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Apple II / Macintosh

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September 1990

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P. 100

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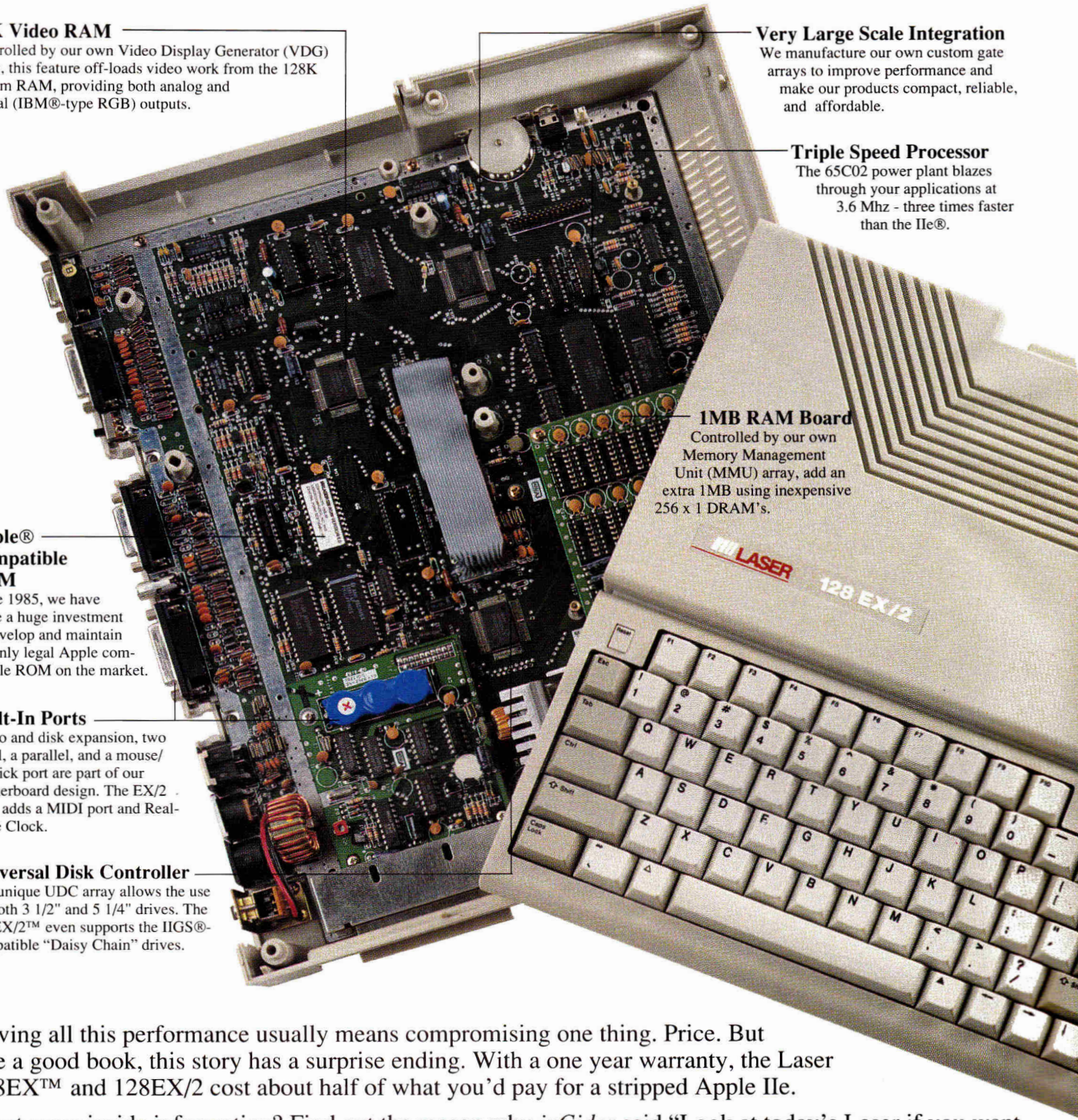

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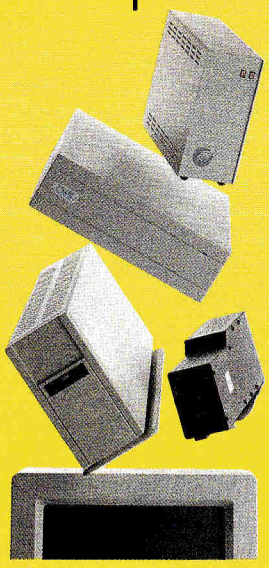

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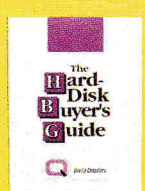

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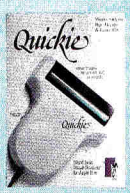

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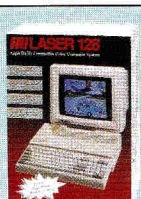

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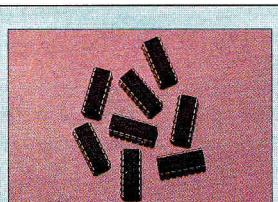

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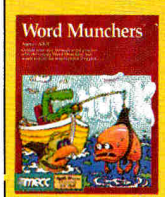

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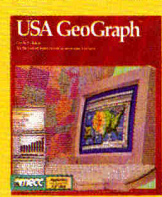

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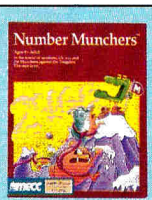

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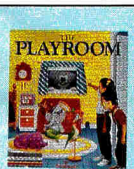

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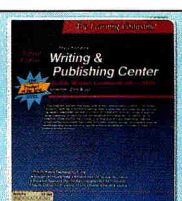

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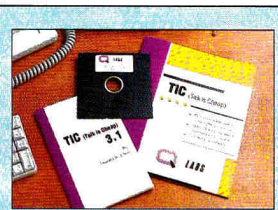

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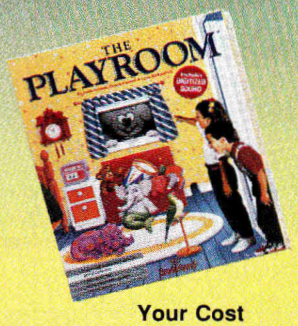

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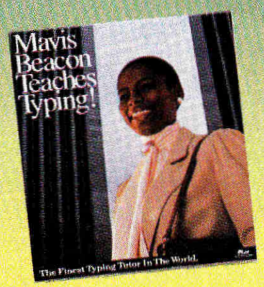

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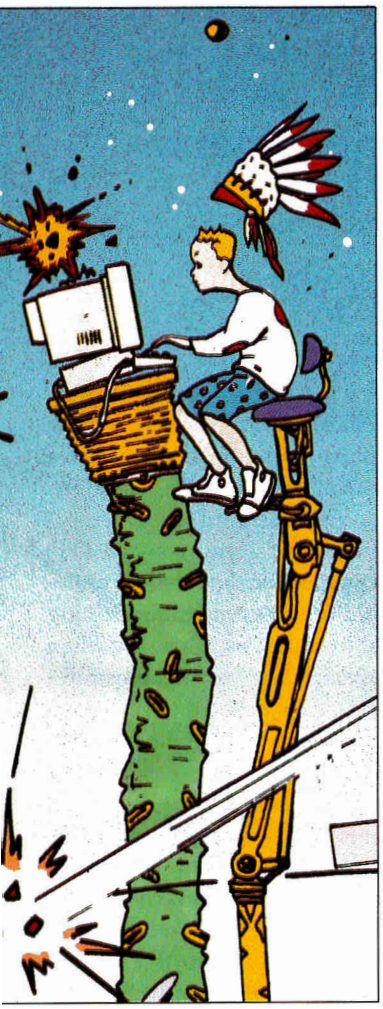

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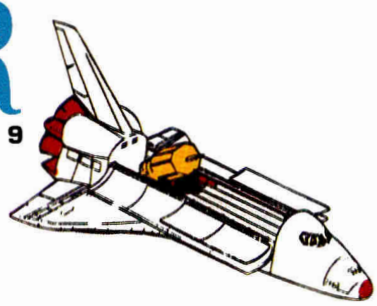

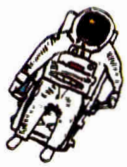

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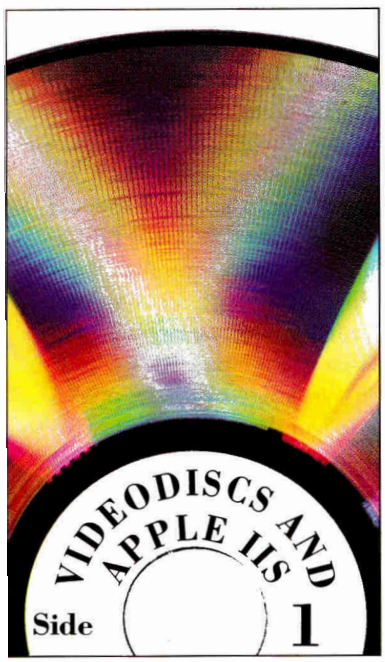

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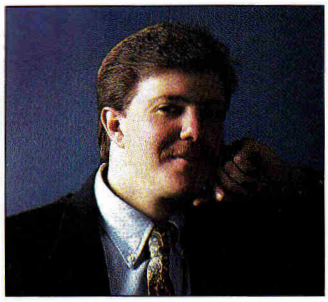

INCIDER'S VIEW

BEATING THE ODDS

By DAN MUSE * EDITOR IN CHIEF

Don't expect computers to be a panacea for a troubled education system: Our role is to use the technology appropriately.

"Human history becomes more and more a race between education and catastrophe."
— H.G. Wells, *The Outline of History*

SEVENTY YEARS AGO, NOT EVEN H.G. Wells would have expected something called a "personal computer" to appear, promising to revolutionize our education system. But if he could have foreseen the power of computers, would he have handicapped his race to make education the favorite over catastrophe?

Probably not — because if he could have predicted computers, he would have also predicted that toxic waste would overflow, that the ozone layer would deteriorate, that the rainforests would shrink, and that dolphins would be strangled for a few cans of tuna. He probably wouldn't be surprised to see catastrophe leading education down the stretch.

Melodrama aside, children are the spark of hope that can ignite education's comeback. But where does the computer fit in? Does it really improve education? People with more experience than I have say it does. Still, I wonder: Does it make students write better, comprehend books more easily, think more logically, solve problems more creatively? My answer: It *can* — but don't assume improvement is automatic.

In a recent report on education from Apple Computer, Chairman and Chief Executive Officer John Sculley says, "In schools where computers were backed up with a commitment in funds, training, and personal effort to make technology work, the changes have been impressive . . . We no longer have to ask whether students can learn using computers. Instead we need to identify when technology should be used and how to use it more effectively."

Sculley's comments make sense: We must use technology *effectively*, not just for technology's sake. But we must be wary of ideas such as those Sculley expresses in the first half of the quotation above. I'm sure it's true that in schools where computers were "backed up with a commitment in funds, training, and personal effort . . . the changes have been impressive." I'm also confident that if schools were to back their investment in books and videocassette tapes with funds, training, and personal effort, the changes would also be impressive.

Apple's Classroom of Tomorrow (ACOT) project, for example, boasts impressive results. And Apple should be commended for making the commitment to education it has. But when a student in an urban classroom demonstrates improved grades after he or she receives a computer at school and another for home use, does that prove that computers improve education? Of course not. Does enhanced self-esteem, motivated teachers, and a sense of opportunity and privilege make children better students? Common sense says yes. Computers can help in the race against catastrophe, but education is more than megahertz and megabytes. As Sculley says, we need to identify *when* technology should be used and *how* to use it effectively.

As well-intentioned as the ACOT program is, some truly impressive results in education have come from Apple's Office of Special Education and Rehabilitation. This underpublicized department helped establish the Alliance for Technology Access, an association of 42 organizations, scattered around the country, that bring computer training and information to people with disabilities. The Office of Special Education and Rehabilitation also ensures that Apple products are fully accessible to all computer users and that needed products are designed by Apple and third-party developers. (For more information, see "Working Together," p. 53.)

If education is to win the race against catastrophe, the personal computer will play a large role. Apple's job is to provide the hardware and training. But don't expect computers to be a panacea for a troubled education system. Our role is to use the technology appropriately: It's up to us to know when and where computers make a difference. □

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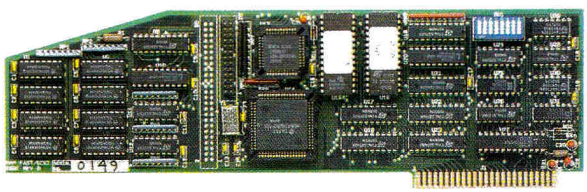

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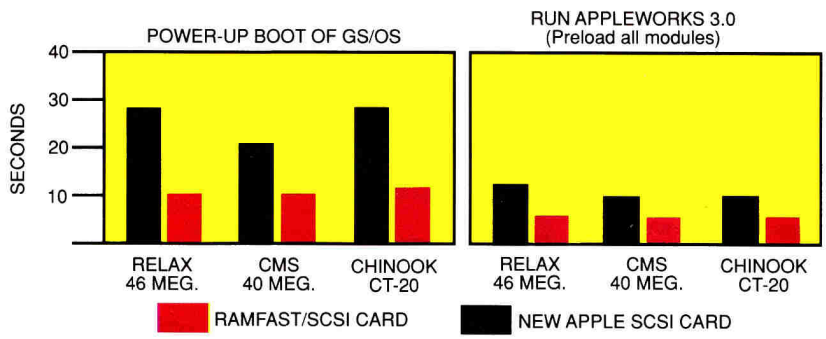

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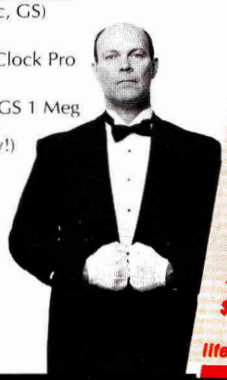

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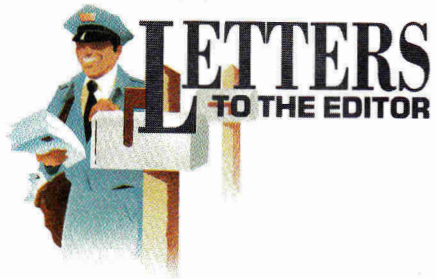

En Espanol

WHERE CAN I FIND A PROGRAM that offers Spanish character input and is compatible with AppleWorks GS version 1.1? Although EuroWorks is compatible with AppleWorks versions 2.0 and 2.1, it's not compatible with AppleWorks GS.

Lee Abraham
1805 Tustin Street
Philadelphia, PA 19152

The Apple IIGS has Spanish character sets built in. Just choose the Alphabet *menu on the GS Control Panel and select* Spanish *as the keyboard and monitor language. — eds.*

Take a Stand

MORE BAD NEWS FOR APPLE II owners: Origin Systems may not make a II version of Ultima VI. In fact, for the first time it has created an IBM version first. I believe that if we send letters showing our enthusiasm, Origin will produce the Apple game. Write in support of an Apple version of Ultima VI: Apple Ultima Comments, Origin Systems, P.O. Box 161750, Austin, TX 78716.

Donald Lee
238 DeLong Street
San Francisco, CA 94112

Biting the Dust

YOU CAN HARDLY PICK UP A copy of *inCider* or log onto America Online without running across an editorial or a letter decrying the demise of the Apple II series; Apple Computer and many of the major third-party software publishers are slowly but surely abandoning this noble machine.

I bought an Apple II Plus in 1981, and over the years I marveled as the software became more innovative. In 1987 I bought an Apple IIGS and thought I'd died and gone to heaven. When AppleWorks GS came out, I thought the software floodgates would open to power the II ranks.

To make a long story short, I now use a Mac SE/30; it's everything I ever wanted the GS to be. It's not really the hardware (I miss the color), it's the software available for the hardware. I hadn't realized how much power there is out there, closer to the mainstream. I hadn't realized how much I wanted that power.

I tried to keep the faith, but after nine years, my computing needs have finally exceeded what the software people were willing to give. In the end, Apple Computer was able to meet my needs, but I can't shake the regret I feel that the company did it with the wrong machine.

Howard M. McCollister, M.D.
301 1st Street Southeast
Crosby, MN 56441

Out with the Old?

IT'S BEEN SEVEN YEARS SINCE I purchased my first Apple computer. I began with a used IIe, then bought a IIc in 1984. In 1987 I upgraded to the GS; my current system also includes a 5.25-inch disk drive, two 3.5-inch drives, an RGB monitor, an ImageWriter printer, a Kensington System Saver, an Applied Engineering DataLink modem, and a 1.5-megabyte RAM card.

During the entire seven years I've never received any information about system or software upgrades from Apple; the only information I've received has come from Claris (on AppleWorks upgrades). All my information has come from computer magazines, which either jump the gun or lag behind announced upgrades.

Apple should remember that we made the GS the sales leader it is today! Lately the news is full of stories about Apple's dwindling profits. If a company is to be successful, it can't turn its back on the customer once a sale is completed.

Before I dump any more money into this antiquated, unsupported, obsolete system, I'm going to say "goodbye Apple" and "hello MS-DOS." If you know anyone gullible enough to buy my system, including several thousand dollars' worth of peripherals, scanners, and software, please have him or her contact me.

Ralph D. Mooers
520 Todd Farm Road
Belle Vernon, PA 15012

Watch Out!

IN FEBRUARY I WROTE TO North Forty Enterprises to purchase an Applied Engineering extended-memory card for my Apple IIc Plus. I enclosed a check for $220. On March 5, 1990, the check was cashed, but by April 6, I hadn't received any goods from the company. When I called to get an expected shipping date, the salesperson told me the item was back-ordered and wouldn't be shipped until the end of April. He also said the company didn't recommend the card I ordered and suggested I purchase one supplied by Applied Ingenuity. I changed my order and waited patiently.

By the end of May I still hadn't received anything. When I called North Forty again to get an expected ship date, the sales ►

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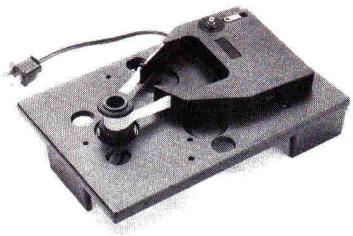

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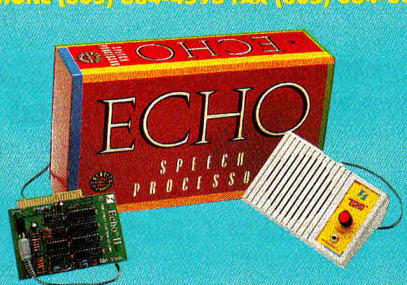

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LETTERS TO THE EDITOR

representative advised me to call Applied Ingenuity myself because North Forty would be closing its doors in a few weeks. When I inquired about my $220, he told me the secured creditors have to be paid before North Forty can send refunds.

Even though I've contacted the Better Business Bureau, the New York State Consumer Protection Board, and the magazine in which I found the ad, I've had no luck getting my money back.

Stephen D. Neigowsk
9696 Hayne Boulevard
Apartment N-24
New Orleans, LA 70127

According to North Forty Enterprises, "We are insolvent with almost no assests available. We haven't filed voluntary bankruptcy because we don't have even the funds to pay the attorney to file the petition.

"We have several secured creditors, and their claims more than offset any collectible assets. Federal bankruptcy law requires that secured creditors are to be paid ahead of all others.

"As there are insufficient assets to pay these secured creditors, there won't be any refunds to customers, or payments to unsecured creditors. Any assets duly collected will belong to our secured creditors." —eds.

Not a Fair Deal

YOUR RECENT EDITORIAL IN the May 1990 issue ("What's the Deal?" p. 8) was offensive to me, and probably to all other people in automotive sales. To refer to automotive salespeople as "loathsome and reptilian" is inexcusable for someone in your profession.

I've worked in an automobile dealership for more than 14 years, and have been a sales manager for the last ten. In that period of time, I've found that the average car salesperson knows his or her product and follows the customer far better than the average Apple computer sales representative. I've purchased five Apples in ten years, but no two from the same store — either they folded or Apple dropped them.

I admit that some automotive-sales representatives contribute to the stigma we bear today, but others are constantly trying to improve the way people perceive our profession. Your profession also carries a

stigma: irresponsibility in what you print and excessive liberalism in your views. When I read your editorial, I realized you aren't trying to change that image.

Instead of taking the "good spouse/bad spouse" approach when you buy a new car, you should deal honestly with the salesperson — then you wouldn't force the negotiation into a silly game. You may also find that being mature in your dealings results in a fair price to you, a fair profit for the dealership, and car buying that's fun.

Craig T. Harding
Sales Manager
Bill Kribs Chevrolet
910 South Main Street
Anderson, SC 29621

I FIND YOUR DESCRIPTION OF car salespersons as "loathsome and reptilian" extremely offensive. To tar all car salespersons with the same brush is not only narrow-minded, but immature. You put yourself in the unsavory position you describe when you play the "good spouse/bad spouse" game because you're trying to buy a deal instead of a car.

Try a more honest approach with your next purchase — decide what you think a fair profit would be on your car, then make an offer. Those of us in the car-sales profession would certainly welcome this approach — and maybe then we could get back to the basics of sales. After all, we're entitled to earn a living.

Gary H. Mills
Bill Kribs Chevrolet
910 South Main Street
Anderson, SC 29621

I didn't set out to offend car salespeople in "What's the Deal?" My point was only to illustrate how badly computer dealers are perceived. I don't work for an automotive magazine (consider yourselves lucky), so I won't elaborate any further on my opinion of "most" car dealerships. If you perceive me — and my "good spouse/bad spouse" tactics — as a car-buying monster, however, you created me.

— D.M.

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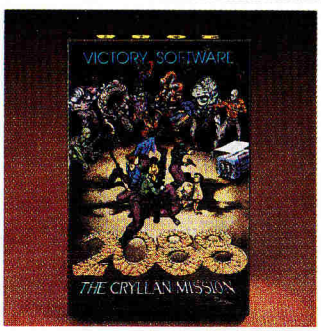

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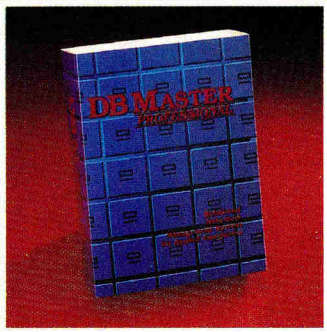

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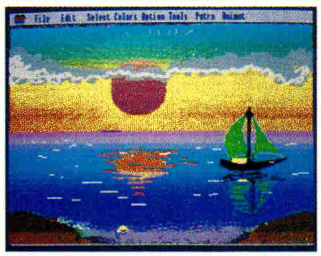

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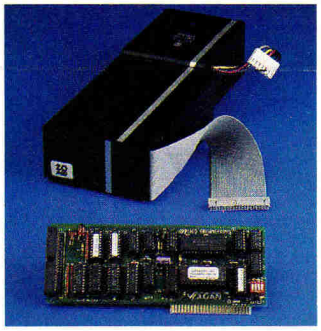

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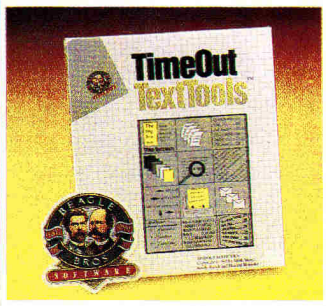
Geometry(GS).....55.
ByteWorks Ugly Duckling(GS)..... 32.



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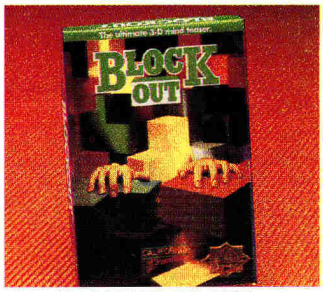

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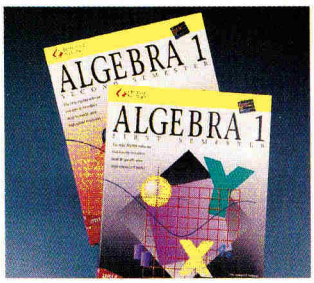

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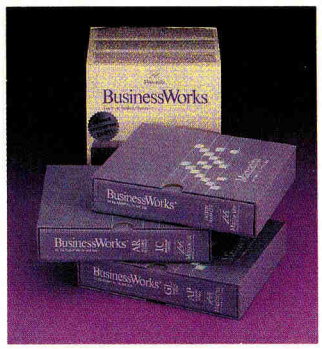

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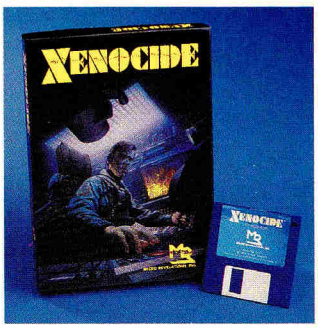

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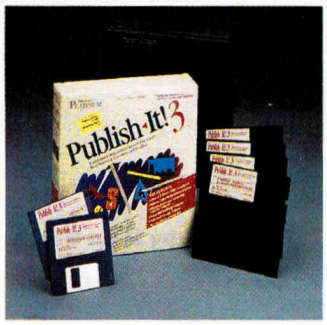

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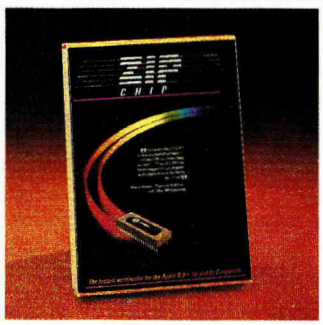

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WHAT'S NEW

edited by Paul Statt

GS ZIP

HARDWARE

ZIP TECHNOLOGY, MAKER of the Zip Chip accelerator card for the Apple IIe and IIc, announced in June that it was shipping its Apple IIGS accelerator board, the **Zip GS**. The cost is $349.

The Zip GS has an 8-megahertz processor; the standard Apple IIGS processor runs at around 2.7 megahertz. In practice, Zip reckons, an Apple IIGS equipped with a Zip GS will run about three times faster.

The Zip GS is 100 percent compatible with all Apple IIGS hardware and software; speaker, paddle, and slot speeds are controlled independently of processor speed.

Zip GS offers 16 software speeds and is said to be DMA (direct memory access) compatible at any of those speeds, enabling access to stored memory without processor slowdown.

The Zip GS board has only 15 parts, and can be installed quickly in any of a number of Apple IIGS slots. Upgrades are possible.

"With the Zip GS, Apple IIGS users can gain the operating speed of a Mac SE/30 for a fraction of the cost," says Richard L. Stivers, president of Zip Technology.

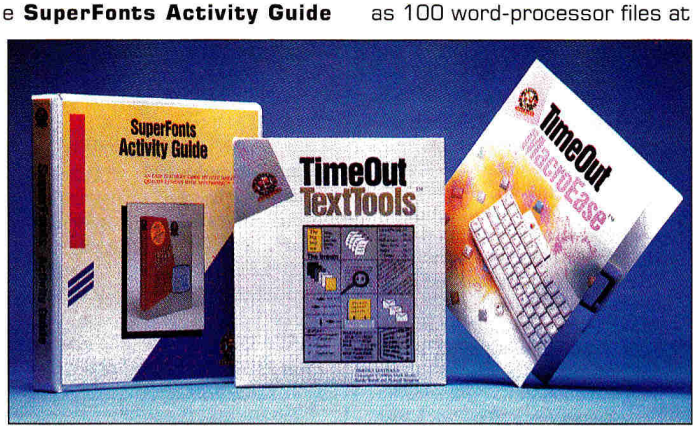
For details, call or write Zip Technology, 5601 Slauson Avenue, Suite 190, Culver City, CA 90230, (213) 337-1313, or circle number 350 on the Reader Service card in this issue. **— P.S.**

BEAGLE STUFF

SOFTWARE

BEAGLE BROS (SAN DIEGO, CA) HAS ADDED three new products to its growing line of AppleWorks enhancements.

MacroEase ($39.95) simplifies the writing of macroinstructions that automate AppleWorks; **TimeOut TextTools** ($49.95) simplifies the production of word-processor documents; and the **SuperFonts Activity Guide** ($49.95) offers ideas for using the popular Beagle Bros typestyle and print utility in the classroom.



A new litter of Beagles.

MacroEase includes six applications: Debug makes macro writing faster by helping you find and remove errors; Ultra Reference is an on-line guide to all commands available to the macro programmer; Mr. Publish prints word-processing files in two or three columns; DB Links lets you use a word-processing file as data in a database file; Question Writer is a macro set that helps teachers create interactive multiple-choice quizzes; and MiniCheck is a checkbook register. MacroEase also includes more than 400K of sample macros.

Several TimeOut TextTools applications speed text entry: Glossary and QuickStyles let you select a block of text or a particular printer format from a menu; QuickTabs makes a tab menu that replaces AppleWorks' clunky ruler; SuperFind helps you locate printer codes and embedded commands as you would text; and CopyBlock lets you duplicate rectangular blocks of text in word-processing documents.

TextTools' printer enhancements include MarkMerge, a mail-merge application for printing forms, and MulitPrint, for printing as many as 100 word-processor files at a time. In addition, Analyst, Table of Contents Generator, and Indexer aid the professional writer in checking style, writing a "t of c," and compiling an index.

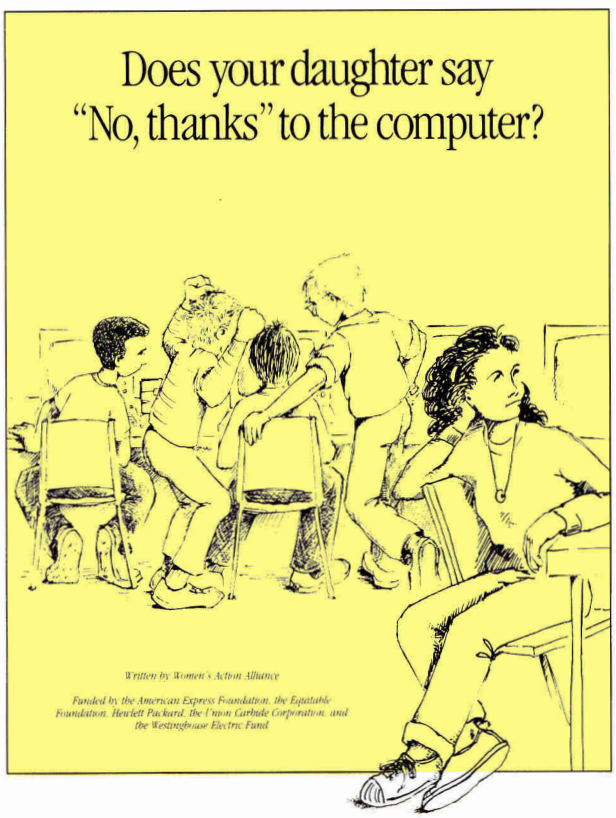
The SuperFonts Activity Guide helps teachers use Beagle's AppleWorks print enhancement in the classroom to create documents in all kinds of different type styles. Lessons include Rebus, for designing picture stories with AppleWorks; Code Breaking; and activities for music, math, science, language, and writing classes. All material was developed and classroom-tested by working teachers.

