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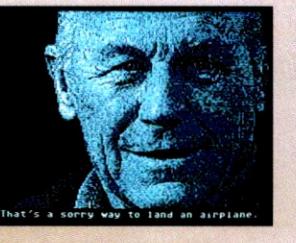

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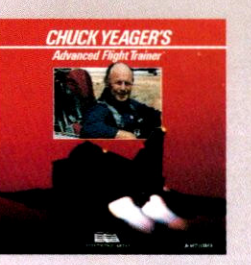

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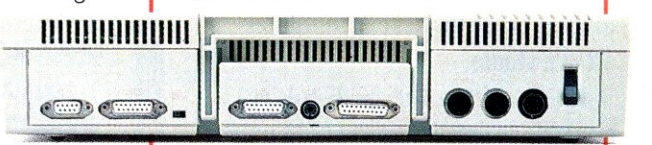

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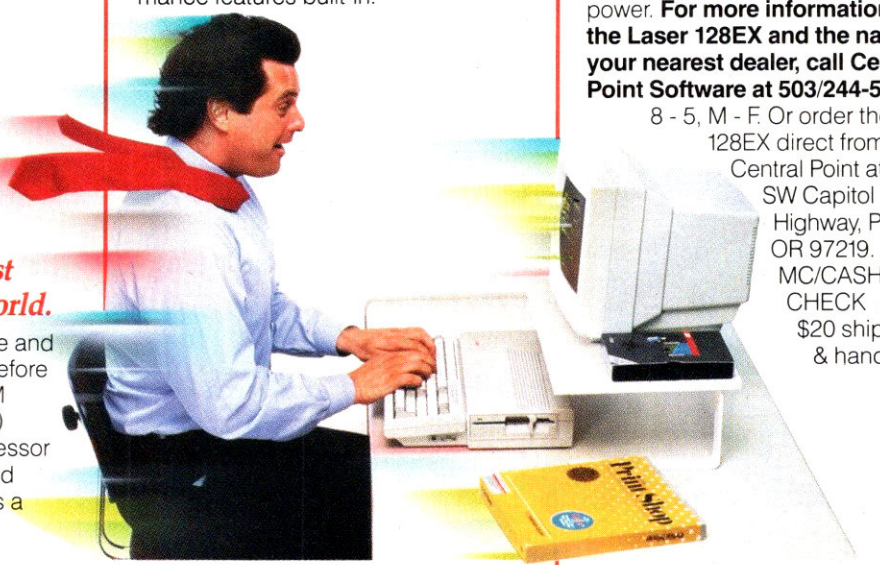

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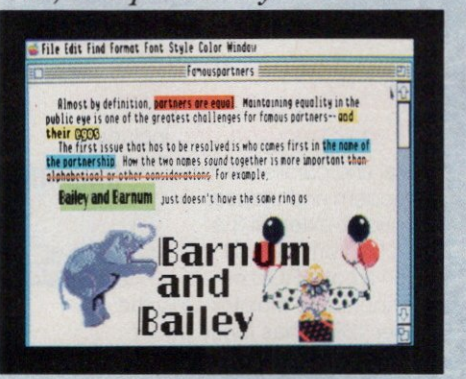

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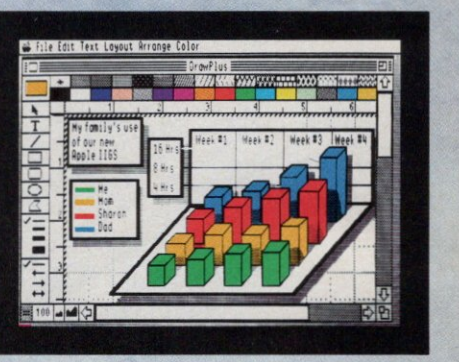

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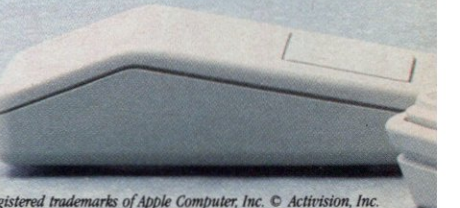

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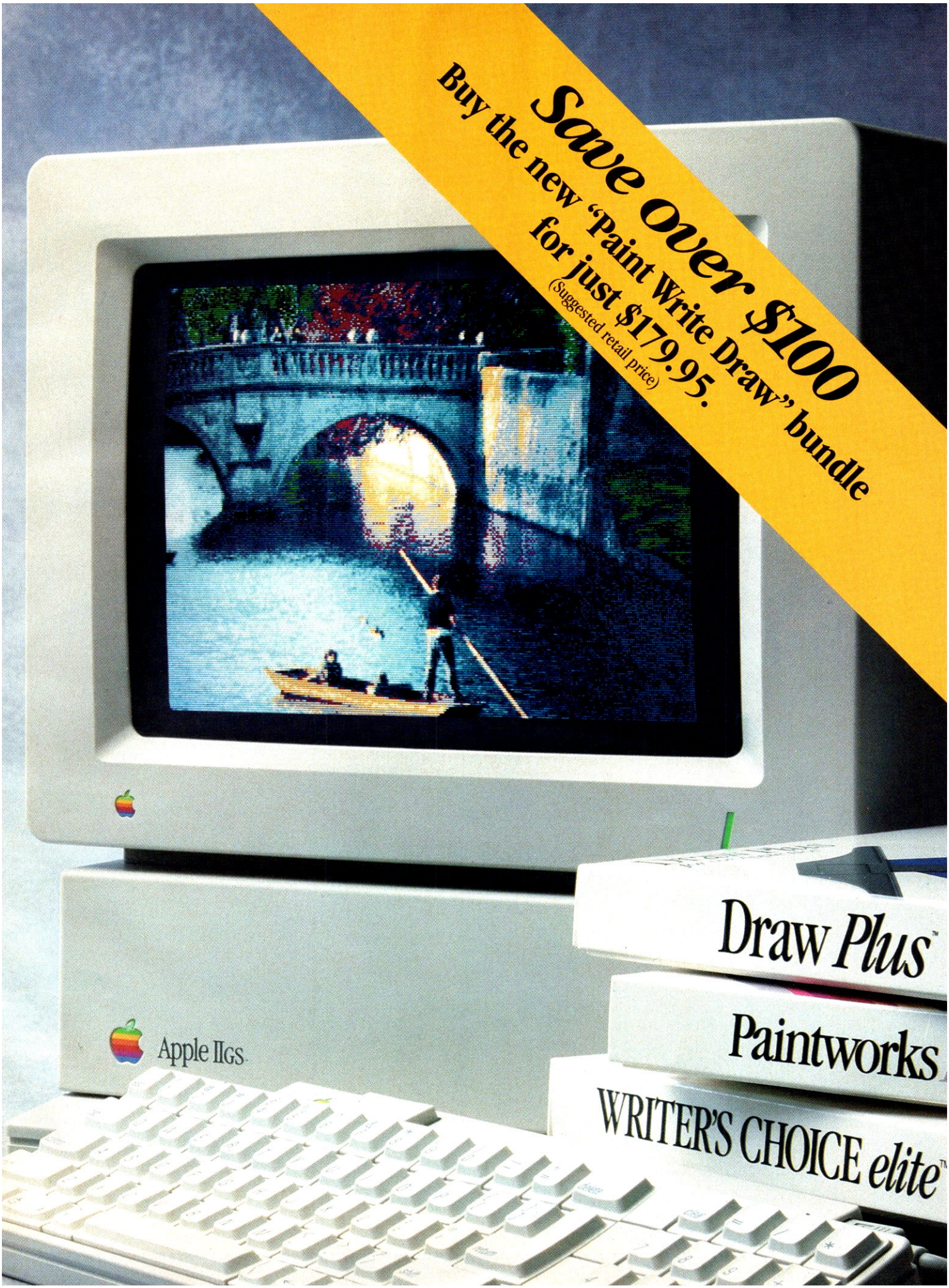
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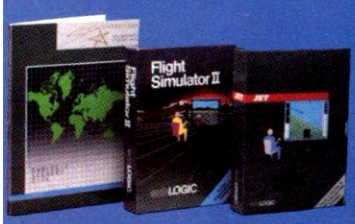

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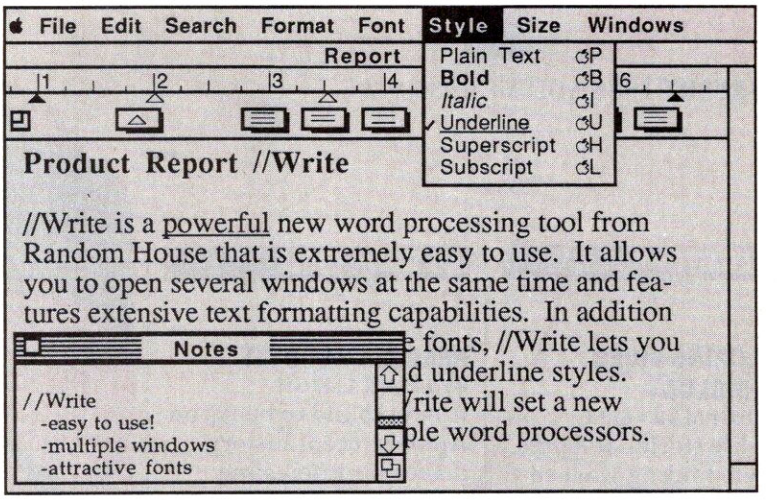

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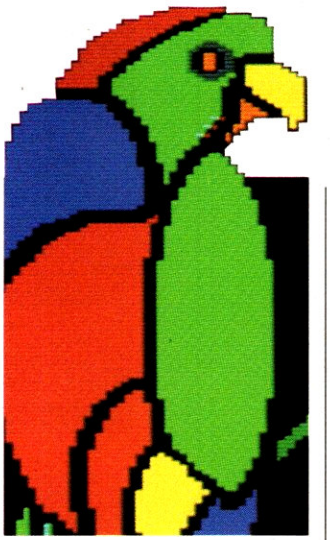

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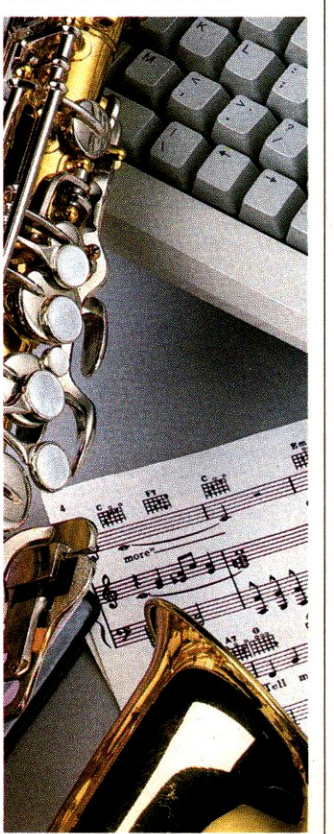

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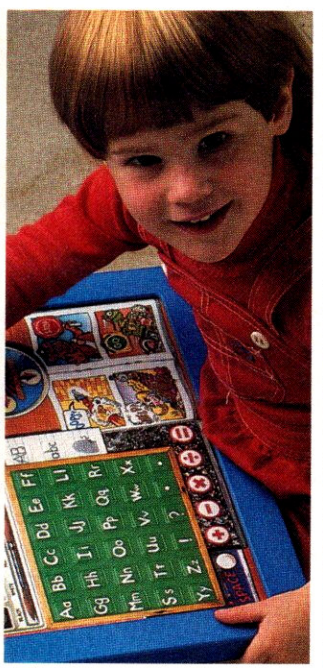

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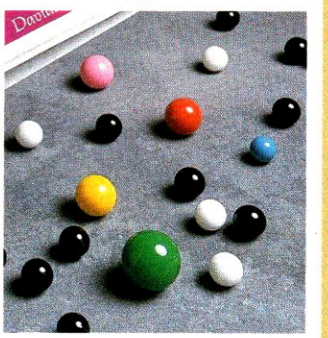

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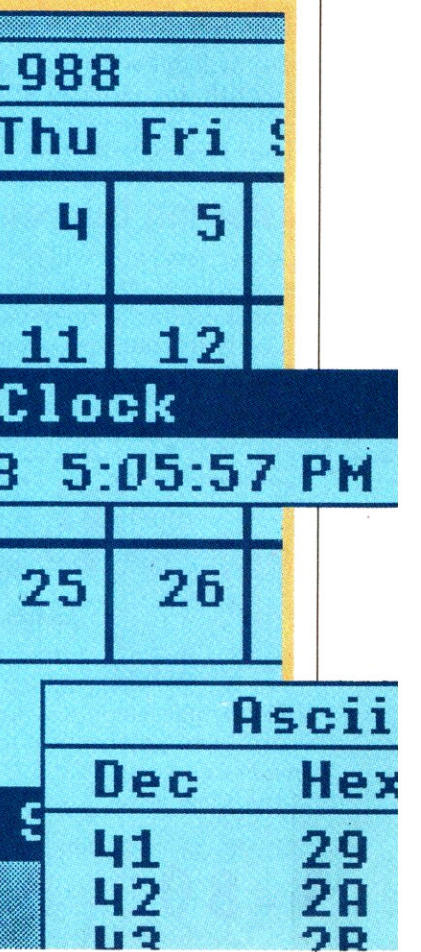

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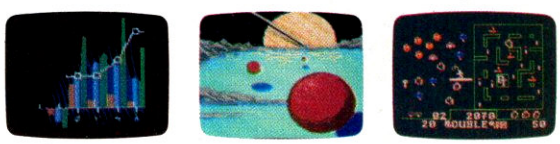

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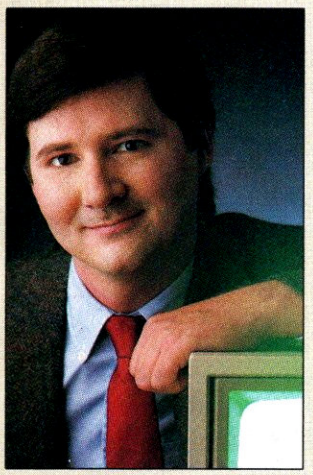

EDITOR'S PAGE

COMPUTERS AND TELEVISIONS

If you want to get a peek at the future of home computing, take a look at your TV set. A computer and a television can make quite a team. In fact, they make such a good team that I think the future of home computing is directly related to television. TVs and home computers share some common features. For example, they both use video screens to display information. They both have the potential to be entertaining and educational at the same time. You can get software for your computer on a magnetic disk, and you can get software for your TV on a magnetic videocassette.

There are, of course, many differences between TV and computers. TV is a one-way communications medium, whereas computing is an interactive medium. Computers cost thousands of dollars, TVs cost hundreds—thus, many people have more than one television, but most people don't have a home computer. TVs have better color graphics and sound than do personal computers.

Companies in the home-computer industry are hoping that someday in the near future computers will rank with VCRs as widely owned high-end consumer-electronics items. Recent market research has revealed some interesting parallels between VCR ownership and home-computer ownership. It seems that virtually everyone with a home computer also has a VCR and that the demographics of VCR and computer ownership are very similar. To try to sell computers to people with VCRs, Apple has produced an entertaining videotape promoting the use of Apple computers. Apple is selling the tape, entitled "Beginner's Luck," for $6.90. (If you want to order the tape, call [800] 328-2791 and have your VISA or MasterCard at the ready.)

I think the best way to sell computers to the people who own televisions and VCRs, however, is not to merely sell them a videotape of a lengthy, albeit interesting, advertisement. The best way is to find ways to make computers, VCRs, and TVs work together to provide new benefits to consumers. If connecting a personal computer to a television set and VCR created a new high-tech video-control center with many new and convenient capabilities, home-computer sales would take off, because the television, unlike the home computer, has already established itself as a central element of American home life. Here are a few ideas I think could help broaden the appeal of home computers by delivering new benefits to VCR and TV owners.

The partnership of personal computers and television has just begun.

The Intelligent VCR

Apple and other companies that are active in the personal-computer market need to persuade electronics manufacturers to make VCRs with a standard remote-control plug-in interface that provides access to all the VCR's internal functions. In this issue, the article "Using Your Apple II with a VCR" discusses special industrial VCRs that can be controlled by an Apple II computer. Companies should be encouraged to come up with a simple standard interface for consumer VCRs as well.

Since it may take some time to convince VCR companies to provide a di-

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EDITOR'S PAGE

rect-connect remote-control port on their machines, someone should design an infrared controller for the Apple II that lets you use the infrared programming codes that hand-held remote-control units use. Although remote-control units don't give you access to all the features of the VCR, they do give access to the basic functions. Another advantage of infrared controllers is that TVs, hi-fi systems, and cable-TV boxes all use infrared codes. An Apple equipped with an infrared broadcaster could store and generate the codes for running virtually any of these remote-controlled devices. An infrared controller for the Apple would be inexpensive to build, since all the necessary parts are readily available at a low cost.

Controlling your VCR and TV with your computer can provide some interesting capabilities. VCRs are rather difficult to program. If you had a computer-to-VCR hookup, you could have an easy-to-use program on the computer that could control the VCR. Imagine, for instance, an on-line version of *TV Guide*—you could just indicate the show you wanted to tape by clicking on it with the mouse, and the computer could take care of the rest. You could also use a modem to program your VCR from a remote location, either from a computer terminal or a touch-tone phone.

The Well-Connected TV

Once you had your computer, VCR, and TV all hooked together, lots of other things could happen—with the right products. You could use your computer to create "desktop MTV," using animation, sound effects, and music software and then tape the finished music video with the VCR. With the addition of a device called a genlock board, you could overlay computer images directly onto VCR and TV images and create titles and special effects for your home videos. A major manufacturer is rumored to be working on a genlock board for the Apple II—we'll keep you posted as it develops.

Although not many people have their home computers hooked into a large network, many people have

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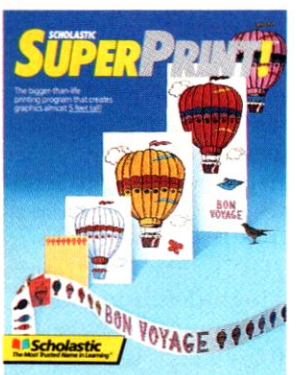

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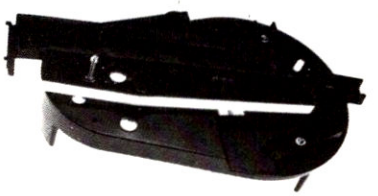

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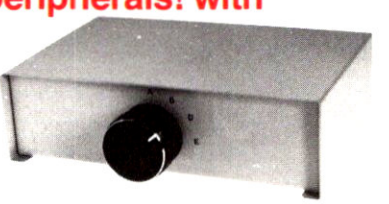

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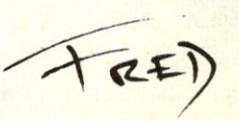
EDITOR'S PAGE

their TVs hooked into a large electronic network; it's called cable TV. One of the untapped potentials of cable TV is to use the cable as a computer network as well. Just as a modem can allow you to send and receive data over the phone line, cable TV lets you send and receive computer data over its lines. Although teletext ventures have been unsuccessful in their forays into this area of technology, I think cable TV may someday replace the telephone lines as the main way of getting on-line information into your computer.

Another idea I have is for a digital TV receiver on a board that goes inside the computer. It would allow you to convert an existing TV (or monitor) into a digital TV that could offer features such as freeze frame, frame grabbing, and digital windowing. Digital windowing is already available on some very expensive TVs and allows you to put two (or sometimes more) windows on the TV screen at one time. Windowing could be mouse-controlled and could enable you to watch one show in the main window while another program was going on in another window, monitor two or more video sources simultaneously, or even watch a TV show in a window on your computer screen while you waited for your database to finish sorting.

This month's *A+* features an overview of some of the possible ways to combine computers and video technology. The partnership has just begun, however. As both technologies advance, I'm sure we'll start to see more of the ideas I've mentioned here turn into reality. And new technologies such as CD-ROM, RCA Lab's Digital-Video Interactive (DVI), videodiscs, digital tape, and high-definition television (HDTV) promise to make the computer/television connection even more exciting. +



FREDERIC E. DAVIS/**EDITOR IN CHIEF**

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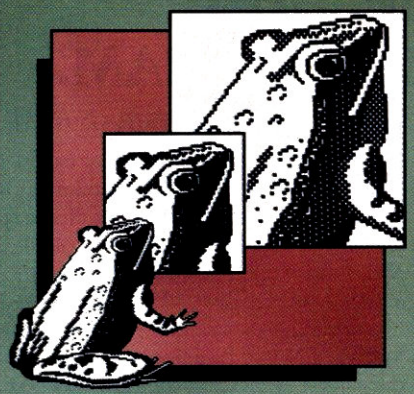

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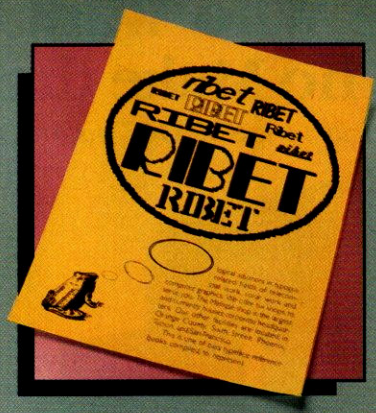

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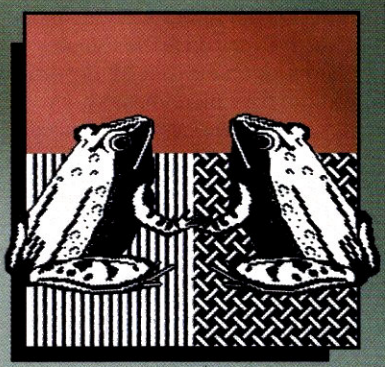

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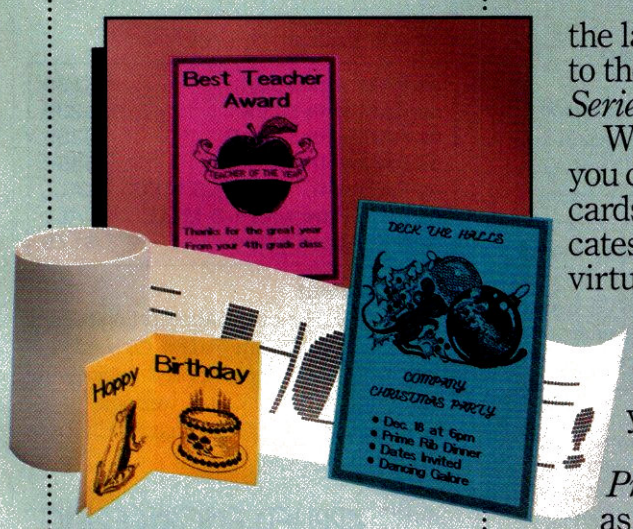

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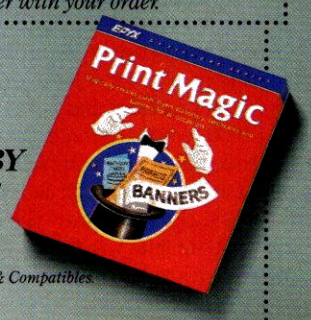

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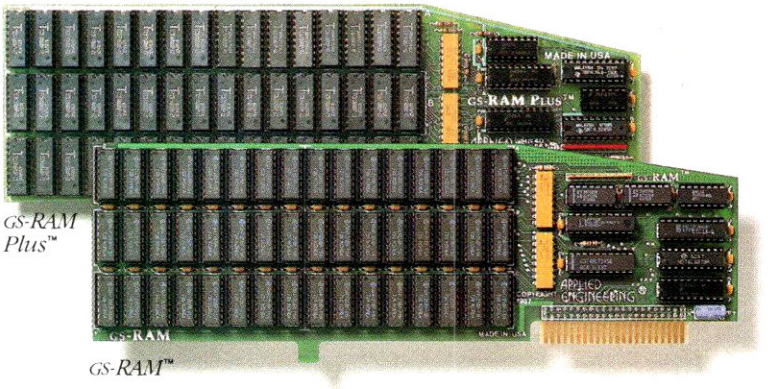

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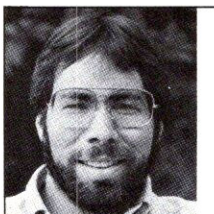

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LETTERS TO THE EDITOR

GETTING THE MOST OUT OF THE II

Dear A+: I would like to congratulate you on the article "Hard-Disk Drives Made Easy," which appeared in the November issue. Michael Fischer presented an excellent comparison of some of the drives available. I particularly liked the small technical articles such as "SCSI Drives," which presented the differences between various interfaces. I have a Sider 10 drive on my Apple IIe, and nowhere does the documentation mention what interface it uses.

Regarding your editorial comments about the performance differences between the Apple II and the latest computers, I agree with you. I use IBM PC/AT-type machines at work, and although they have some advantages in business-software availability, the Apple doesn't lose much performance in the types of things that I commonly use it for, with the right software. The addition of a hard-disk drive for the Apple IIe does a lot to bring the speed up to a competitive level with the IBM machines, which usually have hard-disk drives as a standard item. Great software is being developed for the IIe and the IIGS that is pretty powerful and reasonably fast. The problem that I have sometimes is becoming aware of what is available for the Apple, since some of the software developers for the Apple II are small and lack large advertising budgets.

I honestly feel that the II has suffered from a lack of serious software development, a situation that is only now seeing improvement. Look at the offerings from Pinpoint as examples of what can be done with Apple IIs. That company has some good software with very powerful features that is also fast in operation. I must add that I don't have an accelerator card or a large memory card in my IIe.

I like to kid people that the Apple IIe is not outdated technology but an early RISC computer!

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CORVUS IS WITH US

Dear A+: In your fine article on hard-disk drives in the November 1987 issue, your coverage omitted Corvus as a supplier of hard-disk drives for Apple II computers. Apparently, a misunderstanding led the editorial staff to conclude that "... Corvus Systems ... didn't appear because they are no longer actively seeking Apple II customers for their hard-disk drives and asked to not be covered in this story" (page 49). Your staff member spoke with a member of our education marketing group; in the process of positioning Corvus primarily as a networking company rather than a manufacturer of stand-alone hard-disk drives, we led your staff to believe that we were no longer actively involved in marketing hard-disk drives.

Corvus Systems is involved in networking of many types of personal computer products. The company has been involved with and has supported the Apple II line since Corvus' inception. We developed our line of mass-storage devices for Apple II computers, and we continue to offer those products.

We have strongly supported users of Apple II products and, in fact, very recently introduced the new Constellation III disk-service software for the Apple II.

We have a dedicated marketing group that supports the Apple II products and a special distribution channel set up to promote the use of our Apple II products in the education market. We have more than 10,000 installations nationwide in the education market, the large majority of which are networking Apple II products.

Needless to say, we are distressed by the impact of the story's comment on our customer base. This misunderstanding has caused considerable concern among our customers and dealers.

GARY W. BREEDING
DIRECTOR, CORPORATE COMMUNICATIONS
CORVUS SYSTEMS, INC.
SAN JOSE, CA

SIDER QUIBBLE

Dear A+: I have been a reader of your magazine for several years (ever since *Softalk* folded and transferred my subscription to you) and normally found your articles and advice extremely useful in helping me choose the best software and periph-

LETTERS

erals for my systems, which include a IIGS and a IIe. Your October issue has finally brought that to a close.

In that issue is an article dedicated to reviewing the several hard-disk drives available for the Apple II line. The comment on the Advanced Tech Services ROM for the Sider shows that you do little to no research. First, since the Sider software was upgraded to Revision D (about one year ago), the drive has been able to choose between ProDOS and DOS 3.3 as the bootup system. Second, since Revision C, you have been able to vary the size of the ProDOS volumes and in effect format the disk as one large volume by assigning the minimal size to the second volume (i.e., HARD2). Third, the drive does its own bad-block check during formatting without the additional ROM chip. Last, the Sider has always had the ability to recognize a second Sider daisy-chained to it.

The new ROM chip that was reviewed is unnecessary for any of these functions, although it may make the Sider run faster. I do not know what you were doing when you reviewed the ROM chip, but obviously you had never tried a Sider drive.

LILLIAN H. BANCHIK
NEW YORK, NY

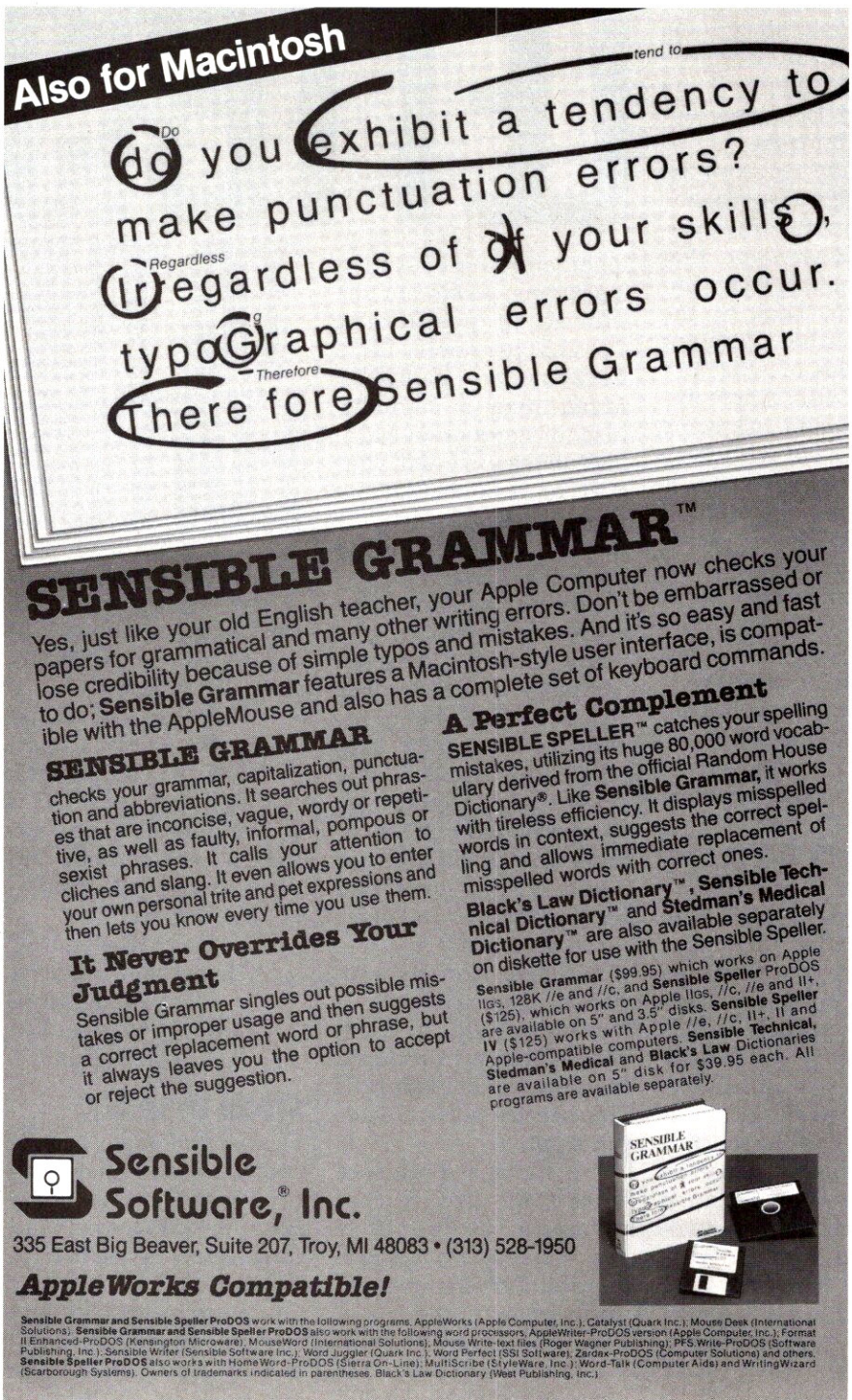
You're right—since February 1987, the Sider utilities disk has included a program that lets you boot ProDOS directly (the program is called PRODOS.BOOTER), but the default is still a DOS 3.3 boot. As for ProDOS volume size, on a standard 10-megabyte Sider, the largest ProDOS volume you can get after reserving minimal space for CP/M, Pascal, and DOS 3.3 is about 9 megabytes. With the Advanced Tech Services ROM, you get the entire 10.4 megabytes to work with, and you don't have to fiddle with a partitioning program. Are you willing to assign 10% of the capacity of your drive to operating systems you never use?

You are correct in saying that the Sider checks for bad blocks during formatting, but it does so very slowly, and if it finds a bad block, it throws out the entire track, not just the one bad block that the Advanced Tech Services ROM would reserve. You can daisy-chain two standard Siders, but only after "phantom-slotting" the second drive on a II Plus or IIe. Don't try to daisy-chain on the GS, because ProDOS 16 allows only two volumes per slot (and the standard ROM organizes each drive as two volumes), so you won't see the second drive. Even ProDOS 8 ignores a daisy-chained Sider on the GS. The easy solution is to use the ATS ROM so you have only one volume per drive.—Editors

DON'T EXPECT UPGRADES

Dear A+: In many letters to the editor, irate customers who believe Apple owes them an upgrade from one model to another vent their frustrations. I have never understood this logic.

Why does Apple owe anyone an upgrade from one model to another? Perhaps in the past Apple has



CIRCLE 130 ON READER SERVICE CARD

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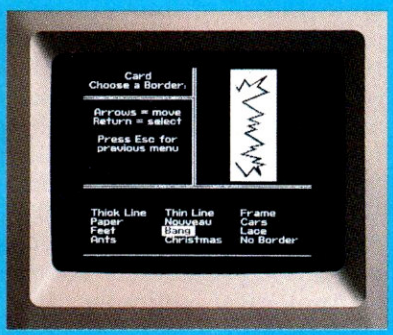

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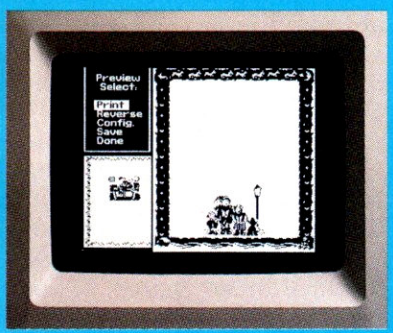

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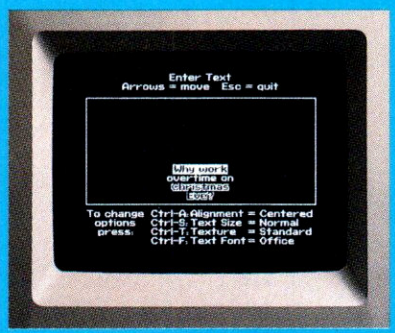

10:03— *Craft your message from 9 expressive typefaces in upper and lower case.*

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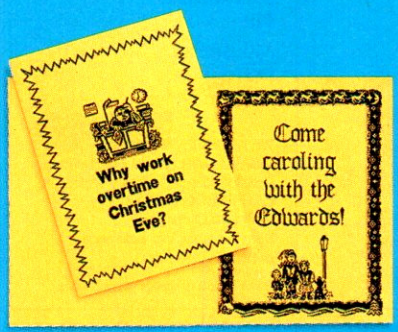

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CIRCLE 109 ON READER SERVICE CARD

LETTERS

Why does Apple owe anyone an upgrade from one model to another?

offered, among other upgrades, motherboard upgrades in the case of the IIc, to accommodate a 3.5-inch drive. This policy makes sense, since Apple wants to sell the drives. I took advantage of that offer and another such "dealer offer," upgrading from an ImageWriter I to a II, for about $300. But these are just offers, sales promotions, not promises of continued technological upgrades. II Plus owners think Apple owes them a IIe, and IIe owners think they deserve an upgrade to a IIGS.

Try this sometime: Walk into the automobile agency you bought your 1986 car from. Say you know that the maker has improved the 1988 models and that you think that since you bought their product in good faith in 1986 and that because they have improved it over the years, the company should allow you to upgrade to the 1988 (at minimal or no charge, of course). Prepare your keester for a kick out the door! It won't work, because it can't be done. A company such as Apple relies on past profit margins to fund future research and development, not to mention dividends to shareholders, manufacturing innovations, and other necessary "capital investments."

Everyone forgets that we are interested in a field, computers, in which decades of normal technological changes happen in just years. You can hardly expect that a company such as IBM or Apple should offer to return profits made on one product line to allow customers to purchase discounted newer lines of products. I guarantee that if Apple did, there would be no need to upgrade in the future, as no funds would be available to develop any new products.

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CIRCLE 156 ON READER SERVICE CARD

LETTERS

flexible and more reliable than any other computer product I have ever owned (a IIc, IIe, and Mac Plus, as well as Apple disk drives, printers, hard-disk drives, monitors, modems), none of which I've had in the shop for service lately. If Apple keeps making them so reliable, I am more than a satisfied customer.

When I buy an Apple computer, a CD, a VCR, or a hand-held calculator, I accept the fact that prices will probably come down; newer, better versions will probably come out; and my recent purchase will decline in value as time goes on. But that is part of the price the consumer pays for technological progress. If that distresses you, don't buy a computer—buy an abacus.

MARK STROTHMANN
WAUWATOSA, WI

QUANTIFYING REVIEWS

Dear *A+*: I have been reading *A+* for quite some time now. I enjoy your magazine very much and realize that it is very difficult to be all things to all people. From my point of view, however, you can improve the usefulness of *A+* with just a few minor adjustments.

Why not quantify your reviews? Reviewers should declare which item in a group they like best. A good case in point is the review of hard-disk drives in the November 1987 issue. I know, I know: The argument is that they were all substantially different and therefore could not be fairly compared. That is nonsense. I was a food critic for a central New Jersey newspaper, and I ate at hundreds of restaurants. Although the cuisines were substantialy different, there were definitely some restaurants that were better than the others. You should insist that the reviewers adopt a rating scale.

JEFFREY B. ROSS
DUNELLEN, NJ

You're correct in assuming that we saw those products as different enough to make a comparison untenable. Whenever possible, we ask reviewers to point out which product in a group stands out.—Editors

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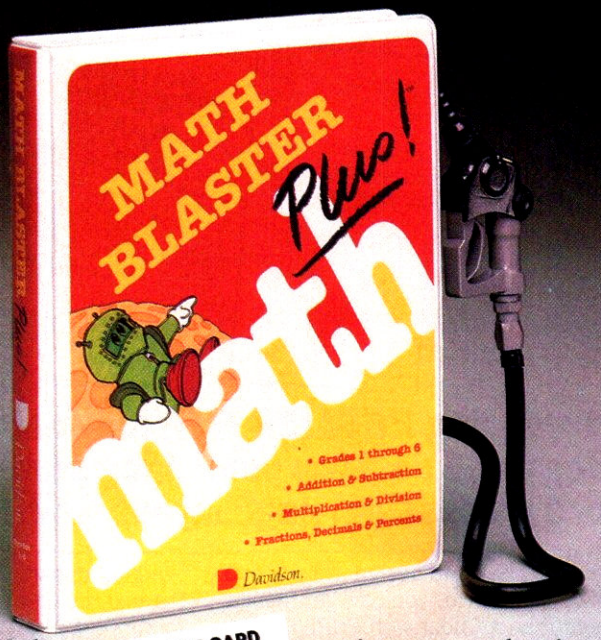

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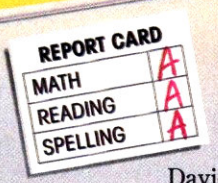

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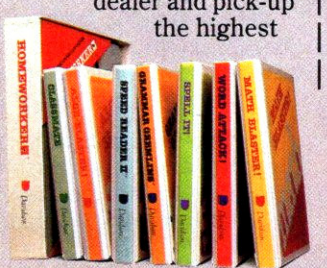

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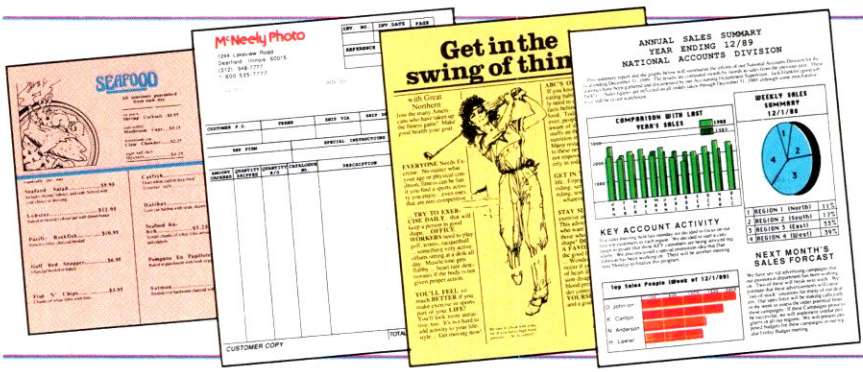

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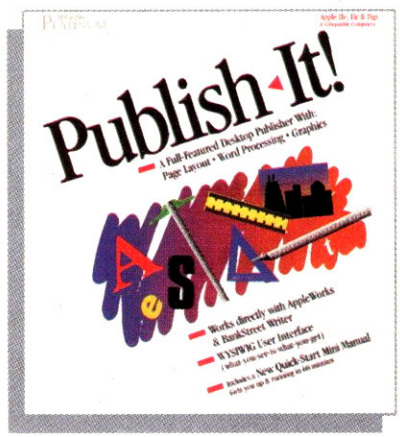

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CIRCLE 116 ON READER SERVICE CARD

NEWSPLUS

Defense Department contracts, Toshiba trade exemptions, contests, information services, and other industry updates for the Apple II world

APPLE TO THE DEFENSE

Apple Computer, Inc., recently scored a big contract to provide the Department of Defense School Systems (DODDS) with 4000 Apple IIGS systems. Actually, Apple will sell the machines to a system integrator called Computer Dynamics, Inc. (CDI), which will in turn package them for DODDS.

Although Apples were chosen, the package must meet certain requirements for "operating system compatibility"—namely MS-DOS, the operating system compatible with the IBM PC. In order to meet that requirement, the systems will include PC Transporter, a coprocessor board recently released by Applied Engineering (see our September 1987 cover story, "MS-DOS Comes to the Apple.")

CDI will furnish these systems to 270 schools throughout 23 countries in Europe, Central America, and the Far East. Apple expected to ship 1700 of the GS systems by the end of the year, with the remainder to go out over the next four years.

ON THE HILL

Apple Computer may be breathing a little easier these days, thanks to the decreased hubbub about a possible ban on the sale of Toshiba products to the U.S. Toshiba, Apple's sole source for the ever-popular ImageWriter printer, came under fire when a subsidiary allegedly sold electronic equipment to the Soviet Union. Congress swung into action last summer and proposed to punish Toshiba by preventing it from doing business with U.S. companies, including the proposal in a massive trade bill. Apple, and other American firms dependent on Toshiba, requested exemptions to the ban.

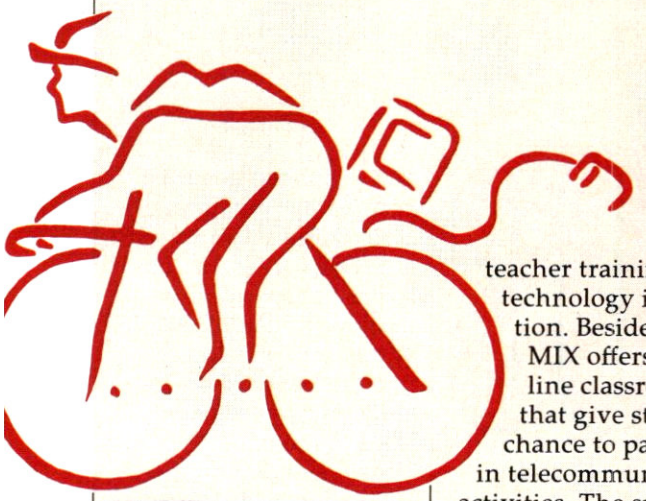
As it stands now, the 1000-page trade bill is bogged down in committee hearings and may not ever emerge because of its complexity, according to Charlotte LeGates, a

spokesperson for the Computer and Business Equipment Manufacturers Association. It's possible that proponents of the ban may introduce a separate bill to create sanctions against Toshiba, but LeGates says that it's unlikely because the current sentiment is that "Toshiba would not be particularly hurt by sanctions, but many U.S. companies would."

