins of the ancient city of Erinoch, you realize the importance of your powers. You stand there before the entrance to the underground labyrinth, beneath

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# REVIEWS

defense — the parry. To jab, you push the joystick forward; to slash, you pull the joystick back, then move it forward. To parry, you move the joystick right and left, depending on the way you want your wizard to lean.

Getting the hang of parrying is actually a bit difficult, because at times your wizard faces you and the movements are reversed. This different perspective may be confusing. As noted above, a good rule of thumb for defense is to move the joystick in the direction in which you want your character to lean.

As you battle your way toward your imprisoned master, you pick up a wide variety of useful items. You access and use these items via the joystick. Pressing the right joystick button brings up the contents of your pack; moving the cursor over the item desired and pressing either joystick button selects the item for use.

You can't save a game in the middle of a level's adventure. When your wizard masters a level successfully, he's rewarded with a certificate. If you've quit a game, but want to return to the same level, type the certificate number when you reboot and

you'll pick up at the last level you completed. The accompanying manual is complete and well written; it contains specific instructions for dealing with common situations and hints for figuring out the tough ones.

For the fantasy gamers who enjoy using dexterity as well as his or her mind to win a game, The Immortal may well be the game you're waiting for. Its splendid graphics, constant action, and fantasy flavor will satisfy players for a long, long time — perhaps forever!

**Jim Trunzo**  
Leechburg, PA

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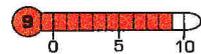
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## PIPE DREAM

**LUCASFILM GAMES, DISTRIBUTED BY ELECTRONIC ARTS, 1820 GATEWAY DRIVE, SAN MATEO, CA 94404, (415) 571-7171**

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Pipe Dream might be more aptly named "Pipe Nightmare." Anyone who's ever had a pipe burst or tried a little do-it-yourself home repair can relive the anxiety of gushing water and emergency plumbing in this wacky strategy-puzzle game from LucasFilm.

You're the Plumber in Chief of the



**Can you control the floop?**

Acme Chemical Company, the inventor of the miracle sewer cleaner dubbed floop! The factory is making floop faster than it can pump it into tank cars. Your task is to do an emergency plumbing job, using spare pieces of pipe, to keep the floop from flooding the company grounds.

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The game is played in a series of rounds. Each round requires you to build as long a pipeline as you can before the flooz catches up with you. By placing and connecting pieces of pipe on an otherwise blank playing field while the flooz flows through the pipe already in place, you try to stay ahead of the mess.

This game isn't nearly as easy as it sounds. Only one piece of pipe is available to you at a time, and there's no guarantee that it's the one that will connect cleanly to the section already on the playing field. You'll have to think ahead and anticipate connections several moves in advance.

Once you place a piece you can't move it, so your task becomes even more complicated. Also you can't rotate, skip, or alter the pieces in any way. You can "bomb" a pipe by placing another on top of it, but you'll receive a penalty. Besides, there's a time delay for replacing pipes, and a points penalty for using the bombing tactic.

You complete a round when you've placed all the pieces you can on the playing field or when you're overtaken by the flooz. You advance to the next level by making the flooz flow through a requisite number of pipes. You gain points by getting flooz to flow through pipes, advancing to new levels, making the flooz cross itself (by placing "cross" pieces of pipe in strategic locations), and using special pipe pieces.

**ENDLESS FUN**

Pipe Dream possesses that frustrating addictiveness that's the mark of all good puzzle games. Perhaps it's the fact that the game looks so easy and the premise seems so simple that you stubbornly play "just one more game."

Whatever the case, Pipe Dream continues to challenge. Thirty-six levels of play, changing flooz rates, obstacles on the playing field at higher levels, special pieces (one-way pipe, bonus pieces, end pieces), and special sections of the playing field that let the flooz exit one side of the screen and reappear on the other side guarantee variety every time you play.

In addition to the regular mode of play, you can enjoy Pipe Dream in expert one-plumber and competitive two-plumber modes. Furthermore, you can set any of the formats to training mode, which forces

the flooz to flow at a slower rate while you get the hang of the game.