For information about these programs and Beagle Bros' other fine AppleWorks helpers, contact the company 6215 Ferris Square, Suite 100, San Diego, CA 92121, (619) 452-5500, or circle number 351 on the Reader Service card. **— P.S.**

G·E·O·S A·R·T·S

PEOPLE WHO USE THE GRAPHIC ENVIRONMENT OPERATING SYSTEM (GEOS) FROM Berkeley Softworks, and especially the company's highly touted desktop-publishing program geoPublish, may sometimes feel they're getting the short end of the clip-art stick. Well, no more: GEOS users can now receive a periodical disk of cartoons created in GEOS format by Dale Beach of **Cartoon Sampler** in Elwell, Michigan.

Each bimonthly disk contains more than 40 cartoons, and sometimes a GEOS font or two, for only $7, including shipping and handling. Summer disks will feature barbecues and swimming pools; holiday disks will cover presents and Santa Claus. Beach also draws and sells specialty disks for travel, and a disk of "visual puns." For details, write to Cartoon Sampler, 7048 Michigan Street, Elwell, MI 48832, or call (517) 463-6619. **— P.S.**



If you have to answer yes — she does say "no, thanks" to the computer — and you'd like her to say "yes, please," start this way: Write or call the Women's Action Alliance (370 Lexington Avenue, Suite 603, New York, NY 10017, 212-532-8330), and ask for this informative booklet, written by Jo Sanders. Single copies are free. It's full of common sense: "Talk to your daughter about computers," "Ask your daughter to help you use the computer," and "Suggest that her teacher write for the brochure 'Do Your Female Students Say "No, Thanks" to the Computer?' "

APPLE BITS

- If you can't beat 'em, join 'em: **Seymour Papert**, inventor of **Logo** and Lego Logo, is working with the **Nintendo** Company, searching for educational value in cartridge games.
- Delta Drawing, an educational graphics program that was a big hit for Spinnaker Software in 1982, is back. **Delta Drawing Today**, set for a fall launch, is an enhanced version from Power Industries (Newton, MA). If you're still using the old Delta Drawing, call (800) 395-5009 — Power Industries wants to hear from you.
- Beagle Bros (San Diego, CA) says it plans to release a **TimeOut Graph Activity Guide** for teachers who use that popular AppleWorks enhancement in the classroom.
- Edmark (Bellevue, WA) now has an Apple Desktop Bus (ADB) version of its **TouchWindow**, which lets you control any GS or Mac program by touching the monitor screen. Call (800) 426-0856 for information.

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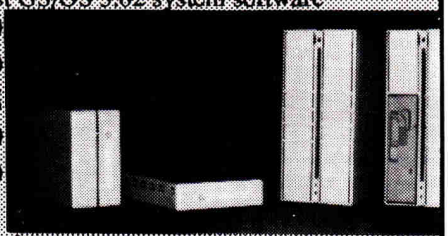

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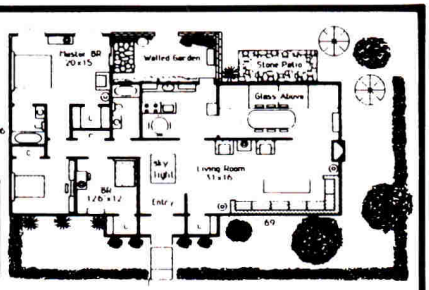

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GS PROGRAMMING, C- AND MERLIN-STYLE

RESOURCES

RON LICHTY AND DAVID EYES, AUTHORS OF "Programming the Apple IIgs in Assembly Language" (one critic called it "everything I need to know specifically so I can write a useful IIgs program"), have announced that the book's HELLO WORLD program, a desktop program shell, is now available in a C-language edition and two Merlin assembler versions.

Cecil Fretwell, known for his fine work as technical editor for CALL A.P.P.L.E. magazine, translated Hello World into C. The conversion contains source code for almost every point at which "Programming the Apple IIgs" says it's possible, plus a useful file that numbers the lines of the final C code and cross references functions and variables. Compiled versions of the Hello World program from chapters 5, 6, 7, 8, and 9 are included.

The author of both Merlin 16+ versions of Hello World is Ken Kashmarek, who also wrote SoftSwitch for Roger Wagner Publishing. Kashmarek converted the first Merlin version by hand, line by line, from the code in "Programming the Apple IIgs." He used Merlin supermacros — they shorten the source code — but also left out the comments. Kashmarek used the Converter routine from the original Hello World to create the second version, which includes all comments.

The assembly-language source code from "Programming the Apple IIgs" is still available. Readers of the book will want to send a self-addressed, stamped envelope for a correction sheet to Ron Lichty, P.O. Box 27262, San Francisco, CA 94127. Lichty is accepting orders for the C disk ($20), the Merlin 16+ disk ($10), the assembly-language disk ($20), and the book ($32) at the same address. — P.S.

START TALKING

RESOURCES

"START TALKING: A Unicorn Users' Kit," a set of 23 activities, lets disabled youngsters use pictures, words, and communications symbols with the Unicorn Expanded Keyboard, a talking alternative input device that replaces the standard Apple IIe or IIGS keyboard. (It requires a compatible adaptive firmware card and an Echo speech synthesizer.)

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"Start Talking" sells for $29.95; the Unicorn Expanded Keyboard retails for $350. For information about these and related products, contact Unicorn Engineering, 5221 Central Avenue, Suite 205, Richmond, CA 94804, (415) 528-0607, or circle number 354 on the Reader Service card. **— P.S.**

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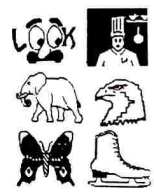

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WHAT'S NEW

UPDATES

Laser Computer (Lake Zurich, IL) offers an all-in-one Apple II work-alike: For $730, you get a **Laser 128 computer**, an RGB color monitor, a parallel printer cable, and a software starter kit, including **Copy II Plus** from Central Point Software. A black-and-white system is only $600; call (708) 540-8086 for details.

Educators who just can't get enough of **Carmen Sandiego**, the sleuth with the encyclopedic brain from Broderbund Software (San Rafael, CA), can see her on her own videotape. Great to watch on Carmen Sandiego Day, and only $14.95. Call (415) 492-3200.

The new version 2.2 of **Design Your Own Home**, the Apple II architecture program from Abracadata (Eugene, OR), adds autodimensioning, plan scanning, and a stud/beam repeater to all the rest of its features. The upgrade costs $15; Design Your Own Home/Architecture is priced at $69.95. Call (503) 342-3030; orders only, (800) 451-4871.

The system software for **PC Transporter**, the MS-DOS clone on a card for the Apple II from Applied Engineering (Carrollton, TX), now includes better support for extended keyboards and hard-disk drives: You can install two 32-megabyte MS-DOS partitions on your ProDOS hard drive. The upgrade costs $25, but it's free when you buy an AE 3.5-inch drive, a Vulcan internal hard drive, or an AE IBM-style keyboard. Call (214) 241-6060 for details.

The latest update to **EuroWorks**, version 3.0, blends imperceptibly into AppleWorks 3.0 to add printing commands for five languages: French, German, Italian, Portuguese, and Spanish. EuroWorks 3.0 is as much as 20 times faster than previous editions, according to the publisher, S.A. AuTeur (Beaverton, OR). The five-language version is priced at $39; French or Spanish is just $24. Call (503) 645-2306 for more information.

GS Numerics Additions

SOFTWARE

GS NUMERICS, THE complete educational calculator, graphing program, and math teacher for the Apple IIGS, is now available for site-license prices.

Your school can have the latest version of GS Numerics, 1.4, in as many as 15 classrooms for $699.95, or in 25 classrooms for $1399.95. Schools in 48 states and 12 foreign countries are already using GS Numerics in algebra, trigonometry, calculus, and science classes at the high-school and college levels. The single-user price is still $139.

If you're using an earlier version, contact Spring Branch Software at its new address — P.O. Box 342, Manchester, IA 52057, (319) 927-6537 — and ask about an upgrade or a site license for your school. **—P.S.**

LOGO NEWS

APPLE II BUFFS WHO USE the educational programming language Logo have lots of new choices this fall: **Logo Plus** in an AppleShare version, as well as **Logo Math** and **LogoExpress**, the first Logo telecommunications program.

The network edition—for AppleShare and others—of Terrapin's Logo Plus, for 128K Apple IIs with ProDOS, is now included in all site licenses for the program ($399.95 per school building).

Logo is famous for its simple turtle graphics, but it's also a powerful mathematical language. With six games and eight tools, featuring a geometry construction tool and a graphing program, Logo Math is a mathematics laboratory for secondary schools. Other programs in the package cover triangles, polar and cartesian coordinates, signed and complex numbers, symmetry, and probability and statistics for geometry, algebra, trigonometry, and calculus classes. Logo Math requires Terrapin Logo, and sells for $39.95, or $99.95 for a site license, from Terrapin Software, 400 Riverside Street, Portland, ME 04103, (207) 878-8200. Circle number 352 for more information.

LCSI's LogoExpress is a companion program for the company's popular LogoWriter word processor. It lets students exchange pen-pal letters and work together over telephone lines on Logo programs.

LogoExpress features automatic dialing and log-on, electronic mail, a number of new word-processing commands that simplify on- and off-line text editing, and tools for dialing many of the popular online services. You can even use LogoExpress as host software for your school's own BBS (bulletin-board system).

LCSI sells only site and district licenses for LogoExpress: The basic site license costs $329; the basic district license is $599 plus $159 per school. For details, call or write LCSI, 3300 Cote Vertu Road, Suite 201, Montreal, Quebec, Canada H4R 2B7, (800) 321-LOGO, or (514) 331-7090. Circle number 353 for more information. **— P.S.**

FLASH

APPLEFEST WON'T BE IN SAN FRANCISCO IN SEPTEMBER, BUT in Long Beach, California, in December, says Andy Calkins of Exposition Management Inc. (Lexington, MA). Calkins has scheduled AppleFest for December 7 and 8 to follow the Mac/LA Conference and Expo, another EMI show, to be held December 6 and 7 in Long Beach.

"It was clear to us," Calkins admits, "that everybody — exhibitors and attendees — was disappointed that Apple wasn't there [at the May AppleFest in Somerset, New Jersey]." Apple's Southwest Operations Group asked Exposition Management "to do a major K–12 show. What was a 60 percent focus on K–12 education at AppleFest will now be something closer to 100 percent."

If you've registered for September AppleFest in San Francisco, call EMI at (800) 262-FEST for an incentive to visit sunny Long Beach in December.

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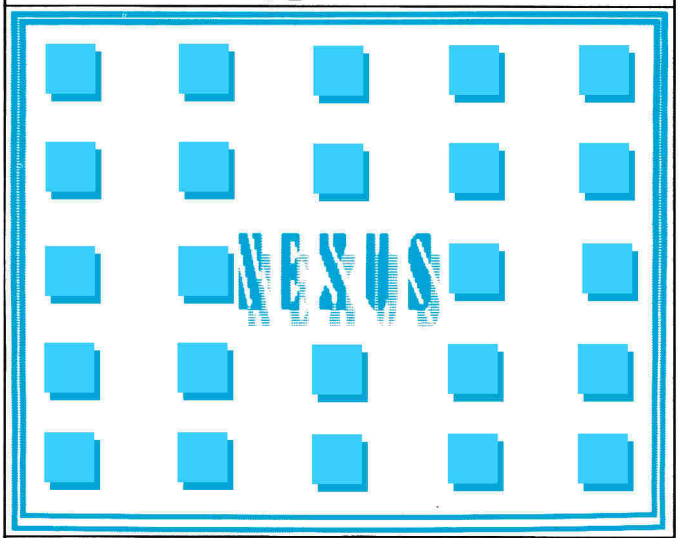

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Editor's Choice August 1990

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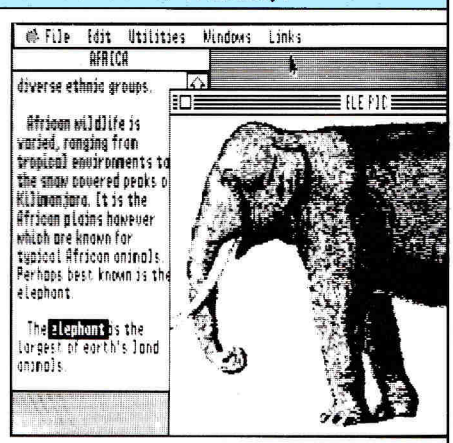

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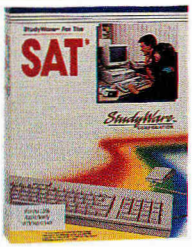

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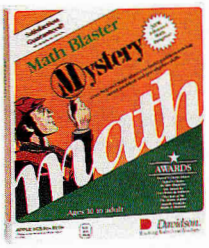

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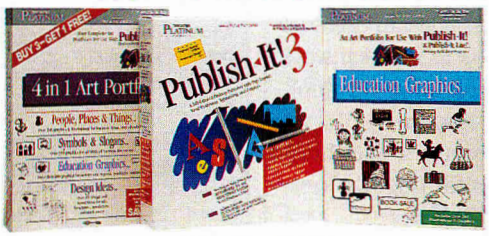

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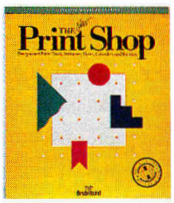

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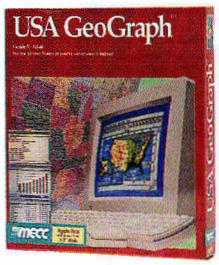

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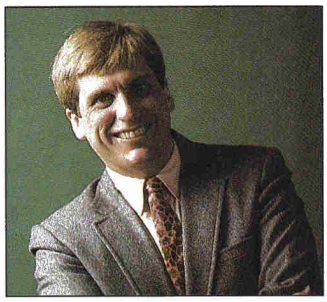

STATTUS REPORT

I WANT MY GTV

By PAUL STATT * SENIOR EDITOR

Interactive multimedia can change passive viewers into active critics of the information being conveyed.

Such labored nothings, in so strange a style,
Amaze th' unlearned, and make the learned smile.
— Pope, *An Essay on Criticism*

I HATE THE TUBE AS MUCH AS THE next writer, but the presence of television in our lives is as solid as its offerings are empty. TV is a wasteland; can we find a way to improve it? Should we tar "interactive multimedia" with the same brush, and brush off ABC News Interactive along with the *ABC Nightly News*?

Steven Levy cut through the cant in a recent column in *MacWorld* (June 1990) to conclude that "multimedia is essentially one thing: computer applications that aspire to being television." That may be, but it doesn't follow that the nightly television news and GTV: A Geographic Perspective on American History, from the National Geographic Society (see "A Star Is Reborn" in this issue, p. 58, and this month's Editors' Choice, p. 100), are *both* labored nothings, full of sound bites and fury and signifying nothing. That's what Levy seems to think.

"Multimedia deals solely with the style in which information is conveyed," Levy writes. "Thoughts are permitted, but they can't look like thoughts — you have to dress them up like showgirls. Sooner or later you realize that you communicate more effectively in this medium if you ditch complex thoughts altogether." A strange style will amaze the ignorant — even when nobody has nothing to say.

If I write that "TV warms the heart, a book the mind," who cares that I've used a stylistic construction called *zeugma*? But it's pretty catchy compared to "Viewers understand the moving pictures and sound of television shows in a more emotional manner than the rational way readers understand written materials such as books and magazine articles," isn't it?

Writing style is what causes a certain combination of words to explode in the mind. The danger of style — in writing, in speech, in painting, in the movies, and in TV news — is that style can overwhelm substance. It's not *what* you say, it's *how* you say it. Style can be fun, like fireworks; but it may be more like a terrorist's bomb if it takes you by surprise and forces you to think something you didn't want to.

A person who can read and write is literate. But the ability to read isn't enough. It's only when you also know how to write a simile that you can read critically a metaphor such as "thoughts can't look like thoughts — you have to dress them up like showgirls."

Television seems ubiquitous. But American viewers have been watching for only 50 years. It's a new medium, mastered by only a handful of "literate" initiates who know how to create it. The rest of us are slaves of TV. People have been writing, on the other hand, for millennia — we brag that we're civilized because most of us learn to read and write in school.

And because we know how to write, we're not easily fooled by what we read. We can smile at a clever argument, a turn of phrase, a figure of speech. TV rules not by virtue of any innate power, but simply because most viewers can't watch the news as critically as they can read the newspaper. Viewers can't be critical because they can't imagine creating their own TV.

Interactive multimedia, such as ABC News Interactive, GTV, and Roger Wagner's HyperStudio, can change passive viewers into active critics of the information being conveyed. GTV's ShowMaker software, for instance, lets you create playlists that include text, videodisc graphics, and sound. With HyperStudio and a videodisc, you can add computer graphics to the mix. This isn't a computer aspiring to be a TV, it's a TV growing up into a computer.

A television show is made, not born. Somebody decides what to show — what pictures, what sound, in what order. Training — outfitting every television viewer with the tools to be a television programmer — won't be easy or cheap. But the "unlearned" alternative is to stand by, amazed, just watching.□

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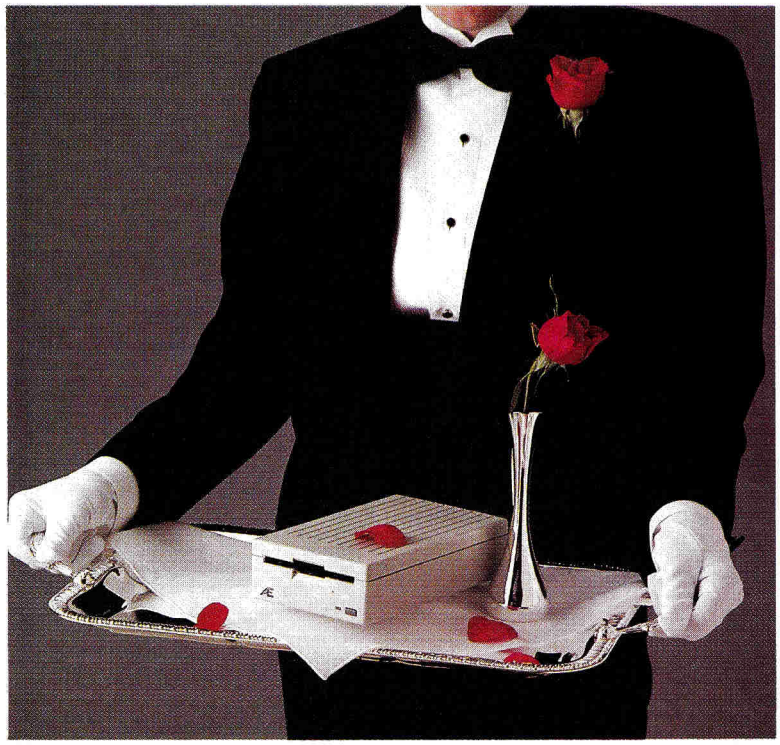

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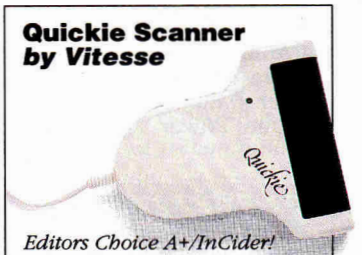

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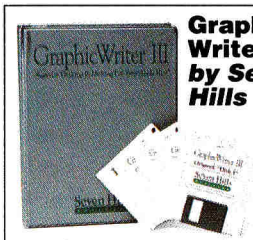

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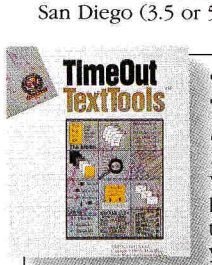

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PARTS AIN'T JUST PARTS

Cheap parts can be very costly to replace. Resign yourself to the extra expense and have a dealer install the correct RAM.

By WILLIAM P. KENNEDY, Ph.D.

RAM ADDITIONS

I'VE SEEN A NUMBER OF ADS IN your magazine for RAM chips. I want to add more memory to my IIe — cheaply — but I'm not sure what to do. Can I buy larger RAM chips and replace the ones I have in my IIe or on the 80-column card? Or do I need a special card?

Bill Smith
Galveston, TX

I don't care what the commercial says — parts ain't just parts. Cheap parts can be very costly to replace. Resign yourself to the expense and have a dealer install the correct RAM so that you can enjoy your computer, not toy with it.

Even if you know what you're doing, adding RAM (random-access memory) to your IIe can be difficult.

First, you need a place to put that extra RAM. No, not on your IIe's motherboard or even the 80-column card — they're probably already fully "populated" with the correct RAM chips. And you can't replace the IIe's or 80-column card's chips with higher-capacity RAM, either. Rather, you put additional RAM chips on a memory-expansion card.

I recommend buying one that already contains the amount of RAM you need, not a "bare bones" board to which you'll add more RAM right away. It's not that much cheaper to add your own, and you risk ruining the card and voiding its warranty.

If you have a memory-expansion card to which you want to add more memory, the hard part is buying the right chips. Consult the card's manufacturer or at least the documentation that comes with the card to obtain the correct chip-identification numbers.

These days, most manufacturers use the 256-kilobit-by-1-bit variety of RAM; that's why there are eight in a pack to make up 256K bytes. RAM is also rated by average data-access times — usually 150 nanoseconds (that's 0.00000015 second) or less.

And because the chip's circuitry is arranged as a matrix of rows and columns, RAM comes as CAS-RAS or RAS-CAS — column/address/strobe before row/address/strobe or vice versa. Once you've identified all the parameters, buy the correct RAM chips from a reputable source, such as Microprocessors Unlimited, 24000 South Peoria Avenue, Beggs, OK 74421, (918) 267-4961.

Now for the installation. First, remove the RAM-expansion card from your IIe and lay it flat, component side up, onto a soft surface such as a mouse pad.

Identify the bank of eight sockets on the card where you should install the new RAM. On a card containing 32 sockets or more, which sets of eight are banks? Markings vary, from lines surrounding individual banks and labeled Bank 1 *and so on to no identification at all. Examine the card carefully and look for clues etched on the circuit board.*

In addition, keep in mind that if you're not populating the card fully, fill up the banks in ascending order; don't fill bank 4 and leave bank 3 empty, for example.

Before you take those new chips in hand, you need to "ground" yourself to eliminate any static electricity: "Jumper" a wire between your person (such as from a metal wristwatch band) and the case surrounding the power supply in your IIe or the plate on a grounded wall socket.

Now insert each RAM chip carefully into its memory-expansion card socket. Try not to handle the chips by their pins. Be sure to align pin 1 of the RAM chip with socket-clip 1; the rest will fall into place.

Pin 1 is either marked by a small dot or is located to the right of an indentation in one end of the RAM chip's case. A similar indentation in the socket or a dot on the circuit board should identify socket-clip 1.

Align all pins in their individual socket clips. You may have to bend them to align them properly: Lay one side flat on a table and press down carefully on the chip's case. Once pins are inserted loosely, push down to seat the chip. You should feel and hear it snap into place.

Some manufaturers also provide RAM-test software with their cards. Now's a good time to use it to make sure the chips are functioning. Repeat the test again after a week or so of moderate use to ensure that the RAM chips are "burned in" properly and reliably.

APPLEWORKS GS FONTS

THERE JUST ISN'T ENOUGH room on the AppleWorks GS System Disk for additional fonts. In fact, the recent upgrade, version 1.1, seems to have fewer fonts and type sizes than version 1.0.

How can I add more fonts and type sizes to my system? And where can I get additional AWGS-compatible fonts?

Ray Pledger
Houston, TX

You're right about fewer accessible fonts for AppleWorks GS; it's because Apple's newest GS/OS release, version 5.0.2, takes up more space on disk than earlier releases.

My first reaction to your query was "Get a hard-disk drive." With a hard disk you can put as many typefaces into the System/Fonts folder as your GS' memory will allow. But having access to more fonts is hardly reason enough to purchase a hard disk.

You could create several copies of the AWGS system disk, each containing selected fonts for specific purposes. Well, naaa.

You might try deleting some files from the AppleWorks system disk (a backup, of course) to make room for more fonts. (See "Version 5 Woes" in the April 1990 Apple Clinic, p. 24, for a discussion of how to select the particular GS/OS version 5.0.2 files you should trash.) But I've got a feeling you want access to many more fonts than even the barest system disk will allow.

Your best bet is to obtain a copy of Mega Systems' new desk accessory LoadFont. LoadFont is shareware ($15), available for download from bulletin-board systems everywhere. I found version 1.2 on America Online under the name DUTCH.NDAS.SHK. (You'll also need a copy of ShrinkIt to separate and decompress the downloaded file's contents, including the documentation.)

Produced by A.W. van Santen (W.V. Abukoudeplein 5, 3515 BW Utrecht, Netherlands), LoadFont works well with AWGS and a variety of other GS desktop applications: It lets you select and load fonts from virtually any folder on any "mounted" disk, not just from the boot System/Fonts folder.

Simply put LoadFont into the System /Desk.Accs folder of your system boot disk and, after restarting your GS with that disk, access the Load a Font *option from the list of NDAs in the Apple menu on the main menu bar. (*Load a Font *doesn't let you load fonts with the Finder because the Finder hasn't activated the Font Manager toolset; the program explains this to you instead of crashing your system, as do other, less-well-engineered NDAs.)*

Now select the drive and folder where your choicest fonts are hiding. (It would be nice if future versions of LoadFont were to include options to select more than one font at a time from the same directory and to "purge" fonts so that you could tailor your font needs while saving precious GS RAM.)

Also included with LoadFont is LoadNDA, which lets you load additional accessories from sources other than the System/Desk.Accs folder on your system disk.

Where can you find more AWGS-compatible fonts? Just about everywhere — any GS-compatible font is AWGS-compatible. You can download GS font libraries from a number of bulletin-board systems, or purchase them through a variety of software publishers, including Claris Corporation. Check with your Apple dealer or a local Apple II user group. (In addition, see "Face to Face," March 1990, p. 61, for a discussion of font editors.)

Why Enhance?

I HAVE AN APPLE IIE THAT HAS seen only moderate use since I purchased it in1984. Recently, my children have prompted me to get more serious about the computer. I've heard that I'm way behind the times, though; the IIe has since been "enhanced." What does enhancing the Apple IIe entail and do I really need to do that?

Owen C. Mart
Gaeta, Italy

Enhancing is simple, but may be unnecessary. Most IIe programs, especially most educational packages, work fine on older IIe systems. Find out whether you'll need programs that require an enhanced IIe before you incur the expense.

The IIe enhancement kit consists of several new ROMs (read-only memory chips) and an updated microprocessor. You can purchase the kit through several mail-order houses (check the advertisers in this issue) or from a local dealer.

Your dealer can also install the chip set, or you can do it yourself; the kit should include instructions.

Installation simply entails prying the old ROMs and the microprocessor from their sockets on the IIe motherboard and plugging in the new ones.

Apple's suggested retail price for the kit with installation is $70.

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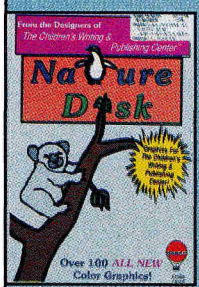

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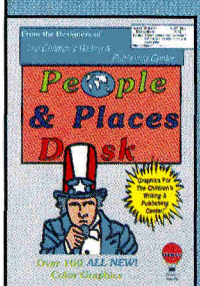

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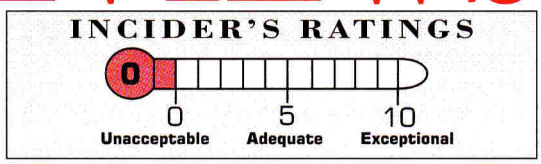

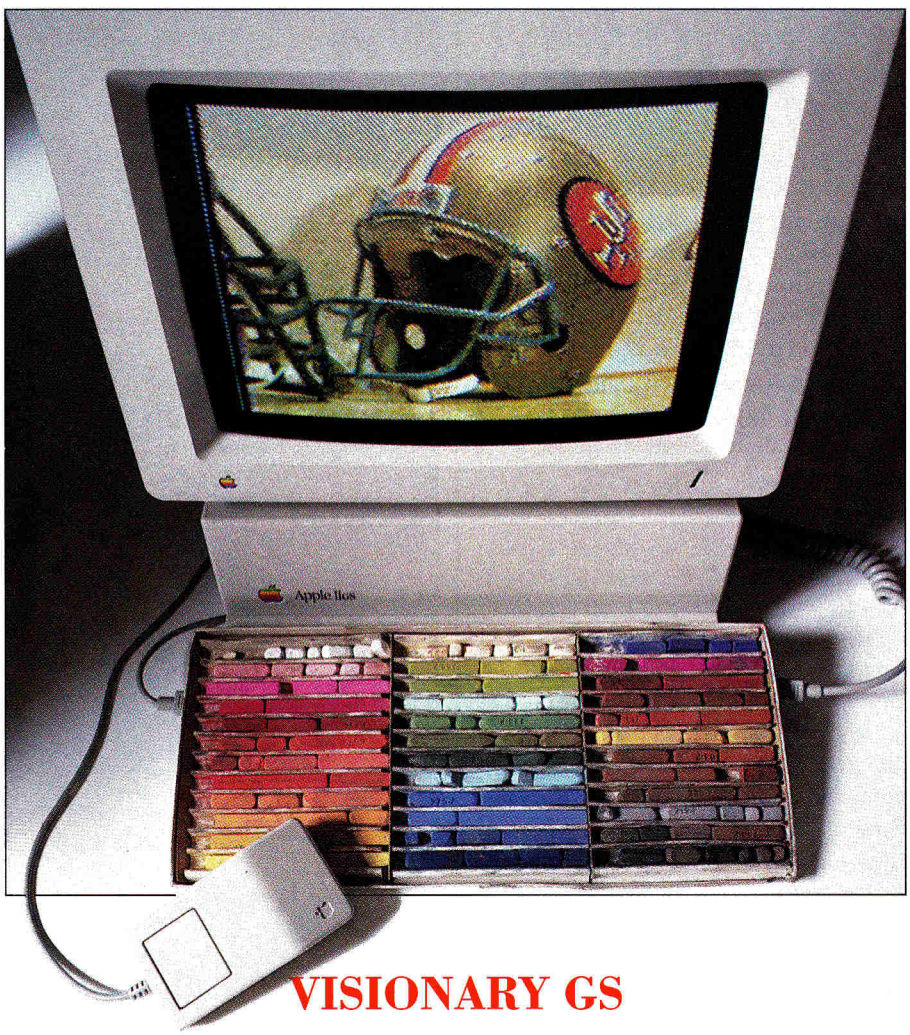

VISIONARY GS

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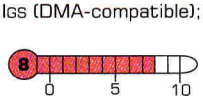

Just as the phoenix dies and comes back to life, the old AST VisionPlus video digitizer has been resurrected as the Visionary GS card. Although VisionPlus didn't exactly throw itself on a burning pyre, AST sent it to an early grave because it was fraught with problems. Since then, a new company called Virtual Realities has been breathing life back into the product. The company acquired the technology from AST and rewrote the software — and now Visionary GS is flying high.