Since the bill resides in a holding pattern in committee, it's business as usual for Toshiba. No sanctions exist yet, so the flow of ImageWriters remains undisturbed.

ILLUSTRATIONS BY VALERIE PIZZO

NEWSPLUS



GOODBYE TO WHEELS FOR THE MIND

Rather than run its own awards program to single out superior educational software, Apple has decided to put its resources behind another such effort. Apple recently announced that it would drop its Wheels for the Mind competition and that it was giving $50,000 to the EDUCOM/NCRIPTAL Higher Education Software Awards Program. Since it is a higher-education competition, the emphasis, no doubt, will be on the Macintosh. So much for the Apple II/K–12 recognition afforded by Wheels for the Mind.

MIXING IT UP

EMS/McGraw-Hill has announced an information service for educators called MIX (McGraw-Hill Information Exchange). It provides electronic mail, conferencing, and an exchange of ideas on teacher training and technology in education. Besides that, MIX offers "online classrooms" that give students a chance to participate in telecommunications activities. The subscription fee is $149.95 a year, with discounts available for volume purchases. Connect fees are $7 an hour during the day and $3.50 an hour during evenings and weekends. For further information, contact EMS/McGraw-Hill at 9855 West 78th Street, Eden Prairie, MN 55344; (800) 622-6310, in MN (612) 829-8200.

STORY TREE CONTEST

It's time once again for Scholastic's Story Tree Writing Contest. Open to kids in grades 4–9, it requires that contestants use the Story Tree creative-writing software to create their entries. The deadline for submissions is April 15, 1988. Grand-prize winners will receive an Apple computer, as will their teachers. Recipients of honorable mentions will receive $100. For further details, write to Scholastic Software, Story Tree Contest, 730 Broadway, New York, NY 10003.

TAXING NEWS

It's not just the federal government that's into tax reform. HowardSoft (1224 Prospect Street, Suite 150, La Jolla, CA, 92037; [619] 454-0121) has recently overhauled its venerable Tax Preparer program to make it oh-so-simple to calculate the amount you'll have to surrender to Washington later this year. After you enter data on a specially designed 1040 form, Tax Preparer automatically creates and completes all relevant supporting forms and schedules for you. The package handles more than 20 IRS forms and schedules.

The president of HowardSoft, Dr. J.E. Howard, claims the 1988 edition takes "a gigantic step towards artificial intelligence." Whether artificial intelligence is what it takes to blunder through the maze created by our legislators remains to be seen.

Personal Financial Services (P.O. Box 1401, Melville, NY 11747; [516] 261-8652) has also modified its 1040Works tax-preparation package for the 1987 tax year. 1040Works is a powerful template for AppleWorks that grabs your raw data and uses it to create individual forms, including the 1040, of course, for a cost of only $24.95.

And the newest kid on the block among tax programs is TaxView, a GS-only product that beautifully emulates the 1040 form on-screen and creates IRS-approved printouts. It's $119 from Softview, Inc., 4820 Adohr Lane, Suite F, Camarillo, CA 93010; (805) 388-2626.

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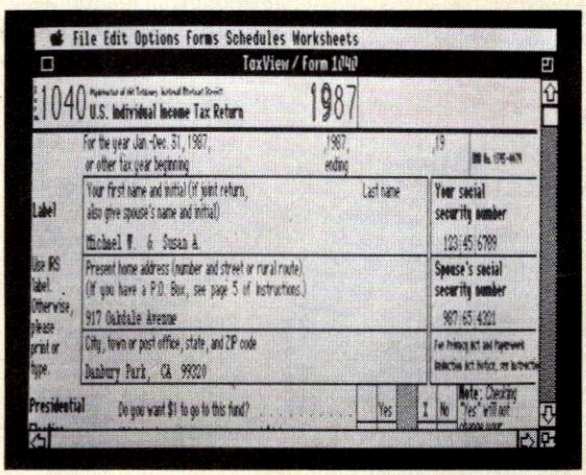

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NEWSPLUS

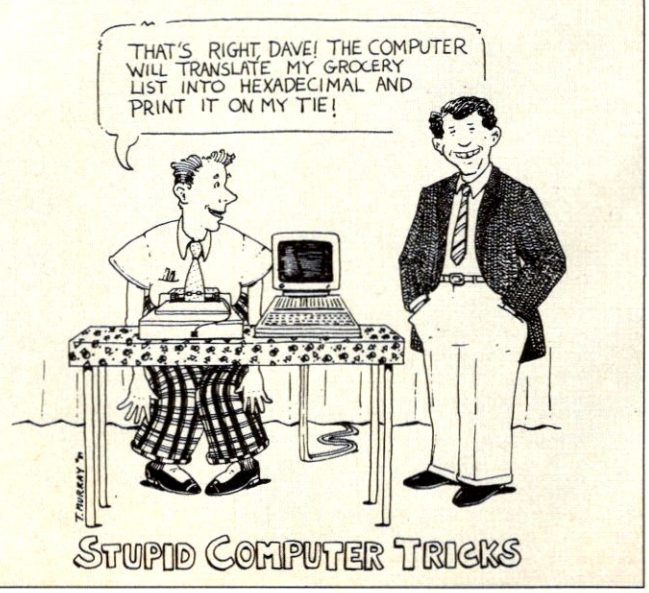
have a chance to do a hands-on evaluation of the software before making a financial commitment to it. Some authors are trying to address this problem by using the shareware method of distribution and marketing. A shareware program may be freely copied and passed around, but the author still retains the copyright to it. Those who use the program are asked to send a registration fee (typically less than $40) to the author if they continue to use the program beyond an initial trial period.

The trouble with shareware, from the authors' point of view at least, is that computer-club libraries, bulletin-board operators, and other distributors often refer to the software as "public domain" (which means the author retains no rights) or fail to emphasize that a shareware payment is expected. As a result, most shareware authors see very little money for their efforts.

The Association of Shareware Professionals was recently formed to help educate shareware distributors and establish a set of software and documentation standards for shareware authors. The Chairman is Buttonware's Jim Button, a successful shareware entrepreneur. If you write shareware and you want to join the ASP, write to 325 118th Avenue SE, Suite 200, Bellevue, WA 98005.

BY TOM MURRAY

LAUGHTRACK



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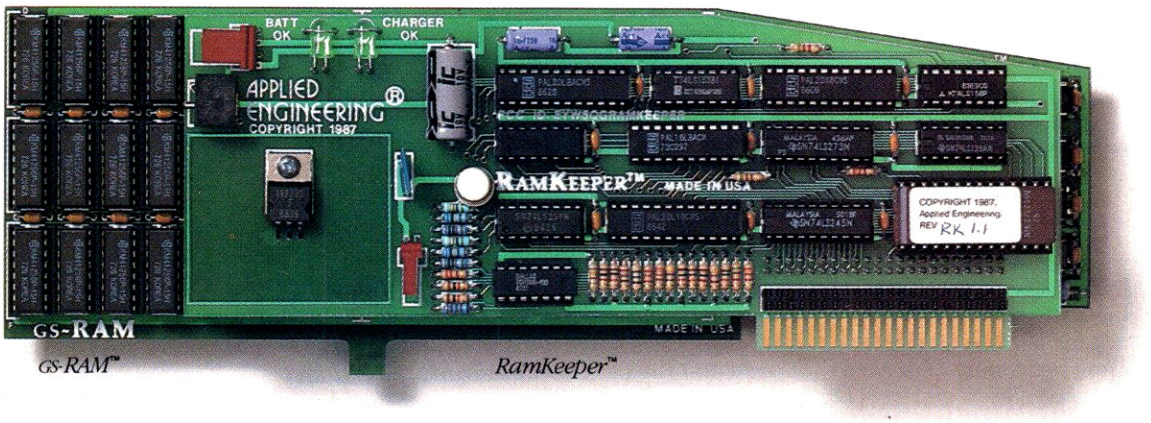

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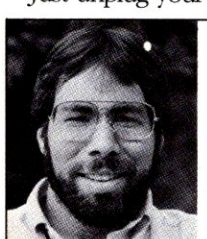

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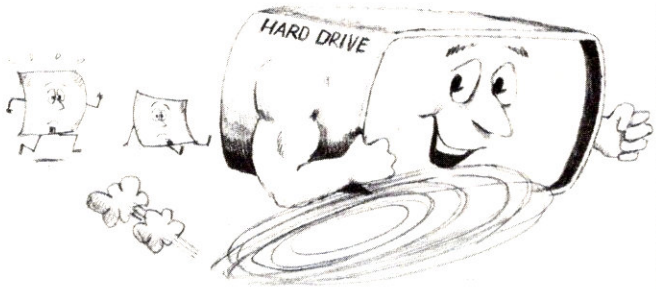

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NEWSPLUS UPDATE

True software all-stars improve with age. A case in point is Harbor Software's MouseFiler, one of the *A+* All-Stars in the disk-utilities category in our December issue. Version 2.0 has just been released, and it contains many new features that make the program even more useful than it already was.

For example, it is now able to locate a file on the disk if you provide its name, or part of its name—especially handy if you have hundreds of files on a large hard disk. Another new feature is a "run list" in which you can place the names of ten of your favorite applications. To run an application, all you do is select the name from a pull-down menu. A third major enhancement makes it possible to run ProDOS 16 applications from within the program, although it works only if you've previously booted ProDOS 16. You can contact Harbor Software at 403 Great Road, Suite #8, Acton, MA 01720; (617) 263-1870.

In this high-tech world, nothing stays the same for long. Since our November issue went to press, Beagle Bros has decided that its MacroWorks and Super MacroWorks customers can upgrade to Ultra MacroWorks for $20. For the same price, FontWorks owners can upgrade to SuperFonts. These prices are slightly different from the ones we quoted in the November issue. Some things stay the same longer than others though: Owners who want to upgrade still need to send in their old disks and $2.50 to cover shipping and handling, and you can still find Beagle Bros at 3990 Old Town Avenue, Suite 102C, San Diego, CA 92110; (619) 296-6400.

Manzanita Software Systems has lowered prices on its accounting software for the Apple II. Manzanita's BusinessWorks and The Business Accountant are accounting-software systems designed for small- to medium-size businesses. The price of the BusinessWorks Bundle for the IIe, IIc, and IIGS (which includes all modules except Payroll) has been reduced from $995 to $495 retail. The Business Accountant Bundle, which runs under DOS 3.3, has been reduced to $395.

For more information, contact Manzanita at One Sierra Gate Plaza, Suite 200-A, Roseville, CA 95678 or at (800) 531-3552 outside California and (800) 447-5700 in California.

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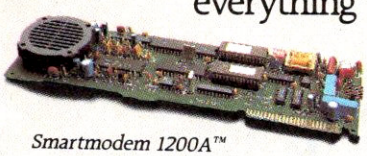

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VIDEO

COVER STORY BY JOHN MARVELLE

Real-life stories of Apple IIs and video gear making a creative match

EXPLORING VIDEO TECHNOLOGY

Saturday mornings are changing from when I was a kid. I remember sitting on the sofa bundled in a blanket beside my brothers and sisters, quietly watching cartoons as my parents slept in. Today many families across the United States are experiencing a different Saturday morning ritual. Depending on what Santa has left under the tree, parents might be awakened by the sounds of kids cheering and bombs blasting as Johnny and Sally play with Captain Power Action Figures by Mattel, firing at their TV screens with Captain Power Vehicles and being fired upon by the TV. Thus, interactive television has come to many American homes.

But that's only one, limited approach to interactive video. As prices of video cameras begin to drop and VCRs are available in almost all schools and many homes, Apple enthusiasts are exploring ways to put video and computer technologies together. Another medium—videodisc—is also getting a run for its money with Apple-using educators.

Elsewhere in this issue of *A+*, you'll find how-to-get-started stories on computer/video applications, but let's take a look here at what several creative individuals are actually doing with their Apple IIs and video equipment. Represented here are home creativity, as well as art, foreign language, and science in the classroom. Let's hope these give you lots of ideas for your own applications.

Susan Griffis of Indianapolis, Indiana, is a computer/video explorer. When her daughter, Sarah, was very young, Griffis introduced her to the Apple IIe, using preschool software. As Sarah started identifying with the software characters, Griffis came up with the idea of creating "video storybooks" that used pictures and animation sequences from some of Sarah's favorite software programs.

With the VCR's TV-video switch set to Video and the TV tuned to the video channel (usually 3 or 4),

VIDEO

Griffis found that by connecting a cable from the Video Out (monitor) port on the back of the Apple IIe to the Video In port of the VCR, she could record the video output of a computer program. (The VCR connection to the TV does not change, which allows the TV to serve as the monitor.) Griffis also found that with a microphone plugged into the Audio In port of the VCR, Sarah could tell a story to go along with the visuals. Thus, Sarah's narration could accompany a sequence of Apple II animation.

Sarah, now seven years old, also uses Koala's KoalaPainter to make her own pictures to accompany her stories. And with the help of a slide-show feature, she can easily tape her creations, as pictures are saved and displayed in a prearranged sequence. She has also discovered that turning your video storybook into a conventional book can be pretty exciting. To do so, Sarah prints out her pictures and types the narration, using a word-processing program. Then she puts the pictures and the words together into a magnetic-mount or slide-in photo album.

Although Susan's video bookmaking began as a personal and fun way to introduce reading to her daughter, it has evolved into a small business in which Griffis and a partner share video story and book ideas with children, parents, and teachers in workshops and conferences and through a monthly newspaper column.

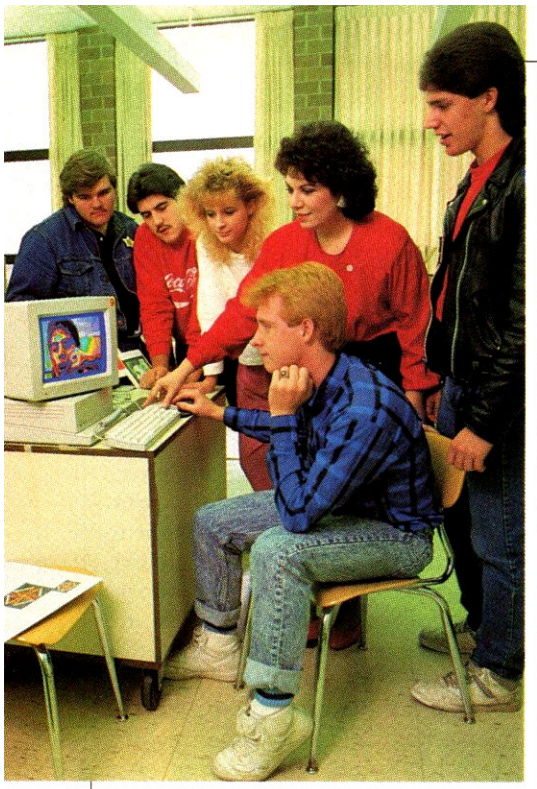
Interactive video and other video-related technologies also are finding their way into schools. Teachers are discovering how to interface their Apples with video technology. Although the use of computer-controlled video is still in its infancy, more and more teachers are experimenting with using video cameras to capture pictures for use in school newsletters or databases and to "film" footage that can serve in interactive video lessons.

The most basic connection between an Apple II and video is through a video camera. Jeanne Krapauskas, for instance, is using this hybrid of technology to change how students at Victor Andrew High School in Tinley Park, Illinois, think of art. So many students at Andrew High were signing up for computer courses that other departments were suffering. Krapauskas believed that by integrating the computer into her curriculum she would attract students to art classes, and she was right.

For the past two years, Krapauskas has offered a course on computer-based art, and the response has been overwhelming. Art classes are now attracting computer whiz kids as well as students who are unfamiliar with computers but want to learn more about high-tech art. Krapauskas' curriculum explores the use of Apple computers (IIs and Macs) to create art forms. The primary thrust of the course is to develop methods for manipulating image making. In addition to using graphic tablets, light pens, and

JOHN STARKEY

Susan Griffis began creating "video storybooks" for her young daughter. The idea evolved into a small business that includes workshops and conferences.



WILLIAM H. CRAMP

Jeanne Krapauskas and her students use Apples and video cameras to explore the possibilities of art and technology.

VIDEO

paint software, Krapauskas teaches students how to use video equipment to explore the endless possibilities of art and technology. Her students use AST's VisionPlus digitizer with a IIGS to capture images and then use paint programs such as Activision's Paintworks Plus to modify and enhance them.

To date, Krapauskas has met with some exciting successes. In 1986, she was named a winner in Apple Computer Clubs' National Merit Competition for her efforts to integrate computers into the curriculum, and one of her students (who had no previous art training) won a national art contest sponsored by Scholastic.

Helen Hamerstrom, a teacher at the Severna Park High School in Severna Park, Maryland, has used interactive video with her foreign-language classes since spring 1986.

Hamerstrom's first project provides her students with an experience that simulates an actual visit to France, using videotaped footage Hamerstrom took on a visit to that country. Her students can see the countryside and hear native speech at full speed—a few minutes of "really being there." The class watches the whole tape and then works through each segment by entering answers to a computer program's questions and reviewing the parts of the tape that were hardest to understand. Because the computer can read the frame numbers encoded on the second track of the videotape, students can access any segment of the video program as they need it. Hamerstrom performs this feat by using an Apple IIe equipped with a BCD videotape-interface card and a Panasonic AG6300 video recorder/player (see "Using Your Apple II with a VCR" in this issue for further information on this equipment).

The other members of the Severna-Park foreign-language department have become interested in interactive videotape and are expanding its use to the Spanish and German classes. In addition, the county Board of Education purchased a Pioneer videodisc system for Hamerstrom and her colleagues. With the assistance of authoring software, nonprogramming teachers in her department and some students are now writing videodisc lessons.

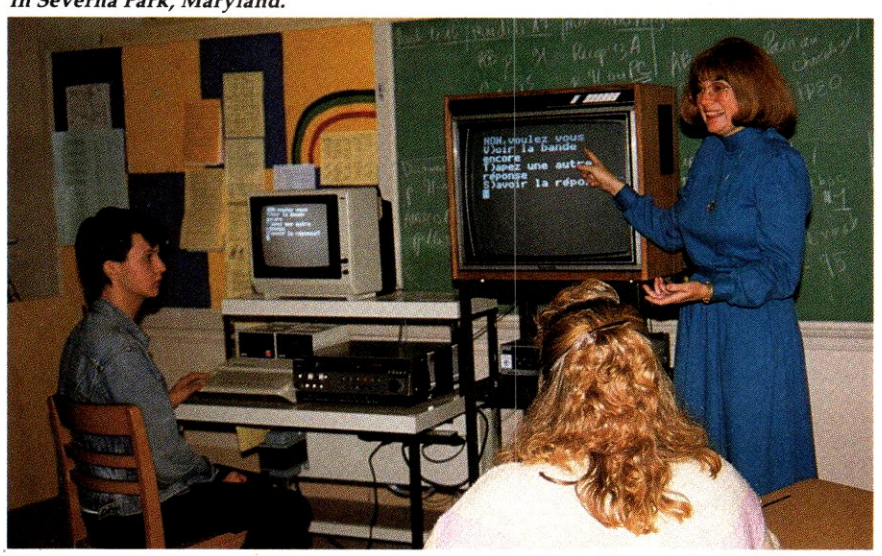
Hamerstrom plans to continue using both laserdisc video and computer-controlled videotape. Even though videodisc systems have more durable disks and provide increased speed in accessing individual segments, she still likes the idea of being able to use her own videotapes and edit them to include just what she wants.

Rita Henry, a ninth-grade earth-science teacher at Glen Ridge High School, Glen Ridge, New Jersey, has created an interactive laserdisc program entitled Mission: Earth that helps students discover astronomical concepts and terms.

Using Optical Data Corporation's authoring software and its Astronomy and Earth Science laserdiscs, which contain more than 20,000 still images and 115 video clips, Henry created a simulation experience that combines the laserdisc images with text and questions; it runs on a Pioneer videodisc player controlled by a IIe.

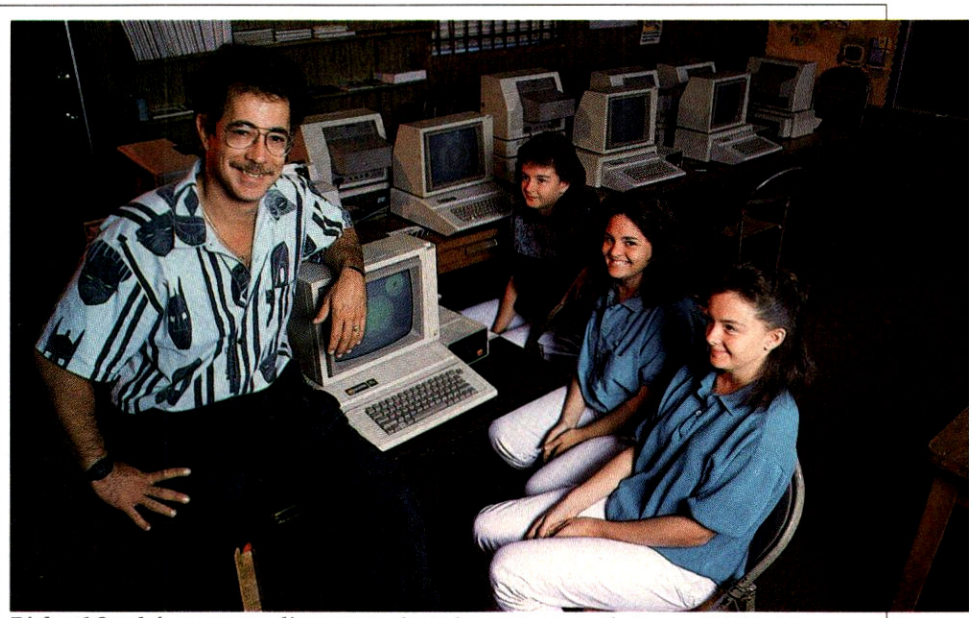
Henry's students, who begin the project on a space station on Alpha Centauri, receive radio transmissions that seem to originate from Earth or its planetary environs. The content of the coded message indicates that intelligent life may exist there, thus justifying an intergalactic trip to Earth's solar system. In the course of their mission, the students go through four lessons that are designed to utilize what they have learned from their textbook readings and lectures. The program allows students to "fly" past stars and galaxies, study the

Helen Hamerstrom uses interactive video with her foreign-language classes in Severna Park, Maryland.



GEORGE WANKEN

VIDEO



Richard Steele's computer-literacy students learn to create their own MTV videos.

STEVEN GEORGES

sun and solar system, and explore other planets.

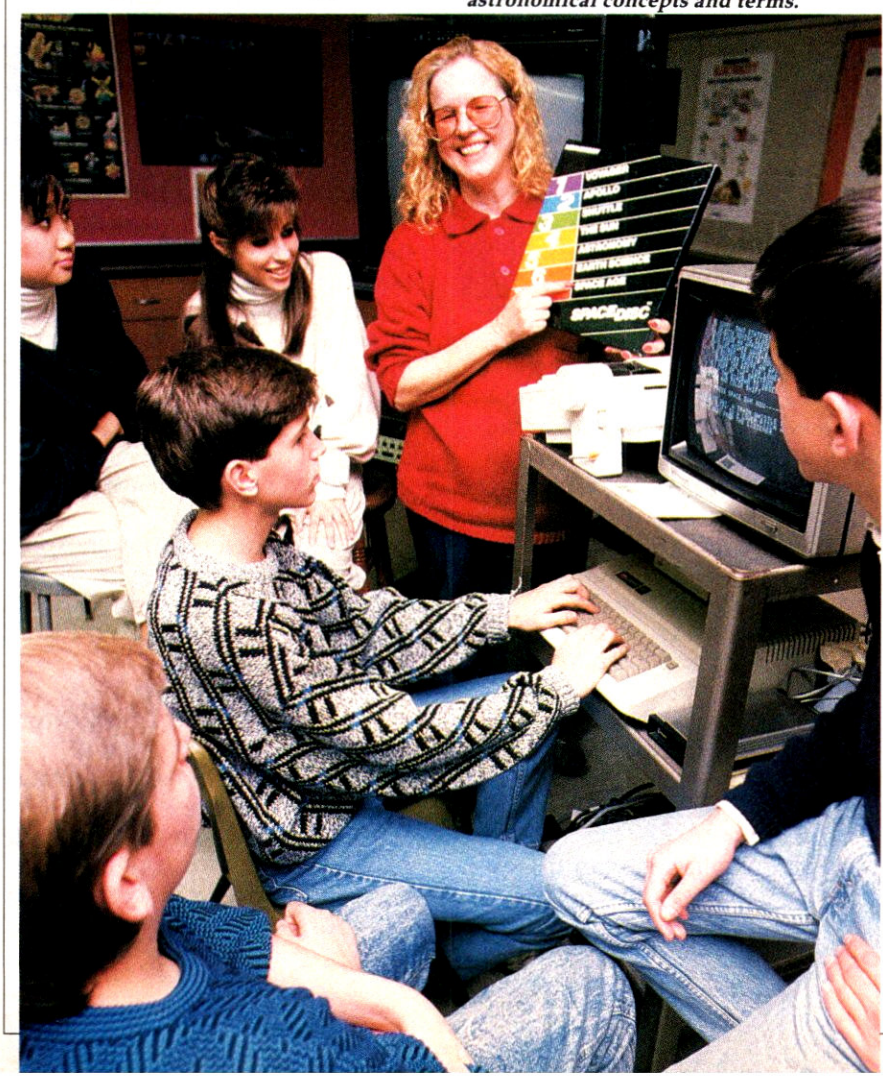
A high-school science teacher for 24 years, Henry put the project together after her principal, James Buckley, asked her to design a year-long earth-science course that would be required of all ninth-grade students.

Henry celebrates the end of each school year by video-digitizing class pictures on T-shirts.

How would your kids like to create their own MTV video? Well, that's exactly what Richard Steele's students at Westchester Lutheran School, Los Angeles, learn in their computer-literacy classes. Steele teaches his students in grades 4–8 how to create pictures and animation sequences on an Apple computer, using a video digitizer and software.

Over the period of a school year, Steele's students learn BASIC and Logo programming, try paint programs such as Baudville's Blazing Paddles, experiment with animation using Brøderbund's Fantavision and Baudville's Take-1, and explore the various uses of a video digitizer—all in preparation for creating, editing, and producing a videotape.

Rita Henry's interactive laserdisc program helps students discover astronomical concepts and terms.



As the end of the year approaches, Steele works with his students to create a video. They gather computer-generated pictures and animation sequences created on the Apple computer or captured with the video digitizer. Finally, a videotape recorder records the various video animation sequences and pictures in real time. Later the students add an audio portion. Thus they create their own music videos.

Integrating computer, video, and laserdisc technology does require extra time, thought, and money. The computer/video pioneers we've met all agree that the effort is well worth it. Furthermore, they all regard video and laserdisc technology as a powerful new medium that teachers and parents have only begun to explore. See "Videodisc Primer," "Using Your Apple II with a VCR," and "How to Make Video Valentines" elsewhere in this issue for tips on how to get started yourself. ✚

John D. Marvelle is the former director of Apple Computer Clubs International, a program sponsored by Apple to promote the use of computers in grades K–12. Marvelle has a special interest in the use of personal computers for teaching and learning.

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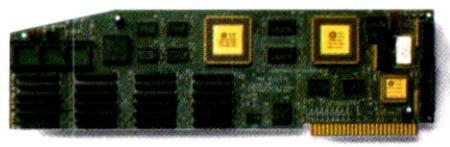
Less expensive than an IBM clone.

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



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

Works with the hardware you already own.

With PC Transporter, MS-DOS programs see your Apple hardware as IBM hardware. You can use the same hardware you have now.

With IBM software, your Apple hardware works just like IBM hardware. Including your drives, monitors, printers, printer cards, clock cards and serial clocks.

You can use your IIe® or IIGS™ keyboard with IBM software. Or use our optional IBM-style keyboard (required for the II Plus).

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

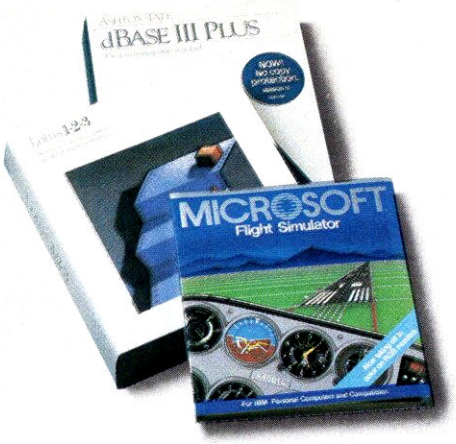
Plenty of power.

PC Transporter gives you as much as 640K of user RAM and 128K of system RAM in the IBM mode.

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

Easy to install.

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



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

A universal disk drive controller.

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

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

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

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

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

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

Versatile data storage.

PC Transporter reads MS-DOS and translates it into Apple native ProDOS. You can store IBM programs and data on any ProDOS storage device including the Apple 3.5 Drive, Apple UniDisk™ 3.5, Apple 5.25″ drive, SCSI or ProDOS compatible hard drives. (You can use the Apple UniDisk 3.5 with its own controller card for storing programs and data, but not for directly booting an IBM formatted disk.)

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

Make your Apple speak IBM.

PC Transporter memory choices.

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

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

IIGS Installation Kit	**49.00**
IIe/II Plus Installation Kit	**39.00**
PC Transporter Accessories	
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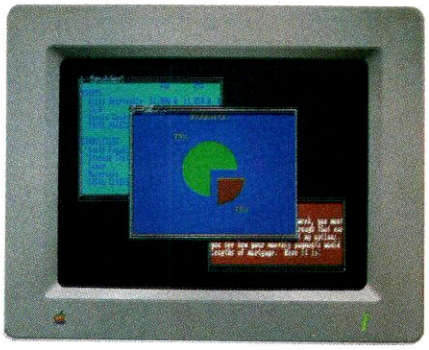
IBM-Style Keyboard (required for Apple II Plus. Requires IBM Keyboard Cable.)	**139.00**
IBM Keyboard Cable	**34.00**
Sony RGB Monitor	**499.00**
Analog RGB Cable (for use with Sony monitor)	**39.00**
Digital RGB Cable (for use with Sony monitor)	**39.00**
Digital RGB Adapter	**24.00**
ColorSwitch (included with IIGS Installation Kit)	**44.00**
128K ZIP	**40.00**
PC Transporter Memory Expansion Chip Set	**per set**
8087-2 Math Co-processor Chip	**229.00**
Heavy Duty Power Supply (IIe and II Plus only)	**69.00**

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



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

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

Created by Apple's original designers.

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

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

So you know the PC Transporter and your Apple were made for each other.

Support and service from the leader in Apple add-ons.

Applied Engineering sells more Apple peripheral boards than anyone else — including Apple Computer. So you know we'll be around after the sale.

PC Transporter comes with a 15-day money back guarantee. If you're not fully satisfied after using it, return it for a full refund. PC Transporter also comes with a 1-year warranty.

How to get your PC Transporter today.

See your dealer. Or call Applied Engineering any day between 9 a.m. and 11 p.m. CST at 214-241-6060.

Applied Engineering

The Apple enhancement experts.

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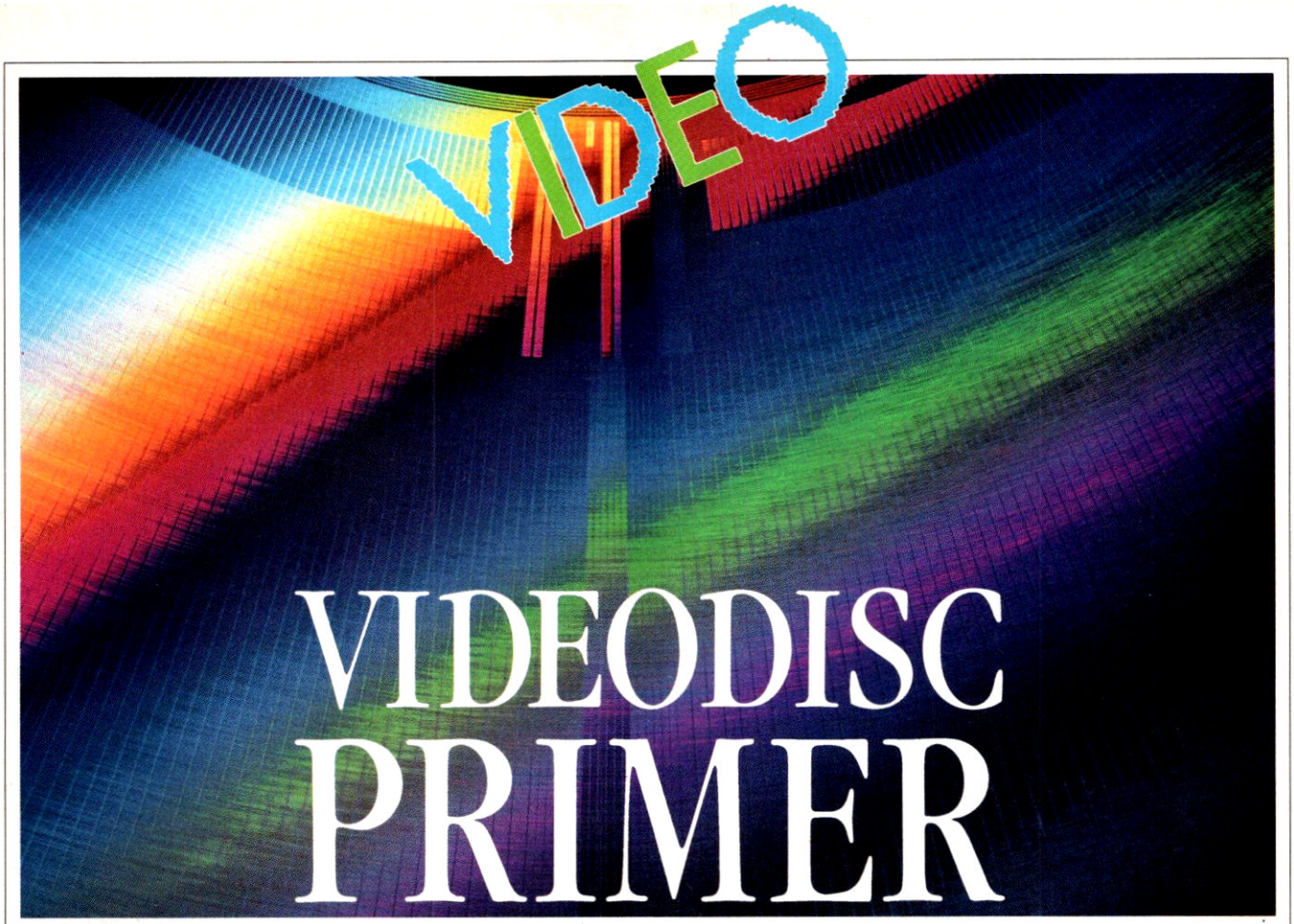

VIDEODISC PRIMER

COVER STORY

BY LISA RALEIGH AND JENNIFER BRAWER

Open up a new domain of educational applications.

People had high hopes for the commercial success of laserdiscs in the late 70s, but that became another consumer-electronics fad that came and went. Still, videodisc lives on, primarily in classroom applications and increasingly under the control of personal computers.

For many educators, the connection between a videodisc player and an Apple II now offers a rich medium for presenting a broad range of topics. The key asset of this combination is the control the Apple provides over the audio and visual goodies on the videodisc, allowing teachers to create lessons around the videodisc material.

Videodisc technology comes in a couple of different varieties, but the common denominator is that the discs are encoded with laser-made pits that you read back with a player that also uses laser technology. The discs can contain a sizable amount of information: up to an hour's worth of audio and video on one side of the tape, or 54,000 individual still pictures. To date, hundreds of videodiscs are available, covering numerous educational topics, and teachers are learning how to "repurpose" them—i.e., design an interactive lesson around the videodisc's contents.

The advantages of videodisc technology in the classroom (depending on the type you use) are:

- the possibility of exerting control over the order and depth of presentation;
- the high-quality realism of filmstrips, without the fuss of projectors and the film itself;
- the availability of two audio tracks, which means you can have two levels of sophistication (or even two languages) for the sound track accompanying the material;
- the capacity to store the equivalent of thousands of slides without having to keep track of them individually;
- random access of material, at a greater speed than with videotape, film, or slides; and
- a sturdiness unavailable with other media—discs won't break, deteriorate, or fade.

That said, videodisc is still a relatively new educational technology that can be fairly puzzling, considering the different flavors of videodiscs and videodisc players—as well as the complications that arise when you propose to hook a player up to an Apple II.

With that background, let's start at the very beginning and take the point of view of an educator with an interest in using an Apple II with videodisc technology, using commercial videodisc material as a starting point.

Applications First

Here's the same advice you heard when you went out shopping for a computer in the first place: Evaluate your needs and survey the software scene. Before you buy any hardware, get an idea of what software (in this case, videodisc) you want to use, because it will probably determine what sort of equipment you need to run it and what you can do with it. To find out what's available on videodisc, start by ordering one of the catalogs listed in the accompanying "Videodisc Resource Guide." Some distributors specialize in do-

mains such as science, whereas others are broader-based.

In reading these catalogs, you'll discover that some types of videodiscs let you play them only from beginning to end on a videodisc player, and others let you control the sequence of events with a computer connected to the player via educational software—the key difference among videodisc formats.

The first type is called CLV (constant linear velocity), which contains up to an hour of audio and video material on one side and can be played only from beginning to end; you can't stop a CLV disk and examine an individual frame. (A software publisher has recently released a product to give you random-access capabilities with CLV, however—details later.) You can find everything from "Faerie Tale Theatre" to auto-repair training in CLV format, and the discs can cost anywhere from $30 to $2000, depending on the complexity of the application. A great many CLV discs, though, fall in the less-than-$50 range. Among the best known are those from the National Air and Space Museum and The National Geographic Society.

The other type of videodisc format is CAV (constant angular velocity). A CAV-format disc contains thousands upon thousands of still pictures that comprise half an hour of material. You can sequence the stills to show a process such as mitosis and freeze them for examination at any step. Or you can view the pictures individually, as in an art-history application in which individual paintings appear. By its nature, CAV lends itself more readily to computer control. It typically costs quite a bit more than its CLV cousin because it often comes with courseware or the software for creating courseware. To use a CAV system, you'll need an interface board with which to connect your Apple to the videodisc player.

The bottom line is that you need to determine whether the videodiscs you're interested in are in CLV or CAV format and take it from there. If it's CLV and you're just interested in viewing the discs, then all you need is a videodisc player on which to play it. If you want to create a lesson around them, however, then you need to consider Whitney Educational Services' authoring software (see below). A CAV videodisc, on the other hand, typically requires you to buy an interface card, and you'll want to find out about authoring software here too if you want to repurpose a CAV disc. (Sometimes the software comes as part of the CAV package.)

VIDEO

Authoring a Lesson

Authoring software that controls videodisc players is available from a variety of companies (see "Videodisc Resource Guide," on pages 40–41). By and large, these authoring systems pertain to CAV applications. Often publishers sell package deals: typically the software plus interface cards, cables, and sometimes the videodisc players themselves—as well as the subject-specific videodiscs. The software allows you to manipulate the video sequence, create menus, ask questions, review difficult areas, and generally tailor the material to your course objectives.

One of the newer developments in this area is Whitney Educational Services' release of VideoLessonWriter, which allows you to fiddle with the previously inalterable sequence of CLV material, but only on two new Pioneer players called the LD-V2000 and the LD-V4200. Whitney's objective in releasing this product is to take advantage of the large base of low-cost, high-quality CLV discs. VideoLessonWriter lets you combine both text and graphics with the videodisc material. It does not, however, let you freeze frames, still an impossibility with CLV discs. VideoLessonWriter, which costs $489, includes the authoring software, an interface controller, and a sample disc; it also works with CAV discs.

Hardware Hints

As you undoubtedly know, computer software works only on certain computers. Apple II software, for instance, doesn't run on the Macintosh. Similarly, in the world of interactive video, you must locate authoring software that's written for the Apple II, but there's an additional twist: Software designed for interactive video also tends to be specific to certain brands of videodisc players. The most common brand is Pioneer. You can find videodisc players to hook up to your Apple that are made by Sony, Magnavox, Hitachi, and others, but the software, interface cards, and cables you need to control them may not be as readily available as those that work with Pioneer players. The operative hint here, then, is to make sure that the authoring software you have in mind works with the videodisc player that you are considering.

The cost for videodisc players starts at about $600 (the approximate price of the Pioneer LD-V2000) and ranges up into the thousands of dollars. You'll want an industrial model, rather than a commercial/retail one, since only the industrial type allows computer control. The higher the price, of course, the fancier the features.

The Drawbacks

Obviously, you can run into a fair amount of expense getting set up to prepare an interactive videodisc lesson. But price isn't the only concern. With competing video-related technologies—videotape, DVI (digital video interactive), and so on—it's hard to say what tomorrow's dinosaurs will be. The chief disadvantage of videodisc is its read-only capability. You can't record and rerecord, as you can with videotape. Still, the quality of videodiscs and the control they afford over their contents have made them an attractive medium for many adventurous teachers. ✚

VIDEODISC CHECKLIST

Here's a quick checklist to run through when looking at videodiscs:

- Do the discs you're interested in come in CLV or CAV format?
- Do you want to use them as is or modify them?
- Are they hardware-specific in any way? That is, do they require an interface card or software that works with only, say, Pioneer or Sony?

Lisa Raleigh and Jennifer Brawer are A+'s executive editor and education editor, respectively.

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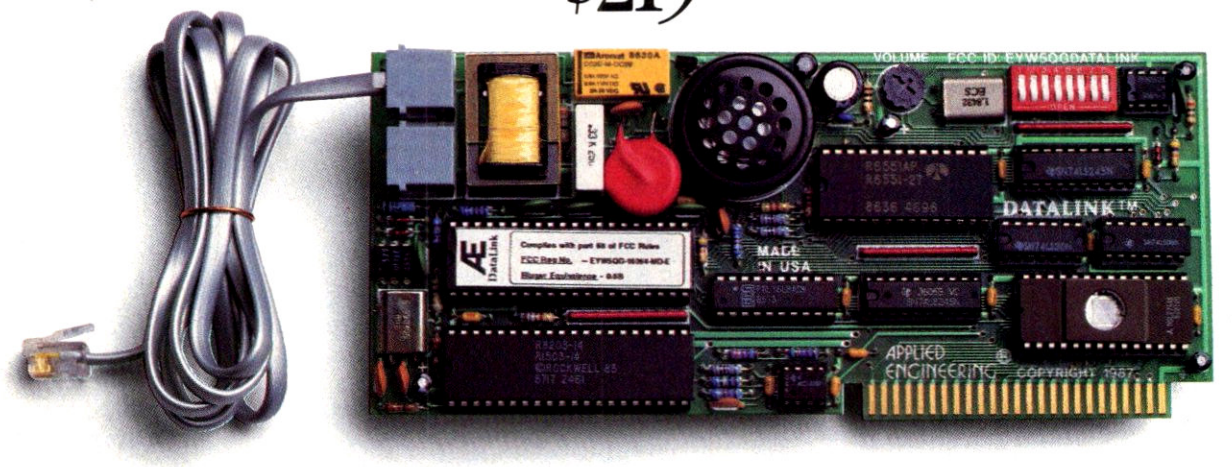

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Unlike the Smartmodem®, DataLink comes with its own easy-to-use communications software in ROM and on disk that supports macros, file transfers, on-line time display, data capture and datascope mode. The software also allows you to store hundreds of phone numbers for auto dialing and log on.

Because DataLink is 100% Super Serial Card compatible, you can also run virtually all other communication software, including Point-to-Point, Apple Access and ASCII Express, to name a few.