Pipe Dream is available for the entire Apple family, including the Macintosh. The game's mechanics are identical, regardless of the machine you're using. All versions employ the same code-wheel off-disk copy-protection scheme, too.

Differences are basically of a cosmetic nature, having to do with the graphics images and color capabilities of each machine. The Macintosh version, however, lets you install Pipe Dream as a desk acces-

sory by simply using the Font/DA program that comes with your Macintosh. Also, the Macintosh's two-player mode requires that one of the gamers use the mouse and the other the keyboard.

Pipe Dream is an excellent hair-pulling strategy game that teaches spatial relations and logic subtly. Its elegantly simple design makes play fast and furious. But you'd better keep looking behind you — the flooz is on your tail. □

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# COMPACT DISCOVERY 2

By DAVID D. THORNBURG, Ph.D.

**T**he concept  
as well as  
the content  
of compact discs  
can create  
an educational  
revolution.

ALTHOUGH COMPUTERS ARE AS COMMON as desks in many classrooms, some educators fail to tap the power of this technology. With the introduction of CD-ROM (compact-disc read-only memory) to school systems, though, teachers have the ability to transform the role of computers in education. As we noted last month in "Compact Discovery," (p. 80) one disc the size of a standard audio CD can hold over 640 million megabytes of information and simultaneously store computer-readable information, high-quality audio, TV-quality video, and a host of other signals. In short, this medium can deliver a complete multimedia presentation. This month we'll continue our exploration of CD-ROM by examining some commercial software that can serve as a model for a revolution in the design of educational courseware and in teaching itself.

Warner New Media has released two CD-ROM titles, **The String Quartet**, which features Beethoven's *14th String Quartet*, and Mozart's **The Magic Flute**. Both titles are Mac-based explorations of classical music that combine HyperCard stacks with CD audio. You can apply the same ideas to stacks you design yourself on

a Mac or on the IIGs using HyperStudio.

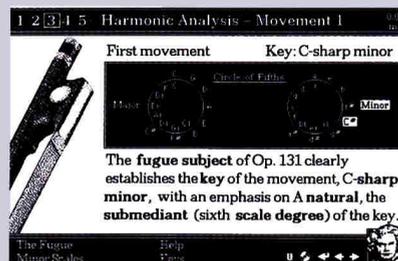
The Beethoven CD contains a folderful of HyperCard stacks and eight tracks of CD audio that include the entire quartet and the additional music used in various parts of the HyperCard applications. (You can play the audio tracks on a conventional CD player, too.)

When you start the program, you have several options. Select one of four visual accompaniments to view while you listen to the quartet. The first of these is a general discussion of the piece, while the remaining choices provide different types of analysis depending on your interest. You can choose a harmonic analysis, for example, or one based on the music's structure. At any time you can switch among the various analyses by clicking your mouse on one of the numbers in the upper-left corner of the screen. (See **Figures 1** and **2**.) Each analysis keeps pace with the music, so you see information that relates directly to what you hear.

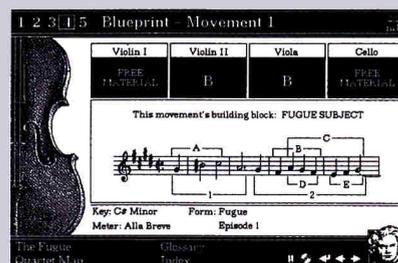
Definitions in small windows are available for words in boldface; just click the mouse on any of these special words, and additional topics for exploration appear in the lower-left corner of

the screen. For example, the first movement of the *14th String Quartet* is a fugue; to learn more about fugues, click the mouse on the word and zoom to a small treatise that includes both a description of the parts of a fugue and musical demonstrations. You can even hear fugues by composers such as Bach and Stravinsky. (See **Figure 3**.)

If your interest runs more to historical context, you can summon a timeline of classical music, see brief biographies of several major composers, and hear samples of



**Figure 1.** Harmonic analysis of the opening movement of the Beethoven quartet.



**Figure 2.** Bar-by-bar view of the same piece of music.





# WHILE THE CAT'S AWAY

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. It's an information swap for readers who want to share their programming pointers, hardware secrets, AppleWorks applications, and all kinds of other insights.