To make Visionary GS a success, Virtual Realities had to overcome a few problems: The VisionPlus card crashed constantly during the digitization process, and any loss or spike in the video signal locked up the software and forced you to reboot. Also, with the old card you couldn't fast forward, pause, or even turn off your VCR while you were digitizing — if you did, the software would crash. But from these ashes has arisen Visionary GS.

OUT WITH THE OLD

The most impressive feature of this digitization card is its speed. In fact, the Visionary GS board is so fast you can almost watch your video on the monitor as you digitize. While other video hardware needs about ten seconds to capture an image, the Visionary GS card can input black-and-white images instantly because it captures a picture of a moving object while the videotape runs. With other products, such as Digital Vision's ComputerEyes card, you must pause the tape, then capture the image. And, because you capture images with the Visionary GS card while the videotape runs, images are clear. Not all VCR pause modes hold images perfectly still, and the resulting images with other digitization cards are blurry.

Although the Visionary GS card captures color images a bit more slowly than black-and-white, its frame-per-second speed is still impressive. (Color capture is a more complex process.) When a digitization card captures super-hi-res color pictures from a videotape, it must process the input from the camera or VCR, then determine the colors to use to create the picture on your GS. Unfortunately, color images from the Visionary GS card are fuzzier and less ►

Photography by • Ed Judice

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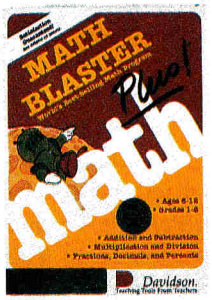

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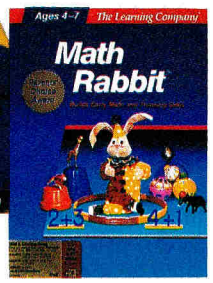

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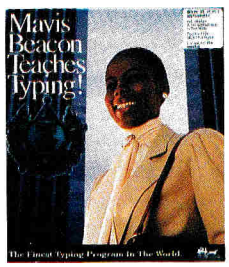

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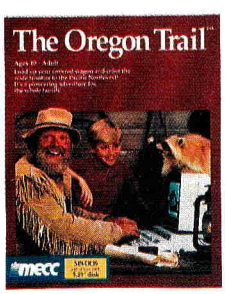

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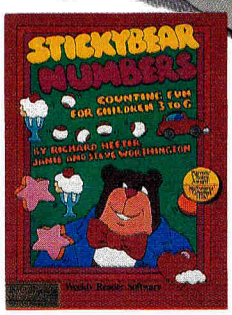

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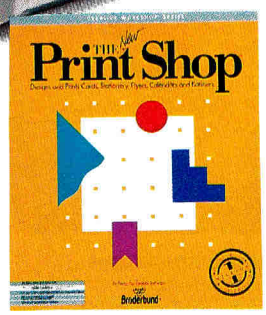

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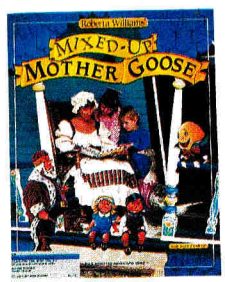

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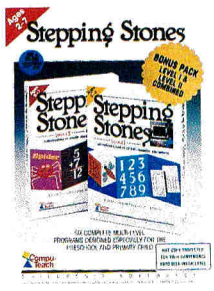

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Then about every four weeks (13 times a year) you'll receive a new Parents Newsletter with details about the next selection for your child. To receive the main selection, you need do nothing — it will be sent automatically.

If you wish to order an alternate selection, or wish no selection at all, simply return the card we provide to tell us your choice. You will always have at least 10 days to decide.

Enjoy a 15-Day Free Trial

What's more, you will always have 15 days to preview each shipment and return any program you don't want. Your only commitment is to purchase three additional selections in the next year at regular club prices. You may cancel your membership anytime after you meet your commitment. You have absolutely nothing to lose, and a whole new world of fun and learning to gain for your children. So don't wait: return the post-paid card today!

Exciting Newsletter...FREE!

Charter members receive the Learning Adventure Computer Club Parents Newsletter FREE. Published every four weeks, the newsletter features a host of recommended software for children 3-13!

701

Learning Adventure™ Computer Club
925 Oak Street, Scranton, PA 18515, Dept. SARA90

detailed than its gray-scale pictures because of the GS' limitations.

In addition, the Visionary GS board is no longer slot-dependent; you can put the card into slot 5 and it won't turn off your 3.5-inch disk drives. You don't have to turn your slot assignment to *Your Card* for the board to work, either, so it's especially handy for people who run their programs from the GS' internal slots.

Visionary GS also returns with improved software. Although only the beta version is currently available, the final version will let you capture colors, color digitize in 640 graphics mode, use on-screen contrast and brightness indicators, and edit in color. Other upgrades will include a new desk accessory to capture images from within any GS program, an "X-command" for HyperStudio to let you digitize from within that program, and a 3200 color utility that will let you digitize and show photograph-quality color on your GS.

PUT IT TO THE TEST

To install the Visionary GS board, simply put it into any slot (even slot 3) and connect the video-input cable to any VCR, camcorder, or laser-disc player. Boot the Visionary GS software and you're ready to capture a picture in monochrome, full color, blue, red, or green.

If you're using a VCR or laser-disc player, press *play*, then select the form of digitization — you'll see your video on your monitor. If you digitize directly from a camcorder, just turn on the power, point the camera at your subject, and select color or monochrome. Although the Visionary GS card captures images from any video source, it renders best results from a still image.

As the PerfectView program digitizes an image, you can change the brightness and the contrast by pressing the GS' left- and right- or up- and down-arrow keys. Although it's easy and effective to alter your image without stopping the capturing process, with the beta release it's difficult to determine the level of brightness or contrast because the company didn't include an on-screen indicator. Be aware that this problem may exist in the software's latest release.

To achieve the best results with the Visionary GS card, your subject must be well lit so that the software can achieve accurate color in the captured images, and less distortion in graphics. (This tip applies mainly to users capturing images directly from video cameras.) Using this product in conjunction with the TransWarp GS card from Applied Engineering is another way to increase its power; you'll double the speed of the screen redraw, and allow the product to digitize more quickly and produce cleaner pictures.

Once you have your images, save and use them in programs such as Paintworks Gold, DeluxePaint II, AppleWorks GS (640 mode), and HyperStudio. You could even put digitized pictures into a HyperStudio stack to increase the visual impact. Capture a picture of each student in a class, for example, and make a biographical stack for a school. Or, for a class project or work presentation, you could digitize pictures and put them into a self-running slide show. Have some fun by capturing a picture of a famous football player and one of yourself, then cutting out your face and placing it on the body of the quarterback.

Sample Visionary output.

DETAILS

Get started on your digitizing adventure with the new Visionary GS card — the price includes the PerfectView program, the Visionary GS board, and RCA cabling. If you already have the AST VisionPlus card, Virtual Realities will provide you with the upgraded hardware and software for $149; you'll receive the PerfectView program and a new Visionary GS board in exchange for your old VisionPlus card. And for no extra charge Virtual Realities will send software upgrades for the board to all registered owners.

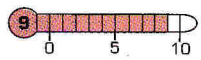
The phoenix has risen from the ashes and it looks as though it'll take off. And just as you can count on the Visionary GS card to deliver impressive images to your GS screen, you can look forward to more innovative products from Virtual Realities.

Jeff Cable
Los Gatos, CA

HYPERSCREEN

Scholastic Software, Inc.,
730 Broadway, New York, NY 10003,
(212) 505-3000, (800) 541-5513

Interactive multimedia program; 128K Apple II; no copy protection; $99.95



Although the term "multimedia" has been around the communications industry for years, it's the current buzzword in the computer industry today. While blue-suited business types have long been cashing in on the appeal of interactive presentations, now educators can spark their students' interests with lessons complete with sound, text, and graphics. All you need is a modestly equipped 128K Apple II and a new program called HyperScreen.

With HyperScreen you can organize, link, and display information. It's similar to HyperCard for the Macintosh and HyperStudio for the Apple IIGS in that it's an authoring tool that stores and uses text, graphics, charts, sounds, and video. The design of all three programs is also similar: Program files are called stacks; you browse through them by clicking on buttons with a hand-shaped cursor; and these buttons direct the software to perform programmed actions. HyperScreen's main menu also resides on the Home Screen, to which you can return by clicking on the house icon.

In many ways, HyperScreen also resembles Slide Shop and Super Story Tree, Scholastic's other multimedia programs. Because each one is an open-ended application, you can use the program's special drawing tools, graphics elements, and sound effects to design the stacks with a variety of special effects. As you move from one card to the next, your screen can "dissolve," "wipe," "fade," and "flicker." All three programs can even share sound and music clips, graphics backgrounds, clip art, fonts, borders, and templates.

HyperScreen is available on either 3.5- or 5.25-inch disks. While the 3.5-inch version comes on one disk and includes the program, sample stacks, setup utilities, graphics, fonts, and sounds, the 5.25-inch version comes on three separate disks. (The 3.5-inch edition minimizes disk swapping and reduces desk clutter — two advantages any computer-using educator appreciates. If you add a second 3.5-inch disk drive or copy HyperScreen to a hard disk, you eliminate disk swapping entirely.)

Scholastic deserves praise for selling HyperScreen without copy protection; you can make one backup for archival purposes. If you need multiple copies for classroom use, get Scholastic's Lab Pack, which includes extra disks.

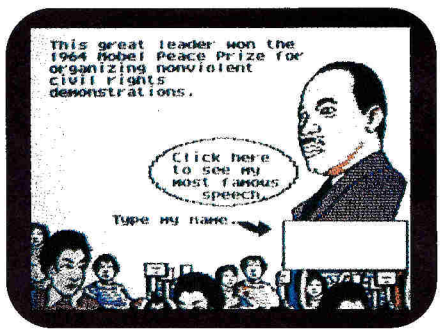
Before you start designing stacks with HyperScreen, you need to prepare some data disks on which to store and display them. You can save your stacks on any ProDOS data disk, but you have more room for graphics-intensive stacks if you use 3.5-inch disks. You can also save customized stacks on specially formatted, self-booting 3.5-inch or 5.25-inch floppies. Because these stacks run without HyperScreen, teachers can prepare multiple copies of a lesson so that students can work on several computers simultaneously, or they can take their assignments home.

Learning your way around HyperScreen isn't difficult. On-line help is always available, and with pull-down menus, dialog boxes, and buttons, you can prepare a variety of interactive presentations without memorizing complex programming commands. Even though you'll find that working with HyperScreen's interface is intuitive, be prepared to experiment with its features before you complete a polished stack. You should also take a look at the sample stacks for ideas.

Although you can manipulate HyperScreen with a mouse, keyboard, joystick, or graphics tablet, you'll probably find that the mouse is the easiest to use. (When you use the arrow keys, for example, the on-screen pointer moves rather slowly.) Because a mouse isn't exactly standard equipment on 8-bit Apple IIs, however, HyperScreen should incorporate some keyboard command equivalents for File and Edit menu options such as *New Stack*, *Save*, *Cut*, *Copy*, and *Paste*.

HyperScreen lets you present information on text or graphics screens. Text screens take up less disk space, but they contain only text. To spice them up you can choose a font from one of eight types, and place characters within a variety of borders. You can't mix fonts on a single text screen, but you can choose from 80 colors to highlight text and borders.

Graphics screens can include borders, multiple fonts, digitized images, full-screen background illustrations, clip art, or line art, which you draw with HyperScreen's graphics tools — and they consume a lot of disk space. Most authors create their stacks with a combination of both types of screens. (You can use a maximum of 175 screens.) Once you create your screens, you can use one of HyperScreen's 15 screen transitions, including dissolves, flickers, fades, and wipes, and present them with a professional touch.



Interactive multimedia in 128K.

With HyperStudio you can use up to 15 buttons per screen to link screens within stacks, or to link screens in related stacks. If you connect a screen to another stack with these buttons, you conveniently circumvent the limit of 175 screens per stack.

Text buttons display text within a window, whereas sound buttons play music, speech, or special sound effects. (You're limited to one sound button per screen.) A *Text Entry* button calls up a box that directs you to type a response. Multibutton buttons have "macro-like" capabilities: You can program them to initiate a series of actions with only one click.

If you have an Apple II Video Overlay Card and a Pioneer LD-V4200 videodisc player, you can program special video control buttons to link screens to real-time images taken from a videodisc. The Overlay Card lets you display frames on the computer monitor and combine HyperScreen graphics with video images.

While a Video Overlay Card and a videodisc player aren't necessary to fashion high-powered, attention-grabbing presentations, they enliven any HyperScreen production and make it a true multimedia event. HyperScreen's Disc Explorer stack offers tape recorder-like control buttons, so that you can navigate throughout a videodisc, preview its frames, and select the ones you want to incorporate.

HyperScreen's considerable educational value is a direct result of its "nonlinear" interface: Students become participants in their own education as they click on topics of interest, explore new ideas, review difficult concepts, and branch to other stacks. Kids learn because they pursue knowledge.

If your students are bored with those filmstrips and slide shows, let HyperScreen introduce them to one of the hottest developments in computer technology. With a parade of sounds, graphics, and action-packed productions, the world of multimedia can entrance your classroom. Design those interactive lessons — you don't need a Mac HyperCard after all.

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

USA GEOGRAPH

MECC,
3490 Lexington Avenue North, St. Paul, MN 55126-8097, (612) 481-3500

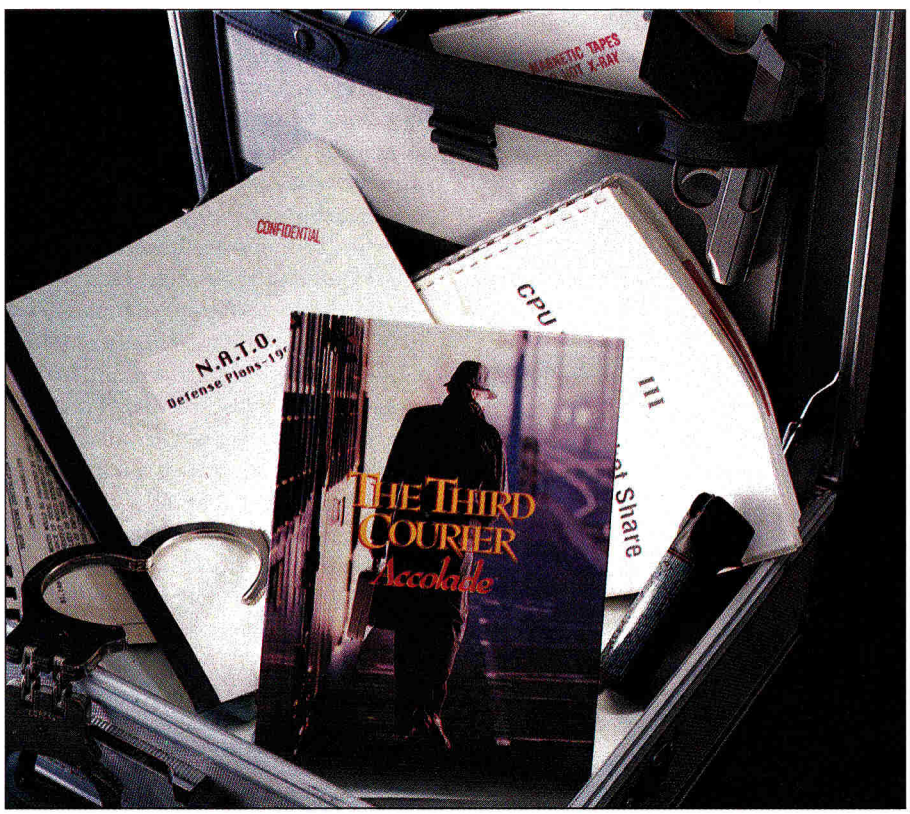
Geography-education program; 768K Apple IIGS, two 3.5-inch disk drives recommended; copy protection;$139; $19, Classroom Guide and manual only

If you don't know the difference between Washington, D.C., and Washington state — or if Iowa makes you think of potatoes instead of corn and soybeans — USA GeoGraph is the program for you. Following on the heels of World GeoGraph, USA GeoGraph is packed with facts and figures on our 50 states and six territories — American Samoa, the District of Columbia, Guam, Northern Marianas, Puerto Rico, and the Virgin Islands.

With USA GeoGraph's interactive maps, students can target specific information with several data cards, and zoom between ►

Continued on p. 82

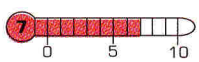
GAME ROOM



THE THIRD COURIER

Accolade,
550 South Winchester Boulevard, Suite 200, San Jose, CA 95128, (408) 985-1700

Adventure; 768K Apple IIGS; off-disk copy protection; $49.95



The Berlin Wall may be a thing of the past, and democracy and free trade may be pouring into Eastern Europe, but that doesn't mean there isn't any more cloak-and-dagger stuff going on. The countries that make up the "border" between East and West have always been a hotbed of covert activity. It's certainly a popular setting for movies and novels — and now we have computer games, too.

In a plot reminiscent of a Ludlum or Forsyth novel, you're charged with finding a courier who has murdered his two associates, stolen their portions of NATO's defense plan, and is heading for Moscow with the complete document.

Before you begin as CIA operative Moondancer, you'll have to select your cover identity. You'll indicate where you've spent most of your life, your occupation, your favorite leisure activities, and your age. That will determine your personality and character traits. If one identity isn't enough to accomplish your purposes, you can establish as many as four.

You start off as a sleuth, but as you gain experience points, you'll advance through the ranks as agent, resident agent, spy, and master spy. All commands in The Third Courier are fairly standard for adventure games. You travel about heading north, south, east, or west, for instance; when you encounter people, you chat with them, run away, fight, or threaten them.

If you want to find the third courier, by the way, you're going to have to talk to everybody. You can never tell who might know something — if you can get it out of him (or her). Sometimes you'll have to bribe, sometimes you'll have to bully, and sometimes you'll just have to wheedle. You'll have to rely on your perception and the sensitivity of what you're trying to find out to choose your tactic.

Spying for The Company in old Berlin.

The level of complexity and detail is the game's strongest point. Between the dossiers you create for yourself and the

Photography by ✻ Ed Judice

manner in which you track down that elusive third courier, it really feels as if you're living out a spy novel. All that detail leads to some fairly slow game play — but if you're patient, the reward will be worth the journey.

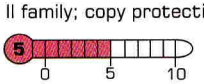
If you're like me, you're going to need all the help you can get to save the free world from having its defense plans plastered all over Red Square. Fortunately, as many adventure and fantasy role-playing game developers are doing these days, Accolade has produced a hint manual, *The Official Third Courier Code Book*, for $9.95. Is the guide just a way for the company to make an extra buck? If you've ever tried to plow your way through an adventure game without one — and The Third Courier is no exception in this genre — you know it's worth it.

Lafe Low
inCider staff

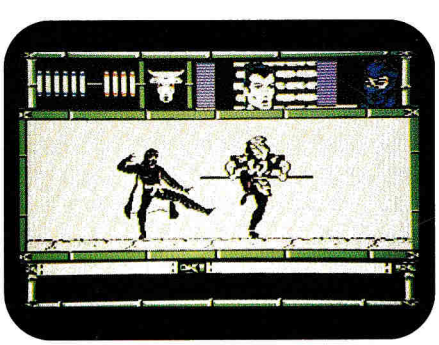
WINDWALKER

Origin Systems,
P.O. Box 161750, Austin, TX 78716,
(512) 328-0282

Action adventure;
128K Apple II family; copy protection; $39.95



Windwalker weaves such a compelling tale that it rates among the brightest lights in the Apple II entertainment business. Yet the shadow of evil lurks around every corner, threatening to usurp the soul of the first reckless adventurer.



The might and magic of the Orient.

The full mystery, magic, might, and sexuality of the Orient are beautifully rendered in Windwalker, the sequel to the popular action-adventure game Moebius. It uses predictable IIe graphics and typical IIe sound, but research is its real selling point. The author, Greg Malone, took years to craft this game, which is a mix of martial-arts action, Oriental mysticism, and role-playing adventure.

You start as a fisherman in the land of Khantun, where Zhurong has overthrown the revered Chao Ti (in a fashion curiously resembling Tiananmen Square). Zhurong has lowered the veil of evil and kidnapped the Ivory Princess. "The princess, once heiress to a continent," explains the documentation, "now inherits only sorrow as Zhurong's slave." Anyway, you get the idea: Live right, gain skills, sacrifice to the gods, save the day, and get the girl. Throw in a little magic, too. I said it was well done — not that it was all that original.

Windwalker is nicely paced and attractively animated. You'll explore Khantun and talk with various residents, who react differently as your knowledge grows. You can sail the seas and battle ocean monsters, but make sure that's really what they are or your karma will suffer.

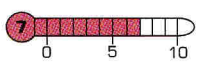
Windwalker wants you to sit down for the weekend or for several weekends and play. If you have the time, you'll have a blast.

Joe Abernathy
Houston, TX

KEEF THE THIEF

Electronic Arts,
1820 Gateway Drive, San Mateo, CA 94404,
(415) 571-7171

Graphics-based fantasy adventure;
512K Apple IIgs; off-disk copy protection;
$39.95



If Keef were operating in the 1990s, he'd certainly fit the definition of a "nasty boy." Keef's an antihero in a genre that celebrates the good guys. Keef is a troublemaker, Keef is a nuisance, Keef is a thief.

Cast out by the elders of the "nobler" professions, Keef must make his way through beast-ridden jungles and dangerous cities. Whether depicting the uninhabited wilds or the hazards of civilization, Keef the Thief exhibits some of the most detailed and artistic graphics screens in entertainment software today, while conveying a strong sense of the game's theme.

That's good, because pictures are essential here. They contain clues: You must observe your environment, examine objects, talk to people, and fight off monsters. You can play almost the entire game via mouse-activated, intuitive icons. Clicking on the mouth, for instance, lets Keef communicate with the people he encounters. All other actions, including movement, are accomplished in a similar fashion. Text descriptions are well written and in sync with the fantasy theme.

Two flaws keep Keef the Thief from being a top-notch game. The first is minor and for experienced gamers probably nonexistent: The puzzles are difficult. While no one would enjoy a game with no bite, some of the logic surrounding the correct responses in Keef the Thief seems more circuitous than usual and proves frustrating instead of challenging. Still, gamers who thrive on this type of stimulation may find the puzzles intriguing.

The other problem is one all players are going to encounter, regardless of your adventure-gaming experience: Combat is virtually impossible to win, at least in the early stages of the game.

It isn't so much the mechanics of combat, because once again, it's simply point and click. It's just that Keef, being a thief, isn't much of a fighter. On the other hand, the monsters are tough from the word go. That combination usually results in death for Keef and starting the game over for you. There are just too many times when you can't use thieving skills to avoid a fight.

Keef the Thief has a number of pluses. It's fun to play a character who can't destroy the opposition with a lightning bolt, a spell, or the swing of a magic sword. Likewise, the puns throughout the game are guaranteed to bring a smile to your face. And, of course, the graphics screens

Don't fight — outwit your enemies.

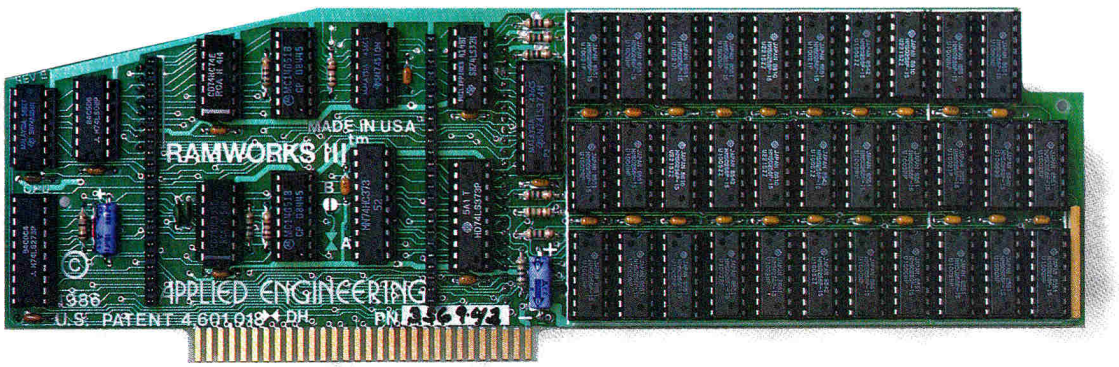
are absolutely top of the line.

Until you find a way to win in combat, however, Keef the Thief will have a tough time "stealing" his way back into society's good graces. □

Jim Trunzo
Leechburg, PA

RamWorks® III

Patented Performance from the Recognized Leader



The Best Selling, Most Compatible, Most Recommended, Most Expandable Card Available.

The AppleWorks Amplifier.

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

RamWorks eliminates AppleWorks' internal memory limits, increasing the maximum number of records available from 1,350 to over 22,000. *Only* RamWorks increases the number of lines permitted in the word processing mode from 2,250 to over 22,000. *Only* RamWorks expands the maximum clipboard limit from 250 to 2,042 lines. And *only* RamWorks offers a built-in printer buffer, so you won't have to wait for your printer to stop before returning to AppleWorks. And auto segments large files so they can be saved on two or more disks. You can even have Pinpoint or MacroWorks and your favorite spelling checker in RAM for instant response.

RamWorks, nothing comes close to enhancing AppleWorks so much.

The Most Friendly, Most Compatible Card Available.

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

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

Highest Memory Expansion.

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

It Even Corrects Mistakes.

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

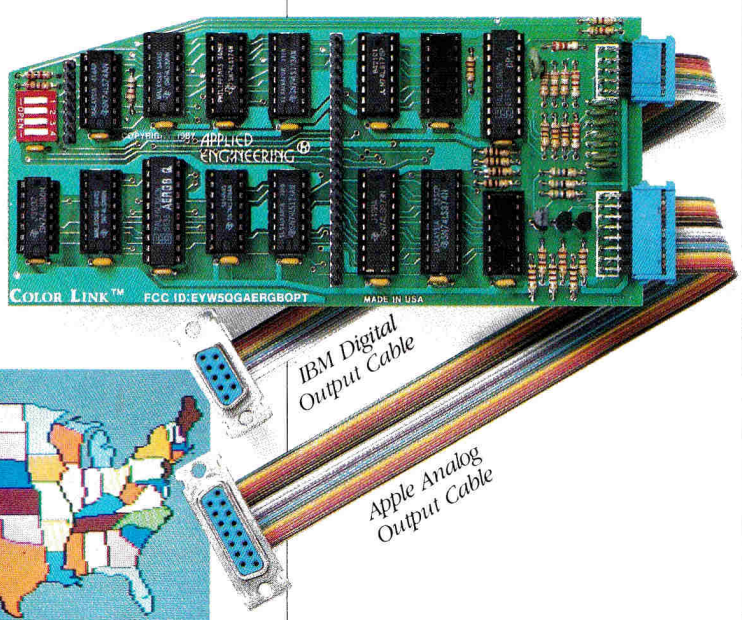
The Ultimate in RGB Color.

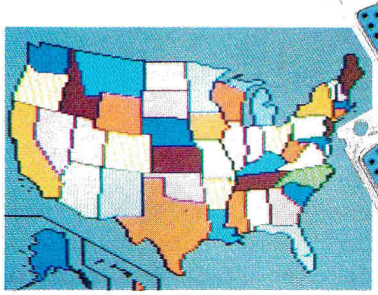
RGB color is an option on RamWorks and with good reason. Some others combine RGB color output with their memory cards, but that's unfair for those who don't need RGB *and* for those that do. Because if you don't need RGB Applied Engineering doesn't make you buy it, but if you want RGB output you're in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

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

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

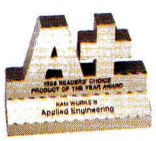
ColorLink™ RGB Option





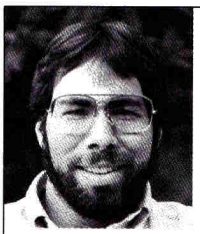
True 65C816 16 Bit Power.

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



Endorsed by the Experts.

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



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

Steve Wozniak, the creator of Apple Computer

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

Quality and Support of the Industry Leader.

RamWorks III is from Applied Engineering, the largest, most well supported manufacturer of Apple peripherals and the inventor of large RAM cards for the Apple. With our 5 year warranty and outstanding technical support, you're assured of the most trouble free product you can buy.

It's Got It All.

- 15 day money back guarantee
- 5 year warranty
- Built-in super sharp 80 column display (U.S. Patent #4601018)
- Expandable to 1 MEG on main card
- Expansion connector for possible future expansion to 16 MEG
- Can use 64K or 256K RAMs
- Powerful linear addressing 16 bit coprocessor port
- Automatic AppleWorks expansion up to 3017K desktop
- Accelerates AppleWorks
- Built-in AppleWorks printer buffer
- 100% compatible with all standard IIe software
- RamDrive™ and ProDrive™ the ultimate emulation software included free
- Memory is easily partitioned allowing many programs in memory at once
- Compatible RGB option featuring ultra high resolution color graphics and multiple text colors with cables for both the new Apple and standard IBM type monitors
- Self diagnostics software included
- Lowest power consumption (U.S. Patent #4601018)
- Takes only one slot (auxiliary) even when fully expanded
- Socketed and user upgradeable
- Software industry standard
- Advanced Computer Aided Design
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YOU ARE THERE

Apple II simulation software takes you across time and space to discover new worlds of fun and learning.

ASK SOMEONE ABOUT SOFTWARE, AND YOU'RE likely to hear him or her rattle off phrases such as *word processing*, *database management*, *spreadsheet*, *desktop publishing*, and *games*. Ask teachers what software they use in the classroom and you'll probably hear the words *drill and practice* and *curriculum-based* so often your head will spin.

While there's no denying the benefits of both productivity programs and traditional classroom applications, there are other ways to take advantage of Apple IIs at home and in school. The field of Apple II software is rich in *simulation* programs — role-play software, thinking-skills applications, learning games, and computer-aided design (CAD) packages — that let students of all ages cross the boundary between learning and entertainment.

WORK AND PLAY

Some simulations are already widely known in the game market — programs such as Seven Cities of Gold (Electronic Arts), The Ancient Art of War at Sea (Broderbund), Balance of Power (Mindscape), and Zork II (Infocom). A number of others are classified as educational software; originally marketed for classroom use, these programs offer fun and learning at home, too. Although they often contain elements inherent in games, they also promote basic concepts and, among adult-level programs, the development of a common vocabulary within an organization. Consequently, simulations of all types, including the genre we call learning games, tend to pay greater attention to accuracy of detail and to offer more quantifiable results than straight entertainment programs. If kids (or adults) learn from adventure, fantasy, arcade, or sports games, it's more by accident than design.