The compact design allows DataLink to fit in any slot — including slots 1 and 2 of the IIGS with a cooling fan installed. DataLink operates at 1200 or 300 baud. Built-in diagnostics check for accuracy of data transmission, and DataLink lets you track the progress of calls either electronically or via an on-board speaker.

Introductory offers from popular networks included.

When you purchase DataLink, you'll get a fee-waived membership to The Source worth $49.95. $60.00 worth of free on-line time from NewsNet. A free $50.00 subscription to the Official Airline Guide. And a free subscription to the GEnie network worth $18.00!

	Applied Engineering Datalink	Hayes® Smartmodem 1200A
Price	$219	$349
Max. transmission rate	1200 baud	1200 baud
Warranty period	5 years at no charge	2 years or 4 years for $75
Software included	YES	NO
Hayes AT command set	YES	YES
Help screens	YES	NO
On-board telephone jacks	YES	NO
Fits any slot (even with fan)	YES	NO

Smartmodem is a registered trademark of Hayes Micro Computer Products.

Order today!

To order or for more information, see your dealer or call Applied Engineering today, 9 a.m. to 11 p.m. 7 days. Or send check or money order to Applied Engineering. MasterCard, VISA and C.O.D. welcome. Texas residents add 6¼% sales tax. Add $10.00 outside U.S.A.

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☐ **NUMBERSCOPE™**—Analyzes your name & birthdate according to traditions of Numerology. Results include destiny number, karmic lessons, life cycles, turning points motivation, expression, inner-self numbers plus interpretations. **$19.95**

☐ **VOCABULATOR™**—Increase your vocabulary at selectable skill level, from high school to advanced. Multiple choice or quick review mode. Add words you want. **"Recommended: Excellent Program"-Electronic Learning Mag** **$29.95**

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☐ **ASTROSTELL™**—Learn all 88 constellations. Four levels of star brightness simulate sky on screen. Gives star names, positions of galaxies, nebula, etc., plus lore & observing tips. **"A Perfect Delight"-Prof. M.F.,Minnesota. $29.95**

☐ **ASTROCALC™**—Calculates for sun, moon & all planets rise/set times, positions in sky, orbital elements, brightness, phase, sidereal time & much more for any date, time & location. Manual explains theory & use. **$29.95**

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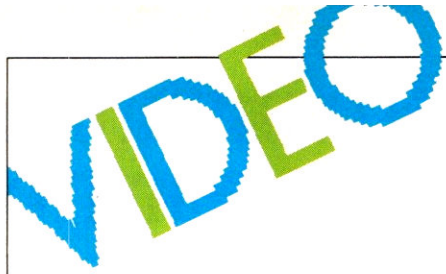

VIDEODISC RESOURCE GUIDE

The following list contains a sampling of directories, catalogs, and other reference material on videodisc technology for the classroom.

College USA, Disk #6

A two-sided disc with information on 11 colleges and universities on one side and A Sampler of Videodiscs for the Classroom on the other. The sampler briefly demonstrates selected discs: College USA; Grolier's Electronic Encyclopedia; National Geographic Society's Whales; and BioSci from Videodiscovery, Inc. The rest of the disc is an Index to Videodiscs by Systems Impact, Inc., which includes 66 videodiscs covering such topics as business education, art, career guidance, films, geography, history, home economics, math, music, photography, physical education, recreation, and science.

List Price: disc, $60
Dr. James Mecklenberger
National School Boards Association
1680 Duke Street
Alexandria, VA 22314
(703) 836-6722

Educational Activities Catalog

Contains information about the company's first interactive videodisc: You Be the Reporter.

List Price: catalog, free
Educational Activities, Inc.
1937 Grand Avenue
Baldwin, NY 11510
(516) 223-4666

Educational Technology Courseware Catalog

Includes information about an interactive science course for grades 4–6 produced on CAV discs. Titles include Weather, Animals, Plants, and Energy. Each course consists of three to five units.

List Price: catalog, free
Educational Technology
6150 North 16th Street
Phoenix, AZ 85016-9855
(800) 422-4339

The Educators' Handbook to Interactive Videodisc

This 1985 handbook by Ed Swartz contains an overview of the technology and offers sources of more-detailed information. It can help you find the appropriate videodisc and software for specific educational applications.

List Price: $14.95
AECT
1126 16th Street NW
Washington, DC 20036
Written inquiries only

Hoffman Interactive Video Systems Brochure

Covers Hoffman's Laser Learning Reading/Language Arts Program for grades 4–12. Program includes CAV laserdiscs and computer discs (for Apple II Plus or IIe, 64K RAM).

List Price: brochure, free
Hoffman Educational Systems
1720 Flower Avenue
Duarte, CA 91010
(800) 826-8377
(818) 303-1571

Interactive Videodiscs for Education Catalog (Ztek Company)

Contains more than 230 titles, all of which can be ordered directly through Ztek. Major topics include Science (49 titles, including 14 National Geographic [CLV] and 3 National Air and Space Museum [CAV]), Art/Design (23 titles, mostly CAV), Music/Dance (23 titles, mostly CLV), Social Studies (17 titles, CLV and CAV), Math/Computers (9 titles, mostly CAV), and Elementary Science (5 titles, all CAV). Six videodisc players as well as Laserworks authoring software are also available.

List Price: catalog, free
Ztek Company
P.O. Box 54790
Lexington, KY 40555
(800) 247-1603
(606) 252-7276

International Interactive Communications Society

Professional organization consisting of educators interested in interactive media, with chapters in 21 U.S. cities and Canada. Dues include access to all public meetings, monthly newsletter, quarterly journal (*Interact*), discounts on industry publications, and events (conferences, teleconferences).

Dues: $50 per year
International Interactive
Communications Society
President, Ken Christie
P.O. Box 4707
Lincoln, NE 68504
(402) 488-DISC

Miami-Dade Community College Brochure

Includes information about a program called Interactive Math: Probability and Statistics, available on either videodisc or videotape. Covers 11 topics and skills and includes three video-

VIDEO

discs and eight computer disks.
List Price: brochure, free
Miami-Dade Community College
Product Development & Distribution
11011 S.W. 104 Street
Miami, FL 33176
(305) 347-2158

Systems Impact Inc. Catalog

Features Core Concepts Mathematics Series and Core Concepts Science Series. The Math Series has four components, each with one to three videodiscs; the Science Series has two components with three to four videodiscs each.
List Price: catalog, free
Systems Impact, Inc.
Suite 203
4400 MacArthur Blvd. NW
Washington, DC 20007
(800) 822-4636

Teach Your Students Well Catalog (MECC)

A catalog of videodisc products that MECC distributes. Included are the minicourses Introduction to Economics, Trigland, and Improving Teacher Effectiveness; utilities; Pioneer LaserDiscs; and 19 National Geographic videodiscs. Videodisc players packaged with a minicourse, utility, or Pioneer LaserDisc are also sold through the catalog.
List Price: catalog, free
Minnesota Educational Computing Corporation
3490 Lexington Avenue North
St. Paul, MN 55126
(800) 228-3504

Videodiscovery, Inc., Catalog

Information on 26 videodiscs covering art, science, music, history, social studies, and "elementary explorations." Science programs come in both CAV and CLV versions. You can order videodisc players separately or as part of a Videodisc & Player Package.
List Price: catalog, free
Videodiscovery, Inc.
P.O. Box 85878
Seattle, WA 98145-1878
(206) 285-5400

Videodiscs for Education: A Directory (MECC)

Lists 243 discs from 50 different companies. Includes both CAV and CLV discs, with descriptions, hardware requirements, information on materials included with the discs, and prices. Major subject areas are science (57 titles; elementary through college and adult); automotive training (35 titles; secondary and up); computer education and training (24 titles; elementary through college); electronics education (14 titles; secondary to adult); history (11 titles; elementary through college and adult); math (8 titles; elementary and up); vocational education and training (6 titles; junior high through college and adult); and physical education (6 titles, elementary and up). Additional subjects include art, business education, career guidance, economics, geography, health care/sciences, music, and photography. Also lists LaserWorks and LaserWriter authoring systems. Except for the titles MECC produces, the company does not distribute any of the programs in the catalog.
List Price: directory, $5
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St. Paul, MN 55126
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Laserworks

Computer disk containing authoring software for the laserdisc/Apple combination.
List Price: $150
Teaching Technologies
Box 3803
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(805) 541-3100

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Companion software for LaserTalk, this package is for interfacing a videodisc player with an Apple IIe or IIGS. The package includes a reference guide, authoring programs, an interface cable, and one videodisc.
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P.O. Box 97
66 Hanover Road
Florham Park, NJ 07932
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(800) 524-2481

VideoLessonWriter

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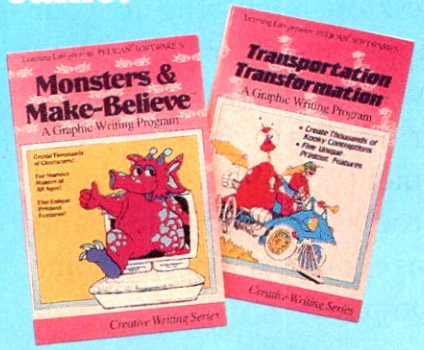

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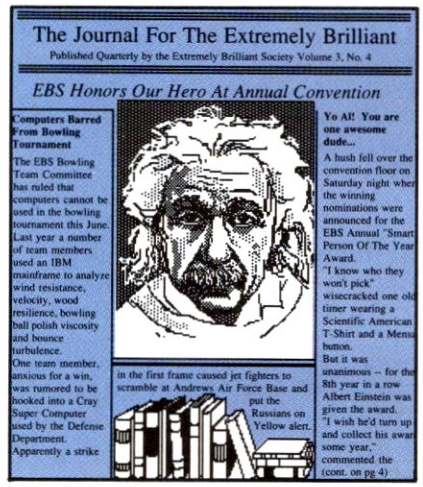

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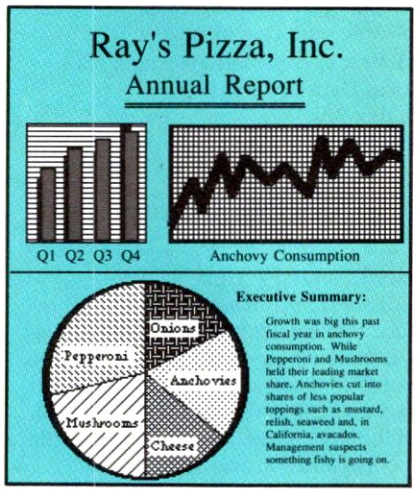

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CIRCLE 293 ON READER SERVICE CARD

VIDEO

COVER STORY BY PAUL HENRY

Setting up an interactive system

USING YOUR APPLE II WITH A VCR

As an avid user of computer and video equipment, have you ever paused in a moment of reverie to dream of the ultimate audiovisual machine? This machine would break free of the constraints imposed by the designers of computer or video technology and sport the best features of each within an integrated system.

Your wish list might include the following capabilities:

•computer programs that capture the live, full-color action and realistic sound of video;

•video programs that harness computer control to provide users with quick access to desired video scenes; and

•an authoring system that puts these powerful features to work in tandem with computer text and color graphics in a wide variety of applications.

You may have imagined yourself in the driver's seat, taking this machine on a test drive:

•creating an audiovisual database of your favorite videotapes,

•designing a computer-controlled video-editing suite,

•developing interactive-video training programs for classroom or business, or

•devising attention-grabbing A/V presentations to promote products or services.

Your dreams can come true with an existing technology—computer-assisted interactive video (CAIV)—which began with computer control of videotape machines roughly ten years ago and is more recently associated with control of videodisc players. Videodisc technology offers faster access time than videotape (roughly 12 times faster: 3 seconds for disc vs. 36 to 40 seconds for tape access of the end of a half-hour program, starting from the beginning). Despite this speed advantage, videodisc is currently a read-only technology—you can't create your own video programs or copy others. You are limited to what producers and publishers create and distribute.

Instead of waiting for videodisc to evolve, you can use versatile and familiar technology—an Apple II computer, an "industrial" VCR, and a color TV or display monitor with audio—for CAIV, rounded out by the purchase of a CAIV interface and authoring software.

Besides being an affordable read/write medium, videotape is the mastering medium for the production of videodisc. Successful CAIV programs using videotape can serve as reliable prototypes for subsequent videodisc versions. Some of the CAIV interface systems allow control of both videotape and videodisc.

The Method behind the Magic

Today, an Apple user can choose from a handful of interactive videotape interfaces and authoring systems (see "Three CAIV Tape Systems for your Apple," which accompanies this article), and a wide variety of compatible add-on products, ranging from touch screens for keyless input to video-overlay boards that superimpose computer text or graphics directly over the video image. Before looking at how hardware and software can help you create interactive video, let's take a look at video technology itself.

Three types of signals are recorded onto videotape. Video signals are recorded in the center as slanted tracks, every pair representing one completely scanned image (a video frame). Every 1/30 second, a control pulse marking each video frame is recorded along one edge of the tape (except with Sony machines, which use two control pulses per frame). On the other edge are two parallel audio tracks.

The method behind the magic of computer-controlled VCRs lies in the predictable series of video frames and their corresponding control-track pulses. A computer (connected to a VCR via an interface) can count the control-track pulses to determine the location of any video segment on a tape. Once the computer knows where the tape is positioned, it can send control signals to access the VCR's transport functions (play, record, fast forward, reverse, stop, pause).

VCR Nuts and Bolts

The videocassette recorder or player must be an industrial model that allows control of the machine's functions through a re-

mote-control port (usually on the rear panel). Edit controllers commonly use this multipin connector to access precise locations on the tape for editing. Industrial VCRs use electronic switching to control tape-transport functions. Thus, a computer can send electronic control signals to control the VCR via this port. Consumer-type VCRs don't allow this type of remote control, so you must control the tape's flow manually.

VCR compatibility depends on the interface card you choose. The industrial VCRs that generally work with currently available CAIV interfaces are the ¾-inch U-matic or ½-inch Beta format by Sony and the Panasonic or JVC ¾-inch U-matic or ½-inch VHS machines. The Nationwide Computer & Video interface works only with Panasonic AG 6000 series VCRs (½-inch VHS), and the others are compatible with most industrial VCRs (¾-inch U-matic and ½-inch VHS or Beta).

Many media departments in schools, corporations, and other organizations use industrial VCRs not only for the remote-control feature but also for their durability. If you don't have access to an industrial VCR and are anxious to try your hand at interactive video, consider the purchase of a "player-only" model for roughly the same price as a consumer VCR.

The CAIV Interface

The common means of connecting and controlling an industrial VCR is through a CAIV interface card inserted into one of the Apple II expansion slots (Apple IIc computers don't work with this type). A ribbon cable extending from the interface attaches to the remote-control port on the industrial VCR with a multipin connector. In addition to the control cable, one video cable (BNC or RCA) and two audio cables (RCA) route these signals from the VCR to the interface (see figure 1).

Connecting the Apple video to the interface allows you to toggle a single monitor's display between computer text/graphics from the Apple and video from the VCR. If you wish to use a separate monitor for the computer text/graphics,

THREE CAIV TAPE SYSTEMS

What excites and involves interactive-video producers and users is the immediacy of live video action teamed with an interactive computer program that prompts for input and branches to appropriate text, graphics, or video segments, depending on individual response. Such a system is what Bob Whitney of Whitney Educational Services envisioned in 1977 while working at the University of California Medical Center. Seeking a way to create a computer-controlled video presentation system, he teamed up with John Starkweather, creator of the Pilot authoring language. Together they developed interactive video hardware and modified Apple Computer's SuperPILOT authoring language to work with videotape machines.

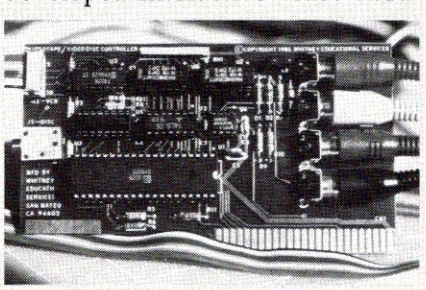

Figure A: The Whitney Supercircuit II CAIV interface card for the Apple II Plus, IIe, and IIGS. It can control VCR and videodisc separately or simultaneously.

Their current Apple-based products include an interface card that controls both videotape and videodisc (Supercircuit II for the Apple II Plus, IIe, and IIGS—see figure A) and an authoring system (INSIGHT) that creates interactive video programs in BASIC. INSIGHT allows easy modification to access a wide range of input devices and incorporate graphics from popular programs. Its users have unlimited license to copyright, sell, and distribute authored programs.

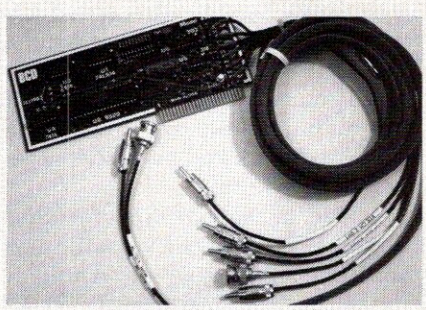

Figure B: BCD's Model 450 CAIV interface for the Apple II Plus and IIe controls a wide variety of VCRs. All the necessary cables are bundled and labeled for easy connection to computer, VCR, and display monitor/TV.

Another pioneering company shared this vision by developing hardware and software with a unique sleight of hand. Bob and Diane Howard of BCD Associates created two videotape interfaces: the Model 450 interface card, which fits neatly in slot #4 of the Apple II Plus and IIe (see figure B), and the VideoLink 232 external interface (see figure C), which connects to the serial port of an Apple or any other computer (Mac and IIc users, take note). Their authoring program (The Instructor) provides powerful features while maintaining the ease of menu-based authoring. Currently in development is an Apple IIGS interface that will control tape or disc (but not the two simultaneously).

A low-cost ($545) but effective system is the recently introduced VILM (Video Instant Lesson Maker) from Nationwide Computer & Video, which combines both interface and authoring software. Although lacking some of the VCR compatibility and authoring-program power of the other (more costly) systems, it comfortably fits the limited budget of many schools and individuals just getting their interactive feet wet.

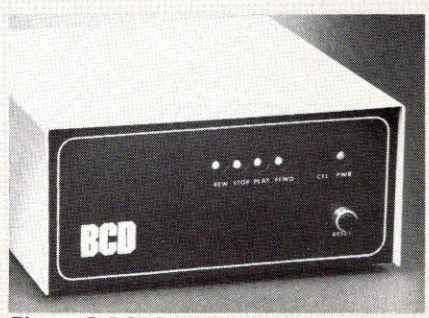

Figure C: BCD's Videolink 232 controls VCRs from a serial port.

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simply connect the Apple Video Out to the computer's display monitor as usual. The remaining cables route the VCR's video and audio signals and the Apple video signal already joined at the interface to the display monitor or TV (see figure 2).

Writing Control Code

If you are preparing your own production or copying existing video, try to have video signals recorded over the entire length of the tape. Even if your program material is limited to a small portion of a long-duration cassette, recording video signal and the corresponding control pulses over the entire length ensures that you can determine the exact location, no matter where the tape is currently positioned. If the tape extends beyond the length of your program, put "video black" signal over the remainder by recording with a video camera with the lens cap on. To reduce access time, try to use a tape length that closely matches the length of your video program (allowing for 5 to 30 seconds before the beginning of the first scene).

Your next step is to determine how the interface card will read the location of the tape at any point during an interactive session. Two addressing schemes, relative and absolute addressing, are in common use. Relative addressing

Figure 1: Cable connections to VCR from interface for remote-control port, video, and audio

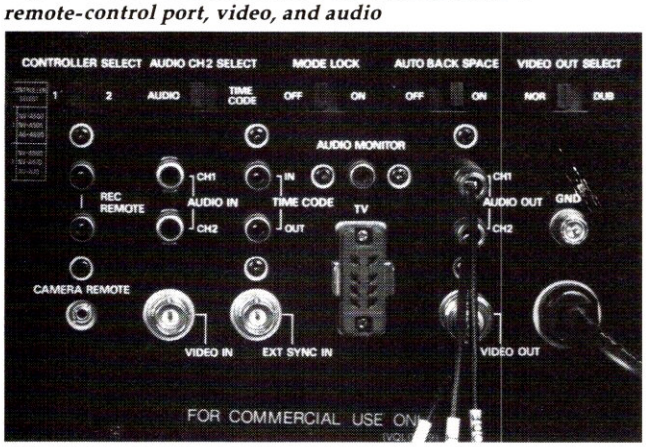
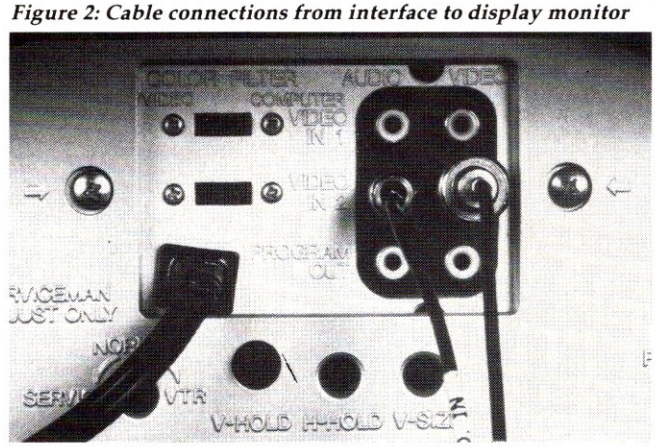


Figure 2: Cable connections from interface to display monitor



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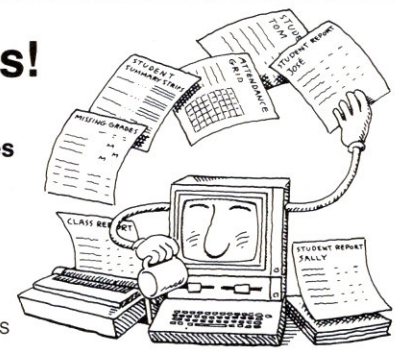

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counts the passing pulses on the control track. Since these pulses are automatically laid down with each video frame, this method is the quickest and easiest for preparing a tape. As the interface card feeds each passing control pulse to a counting routine in your computer, a pulse count defines each location on the tape. When the tape rewinds during the interactive session to access earlier scenes, this count is decremented and constantly updated to the current tape location.

Since this count is relative to the starting address at the beginning of the tape, you should rewind the tape before starting an interactive session. Some tape slippage occurs during repeated fast-forward or reverse searches for scenes, and this cumulative error in the relative count may cause slight problems in accessing a precise point on the tape. If you anticipate frequent searches during a typical session, you may need to allow extra time before or after each scene when defining each scene by its pulse-count numbers.

Absolute, or frame-accurate, addressing solves the slippage problem by assigning an electronic code number (frame code) for each frame of video. Authoring software contains a routine that allows you to record frame code on one of the audio channels (see figure 3). Depending on the flexibility of your VCR, you can use the audio-dub function to write this code on channel 1 or either channel, without erasing video or the other audio channel. If you need both audio channels for stereo or bilingual narration, however, then relative addressing is the style of choice.

CAIV interfaces and software from BCD Associates and Whitney

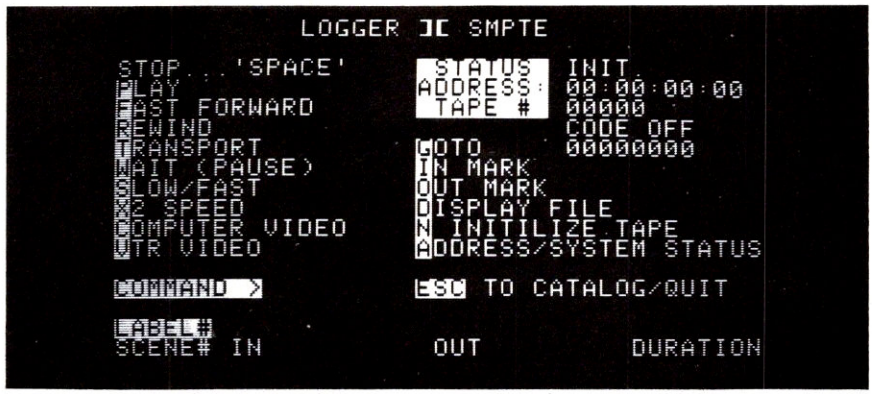
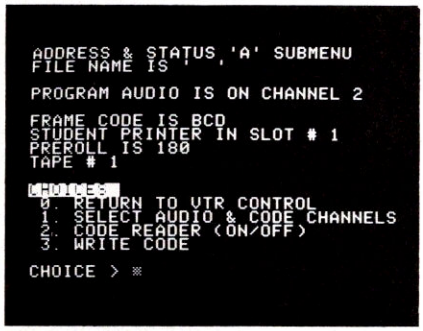


Figure 4: Screen display of logger program – to mark the IN and OUT points of each scene (video segment)

Figure 3: Screen display of addressing status with write-code option



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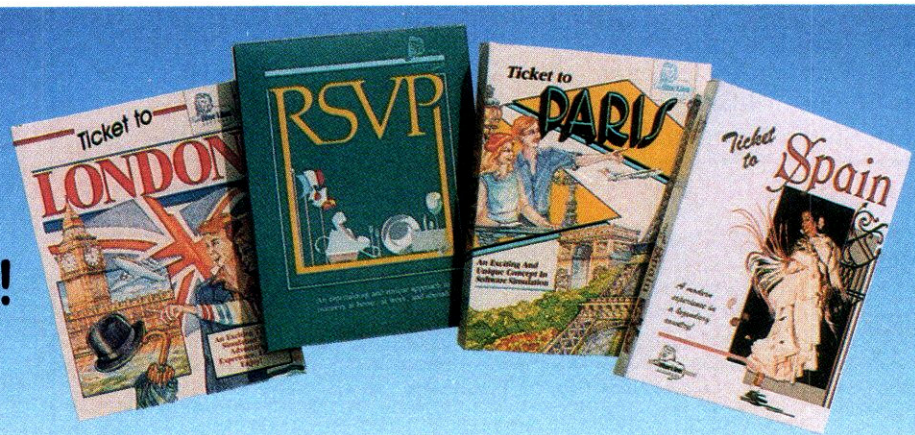

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Educational Services offer you both addressing styles, whereas Nationwide Computer and Video offers the relative addressing mode only.

Now it's time to put on the director's cap. With a firm idea of how you want to use sections of the video material on the tape, you can use a "logger" program to mark the beginning (IN) and ending (OUT) points of each "scene." With the VCR in the Play mode, you can toggle back and forth between the video and the logger-program display, pressing a specified key to mark the IN and OUT points of each scene (see figure 4). The system will use the data file you create during this process to access defined scenes when your interactive program calls for a video scene.

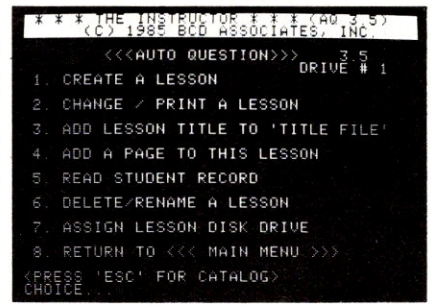

Figure 5: Main menu of BCD's authoring program

A CAIV authoring program is similar to a general-purpose authoring program. It lets you create text and graphics "pages" to present information. Each authored page is represented by a single screen area. You can present users with choices from menu pages or question pages. Depending on the range of user responses, you can create a series of branches to other text or graphics pages for reinforcement or additional information. A CAIV authoring program adds video and audio segments to the list of page styles (see figure 5). Record management of user responses is also a common part of the program features.

You can write your programs using an authoring language such as SuperPILOT or access the machine-language drivers that control the VCR from your own BASIC programs. Alternatively, you can use an authoring program that comes with CAIV interface cards (bundled or at additional cost), which is generally an easy-to-use, menu-oriented system. During the authoring process, the software prompts you at each step, and you can also view the interactive program or user responses on hard copy or the screen. The authoring programs differ in terms of how many additional features they offer and what software or hardware they work with. Generally, the higher the cost, the more features and compatibility.

Next month, watch for a step-by-step tutorial on using authoring software to create an interactive video lesson. ✚

Paul Henry has been enamored of computers and video since 1976. After years of producing traditional audio-visual programs, he has decided to tie the knot (and marry his Apple to his VCR). He now designs and "scripts" interactive video productions.

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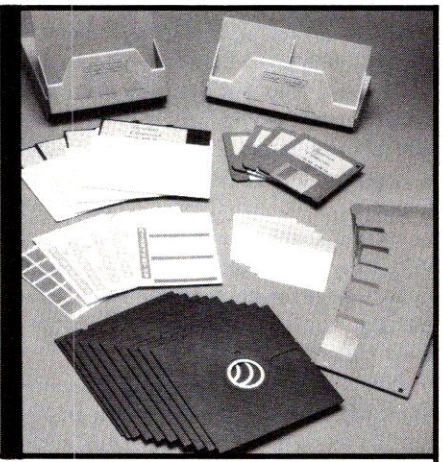

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BCD Model 450 interface card and **The Instructor**
BCD Associates, Inc.
7510 North Broadway
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Oklahoma City, OK 73116
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List Price: Model 450 interface (includes logger program, video drivers, and BASIC subroutines necessary to write your own CAIV programs in BASIC), $595; The Instructor authoring software and manual, $395
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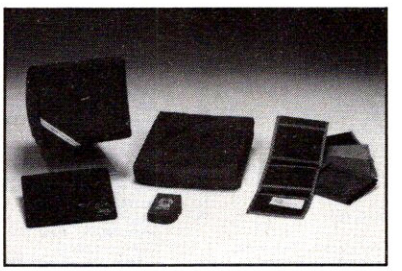

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Z-RAM Ultra 2 or 3 *(256K to 1Meg)* Call
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GS-Ram Plus *(1MB to 6MB)* Call
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M-1509 *(180cps Dot Matrix NLQ) 15"* 389.
HR-20 *(20cps)* Daisywheel 359.
HR-40 *(35cps)* Daisywheel 599.
TwinWriter 5 799.
Epson LX-86/LX-800 Call
FX-86e Call For Call
FX-286e Most Call
LQ-800/1000 Recent Call
EX-800/1000 Low! Low! Call
LQ-2500 Prices Call
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Microline 182P *(120cps Dot Matrix 10")* 249.
Microline 192*Plus (200cps Dot Matrix 10")* 339.
Microline 193*Plus (200cps Dot Matrix 15")* 489.
Microline 292P *(240cps Dot Matrix 10")* 539.
Microline 293P *(240cps Dot Matrix 15")* 639.
Panasonic
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Mitac AD-3C Slimline IIc 129.
Pico Products
Apple Half-Height II+, IIe, IIc 139.
ProAPP ProAPP 20 MB Hard Disk System *(II+, IIe, & IIc)* 799.
Video Technology Computers, Inc.
Laser FD 100c *(Apple IIc)* 139.
Laser FD 100 *(Apple II Series)* 139.

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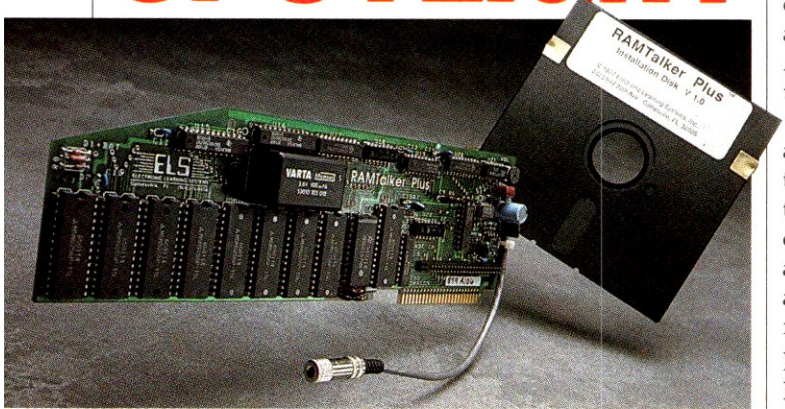
CIRCLE 185 ON READER SERVICE CARD

PICK OF THE CROP
BY PETER TUCKER

The most interesting products of the month for the Apple II family

PRODUCT SPOTLIGHT



RAMTALKER PLUS

From Electronic Learning Systems comes RAMTalker Plus, a multifunction card that provides a battery-protected RAMdisk and the output of high-quality speech.

The card comes with a clock/calendar and additional hardware and software enhancements.

One of the appealing aspects of RAMTalker Plus is the ease and power of speech. A simple print command from BASIC connects the card, providing output to a speaker driver for both synthesized and digitized speech. With a minimum of 128K of RAM, you can even create customized speech files. A speech editor allows you to alter pronunciation.

RAMTalker Plus can be controlled by any program that accesses a printer for output, allowing sentence, word, or letter-by-letter speech.

RAMTalker Plus
List Price: $279
Requires: Apple II Plus, IIe, or IIGS; 64K RAM; one 5¼-inch disk drive.
Electronic Learning Systems, Inc.
2630 NW 39th Avenue
Gainesville, FL 32605
(904) 375-0558

CIRCLE READER SERVICE NO. **405**

RIGHT TOOL FOR THE RIGHT JOB

If you're one of those handy "office fix-it folks" (you know—the person in the office who gets staples out of photocopy machines), you'll appreciate the Office Automation Tool Kit, distributed by Devoke.

This rather hefty package contains the traditional meat 'n' potato tools: hammer, screwdrivers, crescent wrench, and tape measure. You'll also find four sizes of nutdrivers, needle-nose pliers, and a wire stripper. And finally, for the more technical (and adventurous), there's an IC-extractor tool (chip puller), ten-key hex set, and a couple of useful Torx keys.

Just imagine: You'll be hanging pictures, adjusting swivel chairs, and rearranging your ROM chips in no time flat. You may just become the office hero.

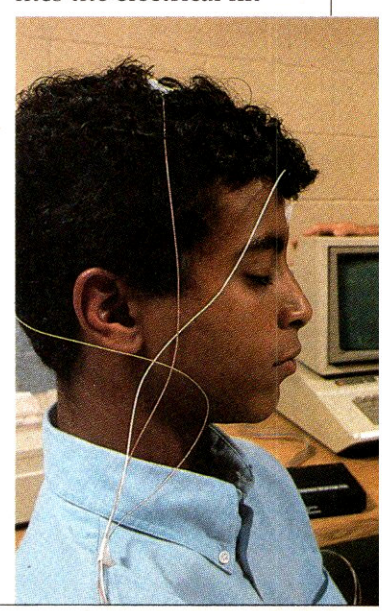
Office Automation Tool Kit
List Price: $99
Devoke
1500 Martin Avenue
Box 58051
Santa Clara, CA
95052-8051
(800) 822-3132

CIRCLE READER SERVICE NO. **406**

THE BODY ELECTRIC

This sophisticated Apple II-based tool from HRM Software enables students to conduct a variety of investigations. With The Body Electric, students measure brain waves, electrical heart activity, and the electrical activity of muscles.

They record and analyze alpha, beta, and lambda waves as they measure brain waves (EEG) during various activities. The electrocardiogram (EKG) program provides a graphic description of the electrical activities of the heart. And finally, an electromyogram (EMG) examines the electrical im-



pulses that cause muscles to contract.

The package comes with a program disk, three gold-plated electrodes, computer interface, electrode paste with assorted supplies, and an extensive teaching guide.

HRM Software also offers a videocassette demonstration, available in VHS or Beta, free for 30 days.

The Body Electric
List Price: $375
Requires: Apple II Plus, IIe, or IIGS; 64K RAM; one 5¼-inch disk drive. DOS 3.3; copy-protected.
HRM Software
175 Tompkins Avenue
Pleasantville, NY 10570
(914) 769-7496
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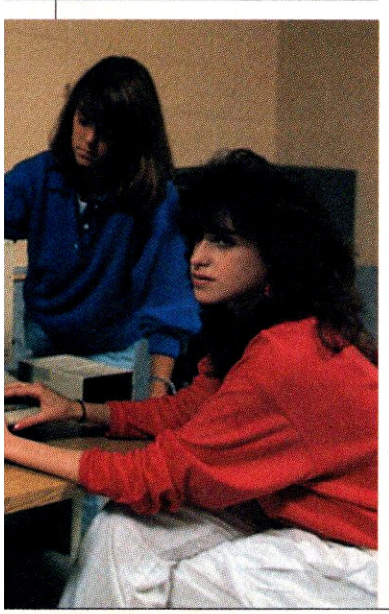
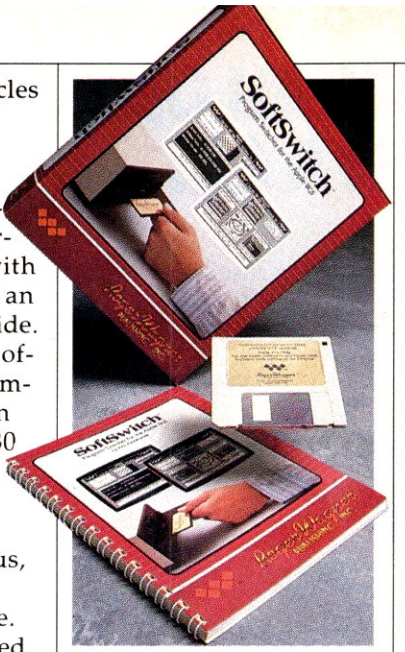
CIRCLE READER SERVICE NO. **407**





SOFTSWITCH FOR THE IIGS

SoftSwitch, from Roger Wagner Publishing, Inc., is a useful and multifaceted desk accessory for your IIGS.

Switch ProDOS 8 or DOS 3.3 programs instantly by returning to the desktop and just choosing a new program, skipping the reload wait. All programs that allow access to the Control Panel while they're running are compatible with SoftSwitch.

Another feature is the ability to copy and paste standard-hi-res and double-hi-res screens between certain graphic programs such as The Print Shop, Fantavision, and Blazing Paddles.

Game players will appreciate SoftSwitch's ability to revert from the current program state to an earlier state. Adventure-game players, for instance, can go back to a point before the slime monster swallowed them.

SoftSwitch can also save the current program status to disk, so you can restart your program, loading at the exact point it was saved. For games that don't have a save-to-disk function, SoftSwitch can be a lifesaver.

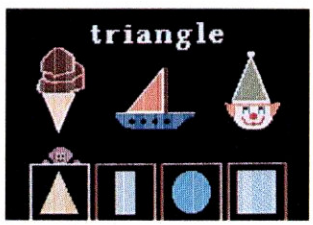
SoftSwitch
List Price: $59.95
Requires: Apple IIGS, 512K RAM, one 3.5-inch disk drive. ProDOS 16; copy-protected.
Roger Wagner Publishing, Inc.
1050 Pioneer Way
Suite P
El Cajon, CA 92020
(619) 442-0522

CIRCLE READER SERVICE NO. **408**

MATH AND ME

From the educators at Davidson comes yet another outstanding learning program. This time it's Math and Me, which helps youngsters 3 through 6 with basic mathematical concepts.

Teachers, parents, and students find Math and Me effortless to run (with

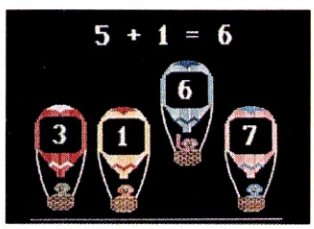


a mouse or the keyboard), colorful, and captivating. Bold graphics point the way to each different activity.

Math and Me covers four subject areas: shapes, numbers, patterns, and addition. Within each subject area are 3 learning games, for a total of 12 games in all. Mischievous monkeys appear throughout the program, popping up and adding to the fun.

When children have completed at least one activity, they are able to print a graphic Certificate of Excellence. The award recognizes their achievement and reminds them of the fun they've had.

As promised, Math and Me is an excellent first

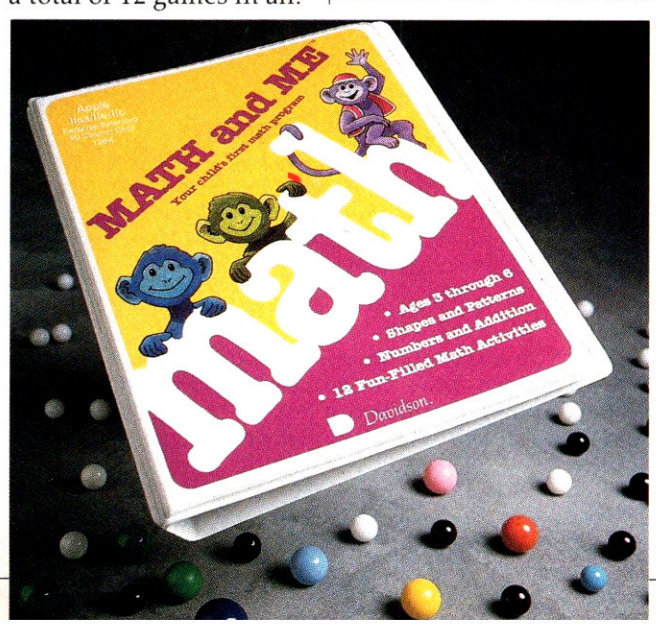


Apple math program for the 3-to-6-year-old in your life.

Math and Me
List Price: $39.95
Requires: Apple IIe (with Extended 80-Column Card), IIc, or IIGS; 128K RAM; one 5¼-inch disk drive (3.5-inch backup available); mouse and printer optional. ProDOS; copy-protected.
Davidson and Associates
3135 Kashiwa Street
Torrance, CA 90505
(800) 556-6141
In CA (213) 534-4070

CIRCLE READER SERVICE NO. **409**

FOR MORE PRODUCT INFORMATION, SEE "ROUNDUP," PAGE 124.



THERE'S MORE THAN ONE WAY TO SCAN A CAT

If you want to create graphics with your Apple®II, there's no reason to pussyfoot around with anything less than ThunderScan.®

Because ThunderScan, the best selling scanner for Macintosh,™ now works with the entire Apple II family. All you need is a IIe, IIc or IIGS and an ImageWriter™ to turn any printed image into a beautiful, high-resolution Apple II graphic.

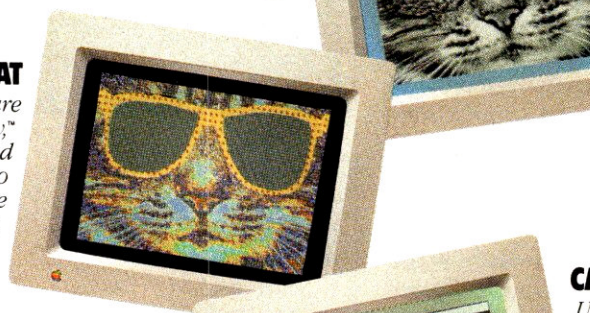
CAT *(AKA Kitty)*
Start with any original image that can roll through your ImageWriter, black & white or color.

FEED THE KITTY
Feed it into any ImageWriter (I, II or wide-carriage). ThunderScan simply replaces ImageWriter's ribbon cartridge, so you don't need a video camera or video digitizer card.

CAT SCAN
ThunderScan zips back and forth, digitizing the image in 16 shades of gray and with the highest resolution of any Apple II digitizer. Plus you can print nearly a full page of graphics at ImageWriter's highest resolution.

CAT'S UP
Or down. When you scan, ThunderScan lets you enlarge or reduce. Control contrast and brightness. And with an ImageWriter II or a color monitor, you can assign colors to all 16 shades of gray for some really wild effects.

HEP CAT
Use painting software like DazzleDraw,™ DeluxePaint™ II and PaintWorks Plus™ to turn an ordinary house cat into a hep cat.



CATALOG
Use scanned images with the new Apple II desktop publishing programs to include graphics in catalogs, newsletters, reports, correspondence, personalized cards and more.

CAT PRINTS
Print out your finished work on your ImageWriter. Or use PinPoint GraphMerge™ to include professional-looking graphics in your AppleWorks™ documents.

Whether you use your Apple in business, at home or at school, there are as many ways to scan a cat as you can imagine. As long as you have ThunderScan. And at just $219 complete, you'll feel like the cat who ate the . . . well, you get the picture.

Thunderware®

ThunderScan® FOR APPLE II

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CIRCLE 114 ON READER SERVICE CARD

SPEAKING OF GRAPHICS

Create homemade Valentines on paper, disk, or even video.