## No MORE MOUSETRAP

By CAMERON CROTTY  
Associate Editor

CALLING ALL PRODOS BASIC programmers! Are you tired of the same old keyboard interface? Are you sick of listening to Mac and GS/OS addicts snicker when you can't point and click on your latest opus? Do you long for the flick of wrist and tap of finger that spell sophistication — perhaps even class? If you remember that the Apple II treats the mouse as though it occupied a slot (just like your printer or disk drives) using the mouse from ProDOS BASIC is easy.

The accompanying **Program listing** is a simple paint program that has only three routines, but demonstrates how to turn the mouse on, read data from it, and turn it off.

The first routine, beginning at line 500,

S	Mouse Button Status
+/- 1	Still being pressed
+/- 2	Just been pressed
+/- 3	Just been released
+/- 4	Not been pressed
If S < 0 then a key on the keyboard has been pressed.	

**Table.** Integers describing status of mouse button.

switches output to the mouse and activates it by sending CHR\$(1). Then it switches output back to the screen where it belongs, and opens the input line from slot 4. In the mouse-read routine, the empty string ("") in line 100 suppresses the question-mark prompt associated normally with INPUT. X and Y will be values ranging from 0 to 1023 and stand for, amazingly enough, movement along the X and Y axes, respectively. S will be an integer

from +/-1 to +/-4 and describes the status of the mouse button. (See the accompanying **Table**.)

The last routine, beginning at line 600, turns off the mouse and resets the keyboard strobe. Once you know how to read the mouse, the rest is up to you! □

SEND YOUR TIP TO HINTS & TECHNIQUES, *inCider/A+*, 80 ELM STREET, PETERBOROUGH, NH 03458.

## CALL FOR SUBMISSIONS

Apple II and Mac users everywhere: Send us your ideas! We want your tips, macros, and shortcuts. Tell us how you fit that graphic into your newsletter. In short, write to us about anything that helps your system run faster or work more efficiently, or just plain makes your life easier. If we print your submission we'll pay you \$25 and make you famous!

**Program listing.** This paint program demonstrates how to use your mouse.

```

10 REM
20 REM DEMO MOUSE PROGRAM
30 REM
40 D$ = CHR$ (4): HGR2 : HCOLOR= 3
50 GOSUB 500: REM INITIALIZE MOUSE
100 INPUT "";X,Y,S
110 XREAL = INT (X / 3.50)
120 YREAL = INT (Y / 3.50)
130 IF XREAL = 0 OR YREAL = 0 THEN GOTO 100
140 IF XREAL > 279 OR YREAL > 191 THEN
GOTO 100
150 H$PLOT XREAL,YREAL: HCOLOR= 0: H$PLOT
XREAL,YREAL: HCOLOR= 3
160 IF ABS (S) = .1 THEN GOSUB 1000: REM
IS THE BUTTON BEING PRESSED?
170 IF S > 0 THEN GOTO 100: REM HAS A KEY
BEEN PRESSED?
180 GOSUB 600
190 TEXT : HOME : END
200 REM
210 REM
500 REM INITIALIZE MOUSE
510 REM
520 PRINT D$;"PR#4": PRINT CHR$ (1)
530 PRINT D$;"PR#0"
540 PRINT D$;"IN#4"
550 POKE - 16368,0
560 RETURN
600 REM
610 REM
620 PRINT D$;"IN#0"
630 PRINT D$;"PR#4": PRINT CHR$ (0)
640 PRINT D$;"PR#0"
650 POKE - 16368,0
660 RETURN
1000 REM DRAW WHITE LINE
1010 REM
1020 HCOLOR = 3
1030 H$PLOT XREAL,YREAL
1040 RETURN

```

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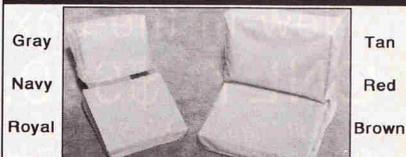
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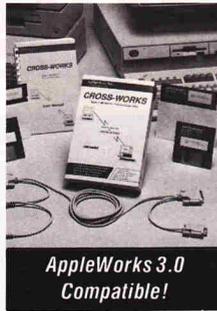
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## INWORDS

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**A**re you fed up with your spouse ripping out that recipe from the paper before you've had a chance to read the article on the other side? Are you tired of typing someone else's copy into your organization's newsletter? Do you just have plain old data-entry blues? Well, WestCode Software's **INWORDS** might be about to change your life.