Defining a goal is equally important in role-play simulations. Although they vary in particulars — covering a wide range of situations, including history, business, and navigational skills — the thread that connects them is one shared objective: to re-create a particular environment as accurately as possible for the purpose of testing ideas and predicting results. In industrial and military training, for instance, flight simulators challenge novice and experienced pilots alike, while at the same time allowing a large ►

By KELLY RIVERS and MICHAEL C. PERKINS

Illustration ✻ Istvan Banyai

OREGON TRAIL

margin of error and the opportunity to make mistakes without dire consequences.

Thinking-skills programs contain elements characteristic of both role-play simulations and games: They re-create environments that provide measurable results — clearly demonstrating whether a puzzle or problem has been solved, for example — but there's room for experimentation without violating the structure of the program's environment. Computer-aided-design (CAD) programs are also similar to role-play simulations, but differ in that they concentrate on the development of a particular product (a home, a car, or an airplane, for example) rather than trial-and-error experimentation as a learning device in itself.

The fight for survival along the Oregon Trail.

Taken as a group, simulations entice children to investigate new subjects and new ways of thinking, inspiring lifelong involvement in computer-assisted learning and attracting them to specific occupations, such as engineering and business. Simulations encourage children to solve problems, organize information, make deductions, and learn from mistakes. Traditional approaches to education — textbooks, lectures, and so on — simply can't offer the visual interaction of the Apple II. Let's take a look at some of the programs that have become classics in the field.

MAKING HISTORY

Role-play simulation software lets children fantasize in a variety of settings — they can be pioneers, businesspeople, detectives, or space travelers for an hour or for a day. One enduring title in this genre is **Oregon Trail** (MECC Software), patterned closely after Francis Parkman's classic book of the same name. Year after year, new "generations" of children continue to find the program engaging and instructive: In the role of American pioneers in the year 1848, they get to act out this exciting time in our country's history rather than simply memorize facts about it.

As students begin preparing for their trek to the Northwest, for example, the first stop is a dry-goods store in Independence, Missouri, to purchase oxen, food, clothing, ammunition, and spare parts. Along the way to Oregon, this hardy band must cross rivers, fight disease, hunt for game, survive harsh weather, and try to stay on the trail. The program awards points based on the number of people in the party who survive the journey, the state of their health, and the condition of their supplies. The simulation's attention to detail makes history come alive and challenges students to improve their scores each time they make the journey.

David Ellison, an English and history instructor at Barnard-White Middle School (grades 5 through 8) in Union City, California, swears by Oregon Trail. To enhance his students' involvement in the American history they're learning, he asks them to keep a diary and write a paper about their simulated experiences as they make their way west on screen.

"Before using programs such as Oregon Trail I used to be very anti-computer," Ellison notes. "Now I'm very pro-computer because of the way a simulation can make an otherwise remote subject such as the pioneer experience in American history come to life."

DOWN TO BUSINESS

One equally valuable role-play program with a modern-day slant is **The Marketplace** (MECC Software). At first glance, this business simulation might not seem engaging to young minds; continuous use in a wide range of school environments over many years has proved otherwise, however. Once known simply as The Lemonade Stand, The Marketplace lets children operate three kinds of businesses: selling apples, tomato plants, and lemonade. In these classic minibusiness formats, children are introduced to a number of useful terms and concepts, including pricing, overhead, advertising, income, profit, and business planning. Children also work with spreadsheets, bar graphs, and reports as they analyze the results of their efforts.

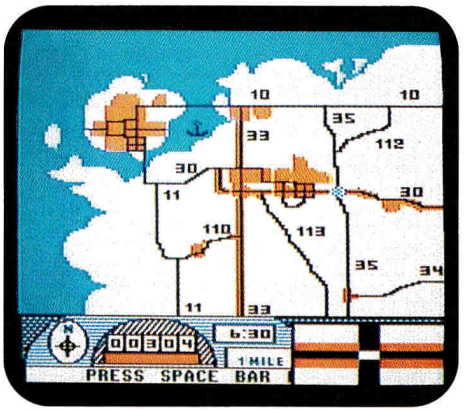
Basic business principles in The Marketplace.

Each level of The Marketplace focuses on a special aspect of business. The goal of the apple stand, for example, is to maximize profits by determining an optimum price and watching the way pricing affects market expectations. The tomato-plant shop focuses on advertising; prices remain fixed to let children concentrate on promoting their products. Here the emphasis is on attaining the optimum level of advertising (getting the word out) — but only within budget.

The lemonade booth brings these elements (pricing, advertising, and overhead) together and combines them with other, more random factors, such as weather conditions. In operating one or more lemonade stands children continue to deal with spreadsheets, business reports, and bar graphs, initially keying in relevant data and analyzing the results. Once they've mastered data entry (usually in a matter of minutes), kids are on their way to learning the value of the computer as an instrument of calculation and

feedback, even as the simulation teaches them some of the rudiments of business.

Teachers appreciate The Marketplace's ability to bring abstract ideas, such as pricing and overhead, to life. Jim McLeod, a teacher at Addison School in Palo Alto, California, comments, "In addition to using The Marketplace to teach business concepts, I also liked the fact that the program has served as an opportunity for applied math, where students are doing calculations that have some demonstrable practical result that goes beyond the usual word problems or busy-work drills found in the typical math textbook."



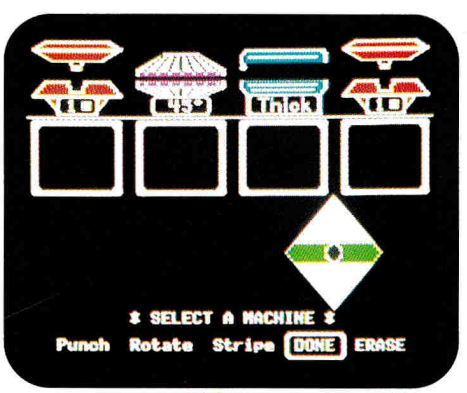
Finding your way around town with Map Skills.

GETTING AROUND

Another type of role-play simulation specializes in teaching kids how to follow instructions and directions. Two prominent representatives here are **Map Skills** (Optimum Resources) and **Jenny's Journeys** (MECC).

Of the two, Map Skills is more appropriate for younger children (ages 7 to 9). At the outset, the program gives students a set of instructions and a simulated bird's-eye-view map. Following a vehicle through a number of streets and byways, all the while observing the points of the compass, children are challenged to reach their destination by the shortest route possible. Upon completion, the program registers the child's score, based on time elapsed compared to optimum time the program allows for a given trip. As children achieve success on one level, the software presents more complex travel projects .

Jenny's Journeys (ages 10 and up) puts the child behind the wheel of a simulated car. As with Map Skills, the driver must record instructions and operate within time limits. Maps and visuals help children recognize key inter-sections and landmarks. After mastering the beginner level with on-line help, children can move on to more difficult levels involving more extensive trips and surprise challenges such as detours.



Sequences of mechanical operations in The Factory.

As do other simulation environments, Map Skills and Jenny's Journeys challenge kids to be organized, to remain alert, and to learn from mistakes.

IT'S ELEMENTARY

Simulations excel at encouraging kids to think critically and deductively. Two programs that help students develop logic and thinking skills are **The Factory** (Wings for Learning) and **Think Quick!** (The Learning Company).

The Factory places children in a simulated industrial environment where they use various machine processes to create a number of products. The program focuses on three main production techniques: punching, striping, and rotating; within these options, children must duplicate the product the program presents. Sequencing, calculation of angles, estimation, and trial and error all come into play. For those who master this program, two others are available — **Gears** (Sunburst) and **Super Factory** (Wings).

Think Quick! presents a much different environment. Taking on the role of knight-errant, children travel through three levels of Mystikar Castle as they solve various puzzles, mazes, and other predicaments on their way to becoming "experts." Getting through three more levels earns the title of "grand master." In the course of the quest, students must follow shape clues, open doors in sequence, evade "slimy worms," construct a passage-finder map, recognize patterns, and save important objects. Think Quick! also teaches children how to follow instructions, gather relevant information, categorize, visualize, observe, note cause and effect, prioritize, strategize, solve problems, and make quick decisions — all in game format.

Tom Sarnicola, computer coordinator at St. Emydius School in San Francisco, California, has a special affection for problem-solving programs. "While the results are not as clearly measurable as a straight [role-play] simulation's or as emotional as a game's," he explains, "I still like to watch my students go to work solving the problems that confront them through these thinking-skills programs. I feel they're using a part of their brain that might not otherwise be called into play by traditional curricula."

LEARNING IS FUN, TOO

With national attention focused recently on the underachievement of American children on geography tests, Broderbund's Carmen Sandiego line of learning games should be a welcome addition to every Apple II user's software library. Currently, four titles are available: **Where in the World Is Carmen Sandiego?**, **Where in the USA Is Carmen Sandiego?**, **Where in Europe Is Carmen Sandiego?**, and **Where in Time Is Carmen Sandiego?**

In these programs, children work (and play) with geographical and historical information while assuming the role of a detective assigned to track down members of Carmen Sandiego's gang of thieves. To stay hot on ►

Carmen's (and her gang's) heels, children must consult maps, almanacs, atlases, and on-line databases as they collect clues about currency, flags, exports, topography, local customs, and history. Children must also collect information about the criminal (hair color, features, hobbies, and so on) and enter it into the "crime database" to obtain a warrant for arrest.

These learning-game simulations present geography and history in an imaginative context, rather than simply as dry facts to memorize before being thrown into the mental dustbin. In addition, the Carmen simulations help teach children to collect data accurately, use databases effectively, make deductions, and find their way around menu-driven computer formats.

Staying hot on the trail of Carmen Sandiego.

Kim Ford, computer coordinator for grades 4 through 8 at Carden El Encanto School in Santa Clara, California, is one of thousands of teachers who have found the Carmen series fun, stimulating, and educational — and about the most popular programs among students, as well. "The Carmen programs really can't be said to teach geography or history in the way a textbook or lecture traditionally does, conveying certain

A SIMULATION SAMPLER

The products described in "You Are There" represent only a small number of simulation programs available for the Apple II. Because the category is defined so broadly, a complete listing of products isn't possible. What follows is a list of some of inCider's favorite packages in this genre:

Revolution '76

Britannica Software
345 Fourth St.
San Francisco, CA 94107
(800) 572-2272
(415) 546-1866
$49.95

Revolution '76 is designed to simulate all aspects of the American Revolution, challenging your military, economic, and diplomatic savvy as you lead the rebellion in the wake of the Boston Tea Party. With brilliant graphics and sound, the game takes full advantage of the GS' capabilities. In addition to challenge and entertainment, it offers new insight into the birth of our country.

Gold Rush

Sierra On-Line
P.O. Box 485
Coarsegold, CA 93614
(800) 326-6654
(209) 683 6858
$39.95.

Joining the '49ers, you pack up and leave your Brooklyn home in search of the fortune that lies out West.

Gold Rush is historically and geographically accurate to the places and events of the period. You can choose from three modes of transportation to the gold country:

1. You can take a ship from New York and sail through the Gulf Stream to Panama, then proceed on a trek through the jungles of Central America, as you try to avoid quicksand, poisonous snakes, and nasty natives.
2. Travel by stagecoach, canal boat, steamer, and wagon train across the country's heartland, as you deal with Indians, thieves, and treacherous climes.
3. Take a long and dangerous voyage from New York down to the tip of Cape Horn, and up to California, as you face scurvy, starvation, and the perils of the sea.

Immigrant: The Irish Experience in Boston

Sunburst Communications
101 Castleton St
Pleasantville, NY 10570-3498
(800) 431-1934
(617) 769-5030
$59.95

Immigrant, which includes classroom activities and an AppleWorks data disk, is investigates the Irish immigration in Boston from 1840 to 1870.

Activities and reproducible worksheets are centered around the AppleWorks database, spreadsheet, and word processor.

Decisions, Decisions

Tom Snyder Productions
90 Sherman Street
Cambridge, MA 02144-9923
(800) 342-0236
(617) 876-4433
$119/module

In keeping with Tom Snyder's "one-computer classroom" philosophy, Decisions, Decisions simulations are designed to be used on only one machine by the whole class or by small groups of students.

Each simulation encourages students to make determinations relevant to various periods of American history. The five programs in the series are Colonization, Revolutionary War, Immigration, Urbanization, and American History Pack.

Operation: Frog

Scholastic Software
P.O. Box 7502
2931 East McCarty St.
Jefferson City, MO 65102
(800) 541-5513
$79.95

If you remember what it was like to dissect frogs in junior-high biology class, you'll appreciate Scholastic's venerable program Operation Frog.

This bloodless approach lets students dissect the animal on screen, examine its organs, and then put it back together again. The program also offers background information on frog physiology and habitat.

facts (dates and places) and concepts (causes of the American Civil War, for example) that can be tested through multiple-choice or essay exams," she says. "Instead, I think Carmen serves as a fun stimulus to take an interest in geography and history as well as to call into play the knowledge a student already has about these subjects."

Townbuilder: computer-aided city planning.

DESIGN FOR LIVING

In the working world, artists and engineers use computers to design airplanes, clothing, home interiors, landscapes, machine processes, and much more. Familiarizing children with the concept of computer-aided design is excellent preparation for a variety of future applications. Two excellent introductions to CAD are **Stickybear Townbuilder** and **Car Builder**, both from Optimum Resources. Townbuilder is designed for younger children (ages 4 to 7) and promotes development of a range of skills — interpreting map symbols, organizing buildings to scale, and reading a compass, among other things. The main focus of the program is on designing a city.

The program presents a variety of map objects (buildings,

Odell Lake

MECC Software
3490 Lexington Ave. North
St. Paul, MN 55126-8097
(612) 481-3500
$59.95

Students play the roles of different species of fish in a mountain lake. Using a game format, this simulation is designed to teach students about animal interaction and food chains in a realistic and entertaining fastion.

Voyage of the Mimi

Sunburst Communications
101 Castleton St.
Pleasantville, NY 10570-3498
(800) 431-1934
(617) 769-5030

Voyage of the Mimi is a multimedia (books, video, and software) package designed to teach science, social studies, and language.

Four modules are included: Maps and Navigation ($75), Whales and Their Environment ($370), Ecosystems ($75), and Introduction to Computing ($75). Contact Sunburst for complete information.

Audubon Wildlife Adventures: Grizzly Bears

Advanced Ideas Inc.
2902 San Pablo Ave.
Berkeley, CA 94702
(415) 526-9100
$49.95 (IIe/IIc version)
$59.95 (GS version)

Grizzly Bears is the first in a series and teaches many of the priniciples of wildlife management.

The package is divided into four parts: On the Spot with Dr. Potts, introducing the grizzly bear and its characteristics; Bear Encounters, a discussion of the conflicts between people and grizzzlies; Grizzly Bear Mystery, an examination of the conflict between people and bears through a simulated investigation of the killing of a grizzly; and Oil Explorer, the most interactive of the sections, in which you design a road location and plan other construction activities with minimal disruption of the grizzly bear's habitat.

Advanced Ideas also offers Wildlife Adventures for Whales and, soon to be released, Sharks.

The Spy's Adventures Series

Polarware Software
1055 Paramount Parkway
Suite A
Batavia, IL 60510
(800) 323-0884
(312) 232-1984
$17.95 each

The Spy's Adventures Series — in Europe, North America, and South America — is designed to teach geography and history in an entertaining and graphically enriched manner.

In these interactive adventures, the child (or adult) travels around Europe or the Americas in search of the internationally know felon Dr. X. Collect jewels and entice informers to sell information as they learn about landmarks and historical sites; the ultimate goal is to dicipher the word clue to Dr. X's whereabouts.

Ticket Series

Blue Lion Software
90 Sherman St.
Cambridge, MA 02140
(617) 876-2500
$39.95 each

In the same genre as Broderbund's Carmen series and Polarware's Spy's Adventures line, the Ticket programs add a comtempory flavor.

Objectives vary: In Ticket to London, you search for a bowler hat; in Ticket to Paris, you look for a lost cousin; in Ticket to Spain, a family heirloom; and in Ticket to Washington, a famous person.

If your child or student is studying either French or Spanish, the respective Ticket program lets him or her play in the game's native tongue.

Balance of Power

Mindscape
3444 Dundee Road
Northbrook, IL 60062
(312) 480-7667
$49.95

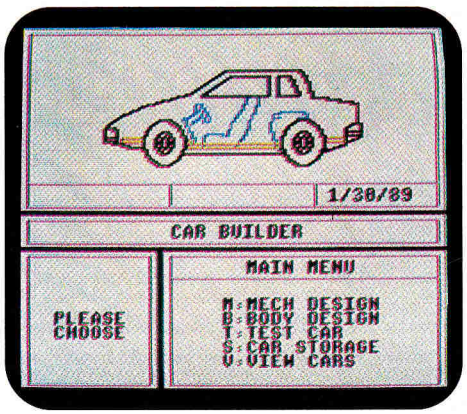
In light of glasnost, Chris Crawford's Balance of Power might not have the social ramifications it did when he orginally wrote it. Still, this simulation is designed to instill in us a crucial understanding of the events that could lead to a nuclear confrontation.

One feature worth noting is the simulation's "multipolar" aspect: Even if the U.S.S.R. and the United States become allies again, Balance of Power brings into the picture other countries that could play a critical role in a nuclear war.

bridges, parks, and so on) from which kids select and organize a town of their own. As they place objects, the software interconnects them automatically by roadways in a grid. Once the town is built, children can choose to drive a simulated car with the help of a map segment or an on-line compass.

Car Builder (ages 8 and up) takes CAD several steps further: Children draw on a large database of components to assemble and modify a simulated car.

Following the program's menu-driven format, he or she begins by constructing the guts of the car, then selects the basic body shell, tests the car, modifies it, and finally customizes it.



Car Builder teaches the rudiments of auto design.

The program teaches several aspects of mechanical design: selection of chassis components (engine, trans-mission, and fuel tank), suspension, steering, tires, and brakes.

Body design involves selecting the front, roof, and rear of the car, which students then modify for optimum aerodynamics and customize to include windows and decals. They also test the car for wind-drag coefficiency and road handling — cornering, braking, acceleration, and top speed. The program provides a full report on every aspect of the car to allow opportunity for modification.

Candice Tasaki, a longtime user of both Car Builder and Townbuilder in her years as a computer coordinator and now as a classroom teacher in the San Jose Unified School District, has found that these programs are a big hit with kids.

"Initially students are a bit thrown by the apparent complexity of the CAD process, but I've found it grows on them in a hurry," Tasaki explains. "I particularly like the fact that the programs are teaching so many things, including the value of reading and following instructions, the value of trial-and-error experimentation, and the value of the computer as an instrument of design."

LOOKING AHEAD

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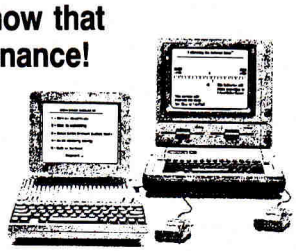

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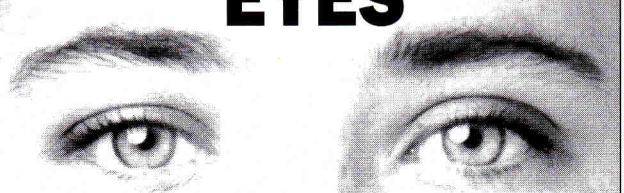

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Simulations of all kinds — role play, thinking-skills software, learning games, and CAD programs — provide unlimited new ways to enjoy the Apple II.

Simulation software encourages children to study processes and procedures they might otherwise avoid; it's an ideal introduction to computer-assisted learning, and may inspire a lifelong interest in computers and their potential application in all areas of work and play; it exposes children to new areas of interest and to potential careers — engineering or business, for instance.

Simulation programs make one important principle of education startlingly clear: The most solid learning often occurs when students are engaged in a stimulating activity just for the fun and the challenge of it.□

KELLY RIVERS AND MICHAEL PERKINS ARE INDEPENDENT COMPUTER-EDUCATION CONSULTANTS, ORGANIZING INSTRUCTION, FACULTY TRAINING, AND CURRICULUM DEVELOPMENT FOR SAN FRANCISCO BAY AREA ELEMENTARY AND JUNIOR-HIGH SCHOOLS. WRITE TO THEM C/O *INCIDER*, 80 ELM STREET, PETERBOROUGH, NH 03458. ENCLOSE A SELF-ADDRESSED, STAMPED ENVELOPE IF YOU'D LIKE A PERSONAL REPLY.

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Apple IIs Meet the Challenge of Special Needs

WORKING TOGETHER

ALL ACROSS THE UNITED STATES, IN SCHOOLS, HOMES, AND VOCATIONAL-TRAINING PROGRAMS FOR CHILDREN AND ADULTS ALIKE, APPLE IIS ARE SPEARHEADING THE MOVEMENT TO INTEGRATE PEOPLE WITH DISABILITIES INTO THE MAINSTREAM OF AMERICAN LIFE. THEIR STORIES ARE A TESTAMENT NOT ONLY TO THEIR OWN RESILIENCE IN THE FACE OF PHYSICAL OBSTACLES, BUT TO THE POWER AND versatility of the machine that is helping them declare their independence.

Reports Christopher Paulus, a Baltimore high-school student who's blind, "Computers have changed my life. I'm now self-sufficient getting work done. I can talk to people around the world via modem and find out information on my own, and I'm now able to help others with computer-related questions."

Dick Stein, an educator at the Cerebral Palsy Center for the Bay Area, located in Oakland, California, uses Apple IIe and IIGS computers to teach a group of adults with severe disabilities, many of whom use wheelchairs and have great difficulty speaking. Stein and his students have embraced the Apple II as an instruction and communication tool that "empowers them in a way they've never before experienced. Let's face it: Computers are fun to use, and students often give a greater effort for the computer than for the instructor."

Delia Vanderheinden, one of Stein's students,

Alternative hardware devices and adaptable software are opening the door to independent living for thousands of Apple II users with physical and developmental disabilities.

adds that "the computer has helped me concentrate more. I use a problem-solving program that has helped build my self-confidence. The computer has opened up a whole new world for me in terms of language and educational skills." Another student, Kishore Maharaj, says, "The computer is very good for me. I can't write by hand but I can use the computer to write." Rob Olsen types that "the computer helped me learn how to read and write." Jim Reeves notes that he "uses the computer for job training." He has learned how to type addresses into an AppleWorks database, and is becoming more self-reliant as he acquires basic vocational skills.

GETTING ORGANIZED

Assisted in part by Apple Computer, many groups are involved in the growing movement to grant computer access to people with disabilities. Some organizations develop hardware and software; others train people with disabilities in computer operation; and some groups help those who are helping others.

If Apple IIs are on the cutting edge of this campaign, much of the credit goes to Apple Computer's **Office of Special Education and Rehabilitation**. The goal of the department is to ensure that every Apple computer is fully accessible to every individual regardless of disability. To that end, it was instrumental in the founding of the **Alliance for Technology Access** (originally named the National Special Education Alliance) in 1987, and continues to work with the ATA by providing computer equipment, technical expertise, and organizational resources to help the ATA grow. The ATA ►

By Joe Kohn

is a coalition of 42 grass-roots organizations, located throughout the country, that are bringing computer technology — in the form of classes, training, and hands-on workshops — to people with disabilities. The goal of the ATA is to establish sites in all 50 states. (See the accompanying sidebar for a listing of current offices.)

> "Working together, special-needs groups are making a difference."

The ATA was cofounded by the **Disabled Children's Computer Group**, a center located in Berkeley, California. The organization's leaders are for the most part volunteers and parents of children with disabilities. DCCG is the oldest of the ATA sites, and works with third-party hardware and software vendors to improve their products. The center houses a number of Apple IIe and IIGS systems for use by local children and adults with special needs and provides a wide variety of alternative input devices that allow people with disabilities to communicate with the computer (more on that below).

Another strong supporter of the ATA is a nonprofit organization known as **Access Unlimited/SPEECH Enterprises**, founded in 1986. It provides information to the public on special-needs computer resources and products, free phone consultation for people with disabilities and their parents and teachers, and hands-on computer training. The group also works with more than 50 developers of adaptive hardware and software products; it distributes a range of customized peripherals and programs, including educational applications such as talking, large-print spelling software and musical readiness-skills modules, and offers technical support.

Still another nonprofit advocacy group is **Technology for Language and Learning**, dedicated to advancing the use of computers by children and adults with special needs. Its Special Education Public Domain Project gathers high-quality freeware and shareware programs and distributes them to individuals and organizations. The goal is to provide parents and educators with low-cost software to supplement their collections of commercial education packages. The TLL catalogue includes 180 public-domain volumes for keyboard and alternative input in categories such as readiness skills, language development, math, word processing, and graphics.

EQUAL ACCESS

Apple's Office of Special Education works closely with outside developers to guarantee that the unique needs of all people are appropriately considered in the design and production of Apple-compatible products. In addition, the department also coordinates the efforts of a loosely knit group of hardware and software engineers at Apple who have joined together as the **Universal Access Society**. This group has been instrumental in the development of two soon-to-be-released products that will ease computer access for people whose mobility and sight are impaired.

The **Video Keyboard IIGS**, a new desk accessory marketed by the Apple Programmers and Developers Association, lets users type in documents or commands by pointing — with a mouse or any other alternative input device — to a special keyboard display on screen. It was designed primarily for use with a remarkable hardware device called the **HeadMaster**, marketed by the Prentke Romich Company, one of the leaders in the field of adaptive technology.

The HeadMaster pointing system replaces the GS' mouse. A transmitting unit sits atop the computer monitor and sends ultrasonic signals to a lightweight headset; HeadMaster translates changes in the user's head position into changes in the cursor's position on screen. Lightly puffing into a tube connected to the headset is equivalent to pressing the mouse button. Using the Video Keyboard with a HeadMaster provides not only mouse emulation, but keyboard emulation, and gives people with severe disabilities and limited mobility almost complete control over the computer. Any "off the shelf" GS-specific program, whether it's AppleWorks GS, HyperStudio, or Arkanoid, is compatible.

The Universal Access Society is also working on the development of **CloseView**, a GS software product that will magnify anything on screen up to 16 times standard size, thereby making the computer more accessible to individuals with vision impairment. Let's hope that both CloseView and the Video Keyboard will eventually be included on the GS System Disk, just as comparable software enhancements now ship with every Macintosh.

Because computers depend heavily on keyboard input, individuals with special needs require unique hardware devices to use alternative input tools, bypassing the standard keyboard. The most flexible product available is the **Adaptive Firmware Card**, an interface board that lets keyboard emulators and switch devices operate standard software such as AppleWorks. Licensed and sold by Don Johnston Developmental Equipment, the AFC provides many people with complete control over the computer, even when mobility is greatly impaired. The AFC goes into a slot in either the IIe or the GS, and connects to a small box on the side of the computer's case containing an on/off switch and hookups for one or two additional switches and for an expanded or a miniature keyboard.

The board is completely programmable, yet no traditional programming skills are necessary. The AFC comes with a number of customized scripts called *setups*, macros that represent sequences of keystrokes for certain popular software packages and input devices. Other setups, developed by the DCCG, are available for a wide variety of other programs and tools. In addition, you can write your own customized scripts, save them to disk, and recall them for later use. Through the use of scripts you can designate different input methods for the same software and hardware, tailored to individual needs.

Among alternative input peripherals compatible with the AFC, one of the most widely used is the **Unicorn Assisted Keyboard**, an 8-by-16-key touch-sensitive device. You can set it up to operate as a standard keyboard, but with larger keys, or you can program it so that half the keyboard corresponds to *yes* and the other half to *no*. The advantage is maximum flexibility: You can program any key to represent any keystroke or any combination or sequence of keystrokes. You can also use overlays with pictures or graphics. It's ideal for prereaders and for people who can't use a standard keyboard.

AppleWorks, for example, works quite smoothly on systems equipped with an AFC and the Unicorn keyboard. Standard AppleWorks commands require some degree of manual dexterity — pressing two keys simultaneously. For those unable to press two keys at once, the appropriate setup means that no modifications to the program are necessary. The Unicorn layout permits easier keyboard input, and you can even arrange it to exclude certain sequences. For instance, it's easy to make the escape key inoperable to reduce unintentional errors.

Most AFC-equipped systems also include a Street Electronics **Echo II** speech synthesizer for immediate voice feedback. Using the AFC with an Echo, all keyboard input is repeated aloud to the user. Although the Echo's chip produces a voice that's pretty mechanical-sounding, it lets people with visual impairment use the Apple II.

In addition, the AFC allows for various switch inputs that can be operated by people whose movement is impaired. Built into the AFC is the ability to scan, for example. In scan mode, all letters of the alphabet and all numbers are displayed sequentially on screen. To type, just hit the switch device as each character you need appears on screen. Although this method is slow, it provides computer access to people with even severe disabilities.

You can also customize setups to operate pull-down menus or graphics toolboxes in scan mode, or for use with other adaptive devices. Even young children who are quadrapalegic can use GS paint programs, for example, thanks to a chin-activated joystick. (See "Partners in Special Achievment," April 1989, p. 54, for a discussion of other products available for people with unique needs, such as braille printers, mouse emulators, Morse-code switches, wheelchair-mounted input switches, touch-sensitive screens, keyguards, and talking software.)

RESOURCES

To stay informed of technological advances in the area of special-needs computing, subscribe to ***Closing the Gap***, a bimonthly publication directed at those interested in computer technology for special education and rehabilitation. Once a year, a special ***Closing the Gap Resource Guide*** is published also, detailing available hardware and software. (Approximately 60 percent of all products in the *Resource Guide* are for the Apple II family.) In addition, *Closing the Gap* sponsors a yearly conference, usually held in October in Minneapolis. In the past, Apple Computer has participated as an official sponsor and has attended the conference.

The HeadMaster pointing system replaces the mouse.