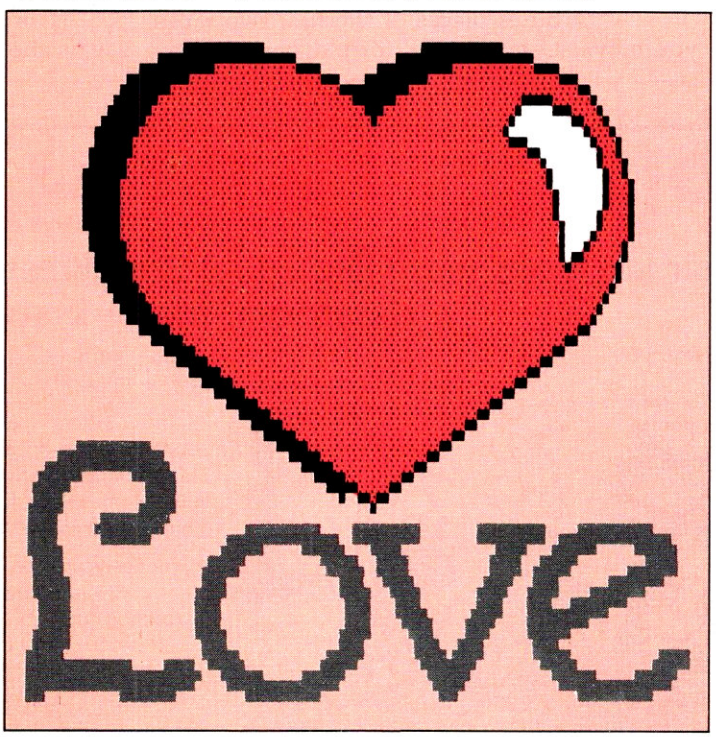
BY ROBERTA SCHWARTZ AND MICHAEL CALLERY

Although this is the February issue of *A+*, chances are you're reading it in January. Like us, you're probably recovering from a hectic season of shopping and sending cards and gifts. Did you notice how, after a while, the greeting cards all seemed to look alike? We did—and it made us wonder. Why aren't more people using their Apples to send greetings?

You've got a super computer with an extraordinary offering of software that's perfect for the job. Don't let lack of artistic skill stand in your way; it's the thought that counts. Besides, so much clip art's available that you can create professional-looking greetings with minimal effort.

Are you ready? Valentine's day is just around the corner. Use your Apple to show someone you care. Of course, the obvious way to create a computer-generated greeting is to print it out on paper. Less obvious, perhaps, is the possibility of putting greetings on disk to send to another Apple owner. And then there's the notion of mixing Apples with video to get a multimedia effect: a video greeting. Since video is the theme of this issue of *A+*, let's tackle video first.

HOW TO MAKE VIDEO VALENTINES



Valentine Videos

Many people these days have video recorders and are just waiting for you to send them a videotape. Anything you can put on disk you can put on tape—all you need to do is make some connections.

Use a cable with an RCA jack to connect your computer to a VCR, and the VCR will intercept the signal that the Apple sends to the monitor. With your VCR in the video loop, anything on the Apple's screen will be captured on tape. Just insert a tape into your VCR and press Record. If you're taping a slide show or animation, start the tape playing when the show or animation starts.

Let's take it a step at a time.

First, turn all your equipment off. If you have a IIe or IIc connected to a standard Apple composite monitor with an RCA cable, unplug the monitor and plug the cable into the Video In jack of your VCR. When you turn your equipment back on (including the TV attached to your VCR), the Apple's screen should be on the television.

If you have an Apple IIGS with an Apple RGB monitor, plug one end of an RCA cable into the GS's composite Video Out connector and the other end into the Video In of your VCR. When you turn your equipment back on (including the TV attached to your VCR), the Apple's screen should be on the TV and on the GS monitor. (To achieve this simultaneous display with an Apple II Plus, IIe, or IIc, use an RCA y-jack at the Apple Video Out. The y-jack allows you to keep your monitor and the VCR on-line at the same time).

Your system may require different cabling; there are so many possible variations that we can't describe exactly what you might need. A local electronics shop should be able to help you with the correct cables and connectors. By the way, these cables and adaptors are inexpensive.

Also, you'll need a different kind of setup if you plan to exert more control over the videotape than just saving images to it. If you plan to use any sort of authoring software, see this issue's "Using Your Apple II with a VCR" on how to set up for that.

The quality of the video you get depends on your Apple. Apple IIGS computers produce a good, clean video signal, but older Apples fudged a bit with the video signal, so your video may not be high quality. It's been our experience

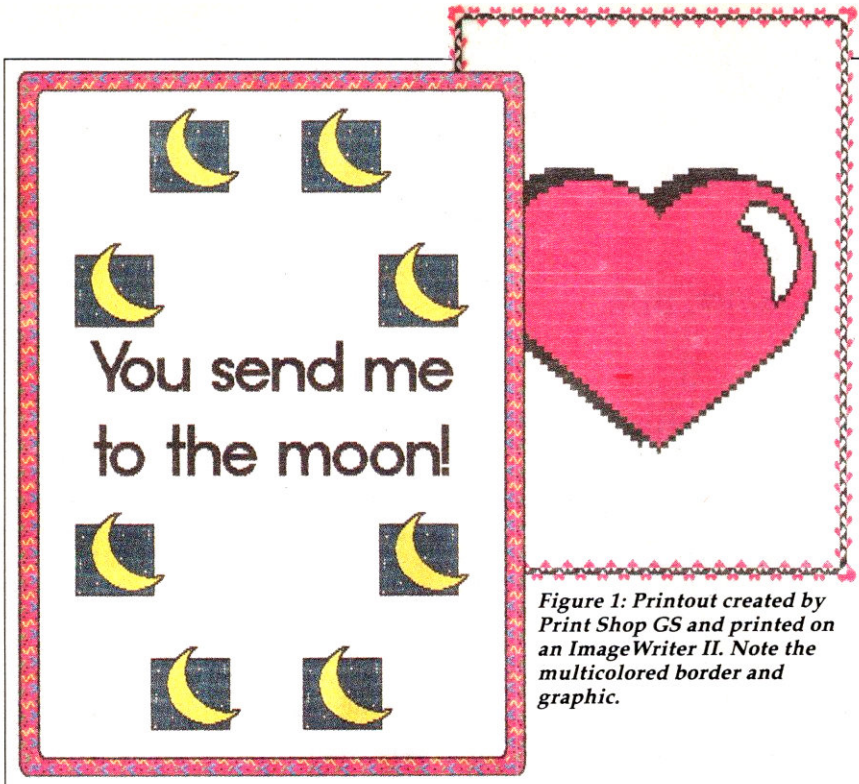


Figure 1: Printout created by Print Shop GS and printed on an ImageWriter II. Note the multicolored border and graphic.

that Apple/VCR combinations vary: Some produce no color, and some produce unrelenting rolling images, but most produce decent video.

Mixed Media

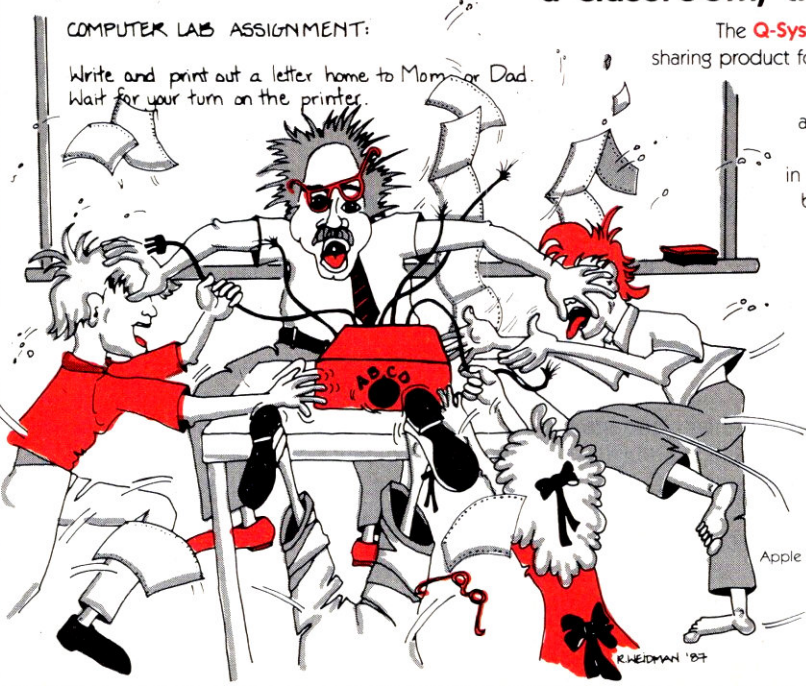
If you have two VCRs, you may be able to combine live video with your Apple images by recording the Apple graphics on one tape and the live-action footage on another. Then, make a third tape that combines pieces of the first two tapes. Use one VCR for playback and the other for recording. You'll lose some quality, as your new tape will be a second-generation copy, but the compromise shouldn't be too noticeable. You can create your own loving but funny silent video, a la Charlie Chaplin, by doing the captions with your Apple. Fontrix would be perfect for such a project. Remake the classics. Start by gathering photos of famous love scenes from books on film. Then, use a digitizer to capture them as Apple graphics. Digitize yourself. Finally, with your favorite paint program, cut and paste your face over an actor's and intersperse these graphics with footage from the real film.

If you have a camcorder, try this. Tape the Apple graphics (title screens, introductory animation, and so on) and remove the tape from your VCR without rewinding it. Then put it into your camcorder and tape the live scenes onto the rest of the tape. You may get some glitches between the graphics and the live scenes, but you'll have a unique and memorable greeting to send.

Unfortunately, we know of no way short of using an expensive

COMPUTER LAB CHAOS?

If your computer lab looks more like an All-Star Wrestling match than a classroom, the Q-System™ is for you.



The Q-System™ is THE fully automatic parallel or serial printer sharing product for the Apple II, II+, //e and //gs on an internal card!

The Q-System™ has no switches, buttons, lights or anything else to operate, nor will your students need to learn any special commands. Instead of waiting in line for the printer, the Q-System's™ on-board print buffer lets them continue with other computer work.

For around the same price as a manual system, why not make the switch to the Q-System™? Your computer lab will go from chaos to classroom order without pinning your budget to the mat.

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CIRCLE 200 ON READER SERVICE CARD

video special-effects generator to overlay Apple graphics onto a video image. This feat requires a genlock device, which synchronizes the two video sources so you can combine them. Amiga owners can buy such a device, and we're hoping that one for the Apple IIGS won't be long in coming.

On Paper

The more traditional type of greeting is, of course, the printed card. The Print Shop, The Print Shop Companion, or Print Master Plus let you create cards effortlessly (see figure 1). Although the cards you can produce with these programs have a certain charm, we find them a little too pedestrian.

You can use these programs, however, to send less traditional greetings. Why not send a banner? I LOVE YOU is impressive in foot-high letters. Mailing the banner won't be a problem. You can purchase mailing tubes in stationery stores. If your banner is small, you can use the cardboard tubes from paper towels.

How about a calendar? Print a calendar and circle the date. A simple heart drawn in the February 14 box says it all. Or circle another date and enter an invitation: "Dinner at 8:00—my treat."

Are you inspired yet?

Have you ever received a certificate honoring an accomplishment? Something about a certificate makes it special; it has an aura of importance. Why not send a certificate greeting? All you need is Certificate Maker or Award Maker Plus (see "Praise in Print," *A+*, November 1987, pages 90–92). We prefer Award Maker Plus because the borders are particularly impressive. Also, with this program you can use your own graphics in some of the templates; you can even put a digitized photograph onto a certificate.

So, now you need a digitizer. You do have a digitizer, don't you? No? Well, why not celebrate the new year by buying yourself a present. Tell yourself it's an unselfish act, since you'll be using the digitizer all year to create greetings for others. There's the AST Vision Plus if you're using a GS; the ThunderScan for the IIe, IIc, or IIGS, if you're using an ImageWriter; and, of course, ComputerEyes, which has a model for every Apple.

Figure 2: "Wondered What to Send Your Way" by Roberta Schwartz from a series of animated greeting cards that never quite made it into the market. The standard hi-res graphics were created with the Graphics Magician Picture Object editor. Copyright 1984 by MikRo Greetings.

Read All About It

How about a newspaper greeting? With The Newsroom and a little imagination, you can send a greeting that will take more than ten seconds to read. The theme for a Valentine issue can be "famous lovers," or you can gather some quotes about love (*Bartlett's Familiar Quotations* is available in any bookstore or library) and intersperse them with graphics. Sending the greeting to your mate? How about a newspaper that chronicles the highlights of your relationship?

If a multipage newspaper is too intimidating for you, you can send a flier—one page that effectively declares your love. The Newsroom and Fontrix work just fine for such a purpose.

On Disk

If you know people who have Apple computers, send your greetings on disk. The program can be as simple or elaborate as you want. The easiest approach is to create just one screen, using a digitized photo of yourself. The fun of using the computer instead of simply sending a real photograph is that you can enhance the picture. Add some hearts. Put a small Cupid on your shoulder. He can be aiming his arrow directly at you. Add some text: "He got me."

Send a series of pictures, perhaps the family (including the pets, of course), organized into a simple slide-show presentation. Draw balloons (as in comic strips) to have each of the characters say something. Use any paint program for this part.

An animated greeting can be sensational (see figure 2). Hearts can flicker and fly. Cupid's arrow can detour around trees, signs, telephone poles, and who knows what else as it pursues its subject. The Graphics Magician, Take 1, or Fantavision can help you here.

When You Care Enough

We hope we've inspired you, because you'll have to hurry. Valentine's Day is only a few weeks away. In March we have Saint Patrick's Day. Easter and Passover come in April. Mother's Day is in May. Father's Day is in June. There's graduation day, Halloween, Thanksgiving . . . ✚

For more information on the products mentioned in this article, see "Product All-Stars" in this issue.

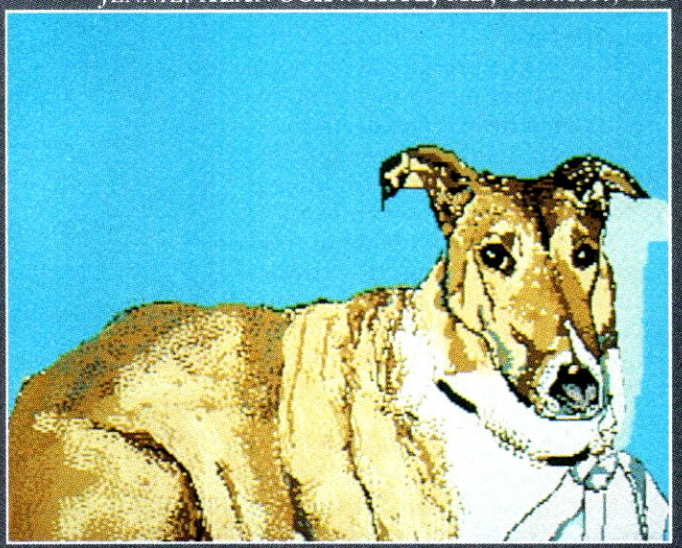
SPEAKING OF GRAPHICS GALLERY

From Yoda to Orca, we celebrate the creature electronic

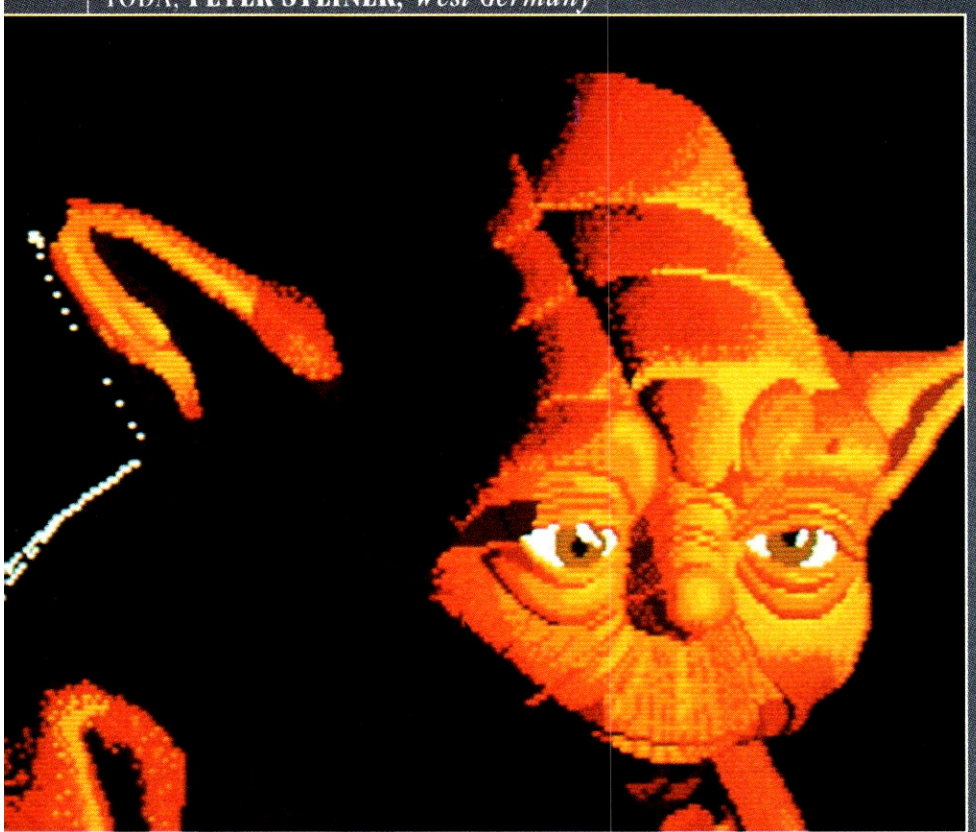
CREATURES IN COLOR

Animals have always been a favorite subject for artists. In this month's gallery, this fascination is apparent as we present "Creatures in Color," from seven creature-loving readers. "Yoda" and "Jennie" were done with PaintWorks Plus in super hi res; "Parrot," "Tiger," "Lion," and "Orca" all are Dazzle Draw double-hi-res images; and "Rabbit" is a super-hi-res rendition in DeluxePaint II.

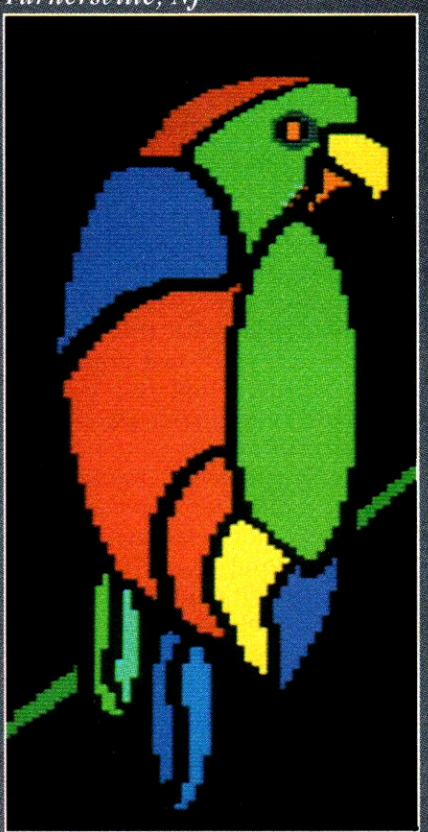
JENNIE, **ALAN SCHWARTZ, MD,** *Cohasset, MA*

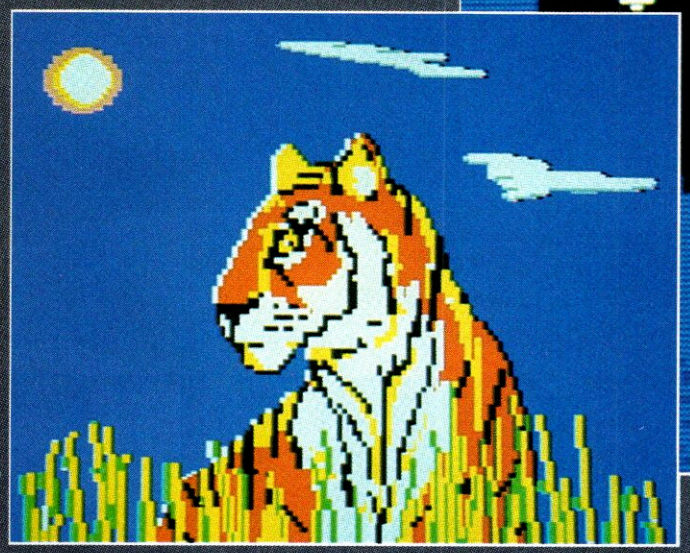


YODA, **PETER STEINER,** *West Germany*



PARROT, **ELLEN CARR,** *Turnersville, NJ*



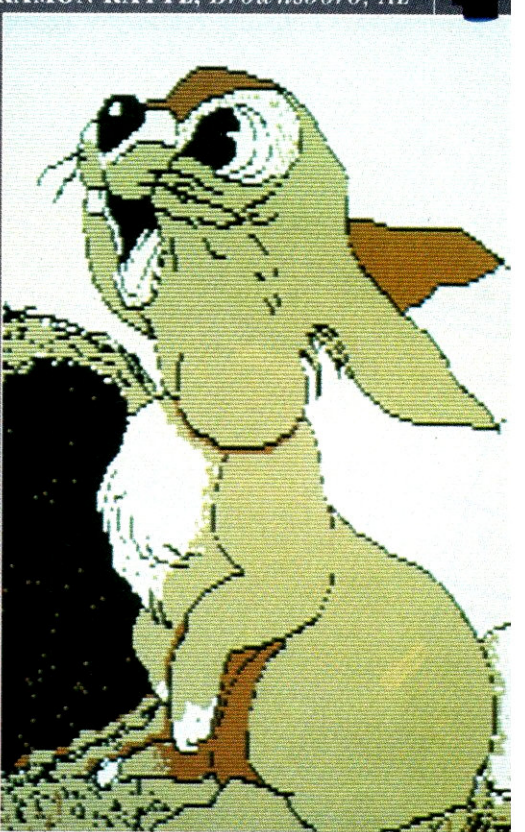


TIGER, **DAVID LATKA,** *Alberta, Canada*

ORCA, **DAVID RHIND,** *Bermuda*

LION, **KATIE DARDEN,** *Pinole, CA*

RABBIT,
RAMON RATTE, *Brownsboro, AL*

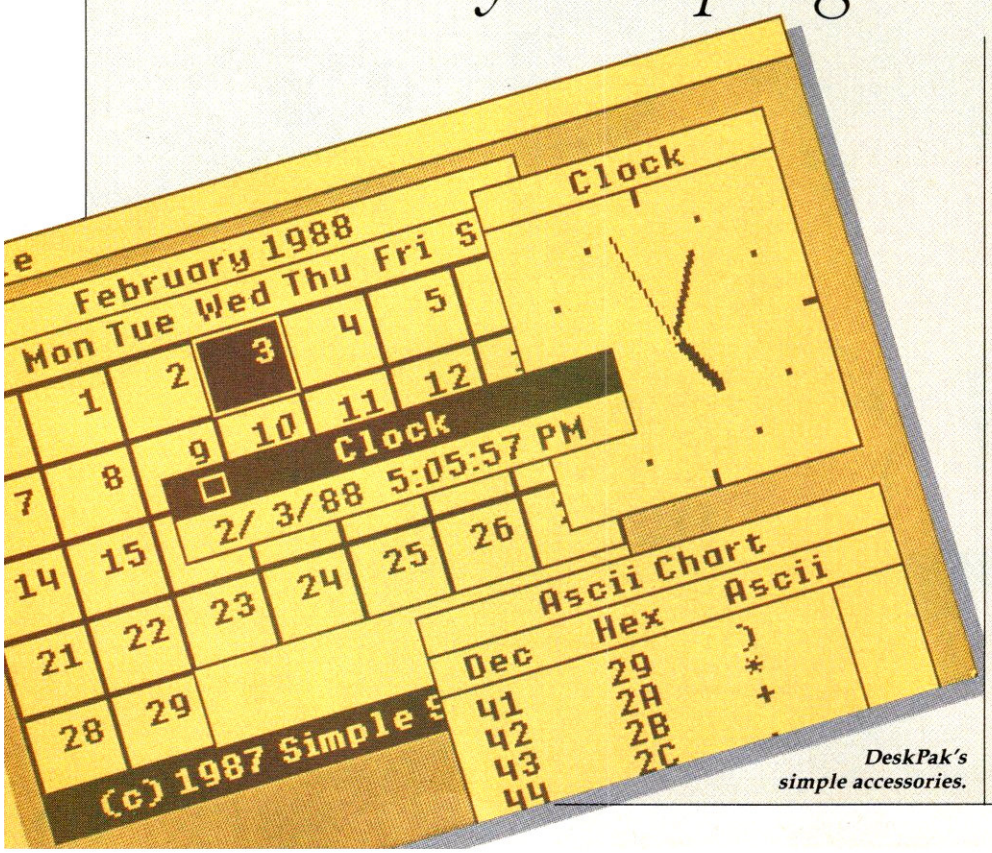


IIGS UPDATE

BY WALTER S. MOSSBERG

DESK ACCESSORIES

Three handy new programs for the IIGS



DeskPak's simple accessories.

Desk accessories, those helpful little utilities you can access while you're in the middle of another program, have been around for several years now in limited fashion for the Apple IIe and IIc. Pinpoint, for example, has had great success with packages such as Pinpoint Desktop Accessories that add "pop up" calculators, calendars, and the like to specific programs, notably AppleWorks. Beagle Bros now has a similar set of utilities in its Timeout series, which is specifically designed for AppleWorks 2.0 only.

The Apple IIGS was designed with desk accessories in mind. Apple has built in capabilities that make it easy for programmers to write desk accessories that you can use while running many different programs, without the need to patch or alter the programs.

For months, the only GS desk accessories available were public-do-

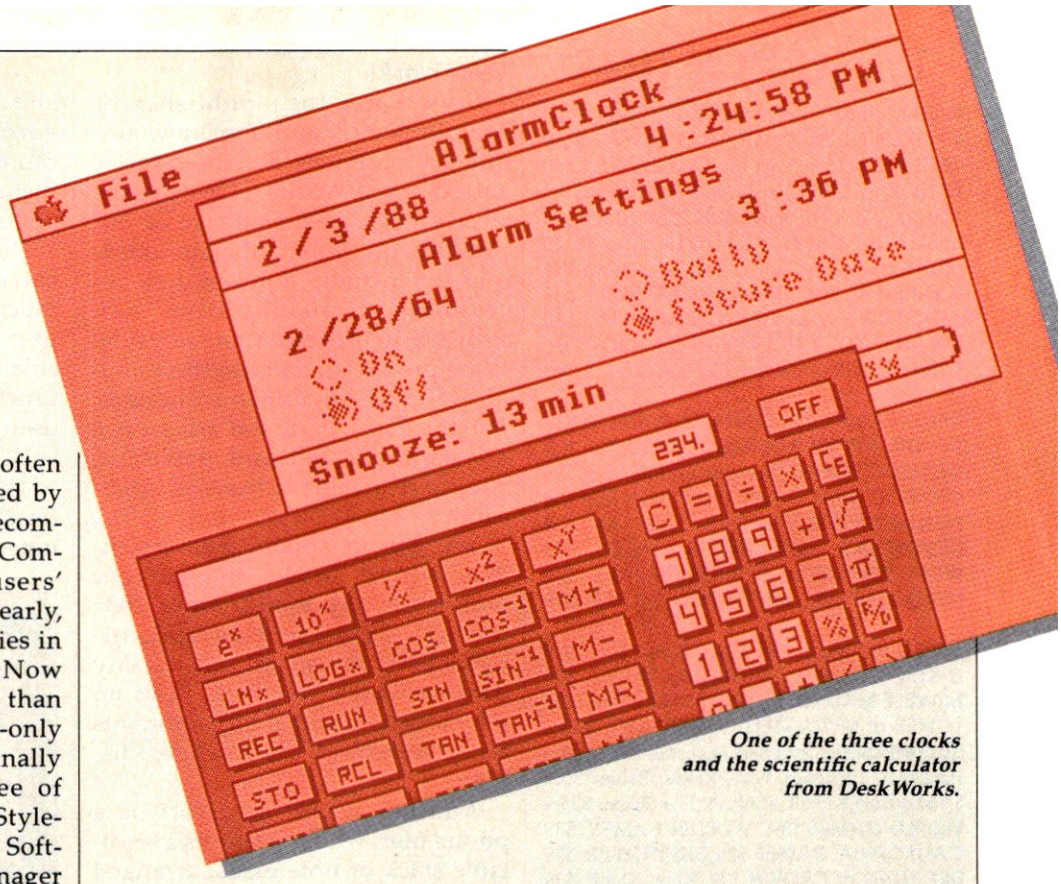
main or shareware efforts, often quite sophisticated, distributed by local users' groups or on telecommunications services such as CompuServe's MAUG Apple users' group. *A+* surveyed those early, noncommercial desk accessories in the September 1987 issue. Now that the GS has been out more than a year, some commercial GS-only desk-accessory packages are finally available. I'll consider three of them here: DeskWorks from StyleWare, Deskpak from Simple Software, and The Desktop Manager from On Three. The first two follow Apple's built-in system for writing and accessing GS desk accessories. The third goes its own way, evolving from a package originally designed for the Apple III.

Some Background

Standard desk accessories for the GS come in two types.

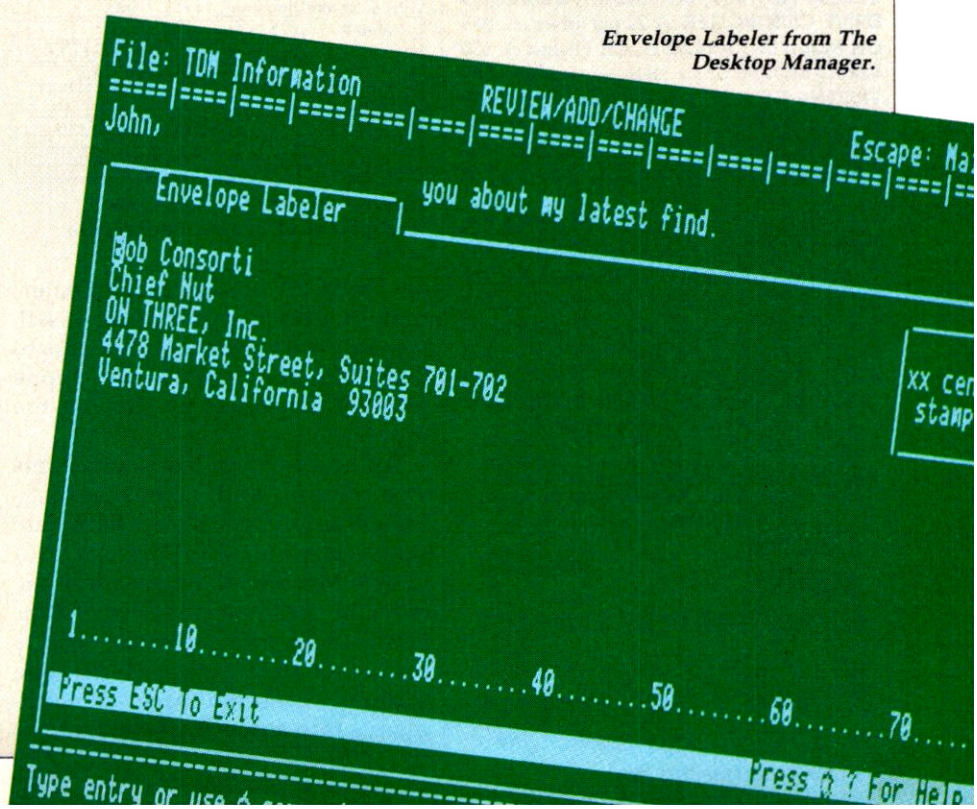
One type, called a new desk accessory (or NDA), appears in a list under the colored apple icon on the menu bar of ProDOS 16 programs that use the standard GS desktop interface. To use an NDA, you just pull down the apple menu and select the one you want. NDAs usually operate on the desktop in a separate on-screen window, and you can keep them open and ready for use while you continue to work in another window with your main application.

The other type of accessory, which you can access from nearly all programs, whether they use the mouse-driven pull-down menu interface or not, is called a classic desk accessory, or CDA. To use one, you just press Control/open-apple/Escape, as you would to reach the GS's Control Panel. If you have other CDAs on your start-up disk, pressing these keys won't merely produce the standard menu of Control Panel, Alternate Display Mode, and Quit. Instead, you'll see a list of desk-accessory choices you can choose from. Unlike NDAs, these CDAs usually take over your entire screen while operating and return you to the CDA menu, rather than directly to your program, when you quit them. Their great virtue, however, is that you can use them from within almost any ProDOS program, including those written before the GS came out.



One of the three clocks and the scientific calculator from DeskWorks.

Public-domain CDAs and NDAs include simple clocks, calendars, notepads, utilities to save screen images to disk, and several programming tools. The challenge for commercial vendors offering desk-accessory packages for a fee is to go well beyond what's available in the public domain.



Envelope Labeler from The Desktop Manager.

For APPLE IIGS

GSRAM 256K $129, 1Meg $219,1.5Meg $269
RAMKEEPER...$149, **MEMORY Saver** ...$119
256K RAM (150ns) Set for RAM cards $40
OCTORAM 256K Expandable to **8 Meg** $149
1 Meg SIMM For above $299,256K SIMM $69
SYSTEM SAVER$79, JUICEBOX $69,Conserver $129
MDIDeas Supersonic Sterio Card $59, Digitizer add on $49
GRAPPLER...$79, **TURBO MOUSE ADB** ...$89
ADAPTOR to connect IIGS to two **20 pin DRIVES** ...$39
MAGNAVOX RGB 13" Monitor for IIGS $329
CABLES: IIGS to Modem, Imagewriter, specify ... $20ea

DELUXE PAINT II$69, DELUXE PRINT II $39
DELUXE WRITER..$79, **MULTISCRIBE** V2 ...$79
GRAPHIC WRITER V2 (For Desktop Publishing) . $99
GRAPHIC STUDIO $49, PAINTWORKS+ $49
PRINTSHOP..$49, WRITER's Choice Elite . $59
DESKWORKS.....$79, **NOTES N FILES** $79
WORD PERFECT....$99, **MERLIN 8/16** $79
VISUALIZER...$79, **SOFTWOOD GS FILE** ..$79

MUSIC STUDIO....$59, Music Constr Set ...$39
INSTANT MUSIC...$39, BARD's TALE $39
MARBLE MADNESS..$29, **DREAM ZONE** $39
TOWER of MYRAGLEN, SEASTRIKE $35ea
Basketball,Hardball,Shanghai,Silent Service$35ea
Hacker II, Tasstimes, Talking Reader Rabbit$35ea
SpellerBee,Kidtalk,Mathtalk,FirstShapes $35ea
WORLD GAMES $39, WINTER GAMES . $39
CALIFORNIA GAMES $29,DESTROYER $29
DEFENDER of CROWN $39, King's Quest $39
Leisure Suit Larry..$29, Sub Battle Simulat . $29
VolcanosDeluxe$49,**3D HelicopterSim**$39
UNICORN IIGS Software (12 titles)....$Call

For APPLE IIGS,e,c

IMAGEWRITER COMPATIBLE PRINTER $279
20 MB SIDER Hard Drive $599, **40 MB** $799
128 K Internal **Buffer for Imagewriter II** $59
64K 80 Col Card for IIe $59, **256K Card** $99
RAMWORKS III 256K $169, 256K Chips $40
ZRAM ULTRA I 256K.....$169, 512K $199
256K ZRAM ULTRA II $219, ULTRA III $269
SYSTEM SAVER for IIe/II+ Beige/Platinum $69
KOALAPAD+ $89,HALF HEIGHT DRIVE $139
DRIVE CONTROLLER for 20 pin drives $59
CH Mach III Joystick$39, CH Flightstick $59
TURBO MOUSE GS,e,c (IIe requires Mousecard) . $89
VISION+ GS $299, **Thunderscan** GS,e,c $199
HEAVY DUTY POWER SUPPLY IIe,II+ . $59
6 SCRIBE Ribbons Black $24, 6 Multicolor$60
6 Ribbons for Imagewrtr $24, 6Multiclr $60

PUBLISH IT! $79, SPRINGBOARD **PUBLISHER** $99
CROSSWORD Magic $35, **PRINTSHOP** . $35
WINGS of FURY $29, Certificate Maker $29
DB MASTER Version 5 $149,Turbo Pascal $45
Merlin Pro $99, Assembly Lines (by RW) Disk+Book $39
COPY II PLUS ...$29, LOCKSMITH $45
APPLEWORKS MADE EASY BOOK $19
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(A+/Nibble Feb 87: Transmitted Nov 87)
NOTE1 : Shipping $3/100 in Continental USA. Others Call.
NOTE 2: We do not guarantee product compatibility.
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DeskWorks

StyleWare, Inc., publisher of MultiScribe GS and TopDraw, also offers a set of new desk accessories called DeskWorks. DeskWorks clearly meets the challenge of improving on public-domain offerings—it includes a dozen desk accessories, available from any ProDOS 16 program (not just StyleWare products), that use the standard GS pull-down-menu interface. For the most part, the accessories are sophisticated and powerful, adding real value to existing applications.

You get an appointment calendar, which shows the current month (or any month from 1935 through 2034), and an appointment list you can fill out for any date on which you click. Days on which you've added appointments are boldface on the calendar display.

Another useful accessory is a phone filer, which presents a scrollable stack of note cards, arranged alphabetically; it includes the name, address, phone number, and notes on each person or business you care to list (see figure 1). Phone Filer can search through the cards for any word or part of a word. With the addition of a piece of add-on hardware (called HyperDialer) that StyleWare is promising to sell, this accessory even allows the GS to dial your phone with any phone number you select by clicking the mouse.

Figure 1: Phone Filer represents a scrollable stack of alphabetical note cards.

An accessory called Keymac lets you create and use macros—StyleWare claims it can automate many popular ProDOS 16 programs. Macros can either allow the entry of common phrases (such as your name and address) with a couple of keystrokes or let you translate common program commands into a two-stroke macro.

A Scrapbook permits collection and editing of common text and favorite graphic "scraps" that you can call up from a special disk directory for pasting into documents via the GS's built-in Clipboard.

DeskWorks includes a scientific calculator that is, if anything, much too powerful for the average user. It certainly does common calculations, but it has many other functions that are unlikely to be useful for anyone but research-scientist types.

There's also a notepad that allows entry of up to 8 separate brief notes of 11 lines each—useful for jotting down thoughts while using another program.

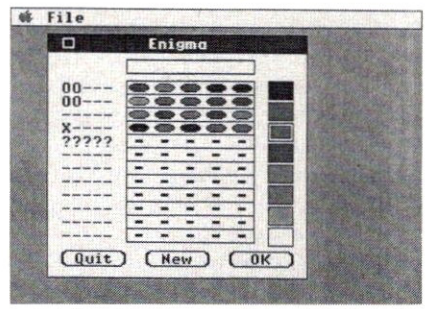

Figure 2: DeskWorks' Enigma is a pop-up code-solving game.

Other features built into DeskWorks include three clocks: a standard time display similar to that of the public-domain accessories, an alarm clock that gives off a piercing sound no matter what you're doing, and a menu clock that places a constant time display on the far-right end of the top menu bar on programs using the standard GS desktop interface. The program also has an accessory that blanks the monitor screen after a specified period of inactivity, one

VITAL STATISTICS

DESKWORKS
A dozen desk accessories that promise to add real power and versatility to gs programs.

CPU: *Apple IIgs*
RAM: *512K (768K recommended)*
DISK DRIVES: *one 3.5-inch*
OTHER: *ProDOS 16-based application software*
OPERATING SYSTEM: *ProDOS 16*
COPY PROTECTION: *no*
LIST PRICE: *$59.95*

Styleware Inc.
5202 Gulfton, Suite 2E
Houston, TX
(713)668-0743

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that makes the apple icon on your menu bar swirl around, and even a pop-up code-solving game (a MasterMind clone) called Enigma (see figure 2).

Most of the DeskWorks accessories are well thought out and easy to use, featuring the standard GS window setup with mouse control of scroll bars and so forth. Several let you cut and paste text among them or between them and application programs, using the GS Clipboard. You can shrink many of the accessories to little icons and keep them out on the desktop while you work on your main programs. You can add as many or as few of these accessories as you like to ProDOS 16 programs that use the standard interface, by choosing which ones to copy into the DESK.ACCS subdirectory on your boot disk. Different ones can go on different disks.

DeskWorks does have a few irritating problems. Instead of building in all those scientific features that are irrelevant to most users, StyleWare should have made it more obvious how to cut and paste calculator results into your application-program documents. The company told me it was possible, but it wasn't apparent to me how to do it. Also, unless you turn off the menu clock, you may find the time of day blocking menu features in some programs or showing up in pictures you save from some paint programs.

If StyleWare cleans up these glitches, DeskWorks promises to add real power and versatility to GS desktop programs.

Deskpak

Much less impressive is Deskpak (Volume I), a set of nine desk accessories (eight NDAs and one CDA) from Simple Software. Although it is the least expensive package reviewed here, at $29.95, and was the first of the three on the market, it barely goes beyond the accessories that were available earlier in the public domain.

Deskpak's calendar displays the current month but can't show any other months, future or past, and permits no appointment entry. It has two standard clocks, one digital and the other a hard-to-read analog version. The two entertainment features, a puzzle and a "melt-down" accessory that appears to cause the screen to "drip," are simi-

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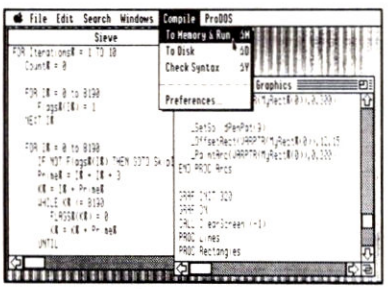

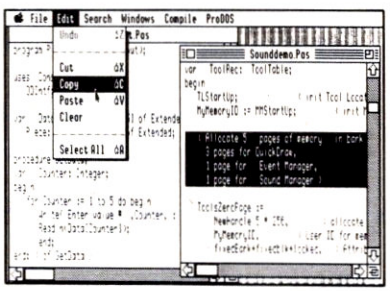

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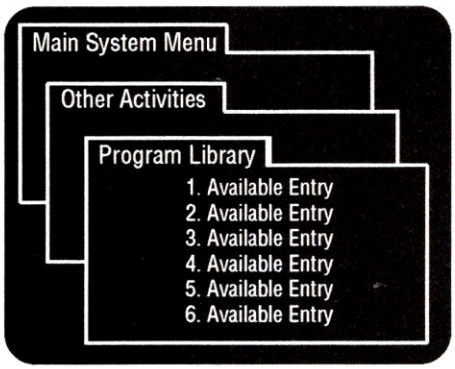

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- sketch, paint, spray, vertically controlled color-fill, line, arc, box, oval, erase, paste, undo
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lar to accessories already in the public domain. There's an ASCII chart, useless to users who do no programming.

Deskpak includes three different accessories that blank the screen at your command. One is an NDA, selectable by mouse from ProDOS 16 programs with the standard GS interface; one is a CDA, selectable from all programs, provided you first boot into ProDOS 16; and the third is an NDA that allows you to blank the screen and require entry of a password of your choice to reactivate it.

As with DeskWorks, you can use any or all of Deskpak's accessories on any or all of your disks by simply copying the ones you want into the DESK.ACCS subdirectory. But even at $29.95, Deskpak Volume I adds only marginal value to your IIGS.

The Desktop Manager (TDM)

Adapted from a desktop-accessory system for the Apple III, The Desktop Manager deliberately ignores Apple's two built-in methods for integrating desk accessories on the IIGS. Instead, it goes its own way, using a proprietary accessory-installation method. You can use TDM in conjunction with standardized GS desk accessories, but at $89.95 for the starter set and $40 or $50 each for sets of add-on accessories, once you start down the TDM path, you may be financially committed to it.