Developed by Beagle Bros' Alan Bird, Rob Renstrom, and John Oberrick, InWords is the first product to bring optical-

to teachers, desktop publishers, and home-based users alike. Use this ProDOS-8-based program and Vitesse's Quickie or ThunderWare's LightningScan hand-held scanner and your data-entry days will be numbered. Boot up InWords instead of the software supplied with each scanner, then scan and capture text into the product's built-in AppleWorks-like editor. Then manipulate or edit the text, and save it to disk as either an ASCII text file or as an AppleWorks word-processing document.

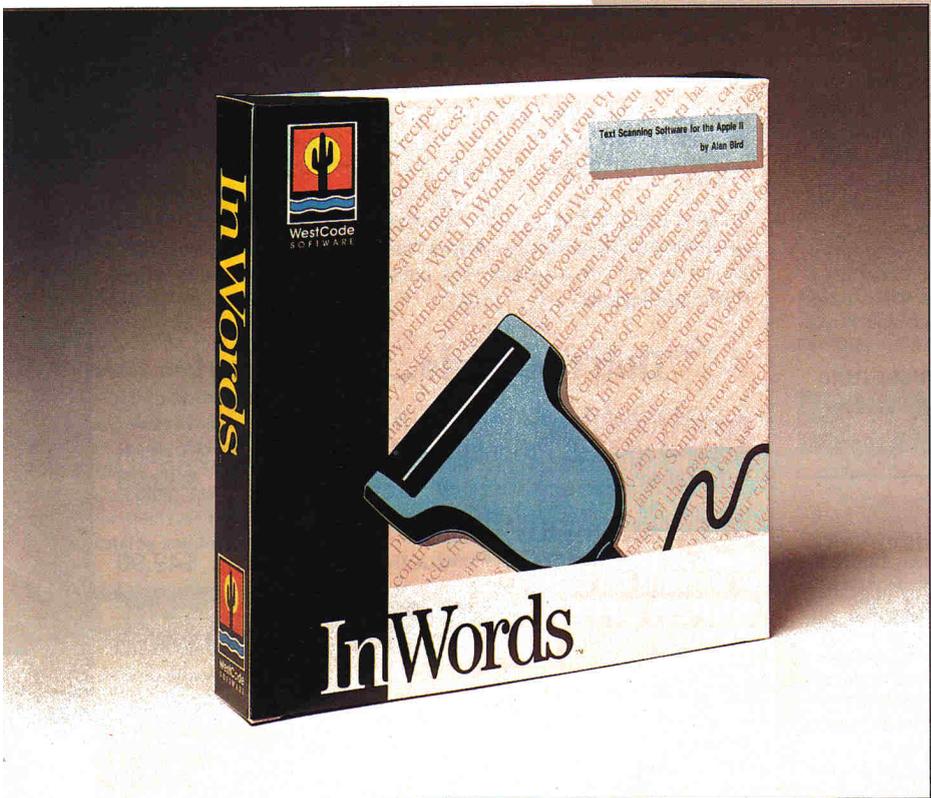
InWords can recognize a number of different fonts such as those found in popular magazines like *Time*, *Newsweek*, *Money*, and *Forbes*. But if these aren't the pages that clutter your coffee table, don't worry. In a little over an hour you can "train" this software to recognize the typefaces in other publications. Simply set InWords to *Font Training* mode and pass the scanner over the new typeface. If InWords doesn't recognize a character it'll enlarge it, cueing you to type the unknown character from the keyboard. Whenever InWords encounters that character again, it'll recognize it.