Apple's Office of Special Education has also compiled a resource guide, ***Apple Computer Resources in Special Education and Rehabilitation***, which it updates annually and makes available through DLM Teaching Resources. It covers all assisted hardware products and special software that operate with Apple computers and describes the computer applications that people with various disabilities can use. The guide categorizes hardware devices as well, and even includes information on software that will assist in running a nonprofit organization. The book is almost 400 pages long and describes more than 1000 products, publications, and organizations that help people with disabilities take advantage of the power of computing. ►

ALLIANCE FOR TECHNOLOGY ACCESS

ALASKA

Alaska Center for Adaptive Technology
Sheffield Hotel
P.O. Box 6069
Sitka, AK 99835
(907) 747-6960

ARKANSAS

Technology Resource Center
Arkansas Easter Seal
Box 5148
Little Rock, AR 72225
(501) 663-8331

CALIFORNIA

Team of Advocates for Special Kids
100 West Cerritos
Anaheim, CA 92805
(714) 533-TASK

Disabled Children's Computer Group
2095 Rose Street
Berkeley, CA 94709
(415) 841-3224

Special Technology Center
590 Castro St.
Mountain View, CA 94041
(415) 961-6789

Computer Access Center
2425 16th St.
Room 23
Santa Monica,CA 90405
(213) 450-8827

Special Awareness Computer Center
Rehabilitation Center
2975 North Sycamore Dr.
Simi Valley, CA 93065
(805) 582-1881

COLORADO

AccessAbility Resource Center
1056 East 19th Ave.
Denver, CO 80218-1088
(303) 861-6250

FLORIDA

Computer CITE
215 East New Hampshire St.
Orlando, FL 32804
(407) 896-3177

HAWAII

Aloha Special Technolgy Access Center
P.O. Box 27605
Honolulu, HI 96827
(808) 834-4092

ILLINOIS

Technical Aids and Assistance for the Disabled Center
1950 West Roosevelt
Chicago, IL 60608
(312) 421-3373

Northern Illinois Center for Adaptive Technology
3615 Louisiana Road
Rockford, IL 61108
(815) 229-2163

IOWA

READI
1655 17th Ave.
P.O. Box 523
Marion, IA 52302
(319) 377-1771

KANSAS

Technology Resources for Special People
3023 Canterbury
Salina, KS 67401
(913) 827-0301

KENTUCKY

SpeciaLink
36 West 5th St.
Covington, KY 41011
(606) 491-2464

Bluegrass Technology Center for People with Disabilities
894 Georgetown St.
Lexington, KY 40511
(606) 255-9951

Disabled Citizens Computer Center
Louisville Free Public Library
4th and York St.
Louisville, KY 40203
(502) 561-8637

LOUISIANA

Center for Adaptive Technology and Education
1636 Toledano
Suite 311
New Orleans, LA
(504) 888-8964

MASSACHUSETTS

Massachusetts Special Technology Access Center
1/6 Mudge Way
Town Center
Bedford, MA 01730
(617) 275-2446

PRODUCT INFORMATION

Access Unlimited/ SPEECH Enterprises
9039 Katy Freeway
Suite 414
Houston, TX 77024
(713) 461-0006

Adaptive Firmware Card
Don Johnston
Developmental Equipment
P.O. Box 639
1000 North Rand Road
Building 115
Wauconda, IL 60084-0639
(708) 526-2682
$520

Alliance for Technology Access
1307 Solano Ave.
Albany, CA 94706-1888
(415) 528-0747

Apple Computer Resources in Special Education and Rehabilitation
DLM Teaching Resources
One DLM Park
Allen, Texas 75002
(800) 527-4747
(800) 442-4711 (TX)

CloseView,
price not available at press time
Video Keyboard IIgs, $20
APDA/MS 33G
Apple Computer, Inc.
20525 Mariani Ave.
Cupertino, CA 95014-6299
(800) 282-2732

Closing the Gap
P.O. Box 68
Henderson, MN 56044
(612) 248-3294
$26/year

The Communicator
Communicator Apple
Users Group
Route 4, Box 263
Hillsville, VA 24343-8047
(703) 766-3869 evenings
$10/year membership
U.S./Canada
$20/year U.S. funds
foreign membership

CompuMentor Project
Randy Dunagan
385 8th Street
San Francisco, CA 94103
(415) 255-6040

CompuServe
P.O. Box 20212
Columbus, OH 43220
(800) 848-8199

Disabled Children's Computer Group
2095 Rose Street
Berkeley, CA 94709
(415) 841-3224

Echo II, $129.95
Echo IIc, $149.95
Echo Headphones, $19.95
plus $4 one unit,
$1 each additional unit shipping
Street Electronics
6420 Via Real
Carpinteria, CA 93013
(805) 684-4593

Exceptional Parent
1170 Commonwealth Ave.
Boston, MA 02134-4646
(617) 730-5800
$16/year individuals
$24/year organizations, schools, libraries, agencies

GEnie
General Electric Information
401 North Washington St.
Rockville, MD 20850
(800) 638-9636

HeadMaster
Prentke Romich, Inc.
1022 Heyl Road
Wooster, Ohio 44691
(216) 262-1984
$900 unit plus $130 adapter

Office of Special Education and Rehabilitation
Apple Computer
20525 Mariani Ave.
MS 43S
Cupertino, CA 95014-6299
(408) 974-7910

Technology for Language and Learning
P.O. Box 327
East Rockaway, NY 11518-0327
(516) 625-4550

Trace Research and Development Center
S-151 Waisman Center
University of Wisconsin
1500 Highland Ave.
Madison, WI 53705
(608) 263-2237

Unicorn Assisted Keyboard
Unicorn Engineering
5221 Central Ave.
Suite 205
Richmond, CA 94804
(415) 528-0670
$350
plus $6 shipping

The WELL
27 Gate Five Road
Sausalito, CA 94965
(415) 332-4335

MICHIGAN

Living & Learning Resource Center
Physically Impaired Assn. of Michigan
601 West Maple St.
Lansing, MI 48906
(517) 487-0883
(800) 833-1996 (MI)

MINNESOTA

PACER Center, Inc.
4826 Chicago Ave. S.
Minneapolis, MN 55417-1055
(612) 827-2966

MISSOURI

Computer Resource Center
St. Louis Easter Seal
5025 Northrup
St Louis, MO 63110
(314) 776-1996

MONTANA

Parents, Let's Unite for Kids
1500 North 30th St.
Billings, MT 59101-0298
(406) 657-2055

NEVADA

Nevada Technology Center
2880 East Flamingo Road
Suite A
Las Vegas, NV 89121
(702) 735-2922

NEW YORK

Techspress
Resource Center for Independent Living
401 Columbia St.
Utica, NY 13502
(315) 797-4642

NORTH CAROLINA

Carolina Computer Access Center
Metro School
700 East Second St.
Charlotte, NC 28202
(704) 342-3004

OHIO

Communication Assistance Resource Center
2140 Arbor Blvd.
Dayton, OH 45439
(513) 294-8086

OKLAHOMA

Developmental Disabilities Resources
4641 South Braden
Suite 113
Tulsa, OK 74135
(918) 664-5257

OREGON

Oregon Outback Technology Access Center
Union ESD
10100 North McAlister Road
Island City, OR 97850
(503) 963-4106

Computer and Technology Services
3241 Northeast 21st Ave.
Portland, OR 97212
(503) 246-8551

TENNESSEE

West Tennessee Special Technology Resource Center
Lambuth College
Carney Johnson Hall
P.O. Box 3683
Jackson, TN 38303
(901) 424-9089
(901) 424-9090

East Tennessee Special Technology Access Center
University of Tennessee
Room 106-A CA
Knoxville, TN 37996-3400
(615) 584-4465

Technology Access Center
2214 Metro Center Blvd.
Nashville, TN 37228
(615) 248-6733

TEXAS

SHIP
United Methodist Church
5084 DeZavala Road
San Antonio, TX 78249
(512) 696-1033

UTAH

Computer Center for Citizens with Disabilities
401 13th Ave.
Salt Lake City, UT 84103
(801) 521-1624

WASHINGTON

Seattle Technology Alliance for Resources and Training
257 100th Ave. Northeast
Bellevue, WA 98004
(206) 637-9848

Another useful publication is ***Exceptional Parent***, a magazine devoted to assisting parents and teachers of children with special needs.

For teachers of visually impaired children and adults, there's a bimonthly newsletter called ***The Communicator***, published by the Communicator Apple Users Group, a Hillsville, Virginia-based computer club with worldwide membership. Each issue includes software reviews, tips and hints written by fellow teachers, and lists of resources and disability-related support organizations.

The group also adapts various public-domain programs, including educational and simulation games, mail-list software, and the Pilot authoring system, for speech output and distributes them for $5 per disk to members of the Communicator club.

In addition, the **Trace Research and Development Center** at the University of Wisconsin's Madison campus is actively involved in helping people with disabilities use computers, and publishes an 800-page resource guide.

CompuServe, one of the larger international on-line networks, sponsors a special forum where people with disabilities and those who work with them can meet and share the latest advances. **GEnie** and **The WELL** (Whole Earth 'Lectronic Link), two other major telecommunications networks, have forums devoted to those who work for nonprofit organizations.

Thousands of volunteers also offer their computer expertise to people with disabilities at hundreds of centers around the country. One widely respected San Francisco organization, **CompuMentor**, matches nonprofit groups that use computers with volunteer computer experts. Some mentors help office staff, while others teach people with disabilities how to use computers. The project has been so successful that CompuMentor, with funding from Apple Computer, has published a manual, available at no cost, to assist others in setting up similar projects throughout the country.

JOINING FORCES

People and organizations, working together, are making a big difference in quality of life for tens of thousands of people with disabilities — and they're using Apple II computers to accomplish what seemed impossible only a few years ago.

As John Sculley, Apple's chief executive officer, has declared, "Our goal has always been to create products that help ordinary people do extraordinary things — and to remember that our products also help extraordinary people do ordinary things." □

JOE KOHN HOLDS A MASTER'S DEGREE IN SOCIAL WELFARE AND IS THE PUBLIC-DOMAIN SOFTWARE LIBRARIAN FOR BIG RED COMPUTER CLUB. WRITE TO HIM AT 166 ALPINE STREET, SAN RAFAEL, CA 94901. ENCLOSE A SELF-ADDRESSED, STAMPED ENVELOPE IF YOU'D LIKE A PERSONAL REPLY.

A STAR IS REBORN

Hollywood's poor relation strikes it rich in the glitzy new world of interactive multimedia.

By PAUL STATT * SENIOR EDITOR

Photography * Ed Judice

Mention *videodiscs* — or *optical videodisks* or *laser discs*, they're all the same thing — and the technologically hip sneer, "Those shiny, overgrown, 12-inch compact discs with pictures? Isn't *Saturday Night Fever* available on videodisc?"

No doubt about it — home laser discs never made it into the mainstream. Stewart Brand, an observer and analyst of the entertainment industry, explains the history of the product: "[In 1978] movie studios decided it was time to resell films direct to the home, bypassing the networks and keeping more of the revenue," he writes in his book *The Media Lab* (Viking Penguin, 1988). "The technology they bought into was laser videodisks, which could be stamped out cheaply like long-playing records."

Ten years later, though, according to the Electronic Industries Association's Consumer Electronics Group, you could find videocassette recorders in 68 percent of American homes, but laser video in only a handful.

Brand gives two reasons: "Videodisks high-mindedly eschewed dealing in pornography whereas VCRs built an industry on it," and, "[although] the disks delivered higher-quality reproduction . . . you could not record on them." Yet the EIA estimates that 400,000 videodisc players will be sold by the end of 1990 — the videodisc is suddenly hip. Why now?

Computer-controlled videodiscs: superb interactivity, crystal-clear sound and images.

It's cool because you control it. And it's interactive and educational — if you teach you're sure to find all kinds of useful images and movies on disc. Although discs never became as popular as cassettes with home video consumers, they've been an underground success among educators for years.

WHAT IS IT?

A videodisc player looks like a hybrid audio compact-disc player/record player. Each platter is 12 inches in diameter like a phonograph record, but it slides into the player like a compact disc. The videodisc plays sound and pictures, too.

All videodisc players sold in the United States today are of the LaserVision type, the winner after a protracted battle over standards. They use light from a low-power solid-state laser to read information encoded on the reflective surface of the disc. Multifunction units can play conventional audio CDs as well as 12-inch and 8-inch videodiscs and the new 5-inch CD-video discs, which hold 20 minutes of sound and five minutes' worth of moving pictures — enough for a good MTV music video. Multifunction players are coming down in price; Pioneer introduced one this year that retails for only $500. To take full advantage of using a computer to control your video, though, you'll probably want just a plain player that handles 12-inch discs. Most schools have one.

Compared with tape, optical discs have distinct benefits: The picture's better and the sound's better — exceptionally clear, because each frame is a digitally recorded still image, or *frame*. (Just compare the sound from a digitally recorded compact disc to an analog recording.)

Frames are numbered from 1 to 54,000 and represent one side of a disc. (Maybe we're lucky that videodiscs are a "read-only" medium — imagine your father-in-law's slide shows if he could include more than 50,000 pictures.)

Cassette tape has only one real edge on the videodisc: You can record your own. If your tastes in multimedia run to filmmaking, you're stuck with pictures and sound that fall short of disc quality.

Once you're set up with a player and some videodiscs, let the show begin. Teachers, parents, students, artists, sci-fi authors — anybody can create a multimedia message. Even if you're not a programmer, you can design your own presentations by choosing the sequence of images and even playing clips in slow motion.

HOW DO YOU USE IT?

Videodisc catalogues usually list each entry with a Roman numeral I, II, or III. It's not a rating system — the numbers represent the disc's level of interactivity, according to an industry standard. Images on a level III ►

disc are organized so that you can find individual frames most easily (given comparable hardware), while a level I disk permits only sequential searching, making it tedious to find a frame. If you want the greatest possible degree of control, level III offerings are for you, but if you want to just watch the disc on a monitor (it'll be a clearer image than a VCR's), a level I disc is all you need (and it's much less expensive).

Level I comes in two formats. Most people who watch videodiscs like films buy movies in CLV — *constant linear velocity* — format, which limits your searching abilities, but allows 60 minutes of playing time per side. Although you can use any player to run videodiscs as movies, the cheapest units can't do anything else; if you want to do more with your level I discs, you need a player with remote control to stop, rewind, and replay.

Some units *step* as well as play: With this feature you can go through a level I disc one frame at a time, providing it's in CAV (*constant angular velocity*, or 30-minute) format. (The more control you have over the disc, the less time it plays.)

Because most CAV discs fill every one of their 54,000 possible frames, some include an image directory that lists still and moving pictures. Enumerating every image isn't crucial, but the directory should include enough frames that you can find your way around. (Imagine flipping through a 54,000-page book in search of a particular quote without a table of contents or an index.)

If you want to invest in level II equipment, you can control a presentation with preprogrammed software on disc, instead of stepping through images frame by frame: The software can stop the show automatically at a particular image, letting the teacher ask a question. After students answer, the teacher can press *play* and the lesson continues. Level II-type interaction was the original instructional format for videodiscs; it still requires a special player with its own on-board computer, usually an MS-DOS machine. Most level II discs are used in industry and business (with fascinating titles such as *Hydraulic Training*) and don't let you change the way they're viewed.

WHERE DOES THE COMPUTER COME IN?

For avid Apple II users, level III CAV discs offer the greatest creative potential. If you connect your videodisc player to your Apple IIe or IIGS you can control the videodisc from either the keyboard or from a "program" you write with certain compatible Apple II software products.

First, to hook up your computer and videodisc player/TV monitor, you'll need an interface cable ($25 to $35 from the company that sells the videodisc player, or ►

Videodisc Sources

The Discovery Channel
8201 Corporate Drive
Suite 1200
Landover, MD 20785
(301) 577-1999
This popular cable network hopes to make all its programming — in life science, physical science, and social science — available on videodisc at reasonable prices. Computer software is available only for the Mac, but you can repurpose many of the discs.

MECC
3490 Lexington Ave. North
St. Paul, MN 55126
(800) 228-3504
In addition to distributing videodiscs from all major producers to its customers — a plus if you're already in the MECC program — the company also publishes some videodisc courseware, such as "Trigland" for high-school math, plus teacher training videodiscs.

National Geographic Society
Educational Services
Department 5368
Washington, DC 20036
(800) 368-2728
(301) 921-1330
In addition to GTV: A Geographic Perspective on American History, the NGS also publishes some of its television specials and other educational materials on videodisc.

Optical Data
30 Technology Drive
Warren, NJ 07060
(201) 668-0022
(800) 524-2481
Optical Data is the pioneer publisher of videodiscs; many of the discs mentioned here are actually "printed" by Optical Data. This is also the place for old favorites, such as the "Space Discs" with NASA pictures and "The Frog" for biology classes.

The Videodisc Compendium
Emerging Technology Consultants
2819 Hamline Ave. North
Minneapolis, MN 55113
(612) 639-3973
The Videodisc Compendium is a catalogue of discs in all fields from many publishers, updated periodically. It's not a publisher or distributor, but it's a good place to start. Compendium and updates cost $25 a year.

VideoDiscovery
1515 Dexter Ave. North
Suite 400
Seattle, WA 98109
(800) 548-3472
(206) 285-5400
VideoDiscovery publishes science discs and distributes videodiscs in all categories.

The Voyager Company
1351 Pacific Coast Highway
Santa Monica, CA 90401
(800) 446-2001
(800) 443-2001 (CA)
(213) 451-1383
The Voyager Company supplies classic films ("Casablanca" to "Ghostbusters") and art ("The Louvre") on disc, and some ABC News Interactive current-affairs discs.

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

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

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

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

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

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

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

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

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

Ease of Use? Incider says, *" The true test of a hard drive lies in its ease of use and maintenance. In that respect, the Vulcan brings together a more complete package that any of its current competitors."* Vulcan simply pops in; replacing the Apple power supply under your computer's hood. Our built-in firmware automatically installs itself as a Desk Accessory for write protection and partitioning. The software we provide lets you easily park heads, back up and reformat.

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less from **Redmond Cable**): Pioneer CC-03 for the IIGS (or Macintosh), or CC-04 for the Apple IIe with Super Serial Card.

You'll also need software such as **HyperStudio** or **Tutor-Tech** that "knows" it's connected to a videodisc player, or, with the help of a **TimeOut UltraMacros** task file called **ImageWorks**, you can control a videodisc player from the **AppleWorks** database manager or word processor. Optical Data includes ImageWorks with its videodisc products; it's also available from the author, Ron Blodgett, of Teaching Technologies in San Luis Obispo, California.

If you're thinking that you didn't spend $2000 on a computer just to use it as a remote control, the most interactive way to use videodisc technology with the machine is to "author" your own lessons, or "repurpose" the disc. When you repurpose a videodisc, you redesign it for a new objective. Think of an encyclopedia: To create a report on Albania or albumen, for example, you'd simply look up the relevant bits of information throughout the text and ignore the rest. Laying your finger on the visual information in a videodisc is much more difficult, though — unless you have a computer.

To repurpose a disk quickly, use an AppleWorks database file containing the frame addresses and some information about the disc's pictures or films. (Buy the database from the disc's manufacturer or type your own — copy the manufacturer's printed index or view the disc frame by frame and take notes.) If you have a disc of satellite photos of the United States, for example, you can use AppleWorks' selection powers to create a smaller list of all frames that include the word *river* to produce a relevant report. If you want to limit yourself to the rivers in New York State, select records containing *New York*, too.

If you don't want to set up a database, finding frames is a lot simpler if you have an index before you begin hunting. (For instance, with $10,800 you can buy CEL's **Video Encyclopedia of the 20th Century**, which includes 40 videodiscs with movies and recordings, but it's not much good without its four-volume printed index.)

Your other option is to step through as many as 54,000 pictures, as you try to locate the frames you want to show; it's tedious, and if you're a teacher you're already strapped for time. If you'll be repurposing a lot of generic discs without indexes, invest in HyperStudio — with its built-in remote-control software for the videodisc player, stepping through pictures is somewhat easier.

Once you find the right images on your videodisc, use HyperStudio (GS only), Tutor-Tech (any Apple II), Scholastic's **HyperScreen** (any Apple II), or ImageWorks with AppleWorks (any Apple II) to create a slide show. If your first video purchase was the National Geographic Society's **GTV: A Geographic Perspective on American History**, you received a GS program called **ShowMaker** along with the discs. Even if you're not a programmer, you can author a lesson or repurpose a disc — after all, it can be as simple as creating a slide show from a choice of thousands of pictures.

But remember: When you want to create your own lessons from a videodisc, it's crucial to have the manufacturer's printed list of the disc's contents. Ideally, ask for an AppleWorks database file of frame numbers and descriptions so that you can access frames and play sequences of frames by number.

WHAT MAKES IT INTERACTIVE?

But truly interactive multimedia is more than passive viewing, no matter how high-tech the slide show. Interaction means that the picture on the video monitor changes in response to what you're doing at the keyboard.

For example, if you use AppleWorks with ImageWorks, it's easy to write an interactive story, giving your readers the option of seeing pictures on the video screen as they read the computer monitor.

Simply type text that looks something like this: *The earth is exploding! Islands are bursting from the sea near Iceland (^12345). The bursting results from a growing crack in the Atlantic Ocean floor (^51987). It's all explained by the new theory of plate tectonics (^45631), or continental drift (^49000).*

The numerals in parentheses are frame numbers; ImageWorks recognizes them as such by the carets (^) preceding them. The reader starts with the cursor at the beginning of the story or lesson, then moves it through the text and presses Open-apple V (for *videodisc*) to show the picture or play the movie that starts at the frame indicated.

In the example above, frame 12345 is a still photograph of the island of Surtsey, frame 51987 is a map of the Atlantic Ocean floor, frame 45631 contains a

CREATING YOUR OWN VIDEODISCS

AS WE NOTED IN THE accompanying article, the videocassette tape has only one real edge on the videodisc: You can record on a videocassette, but you can't on a videodisc. But now even that edge is wearing thin: A New York company called **Magno Sound and Video** can create a single CAV videodisc from a videocassette tape for only $300.

Ken Kurzweil, a teacher at the Fox Lane Middle School in Bedford, New York, filmed a videodisc for a "class biography" of fourth- and fifth-graders. Each student wrote his or her story with a word processor, added decorations created with **Paintworks Gold**, then filmed "a one-minute autobiographical speech, to be used in the multimedia class history we created with HyperStudio," notes Kurzweil. "We didn't use the entire 30 minutes on the videodisc, but that would be more cost-effective."

dictionary definition of *plate tectonics*, and frame 49000 is a movie about continental drift.

AppleWorks offers only the most basic type of interaction, but if you use HyperStudio, ShowMaker, HyperScreen, or Tutor-Tech, it's possible to combine computer graphics and text with videodisc images. You can even create the most important form of interaction — complex branching lessons.

If you want to make your classroom lessons come alive, all you need is your imagination, a videodisc loaded with information, and some time — creating a video lesson may be easy, but it's also time-consuming.

If you use HyperStudio or Tutor-Tech, plan ahead and locate the disc's images and films before you begin programming — if you don't, editing your work may be frustrating.

Videodiscs are a superbly inter*active* medium: Users can work with the material by creating their own shows, or by watching TV in a way that's *active* — really more like reading a book (flipping pages and skipping around).

As a tool for teachers to create lessons, the computer-controlled videodisc player is as versatile as the blackboard; for students it's as compelling as television.□

PRODUCT INFORMATION

AppleWorks 3.0, $249
AppleWorks GS, $299
Claris Corp.
5201 Patrick Henry Drive
Santa Clara, CA 95052
(408) 727-8227

GTV: A Geographic Perspective on American History
ShowMaker included
Optical Data Corp.
30 Technology Drive
Warren, NJ 07060
(800) 524-2481
$650 until 12/1/90
$995 thereafter

HyperScreen
Scholastic Software
2931 East McCarty St.
P.O. Box 7502
Jefferson City, MO 65102
(800) 541-5513
(800) 392-2179 (MO)
$99.95 educators
$124.95 consumers

HyperStudio 2.1
Roger Wagner Publishing
1050 Pioneer Way
Suite P
El Cajon, CA 92020
(619) 442-0522
$149.95

ImageWorks
Teaching Technologies
P.O. Box 3808
San Luis Obispo, CA 93403
(805) 541-3100
$19.95

Magno Sound and Video
729 7th Avenue
New York, NY 10019
(212) 302-2505

Paintworks Gold
Activision
3885 Bohannon Drive
Menlo Park, CA 94025
(415) 329-0500
$69.95

Redmond Cable
17371-A1 NE 67th Court
Redmond, WA 98052
(206) 882-2009

Tutor-Tech 2.6
Techware Corp.
P.O. Box 151085
Altamonte Springs,
FL 32715
(800) 347-3224
(407) 695-9000
$195

TimeOut UltraMacros
Beagle Bros
6215 Ferris Square
Suite 100
San Diego, CA 92121
(800) 345-1750
(800) 992-4022 (CA)
(619) 452-5500
$59.95

Video Encyclopedia of the 20th Century
CEL Educational Resources
477 Madison Ave.
New York NY 10022
(800) 235-3339
(212) 421-5000
$10,800

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❑ **GS54, GS55, GS56, GS57 & GS66 -** Five full disks of Sound Smith music files.
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❑ **GS48 GIF Graphics & SHRConvert -** This disk contains over 75 colorful graphics in the GIF format. This can be viewed using the shareware program, SHRConvert.
❑ **GS63 HyperStudio Sound Effects -** This collection of sound effects is just right for use with HyperStudio. Doorbells, barking dogs, and laser guns.
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❑ **GS79 Plunder GS -** Escape from the treasure room with the most cash to win this exciting game with fantastic sound effects. Watch out for the bombs!
AppleWorks Files
❑ **R302 AW Patch Kit -** Over 25 different patches for use with classic AppleWorks 3.0. Plus Ultramacros ideas, accounting templates and much more.
❑ **GS36 AppleWorks GS Files -** A collection of database files, templates and word processing documents for use with AppleWorks GS.
Graphics, Clip Art & Fonts
❑ **GS77 Print Shop Graphics, Fonts & Borders -** A fantastic collection of all new Print Shop GS multi-color graphics. Plus borders and fonts.
❑ **GS78 Print Shop Graphics -** More new graphics for Print Shop GS..
❑ **GS67 Joe's Clip Art Disk #1 -** Clip art for use with HyperStudio or AppleWorks GS and other GS applications. Stored in Apple preferred format.
❑ **GF04 Billboard Fonts-** A collection of large-sized GS-type fonts including Black Shadow, Las Vegas, LED, Blockbuster, Giants, Leavenworth and 20 others.
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PROSPEROUS PORTFOLIOS 2

Analyze your portfolio with a stockpile of database reports that would fill any broker's briefcase.

By RUTH K. WITKIN

USING AN APPLEWORKS DATABASE to keep track of your stocks is a good investment of your time. After all, if you want to play the stock market successfully you have to amass and organize your information, then analyze it from a number of different angles.

AppleWorks simplifies this process by providing a place where you can gather, calculate, sort, select, and print information. Who knows? Maybe you won't need that stockbroker after all.

Last month you created a portfolio database, entered records, dressed up the single-record screen, and printed a report showing all records in a labels layout (August 1990, p. 60). In this session, you'll use the database to produce four reports, three of which contain calculations:

- The first report, shown in **Figure 1**, lists the basic stock information you entered.
- The second report, shown in **Figure 2**, uses AppleWorks' calculation capability to list original and current values of stocks, value totals, and profit or loss by stock and by portfolio.
- The third report, shown in **Figure 3**, groups stocks by exchange, and lists total values by group.
- The final report, shown in **Figure 4**, presents only those stocks listed on the New York Stock Exchange. If you're still stymied by record selection, this exercise is for you.

Start up the AppleWorks program and load the *PORTFOLIO.DB* file. When the *Review/Add/Change* screen appears, you should see multiple-record layout with the first five categories and seven records.

If you need to bring all records into view, press Open apple-1 (OA-1), then OA-Tab to move the cursor to the company names. The cursor should now be on the *A* in *ABRACADABRA*.

Because all the various lengths of the company names fit in the same category, some appear truncated while others have far too much room.

You can design a well-spaced screen that looks like the one in **Figure 5** simply by adjusting column widths: Press OA-L and hit Return to confirm *Change the existing record layout*. You'll see the *Change Record Layout* screen with the cursor in the *COMPANY NAME* category. Now increase the column width by pressing the OA-Right Arrow key combination six times.

Press Right Arrow once to move the cursor to the *SYMBOL* category, then press OA-Left Arrow nine times to reduce the column width.

To move to each of the other categories, press the right-arrow key first, then reduce their width with the following series of keystroke combinations:

EXCH: OA-Left Arrow (9 times)
SHARES: OA-Left Arrow (8 times)
OPRICE: OA-Left Arrow (8 times)
CPRICE: OA-Left Arrow (8 times)
PURCHDATE: OA-Left Arrow (4 times)
COMMIS: OA-Left Arrow (9 times)

Now press Right Arrow once and OA-D twice to delete both spares. (These deletions are temporary because you can call back the spares at any time.)

Press Escape, then Return to confirm the cursor's standard *Down* direction. The *Review/Add/ Change* screen returns with every category nicely spaced. Press OA-S to store the database on disk.

TAKE STOCK

Last month you designed a fanciful single-record screen and printed a report with the same layout without repeating any steps. Now that you've designed AppleWorks' multiple-record screen, you can print a report in that layout just as easily: Press OA-P to bring up the Report menu, then type **2** and hit Return to choose *Create a new "tables" format*. To choose *From the current record layout*, type **2** and hit Return. Now type **MASTER STOCK LIST** (the name of the report) and hit Return again. The *Report Format* screen appears with commands, cursor movements, and the first three entries in each category.

Press Right Arrow eight times and you see the print-width indicator, which now reads *Ln79* — perfect for printing with the standard 10-characters-per-inch type size. Before printing, view the report on paper: Press OA-P, type the number corresponding to *The screen*, and hit Return twice. And here's the entire report nicely spaced and still perfect. Press Escape to return to the *Report Format* screen.

Now turn on your printer. Press OA-P type the number corresponding to your

printer, and hit Return. Type @ (the "at" sign, which prints the date) and hit Return twice. When the printer stops, your report should look like **Figure 1**. All your printed reports will include the date.

ACCORDING TO FORMULA

Report 2, shown in **Figure 2**, presents the portfolio's current status in three calculated categories (the AppleWorks limit) and includes original value, current value, and profit or loss. Calculated categories exist only in a printed report, not in the database at large.

To create this report, first duplicate the format of report 1: Press Escape to return to the Report menu, then type **4** and hit the return key to choose *Duplicate an existing format*. Type **2** to choose *MASTER STOCK LIST* and hit Return again.

Press OA-Y to delete the old name, type **STOCK CALCULATIONS** (the new name), and hit Return. The report format now reappears. To multiply the number of shares by the original value of each stock, you must insert a calculated category: Press Right Arrow five times to reach the spreadsheet's *CPRICE* category.

Press OA-K to insert a calculated category, and AppleWorks pops a category generically named *Calculated* into the report format. Press OA-Y to erase the name *Calculated*, then type **OVALUE** and press Return.

AppleWorks now asks for calculation rules, also known as *formulas*. A formula defines the arithmetic relationship between calculated and existing categories.

You want to multiply column D (number of shares for each stock) by column E (the corresponding original price), show the result with two decimal places, and insert three spaces between columns F and G.

To do this, type **D*E** when AppleWorks asks about the formula, then hit Return. Next, type **2** when the program asks for the number of decimal places, and hit the return key again. Lastly, type **3** to insert blank spaces after the category and hit the return key.

Now press OA-T and hit Return twice; AppleWorks totals the result of these calculations while keeping the number of decimal places and blank spaces you specified. The *9*s represent the printed numbers, and the double line indicates numbers that were totaled. Now reduce the width of the *OVALUE* column by pressing the OA-Left Arrow key combination twice.

To print the current value of your portfolio, insert a second calculated category the same way. Press Right Arrow twice to reach the *PURCHDATE* category, then press OA-K. Press OA-Y, type **CVALUE**, and hit Return.

You now want to multiply the number of shares in column D by the current price in column G, so type **D*G** and hit Return.

To set the number of decimal places and blank spaces, type **2** and hit Return, then **3** and hit Return.

Press OA-T and hit Return twice to print the total current value. Then reduce the width of the column by pressing OA-Left Arrow twice.

P AND L

The last calculated category prints your profit or loss for each stock. Press Right Arrow three times to land the cursor on the print-width indicator, which now shows *Ln101*, and press OA-K.