On Three, Inc., the company that sells TDM, is a long-established maker of Apple III products that is trying to break into the Apple II market. The company says it rejected Apple's built-in GS desk-accessory standards as too limiting in

VITAL STATISTICS

DESKPAK

A set of nine desk accessories that are inexpensive but don't go much beyond what's available in the public domain

CPU: *Apple IIgs*
RAM: *512K*
DISK DRIVES: *one 3.5-inch*
OTHER: *ProDOS 16-based application software*
OPERATING SYSTEM: *ProDOS 16*
COPY PROTECTION: *no*
LIST PRICE: *$29.95 plus $3 handling*

Simple Software
4612 North Landing Drive
Marietta, GA 30066
(404) 924-2667

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several respects. It also admits, however, that it was interested in adapting its successful Apple III desk-accessory system for the GS, and that didn't conform to Apple's new approach.

What results from this parentage is sophisticated, capable accessories that show a lot of clever programming, but—although TDM works only on a GS and only if ProDOS 16 is booted first—its accessories have a distinctly pre-GS "feel" to them. They are all-text—somewhat like Pinpoint accessories or some CDAs. They are among the rare GS-only programs that don't work with the mouse, and editing commands don't follow GS conventions, though they borrow heavily from AppleWorks. The accessories aren't loaded into memory, except for a 74K core of shared code, which means that TDM must access the disk whenever you request an accessory.

In addition, you have to become

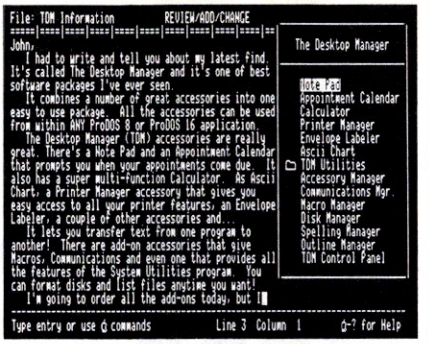

Figure 3: TDM's menu offers eight starter accessories, plus special programs for managing TDM itself.

familiar with a nomenclature borrowed from the Apple III that is foreign to the Apple II. To send displays to the screen, for example, you must specify the destination as CONSOLE. TDM has an optional device-naming system in which Slot 5, Drive 1 is represented as .D51.

TDM appears compatible with most major applications, but you can't use the GS Control Panel, and in ProDOS 16 graphics-based programs, the TDM accessories can't share the desktop screen with application windows. They shift to their own screens to work.

Installing TDM is a bit more complex than usual, but the program's installer utility makes it a smooth process, putting a special TDM loader in the SYSTEM.SETUP subdirectory and a TDM directory on your disk to hold the accessories. The same installer adds new accessories when you buy extras.

The TDM menu, which you access by pressing Option and Escape, offers eight accessories in the initial package, plus special programs for managing TDM itself (see figure 3).

The eight starter accessories are a notepad, appointment calendar, calculator, printer manager, envelope labeler, clipboard, screen saver/printer, and ASCII chart. The accessories all do their jobs well. Some are directly accessible without menu entry, and they are generally more powerful than those in the other two packages reviewed here.

For instance, TDM's appointment calendar (see figure 4) allows much lengthier appointment notes than the one in DeskWorks, and it pops up in the middle of other programs at the appointed time to remind you of your appointments.

IIGS DESK ACCESSORIES

FEATURE	DESKWORKS	DESKPAK	TDM
NO. OF ACCESSORIES	12	9	8
TYPE OF ACCESSORIES	NDA	8 NDA, 1 CDA	*
PRICE	$59.95	$29.95	$89.95
CALCULATOR	■		■
NOTEPAD	■		■
CALENDAR	■	■	■
APPOINTMENTS	■		■
CLOCK	■	■	
ALARM CLOCK	■		
SCREEN BLANKER	■	■	
GAMES	■	■	
ASCII CHART		■	■
MACROS	■		
PHONE FILE/DIALER	■		
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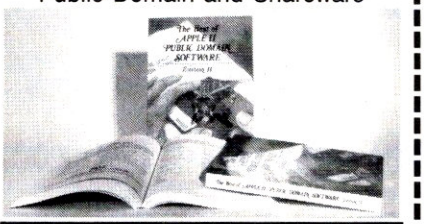

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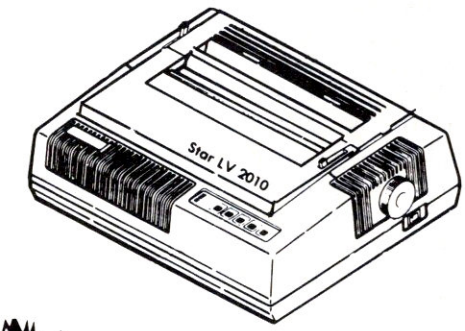

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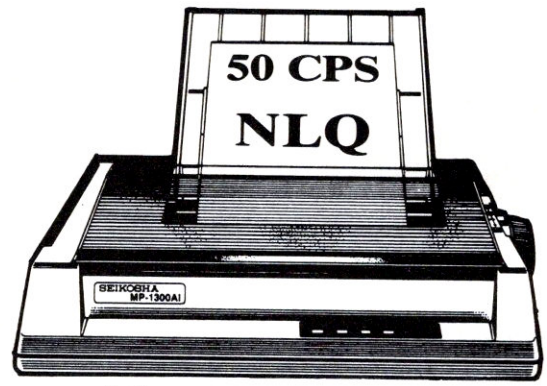

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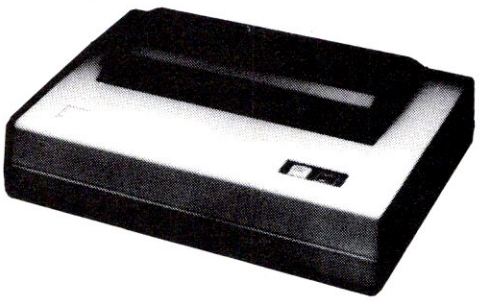

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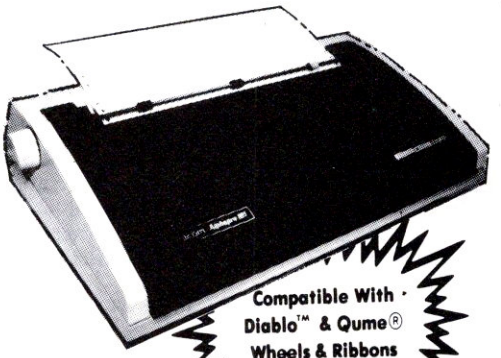

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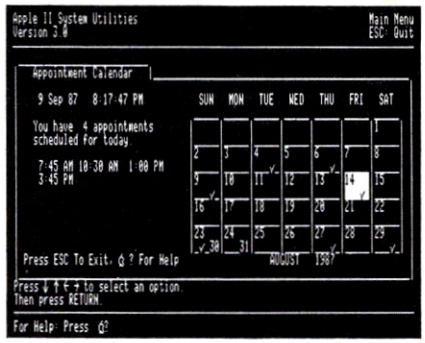

Figure 4: TDM's appointment calendar pops up in the middle of other programs to remind you of appointments.

TDM's calculator, which is also overly complex and scientifically oriented, can display a "tape" on the screen, or you can print it out. You can also cut and paste results into documents.

The notepad is a fairly full-featured word-processing program, able to accommodate 245 "notes" of 59 lines each. The printer manager lets you send special codes to printers, to customize your printouts. The program can also print or save as disk files the images of text screens or save graphics screens to disk.

On Three also sells a TDM Communications accessory that provides a popup telecommunications program ($49.95) and a TDM Disk Manager with pop-up file copying, deleting, etc. ($39.95). It is also preparing a TDM Super Accessories package ($39.95) with file-search and -display features.

All of these capabilities are very powerful, but this power carries a price. Learning to use TDM accessories fully takes much more effort than does learning those in the DeskWorks or Deskpak packages. Each accessory is almost like a stand-alone program.

The Desktop Manager has already acquired some fans, but it isn't for everyone. Its price and deliberate deviation from Apple standards and the GS interface put it outside the mainstream of GS desk accessories, but the package is so well produced that it deserves a following.

How They Stack Up

IIGS owners who make heavy use of ProDOS 16 software that takes advantage of the GS interface will find StyleWare's DeskWorks a solid value. Deskpak may disappoint any user with access to public-domain desk accessories. And The Desktop Manager is a capable package, but mainly for those who seek a different path, prefer all-text, or dislike the mouse. ✚

Walter S. Mossberg is an economics reporter in the Washington Bureau of The Wall Street Journal *and writes an Apple II column in the monthly journal of Washington Apple Pi.*

VITAL STATISTICS

THE DESKTOP MANAGER

These desk accessories are powerful and full-featured but hard to learn, since they were adapted from the Apple III environment.

CPU: *Apple IIgs*
RAM: *512K*
DISK DRIVES: *one 3.5-inch*
OTHER: *ProDOS or ProDOS 16-based software; does not work with mouse*
OPERATING SYSTEM: *ProDOS*
COPY PROTECTION: *no*
LIST PRICE: *$89.95 plus $6 shipping; Communications Manager, $49.95; Disk Manager, $39.95*

On Three
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The Communications Manager is a TDM accessory that gives you a full-featured communications program within all of your current applications. VT-52 terminal emulation combined with complete support for XModem and Binary II transfers makes it one of the most powerful comm. packages for your GS. **$49.95**

Super Accessories #1 is a set of TDM accessories that provides 10 new utilities that increase the power and usefulness of your Apple IIGS. A Keyboard Lock, Show Time with job timer, Character Ruler, File Type Changer, Text Screen Printer, Hex./Regular File Viewer, Hex./Regular File Printer & a Disk Block Editor are included. **$39.95**

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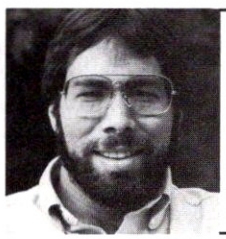
With the TransWarp accelerator, your IIe or II+ is 40% faster than the IIGS!

Computing at warp speed!

It's an experience you shouldn't miss. And with TransWarp, you won't have to. Because TransWarp will run your IIe or II+ software *3.6 times faster* —that's 40% faster than Apple's IIGS!

No more yawning while your Apple slowly rearranges text or calculates spreadsheets. With 256K of ultra-fast RAM, TransWarp speeds up *all* Apple software — including AppleWorks, and all educational software, graphics and games. And it's compatible with all standard peripheral cards (such as RamWorks and Apple memory cards), hard disks, 3½" UniDisks, 80-column cards, modems, clock cards, mouses and more! You name it, TransWarp accelerates it. There's even a 16 bit upgrade chip available.



"TransWarp is great! I have replaced all my other accelerators with it!"

Steve Wozniak, the creator of Apple Computer

An important difference.

With TransWarp, software runs up to three times faster than with other cards, since the others can't accelerate programs in auxiliary memory. That's why TransWarp is so much faster than the rest. Nearly all of today's more powerful programs run partially or completely in auxiliary memory: programs like AppleWorks, Pinpoint, Managing Your Money, SuperCalc 3a, BPI and Pascal, to name a few. Why settle for a card that accelerates only part of the memory?

There's one more important difference. Since TransWarp doesn't use memory caching, you get *consistent* high speed performance.

A cinch to use.

Simply plug TransWarp into any slot in your Apple II, II+ or IIe—including slot 3 in the IIe. Instantly you'll be computing at speeds you only dreamed about before. And should you ever wish to run at normal speed, simply press the ESC key while turning your Apple on.

Since TransWarp is completely transparent, you won't need preboot disks or special software. It's ready to go right out of the package!

Speed = Productivity

Imagine the productivity gains you'll achieve when your programs are running over three times faster. TransWarp is so powerful, your Apple will make IBM PCs and even ATs look like slowpokes.

- 3.6 MHz 65C02
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- Totally transparent operation with all software
- Plugs into any slot, including slot 3 on the Apple IIe
- Accelerated 16 bit option available
- 5-year warranty

Satisfaction guaranteed!

Give *your* Apple the TransWarp advantage. With our risk-free 15-day money back guarantee, you have nothing to lose but wasted time. Call today!

TransWarp accelerator $219
65C802 16 bit upgrade (may add later) $69

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THE MUSIC CLASS

SOFTWARE BY PHILLIP ROBINSON

Five volumes of basic musical instruction

The Music Class, for teaching music fundamentals to beginners, comprises five volumes. They concentrate on five different areas of music reading and understanding:

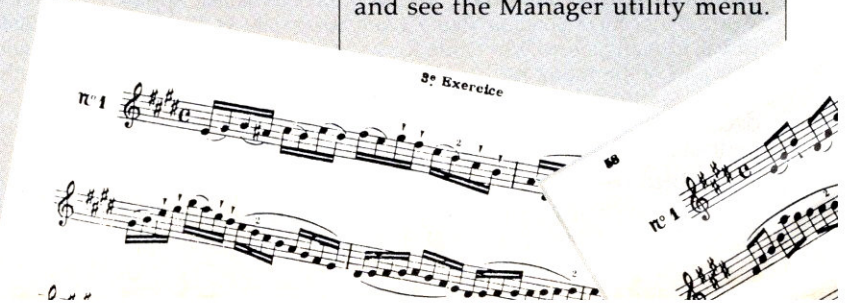
- Volume 1, Fundamentals, covers a broad range of the basics, including what notes are and where they fall on the written staff;
- Volume 2, Rhythm, has lessons on recognizing and following note lengths and rhythmic patterns;
- Volume 3, Ear Training, shows how to recognize and identify notes, intervals, and chords;
- Volume 4, Music Symbols, explores and tests knowledge of rest and note symbols, as well as chromatic and volume symbols; and
- Volume 5, Note Reading, picks up where Volume 1 left off and continues through note recognition, both in a variety of clefs and on the piano keyboard. The volumes are independent: You definitely don't need to buy more than one at a time.

Wenger Corporation says the Music Class is suitable for "ages 8 and up." That worried me a bit: It's such a broad range. For someone of my advanced age (almost four times that bottom level), I thought the presentation might be too cute. Besides, as someone who has played the violin since before that bottom-level age, I was pretty sure the programs wouldn't have anything to teach me. I was wrong on both counts. The presentation was simple but not offensive to older folks, and the practice the programs offered in identifying notes, sounds, and symbols were a good brushup for me. I can now read some clefs and identify keyboard notes better than ever.

Still, some of the volumes aren't useful to anyone except a true novice to music. Volume 2 on rhythm, for instance, sticks to fairly tame rhythms in its quizzes and didn't have much challenge for me (although I did learn that I released the first note in an eighth-note pair too soon).

Perhaps I should explain how the programs work. First of all, they run on just about any Apple II around, needing only 64K of RAM and a single 5¼-inch disk drive. I had no problem running them on my IIGS, although I did have to attach a 5¼-inch drive, and the programs took no special advantage of the GS's sound or graphics abilities. (The GS has some problem with record keeping, which I'll explain later.) Each volume comes on two disks, and the disks have lessons on both sides.

When you start any of the programs in The Music Class, you can jump right into the lessons, or you can type the instructor's password and see the Manager utility menu.



PHOTOGRAPHY BY PACIFIC IMAGE

Apple IIe
Note Reading
the MUSIC CLASS
more"
Oth - er plac - es on
Tell me you're the heart of all
I'm com - ing home_ to go
SH 1449-3
SH 1449-3

The Manager, a utility that lets teachers keep track of student scores and progress in The Music Class, is part of all five volumes. The Manager can also allow more than one person to use the same disk. That is, it can keep track of who is allowed to use the disk and store passwords for those users. If you don't use the Manager to turn internal Record Keeping on, the program uses the generic password MUSIC and stores new scores under that name.

The Manager can save scores for as many as 125 students. Each time a student completes a tutorial, exercise, or drill-and-practice session, it stores the score to disk. There is a special instructor password for entry to the Manager, and teachers or organizers can change this initial password to whatever they choose, to maintain confidentiality.

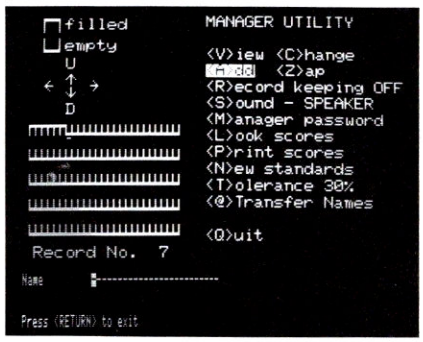


Figure 1: The Manager's menu

The Manager's menu shows graphically how many of the 125 potential student slots is occupied and offers a list of commands and options (see figure 1). These let you enter and change names and passwords, turn record keeping on or off, view or print individual scores, and set standards for scores (levels that rate an E for Excellence, for example). Other commands let you customize some of the volumes. You can choose to use the Apple's speaker or an ALF synthesizer and set difficulty levels (with numeric coefficients) for the Rhythm (Volumes 2 and 5), Interval (Volume 3) and Melodies (also Volume 3) tests. There is even an option for drawing and using custom symbols in the Music Symbols (Volume 4) quizzes. Finally, the Manager lets you transfer names and passwords between the disks in the Music Class series.

Although I did not detect any problems with the Manager, I was using it only for myself and an imaginary learning partner: I didn't test The Music Class on a real class. I called Wenger's support line (an 800 number, which was answered immediately) and asked which Apples the programs ran on. The service representative volunteered that although all five volumes ran on all models of the Apple II, the company had received reports of some intermittent bugs with the Manager utility on the IIGS. Apparently, the Manager sometimes keeps scores and sometimes doesn't. According to the representative, there was no way to tell when the bug would appear, and—as far as she knew—Wenger had no present schemes or planned improvements to deal with it.

General Approach

All five volumes work in generally the same way. After you start your system, you can choose to enter the Manager or get right to the lessons. If you choose the lessons, you select either keyboard or joystick/paddle operation. I stuck to the keyboard. Next a menu appears that shows the different lessons or tests on the disk. The lessons generally explain a principle, ask you for a response on a multiple-choice question, and then move on to the next part of the principle or a related subject. When you fail to provide the desired answer on a question, the programs lead you by stating that the answer wasn't quite correct and suggesting how it might be related to the right answer. If you answer correctly, they will congratulate you and move along to the next section.

Throughout the programs, simple graphics and sound illustrate the principles and parts of the tests. At first, the graphics consist merely of circles for notes and lines for the staff. Later, the programs sometimes add musical symbols, along with liberal use of color for pointing out the relevant parts of the display. Some of the lessons use an image of a keyboard, and others depend on a Mr. Metro Gnome, a graphic stick figure who can play a trumpet (although it doesn't sound like one) and beat his foot in proper time. For example, in the rhythm tests of Volume 2, several bars of a musical rhythm appear on the screen, and the Gnome taps his foot to the beat while you tap the displayed rhythm on the keyboard (see figure 2). The sounds in the program generally consist of simple beep tones—you definitely don't need peripheral sound gear to get your money's worth.

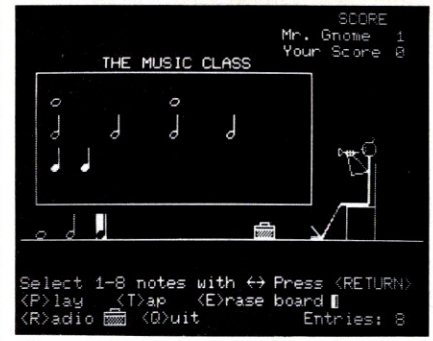


Figure 2: Mr. Metro Gnome teaches rhythm with his tapping foot.

Each of the volumes comes with a 22-page booklet that includes information on the Manager utility, the elements of the current volume, summaries of the other volumes, and possible solutions to error messages and assorted problems. These booklets explain how to use the programs but spend only a concise page or so on the musical principles of the programs.

Here's more detail on what the volumes cover:

Volume 1: Fundamentals

This pair of disks begins at the absolute beginning, showing how circles can represent tones and how the height of those circles on a page can correspond to frequencies. The four programs in Volume 1 cover note reading and staff note reading; rhythm of whole, half, and quarter notes; major and minor scales; and interval counting.

Volume 2: Rhythm

The versatile Mr. Metro Gnome is the star of this entire volume, as he taps out rhythms and challenges you to tap them in turn on the space bar. Starting with whole, half, and quarter notes, the four lessons progressively add eighth notes, dotted notes, and sixteenth notes. When your tapping does not match the displayed rhythm, Mr. Metro Gnome stops the action and shows you a graphic depiction of the length of your notes alongside the correct note lengths.

Volume 3: Ear Training

Four programs cover melodic er-

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You work faster, more efficiently. Your IIe does things it could never do before.

Memory intensive software like AppleWorks runs faster. You can put Pinpoint or MacroWorks *and* your spelling checker into RAM at the same time for instant response. And you can work with massive files without constantly going back to your disk drive.

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With 512K or larger RamWorks, *all* of AppleWorks (including printer routines) automatically loads into RAM.

The result? AppleWorks runs up to 20 times faster. You don't waste time accessing the program disk drive. You switch instantly from word processing to spreadsheets to database. Anytime. And without wear on disk drives.

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

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

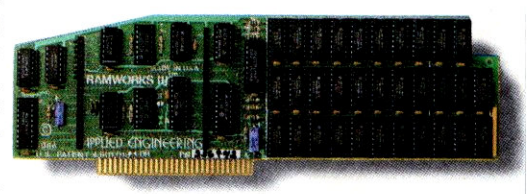
RamWorks boards include an AppleWorks print buffer — up to 125K in the 512K model — so you can keep working while your printer is printing. Also, you don't have to buy a separate print buffer, a savings of up to $250.00.

Autosegments large files.

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

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

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



RamWorks III expansion board

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

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

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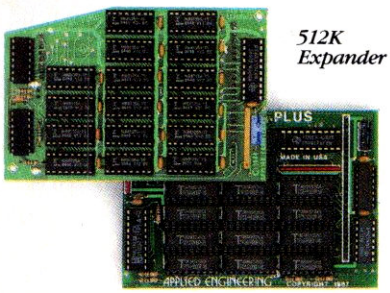
For even more power, snap an Applied 512K, 1 MEG or 2 MEG expander card into the RamWorks III low profile connector. The expander card won't interfere with Slot 1.



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

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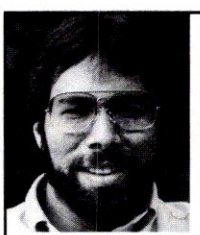
RamWorks III is compatible with most hardware add-ons like ProFile and Sider hard disks.

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



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Steve Wozniak, the creator of Apple Computer.

Easy to install and use.

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

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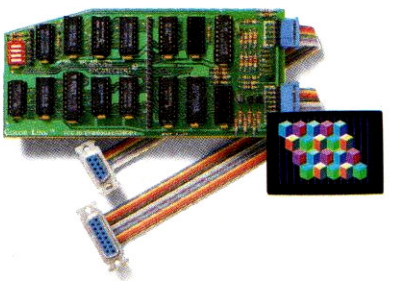
ColorLink offers four text colors so you can use the one that's easiest on your eyes (others offer only green).

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

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



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

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

The RamWorks basic® alternative.

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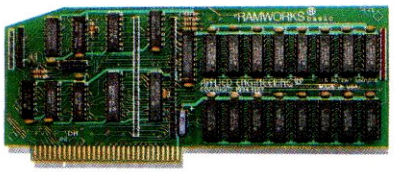

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ror detection and correction, aural interval recognition, and melodic and rhythmic dictation. The program plays intervals and melodies and asks you to correct melody lines and enter notes on a staff. In the dictation lessons, you also attempt to enter rhythm values.

Volume 4: Music Symbols

Three programs use animated graphics and games to show the meanings of sheet-music symbols (figure 3). Rests, accents, repeats, sharps, fermatas, flats, and naturals are in the first part. The second part adds slurs, crescendos, tied notes, triplets, common time, and cut time. The last part is a tool kit for drawing up to 80 new symbols for use in the recognition game.

Volume 5: Note Reading

In some respects, Volume 5 is like a compressed version of Volumes 1 and 3. The note reading is more advanced, however, challenging you to read notes in a variety of clefs and on ledger lines beyond the confines of Volume 1. The second program is dedicated to keyboard note reading of similar complexity, where the note's letter is shown and you have to move the cursor to the proper key of the note. The third and fourth programs represent the return of Mr. Metro Gnome and have rhythm exercises with sound and graphics.

In their favor, the lessons in the Music Class series are very simple to start and to follow. They do a thorough job of covering the fundamentals of music reading for beginners and can even help drill experienced music-literates in quick note and interval recognition, both in clefs and on a keyboard image. Unfortunately, buying the entire series would set you back more than $200—too much, in my opinion, for a program that covers only fundamentals and cannot boast anything beyond rudimentary graphics and sound.

With the options of the Manager utility program and the ability to keep scores for as many as 125 students, the Music Class series can be a good deal for a large group of students. Keep in mind, though, that only one person can use each disk at a time (the full set can handle ten students at once). That is assuming, of course, that you don't have GS systems in the classroom. GS owners should basically ignore the Manager utility until Wenger decides to straighten the bug out and should just think of the series as a single-user package. ✚

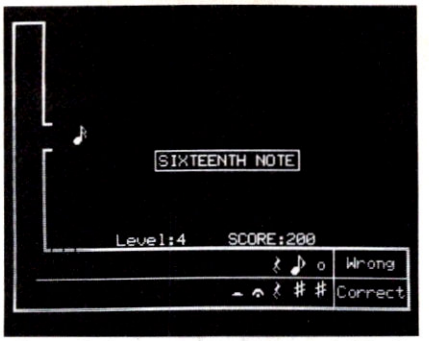
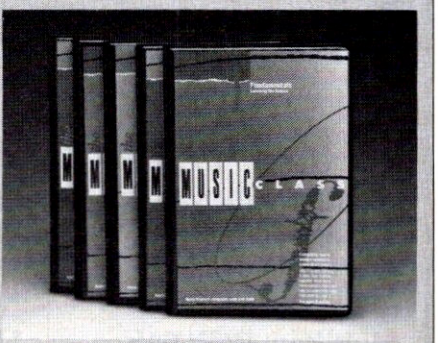


Figure 3: A screen from Volume 4, Music Symbols

Phillip Robinson has written for BYTE, InfoWorld, *and other computer publications; is the author of several books; and contributes a weekly computer column to the* San Jose Mercury News. *He is currently an editor of the* Desktop Engineering News *newsletter.*

VITAL STATISTICS



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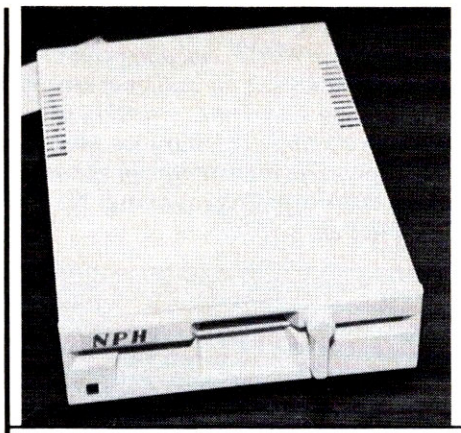

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A new round of Apple books

READ ALL ABOUT IT

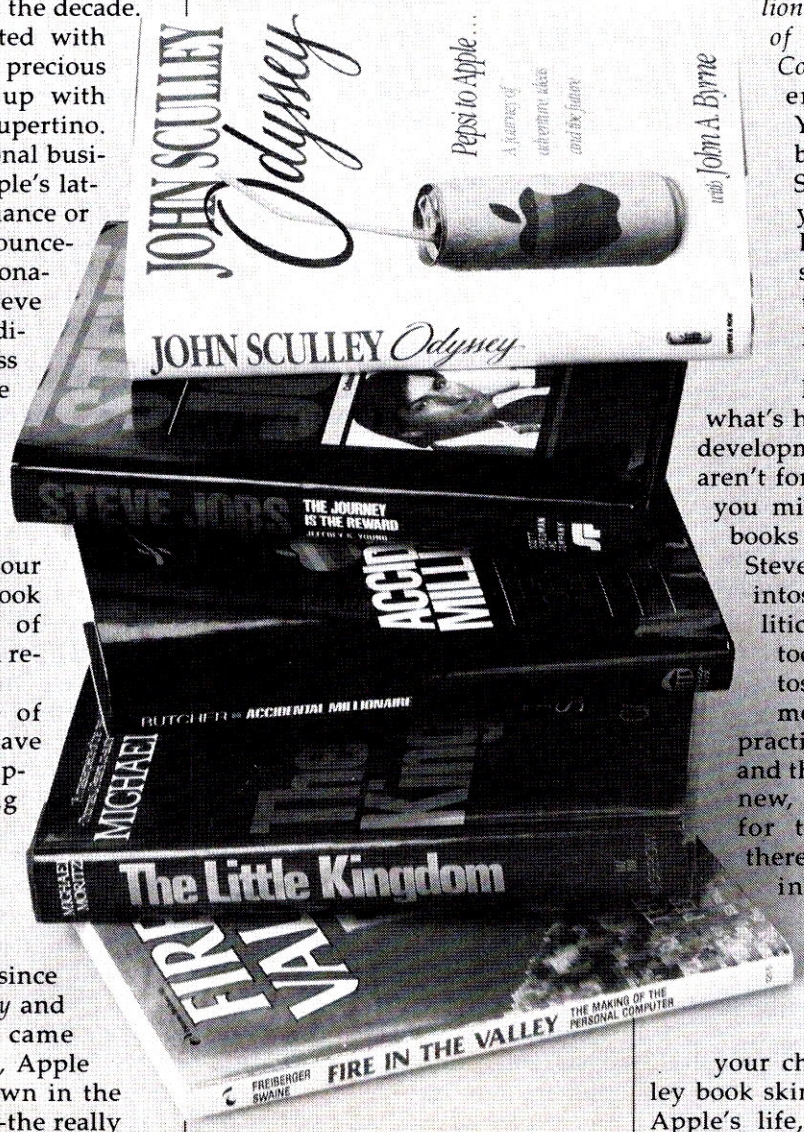
When you buy an Apple computer, you get more than a machine—you also get the mythology: the two Steves; the Los Altos garage; the Cinderella story of Apple's rise to fame and fortune; and the ongoing, larger-than-life escapades of the company's founders. All that legendary stuff is as much part and parcel of every computer Apple sells as is the rainbow-striped logo on the front of every Apple system. Of course, some of us buy Apples for purely practical reasons, but the fact is that owning an Apple II means having a connection to one of the most intriguing success stories of the decade.

For those fascinated with Apple lore, there are precious few ways to keep up with current events in Cupertino. You might find national business coverage of Apple's latest financial performance or major product announcement; local, sensationalized stories about Steve Wozniak's pending divorce; and trade-press coverage of Steve Jobs' public appearances, but that's pretty slim pickings. To get the dirt on what's happening within Apple, your best bet might be to look at one of a spate of books that have been recently released.

Of course, none of these books will have up-to-the-moment Apple gossip, having been sent to the printers months ago, but they provide the most thorough doses of inside Apple information since both *Fire in the Valley* and *The Little Kingdom* came out in 1984. Besides, Apple has really settled down in the last couple of years—the really juicy stuff took place in 1985, when Apple chalked up its first quarterly loss; reorganized the product divisions; laid off more than 1000 people; and eventually lost its wunderkind chairman of the board, Steve Jobs. These new books cover this period of time in great detail.

In all, three Apple-related books came out in the last quarter of 1987. More accurately, three Steve Jobs-related books were published then. They are: *Odyssey: Pepsi to Apple*, the highly publicized autobiography of Apple Chairman John Sculley; *The Journey is the Reward: The Life and Times of Steve Jobs*, by Jeffrey S. Young; and *Accidental Millionaire: The Rise and Fall of Steve Jobs at Apple Computer*, by Lee Butcher. Obviously, the Young and Butcher books are specific to Steve Jobs, Apple's 32-year-old cofounder. But the Sculley book spends a great deal of time exploring Jobs' personality as well.

If you're looking for lots of insight into what's happening in Apple II development, then these books aren't for you. The truth is, as you might guess, that these books have a lot to do with Steve Jobs' baby—the Macintosh—and with the political maneuvering that took place as the Macintosh was under development; came to market; practically self-destructed; and then bounced back in a new, improved form. Still, for true Apple addicts, there's enough here on the internal goings-on to get a formidable fix. Also, if you haven't yet read about the early days of Apple, you haven't missed your chance. Only the Sculley book skimps on that period of Apple's life, whereas the Young



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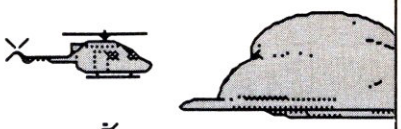

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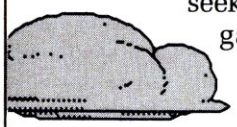

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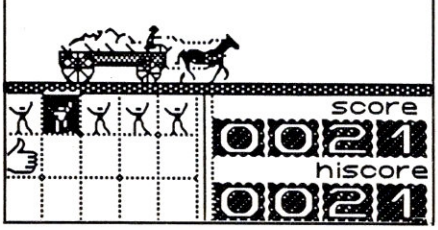
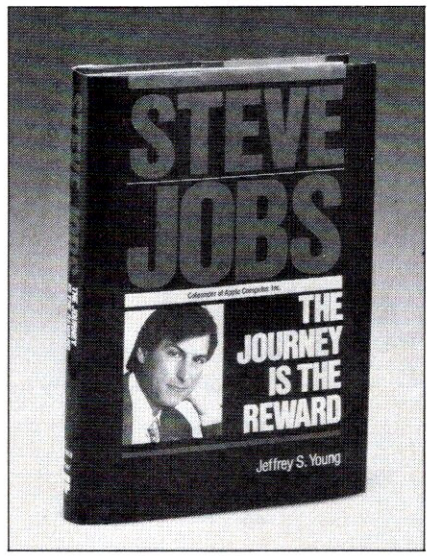


and Butcher books rehash it at length.

Odyssey

The book that rings most true is Sculley's, an autobiography that he cowrote with John A. Byrne, a *Business Week* editor. The veracity



should come as no surprise; after all, since Sculley was a participant in the boardroom and not a reporter relying on interviews to triangulate the evidence. What is surprising is Sculley's candor, the descriptions of his mistakes, and his confession of how far out of hand he let Jobs get. It's an emotionally told story that carefully recounts the corporate courtship, marriage, honeymoon, and bitter split-up of Sculley and Jobs.

Odyssey is a page-turner because it takes such a thorough behind-the-scenes look at Apple. If you've ever wondered what it might be like to sit in on an executive staff meeting at Apple, or to visit President Mitterand in Paris or IBM's corporate headquarters with Steve Jobs, then this book will give you a glimpse. It's got all kinds of interesting anecdotes: Alan Kay's disparaging memos about the Macintosh, Ben Rosen's bet with an Apple manager that Jobs would outlast Sculley and eventually oust him, and Apple's flirtation with buying Xerox Corporation, among many others. Equally fascinating are Sculley's early chapters describing executive life at Pepsi-Cola, the company from which Apple lured him. He draws a remarkable contrast between the opulence and cigar-chomping competitiveness of the soda-pop conglomerate vs. the seat-of-your-pants creativity and chaos he chose to join at Apple.

The fact is that owning an Apple II means having a connection to one of the most intriguing success stories of the decade.

Apple lovers will want to skip Sculley's minichapters on marketing and positioning strategy and get right to the heart of the power struggle. (*Odyssey*, Harper & Row, $21.95)

The Journey Is the Reward

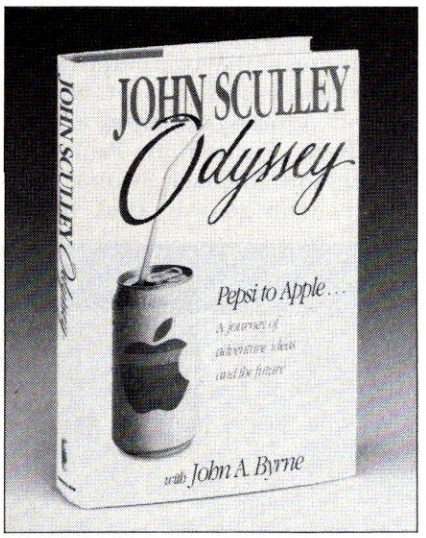
Jeffrey Young's book has its own surprises. The trendy Zen title makes it sound as if he'll trump up Jobs' already outsized image, but he makes it clear early on that he intends an evenhanded approach. He paints a fairly unsparing portrait of Jobs—as genius, tyrant, showman, and silver-tongued salesman. Young, a founding editor of *MacWorld* magazine, captures perfectly the paradox between Jobs' humanistic ideals and his propensity for cruelty.

The Journey is the Reward could be subtitled *Everything You Always Wanted to Know about Steven P. Jobs but Might Never Ask*. As a good biography should, this one contains voluminous, interpretive detail on Jobs' childhood and youth, with all you'd care to know about his trip to India and experimentation with drugs, diet, and sleep deprivation. It's interesting material but may be a bit excessive for the average Apple watcher looking for insight into the workings of the company. Nonetheless, if you've never picked up *Fire in the Valley* or *The Little Kingdom*, Young's book thoroughly covers the nascent days of Apple and Jobs' tumultuous relationship with company cofounder and Apple inventor Steve Wozniak. It also explores Jobs' obsession with proving himself as important to Apple as Woz.

What's really remarkable about Young's book is the way it contrasts with Sculley's. Sculley's story hinges upon Jobs' behavior, but the reverse is hardly the case in

Young's book. In fact, Sculley appears to be one of a vast number of supporting players in Jobs' universe, making it appear that Sculley's infatuation with Jobs was unrequited. In fact, Jobs seemed to think Sculley was something of a "bozo." It's hard to tell where the truth lies here, though, since both Jobs and Sculley refused to be interviewed for this book.

The biggest surprise appears near the end of Young's book, where he credits Steve Jobs with the turnaround at Apple. The company took a nosedive in early 1985—culminating with losses and layoffs at midyear and Jobs' resignation shortly thereafter—and has since climbed back, quarter after quarter, to record profits. Young's assertion is that, since Jobs championed the LaserWriter against upper-echelon resistance, he made it



possible for the desktop-publishing market to emerge and thus paved the way for Apple's salvation. Sculley merely "found himself sitting at the head of a company perfectly poised to take advantage of a groundswell of profits from the advent of desktop publishing," says Young in his book, acknowledging, though, that John Sculley's "reorganization, streamlining, and appearance of stability all contributed."

It's a pretty naive analysis of the way things do and don't happen in the personal-computer marketplace. If Sculley hadn't done all those things, desktop publishing wouldn't have mattered. And, as Young points out, Sculley had to do all those things because the low-powered Macintosh that Jobs in-

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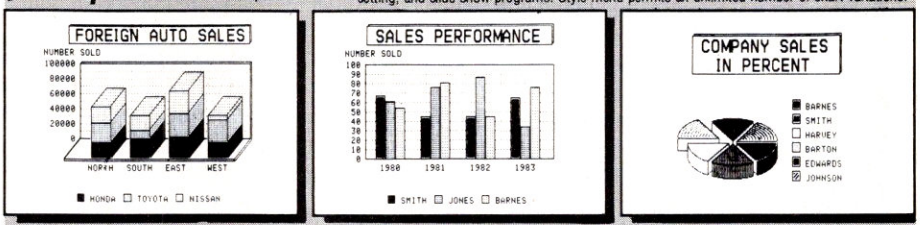

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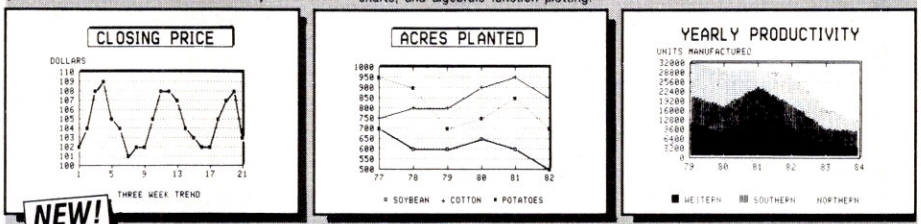

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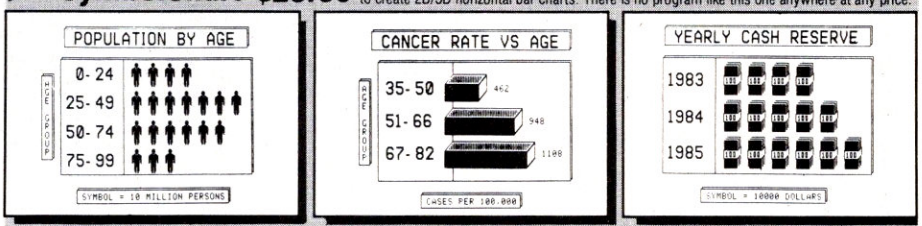

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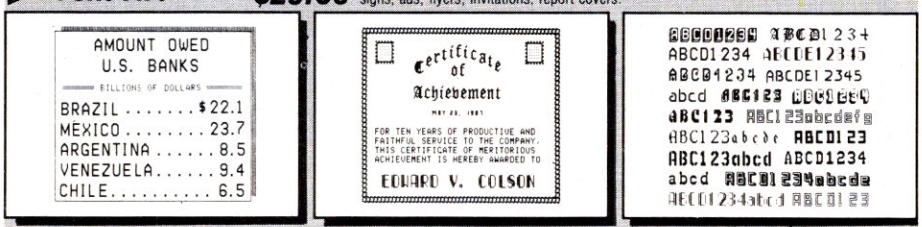

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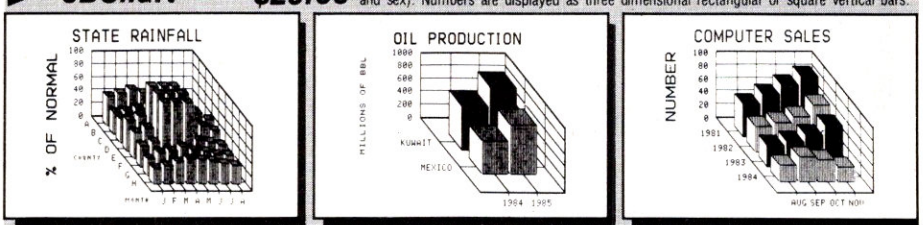

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CIRCLE 124 ON READER SERVICE CARD

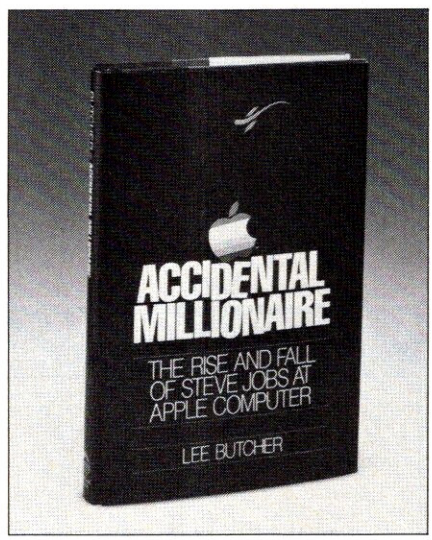
For true Apple addicts, there's enough here on the internal goings-on to get a formidable fix.

sisted on just wasn't making it in the marketplace, not to mention the fact that Jobs himself was wreaking havoc throughout the company.

In all, this is a very entertaining read that gives a great deal of insight into Jobs and into Apple. (*The Journey is the Reward*; Scott, Foresman and Co.; $18.95)

Accidental Millionaire

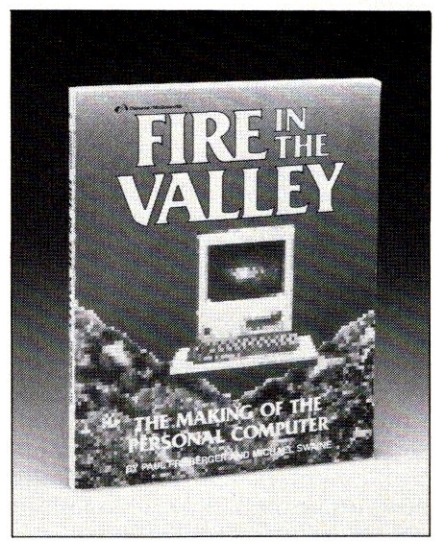
Accidental Millionaire, written by the former editor of the *San Jose Business Journal*, follows pretty much the same chronology as Young's book, but with a vituperative twist. As you can tell from the title, the thesis here is that Steve Jobs was in the right place at the right time—an opportunist's opportunist. "Because Jobs had so little to do with the creation of the first personal computer that led to Apple Computer, many people feel that he became important only through hanging onto Wozniak's shirt tails. Hence the title *Accidental Millionaire*," writes Butcher.