Whether you want to input text that's a full page wide, or as narrow as one column in a newspaper, InWords can handle it. In *Merge* mode, you can scan one side of a page, then the other; InWords combines the two into a single document. In *Column* mode, the software will ignore all but the text directly under the scanner's center.

And if you're artistically inclined, you can import graphics images into your painting or desktop-publishing program by simply passing the scanner over almost any type of artwork — including paper-based photographs, line art, and half-tones.

Optical character recognition may change the way you use your computer. Whether you want to record recipes, client information, sports statistics, or data from student report cards, InWords can free up your time — and unleash your creativity.

*InWords, priced at \$129, is available for 512K Apple IIGSes and enhanced IIs, and comes with both 3.5- and 5.25-inch disks. For more information, contact WestCode Software, 11835 Carmel Mountain Road, Suite 1304-311, San Diego, CA 92128, (619) 679-9200.*



character-recognition (OCR) software to the Apple II family. (OCR software lets you scan text from printed documents and save it as a standard ASCII text file or AppleWorks word-processing document.) Although giant companies such as Kurzweil and Oberon International developed the technology, it was too expensive for the average computer user. InWords, however, costing a fraction of previous systems, brings this capability

EDITORS' CHOICE SINGLES OUT ONE PRODUCT EACH MONTH THAT THE INCIDER/A+ EDITORS FEEL IS A SIGNIFICANT ADDITION TO THE APPLE FAMILY. PRODUCTS EVALUATED ARE AMONG THE MOST RECENT RELEASES AND MAY NOT BE AVAILABLE YET FOR RETAIL DISTRIBUTION.

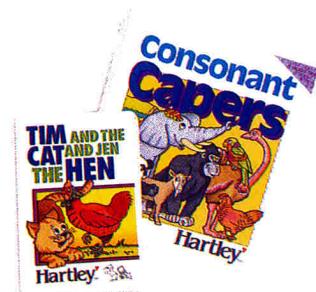
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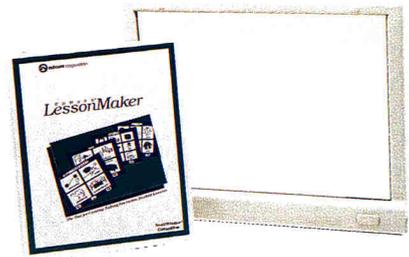
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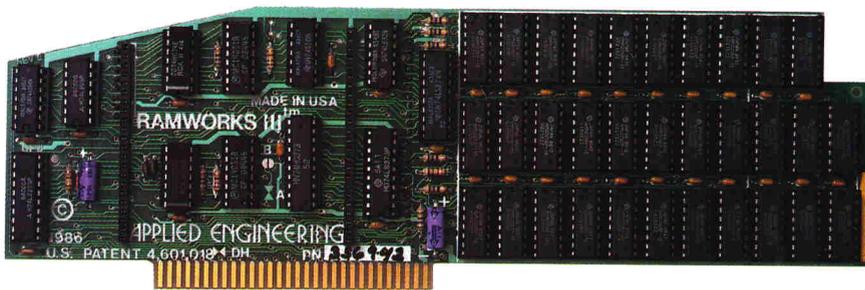
While there are a few programs that use the Apple IIGS® built-in voice capability, for most of the Apple II family "talking software" it is still necessary to use an Echo Speech Processor.

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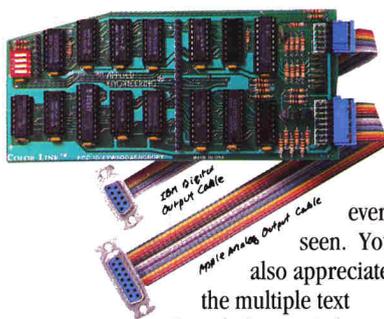
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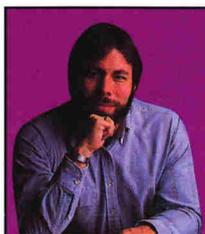
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*Steve Wozniak, co-founder of Apple*

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