Press OA-Y, type **PROF/LOSS**, and hit Return. You want the formula to enter the current value of each stock after it's subtracted the stock's original price and the commission, so type **H–F–J** and hit Return. Then type **2** and hit Return twice. (The second time you hit Return you insert one blank space.)

Now press OA-T to print the total profit or loss, and hit Return twice. Press OA-Left Arrow three times to reduce the width of that column.

You'll also want to know the total commission paid on these stock purchases, so press the left-arrow key to reach column J, then press OA-T.

Type **2** to set the decimal places, hit Return, type **3** to confirm the number of blank spaces, and hit Return again. Press OA-Right Arrow twice to increase the width of that column.

Next, have AppleWorks insert two decimal places in each price. Press Left Arrow three times to reach the *CPRICE* category.

Now press OA-J to right-justify the number, type **2**, hit Return, type **3**, and hit Return again. Press OA-Right Arrow to increase the width of the column.

Now move on to the original prices: ►

File: PORTFOLIO.DB Page 1
Report: MASTER STOCK LIST

COMPANY NAME	SYMBOL	EXCH	SHARES	OPRICE	CPRICE	PURCHDATE	COMMIS
ABRACADABRA CORP	ALC	NYSE	200	13.5	22.87	Jun 7 87	27
ALASKA MINING	ALM	OTC	500	6.75	4.25	Mar 25 89	33
BUTTERNUT FOODS	BUF	OTC	100	13.75	15	Nov 23 88	14
COMPUTERS UNLIMITED	COU	AMEX	200	23	21.62	Sep 9 88	46
DIVA FOODS	DIF	NYSE	100	15.5	21	Feb 25 87	23
MERLIN FUND	MEF	NYSE	100	47.12	49.75	Jun 21 88	45
PAPPY ELECTRONICS	PAL	AMEX	1000	12	13.5	May 23 90	96

Figure 1. Master list of portfolio stocks.

File: PORTFOLIO.DB Page 1
Report: STOCK CALCULATIONS

COMPANY NAME	SYMBOL	EXCH	SHARES	OPRICE	OVALUE	CPRICE	CVALUE	PURCHDATE	COMMIS	PROF/LOSS
ABRACADABRA CORP	ALC	NYSE	200	13.50	2700.00	22.87	4574.00	Jun 7 87	27.00	1847.00
ALASKA MINING	ALM	OTC	500	6.75	3375.00	4.25	2125.00	Mar 25 89	33.00	-1283.00
BUTTERNUT FOODS	BUF	OTC	100	13.75	1375.00	15.00	1500.00	Nov 23 88	14.00	111.00
COMPUTERS UNLIMITED	COU	AMEX	200	23.00	4600.00	21.62	4324.00	Sep 9 88	46.00	-322.00
DIVA FOODS	DIF	NYSE	100	15.50	1550.00	21.00	2100.00	Feb 25 87	23.00	527.00
MERLIN FUND	MEF	NYSE	100	47.12	4712.00	49.75	4975.00	Jun 21 88	45.00	218.00
PAPPY ELECTRONICS	PAL	AMEX	1000	12.00	12000.00	13.50	13500.00	May 23 90	96.00	1404.00
					30312.00*		33098.00*		284.00*	2502.00*

Figure 2. Stock list with calculated categories showing original value at time of purchase, current value, and profit or loss by stock and by portfolio.

Press the left-arrow twice to reach the *OPRICE* category, then press OA-J, type **2**, hit Return, type **3**, and hit Return again. Press OA-Right Arrow to increase the width of the column.

Press Right Arrow seven times and you can see that the print-width indicator now shows *Ln115* — an important number to bear in mind before you start printing.

To fit 115 characters across one page, this report needs a smaller character size than the first one. Press OA-O to bring up the *Printer Options* screen. Now set the print options: Type **CI** (*character size*), press Return, type **15**, and hit Return again. Type **LM** (*left margin*), press Return, type **.2**, and hit the return key again. Now type **RM** (*right margin*), press the return key, type **.2**, and hit Return again. To enhance the report's readability, type **DS** (*double spacing*) and press the return key.

Now that you've set the printer options, press Escape to return to AppleWorks' *Report Format* screen. Be sure the printer is still turned on, and press OA-P. Press Return to confirm the printer (or type a printer number, then Return), and press Return twice. When the printer stops, your report should look like the one shown in **Figure 2**.

File: PORTFOLIO.DB — Page 1
Report: STOCK CALC-GROUP

COMPANY NAME	SYMBOL	EXCH	SHARES	OPRICE	OVALUE	CPRICE	CVALUE	PURCHDATE	COMMIS	PROF/LOSS
COMPUTERS UNLIMITED	COU	AMEX	200	23.00	4600.00	21.62	4324.00	Sep 9 88	46.00	-322.00
PAPPY ELECTRONICS	PAL	AMEX	1000	12.00	12000.00	13.50	13500.00	May 23 90	96.00	1404.00
					16600.00		17824.00		142.00	1082.00
ABRACADABRA CORP	ALC	NYSE	200	13.50	2700.00	22.87	4574.00	Jun 7 87	27.00	1847.00
DIVA FOODS	DIF	NYSE	100	15.50	1550.00	21.00	2100.00	Feb 25 87	23.00	527.00
MERLIN FUND	MEF	NYSE	100	47.12	4712.00	49.75	4975.00	Jun 21 88	45.00	218.00
					8962.00		11649.00		95.00	2592.00
ALASKA MINING	ALM	OTC	500	6.75	3375.00	4.25	2125.00	Mar 25 89	33.00	-1283.00
BUTTERNUT FOODS	BUF	OTC	100	13.75	1375.00	15.00	1500.00	Nov 23 88	14.00	111.00
					4750.00		3625.00		47.00	-1172.00
					30312.00*		33098.00*		284.00*	2502.00*

Figure 3. Records in the portfolio grouped by stock exchange.

File: PORTFOLIO.DB — Page 1
Report: STOCK CALCULATIONS
Selection: EXCH equals NYSE

COMPANY NAME	SYMBOL	EXCH	SHARES	OPRICE	OVALUE	CPRICE	CVALUE	PURCHDATE	COMMIS	PROF/LOSS
ABRACADABRA CORP	ALC	NYSE	200	13.50	2700.00	22.87	4574.00	Jun 7 87	27.00	1847.00
DIVA FOODS	DIF	NYSE	100	15.50	1550.00	21.00	2100.00	Feb 25 87	23.00	527.00
MERLIN FUND	MEF	NYSE	100	47.12	4712.00	49.75	4975.00	Jun 21 88	45.00	218.00
					8962.00*		11649.00*		95.00*	2592.00*

Figure 4. Records selected by New York Stock Exchange.

File: PORTFOLIO.DB — REVIEW/ADD/CHANGE — Escape: Main Menu
Selection: All records

COMPANY NAME	SYMBOL	EXCH	SHARES	OPRICE	CPRICE	PURCHDATE	COMMIS
ABRACADABRA CORP	ALC	NYSE	200	13.5	22.87	Jun 7 87	27
ALASKA MINING	ALM	OTC	500	6.75	4.25	Mar 25 89	33
BUTTERNUT FOODS	BUF	OTC	100	13.75	15	Nov 23 88	14
COMPUTERS UNLIMITED	COU	AMEX	200	23	21.62	Sep 9 88	46
DIVA FOODS	DIF	NYSE	100	15.5	21	Feb 25 87	23
MERLIN FUND	MEF	NYSE	100	47.12	49.75	Jun 21 88	45
PAPPY ELECTRONICS	PAL	AMEX	1000	12	13.5	May 23 90	96

Type entry or use @ commands — 12:12 am

Figure 5. Customized multiple-record screen.

GROUP REPORTS

To print a report that shows the calculations grouped by stock exchange, all you have to do is duplicate a report format and perform a few tricks with grouping. (See **Figure 3**.) Press Escape to bring up the Report menu. Type **4** and hit Return, then type **3** and hit Return again to choose *STOCK CALCULATIONS*. Hold down Right Arrow to move the cursor to the *U* in *CALCULATIONS*, press OA-Y, then type a dash followed by **GROUP** (so it becomes *STOCK CALC — GROUP*) and hit Return.

Try the following simple two-step procedure to produce group totals:

1. Arrange records according to stock exchange: Press the right-arrow key twice to reach the *EXCH* column, then press OA-A and hit Return twice to confirm *Category (EXCH)* and *From A to Z*.
2. Have AppleWorks group the records: Press Right Arrow twice to reach the *EXCH* column and press OA-G to toggle the group totals. Hit Return twice to just say *No* to *Print group totals only?* and *Go to a new page after each group total?*. Your first answer tells AppleWorks to print all records; the second, to print groups one after another, not one group per page.

Above the double lines, AppleWorks now displays *Group totals on: EXCH*.

Report 3 is a clone of Report 2, so print settings are the same. Be sure your printer is still on, then press OA-P and hit Return three times. The printer rolls out the report, and you're back in AppleWorks' *Report Format* screen again. This report

should look similar to the one in **Figure 3**. (As a group, your NYSE stocks fared better than either AMEX or OTC, which posted a loss because of the downturn in Alaska Mining's fortunes.)

If you want to print only a list of stocks on the New York Stock Exchange, it's just a matter of record selection. (You did the same thing last month, but in AppleWorks' labels format.) First press Escape to return to the *Report Format* screen. Now press Return, then type **3** and hit Return to display the *STOCK CALCULATIONS* report format.

Tell AppleWorks to select records by exchange: Press OA-R, type **3**, and hit Return. The screen now shows 12 selection criteria with the highlight on *equals*, which is what you want. Press Return again. Now type **NYSE** as the comparison information, and hit Return. The line at the top left of the screen shows *Selection: EXCH equals NYSE*. You have no other comparison information, so press the escape key.

Now print the report: Press OA-P and hit Return three times — you'll see a printout of the selected records that looks similar to the one in **Figure 4**. To return the selection to all records, press OA-R and type **Y**. That does it. Press OA-S to store the final version on disk.

A FEW FINAL WORDS

This database is a starting point for others you'll create with your own unique blend of categories, entries, and formulas. It's a good idea to include the company's main product or service, stock highs and lows for the year, selling prices and dates, sales commissions, notes to yourself, your account number and broker, and so on.

Next month we move on to some more exciting stuff. You'll learn to create a balance sheet that'll become a super spreadsheet when you add an income statement and financial ratios. □

RUTH K. WITKIN IS THE AUTHOR OF THE POPULAR TEMPLATE/HANDBOOK SERIES *SUCCESS WITH APPLEWORKS* (*INCIDER*, IDG COMMUNICATIONS/PETERBOROUGH), *THE BEST BOOK OF APPLEWORKS* (HOWARD W. SAMS & CO.), AND *PERSONAL MONEY MANAGEMENT WITH APPLEWORKS* (JOHN WILEY & SONS). WRITE TO HER AT 5 PATRICIA STREET, PLAINVIEW, NY 11803. ENCLOSE AN SASE IF YOU'D LIKE A REPLY.

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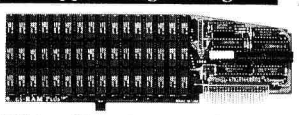

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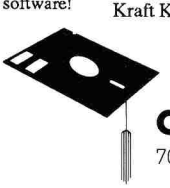

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FLIGHTS OF FANCY

For business or pleasure, desktop-published aerogrammes keep your overseas correspondence neat, attractive, and inexpensive.

By CYNTHIA E. FIELD, Ph.D.

REACHING OUT AND TOUCHING someone can be an expensive proposition, whether your message is delivered by fiber-optic cable or by mail carrier. And, given the U.S. Postal Service's pending rate hike, you may need to keep an especially watchful eye on the cost of personal letters that go winging their way overseas.

To its credit, the Postal Service sells a handy postage-paid (39 cents at press time) sheet of stationery called an *aerogramme*. When you finish writing your letter, follow the printed guidelines for folding it into an envelope, then moisten and seal its three pregummed flaps.

But there's the rub: You have to write the message by hand or type it on a typewriter (gasp!) to help keep the weight of the mailing piece within specifications. You can't use tape or stickers to seal the piece, nor can you insert any enclosures.

So what's a word-processing fan to do? Thanks to this month's template, it's a snap to transform the post office's humble stationery form into a desktop-published document.

Depending on the type size and style you choose, you may be able to squeeze in more words than ever before. Even better, you can use stylish typefaces and incorporate clip art and other graphics effects into these air-mail masterpieces.

THE EUROPEAN INFLUENCE

The inspiration behind this month's template is an Amsterdam-born *inCider* reader — Jake Keeser, former supervisor of the graphic-arts department at the Chevron Oil Field Research Company in La Habra, California.

Duplicating our version of Keeser's template is easy. Start up **Publish It! 3** and work in *Size to Fit* mode (Open apple-4). The features of this template are compatible with any version of Publish It!.

In fact, you should be able to replicate the design, consisting of six text frames, with virtually any Apple II desktop-publishing system.

This template requires two Publish It! pages, one for the back of the aerogramme, where the bulk of your letter's text appears, and one for the front, where your return address, the recipient's address, and any overflow text from your letter appear.

To add this second page to your document, use the pointer to click on the right paging arrow at the bottom of the screen.

Return to page 1 (representing the back of the aerogramme) and select the text tool. "Rubber-band" a text area of any size anywhere on the page: Press and hold the mouse button at any starting point, drag the mouse diagonally until the text area is the size and shape you want, then release the mouse button.

You can afford to be a little "sloppy" in creating objects with Publish It!'s tools, because the program offers a *Show Specifications* feature that lets you fine-tune any object's size and position.

Use the pointer to select the text frame you just drew. If it has "handles" at its corners, it's already selected, so you can skip that step. Press Open apple-M (or pull down the Objects menu and choose *Show Specifications*).

The dialog box that pops up displays the object's dimension specifications, precise to thousandths of an inch. Retype those ►

	Left Start	Top Start	Width	Height
Page 1 Text Frames				
Top	1.050	1.000	6.5000	0.500
Left	1.050	1.750	3.000	9.000
Right	4.550	1.750	3.000	9.000
Page 2 Text Frames				
Return Address	1.050	1.750	3.000	1.000
Recipient's Address	3.000	3.000	3.000	1.000
Bottom	1.050	8.500	6.500	2.250

Table. Specifications for template (inches).

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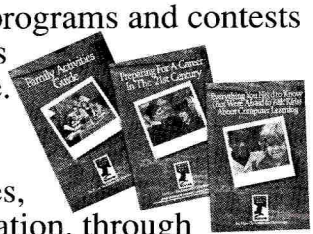

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specifications so that they agree with the values for the top text frame listed in the accompanying **Table**.

If you're using Publish It! 3, click on the *Locked* check box to cement the object into place. If you decide later to nudge the object a bit or resize it, unlock the object first by deselecting the check box. Locking objects is a prudent step; it prevents you from shifting them accidentally.

Repeat the sequence described above to replicate the remaining two text frames on page 1. Your template should now look like **Figure 1**.

In the top text area, Keeser likes to insert a dateline, such as "Costa Mesa . . . September 10, 1990." The two large text frames below the dateline area accommodate the bulk of a letter's text.

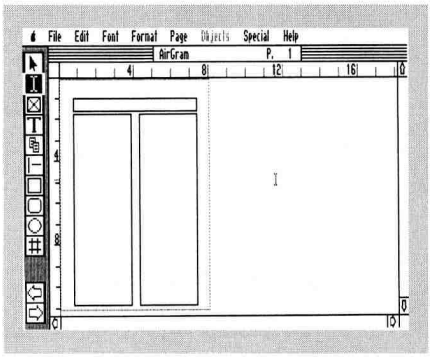

Figure 1. Page 1, template for back of aerogramme.

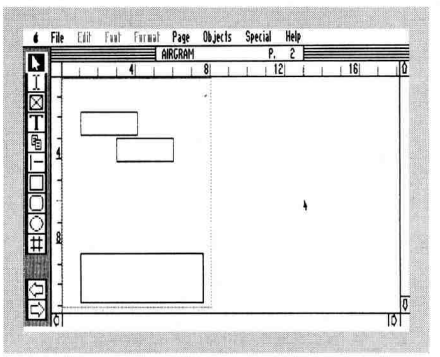

Figure 2. Page 2, template for front of aerogramme.

SOARING HIGHER

Switch to page 2 and duplicate the three text frames shown in **Figure 2**. The first of the upper frames will accommodate your return address; the next, the recipient's address. The lowest frame provides space for any overflow of your letter's text from page 1.

If you'd like to include your return address as part of the basic template and avoid retyping it each time you send a letter, place the I-beam into the return-address text frame, select the font you'd like to use, and type the information now. Picking a font is as easy as pressing Open apple-W (or selecting *Choose Font* from the Font menu) and then selecting one from the list that appears.

If you have trouble fitting your complete address into the text frame (the program beeps to warn you), select the text by dragging the I-beam over it with the mouse. Then choose a smaller type size, try a different typeface, or enlarge the text area.

For ease in editing a letter later on, link the body-text columns before saving the template: Return to page 1 and select the link tool; skip over the dateline text frame; click on the first long text column, then the second; switch to page 2 and click on the lowest of the three text frames. Now click on the link-tool icon in the toolbox to complete the chain of linked frames.

Now that your template's complete, save it with the name Jake Keeser chose (*AirGram*) or use another name that's meaningful to you. Press Open apple-A (or select *Save As* from the File menu) to name and save a file.

FREQUENT FLIERS

Thanks to our AirGram template, writing aerogramme letters is like flying first class. Just load the AirGram template and type your letter with Publish It!'s word processor.

First choose the I-beam tool and insert the cursor into the dateline text frame on page 1. Type the names of your town and state and then the date. Or use this area for some other type of text: your phone number and the date, your company logo, or even a headline.

Move the I-beam to the left-hand text column, choose a font, and begin typing your message. Because you've already linked the text columns, the program advances the I-beam automatically to the next text column on the page when you run out of room in the first column.

After the second column fills with text, click on the right paging arrow to move the I-beam to the bottom text area on page 2. Now finish entering the text of your letter there.

Because the text frames that comprise the body of your letter are linked, any changes you make on page 1 are reflected automatically on page 2. For example, if you delete a line of text from the first page, the first line of text from page 2 will flow back to page 1. On the other hand, if you add a paragraph to page 1, an equivalent amount of text at the end of the second column on page 1 will flow forward to page 2.

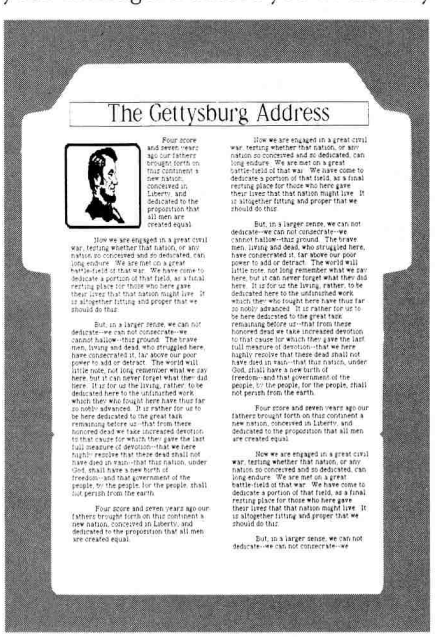

Figure 3. Back of finished aerogramme, with main text area.

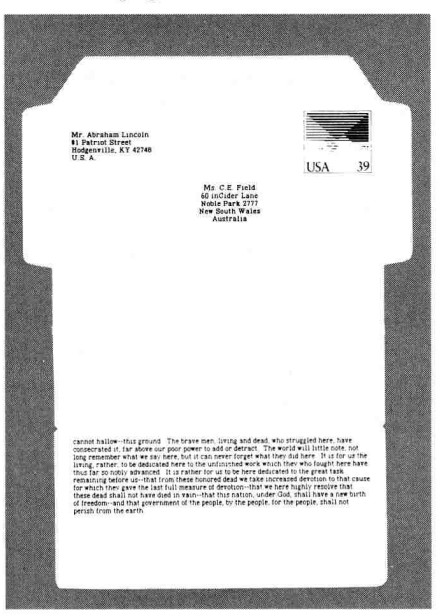

Figure 4. Front of finished aerogramme, showing address areas and text areas.

When you're finished writing and editing your letter, place the I-beam into the recipient's address-panel text frame near the top of page 2. Type the recipient's name and address.

If you'd like to keep copies of your letters on file, save the document under a unique name, such as *Keeser.12.11.90* (where *Keeser* is the recipient's name, and *12.11.90* represents the date you wrote the letter). Remember that Publish It! 3 limits you to 15 characters per filename.

If you prefer to create your document with a more full-featured word-processing program such as AppleWorks 3.0, all the better. Type your document, format it, check its spelling, and save it to a data disk, all with your word-processing program. Then start up Publish It! and open the AirGram template. Complete any preliminaries, such as typing the dateline and entering the recipient's address.

Now place the I-beam into the first large text column on page 1, insert your AppleWorks data disk into a drive, and select *Import AppleWorks* from Publish It!'s File menu. Choose the file you want from the directory that appears. Within moments the AppleWorks file will fill the prelinked columns in your aerogramme document.

The aerogramme's dimensions will make your ImageWriter II sense that it's out of paper after printing just a few lines. (The red LED on the front panel lights up.) To avoid this situation, use a regular piece of computer paper as a backer for the aerogramme. Align the aerogramme's top and left edges with the top and left edges of the backer page, and friction-feed this two-sheet sandwich into your printer. Line up the left edge with the left-hand vertical red mark on the ImageWriter's paper bail (the metal bar that rests atop the platen); line up the top edge of the paper with the horizontal red line on the plastic paper guide; and then advance the paper about a sixteenth of an inch.

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Now press Open apple-P; when the printer dialog appears, click on the *Pause Each Page* check box. Press the return key (or click on the *OK* button) to commence printing. When page 1 is finished, flip the aerogramme over and print page 2.

Aligning aerogrammes in other printers may require some practice. To avoid wasting them, print a sample AirGram letter on regular computer paper: Place a blank aerogramme on top and hold the package up to the light to see whether you've aligned the page properly.

When you've determined the appropriate alignment marks for your printer, insert the aerogramme and print the document. For your next aerogramme writing session, try to remember the alignment marks you used.

BAGGAGE RESTRICTIONS

We created our sample aerogramme publication (see **Figures 3** and **4**) not only to try Keeser's template, but to test a method we're devising that determines the number of words that will fit into Publish It! text frames. At least one newsletter publisher has written to us to ask for such assistance.

For our aerogramme experiment, we wanted about 1000 words of text, so we typed Lincoln's *Gettysburg Address* as an AppleWorks 3.0 word-processing file. We then used AppleWorks' copy command (Open apple-C) twice to lengthen it.

After importing the text into Publish It!, we still had some white space left over, so we incorporated the accompanying illustration of Abraham Lincoln, which we imported from Timeworks' **People, Places & Things** clip-art disk.

In next month's column, we'll describe the method we use to calculate the number of words that will fit into an aerogramme, and show you how to use our formula to figure the number of words you can fit into the desktop publications *you* create. □

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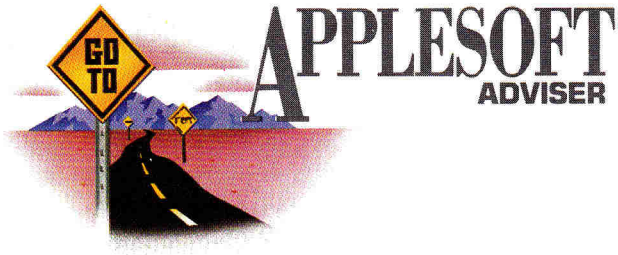

APPLESOFT ADVISER

THE BIG SCREEN

Now playing: hi-res graphics, in living color. BASIC directs the plot development, for images and animation you can program yourself, right on your II.

By DAN BISHOP

MORE THAN ANY OTHER FEATURE, high-resolution graphics made the Apple II a star in the early days of the microcomputer revolution. In the late 1970s it was the only mass-marketed machine with both color graphics and a whopping 280-column by 192-row screen resolution. These days there's plenty of competition, but one thing remains the same: Applesoft BASIC still makes the II's hi-res capability just about the easiest graphics system to program.

This month I'll introduce Applesoft's hi-res commands and demonstrate animation with hi-res graphics. Although animation is slower in BASIC than in machine language, you'll be amazed at what you can do if you apply some simple fundamental principles and keep your objects small.

One note before we get started: If you find yourself stuck in graphics mode and you want to return to text mode to work on your program, type TEXT, press Return, then type HOME, and press Return. Although you won't see the letters you type on screen, this procedure will switch your Apple back to text mode.

COMMAND PERFORMANCE

In some ways, Apple II high resolution is easier to use than low resolution. For one thing, you have to learn fewer commands. For another, Applesoft hi-res commands are more versatile.

To switch your Apple to hi-res display, for instance, you first give the command HGR or HGR2, depending on whether you want to use hi-res page 1 or hi-res page 2. Then tell your computer the color with which you want to begin drawing by issuing the HCOLOR=# command, where # is an integer between 0 (black) and 7 (white).

Instead of the three lo-res commands PLOT, HLIN, and VLIN, hi-res graphics has only a single plotting command, HPLOT, which you use to draw single points, horizontal, vertical, and diagonal lines, or a series of connected lines. And you can do all these things without a FOR/NEXT loop.

HPLOT uses screen coordinates to determine where to draw your point or line. You enter the coordinates after the HPLOT keyword as the point's column (horizontal) position, followed by a comma and the point's row (vertical) position. Point 0,0 is the upper left corner of your screen; the command HPLOT 0,0 draws a single point in that corner (assuming you've used HGR and HCOLOR already).

Because the full hi-res screen measures 280 columns across and 192 rows down, the first number in the coordinate pair may have a value of 0 through 279; the second number may have a value of 0 through 191. So HPLOT 279,191 places a single point in the lower right corner of your screen when your Apple is in full-screen mode.

To plot a single line between any two points on screen, Applesoft uses the connecting word TO between the coordinates of the two points that mark the start and end of the line. For example, HPLOT 0,0 TO 279,191 draws a diagonal line through the center of the screen, connecting the top left corner with the bottom right corner. You can draw hi-res lines running in any direction, anywhere on screen, with this simple command, and you don't need a FOR/NEXT loop.

You can draw several connected lines on screen simply by extending the expression with several TO s. For example, the following line draws a box around your screen and connects the four corners whose coordinates are given in the command:

```
PLOT 0,0 TO 279,0 TO 279,191 TO
0,191 TO 0,0
```

The only limit on the number of points you can connect this way with a single command is the 235-byte limit Applesoft places on a command line.

Listing 1, Random Radials, draws four lines from the center to the edges of your screen each time you press any key except Return (ASCII code 13), which terminates it. The program sets colors at random, sometimes to black. You can alter the code for automatic operation by changing line 70 to GOTO 35. To stop the program while it's running, press Control-Reset.

As with nearly all Applesoft BASIC commands that have numeric parameters, you may use variables in place of actual numbers. For example, HPLOT X1,Y1 TO X2, Y2 plots a line between two points ►

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Listing 1. Random Radials.

```
1  REM   RANDOM RADIALS  [2822]
2  REM   BY DAN BISHOP  [2746]
3  REM   APPLESOFT ADVISOR  [3476]
4  REM   INCIDER, SEPT. 1990  [4332]
5  REM  ********************  [3405]
6  REM   [186]
9  REM   PROTECT GRAPHICS PG.1  [4384]
10  HIMEM: 8192  [808]
14  REM  HIRES GRAPHICS PG 1  [4094]
15  HGR   [173]
19  REM  FULL PAGE GRAPHICS  [3610]
20  POKE  - 16302,0  [939]
24  REM  PAUSE FOR KEY PRESS  [3876]
25  GET X$  [666]
29  REM  END IF <RETURN> PRESSED  [4417]
30  IF  ASC (X$) = 13 THEN 100  [1351]
    8713  [3170]
35  HCOLOR=  INT ( RND (1) * 8)  [1323]
39  REM   SET RANDOM ENDPOINTS  [4134]
40 X =  INT ( RND (1) * 280)  [1618]
45 Y =  INT ( RND (1) * 192)  [1680]
49  REM   DRAW 4 LINES  [2468]
50  HPLOT 140,86 TO X,0  [1381]
55  HPLOT 140,86 TO X,191  [1469]
60  HPLOT 140,86 TO 0,Y  [1580]
65  HPLOT 140,86 TO 279,Y  [1803]
70  GOTO 25  [764]
99  REM  RESTORE TO TEXT MODE  [3990]
100  TEXT : HOME : END  [988]
```

Listing 2. Mum Burst.

```
1  REM  MUM-BURST  [1895]
2  REM  BY DAN BISHOP  [2746]
3  REM  APPLESOFT ADVISOR  [3476]
4  REM  INCIDER, SEPT. 1990  [4332]
5  REM  ********************  [3588]
6  REM   [186]
9  REM   PROTECT GRAPHICS PG.1  [4384]
10  HIMEM: 8192  [808]
13  HOME : INPUT "DO YOU WANT MANUAL OR AUTOMATIC CONTROL FOR
    THIS DEMONSTRATION? (M/A) :";C$  [5646]
14  IF C$ <  > "M" AND C$ <  > "A" THEN 13  [2507]
15  HGR : HOME  [388]
19  REM  PARAMETER INQUIRY  [3440]
20  IF C$ = "M" THEN  GOSUB 300  [1149]
24  REM  AUTOMATIC RUN.  [3003]
25  IF C$ = "A" THEN  GOSUB 400  [1103]
29  REM  DRAW FLOWER  [2237]
30  GOSUB 500  [685]
35  IF Z$ <  > "AUTO" GOTO 55  [2296]
39  REM  CHECK FOR USER INTERRUPT  [4965]
40 Z =  PEEK ( - 16384)  [1606]
45  IF Z = 211 GOTO 95  [998]
50  POKE  - 16368,0: GOTO 25  [1705]
55  HOME  [215]
65  HOME : VTAB 21  [794]
70  INPUT "ANOTHER RUN? (Y/N): ";Z$  [5314]
75  IF Z$ = "N" GOTO 95  [1347]
80  INPUT "ERASE SCREEN FIRST? (Y/N): ";Z$  [6687]
85  IF Z$ = "Y" THEN 15  [1551]
90  GOTO 20  [769]
95  TEXT : HOME : END  [926]
194  REM  [306]
195  REM  ********************  [2348]
196  REM  CALC. LINE ENDPTS  [1590]
197  REM  [316]
198  REM  ********************  [2414]
```

defined by (X1,Y1) and (X2,Y2). Make sure your variables always have appropriate values, corresponding to graphics-screen coordinates. Substitution of variables lets you use the generic HPLOT command in loops and subroutines.

PAGE AFTER PAGE

Applesoft BASIC reserves two areas of RAM (random-access memory) for hi-res graphics. These blocks are larger than those you need for lo-res graphics, because you're storing more points (53,760 versus 1920). Their RAM addresses are 8192 through 16383 (page 1) and 16384 through 24575 (page 2). (In hexadecimal notation, or base 16, those address ranges are $2000 through $3FFF and $4000 through $5FFF.) You must have more than 24,000 bytes (24K) of RAM in your computer to be able to use page 2.