Accidental Millionaire is fun to read in the same way that pulpy made-for-TV movies are fun to watch. Besides the book's brazen premise, its climax includes an incredibly hokey scene wherein the *San Jose Business Journal* has gotten wind of Apple's reorganization plans. "You've got to get something more solid than rumors," says the editor (presumably Butcher) to reporter Jimmy Olsen—oops, I mean Nick Arnett. When something more solid is found ("Let's go with it," the editor says), the story forces Sculley to announce the reorganization earlier than he planned, according to Butcher. It's a gratuitous scene that's more self-serving than anything in Sculley's book. If you're really interested in a biographical look at Jobs, pick up Young's book, which makes a lot of the same points as Butcher does, but in a more gentlemanly, better-researched, and better-written fashion. (*Accidental Millionaire*, Paragon House, $19.95)

Fire in the Valley

The "classic" Apple history is *The Little Kingdom*, a thoroughly researched account by Michael Moritz, a former *Time* reporter, that is now out of print. *Fire in the Valley*, the quintessential computer-industry primer, is still in print, however, and certainly deserves a mention here. Written by Paul Freiberger and Michael Swaine, two writers who go way back to the heyday of *InfoWorld* in the early 80s, it covers much more ground than just the Apple story per se. In fact, Apple doesn't really get much play until about two-thirds of the way through the book. But it's the book to read if you want to understand the context in which Apple evolved and get the original "two Steves" story. (*Fire in the Valley*, Osborne/McGraw-Hill, $11.95) ✚



Lisa Raleigh is the Executive Editor of A+ magazine

A product that gives you color with a capital K

KROYKOLOR

Are you disappointed in the color output of your ImageWriter II? Are you longing for an easy, relatively inexpensive way to add color to your printouts? I mean real color: bright, intense, opaque reds, blues, greens, and so on. I have good news for you. Read on.

With the help of my Apple IIGS and LaserWriter, I just wrote and printed a five-page report. It looks good, especially the cover page. It's on dark-blue card stock with a 64-point title, and the type is silver. Impressive!

No, I'm not hallucinating. And I don't have a $30,000 color printer. I know that the LaserWriter doesn't print in color, but I can do it anyway. I can take anything printed on a laser printer and color it quickly, easily, cleanly, and professionally. In fact, I can do the same thing with any photocopied page. You can too—with a KroyKolor or Omnicrom system.

I first saw KroyKolor at a computer store. I looked at some sample output, and then I colored one of my own LaserWriter prints. My instantaneous reaction: "Wow, I want it!"

The KroyKolor system, from a company that is well known in the graphics field for its sign systems, consists of a processor, a rather large unit (26½ inches wide by 9 inches high), and color-transfer film. The system is made by Omnicrom Systems Corporation and is also available directly from that company under the Omnicrom name. The processor is basically a temperature-controlled heating unit. The color film, when properly heated, adheres to toner (a dull, black powder). Laser printers and most photocopiers print with toner. Put it all together and — well— let me explain how it works.

The KroyKolor/Omnicrom processor and color transfer film

Fast and Easy

Take any laser-printed or photocopied page. Slip the page between a sheet of color film and the film's backing paper and feed it into the processor. In seconds, the paper rolls out of the rear slot of the processor. Peel off the film and presto! Wherever there was toner, there is now vivid color, color that is permanently bonded onto the paper. Your document looks as though it had been professionally printed.

What is most impressive about the KroyKolor system is the quality of the transfer film. The 8½ × 11-inch sheets come in a variety of different colors and finishes. Presently, you can get 35 matte, 11 gloss pastel, and 14 metallic colors. All the colors—matte, gloss, and metallic—bond perfectly: no wrinkles and no uneven shading. The colors are opaque, so the paper does not show through. The metallic sheets are fabulous. Imagine seeing your computer output in gold, silver, bronze, metallic blue, and so on.

It's Fun

You'll find yourself printing and photocopying just about anything, just so you can color it. At first, you'll probably be content with using one color to a page, but soon you'll want to create multicolored prints. You can do so easily by cutting pieces of different-color film and taping them over the appropriate areas of your image. When you run the sheet through the processor, each color bonds to the area you placed it on. Alternatively, you can print or copy part of an image, KroyKolor it with one color, send the same sheet through the printer or copier again to print another area, KroyKolor the newly printed area with another color, and so on.

It's Practical

Fun aside, the KroyKolor processor is a useful tool that allows you to do professional-quality color work economically.

If your business or organization does low-volume presentations and reports, you can create color covers for considerably less money than you'd have to spend to have them done professionally at a print shop. Kroy provides paper and card stock in a range of colors that are perfect for such covers.

You can use any Apple graphics program to create business charts; print them; and, if you're not using a LaserWriter, send your printout through a copier and use KroyKolor to add pizzazz to the charts.

KroyKolor can take anything printed on a laser printer and color it quickly, easily, and professionally.

Are you an artist? Instead of using colored markers or adhesive-backed sheets that you have to meticulously cut with an art knife, you can prepare layouts and comps with KroyKolor.

If you need lots of small signs and change them often, you might want to check out Kroy's new software program called SignXpress, which positions text and graphics on predefined sign templates. The templates fit into special plaques, also available from Kroy. Pop out one sign and insert a new one.

Schools are using the Kroy system with programs such as Certificate Maker and Award Maker Plus. Print the certificate on an ImageWriter, photocopy it, and then KroyKolor the photocopy. Certificates look fabulous with metallic-colored borders. Print Shop signs and posters come alive. Newsroom fliers with colored mastheads demand attention.

Black is Black

If you use a LaserWriter and find yourself bemoaning the fact that the black is actually a dull, lifeless gray—a problem especially when you're printing graphics—you can take that dull page and apply Kroy's matte or gloss black film to it. You'll surely be impressed with the results.

The processor is also an excellent laminating machine. Instead of using color film, sandwich your document between a sheet of laminating film and backing paper, send it through the processor, and you have it.

One Complaint

I like this system. I like it so much that I wish it were priced so that schools, small businesses, organizations, and individuals like me could more readily afford it. That's my only complaint. I think the $995 price is steep for what is, after all, just a heating unit. When I questioned the price, Kroy personnel told me that the processor's infrared bulb is the same high-quality, expensive bulb as the one in Apple's LaserWriter, only bigger. The rollers in the processor had to be meticulously designed to provide just the right pressure for wrinkle-free bonding of the film to the toner. I'm sure that's all true, and this attention to detail is undoubtedly what lets you produce superior-quality colored output at a fraction of the cost of commercial printing. Still . . .

Try It

If you'd like to use KroyKolor but are not ready to purchase it, check out some of the service bureaus in your areas. Some of these bureaus, where you pay by the page for LaserWriter or Linotronic output, now have a Kroy processor. For a minimal fee, sometimes just the cost of the sheet of color film, you can use the processor to color your documents.

Or Buy It

Whether you're using KroyKolor with a LaserWriter or copier, you'll love the new color in your life. If you plan to use it with a copier, check with your dealer, or call Kroy, to be sure your copier is compatible. Then, while you're waiting for delivery, clear out a few shelves in your paper cabinet—you'll want to try all the colors and finishes. ✚

Roberta Schwartz is an A+ graphics editor and coauthor of our "Speaking of Graphics" column.

VITAL STATISTICS

KROYKOLOR PROCESSOR/OMNICROM

A heating unit that bonds color film to the toner on laser-printed or photocopied materials to give you professional-looking color printouts

LIST PRICE: *$995; KroyKolor film (100 sheets of one color or assorted colors): matte, $41.95; metallic, $49.95; gloss pastel: $57.95; KroyKolor cover stock (100 sheets of one color): $19.95*

REQUIRES: *Hard copy printed with LaserWriter or copier that uses toner*

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CIRCLE READER SERVICE NO. **351**

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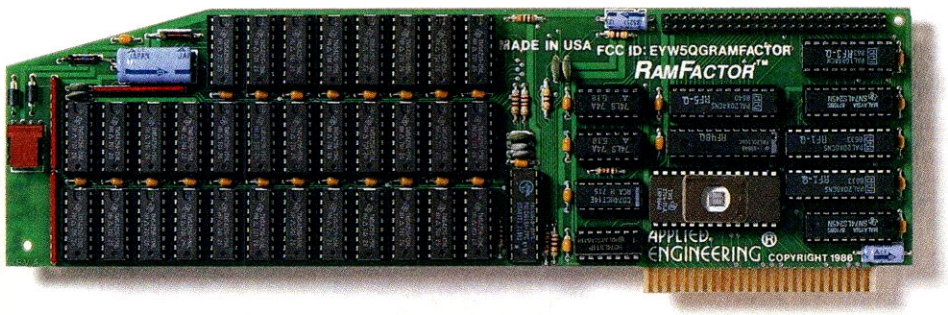


RamFactor is automatically recognized as additional workspace memory by AppleWorks 1.3 and 2.0. In addition, RamFactor's memory can be used for creating the ultimate in program speed—a lightning-fast RAMdisk for the Apple IIGS, IIe, II+, Franklin and Laser 128. A RAMdisk does not depend on the slow moving parts of a conventional floppy drive. RAMdisks eliminate wear and tear on your disk drive plus your programs run up to 20 times faster! When a program is in RAM, your computer won't have to search for it in the mechanical disk drive during program operation. With RamFactor, you can have up to 9 seperate simultaneous RAMdisks—even in different operating systems! Now you can instantly switch from one program to another or even switch from AppleWorks to DOS 3.3 to CP/AM to Apple Pascal 1.3 to ProDOS.

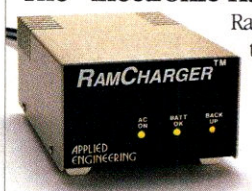
Apple Memory Expansion Card Compatible

RamFactor is 100% Apple Memory Expansion Card compatible. This means that software designed for Apple's card is automatically compatible with RamFactor. Thousands of software programs—including AppleWorks, Pinpoint, MacroWorks, MultiScribe, and Managing Your Money—can take advantage of the speed and performance RamFactor provides. But with Apple's card, you can have only one RAMdrive partition instead of the 9 simultaneous RAMdrives that RamFactor offers. And that's only part of the story . . .

2.0 AppleWorks Power

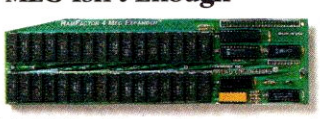
Other slot 1-7 cards can give AppleWorks a larger desktop, but that's the end of their story. RamFactor provides many more powerful functions. It's the only slot 1-7 card that increases AppleWorks 2.0 internal limits by increasing the maximum number of records in the database to 22,600, increasing the maximum number of lines permitted in the word processor to 22,600, and expanding the clipboard size to 2,250 lines maximum. RamFactor is the only standard slot card that will automatically load all of AppleWorks into RAM, dramatically increasing speed and eliminating the time required to access the program disk. It will even display the time and date on the AppleWorks screen with a ProDOS clock. RamFactor will automatically segment large files so they can be saved on multiple 5¼" and 3½" floppies or a hard disk. All this performance is available for the Apple IIe, Laser 128, Franklin or 64K Apple II Plus when used with an 80 column card. No other standard slot card comes close to enhancing AppleWorks so much.

The "Electronic Hard Disk"



RamCharger is an optional battery back-up device, (about the size of a disk drive), that can plug into a connector on RamFactor. With RamCharger added to RamFactor, your program will appear almost instantaneously when you turn on your computer. RamCharger contains LED's that let you know RamFactor's reserve power status. Since RamCharger has its own built-in power supply, it can retain RamFactor's memory indefinitely. Plus, RamCharger's battery will continue backing up RamFactor's memory for up to 10 hours during power failures. An optional "Y" cable is also available that allows one RamCharger to power two fully expanded RamFactors.

If 1 MEG Isn't Enough



A 4 MEG RamFactor Expander can be plugged into the expansion port on RamFactor for up to 5 MEG's total. RamFactor Expander uses standard 1 MEG chips and can be expanded in 1 MEG increments. With the addition of RamCharger, both RamFactor and the expander will provide up to 5 MEG's of lightning-fast battery backed storage.

Features

- Compatible with Apple IIGS, IIe, II+, Franklin and Laser 128
- 256K to 1 MEG on main board with 256K memory chips; expansion port supports up to 5 MEG with Expander option
- 100% Apple Memory Expansion Card compatible
- RamCharger battery back-up option available for permanent storage
- Reduces power strain to internal power supply with RamCharger option
- Fully socketed and user upgradeable
- Expands internal limits of AppleWorks 2.0
- Automatically recognized by ProDOS, DOS 3.3, Apple Pascal 1.3 and CP/AM
- Built-in RAMDrive software (true RAMdisk not disk caching)
- Graphic memory test included
- Allows Apple II+ to run AppleWorks 2.0 without buying additional software
- Automatically recognized by AppleWorks 1.3 and 2.0
- Fits in any I/O slot except slot 3
- 5 year warranty — parts and labor
- Proudly made in the U.S.A.

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RamFactor with 512K	**$299**
RamFactor with 1 MEG	**$419**
RamFactor Expander with 1-4 MEG	**CALL**
RamCharger backup option	**$179**
"Y" cable	**$24**

(Allows one RamCharger to power two RamFactors.)

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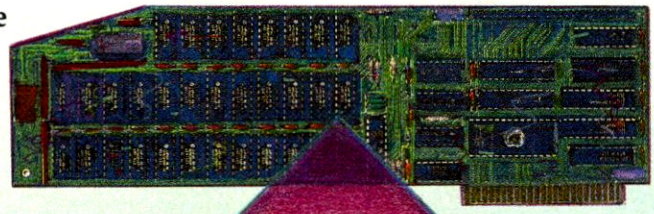

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Sensible Speller to Sensible Grammar	1.3 sec.
Power on to AppleWorks	* 2.8 sec.
Control A- Reset to AppleWorks	* 2.9 sec.

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A+ APPLEWORKS REPORT

FEATURE REPORT
PREPARING A TAX-DEDUCTION DATABASE

FEATURE REPORT
BY STEVE MILLER

PREPARING A TAX-DEDUCTION DATABASE

Well, it's that time of year again: time to think about preparing last year's tax return and to make resolutions about how to be better prepared this year. Let's look at how the AppleWorks database module can make your tax preparation less tedious.

Many excellent financial-management and tax-preparation programs are on the market, but most of them require a lot of learning time and, frankly, do more than is necessary for most of us.

If you operate a small business or have enough deductions to file Schedule C (itemized deductions) on your tax return, you can use the good old AppleWorks database module to itemize your deductions quickly and easily and provide you with a subtotal for each deduction category.

You don't have to do data-entry work every time you write a check—if you spend half an hour at the end of each month and enter only checks for expenses that are deductible, at the end of the year you'll be able to face tax preparation with ease.

Here's how to set up the tax-deduction database:

From the AppleWorks main menu, choose Option 1, `Add Files to the Desktop`. Then choose `Database` from the Add Files menu and `From Scratch` from the Database menu. Enter an appropriate name for the file, such as `TaxDedctns87`. Create the category names that appear in figure 1: Date, Check, To, Amount, For, and Type. If you have special needs, you can add extra categories.

Once a month, or whenever it's convenient, sit down at your computer and enter your deductible ex-

```
File: TaxDedctns87            CHANGE NAME/CATEGORY    Escape: Review/Add/Change

Category names
==========================================================================
date
check
to
amount
for
type

------------------
Type entry or use
```

```
File: TaxDedctns87              REVIEW/ADD/CHANGE              Escape: Main Menu

Selection: All records

date            check           to              amount          for
==========================================================================
Jan  3 87       103             Fdtn for Jr Bli 20.00           donation
Jan 12 87       124             Sprint          34.02           long distance
Feb  3 87       156             ABC Stationery  87.02           business forms
Feb 12 87       183             Sprint          23.16           long distance
Mar 13 87       216             Sprint          26.02           long distance
Mar 15 87       275             J. Smith Esq.   100.00          prepare contrac
Apr  8 87       303             Goodwill Indust 15.00           donation
Apr 11 87       320             Sprint          29.30           long distance
Apr 12 87       326             U.S. Postal Ser 44.00           postage
May 12 87       436             ABC Stationery  53.85           office supplies
May 12 87       437             Sprint          28.16           long distance
Jun 13 87       456             Sprint          27.13           long distance
Jul 13 87       472             Instant Copy    33.73           fliers
Jun  9 87       620             Food for the Hu 25.00           donation
Sep 10 87       964             J. Smith Esq.   100.00          review contract
--------------------------------------------------------------------------
Type entry or use @ commands                                    @-? for Help
```

Figure 1: To set up a tax-deduction database, start by creating categories such as these. Figure 2 (below): After entering a month's worth of deductions, you can zoom in to look at all records. Note that not all categories fit on the screen.

penses, working from your checkbook ledger or stubs. Don't forget to go through your credit-card bills and receipts and add deductible expenses charged to credit cards.

In the Type category, use a list of standard abbreviations for allowable types of deductions: `contrib` (charitable contributions), `suppl` (supplies), `legal`, `office`, `repairs`, and the like. (If you're not sure what's deductible, look at last year's tax return.) You can use code numbers instead, if you prefer.

If you use more than one checking account, enter a letter next to the check number to designate which account it came from (362P could be from a personal account, for example). If you file more than one return, create an additional category to designate which entity each deduction belongs to (e.g., P for personal, B for business).

Be sure to save your work to a data disk frequently. Make a notation in your checkbook showing the date when you entered the information into AppleWorks, and

```
File: TaxDedctns87          CHANGE RECORD LAYOUT    Escape: Review/Add/Change

================================================================================

                    --) or (--  Move cursor
                     )  @   (   Switch category positions
                    --) @  (--  Change column width
                    @-D         Delete this category
                    @-I         Insert a previously deleted category

--------------------------------------------------------------------------------

date       check to                    amount  for             type      M
---------- ----- --------------------- ------ --------------- --------- A
Jan  3 87  103   Fdtn for Jr Blind      20.00  donation        contrib   R
Jan 12 87  124   Sprint                34.02  long distance   phones    G
Feb  3 87  156   ABC Stationery        87.02  business forms  suppl     I
                                                                       N
--------------------------------------------------------------------------------
Use options shown above to change record layout                 327K Avail.
```

ape: Main Menu

date	check	to	amount	for	type
Jan 3 87	103	Fdtn for Jr Blind	20.00	donation	contrib
Jan 12 87	124	Sprint	34.02	long distance	phones
Feb 3 87	156	ABC Stationery	87.02	business forms	suppl
Feb 12 87	183	Sprint	23.16	long distance	phones
Mar 13 87	216	Sprint	26.02	long distance	phones
Mar 15 87	275	J. Smith Esq.	100.00	prepare contract	legal
Apr 8 87	303	Goodwill Industries	15.00	donation	contrib
Apr 11 87	320	Sprint	29.30	long distance	phones
Apr 12 87	326	U.S. Postal Service	44.00	postage	suppl
May 12 87	437	Sprint	28.16	long distance	phones
May 12 87	436	ABC Stationery	53.85	office supplies	suppl
Jun 9 87	620	Food for the Hungry	25.00	donation	contrib
Jun 13 87	456	Sprint	27.13	long distance	phones
Jul 13 87	472	Instant Copy	33.73	fliers	suppl
Sep 10 87	964	J. Smith Esq.	100.00	review contract	legal

Type entry or use @ commands @-? for Help

Figures 3 and 4: To get all categories to fit, use open-apple/L in conjunction with the left- and right-arrow keys.

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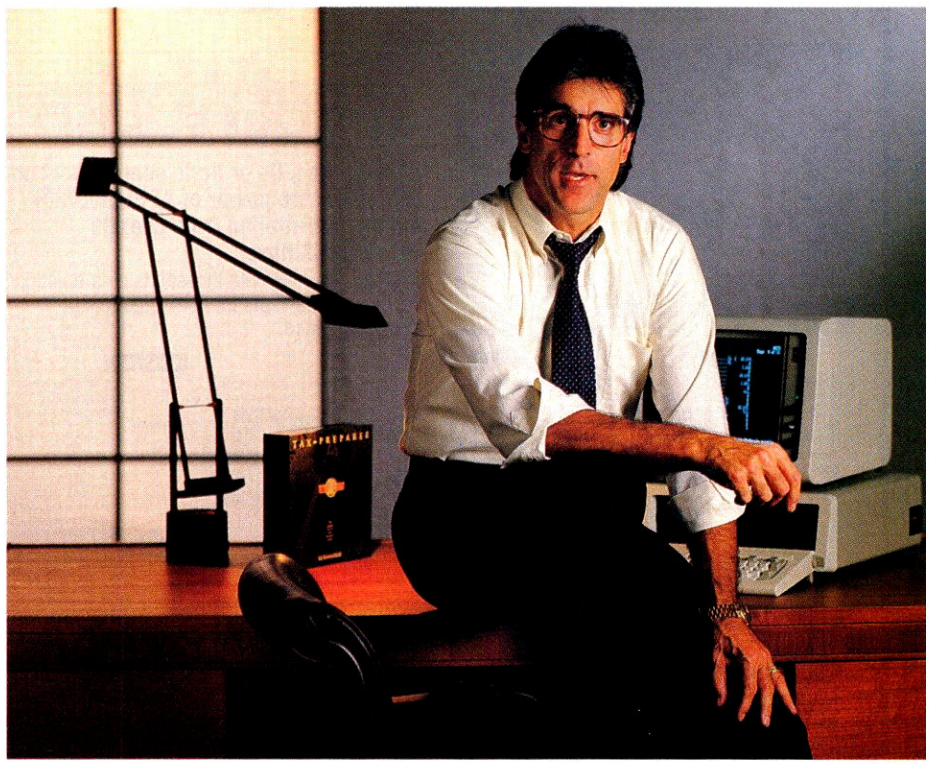

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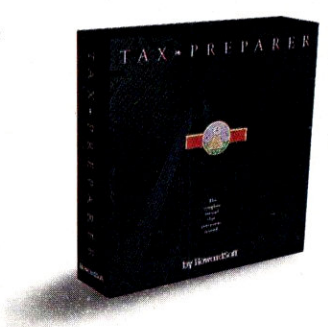

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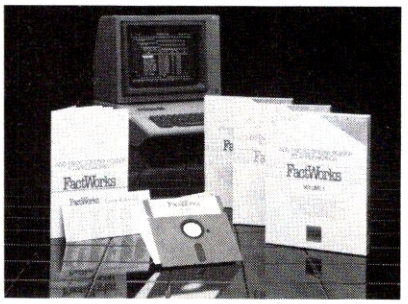

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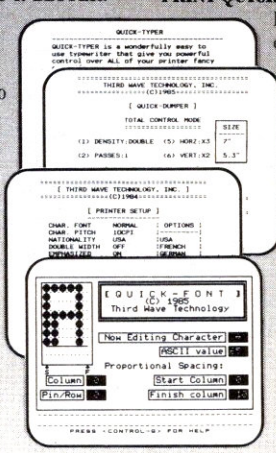

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CIRCLE 144 ON READER SERVICE CARD

mark the last check number in the computer file. I strongly suggest creating a backup disk and saving your data to it at the end of every session.

After you've entered a month's worth of deductions, use open-apple/Z to look at all the records in your file simultaneously (see figure 2). You'll see that all the information does not fit on the screen—the Type category is off to the right somewhere. You can make an adjustment by typing open-apple/L, and changing each category to an appropriate length using the open-apple key in combination with the left- and right-arrow keys (see figures 3 and 4).

Formatting Reports

At tax time, you'll need to print your itemized deductions in a way that makes sense to your tax preparer and the IRS.

Presumably, you've already entered your expenses in chronological order and check order. If not, you can arrange them that way by putting the cursor on the Date or Check column and typing open-apple/A. Choose `Chronological` or `From 0 to 9`, depending on which category you've chosen to arrange.

Next, and most important, you must group similar deductions together for subtotaling. Put the cursor on the Type column and type open-apple/A. Choose `From A to Z` to create an alphabetical listing of deductions by type. (You can do so regardless of whether you're in the Review/Add/Change mode or the Print mode).

To create a report format, type open-apple/P. Choose option 2, `Create a new ''tables'' format`. You can name the format anything you like, such as Totals.

Using the open-apple key with the left- and right-arrow keys, change the category widths so the categories will all fit on your printed page. Note that at the far right of your sample report format, AppleWorks gives you the total width of your report under the letters `Len` (in figure 5, it's 78 characters). If the length is greater than 80 characters, or if it's off the screen to the right entirely, you'll have to do some adjusting of category lengths

A Comparison Between the #1 Maker of Apple Memory Cards (Applied Engineering) and the #2 Maker (Apple Computer)

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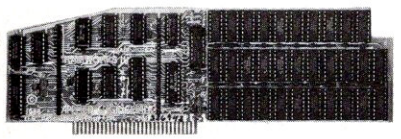
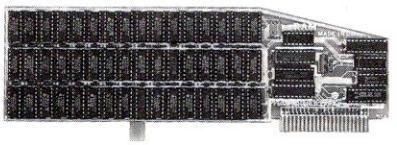


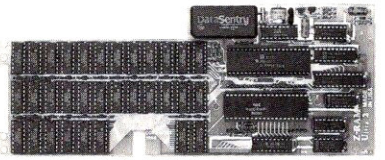
	RamWorks III®	Apple's™ Card
Maximum Desktop	3017K	1012K
Maximum Number of Records in Database	22,600	6350
Maximum Number of Lines in Word Processor	22,600	7250
Maximum Clipboard Lines	2042	255
Autoloads All of AppleWorks	YES	NO
Multiple Disk Save	YES	NO
Built-in Printer Buffer	YES	NO
Compatible with All Versions of AppleWorks	YES	NO
Displays Time & Date on AppleWorks Screen	YES	NO
RGB Option	YES	NO
16 Bit Co-Processor Port	YES	NO
Built-in Hi-Res Diagnostics	YES	NO
Memory Expansion Port	YES	NO
80 Columns Built-in	YES	NO
Maximum Total Functions	6	1
Software Standard	YES	YES
Made in	USA	Singapore
Warranty	5 years	90 days

FOR THE IIGS



	GSRAM™ GSRAM Plus™	Apple's™ Card
Maximum Desktop	8000K	1012K
Maximum Number of Records in Database	22,600	6350
Maximum Number of Lines in Word Processor	22,600	7250
Maximum Clipboard Lines	2042	255
Autoloads All of AppleWorks	YES	NO
Multiple Disk Save	YES	NO
Built-in Printer Buffer	YES	NO
Displays Time & Date on AppleWorks Screen	YES	NO
Time and Date Macros	YES	NO
3.5 Disk Cache	YES	NO
Built-in Hi-Res Diagnostics	YES	NO
Memory Expansion Port	YES	NO
ROM Expansion Port	YES	NO
Number of RAM Banks	6	4
Maximum Memory on Main Card	1.5 or 6 MEG	1 MEG
Software Standard	YES	YES
Made in	USA	Singapore
Warranty	5 years	90 days

FOR THE IIc



	Z-RAM Ultra™	Apple's™ Card
Compatible with All IIc's	YES	NO
Maximum Desktop	727K	1012K
Maximum Number of Records in Database	22,600	6350
Maximum Number of Lines in Word Processor	22,600	7250
Autoloads All of AppleWorks	YES	NO
Multiple Disk Save	YES	NO
Built-in Printer Buffer	YES	NO
Compatible with All Versions of AppleWorks	YES	NO
Displays Time & Date on AppleWorks Screen	YES	NO
16 Bit Co-Processor Port	YES	NO
Built-in Hi-Res Diagnostics	YES	NO
Built-in ProDos, DOS 3.3 Clock	YES [1]	NO
Built-in CP/M Capability	YES [2]	NO
Maximum Total Functions	5	1
Software Standard	YES	YES
Made in	USA	Singapore
Warranty	5 years	90 days

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1) Only on Ultra 2 or 3, 2) only on Ultra 3

or type size to make everything fit on the printed page.

If you are using more categories than the examples show, you will probably have to use a smaller type size than the normal 10 characters per inch. To change the size, type open-apple/O. Type CI; press Return; and then enter 12, 15, or 20, and press Return.

The larger the number of characters per inch, the smaller the type size. Use the largest type that lets you get all the necessary information printed on one line. You may need to do some experimentation to get everything just right.

Note that near the middle of the screen, AppleWorks tells you Char per line (est). This is the number of characters that will print, based on left and right margins, characters per inch, and other printer options. It should be equal to or greater than the width of your report described above (mine is 78 characters wide). If it's not, try a smaller type size. Finally, press Esc to go back to the report format.

Next ask AppleWorks to group things together for subtotaling. Put the cursor on the Type column and press open-apple/G. Select No in response to the questions Print group totals only? and Go to a new page after each group total? (No is the default answer to both questions, so just press Return.)

Finally, tell AppleWorks to calculate totals by putting the cursor on the Amount column and typing open-apple/T. Choose two decimal places, press Return, and put one or two blank spaces after the category. Your report format should now look like figure 5. Save it to disk before going further and again every time you modify it.

Give it a try: Type open-apple/P (Print the report) and choose The screen. Add the current date and press Return. Then study the report on the screen to see if it looks

```
File: TaxDeductions                CHANGE NAME              Escape: Report Format
Report: totals
Selection: All records


Group totals on: type
================================================================================
--> or <--  Move cursor                    @-J  Right justify this category
 >  @   <   Switch category positions      @-K  Define a calculated category
--> @  <--  Change column width            @-N  Change report name and/or title
@-A  Arrange (sort) on this category       @-O  Printer options
@-D  Delete this category                  @-P  Print the report
@-G  Add/remove group totals               @-R  Change record selection rules
@-I  Insert a prev. deleted category       @-T  Add/remove category totals
--------------------------------------------------------------------------------

date        check to                       amount  for                 type      L
-A--------  -B---  -C--------------------  -D-----  -E----------------  -F--------  e
Jan  3 87   103    Fdtn for Jr Blind       9999.99  donation          contrib     n
Apr  8 87   303    Goodwill Industries     9999.99  donation          contrib     7
Jun  9 87   620    Food for the Hungry     9999.99  donation          contrib     8
                                           =======
--------------------------------------------------------------------------------
Type title line at cursor position                                  326K Avail.
```

Figure 5: When formatting reports, notice the number under Len *on the far right.* Len *indicates how many characters wide your report is.*

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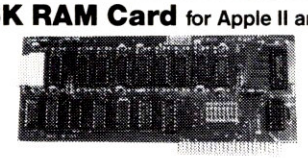

The JE860 RAM Card (Language Card) allows the Apple II and II+ computers to expand from 48K to 64K. Complete with instructions.

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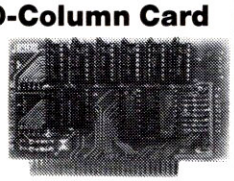

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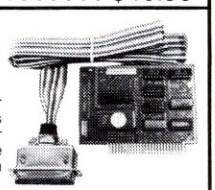

The JE880 is a parallel printer interface for most of today's dot matrix printers • 64K Buffer card for JE880 is also available (JE883, below) • Complete with instructions

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JE883 64K Buffer for JE880 . . . . . $49.95

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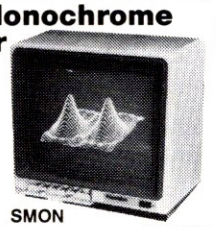

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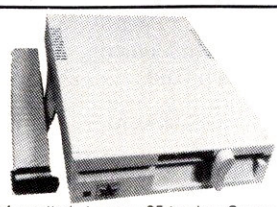

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correct and if each category is being subtotaled. Note: If your report is too wide for the 80-column AppleWorks screen, it will not be completely visible.

If everything looks acceptable, try sending the report to your printer. It should look something like figure 6.

You can add a title to your report while you're in the Report Format mode: Type open-apple/N. Don't change the report name—press Return to accept it, and you'll see the cursor move to the top of the sample format. You can now enter a one-line title, such as `Itemized deductions for Steve Miller, Calendar year 1987`, which will appear at the top of every page of your report.

Keep in mind that a report format does not arrange the data each time you print it, so if you add more deductions to your file, you must again arrange the Type category alphabetically before you print the report.

Here's the good news: Next year, you won't have to go through all these steps to create a new file! Just add the old file to the AppleWorks desktop from your data disk, change the name (using open-apple/N), and delete all the old data (using open-apple/D).

There's nothing like a big, healthy list of deductions to make a taxpayer smile! Why buy a new program to organize your deductions, when AppleWorks is ready to do it for you? ✚

Steve Miller is a free-lance TV director and producer whose work has appeared on ABC, PBS, and the Disney Channel. He has used AppleWorks to do his taxes for the last three years.

```
File:   TaxDeductions                                          Page  1
Report: totals                                                 1/10/88
date        check  to                    amount  for              type
----------  -----  --------------------  ------  ---------------  ----------
Jan  3 87   103    Fdtn for Jr Blind      20.00   donation         contrib
Apr  8 87   303    Goodwill Industries    15.00   donation         contrib
Jun  9 87   620    Food for the Hungry    25.00   donation         contrib
                                          60.00

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Figure 6: A finished report looks something like this.

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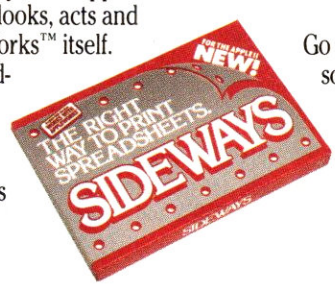

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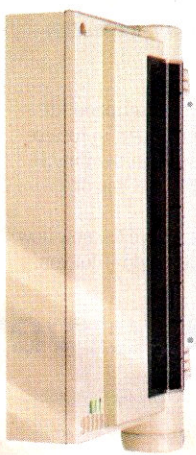

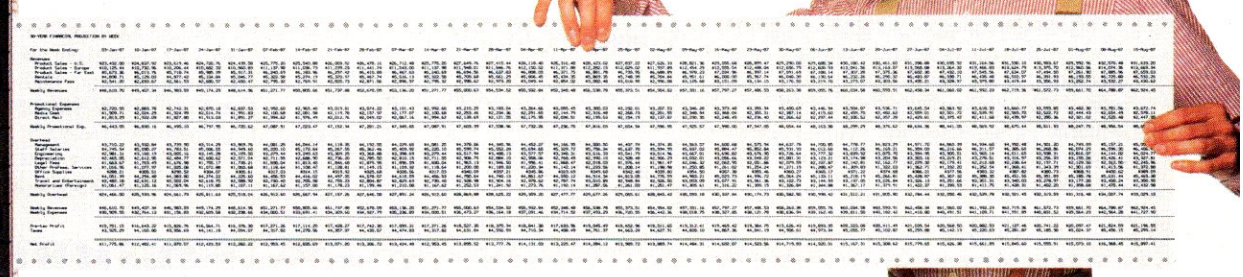

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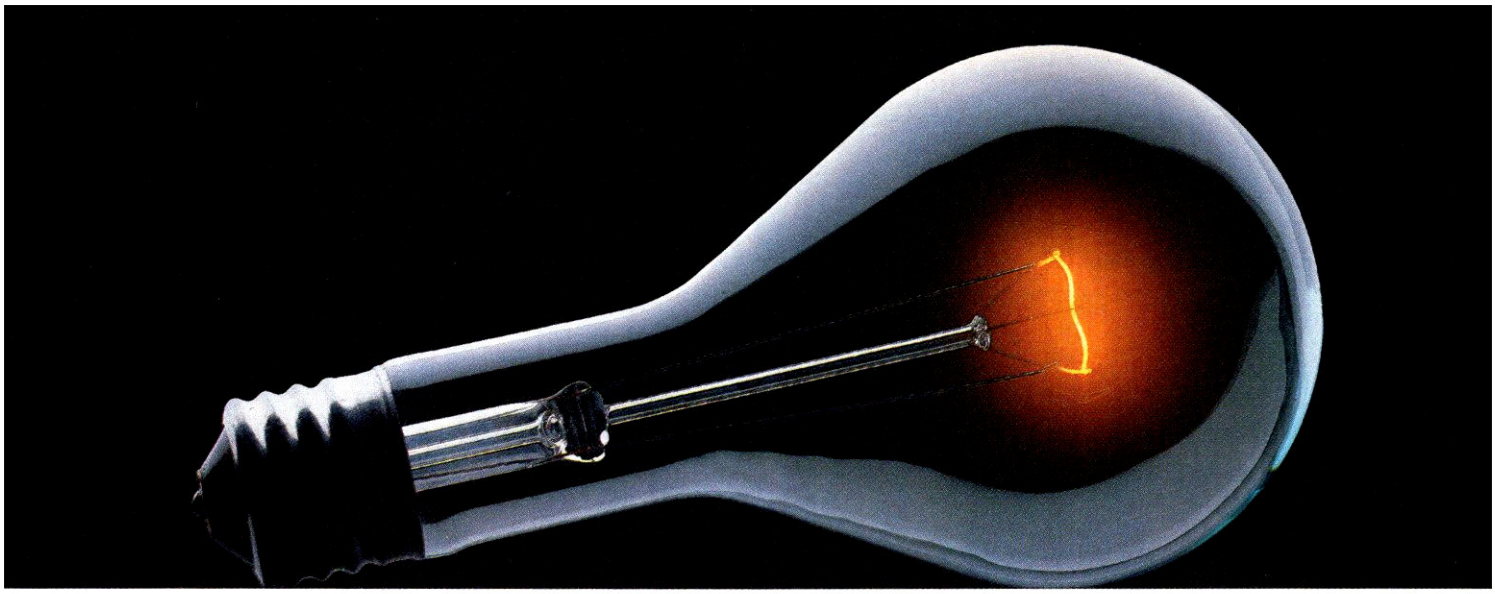

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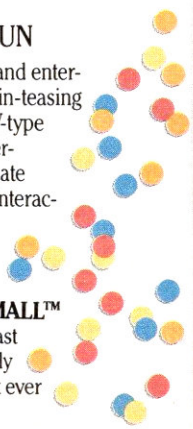

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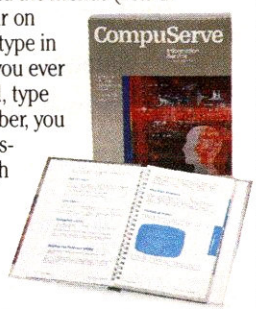

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CIRCLE 271 ON READER SERVICE CARD

TELECOMMUNICATIONS

The new year brings higher speed for better prices, and other improvements.

BY MICHAEL FISCHER

COMMUNICATIONS ADVANCES

This last year has seen a significant increase in the speed of telecommunications, with 2400-bps modems becoming much more commonplace as prices for them fall. Now the first internal 2400-bps modem is available for the Apple II. (By the way, *bps* is an abbreviation for *bits per second* and is a measure of the speed at which a modem sends information over the phone lines. A modem typically sends each character as one start bit, eight data bits, and one stop bit, for a total of ten bits per character. Thus, 2400 bps is 240 characters per second.)

When I first started telecommunicating, the basic speed was 300 bps, and some people still used 110 bps. A few pioneers used 1200 bps, although most of us thought that standard voice-grade telephone lines were too noisy for that speed.

Today you generally find a basic speed of 1200 bps—a few people still use 300 bps. We're witnessing a fairly steady move on the part of many telecommunicators to 2400 bps, and some advanced users are currently using 9600 bps.

All this speed comes at a price, and even though the price of modems has generally dropped recently, most 2400-bps modems tend to cost at least $300.

A new modem company called Epic Technology has recently introduced 2400-bps internal and external modems for the Apple II at prices less than $200. The external modem works with any computer equipped with an RS-232 interface. The internal 2400-bps modem fits into one of the Apple II Plus, IIe, or IIGS slots, the first such internal modem for the Apple II that runs at 2400 bps. (Practical Peripherals recently announced a similar modem, the Practical Modem 2400II, but it is not yet in production.) The price for either of these units is less than the cost of many 1200-bps modems.

If the price is not enough to interest you, Epic claims that its modems are upgradable. If you want the special hardware error-correcting protocol (known as MNP) available on some 2400-bps modems, you simply replace a chip on the modem. If you want data encryption, just change a chip. The company plans other features for the future.

So far, I have only been able to look at a modem and discuss the product with company officials. I have not yet tested one in my system, so I cannot report on how well the modems work. They look promising, however, and will be reviewed in *A+* soon.

On-Line 2400-bps Charges

For a while now, CompuServe Information Systems has provided on-line services at either 1200 or 2400 bps, at the rate of $12.50 per hour plus a network surcharge of $.25 or more per hour, depending on the method of access. GEnie (General Electric Network for Information Exchange), using the slogan "Stay on Line Longer for Less," has service at 1200 bps for only $5 per hour. It imposes certain conditions, though:

- The GEnie rate is available only during nonprime time (6 P.M. to 8 A.M. weekdays and on weekends and holidays), whereas the CompuServe rate is available 24 hours a day, 7 days a week.
- The GEnie rate is for 300 and 1200 bps only; 2400 bps carries a surcharge of $10 per hour, resulting in an effective rate of $15 per hour.

GEnie has lowered its 2400-bps surcharge to $7.50 per hour, however, making the total rate at 2400 bps $12.50 per hour—the same as CompuServe's before addition of

ILLUSTRATION BY RON GEBERT

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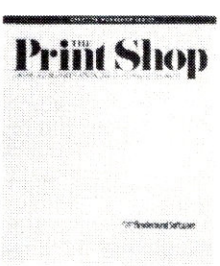

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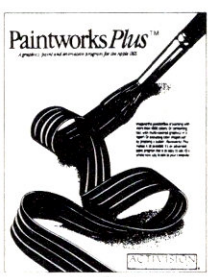

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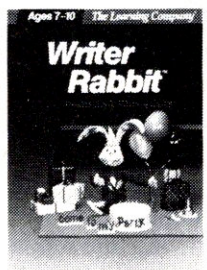

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the CompuServe network surcharge. Now if GEnie could only be available around the clock.

Looking for an Address

In the old days, before microcomputers, I used to communicate by a method still in use known as mail. Note that the word is spelled without an initial *E-*. One way I had to obtain addresses was through telephone-company directory assistance. The phone company did not like that use of its service, but it did dutifully supply the addresses of my out-of-town correspondents who were listed in the telephone directory. Alas, that system is no longer available.

The problem is more significant in electronic mail (E-mail), since you not only need your correspondents' E-mail address but also access to the same service to which they subscribe. Some services have gateways to other services, allowing you to send E-mail to people on services to which you don't belong, but getting their E-mail address is still a problem.

A partial solution is the National E-Mail White Pages, an on-line directory of service subscribers with their name and address, together with a preferred and alternate E-mail address. If you want to register your name and E-mail address, all you have to do is call the toll-free modem number to enter your listing. Before calling, be sure to set your system to seven data bits, even parity, and one stop bit.

When I called the number, I had to try several times—at times the host system was either not functioning or simply did not respond to my system. The software on the host system is basic but does get the job done eventually.

The listing suffers from one major problem. You can list only two E-mail addresses, a preferred and an alternate. I'd like to see a system that allowed you to list all addresses, perhaps in order of preference.

You can also search the listings for an E-mail address for any person, although you must use a different phone number (it's a Connecticut listing and not toll-free, and there is a charge for each successful search). Search charges are either 20 cents per search or $95 per year for unlimited use. You must make a minimum purchase of $10 for 50 searches.

AESP has several charts that tell you exactly what cable to get for your equipment.

The Cable Solution

I have finally found a solution to a problem that plagues many new owners of external modems: how to connect the modem to the computer. Many different types of cables are available, some of which claim to function with various combinations of computers and modems. You can't always find the correct cable at your local computer store, however, and ordering one through the mail can be risky unless the dealer knows cables very well.

A company called AESP (Advanced Electronic Support Products, Inc.) specializes in cables and Apple computers. It has several charts that tell you exactly what cable to get for which combination of modem and Apple computer. It will either sell you the cable by mail order or tell you the name of one of its dealers in your area. ✚

FURTHER INFORMATION

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LEARNING CURVE

A simple public-domain program that gets your ideas flowing

BY DAVID D. THORNBURG

CREATIVITY AND COMPUTERS

Many people—adults as well as children—sometimes experience creative blocks. I've seen sixth-graders at the top of their class who become completely blocked when they have to confront a creative challenge.

For many people, the normal response to a creative block is to become anxious and frustrated, which often has the effect of making the block deeper and stronger. Fortunately, techniques have been developed that help melt these barriers to creative thought, techniques that can open us to ideas we've had all along without knowing it.

Last month I discussed computers as tools to promote the development of intuitive skills and promised to publish a simple program this month that would further such skills. Accordingly, I'm presenting a public-domain Apple II program in this issue to help keep you in touch with your creativity. Before going into this program, I need to describe some general strategies for unlocking your creative blocks.

Relax!

Although some people do their best work under pressure, many find that the pressure of an unsolved problem just makes its solution more difficult. Activities that remove this pressure can sometimes help. If you've ever had a brilliant idea while relaxing in the shower, you know how powerful a change of focus can be.

Premature judgment is a major creativity blocker. The mind does only one thing at a time. If we try to create and judge our ideas simultaneously, we end up inhibiting their flow. I don't mean to say that judgment isn't useful—it is. Judgment is an essential part of all problem solving, but when we bring it to bear too early, we miss the opportunity to let loose the diverse collection of ideas waiting for expression.

Much of our judgment takes place unconsciously. To see how it can interfere with ideas, try the following experiment. Write down 20 uses for a brick. If you're like most people, you probably wrote down a few obvious choices and then got stuck trying to think of others. Your mind was probably bubbling over with possible answers (paperweight, door knocker, fly killer, and so on), but if you were judging and rejecting your ideas, you ended up sitting there with your pen in your hand and nothing in your mind.

Research by Gabriele Rico, Tony Buzan, and others has shown that anyone can be helped to gain access—with practice—to the vast reservoir of thoughts and ideas that normally lie undetected. The techniques these researchers have developed have many names: webbing, mind mapping, clustering, and the like, but they share one common element. Each technique gives all new ideas equal validity, whether or not they are relevant to the problem. You suspend all judgment until after you've captured all the ideas. Only at this point do you look at your list of thoughts and pursue those that make sense to you.

The ability to capture thoughts without judgment comes with practice. When I'm working with a group of students, I have each student draw an oval with ten radial lines around it, like rays from the sun. Next I give the students a target word to write inside the oval. As soon as they've written this word, the students write the next ten words that come to mind as fast as they can, one per line. Relevancy is irrelevant; the only goal is speed.

If you try this exercise with a tar-

ILLUSTRATION BY ADRIAN DAY