The HGR command switches the screen mode to display the first block of hi-res memory. HGR2 displays the second block. Neither command changes the current value for color, so follow them immediately with an HCOLOR command to be sure the screen is defined for the hue you want. Both HGR and HGR2 clear the respective screen to black.

If you've already drawn on one screen, you can issue an appropriate POKE command to switch to the other screen without erasing your objects. POKE –16304,0 switches from text to hi-res mode without clearing your screen. (Usually you'll switch to hi-res page 1, because your text display is commonly page 1.) POKE –16299,0 switches from page 1 to page 2; POKE –16300,0 switches from page 2 to page 1. Neither command erases either graphics screen.

You may recall from previous columns (notably "Draw It in BASIC," May 1990, p. 72, and "Graphics Alive!" July 1990, p. 74) that lo-res graphics screens may be either full-screen or mixed text-plus-graphics. Mixed mode shortens the graphics-display window by four text rows, which appear at the bottom of the screen. Hi-res graphics screens also have these two modes. HGR switches you automatically into mixed mode, in which only 160 rows are available for graphics. To remove those four text lines from the bottom of your screen, you must give the command POKE –16302,0 right after HGR. POKE –16301,0 resets the screen to mixed mode. HGR2, on the other hand, uses full-screen graphics automatically. If you're using page 2 and want mixed mode, enter POKE –16301,0.

Your Apple II stores program code in RAM, beginning at address 2048. Variables are stored in memory above the last line of your program. If you have a moderately long program, with code extending beyond address 8192, where hi-res page 1 begins, the HGR command will wipe out part of your program. And because variables are stored in RAM above the last line of your code, your program may save variables to the hi-res page 1 area while it's running, destroying your image before your very eyes as your graphics screen fills with "garbage."

If you can squeeze your program and variable storage requirements into the 6143 bytes below address 8192, you can protect both graphics pages from harm with the command HIMEM: 8192. It must be the first command in your program; it tricks your Apple II into thinking that RAM addresses above 8192 are

unavailable for variable storage. If you can put all your graphics into page 2, however, set HIMEM:16384. This command protects only page 2, but it gives your program another 8192 bytes of space for code and variable storage.

COLOR YOUR WORLD

Hi-res color isn't as easy to program as lo-res. The values you can use with the HCOLOR command are 0 through 7 — but you don't actually have eight colors available. Only four are defined, and which ones they are depends not only on the value you assign to HCOLOR, but also on the column in which the dot you're plotting appears. Color values 0 and 4 are always black. In effect, they tell your computer to turn off anything displayed at the points specified by the HPLOT commands that follow. The odd-numbered HCOLOR values 1 and 5 result in green and orange, respectively, for points plotted in odd-numbered columns (1, 3, 5, and so on). If you plot your point with these colors in even-numbered columns, the result will be black. Similarly, the even-numbered HCOLOR values 2 and 6 result in violet and blue for points plotted in even-numbered columns, but black for points plotted in odd-numbered columns.

Color values 3 and 7, listed as white, actually display colored points at all times, regardless of column position. The particular color they display, however, does depend on column position. Color 3 provides a green point in odd columns and violet in even, just like colors 1 and 2; color 7 gives an orange point in odd columns and blue in even, just like colors 5 and 6. For white, set HCOLOR to 3 or 7 and plot two points side by side. With one point in an even column and its neighbor in an odd column, you have two adjacent points that are either violet and green or blue and orange, combinations that blend the dots to appear white.

The accompanying **Table** summarizes these relationships. If you want to draw vertical lines one point wide in hi-res mode without regard to whether the column in which the line appears is even or odd, the line will sometimes appear in one color, sometimes in another. (Of course, that's no problem on a monochrome monitor.)

HCOLOR	Even Column	Odd Column	Double Horizontal Dots
0	black	black	black
1	black	green	green
2	violet	black	violet
3	violet	green	white
4	black	black	black
5	black	orange	orange
6	blue	black	blue
7	blue	orange	white

Table. HCOLOR code conventions.

On the other hand, you can program your points "double wide," forcing the points and the line to appear white. But if you use HCOLOR value 1, 2, 5, or 6 for single-width vertical lines, you run the risk of some lines simply disappearing when the color value is incompatible with the even or odd column value, resulting in a combination that produces black.

You have to handle colored horizontal lines carefully, too, for HCOLOR value 3 or 7. If you simply HPLOT a horizontal line in either color, it will be white, because all dots in even and odd columns appear side by side. To get a specific color, use color 1, 2, 5, or 6 to produce a horizontal line that lights only alternating points. You can also use color 3 or 7 and place HPLOT in a FOR/NEXT loop that plots only every other dot. (Use the STEP 2 looping feature.) Depending on whether you start plotting in an even or an odd column, you'll get a single horizontal line of a specific color. ►

Listing 2 Continued

```
199  REM   [316]
200 AA = 3.14159 / N  [1205]
205  RETURN   [329]
210 Y2 =  SIN (A) * L + Y1  [2237]
215 Y3 = Y1 -  SIN (A) * L  [1565]
220 X3 = X1 -  COS (A) * L  [1559]
225 X2 =  COS (A) * L + X1  [2037]
230  RETURN   [317]
294  REM   [188]
295  REM  ********************  [3494]
296  REM  GET FLOWER PARAMETERS  [4193]
297  REM  ********************  [3494]
298  REM   [196]
300  HOME : VTAB 21  [442]
305  PRINT "ENTER COORDINATES FOR FLOWER CENTER:"  [7507]
310  INPUT "10 TO 269 FOR X: ";X1  [4149]
315  IF X1 < 10 OR X1 > 269 THEN 310  [2342]
320  INPUT "10 TO 149 FOR Y: ";Y1  [4789]
325  IF Y1 < 10 OR Y1 > 149 THEN 320  [2487]
330  HOME : VTAB 21  [782]
335  INPUT "ENTER NUMBER OF PETALS TO BE DRAWN: ";N  [7961]
340 SX = X1: IF 279 - X1 < SX THEN SX = 279 - X1  [3497]
345 SY = Y1: IF 159 - Y1 < SY THEN SY = 159 - Y1  [3469]
350 S = SX: IF SY < SX THEN S = SY  [2237]
355  HOME : VTAB 21  [844]
360  PRINT "ENTER FLOWER SIZE (1 TO "S"): ";  [6816]
365  INPUT L  [510]
370  IF L < 1 OR L > S THEN 360  [1916]
375  RETURN   [321]
394  REM   [196]
395  REM  ********************  [1022]
396  REM  GENERATE PARAMETERS  [1375]
397  REM  FOR AUTO OPERATION  [1513]
398  REM  ********************  [1044]
399  REM   [178]
400 X1 =  INT ( RND (1) * 259 + 10)  [2198]
405 Y1 =  INT ( RND (1) * 139 + 10)  [2268]
410 N =  INT ( RND (1) * 20 + 10)  [1791]
415 SX = X1: IF 279 - X1 < SX THEN SX = 279 - X1  [3366]
420 SY = Y1: IF 159 - Y1 < SY THEN SY = 159 - Y1  [3416]
425 S = SX: IF SY < SX THEN S = SY  [2104]
430 L =  INT ( RND (1) * (S - 10) + 10)  [2632]
435 Z$ = "AUTO"  [1063]
440  RETURN   [193]
495  REM   [306]
496  REM  ********************  [2028]
497  REM  DRAW FLOWER  [1030]
498  REM  ********************  [2028]
499  REM   [314]
500  GOSUB 200  [623]
505 A = 0  [635]
510  FOR I = 1 TO N  [993]
515  GOSUB 210  [637]
520 C =  INT ( RND (1) * 7 + 1)  [1711]
525  IF C = 4 THEN 520  [1337]
530  HCOLOR= C  [351]
535  HPLOT X3,Y3 TO X2,Y2  [1522]
545 A = A + AA  [794]
550  NEXT I  [437]
555  RETURN   [201]
```

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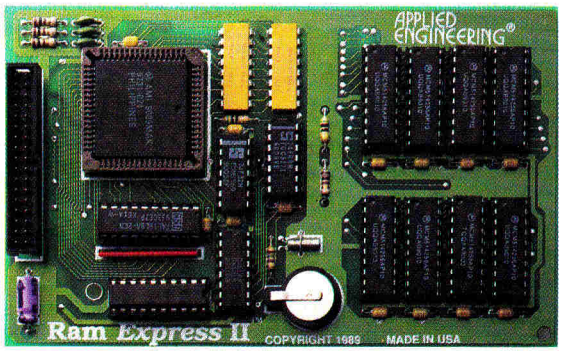

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Listing 3. Radar Ranger.

```
1  REM   RADAR RANGER  [2446]
2  REM  BY DAN BISHOP  [2746]
3  REM  APPLESOFT ADVISOR  [3476]
4  REM  INCIDER, SEPT. 1990  [4332]
5  REM  ********************  [3588]
6  REM   [186]
10  HIMEM: 8192  [808]
25  HGR   [161]
30  HOME   [167]
35  HCOLOR= 7  [346]
39  REM  DRAW INSTRUMENT PANEL  [4214]
40  GOSUB 200  [686]
44  REM  SET STARTING VALUES  [3984]
45 XX = 1:M1 = 1  [1432]
50 XS = 106:XE = 112  [1914]
55  HOME : VTAB 21  [494]
59  REM  SWEEP RADAR 360 DEGREES  [4435]
60  GOSUB 400  [704]
16649  [1898]
70  IF Z > 128 GOTO 95  [1560]
75  POKE  - 16368,0  [593]
80  IF XX = 1 GOTO 60  [1313]
85  GOSUB 400  [957]
90  GOTO 45  [768]
95  TEXT : HOME : END  [926]
194  REM   [306]
195  REM  ********************  [2348]
196  REM  DRAW INSTRUMENT PANEL  [1687]
197  REM  ********************  [2436]
198  REM   [314]
200 PI = 3.14159  [815]
205  FOR I = 0 TO PI STEP 0.02  [2063]
210 X1 =  COS (I) * 50  [1552]
215 Y1 =  SIN (I) * 50  [1556]
220  HPLOT 85 + X1,85 + Y1  [1898]
225  HPLOT 190 + X1,85 + Y1  [2040]
230  HPLOT 85 - X1,85 - Y1  [2108]
235  HPLOT 190 - X1,85 - Y1  [2000]
240  NEXT I  [413]
245  FOR I = 140 TO 240 STEP 2  [1923]
250 Y =  SQR (2500 - (I - 190) * (I - 190)) + 85  [4252]
255  HPLOT I,82 TO I,Y  [1215]
260  NEXT I  [346]
265  GOSUB 1030  [842]
270  HPLOT 140,85 TO 240,85  [1810]
275  HPLOT 191,35 TO 191,135  [1873]
280  HPLOT 190,35 TO 190,135  [1914]
285  RETURN  [205]
394  REM   [196]
395  REM  ********************  [1022]
396  REM  CALC. RADAR SWEEP &  [1440]
397  REM  CALL BOAT ROUTINES  [1516]
398  REM  ********************  [983]
399  REM   [178]
400  FOR I = PI TO 0 STEP  - 0.03  [1590]
405 X1 =  COS (I) * 48  [1758]
410 Y1 =  SIN (I) * 48  [1742]
415 XB = XA:YB = YA  [1539]
420 XA = 85 + X1  [1497]
425 YA = 85 - Y1  [1517]
430  GOSUB 500: IF XX = 0 GOTO 435  [2018]
431  IF I < 1.59 AND I > 1.56 THEN  GOSUB 700: GOSUB 800  [3193]
432  IF I < 0.74 AND I > 0.71 THEN  GOSUB 835: GOSUB 700  [3266]
433  IF I < 2.38 AND I > 2.35 THEN  GOSUB 700  [2903]
435  NEXT I  [361]
436  IF XX = 1 THEN  GOSUB 700: GOSUB 850  [1712]
440  FOR I = 0 TO  - PI STEP  - 0.03  [2076]
445 X1 =  COS (I) * 48  [1718]
450 Y1 =  SIN (I) * 48  [1478]
```

Listing 3 continued next page

Listing 3 Continued

```
455 XB = XA:YB = YA  [1539]
460 XA = 85 + X1  [1153]
465 YA = 85 - Y1  [1173]
470  GOSUB 500: IF XX = 0 THEN  GOTO 475  [1915]
471  IF I <  - 1.55 AND I >  - 1.58 THEN  GOSUB 700  [3187]
472  IF I <  - 0.81 AND I >  - 0.84 THEN  GOSUB 875: GOSUB 700  [3730]
473  IF I <  - 2.36 AND I >  - 2.39 THEN  GOSUB 700  [3195]
475  NEXT I  [337]
476  IF XX = 1 THEN  GOSUB 700  [1750]
480  IF XX = 1 THEN  GOSUB 700  [1746]
485  RETURN  [317]
494  REM  [332]
495  REM  ********************  [2006]
496  REM  DRAW RADAR SWEEP  [1205]
497  REM  ********************  [2006]
498  REM  [308]
500  HCOLOR= 7  [428]
505  HPLOT 85,85 TO XA,YA  [1876]
510  HPLOT 86,85 TO XA + 1,YA  [1679]
515  HCOLOR= 0  [323]
520  HPLOT 85,85 TO XB,YB  [1417]
525  HPLOT 86,85 TO XB + 1,YB  [2132]
530  HCOLOR= 7: RETURN  [528]
594  REM  [314]
595  REM  ********************  [4676]
596  REM  BOAT DRAWING ROUTINES  [4384]
597  REM  ********************  [4676]
598  REM  [322]
600  HPLOT X6,81 TO X6 + 11,81  [2494]
601  HPLOT X6,80 TO X6 + 11,80  [2491]
602  HPLOT X6 + 4,79 TO X6 + 9,79  [1878]
603  HPLOT X6 + 4,78 TO X6 + 9,78  [1873]
604  HPLOT X6 + 7,77 TO X6 + 7,76: RETURN  [2066]
605  HPLOT 151,77 TO 151,76  [1842]
606  HPLOT 148,78 TO 153,78  [1912]
607  HPLOT 148,79 TO 153,79  [1916]
608  HPLOT 144,80 TO 155,80  [1857]
609  HPLOT 144,81 TO 155,81: RETURN  [2060]
610  HPLOT 151,78 TO 151,77  [1896]
611  HPLOT 148,79 TO 153,79  [1920]
612  HPLOT 148,80 TO 153,80  [1937]
613  HPLOT 146,81 TO 155,81  [1889]
614  RETURN  [321]
615  HPLOT 151,78: HPLOT 149,79 TO 153,79  [3662]
616  HPLOT 149,80 TO 153,80: HPLOT 147,81 TO 155,81: RETURN  [3995]
617  HPLOT X6,79 TO X6 + 3,79  [2445]
618  HPLOT X6,78 TO X6 + 3,78  [2462]
619  HPLOT X6 + 1,77 TO X6 + 1,76: RETURN  [2075]
620  HPLOT 151,79: HPLOT 150,80 TO 152,80  [3604]
621  HPLOT 149,81 TO 153,81: RETURN  [2119]
622  HPLOT X6,79 TO X6 + 1,79  [2424]
623  HPLOT X6,78 TO X6 + 1,78: RETURN  [2726]
625  HPLOT 151,80: HPLOT 150,81 TO 152,81: RETURN  [3824]
626  HPLOT X6,80 TO X6 + 1,80: RETURN  [2775]
628  HPLOT 151,81: RETURN  [2018]
630  HPLOT X6 + 10,81 TO X6 + 11,81  [2033]
631  HPLOT X6 + 10,80 TO X6 + 11,80  [2033]
632  HPLOT X6 + 8,79 TO X6 + 9,79  [1908]
633  HPLOT X6 + 8,78 TO X6 + 9,78  [1903]
634  HPLOT X6 + 7,77 TO X6 + 7,76  [1915]
635  HCOLOR= 0  [587]
646  HPLOT X6 - 2,81 TO X6 - 1,81  [2438]
647  HPLOT X6 - 2,80 TO X6 - 1,80  [2439]
648  HPLOT X6 + 2,79 TO X6 + 3,79  [2436]
649  HPLOT X6 + 2,78 TO X6 + 3,78  [2431]
650  HPLOT X6 + 5,77 TO X6 + 5,76  [2439]
651  HCOLOR= 7: RETURN  [393]
694  REM  [194]
695  REM  ********************  [625]
```

Listing 3 Continued page 79

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Listing 2, Mum Burst, draws flowers on your screen. It contains only one HPLOT command in subroutine 500. The FOR/NEXT loop executes it N times, where *N* is the number of petals. The program uses simple trigonometric formulas in the subroutine at line 200 to calculate points on the circumference of a circle and determine the line endpoints.

You can run Mum Burst in automatic mode, controlled by the subroutine at line 400, or in manual. If you select manual, the program prompts you to designate the flower's location on screen, number of petals, and petal length. After the program draws each flower, you can choose to erase the screen or to leave it intact before drawing another flower. If you run the program in automatic, you can terminate it by pressing the S key or Control-Reset.

BRINGING GRAPHICS TO LIFE

Listing 3, Radar Ranger, demonstrates that the same principles of animation I described in the July column (p. 74) on lo-res graphics apply as well to high resolution. You can stop this program by pressing any key; the program will come to a halt when the radar sweep completes its 360-degree scan. Otherwise, it operates continuously without intervention.

Radar Ranger first draws two hi-res circles on screen to represent a radar scope and a periscope. It uses the same trigonometric calculations as **Listing 2**. The three buttons on the instrument panel are located just above text line 21. The screen's mixed text-plus-graphics mode lets you add descriptive information just beneath the buttons with simple PRINT commands.

HCOLOR is 7. If you have a color monitor, the circles are made up of white, blue, and orange dots. Based on color's dependence on column number, as described above, you should be able to explain their appearance. To make the circles white, change lines 220 through 235 so that the program plots two adjacent points instead of one, as in the following line:

220 HPLOT 85 + X1,85 + Y1 TO 86 + X1,85 + Y1

Note that the vertical lines in the button boxes are double wide and appear uniformly white.

The sweep arm within the radar scope is the first animated object you see. To keep it from flickering with different colors, each dot is actually two hi-res dots wide. The sweep arm is formed by plotting all points as horizontal pairs; the line always appears white. The illusion of movement comes from drawing the line, then erasing it, then drawing it again in a different position. To reduce the flicker, erase only the trailing points and draw the leading-edge points just ahead of the previous lead line. Half the sweep arm is always on screen; the line is never completely erased.

The second animated object is the radar blip. This image appears when the sweep arm passes through it, then gradually fades and disappears as the sweep arm progresses around the scope. The third animated object is the target ship that appears within the periscope sights. The program changes the object's size or position with each eighth of a revolution of the sweep arm. During the phase in which the object approaches the observer, you don't have to erase the former object, because it's growing in size; the new image simply draws over the old. Once the object starts moving across the periscope, however, the sequence of drawing and erasing images produces the animation effect.

Listing 3 Continued from page 77

```
 696  REM  BOAT CALCULATIONS  [1385]
 697  REM  ******************  [627]
 698  REM   [202]
 700 XS = XS + 2:XE = XE + 2  [2384]
 705  IF XE = 140 THEN  GOSUB 628: RETURN   [2384]
 706  IF XE = 142 THEN  GOSUB 625: RETURN   [2384]
 710  IF XE = 144 THEN  GOSUB 620: GOSUB 1010: GOSUB 1075:
    RETURN   [4332]
 715  IF XE = 146 THEN  GOSUB 615: RETURN   [2443]
 720  IF XE = 148 THEN  GOSUB 610: RETURN   [2413]
 725  IF XE = 150 THEN  GOSUB 605: RETURN   [2382]
 735  IF XE = 186 THEN  GOSUB 1020: GOSUB 1080  [2947]
 740  IF XE >  = 152 THEN X6 = XS: GOSUB 630  [2367]
 745  IF XE = 196 THEN  GOSUB 900: HCOLOR= 0: GOSUB 600:
    HCOLOR= 7: GOSUB 275  [4874]
 750  RETURN   [305]
 794  REM   [204]
 795  REM  ********************  [3262]
 796  REM  DRAW RADAR BLIP  [3206]
 797  REM  ********************  [3478]
 798  REM   [180]
 800  HPLOT 79,60 TO 83,60  [1580]
 805  HPLOT 80,59 TO 82,59  [1590]
 810  HPLOT 81,58  [1031]
 815  HPLOT 80,61 TO 82,61  [1520]
 820  HPLOT 81,62  [993]
 825  IF M1 = 1 THEN  GOSUB 1000: GOSUB 1070:M1 = 0  [3329]
 830  RETURN   [305]
 835  HCOLOR= 0  [510]
 840  HPLOT 81,62: HPLOT 81,58  [2198]
 845  GOTO 885  [983]
 850  HCOLOR= 0  [531]
 855  HPLOT 80,59 TO 82,59  [1568]
 860  HPLOT 80,61 TO 82,61  [1621]
 865  HPLOT 79,60: HPLOT 83,60  [2264]
 870  GOTO 885  [990]
 875  HCOLOR= 0  [566]
 880  HPLOT 80,60 TO 82,60  [1581]
 885  HCOLOR= 7: RETURN   [892]
 894  REM   [180]
 895  REM  ********************  [918]
 896  REM  DRAW EXPLOSION  [962]
 897  REM  ********************  [1006]
 898  REM   [188]
 900  HCOLOR= 7: GOSUB 950  [839]
 905  HCOLOR= 0: GOSUB 950  [877]
 910  HOME : VTAB 21  [698]
 915  PRINT "CONGRATULATIONS!  DIRECT HIT!"  [1979]
 920  HCOLOR= 7: GOSUB 265  [853]
 925 XX = 0  [744]
 930  HCOLOR= 0  [227]
 935  GOSUB 1070: GOSUB 1075: GOSUB 1080  [1495]
 940  HCOLOR= 7: RETURN   [423]
 950  HPLOT 190,81 TO 185,79  [2002]
 955  HPLOT 190,81 TO 185,76  [1976]
 960  HPLOT 190,81 TO 187,74  [1957]
 965  HPLOT 190,81 TO 189,72  [1974]
 970  HPLOT 190,81 TO 191,72  [1944]
 975  HPLOT 190,81 TO 193,74  [1975]
 980  HPLOT 190,81 TO 195,76  [1966]
 985  HPLOT 190,81 TO 195,79  [1976]
 990  RETURN   [305]
 994  REM   [316]
 995  REM  ********************  [2414]
 996  REM   MESSAGES  [766]
 997  REM  ********************  [2342]
 998  REM   [324]
1000  HOME : VTAB 21  [1102]
1005  PRINT "TORPEDO ALERT": PRINT "RADAR SIGHTING": RETURN   [4914]
```

Listing 3 Continued page 80

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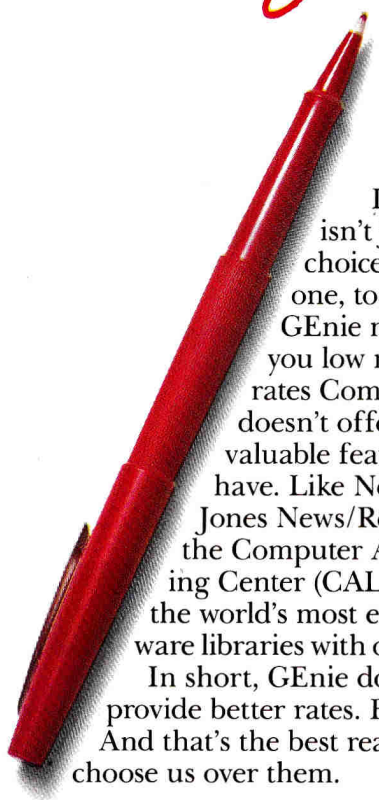

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Listing 3 Continued from page 79

```
1010  VTAB 21: HTAB 20: PRINT "ARM";  [1902]
1015  VTAB 22: HTAB 18: PRINT "TORPEDOS";: RETURN   [2595]
1020  VTAB 21: HTAB 33: PRINT "FIRE";  [2113]
1025  VTAB 22: HTAB 31: PRINT "TORPEDO";: RETURN   [3377]
1026  REM   [186]
1027  REM  ********************  [3588]
1028  REM  DRAW PANEL BUTTONS  [3753]
1029  REM   [196]
1030 B = 37: GOSUB 1050  [863]
1035 B = 137: GOSUB 1050  [1042]
1040 B = 227: GOSUB 1050  [1075]
1045  RETURN   [193]
1050  HPLOT B,156 TO B + 16,156 TO B + 16,150 TO B,150 TO
   B,156  [5781]
```

Listing 3 Continued

```
1055  HPLOT B - 1,156 TO B - 1,150  [1577]
1060  HPLOT B + 17,156 TO B + 17,150: RETURN   [2114]
1064  REM   [202]
1065  REM  ********************  [3604]
1066  REM  DRAW BUTTON LIGHTS  [3506]
1067  REM  ********************  [3604]
1068  REM   [178]
1070 B = 39: GOSUB 1090: RETURN   [1110]
1075 B = 139: GOSUB 1090: RETURN   [1313]
1080 B = 229: GOSUB 1090: RETURN   [1378]
1090  FOR J = B TO B + 12 STEP 2  [1490]
1095  HPLOT J,151 TO J,155  [1311]
2000  NEXT J: RETURN   [516]
```

As with the sweep arm, erase only the trailing edge while redrawing the leading edge; the bulk of the object stays on screen. Again, this sequence eliminates flicker and speeds up the program's drawing routines. The program draws the blue water in the periscope field with color 7, by plotting vertical lines only in even-numbered columns. The orange lights in the button boxes also use 7, with points plotted only in odd-numbered columns.

TRICKS OF THE TRADE

Almost every graphics trick you've seen in commercial Apple II software you can now do in BASIC. We'll enhance "the basics" next time with a discussion of shape tables, which let you speed up your animation without learning machine language or binary notation.

In later columns we'll move on to procedures for getting around that bothersome hi-res memory design (it's right in the middle of RAM, where it interferes with program storage), and a description of a simple method for creating letters and symbols on the hi-res graphics screen. Graphics programming isn't so mysterious after all. Take that, Big Blue!□

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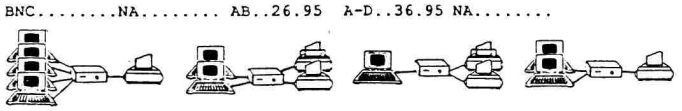

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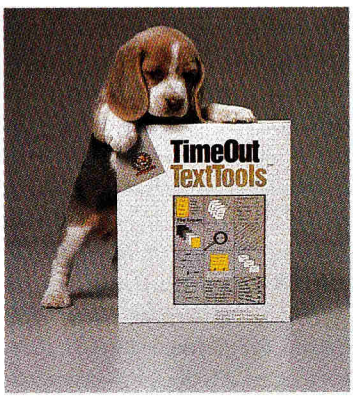

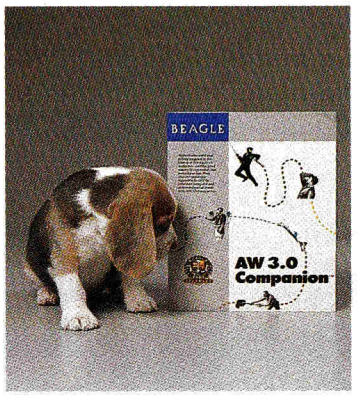

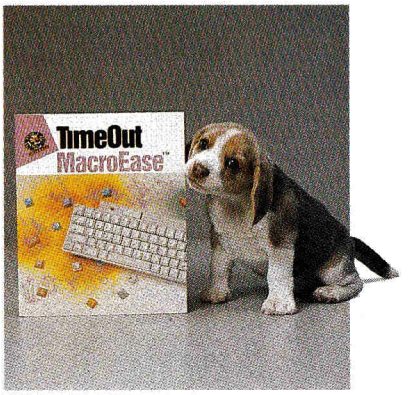

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Continued from p. 39

the *Fifty States* map and the *Region* map. Your young geographers can even view maps with either metric or English units of measurement.

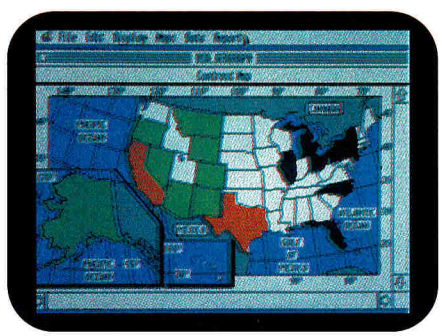
LIFE IN THE USA

USA GeoGraph is computer-enhanced education at its best. Budding geographers aged 10 and up can learn to locate each state by latitude and longitude, or by recognizing its neighboring states. Students can learn to describe a state by physical characteristics such as total area, elevation, and natural features, as well as its sociocultural and ethnic makeup. USA GeoGraph also provides data so that students can explore the similarities among states within the same region of the country.

To view a particular state or territory, young geographers can call up data cards; each card contains 105 categories of information, such as population statistics, ethnic group composition, birth and death rates, borders, energy consumption, industry, gross domestic product, and labor-force figures. Students can use one category to compare a state or territory with the rest of the country, or they can use several categories to examine many states.

Students operate this program with pull-down menus, point-and-click mouse control, scroll bars, dialog boxes, and keyboard equivalents for several menu commands. (It operates in much the same way as its cousin, World GeoGraph.) Although it takes some time to learn all the features, USA GeoGraph's friendly interface and well-written manual make it easy to master. There's also an optional teaching guide that provides lesson plans and activity suggestions for classroom use.

USA GeoGraph's documentation reveals several shortcuts that speed up program operation; don't be tempted to run the program without consulting the documentation. By clicking on a state or a territory, for example, students select it in the database automatically. Also, by holding down the apple key and clicking the mouse, young geographers zoom from the *Fifty States* map to the *Region* map. By pressing the apple key and clicking the mouse again, they zoom to view the *Close-up* map; by pressing the option key and the apple key while clicking the mouse, they zoom back to the *Fifty States* map. If they press only the apple key, they toggle from data card to data table or vice versa.



Exploring the USA on screen.

Another method for viewing a close-up map is to pick *Select Places* from the Data menu, and choose a state from the list. If your students don't want to scroll through the entire list to reach a particular state, however, they can type the first letter of the state or territory and USA GeoGraph moves the cursor to the first entry that begins with that letter. Unfortunately, this

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handy shortcut doesn't work on every list, and kids can't use it to select more than one state at a time.

THIS LAND IS YOUR LAND

When students begin working with USA GeoGraph, they see an overview map that shows United States geography and includes the countries and the bodies of water that create the nation's borders. There's also an option to view state boundaries, even though the states' names don't appear on the first map.

When your geographers select *Fifty States* from the Maps menu they zoom to the continental United States (Alaska and Hawaii appear as insets) to examine 50 states by 24 topics, such as settlement patterns, acid-rain levels, population density, and agricultural regions. Once kids pick a theme, a color-coded map of the states appears on screen. If they click on *Show Key* in the Maps menu they see a color key.