```
10  REM MIND MAPPER
20  REM PUBLIC DOMAIN PROGRAM BY DAVID THORNBURG
30  REM SEND COMMENTS AND MODIFICATIONS TO HIM AT
40  REM INNOVISION, BOX 1317, LOS ALTOS, CA 94023
99 :
100  DIM W$(10),S(10)
110  GOSUB 1000: REM  INSTRUCTIONS
120  GOSUB 2000: REM  CAPTURE WORDS
130  GOSUB 3000: REM  SCORING
140  GOTO 120
150  END
999 :
1000  REM  INSTRUCTIONS
1010  HOME
1020  PRINT "Welcome to the Mind Mapper"
1030  PRINT : PRINT "This program helps you develop your"
1040  PRINT "ability to gain access to your sub-"
1050  PRINT "conscious mind."
1060  PRINT : PRINT : GOSUB 5000
1070  HOME : PRINT "You will be presented with a stimulus"
1080  PRINT "word on the screen.  As soon as you"
1090  PRINT "see this word you should type the next"
1100  PRINT "ten words that come to your mind as"
1110  PRINT "fast they come to you.  Don't 'think'"
1120  PRINT "about the words you are using and don't"
1130  PRINT "worry about spelling or relevance to"
1140  PRINT "the target word.  Speed is all that"
1150  PRINT "matters.  Once you have entered ten"
1160  PRINT "words you will be shown a measure of"
1170  PRINT "the time you took prior to starting"
1180  PRINT "to type the word shown.  Your goal is"
1190  PRINT "to make this time as short as possible."
1200  PRINT : PRINT
1210  PRINT "PRESS RETURN AFTER EACH WORD YOU TYPE!": PRINT : PRINT
1220  GOSUB 5000
1230  RETURN
1999 :
2000  REM  CAPTURE WORDS
2010  HOME
2020  READ C$
2030  IF C$ = "ZZZ" THEN  PRINT "YOU ARE DONE FOR NOW!": END
2040  PRINT "As soon as you see a word appear on the"
2050  PRINT "screen, start typing the words that"
2060  PRINT "come to your mind as fast as you can."
2070  PRINT : PRINT "Press RETURN after each word."
2080  PRINT : PRINT "Press any key to start.": PRINT
2090  GET A$
2100  PRINT C$: PRINT : PRINT
2110  FOR I = 1 TO 10
2120 A = 0
2130  PRINT "Word ";I;" ";
2140  IF  PEEK ( - 16384) < 128 THEN A = A + 1: GOTO 2140
2150  GET A$: IF A$ = "" THEN  GOTO 2140
2160  PRINT A$;
2170  GET B$: IF B$ =  CHR$ (13) THEN  GOTO 2200
2180  PRINT B$;:A$ = A$ + B$
2190  GOTO 2170
2200 W$(I) = A$:S(I) = A
2210  PRINT
2220  NEXT I
2230  PRINT : PRINT
2240  GOSUB 5000
2250  RETURN
2999 :
3000  REM SCORING
3010  HOME
3020  PRINT "New let's see how you've done!"
3030  PRINT : PRINT "The number of brackets after each word"
3040  PRINT "are an indicator of the time you took"
3050  PRINT "before starting to type the word."
3060  PRINT : PRINT "Your goal is to make this time as short"
3070  PRINT "as possible."
3080  PRINT : PRINT : GOSUB 5000
3090  HOME : PRINT : PRINT "Your target word was: ";C$
3100  PRINT : PRINT "Here are your words and scores:": PRINT
3110 T = 0
3120  FOR I = 1 TO 10
3130  PRINT W$(I),
3140 T = T + S(I)
3150  IF S(I) > 529 THEN S(I) = 529
3160  FOR J = 1 TO  SQR (S(I))
3170  PRINT "]";
3180  NEXT J
3190  PRINT
3200  NEXT I
3210  PRINT : PRINT "Your total score was: ";T
3220  PRINT "Try to get this number as low as"
3230  PRINT "possible!": PRINT
3240  GOSUB 5000
3250  RETURN
3999 :
4000  REM  TARGET WORD LIST
4010  DATA  ROPE,TREE,ROOM,DOOR,SKY,FOG
4020  DATA  CHAIR,DESK,BOOK,SONG,LEAF,LAMP
4030  DATA  BOX,RUG,WAVE,LIGHT,FOOD,PLUG
4090  DATA  ZZZ
4999 :
5000  INVERSE : PRINT "PRESS ANY KEY TO CONTINUE": NORMAL
5010  GET A$
5020  RETURN
```

Figure 1: The Mapper program consists of three major subroutines controlled by a main program.

get word such as FOOD, you may find yourself with a list containing some food-related words, along with some other words that don't mean much to you. You may also find yourself stuck during this process. If you do, just write any word—no matter what it is—and keep going.

By doing this exercise frequently, you will find it easier and easier to come up with a rich set of ideas whenever you have a challenging problem to solve, and—best of all—you will find new ideas easier to come by when you are solving a "real" problem.

The paper-and-pencil mapping exercise works well when others can monitor your performance, but it is hard to monitor your own performance while you are doing it. That's why I've written Mapper.

```
ROOM
DOOR
529
WALL
31
SCREEN
88
WINDOW
47
SHADE
65
MASTER
152
BEDROOM
63
LIVING ROOM
49
TOOL SHED
26
WORKSPACE
363
```

Figure 2: Printout of a typical Mapper session