With this version, students can use the theme maps at only the 50-states level — USA GeoGraph can't zoom in for theme close-ups of the regions. Without this close-up view, the states in the Northeast are so bunched together that it's difficult to identify their color codes. (MECC attributes this programming decision to GS memory limitations, but now that the machine comes with a megabyte of RAM, MECC should consider adding regional maps.)

Instead of hunting through all database records, young geographers can use the search command in the Data menu to find specific information. After performing the search they can display the information either on a map or in a table, and they can sort it alphabetically (by state name) or numerically. Students can view numeric data either in a bar graph or a distribution table listing information in deciles (ranked tenths) or quartiles (ranked quarters).

In addition to displaying lists of data, USA GeoGraph can tabulate numeric data into a color-coded map. If students want to examine ranked quartiles of the category *Population Age 65 and Over*, for example, they'll see in blue the top 25 percent of the states with the largest elderly populations, states with the second highest percentage group shown in green, and so on. Some states are so small that it's difficult to discern which quartile they fall into, but you ►

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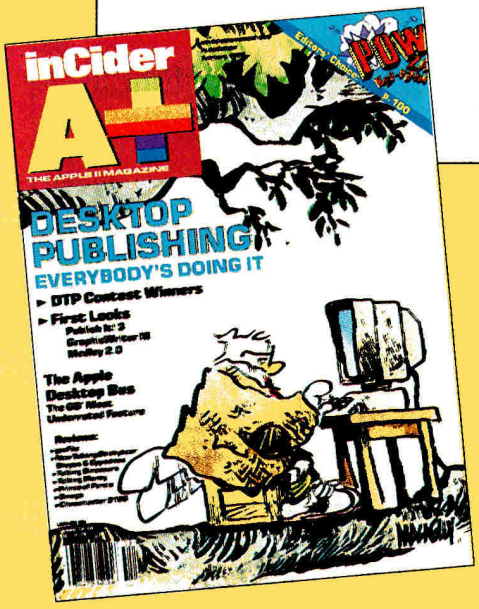

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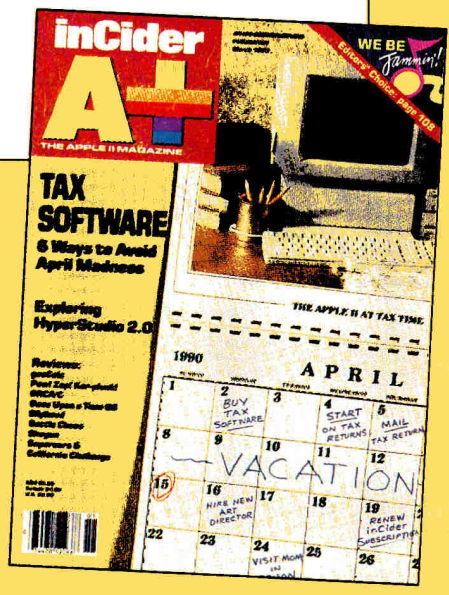

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can zoom in for a closer look and inspect the data more closely in a *Region* map .

When students finish collecting and analyzing data they can create reports consisting of the maps, data tables, data cards, graphs, or distribution tables viewed during a single work session. Students can add new sections, or delete or replace unwanted sections of their reports. Although you can't change or update the database entries in USA GeoGraph, you can save data in DIF or text-file format and export the information to other applications — then you can modify the data.

Students can either print full reports, or just a dump of a current screen on an ImageWriter, LaserWriter, or Epson mode printer. USA GeoGraph will generate color printouts on an ImageWriter equipped with a color ribbon.

HOME SWEET HOME

USA GeoGraph is an impressive product, but MECC could improve it if they removed the copy protection. If students run the program from a hard disk, they have to insert the original program disk every time they open it. This tedious procedure slows program operation.

Despite some minor limitations, USA GeoGraph is a powerhouse of information about the people and places of the United States. The program operates quickly and efficiently, and isn't hampered by a slow screen-redrawing speed. By combining text and graphics in an innovative way, USA GeoGraph makes a tremendous amount of data available instantly. (In fact, printing the entire USA GeoGraph database on an ImageWriter in draft mode would take more than an hour and would produce a three-inch stack of paper.) USA GeoGraph makes classroom geography come alive.

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

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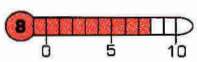

Admit it — your disk box is a mess. With all those unlabeled disks, you can't locate your latest word-processor files. And with four floppies that have "Graphics" scribbled on them, you can't tell if they're Print Shop or Paintworks Gold.

Instead of throwing away those mystery disks and starting from scratch, try a new product called Graphic Disk Labeler — a utility that's quick, easy, and, best of all, fun to use. You'll create great-looking labels and keep your collection organized.

LABELS MADE EASY

When you boot up Graphic Disk Labeler (GDL) you'll see the title screen and an option to select 320 or 640 mode. Although you can't change modes in GDL without rebooting, the program takes only a few seconds to load. (It's even faster from a hard drive, and hard-disk installation is

a snap because GDL isn't copy-protected.) Graphic Disk Labeler operates under GS/OS 5.0.2 or higher, and requires a color monitor, one 3.5-inch disk drive, and an ImageWriter II printer (color ribbon recommended).

If you've used a GS, the GDL menu will be familiar. Along with the usual cut, paste, and print options are a number of specific commands that are clearly explained in the manual.

If you hate reading manuals, you won't mind this one; its 13 pages cover almost any question. In the documentation you'll also find a short tutorial explaining how to make a label for the unadorned GDL program disk.

The center of the work screen shows the label window. At the top is the back of the disk label, where you can enter a single line of text. In the default label mode, this line prints upside-down so that it will be properly oriented when you attach the label to a disk. If you select the *Sticker* option, the line prints right-side up. Below the label back is the *spline* — a small line of type on the area of the label that folds over the disk's edge. (GDL provides a special font for this purpose.) The label spline is particularly useful if you're working in 640 mode.

The largest part of the window shows the front of the label — where you'll place

Clean up that collection of disks.

your picture. Graphic Disk Labeler isn't particular about the type of graphics you put on your labels — you can use Print Shop GS pictures, super-hi-res graphics, ultra-hi-res, or even icons. (Or if you prefer, you can produce labels without any graphics at all.)

If you select Print Shop GS graphics you'll bring up the Open-File menu. Any Print Shop graphic you choose will be sized to fit the label automatically. Choosing an icon lets you use system icons or those created with any icon-editing program. You can enlarge icons to fill the entire label, use them as they appear on your screen, or print them at each corner. The last two commands give you room to write on the label.

The *Shrink to Fit* and *Clip* commands let you manipulate artwork for your labels. With *Shrink to Fit* you can convert a full-screen 320- or 640- mode graphic to label size, and with *Clip* you can capture part of a picture without reducing its size. The *Clip* command is also useful if you want to extract small pieces of clip art from a screen.

If you add a bit of white space above or below the picture as you clip, you'll have room to type a line or two on your label in any font you have on disk. The default text alignment is centered, although you can select right, left, and full justification if you prefer.

If imported graphics images aren't what you want, GDL offers a resident paint program that features *Rectangle* and *Circle Outlines*, *Fill*, *Zoom*, and *Undo*. The *Snapshot* command saves the label as a graphics file so that you can edit it further. Don't expect GDL to take the place of a full-featured paint program — that's not its purpose. Instead, use it for any last-minute editing and it'll serve you well.

Now what do after you've spruced up your disks? Do you put away GDL until your next backup needs a label? You could, but that would be a waste of a good program.

Try using the *Sticker* option (the one that lets you print lines right-side up) to design personalized bookplates. Then when you're through with the library, create labels for all those mysterious boxes down in the workshop or the sewing room.

If you're proud of your jars of pickled green beans and home brew, try labeling them. Or you could make stickers for the spines and covers of your scrapbooks and photograph albums — maybe then you wouldn't grab your vacation snapshots when you want to add a baseball card to your collection. With Graphic Disk Labeler, your imagination is the only limit. □

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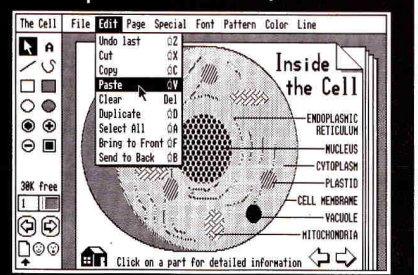

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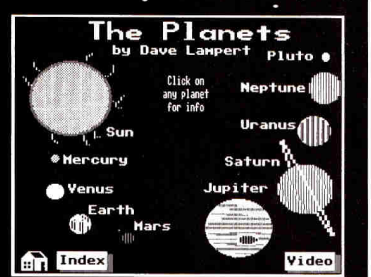

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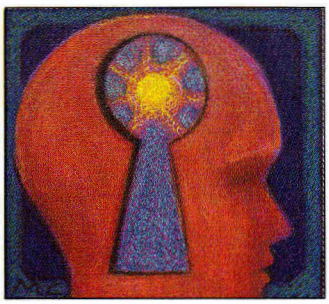

LEARNING CURVE

MUSIC TO MY EARS

By DAVID D. THORNBURG, Ph.D.

To be human is to make music. The Apple II can help students explore ideas they simply can't express any other way.

Through my influence human nature has been uplifted, sweetened and refined . . . . I have a myriad of voices and instruments. I am in the hearts of all men . . . . I am music.

— Allan C. Inman

THE UNIVERSALITY OF MUSIC AMONG all cultures on this planet is often ignored in the classroom. In many school classrooms music is rarely, if ever, heard. And yet, as any survey of the radio dial will show, music pervades society.

I thought about the importance of music, and music education, on a recent visit to Southern Illinois University at Edwardsville (SIUE), where I had the pleasure of conducting some workshops for students and faculty on creativity and whole-mind education.

During this visit I spent some time with Warren Joseph, who, in addition to his teaching and research at the university, has spent several years establishing a computer lab in the school's music department. It houses a mix of Macs and Apple IIs connected to a wide range of synthesizers, from consumer-grade Casio models to the magnificent Kurzweil 250.

SINGING IN THE BRAIN

The SIUE project that intrigued me most was a music-theory instruction program Dr. Joseph designed to work with the Apple II. Versions of this system, called **Micro Notes** (from Teachnology, 11220 West Florissant, Suite 303, St. Louis, MO 63033, 618-466-1775, $495), are now available for both the IIe and the GS. The IIe version requires a MIDI interface and an external synthesizer. (See "Is It Live or Is It Apple II?" in the August 1990 issue, p. 52, for more information on making music with your Apple II.) The course uses Micro Notes' computer-generated musical illustrations, which follow a sequence of instructions designed to help students gain proficiency in several aspects of music, from sight reading to the development of perfect pitch.

One of the central components of the system is a pitch-recognition card that plugs into an Apple II slot. When a student sings or plays an instrument into the microphone included with the card, the computer recognizes the pitch and displays it on a musical staff on screen. Because the system detects actual pitch, it can also determine whether the student is slightly off and indicate that, as well. The program lets the student set the tolerance level for accuracy, allowing as little or as much latitude as he or she wants.

If you've seen the Breakaway Vocalizer, a self-contained instrument that converts vocal input to MIDI signals and plays them through a built-in synthesizer, you've got some idea of what this board lets you do. You can set up the Micro Notes card, however — unlike the Breakaway system — to handle harmonic-rich instruments such as clarinets and saxophones, instruments that have been known to stump pitch recognizers in the past.

The beauty of basing a music-theory course around the student's creation of sounds is that the theory and the music are never separated. If asked to identify C on the treble-clef staff, the student sings the note to move the cursor to the proper position instead of moving it with keystrokes or a mouse. A student exploring the rich variety of seventh chords can enter responses by singing a chord one note at a time.

Micro Notes also drives any MIDI-based instrument, so the student can hear musical prompts and activities played with high-quality sounds instead of raspy computer-generated tones. As the student sings each note correctly, the synthesizer echoes it to reinforce success. The student can also practice singing one part of a multipart piece by choosing one voice and letting the synthesizer play the remaining voices in time to the student's singing.

Because of the immediate visual and auditory feedback the Micro Notes system provides, Dr. Joseph has found that people who claim to be ►

Not all modems are created equal.

The right modem can change the way you use your computer. Modems allow you to step outside the limitations of your own hardware and software. But the degree to which you are benefitted by your modem is directly proportional to the quality of modem you select.

Not all modems are created equal. A new generation of 2400 baud modems, both internal and external, have appeared on the scene as of late. While Hayes AT compatibility and equivalent raw transmission speed can be expected, there are differences. Some are subtle. Others, quite significant.

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Other advantages are more evident. Like the inclusion of sophisticated, genuinely useable communications software, something others offer as an expensive option.

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While most people just plug the DataLink 2400 in and go, advanced users will find a host of sophisticated features like the ability to select firmware defaults of baud rate, data format, parity and control interrupts. Other modems require a set of obscure commands when running from firmware or don't allow you to disable interrupts.

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**OnLine 64* and DataLink have most, but not all the features of *DataTerm* and DataLink 2400 respectively.

tone deaf can learn to sing with perfect pitch in just a short time. Perfect pitch isn't just something you're born with; with the right kind of visual and auditory feedback, you can acquire perfect pitch with practice.

TESTS THAT TEACH

In addition to the theory course, Micro Notes also provides interactive quizzes to test for mastery of the material. Even though the format is multiple choice, the coaching the program provides after a wrong answer is so thorough that the quiz becomes an integral part of your students' learning experience.

"Kids are so used to being told what they are doing wrong," explains Dr. Joseph, "that we need to let them know what they are doing right." His philosophy shows in the gentle guidance the program's clues provide. Each one takes into consideration the nature of the question and the type of error the student made.

At $495, Micro Notes isn't designed for home use — but it can be an integral part of music-theory courses at the high-school and college levels. Those of you who have followed my writing might be surprised at my support for something that looks remarkably like an "integrated learning system." After all, isn't this just another example of the computer programming the student, rather than placing the student in charge of his or her own destiny?

Well, yes and no. First, as those of you who read music know, a grasp of certain fundamental principles can help improve your ability to play other people's compositions, and a basic-theory course sets the stage for that activity. If we can off-load that work to the computer, we help students in two ways. First, the student works in the privacy of the computer environment; there's none of the performance anxiety that comes from making a musical fool of yourself in front of a teacher. Second, it frees the teacher to work on the uniquely human aspects of music — expression, intention, feeling, and all the attendant processes that turn black dots on a page into a breath-taking experience.

Another compelling feature of the Micro Notes system is that the student makes music — singing or playing — and the computer shows the student how accurately he or she is sounding those notes. For those of us who have always wanted to sing in the same key as everyone else at a party, this feature alone is worth the price. A human coach might be tempted to say, "You're singing too high," or "Lower your pitch by three semitones" (whatever that means). With the computer you can see exactly where your voice is in relation to the note and adjust your pitch until it's right on.

At a time when music programs — along with art and physical education — are being cut by cost-conscious school boards, I see products such as Micro Notes as wonderful tools to help all students develop their capacity for exploring creative ideas they simply can't express any other way.

To be human is to make music. If you doubt it, find me a culture on this planet with no music. I've tried and I can't. □

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Apple users know there's always an easier way to get the job done. A shortcut here, an elegant twist there — that's what Hints & Techniques is all about. Bracketed numbers refer to *inCider*'s Applesoft Proofer program. For your copy, send a self-addressed, stamped envelope to Proofer, c/o *inCider*, 80 Elm Street, Peterborough, NH 03458.

BINARY TO BASIC

By Gordon Macfarlane

IF BINARY NOTATION IS THE language of your Apple II's inner circuitry, why would you ever want to translate it into a "higher-level" dialect? Doesn't that just force your machine to work that much harder? Well, maybe, but it'll make *your* job easier — and that's what computers are for, right?

Translation has two distinct advantages. First, you can insert short machine-language routines into your BASIC program to cut down on disk access. Second, if you're sharing a printout of your program with other computer users, BASIC's abbreviated English and decimal notation are a lot faster and easier to type in than strings of binary digits.

The accompanying **Program listing**, BIN.TO.BAS, is ProDOS-based to take advantage of your RAM disk's (pathname /RAM) quick access time. Just enter the name of the binary program you want to convert and sit back while your Apple II does the hard part.

When BIN.TO. BAS is finished, you can either bring your converted program into memory or leave it stored in your RAM disk. If you decide to load it, a number of bracket prompts will appear on screen; type LIST to view the code. If you leave it in your RAM disk, first type –/RAM/TRY to load it into memory as a BASIC program, then type LIST to see it.

Your new BASIC program starts with line number 1000, which you can change by modifying lines 210 and 220 in the **Program listing** BIN.TO.BAS. If you're using a II Plus, change /RAM/TRY to TRY wherever it occurs. □

Write to Gordon Macfarlane at 16 Namao Drive, Trenton, Ontario, Canada K8V-1C2.

QUICKIES

AppleWorks GS Easter egg: Make sure you have the Cairo 18 font in your */system /fonts subdirectory; fire up AppleWorks GS; go to the "About" box; type "moof"; press Return — and enjoy.

— Gregory Ross Thompson

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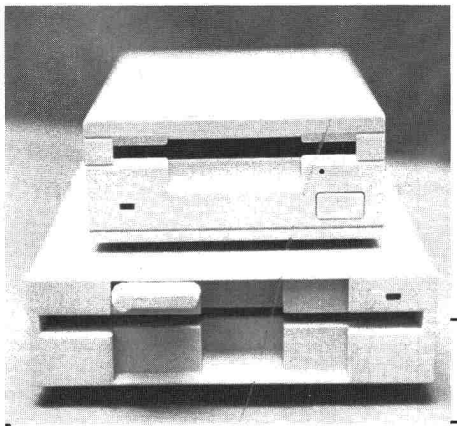
Program listing. BIN.TO.BAS, a translation program that converts binary code to BASIC.

```
100  HOME   [343]
110  PRINT "ENTER BINARY PROGRAM TO CONVERT"  [6897]
120  PRINT : PRINT   [628]
130  INPUT "->";A$  [489]
140  PRINT  CHR$ (4)"BLOAD "A$  [2790]
150 ST = 256 *  PEEK (48826) +  PEEK (48825)  [2725]
160 EN = 256 *  PEEK (48841) +  PEEK (48840) + ST  [3223]
170  PRINT : PRINT : PRINT "Working....."  [2860]
180  PRINT  CHR$ (4)"OPEN/RAM/TRY"  [3874]
190  PRINT  CHR$ (4)"WRITE/RAM/TRY"  [3998]
200  PRINT "NEW"  [573]
210  PRINT "1000 FOR Z="ST"TO"EN": READ ZZ:POKE Z,ZZ:NEXT"  [3566]
220  PRINT "1001  CALL"ST  [1340]
230  FOR Z = ST TO EN  [1240]
240  IF CO = 0 THEN  PRINT 1100 + CC"DATA"; PEEK (Z);:Z = Z + 1
   [4209]
250 CO = CO + 1: IF CO = 50 THEN CO = 0:CC = CC + 1: PRINT ","
   PEEK (Z):   GOTO 270  [4954]
260  PRINT "," PEEK (Z);  [941]
270  NEXT   [156]
280  PRINT  CHR$ (4)"CLOSE/RAM/TRY"  [1420]
290  HOME : PRINT "A TEXT FILE CALLED /RAM/TRY WAS CREATED WITH
   YOUR CONVERTED PROGRAM IN IT."  [5641]
300  PRINT : PRINT "DO YOU WANT THE CONVERTED PROGRAM LOADED INTO
   MEMORY?       (Y/N) ";: GET R$: IF R$ = "Y" THEN 320  [6536]
310  END   [238]
320  PRINT  CHR$ (4)"-/RAM/TRY"  [1033]
```



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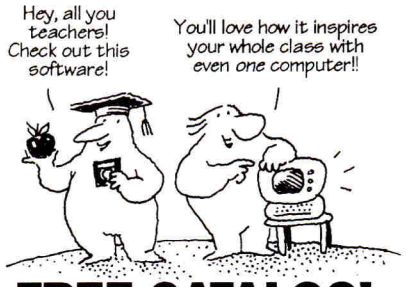

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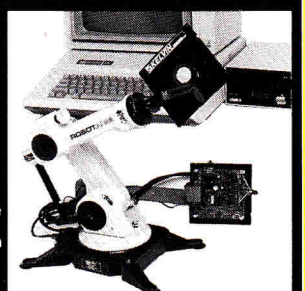

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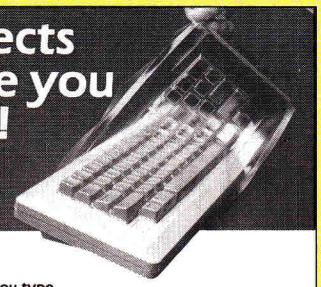

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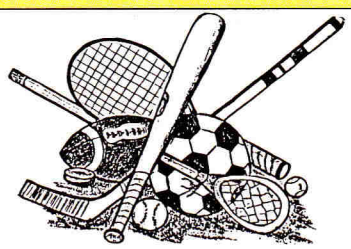

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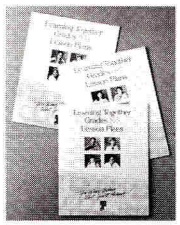

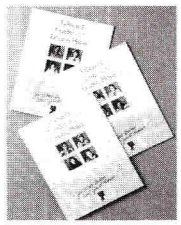

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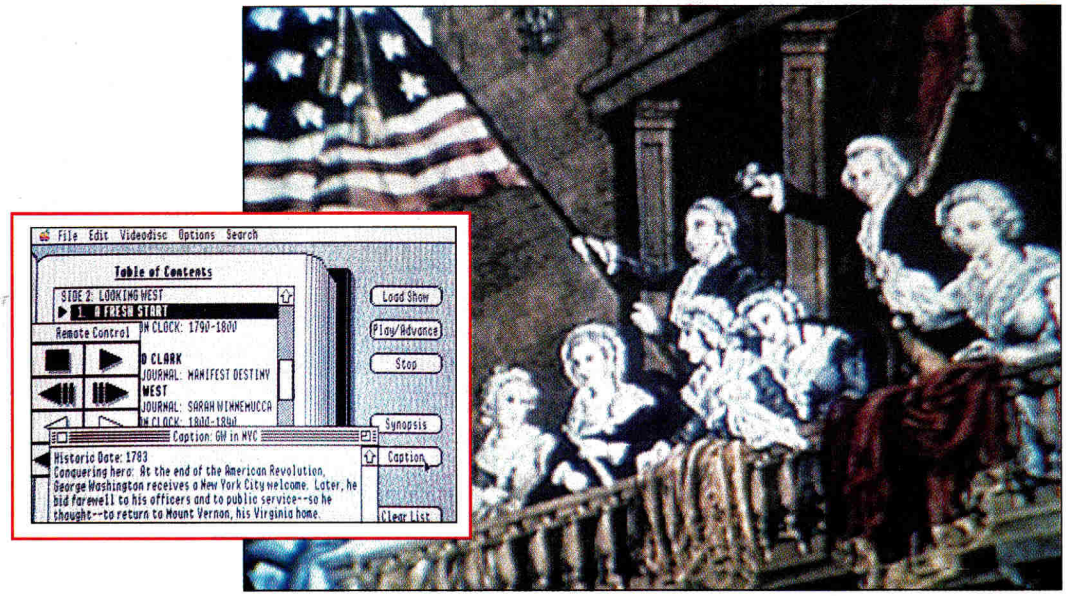
EDITORS' CHOICE

BACK TO THE FUTURE



Thanks to the creative energy of a 100-year-old scientific organization, one of the hottest technological resources in education today is helping students explore the lessons of the past in classrooms across the nation. **GTV: A Geographic Perspective on American History**, a new interactive-video package from the National Geographic Society, brings you the chronicle of our country's political and social development with the visual clarity of a laser disc and the operational precision of a software program.

Turn your GS into a command center — pop one of GTV's two videodiscs into your player, then hook the player and a television monitor to your computer, and you can use GTV's software like a videodisc editor: Skip instantly to any portion of the disc, play segments as long as you want, and create your own interactive exercises. Three modules give you complete control:

* From *Table of Contents*, show any of GTV's 32 "feature presentations." Each is a two- to four-minute multimedia look at a particular event in America's history, from *Linking Life and Land*, a depiction of early Native American culture, to *You've Grown Accustomed to My Face*, a sequence on coming of age in the information age.

* *ShowMaker* puts you in the director's chair. Using built-in software tools, search all four sides of the GTV videodiscs for still and moving pictures that relate to your keywords — then create a storyboard layout simply by moving icons on screen. Write your own captions, or use those supplied on the videodisc.

* Once you've put your masterpiece together, show it off with *ShowTime!* and dazzle your audience.

No doubt about it: GTV requires a lot of hardware. Besides an Apple IIGS with at least 512K (more is better), you'll need a videodisc player (compatible models include Pioneer's LD-V2000, LD-V2200, LD-V4200, LD-V6000, and LD-V6000A, and Sony's LDP-1000 and up), and a TV monitor with audio and video connections. (You can also use your GS' RGB monitor with an Apple II Video Overlay Card, but that's another story.)

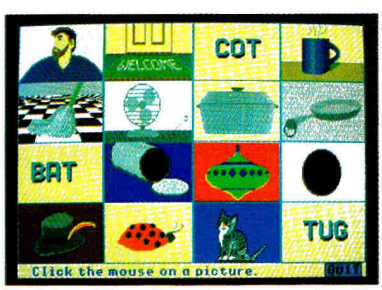
The GTV package retails for $995, but until December 1, 1990, the special introductory price is $650. To begin *your* adventures in American history, contact Optical Data Corporation, the product's distributor, at 30 Technology Drive, Warren, NJ 07060, (800) 524-2481. If you're planning to purchase videodisc equipment, you'll find GTV an essential addition to your educational arsenal.

ANNOUNCING . . .
3 more GS programs that STAND UP and SHOUT!

Talking Schoolhouse *now* has 18 programs that take full advantage of the Apple IIGS with real human voice and super high-res graphics. No speech board is required.

Our 3 Newest Programs . . .

Talking Classroom offers a thrilling assortment of multisensory learning activities in the areas of time, money, science, map, and calender skills.



Talking First Words uses voice and animation to introduce children to nouns and verbs.

Talking Multiplication & Division provides a human voice to help kids with basic math skills.

These new programs join the 15 others listed here to form the Talking Schoolhouse Series, which educators and parents across the country are hailing as the most outstanding software available for the IIGS. IBM PS/2 and TANDY 1000 versions will be ready for shipment shortly.

The suggested retail price for each program is $49, or $59 for the School Edition (with backups). To order or obtain information contact your dealer or call (800) 672-6002.

Toll Free Hotline (800) 672-6002

ORANGE CHERRY/TALKING SCHOOLHOUSE SOFTWARE
Dept. I, P.O. Box 390, Pound Ridge, NY 10576

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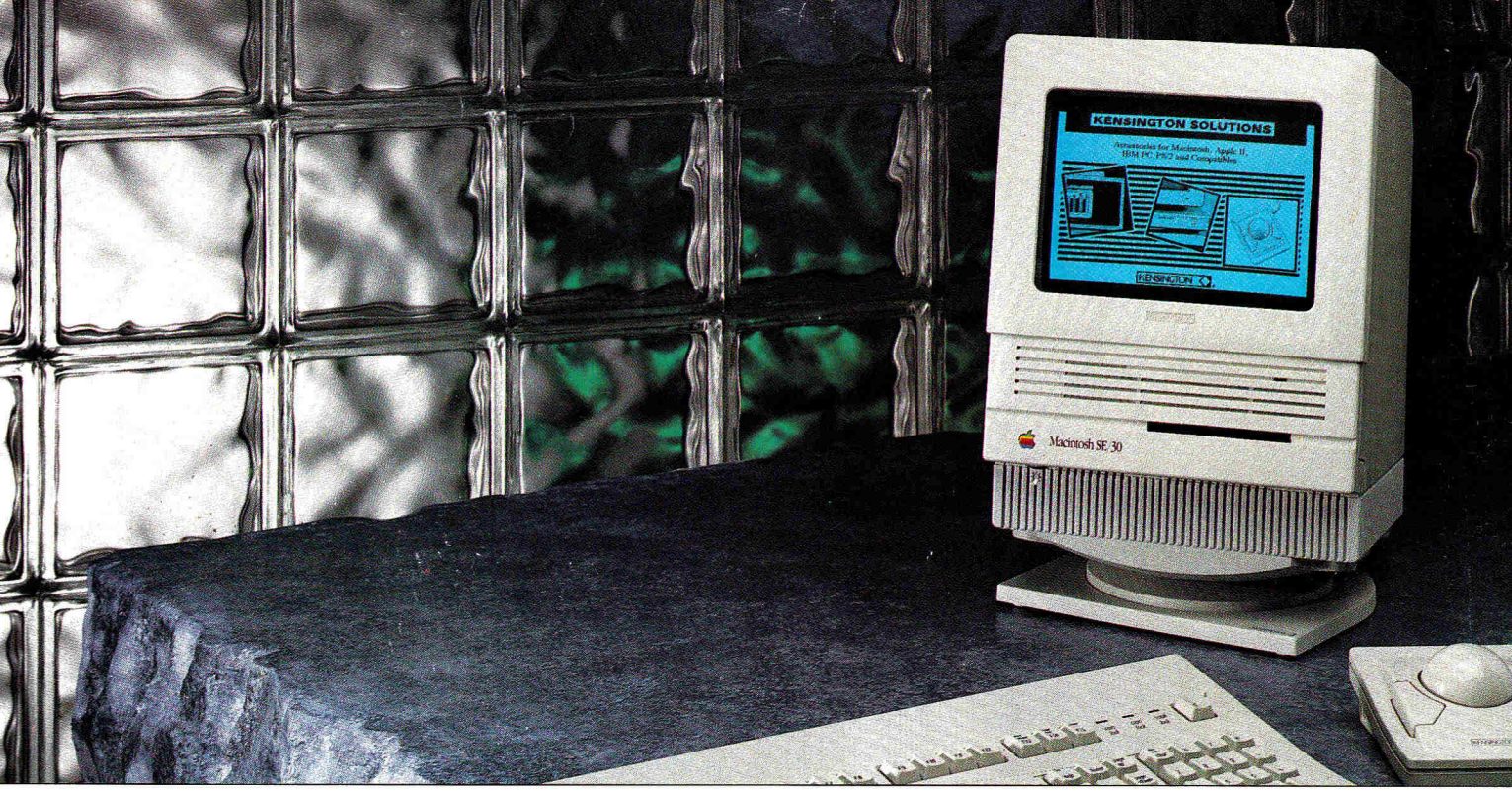

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As today's monitors get bigger and brighter, anti-glare filters become less of an option and more of a necessity.

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

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

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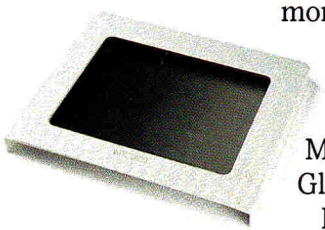

An example is our Maccessories® SE Anti-Glare Filter.

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

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

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

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

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

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

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

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

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