```
5020  IF  ASC (A$) = 12 THEN  GOSUB 7000
5030  IF  ASC (A$) = 19 THEN  GOSUB 6000
5040  RETURN
5999 :
6000  REM SAVE WORK
6010  PRINT  CHR$ (4);"OPEN ";C$
6020  PRINT  CHR$ (4);"WRITE ";C$
6030  PRINT C$
6040  FOR I = 1 TO 10
6050  PRINT W$(I)
6060  PRINT S(I)
6070  NEXT I
6080  PRINT  CHR$ (4);"CLOSE ";C$
6090  RETURN
6999 :
7000  REM LOAD WORK
7010  INPUT "WHAT FILE DO YOU WANT TO SEE? ";C$
7020  PRINT  CHR$ (4);"OPEN ";C$
7030  PRINT  CHR$ (4);"READ  ";C$
7040  INPUT C$
7050  FOR I = 1 TO 10
7060  INPUT W$(I)
7070  INPUT S(I)
7080  NEXT I
7090  PRINT  CHR$ (4);"CLOSE ";C$
7100  GOSUB 3090
7110  RETURN
7999 :
```

Figure 3: Extensions to the Mapper program

Mapper

Mapper is a program that presents you with a target stimulus word, lets you type the next ten words that come to mind, and charts the time delays before you start to type each word. The chart lets you see when you were blocked. The program also gives you a total score and challenges you to get your score as low as possible, since a low score indicates that you are learning to suspend your judgment.

Because the program measures the time between pressing Return and typing the first letter of the next word, a slow typing speed does not adversely affect your score.

A Quick Tour of the Listing

Mapper (figure 1) consists of three major subroutines controlled

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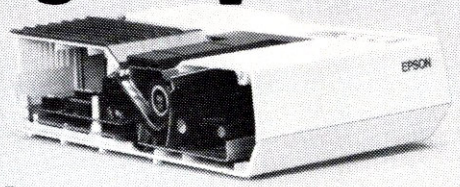

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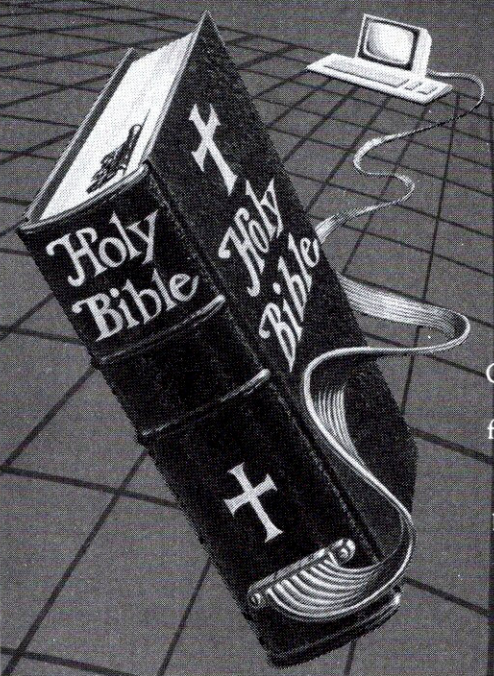

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The ability to capture thoughts without judgment comes with practice.

by a main program. The program runs in any Applesoft BASIC environment, so it should work on Apple II computers of any vintage.

The program measures the delay time before the typing of the first character in line 2140 by counting loop cycles until a key press. If you are using an Apple IIGS, you may want to set your processor speed to "normal" to slow this process down a bit.

The subroutine starting at line 3000 plots your performance with a bar graph. Each bar's length is related to the square root of the delay time (line 3160), to provide more sensitivity for fast responses than for slow ones.

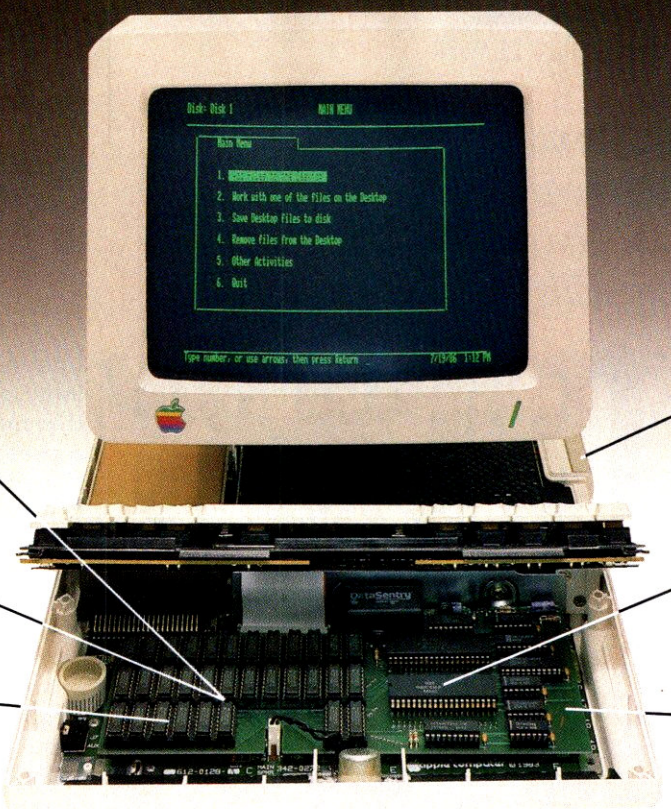
Figure 2 shows a printout of a typical Mapper session. As you can see, the user got stuck in two places. As you practice, you will find your score dropping steadily, and the number of "block" points will decrease.

You can use Mapper as a warmup for a creative-writing project or before working on a complex problem requiring imagination.

Each time I publish a program in *A+*, I get lots of responses from readers who have great modifications and enhancements. I welcome any contributions—please send them to me in care of this magazine.

I've already made a rudimentary modification that saves and loads the data for the score of each trial word (see figure 3). To use this modification, simply type Control-S to save or Control-L to load your data. (Use the Save option only after the results have been displayed!) Files are saved under the name of the target word; you can load them any time you see the PRESS ANY KEY TO CONTINUE message. +

David Thornburg is actively involved in the development of creative uses for computers. For a free copy of Mapper, send a formatted 5¼-inch ProDOS diskette and self-addressed stamped mailer to him in care of this magazine.



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BY JENNIFER BRAWER

Three alternatives to the keyboard for special-education and basic-skills students

A+ TEACHERS' TOOLBOX

Curricula designed for children in preschool and kindergarten classrooms have a lot in common with their counterparts in special education; both have a similar commitment to the enhancement of a broad range of developmental skills and provide opportunities to experience the world from a variety of perspectives. Fortunately, basic-skills curricula in early and special education generally present information in ways that allow children to experience it through multiple sensory pathways.

Several years ago when computers began trickling into such classrooms, I worried about how the machines would fit into the curriculum and be compatible with the educational philosophy. Yes, computers could present information to a variety of sensory channels, but the abstract association necessary to use a standard keyboard was difficult for many children. Before the days of the arrow keys, children had to use bizarre combinations of keystrokes to move a cursor. Not only was it difficult for them to understand that pushing the letter *N* made a cursor go sideways, for example, but sometimes they did not have the necessary hand/eye coordination to press a single key. The outcome was usually a crashed program.

Today some good alternatives to the standard keyboard are available for young and special-education children. They make the computing experience more compatible with a basic-skills curriculum because they allow children to explore software in a manner appropriate for their developmental level—computing becomes more intuitive and less dependent on mature hand/eye coordination and fine motor skills.

In this column, I review three alternatives to the standard keyboard: Muppet Learning Keys, Touch Window, and WonderWorker. Each input device has a unique interface structure and a large body of compatible software that makes it easy to integrate into a preschool, kindergarten, or special-education curriculum.

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Muppet Learning Keys

The Muppet Learning Keys are the result of a collaboration between Sunburst Communication and Henson Associates, the creators of the Muppets. The keyboard is a colorful tablet for the desktop or lap that plugs into the game port. It has a blackboard with the uppercase and lowercase letters (arranged alphabetically), a paint box for colors, a ruler with the numbers 0–9, mathematical signs, an eraser, a zap button, and special function keys coded with pictures of some familiar Muppets. My personal favorite is Miss Piggy, tied to train tracks, screaming for HELP!

The Muppet Learning Keys come with Muppets on Stage, an award-winning software program that uses a clever set of graphics and music to present elementary lessons in number, letter, and color recognition. Muppets on Stage is also the first in a series of Sunburst programs that make up a complete kindergarten curriculum. The other titles are Muppet Word Book and Muppetville. The breadth of the three programs is evident in a chart, included with the manuals, that details the correlations with standard kindergarten curriculum objectives. In addition to the three kindergarten programs, nine other Sunburst programs work with the Muppet Learning Keys. The programs, which cover multiple topics and an age range from preschool to adult, are listed in the Sunburst catalog.

Touch Window

The Touch Window from Personal Touch Corporation is a combination touch screen, graphics tablet, and interactive book pad. Like the Muppet Learning Keys, it plugs directly into the game port. It

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Back to Basics Accounting System is designed to take full advantage of the capabilities of your Apple II computer, with customized versions for the Apple II+, IIe, IIc, IIgs and Macintosh.

Peachtree's support, labeled by *InfoWorld* as "the finest in the industry", is available as you need it, at a nominal charge directly from Peachtree or through our network of local authorized support centers.

Money Back Guarantee

When you purchase Back to Basics directly from Peachtree Software you're protected with a 30-day, money back guarantee (an option even the most expensive accounting products don't offer).

If you're not satisfied, simply return the complete product in saleable condition within 30 days and your purchase price will be promptly refunded. For full details, call the toll free telephone number below.

Now Available for the Apple IIgs

A new version of Back to Basics Accounting is now available for the Apple IIgs, designed specifically for use with the PRO-DOS operating system and 3½" disk drives or a hard disk.

Hardware Specifications

- IBM Personal Computer, PC/XT, PC/AT with two floppy disk drives or one floppy disk drive and a hard disk.
- Apple II+, IIe, IIc, IIgs with 128K and two disk drives or hard disk.
- Apple Macintosh 512K or Plus with two disk drives or hard disk.

Features That Made Back to Basics A Best Seller

GENERAL LEDGER
- On-line help displays Chart of Accounts.
- MTD and YTD show on income statements.
- Allows automatic Journal entries.
- Check processing and printing capability through Cash Disbursements
- Optional cost of sales ranges.
- User modifiable Chart of Accounts included.
- Allows up to 3 checking accounts.
- Up to 10 departments with separate income statements.

ACCOUNTS RECEIVABLE
- Calculates receivables on balance forward basis.
- Prints statements and mailing labels.
- Allows automatic posting to General Ledger.
- Accepts partial payments.
- Calculates finance charges.
- Up-to-date customer information can be scrolled for review at any time.
- Customer ID's can be alpha or numeric.
- Verifies customer credit limit.
- Calculates up to 3 sales taxes per entry.

ACCOUNTS PAYABLE
- Up to 10 vendor payment terms.
- Calculates cash discounts.
- Accepts partial payments.
- Automatic posting to General Ledger.
- Prints vendor mailing labels.
- Up-to-date vendor information can be scrolled for review at any time.
- Customer ID's can be alpha or numeric.
- Prints computer checks or processes hand-written checks.
- Invoices automatically or manually selected for payment.

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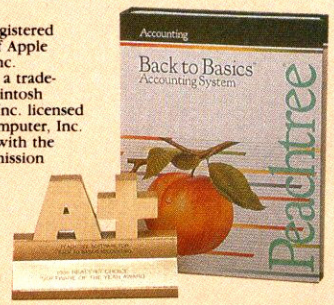

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CIRCLE 318 ON READER SERVICE CARD

is a highly transparent pressure-sensitive touch screen that fits over the monitor and allows you to use many software applications with a touch of a finger or plastic stylus instead of keystrokes. A unique feature of the Touch Window that makes it particularly appropriate for special-education settings is the confinement of the learning experience to a single vertical plane. Since the screen is mounted over the monitor, children do not need to deal with the horizontal plane of a standard keyboard or touch-sensitive tablet.

The Touch Window comes with Master Touch I, a software disk containing sample programs that demonstrate its versatility for productivity, education, and entertainment. The first side of the Master Touch I disk contains six programs: a word-processing program, a picture/graphics editor, a simple spreadsheet application, a puzzle called Bishop's Square, checkers, and a window test for checking and recalibrating the Touch Window. The second side of the disk works with an interactive book published by Personal Touch Corporation. The Touch Window is not attached to a computer monitor for this application. Rather, the book fits neatly on top of the Touch Window itself, for use on a flat surface. The interactive book has entertaining tasks for young children and adults.

The Touch Window works with software from a variety of developers, including the Sunburst kindergarten curriculum. Examples of programs that run with the Touch Window are The Newsroom (Springboard); Music Construction Set (Electronic Arts); Blazing Paddles (Baudville); The Print Shop, Fantavision, and Dazzle Draw (Brøderbund); and VideoLessonWriter (an authoring language used to create interactive videodisc programs. See the cover story "Videodisc Primer" in this issue).

Many early-learning/special-education/ESL (English as a Second Language) software packages work with the Touch Window. These programs focus on the development of letter/number/pattern/shape/color recognition, sequencing, discrimination, identification, association, and vocabulary skills. Most work with the Street Electronics Echo speech synthesizer.

Personal Touch Corporation distributes three software programs designed specifically for the special-education setting and the Touch Window: Touch 'n See, Touch 'n Match, and Timekeeper. A complete list of software titles that work with the Touch Window is available from Personal Touch Corporation.

VITAL STATISTICS

TOUCH WINDOW

The Touch Window is a combination touch screen, graphics tablet, and interactive book pad for very young learners and special-education students.

CPU: *Apple II Plus, IIe, IIc, or IIgs*
RAM: *64K*
DISK DRIVE: *one 5¼-inch*
OTHER: *color monitor recommended*
LIST PRICE: *$199.95*

Personal Touch Corporation
4320-290 Stevens Creek Blvd.
San Jose, CA 95129
(408) 246-8822

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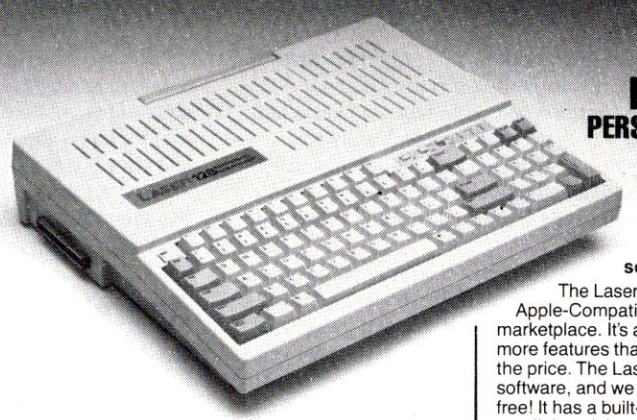

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After 7 years of gripes, complaints and suggestions from more than 50,000 DB Master® users ...

... you bet I know what you want in a data base manager!

Sure DB Master was great back in 1980 when we first introduced it. After all, it was the first serious data base management program for the Apple //. In fact, two years later, Softalk magazine reported that "many Apple dealers are selling a copy of DB Master with every computer they sell." And yes, we fixed it and added to it and improved it over the years, as we watched all of the serious software development move to other computers.

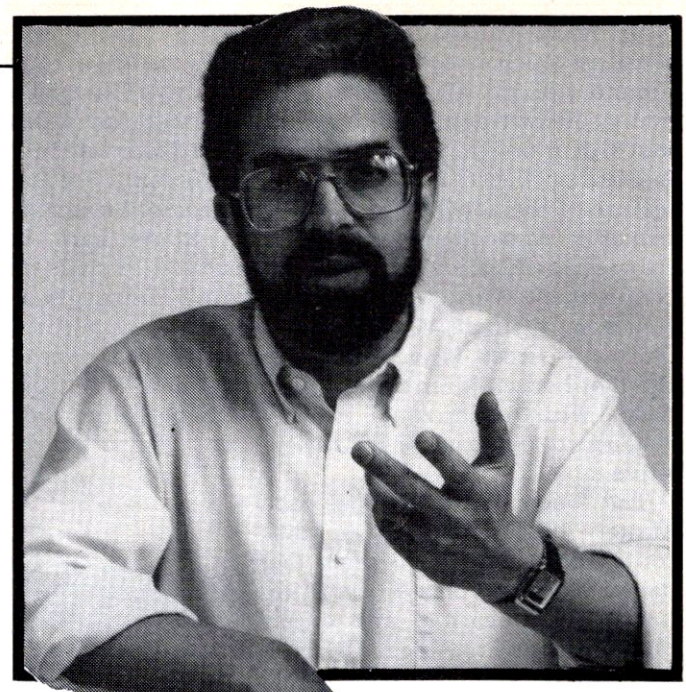
But when the time came to improve the program one more time, we decided it just wasn't worth it. If we were going to the trouble, then the only thing to do was throw it away, and start over. After all, we've learned a lot in the last seven years, and the Apple // has improved a lot, too. This time we'd really do it right.

So we set out to write the ultimate data base manager for the Apple //!

It had to be powerful, with features and capabilities exceeding any other program you could find.

And it had to be easy to use. But not just easy—it had to be *convenient* to use. Fast. Efficient. Forgiving. And compatible.

In a word, it had to be **elegant.**



Barney Stone **Designer, DB Master**

So we took everything we'd learned about database management and report generators, about what you like and don't like in computer programs, about making software easy to learn and convenient to use and as flexible as possible...

And we wrote **DB Master Version Five—The Data Base Manager You've Always Wanted for Your Apple // !**

You're going to love it!

Specifications

Hardware Requirements:
Apple //e (Enhanced, with extended 80 column card), //gs, //c or Laser 128. At least two 5 1/4" floppy disk drives, or any combination of 5 1/4" and 3 1/2" floppies, ProDOS compatible hard disk, or RAM disk. **NOT COPY PROTECTED.**

Capacities:
- 2000 bytes/record
- 200 fields/record
- 30 screen pages/record
- 250 characters in alphanumeric fields
- Hard disk files—up to 40 Megabytes
- Floppy disk files—up to 50 disks

Field Types:
- Alphanumeric, 1 to 250 characters
- Numeric—3 types
- Dollar/cents, to $99,999,999,999,999.99
- Yes/No—only accepts "Y" or "N"
- Date—11 formats available
- Add Date—date when record was added
- Edit Date—last date when record edited
- Add Time—time when record was added
- Edit Time—time when record last edited
- User Defined—for phone & social security numbers, part #'s, etc., 2-20 characters, control over type of characters allowed in each position
- Label Only—no input area—useful for customizing screens

Computed Fields:
Floating point numeric, dollar & date fields can be computed fields.
Examples: (the F stands for Field)
F10 = F7+F8+F9+.06*F12
F28 = F10*(F50>=F10)+F50*(F50<F10)
F5 = (F10>100 AND F20< 1000) OR (F27 > F26)

Report Generator:
- report width: 20 - 255 characters
- up to 255 lines/record on up to 3 pages
- up to 255 fields per report
- print labels up to 5 across
- header and footer lines: separate lines of text (including normal and computed fields) at beginning/end of report, page, group of records, and/or column
- column subtotals and totals, page #s, record #s, & date or time report is printed can be printed anywhere on the page or in header and/or footer lines
- set justification, printstyles, case conversion, number formatting, statistics, date formats, etc. on field-by-field basis
- statistics: count, total, average, min., max. & standard deviation
- complex computed field formulas, including calculations based on column totals and subtotals
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- print to printer, disk (text file), or screen

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CIRCLE 267 ON READER SERVICE CARD

WonderWorker

The WonderWorker is only part of a comprehensive computer-based basic-skills package from DIL in Canada. DIL is a company that concentrates exclusively on the development of computers as primary-level educational tools. Its products are language-independent and appropriate for preschool, kindergarten, and special-education students.

The WonderWorker itself is a plain touch-sensitive tablet (also known as the PowerPad) that runs in conjunction with the Mademoiselle Merveille Series of educational software. A special connector cable (available from DIL) is necessary to attach the WonderWorker to the game I/O connector. The software is available singly or in various Basic Skills Packages. Each package comes with multiple disks, graphic overlays for the WonderWorker, and a comprehensive teachers' guide that explains the purpose and function of the programs. The teacher's guides that come with the two packages I have are the most comprehensive I have ever seen.

As for the content of the DIL software curriculum, the individual disks cover reading and math readiness, problem solving, social concepts, and music. A few of the specific skills the series addresses are attention to task, fine visual and auditory discrimination, classification and direction, spatial relationships, sequencing, inferences, analogies, sharing, and singing.

The software disks contain only one program each and are two-sided. One side works with the WonderWorker, the other with the standard keyboard, as is also the case with the graphic overlays. The graphic overlays and disks are picture-coded, so children can select programs and overlays.

The graphic overlays make the WonderWorker an easy-to-use input medium. Colored circles along the overlay border are the primary function keys; in the center are colorful graphics that coincide with the matching software program. The more advanced overlays have a picture of an open door. Pushing the open door lets you use an add-on graphics program called Extra-Tele-Tacto-Graph (E.T. for short). E.T. lets children use a finger to draw pictures. The program lets you choose brush size and color, edit, add text, and print. Special E.T. overlays have icons that make the program features easy to understand and use. ✚

VITAL STATISTICS

WONDERWORKER

Part of a comprehensive computer-based basic-skills curriculum, WonderWorker is a touch-sensitive input tablet that works in conjunction with an educational-software series.

CPU: *Apple II Plus, IIe, IIc, or IIGs*
RAM: *64K*
DISK DRIVES: *one 5¼-inch*
OTHER: *color monitor recommended; printer recommended for Extra-Tele-Tacto-Graph.*
LIST PRICE: *WonderWorker, $99.95; connector cable and adapter for the Apple, $9.95; Madame Merveille Series software disks, $39.95 each (DIL offers Basic Skills packages containing multiple disks and overlays with substantial discounts)*

DIL
2025 Rue Lavoisier, Suite 180
Sainte-Foy, Quebec
Canada G1N 4L6
(800) 463-5581 or (418) 687-9788

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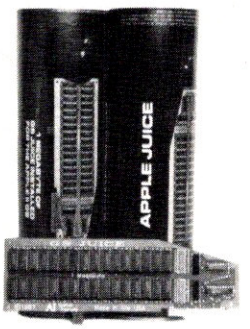

GS JUICE: $189 For the Apple IIGS. One Mega-byte of extended memory(all memory chips installed). 100% Apple compatible, no software required, Automatically recognized by Pro-Dos, can be used as a Ram Disk. Works with Checkmate Technology's Memory Saver.

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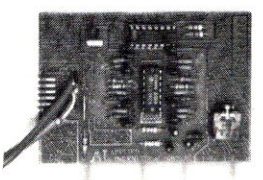

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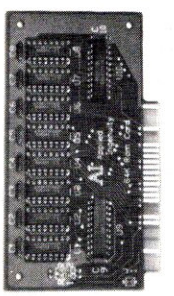
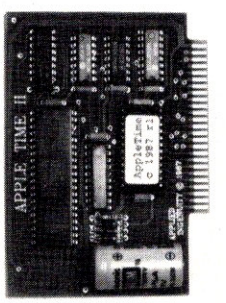
64K 80 COLUMN IIe





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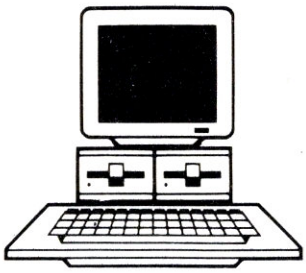

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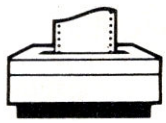

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ENTERTAINMENT

GAMEPORT

BY BOB LINDSTROM

1988 predictions, credit where credit is due, naval combat revisted, and Bard beaters' bugs

I PREDICT

"Everyone is interested in the future, because that is where you and I are going to spend the rest of our lives."

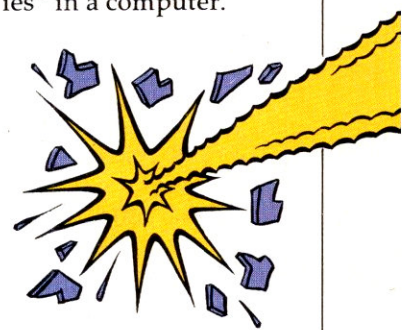
Those immortal words of The Great Criswell (star of everyone's favorite bad movie, *Plan Nine From Outer Space*) are appropriate this month, as "GamePort" gazes into its crystal byte to speculate on the hot trends in computer gaming for 1988:

•Despite the lone-wolf personality streak that inspires computer game players to spend long, solitary hours gaping at a video screen, two-player telegames are likely to be an important trend in 1988. Playing against another human by connecting two computers via a telephone modem can satisfy gamers' need to be alone, while allowing them the challenge of a living opponent.

Micro-Illusions already has planned a trio of arcade-style games with telegaming options in its One-to-One series for the Apple IIGS. You can play all these games—from tank combat to spaceship jockeying—over telephone lines. And for Electronic Arts, superstar game designer Dan "Seven Cities of Gold" Bunten's newest creation will make extensive use of telegame techniques.

•Hybrid designs that combine role-playing, strategic, and arcade elements will enhance the richness of computer games in 1988. Legacy of the Ancients (Electronic Arts) for the Apple II line incorporated elementary arcade sequences within a fantasy/role-playing context. Even Infocom's Beyond Zork allowed aspects of role-playing to invade the verbal world of the text adventure. Upcoming titles, including Cinemaware's Defender of the Crown for the IIGS, will go further to put high-quality arcade action into a strategic framework.

•Designers and publishers will realize that computer games aren't just for computer game players. In short, they will release entertainment products with broader appeal. Automatic mapping and on-line hints now are helping to bring new players into the computer-game arena. Role-playing games with less combat and more plot will reach toward a goal of producing audience-participation "movies" in a computer.



•The year 1988 will see a resurgence of arcade-action games, brought on by the superior audiovisual potential of the IIGS. Game fans will recover a zest for shoot 'em ups and realize that a well-placed laser blast can be as satisfying as a month in a dungeon.

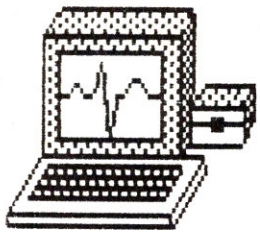
And now, let's adjourn to the joystick for a year and return in 1989 to tally the prediction success rate of "GamePort."

ASK PROFESSOR GAMEPORT

"Gee, Professor GamePort, where do computer games come from?"

"Ho, ho, I'm glad you asked that, Tommy. You know, people have all kinds of theories about the origins of computer

ILLUSTRATIONS BY ROBERT KOPECKY



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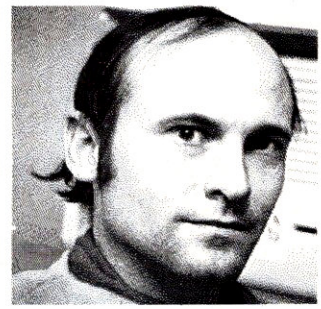
GAMEPORT



CHRIS CRAWFORD

games. The folks who believe all jokes start in prison believe that games are created in the next cell. Others have concluded that games are just picked up off the floor in the office hallways of San Mateo, Mountain View, Cambridge, and San Rafael. And those few who think milk comes from cardboard cartons are convinced that games begin in software stores.

"But do you want to know the truth, Tommy? Computer games come from people, and the best of them come from very talented people."

"Naaahh, pull the other one, Professor GamePort; I don't believe it."

And neither do many other game buyers. The anonymity of game designers is examined by Balance of Power creator Chris Crawford in an article for *The Journal of Computer Game Design*, an industry newsletter that Crawford began publishing in June 1987.

Crawford suggests that game publishers promote their corporate image at the expense of the actual creators of games. To make his point, he browsed through the front-cover packaging of four types of entertainment products and compared the ratio of the artist's name to the publisher's name.

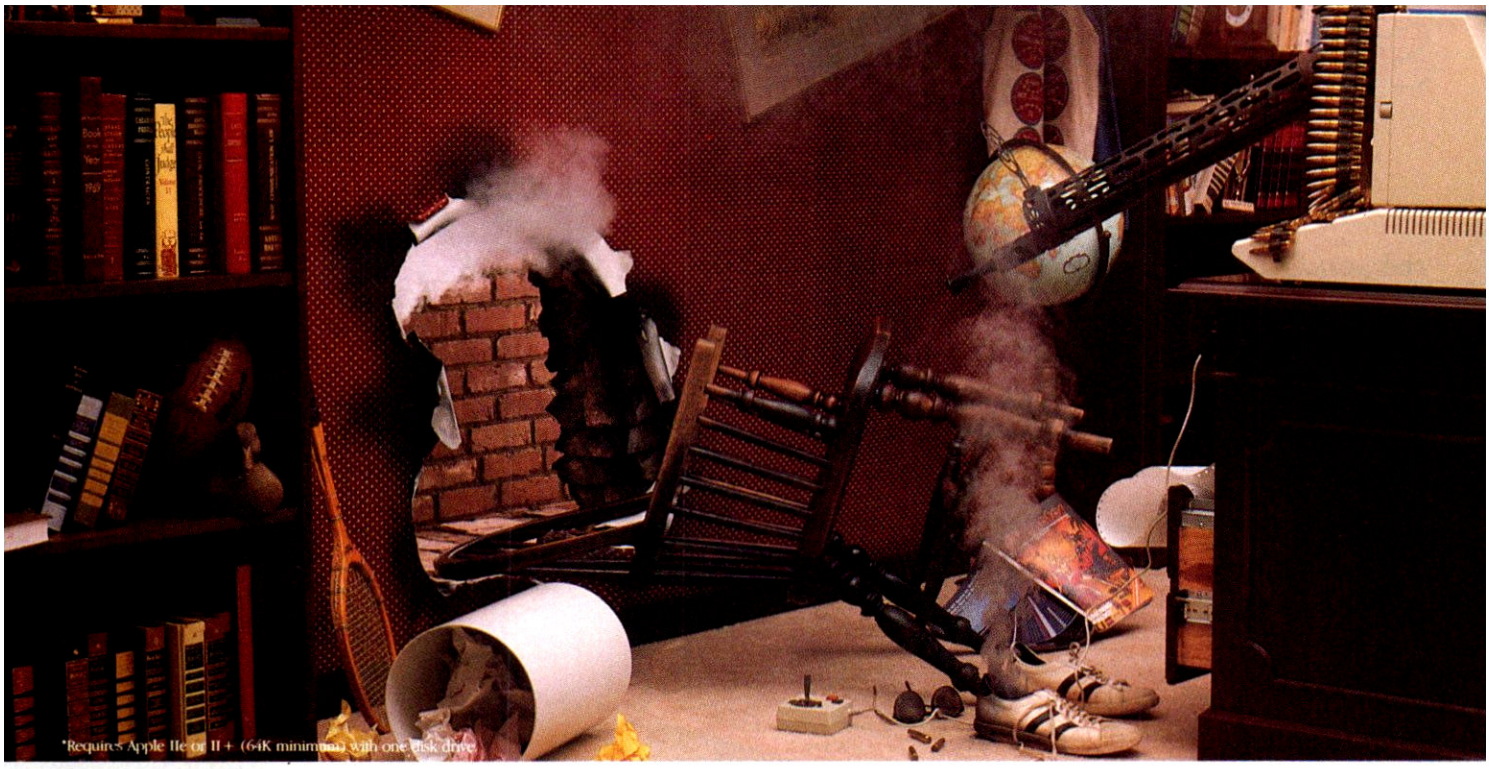
Books provided the most recognition for the author, followed by compact discs, with videotapes lagging behind.

Computer games brought up the rear, however. In most cases, the computer-game publisher's name was larger than the designer's—or the designer's name was not present at all on the front of the package.

"We authors of computer games do not get as much recognition as our compatriots in other entertainment fields," Crawford writes.

The *Journal of Computer Game Design* contains many other fascinating points of view expressed by some of the best game professionals in the business. In the October/November 1987 issue, for instance, Brøderbund producer Don Daglow discusses the elements he looks for in a game design, Silicon Beach Software's Frank Boosman comments on the importance of meaningful icon design, and David "Dr. Cat" Shapiro of Origin Systems provides an essay on fantasy games.

States Crawford, "I'm interested in reaching two main groups with this publication: game-design professionals and those who might want to become professional game designers." If you fit into one of those two groups or just have a seri-



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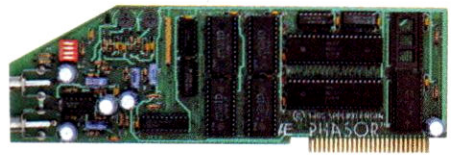

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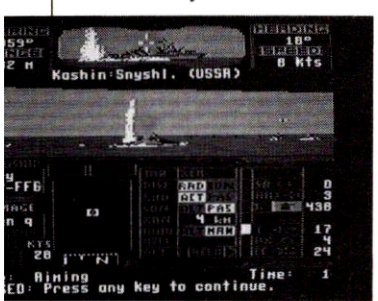
ON THE WINGS OF PEGASUS

More than a year ago, "GamePort" visited the fantasyland that film mogul George Lucas has built at Skywalker Ranch



in California. The occasion was the release of P.H.M. Pegasus, a military-hydrofoil simulation created by the artists of Lucasfilm Games.

Now designer Noah Falstein and his Lucasfilm Games colleagues still can't get enough of surface naval combat. They return to the missile-infested waves with Strike Fleet, another naval-combat simulation for the Apple IIe/c/GS published by Electronic Arts.

Players will have to get into a split-brain, multitasking mode to excel in this new effort based on an enhancement of the P.H.M. Pegasus game system. Instead of commanding a single hydrofoil, keyboard commandos call the shots for an entire fleet of warring vessels, including destroyers, frigates, hydrofoils, and helicopters.

During a battle, omnipotent admirals can move from vessel to vessel and take over the bridge of their choice. Although some defensive systems are under automatic control, the player has all the responsibility for offensive weaponry.

If ship-hopping isn't power enough, the program provides a war map with three levels of magnification to provide an (Admiral) Byrd's-eye view of the conflict and provide overall perspective as the battle rages on into the night and through varying weather conditions.

The combat scenarios sound suspiciously like front-page headlines. Encounters take place in the Falklands Islands and the Persian Gulf. One multipart scenario requires that you manage your resources and weaponry through four different confrontations.

BARD BEATERS BEWARE!

It's not nice to cheat the Bard—satisfying perhaps, but not nice. And a few "GamePort" readers who used the Bard's Tale character editor offered by Milind Limaye found it could be downright maddening.

It seems there are some bugs in the editor, several of the little devils, that will render your edited characters extinct. When you try to add the edited character to a party, the program can't find it.

The bug is not all-encompassing, however. If you want to increase your gold or experience level or spell points, The Bard's Editor really, really works. But diddle with experience or attributes, and your character is sentenced to The Phantom Zone. It only reinforces the old saying "There's no such thing as a free hit point."

Here's some solace for those who've lost characters: Limaye reports that he is unable to allow himself time to fix the bugs because he is enrolled in his freshman year at Notre Dame University, "and the work is rough." The next time you try to add a character and painfully discover that The Bard's Tale won't recognize it, think of Milind sitting behind a late-night word processor, sweating over a last-minute term paper.

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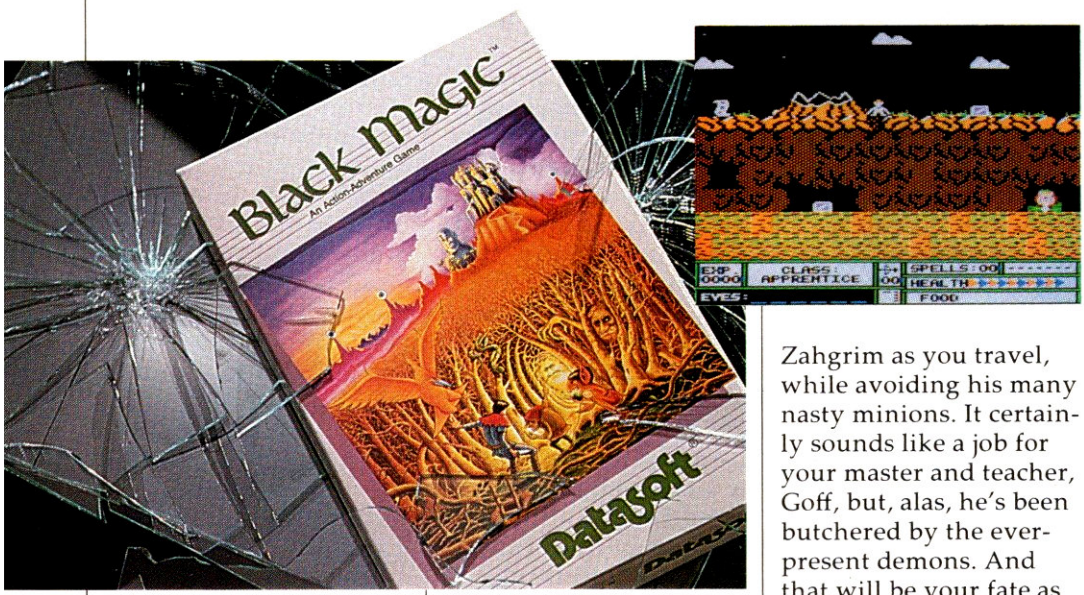


Travel back in time or to a fantasy world: Sherlock Holmes' England, World War II Normandy, or the evil realm of Anakar.

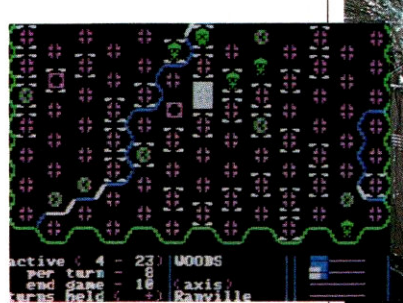
UNFRIENDLY TO WIZARDS

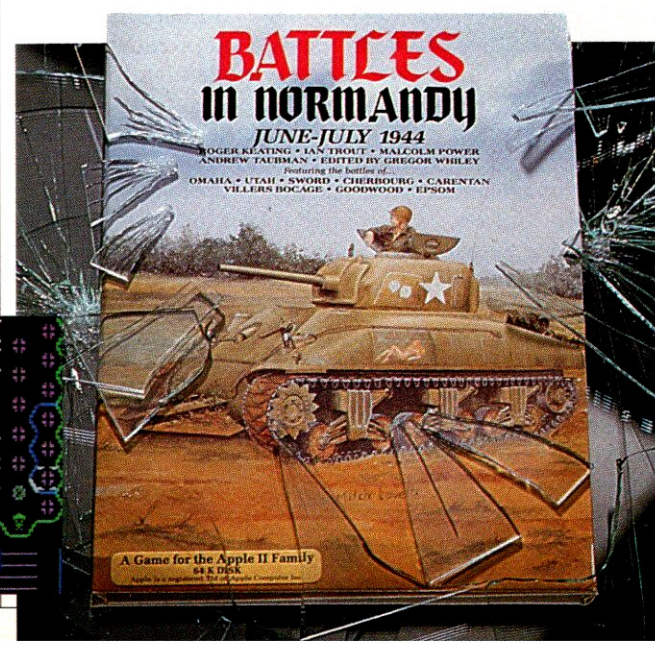
You're the only remaining good wizard left, and your duty is clear. That doesn't make it any easier to start out in search of Anakar's six scattered Eyes. As an apprentice, you know only two spells, Blink and Vanish—useful spells, to be sure, but limited.

However weak and unprepared you feel, the responsibility is yours. You must set off in search of the Eyes, freeing prisoners of the evil Zahgrim as you travel, while avoiding his many nasty minions. It certainly sounds like a job for your master and teacher, Goff, but, alas, he's been butchered by the ever-present demons. And that will be your fate as well if you are not very careful and very lucky.

Such is the stage on which you play Datasoft's Black Magic. Billed as an Action-Adventure game, it is a fast-paced arcade-like foray into an evil world of Death Spitting Plants, Demons, Ghosts, Water Creatures, and other odd and unfriendly creatures. There are a few more or less neutral creatures around, such as the Roc, a bird that occasionally carries you randomly elsewhere, and friendly trolls who offer you favors in exchange for food, but the overall composition of this world is decidedly unfriendly.

Magic plays a major role in successful game play. You can't win without it. As you gain points from recovering lost Eyes or from destroying the evil creatures and freeing prisoners, you move from Apprentice to Wizard to Sorcerer, and finally to Necromancer. At each level, new spells become available. Spells include Vanish, Blink, Chill, Bolt, Fire, Fear, and Conjure. Conjure is useful since it allows you to create food or arrows in a pinch, but it is available





MENT REVIEWS

only to Sorcerers and Necromancers. The trick is to survive to the highest level, where the most potent spells become yours.

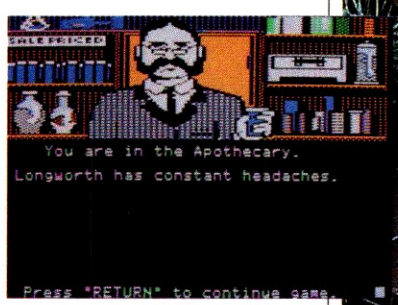
Survival is not easy. You must penetrate deep dungeons, prisons, and castle keeps in order to find and retrieve the lost Eyes. Timely use of spells and careful study of the enclosed map are prerequisites if you wish to become a Necromancer and have a chance at defeating Zahgrim.

Each time an enemy hits you, you lose some health points. When all your health points are gone, you die. In the absence of a save-game feature, dying means starting over. The only way to recover your health is to find food. Slowly, if you aren't killed in the meantime, food replenishes your health. But food, spells, and arrows are not everywhere, and you can have only so many of each at any time. And the locations of these items change each time you play the game. The Eyes are always in the same places, but other items are randomized, making it difficult to plan where you'll stock up on food or spells (commodities more scarce than arrows).

Once you've returned the six Eyes to the statue of Anakar, he will reveal to you the secret of defeating Zahgrim. Now your toughest challenge begins: You must penetrate Zahgrim's castle, puzzle out its secrets, and defeat the evil warlock.

This game is fun—no question—but it is also quite difficult to complete. The playing mechanics make it fast and exciting, but the strategic aspects make it far more than a test of hand/eye coordination. Even if you have a well-planned strategy, success is not guaranteed. A little luck helps. One mistake along the way can cost you in health, food, or spells—just enough to bring on defeat.

Graphically, Black Magic is very good. The screens are well drawn, and the monsters animate smoothly. You can



reach some of its 100 locations by land, some by water, some by jumping, some by climbing ladders or handrails. Some even require blasting through walls or building your own bridges by shooting down stalactites from the cave ceiling!

Several animated scenes grace the program at different points. One that you'll see often is the death scene, in which your character disintegrates before your eyes and is buried under a gravestone. It's an amusing touch as an unseen entity says (through a speech balloon), "You're dead," to which you reply from under your tombstone, "No kidding!" For all Black Magic's humor, however, you will wish Datasoft had provided a way to cut the display short after the 20th or 30th time you've witnessed the same scene.

But all other complaints aside, Black Magic is an excellent, highly challenging game that should provide entertainment over a long period of time. Its fast-paced action is always changing, and its adventure features add extra dimension to it. It just goes to show that new arcade games can work!

Rusel DeMaria

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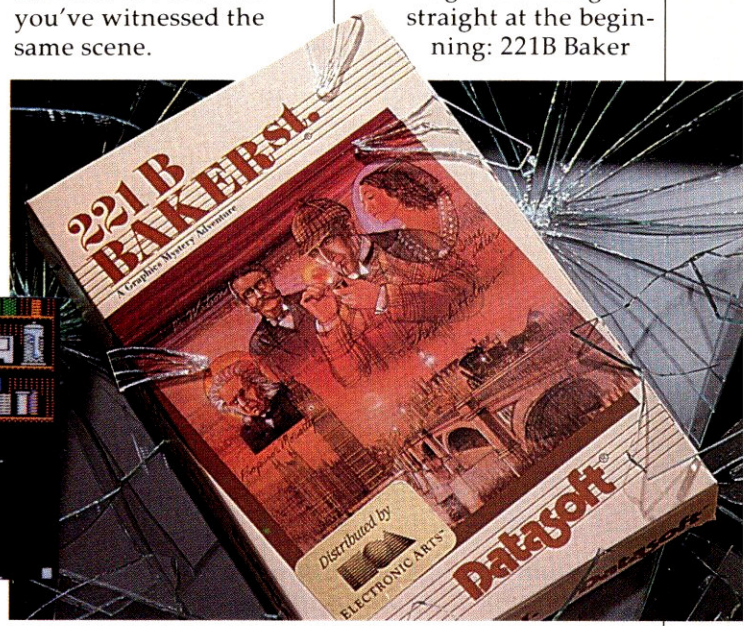
Let's get one thing straight at the beginning: 221B Baker



Street, from Datasoft, is not interactive fiction. It's a board game. Central

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- **Dust Covers** for IIGS & Imagewriter
- **Package of Paper** (Package of 500)

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This system includes 512K of RAM required by most Apple IIGS Software and two drive formats for running both Apple II software and new 3.5 format software

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CIRCLE 235 ON READER SERVICE CARD

REVIEWS

casting has set Basil Rathbone aside and replaced him with Simon Sez.

But then 221B Baker Street doesn't pretend to be anything else. Adapted from a real board game created 12 years ago, it's remarkably faithful to its original source. Sometimes it's too faithful: It loses many of the advantages of the board game without getting much back in return.

In the game, you take one of four parts: Holmes, Watson, Inspector Lestrade, or Irene Adler. Using a brief narrative as a starting point, you move these animated figures around the board and collect clues. (The program asks if you want to use a joystick, although it refused to accept mine. As an alternative, the keyboard worked just fine.)

The cases are well designed, ranging in difficulty from easy to moderate. Don't waste time looking for subtlety, though. The game-board graphics are well designed, too. The board itself is as close to three-dimensional as it can get. And each detective has a unique personality: Holmes leaves a trail of pipe smoke behind him; Lestrade clasps his hands behind his back as he plods along.

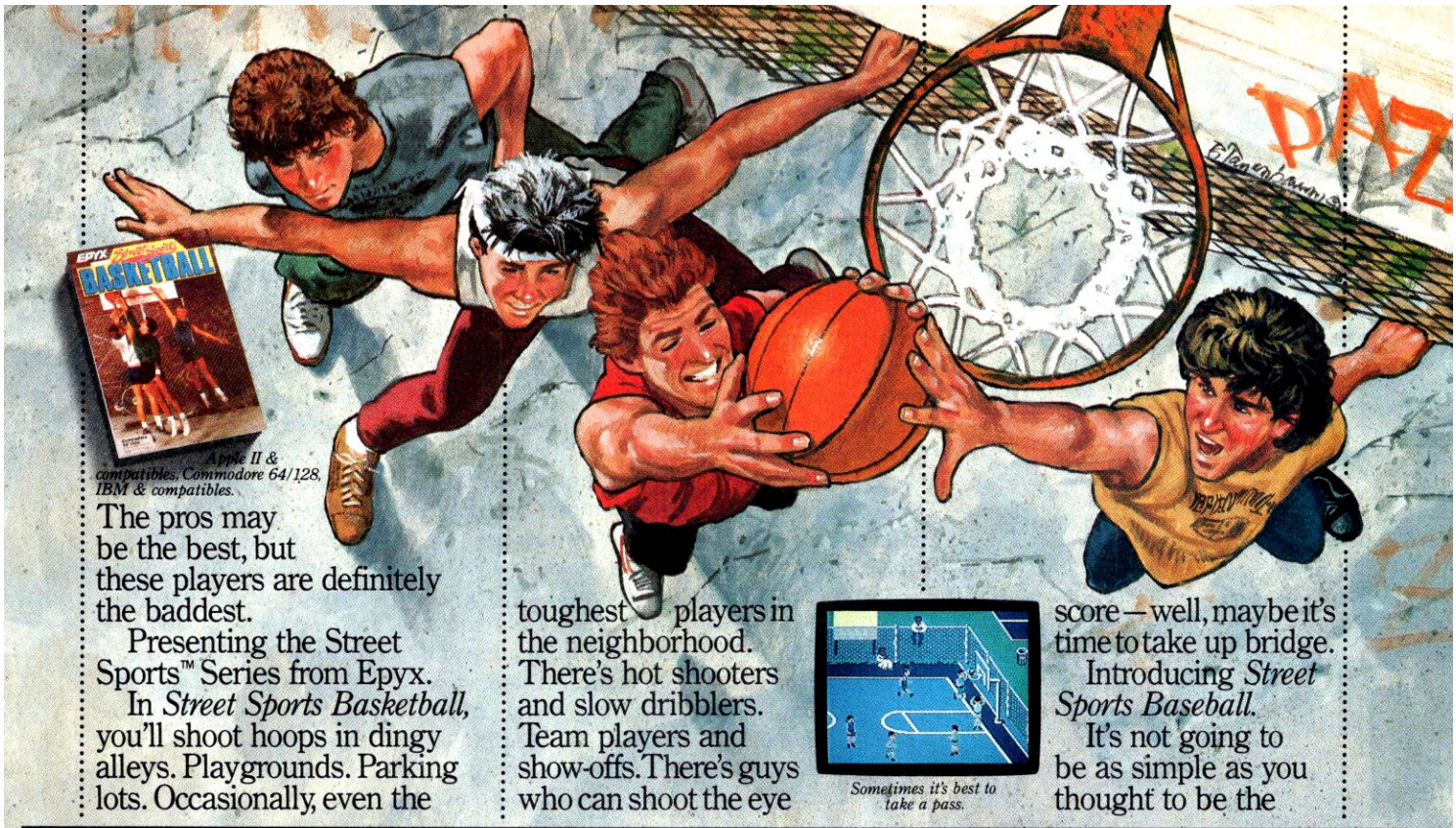
There are glimpses of late Victorian London: the Tobacconist, the Apothecary, the Carriage Depot, and (of course!) Scotland Yard. When you enter one of these places, you get a half-screen view of the interior, with a clue at the bottom of the display. If you get lost—not hard to do, since the Apple II screen can't hold the entire game board—you can call up a map by pressing the M key.

Adapted from a real board game, 221B Baker Street is remarkably faithful to its original source. Sometimes too faithful.

These features are all handy, and they show the care that's gone into making this translation as complete as possible. But any translator will tell you that translating can be an impossible task. After playing the computer version of this game a couple of times, you may find yourself yearning for the original.

Think about the things you normally do with a board game: take your turn over if you make a mistake, keep your cards hidden from your opponents, move to your target position instantly, move the game onto the porch, tuck it under your arm when you head for the beach.

That last might not bother you if your computer's already set up in the family game room, but playing sequence remains unforgiving. Once you've rolled the die, you're stuck; you can't back up without starting



Apple II & compatibles, Commodore 64/128, IBM & compatibles.

The pros may be the best, but these players are definitely the baddest.

Presenting the Street Sports™ Series from Epyx.

In *Street Sports Basketball,* you'll shoot hoops in dingy alleys. Playgrounds. Parking lots. Occasionally, even the suburbs (have fun dribbling on the lawn).

You'll pick your three-person team from the 10 toughest players in the neighborhood. There's hot shooters and slow dribblers. Team players and show-offs. There's guys who can shoot the eye out of a needle at 20 feet. And guys who couldn't sink one if they were sitting on the backboard. Pass on the run. Get that big man on the inside. Let Joey pop 'em from the corners. This is real street strategy. Take a hook shot. A tip-in.

Bounce the ball off the chain-link fence, then go for the basket. Or power through a slam dunk.

But don't dribble in the oil slick. And for heavens sake, watch out for windows.

It's not like any basketball game you've ever played on a computer. But just like every basketball game you've ever played for real.

ANOTHER HIT.

It's bottom of the ninth. Batter's 0 and 2. The score—well, maybe it's time to take up bridge.

Introducing *Street Sports Baseball.*

It's not going to be as simple as you thought to be the first on your block.

After all, you'll have to cope with makeshift diamonds, bases made from spare tires and trashcans, bushes, rocks, even squealing cars.

Not to mention 16 neighborhood players. Each with their own personalities and skills in pitching, hitting and fielding. With the right combination, you could be the champs. With the wrong combination, the chumps.

You'll pick the place. The team. The positions. The strategy. And then, you'll be right in the middle of it all. With a split-screen view from above and up close.

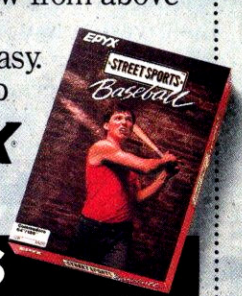
It won't be easy. But it's right up your alley.

EPYX

Apple II & compatibles, Commodore 64/128, IBM & compatibles.

Sometimes it's best to take a pass.

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



TASTE THE THRILL OF VICTORY AND THE AGONY OF THE STREET.

THE STREET SPORTS SERIES

CIRCLE 145 ON READER SERVICE CARD

the whole game over. You also have to ask others to hide their eyes when your clues appear or else play the game in cryptogram. You have to move your piece one (painfully slow) square at a time.

It was a nice idea, but some things work better on paper.

Tad Davis

221B BAKER STREET
Datasoft
19808 Nordhoff Place
Chatsworth, CA 91311
(818) 886-5922

LIST PRICE: *$34.95*
REQUIRES: *Apple II Plus, IIe, IIc, or IIGs; 64K RAM; one 5¼-inch disk drive; joystick optional. Copy-protected.*

CIRCLE READER SERVICE NO. **401**

ARMCHAIR STRATEGY

The invasion of Normandy, on the northern coast of Nazi-occupied France on June 6, 1944, is perhaps the most controversial battle of the Second World War. Over the past 42 years, armchair strategists have expended buckets of ink and millions of war-gaming hours refighting the bitter battles of that summer. If the Germans had concentrated their forces along the coastline, as Rommel wished, could the invasion have been crushed at the water's edge? If American paratroops had not been so scattered, or if British commanders had been more aggressive, could the Allies have beaten the Russians to Berlin?

Battles in Normandy simulates eight major battles during this critical phase of the war. It allows gamer/historians to experience the dilemmas the opposing commanders faced and to explore some of the "What If . . . ?" alternatives.

The game system is adapted from Roger Keating and Ian Trout's Battlefront game, which was a breakthough (or at least a major evolution) in computer-war-game design. The player takes the role of a corps commander, directing two or three divisions. The basic maneuvering units are battalions (typically about 1000 men, 50 tanks, or 36 cannons). The computer can play either side; in fact, it can even play both sides if you want to sit back and watch. Each hexagonal cell on the map represents one kilometer of terrain. The entire Normandy peninsula is mapped in the game database, but most of the battles are fought over small segments of this area, which is just as well, since the screen display is limited to a 13 × 7-hex window.

The game is realistic, in that it rewards good tactics and punishes poor planning severely. If you fail to rest and refit your battalions, they will disintegrate. If you don't coordinate air support, artillery, and ground troops in your attacks, they will be repulsed.

Battles in Normandy, like its predecessor Battlefront, provides an elaborate kit of design utilities that make it possible to simulate virtually any division-level operation of World War II.

The game would be easier to play if it had a "zoom out" feature that let you view the entire battle on one screen. The game is handsomely packaged, with an excellent manual. A large, detailed map of Normandy comes in the package. It's plastic-laminated, so desktop generals can mark up battle plans with grease pencils.

Your task would also be easier if the multiple layers of control menus referred to units by their historical designations, rather than as "DIV 1" or "REGT 4." You need to keep notes on a pad beside the computer to keep track of your forces. A useful screen-dump feature lets you print out any status report, map, or menu. Unfortunately, it does not work with the Apple IIc or with serial printers, including the ImageWriter.

Battles in Normandy is a complex war game that will appeal to experienced players. To fully appreciate the game, you need some familiarity with the history of the campaign, though.

Mike Markowitz

BATTLES IN NORMANDY
SSG, Inc.
1747 Orleans Court
Walnut Creek, CA 94598
(415) 932-3019

LIST PRICE: *$40*
REQUIRES: *Apple II Plus, IIe, IIc, or IIGs; 64K RAM; one 5¼-inch disk drive; color monitor recommended. Copy-protected (one backup allowed).*

CIRCLE READER SERVICE NO. **402**

BY TOM MURRAY

LAUGHTRACK

SUDDENLY, RITA GIMPLETON WINS THE NOBEL PRIZE FOR WORD PROCESSING.

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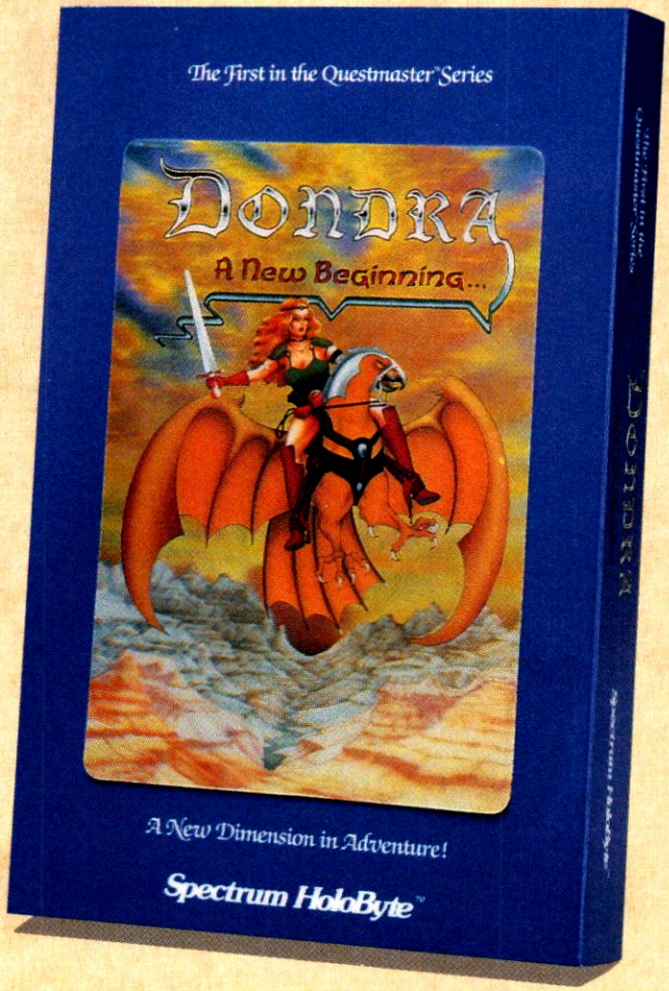

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Screens shown are Apple II GS.

BY SHANON CULLEN

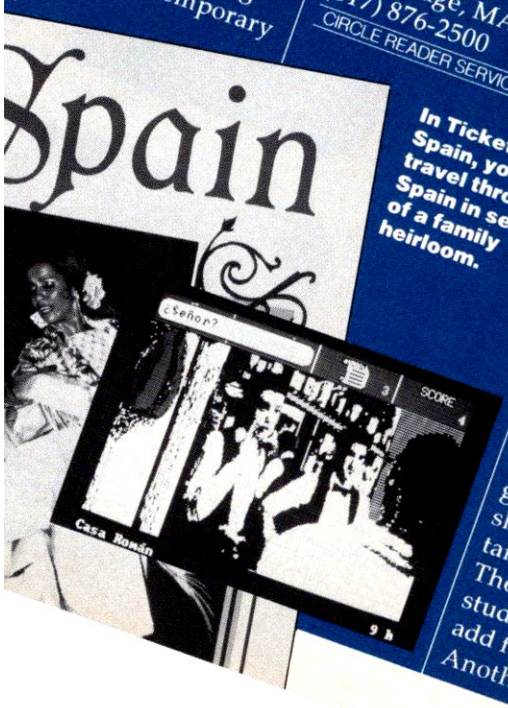
A collection of interesting products for you and your Apple II-series computer

PRODUCT ROUNDUP

TICKET TO SPAIN

In this program, you travel through Spain in search of a family heirloom. With a limited budget and a series of tasks to perform, you go through various towns, exploring historical landmarks, conversing with locals, attending a bullfight, or dining or shopping in Spanish locales. The program is designed to teach Spanish culture, language, history, geography, and contemporary life. You can play the game in either English or Spanish, and a phrase book is included to help with the most difficult situations.

List Price: $39.95
Requires: Apple IIe, IIc, or IIGS; 128K RAM; one 5¼-inch disk drive.
Copy-protected.
Blue Lion Software
90 Sherman Street
Cambridge, MA 02140
(617) 876-2500
CIRCLE READER SERVICE NO. **501**



In Ticket to Spain, you travel through Spain in search of a family heirloom.

NONNIE THE MATCHMAKER

Nonnie the MatchMaker is a get-acquainted game that matches students of the opposite sex on the basis of their responses to 25 questions. Two sample questionnaires are supplied with the program, and you can combine or customize all or part of the questions. Each participant receives up to 12 names with corresponding compatibility scores. The program can be used for fund raising, and poster ideas for advertising a fund raiser come with the package.

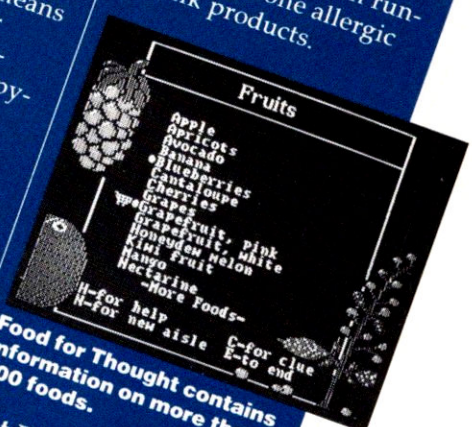
List Price: $32.95
Requires: Apple IIe, IIc, or IIGS; 128K RAM; one 5¼-inch disk drive; printer; copier or other means of reproducing your questionnaire and response sheets. Not copy-protected.
Plume Software, Inc.
P.O. Box 2209
Altoona, PA 16603
(814) 942-7058
CIRCLE READER SERVICE NO. **502**

Nonni MatchM

teachers choose the nut
ents around which the
class will focus.
The program includes
a teachers' guide with a
"getting started" repro-
ducible nutrition booklet.
The guide's menu-plan-
ning worksheets allow
students to choose foods
that they like, as well as
foods that are good for
them. Suggested class ac-
tivities include problem-
solving involving special
dietary needs such as
those of a marathon run-
ner or someone allergic
to milk products.

FOOD FOR THOUGHT

Food for Thought is a nutrition-education program consisting of interactive games and a database containing information on more than 300 foods. The games involve students' shopping for foods containing certain nutrients. The Change option lets students and teachers add foods to the database. Another option lets

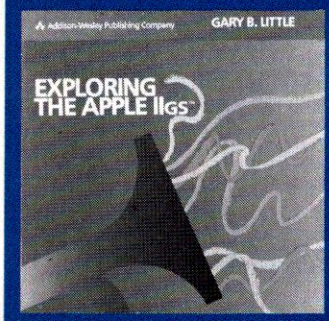


Food for Thought contains information on more than 300 foods.

List Price: $65
Requires: Apple IIe, IIc, or IIGS; 64K RAM; one 5¼-inch disk drive. Pro-DOS; copy-protected.
Sunburst Communications, Inc.
39 Washington Avenue
Pleasantville, NY 10570
(800) 431-1934
(800) 247-6756
In AK (9

EXPLORING THE APPLE IIGS

Exploring the Apple IIGS, by Gary B. Little, introduces and explains all of the new features of the Apple IIGS. Items covered in the book include Apple IIe/IIc emulation, architecture and operations of the 65C816 processor, memory map and memory manager, event handling, super-hi-res graphics, QuickDraw II, the Macintosh-style user interface included in the



Exploring the Apple IIGS

IIGS Toolbox, disk-file management with ProDOS 16, and printing text and graphics.
List Price: $22.95
Addison-Wesley Publishing Company
Trade Computer Books Division
Reading, MA 01867
(617) 944-3700

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MODEL 5720 MEDIA FIRE FILE

The Sentry Media Fire File is designed to protect magnetic media by maintaining internal low temperature and humidity during a fire. The interior chamber of the file remains below 125°F and below 80% humidity in a half-hour fire of up to 1550°. The file holds 110 5¼-inch disks and can also hold 3.5- or 8-inch disks.
List Price: $289
Value-tique
Box 67
Leonia, NJ 07605
(201) 461-6500

CIRCLE READER SERVICE NO. **505**

The Sentry Media Fire File is designed to protect magnetic media during a fire.

TOUCH WINDOW EDUCATIONAL PROGRAMS

Three new Touch Window-compatible educational programs have been announced by Personal Touch Corporation: Touch 'N See, Touch 'N Match, and Timekeeper.

Touch 'N See is a memory game in which students "turn over" cards to reveal what is behind them. Children match six pairs of color pictures, shapes, letters, or words. The program is designed to improve the skills of concentration, matching, classification, and association, as well as letter and word discrimination.

Touch 'N Match involves three activities: matching the picture that belongs in a group; matching identical pictures; and finding the picture that does not belong. Seven categories of pictures include animals, body parts, kitchen items, food, clothes, travel, and outside. Teachers can control the complexity of presentation and number of trials. A testing mode is provided for student progress evaluation.

Timekeeper includes four activities that are designed to teach students how to tell time. The program provides practice in setting digital time as well as an analog clock face. It also provides practice in matching time displayed as text to analog and digital clocks. The teacher can control increments of time intervals (one hour, 15 minutes, 5 minutes, etc.) and other options.

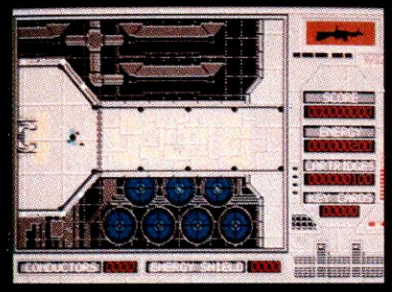
Musical reinforcement and animated graphics are used throughout these programs, and a teachers' guidebook comes with each disk.
List Price: Touch 'N Match, $29.95; Touch 'N See and Timekeeper, $39.95 each
Requires: Apple II Plus, IIe, or IIc; 64K RAM; one 5¼-inch disk drive; Touch Window. DOS 3.3; not copy-protected.
Personal Touch Corporation
4320 - 290 Stevens Creek Blvd.
San Jose, CA 95129
(408) 246-8822

CIRCLE READER SERVICE NO. **506**

Three new Touch Window-compatible educational programs are available.

New! for the Apple IIGS

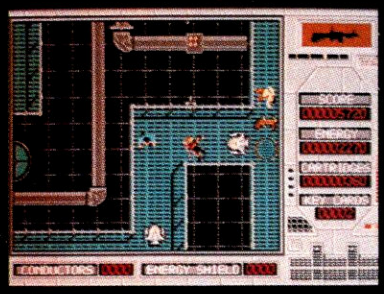
ALIEN MIND

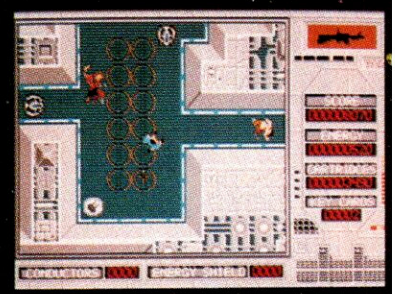


You have just received a telegram from your associate, biologist Aaron Avery, telling of the completion of the new Zekford Space Station for biological research. He invites you to join his research team as they analyze two unhatched eggs of a species unknown to mankind.

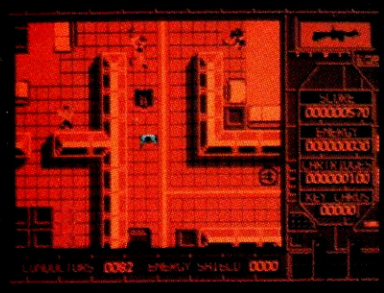
You arrive at Zekford and immediately sense danger. A chill shoots up your spine as you notice the receptionist is lying lifeless next to her desk. You turn, only to realize that the hatch has closed behind you and a display reads "No Entry. No Escape."

Whatever has taken over the space station is now after you. You must penetrate into the lower levels of the space station in which the very walls have turned against you: a fortress in which you no longer have clearance to enter. Robots and other alien life are now seeking your demise. You must gather the necessary components to build the ultimate weapon, and destroy the alien . . . but your mission does not end there, a second egg must be neutralized before it hatches.





Your intelligence is being tested.
Your agility is being tested.
Your very inner strength is being tested.
Will your mind be able to stand up against the Alien mind?
Just how advanced is the human race?
Only time will tell.



Alien Mind for the IIGS – $54.95. Order your copy today. Things will never be the same.

Order line: (800) 843-5722 ext. 103,
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PBI SOFTWARE, INC.

1163 Triton Drive Foster City, CA 94404
Telephone: (415) 349-8765

CIRCLE 307 ON READER SERVICE CARD

Alien Mind requires an Apple IIGS w/512k, RGB Monitor and MDIdeas SuperSonic Stereo Card recommended

PRODUCT ROUNDUP

SOFTWARE

ABRACADATA SOFTWARE

Abracadata has released one new program, Run Your Own Train, and two new versions of Design Your Own Home, Architecture.

The company describes Run Your Own Train as "a flight simulator for down-to-earth people." You begin by making a track layout, using hundreds of straight and curved tracks and switches. Then you set the speed of the train, "climb aboard," and drive. You can operate one to four trains at yard, freight, or express speeds.

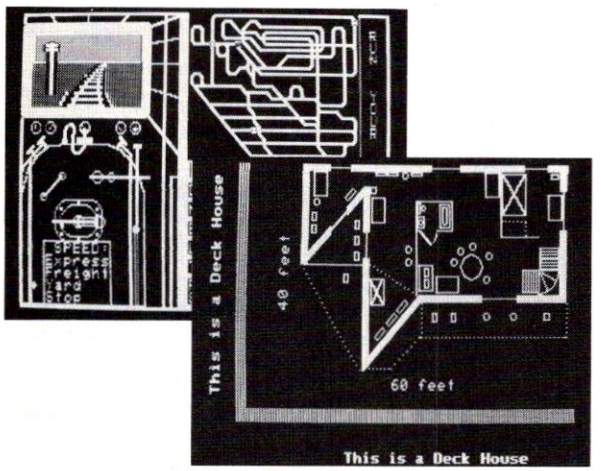
Design Your Own Home, Architecture is now available in Version 2.0 for standard Apple II computers and a separate version for the IIGS. Both programs allow you to draw floor plans, side-view building plans, and structured details. Hundreds of shapes can be rotated, scaled up and down, or arranged in numerous ways on the screen. The programs include standard architectural scales, along with automatic calculations of distances, angles, areas, diagonals, and other measurements. Plans may be saved, edited, and printed. They may be up to four screens in size, and you can create and save four types of overlays as well. The IIGS version features zoom, 360° variable-shape rotation, and color printing.

List Price: Run Your Own Train, $34.95; Design Your Own Home, Architecture (standard Apple II version), $69.95; Design Your Own Home, Architecture (IIGS version), $89.95

Requires: Apple II Plus, IIe, IIc, or IIGS; 64K RAM (for Train or standard version of Architecture); one 5¼-inch disk drive. DOS 3.3; copy-protected. Train works with mouse, paddles, joystick, graphics pad, or keyboard. Standard version of Architecture requires mouse, paddle, graphics pad, or joystick. GS version of Architecture requires mouse.

Abracadata
P.O. Box 2440
Eugene, OR 97402
(503) 342-3030

CIRCLE READER SERVICE NO. **507**

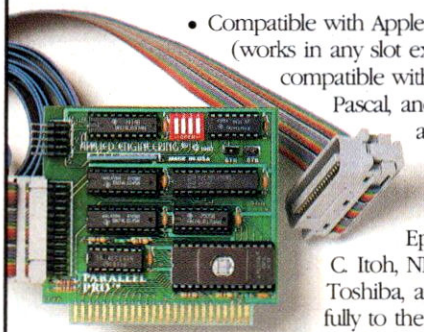


Screens from Abracadata's Run Your Own Train (top) and Design Your Own Home, Architecture programs

Parallel Pro™

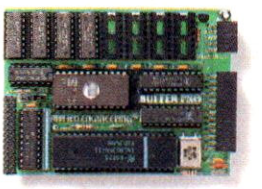
The Most Powerful Apple Printer Interface You Can Buy

When you're trying to find the right parallel interface for your printer, look to Applied Engineering to bring you the best in quality and features.



• Compatible with Apple IIe, IIGS, and II+ (works in any slot except 3). • Fully compatible with ProDOS, Dos 3.3, Pascal, and CP/M. • Works automatically with all software. • Supports almost all parallel printers including: Epson, IBM, Okidata, C. Itoh, NEC, Star Micronics, Toshiba, and more. • Conforms fully to the Centronic Standard • Built-in control panel allows easy access to set-up information • Automatic formatting of basic listings. • Built-in self test and Buffer Pro™ support. • Extensive graphics print capability for the hi-res, double hi-res, and the IIGS super hi-res screens • Buffer option available (see below). • Includes 6-ft. cable for connecting to your printer.

Buffer Pro™



Buffer Pro adds memory to Parallel Pro, freeing your Apple from running the printer. With Buffer Pro, you can continue to use your Apple while the printer is printing. To add Buffer Pro to Parallel Pro, simply unplug the cable on Parallel Pro and plug Buffer Pro where the cable was, then plug the cable onto Buffer Pro. That's it!

• Compatible with IIe, IIGS, and II+. • Fits in a IIGS with or without fan. • Adds 32 to 256 pages of printer buffering. • User expandable using 64K or 256K RAM chips one chip at a time and in any combination. Each 256K chip adds 32 pages (maximum of 8 chips). • Connects directly to Parallel Pro. • Works automatically with all software • May be paused or cleared with simple commands (unlike other buffers, you don't have to "shoot the computer" if you want to stop the print-out before it's done).

Both Parallel Pro and Buffer Pro come with a comprehensive manual, a 5-year warranty — parts & labor, and outstanding technical support if needed.

Parallel Pro. **$89.00**

Buffer Pro Option: with 32-page buffer. **$99.00**
with 128-page buffer. **$129.00**
with 256-page buffer. **$159.00**

Order today!

See your dealer or call Applied Engineering today, 9 a.m. to 11 p.m. 7 days. Or send check or money order to Applied Engineering, MasterCard, VISA and C.O.D. welcome. Texas residents add 7% sales tax. Add $10.00 outside U.S.A.

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The Apple enhancement experts.

(214) 241-6060
P.O. Box 798, Carrollton, TX 75006

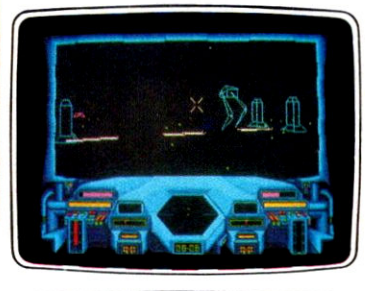
Prices subject to change without notice.

Parallel Pro and Buffer Pro are trademarks of Applied Engineering.
Other brands and product names are registered trademarks of their respective holders.

STARGLIDER

Starglider—is an all action combat simulation featuring fast moving, animated, 3D vector graphics. The animation and speed of the action will have you screaming out for more. The scenario places the user in the role of a pilot of the only surviving ground attack vehicle left to oppose the alien invaders of the planet Novenia. The mission is to destroy the aliens powerful flagship the Starglider. To achieve the final conflict requires flying skill and battle strategy.

The novella accompanying the product incorporates many clues necessary to survive the increasing levels of combat difficulty and sets the mood for the player as the protector of the human race.



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PRODUCT ROUNDUP

NIGUNIM

Nigunim (the Hebrew word for *tunes*) is a computer program that teaches and plays popular Jewish songs. The program contains approximately 40 songs, ranging from "Hava Nagila" to modern Hasidic hits. Nigunim is divided into three sections: Teaching, Playback, and a game for one or two players entitled Name That Nigun!

In the Teaching mode, the song is played one phrase at a time, while the computer highlights the phrase on the screen. In the Playback section, the song plays in its entirety. In Name That Nigun!, the computer chooses a song at random and begins to play it. Players stop the song when they think they know it and select the name from the list that appears.

List Price: $34.95
Requires: Apple II Plus, IIe, or IIc; 64K RAM; one 5¼-inch disk drive. Not copy-protected.
Davka Corporation
845 North Michigan Ave.
Suite 843
Chicago, IL 60611
(312) 944-4070

CIRCLE READER SERVICE NO. **508**

EDUCATIONAL ACTIVITIES PROGRAMS

Educational Activities, Inc., has released two new Spanish products: Spanish EA Test Writer and EA Spanish Word Processor. Both programs use Spanish characters, punctuation, and accent marks.

Spanish EA Test Writer helps teachers create tests in Spanish, using one of four formats: fill-in, true/false, multiple choice, and short answer. You can print tests out on paper, or students can take the test independently on the computer. When working on the computer, students get immediate feedback. A management system keeps track of scores, and up to 50 tests containing 30 items can be stored on disk.

The EA Spanish Word Processor uses Spanish in all menus, prompts, screen displays, and printouts. The program is based on FrED Writer and includes the functions Insert, Delete, Find and Replace, Paging, Margin Sets, and Centering. The word processor works in either a 40- or 80-column format.

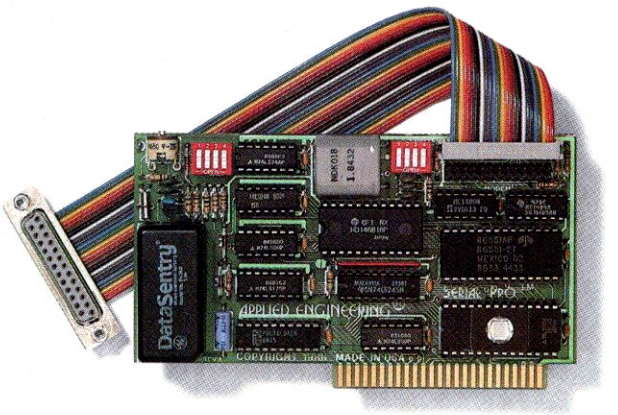
List Price: Spanish EA Test Writer, $69; EA Spanish Word Processor, $59.95
Requires: Apple II Plus, IIe, IIc, or IIGS for Test Writer; Apple IIe for Word Processor; 48K RAM; one 5¼-inch disk drive; Epson printer (Test Writer). DOS 3.3; copy-protected.
Educational Activities, Inc.
1937 Grand Avenue
Baldwin, NY 11510
(516) 223-4666

CIRCLE READER SERVICE NO. **509**

SYLLABLE SQUARE

Syllable Square is a word game for ages 7 to adult. The syllables of words appear in a grid, and the object of the game is to put the syllables together to form the words that will clear the board. Easy, intermediate, and advanced levels of difficulty incorporate vocabulary frequently used in

Serial Pro® The intelligent multifunction card from Applied Engineering.



Serial Pro is a powerful multifunction card for the Apple IIe, II+, IIGS and compatible computers. Serial Pro combines a powerful serial port for interfacing to a printer, modem or other serial device, with a full function clock/calendar. Serial Pro's serial port is compatible with virtually all letter quality and dot matrix printers, including Apple's Imagewriter and Imagewriter II, and can communicate with the fastest external modems at baud rates from 50 to 19,200.

Set up is easy, because unlike other cards, there are no switches to program serial parameters or disks to use. Serial Pro has a built-in setup screen that allows all parameters to be set. And on-screen help that makes it super-easy. An on-board battery stores your selections for over 20 years, but you can change them at any time. Serial Pro is the perfect upgrade for Super Serial card owners looking for more performance or a built-in clock.

Serial Port Features • Fully Super Serial Card compatible but more versatile and easier to use • Compatible with printers • Compatible with modems • Prints graphics to printer (without software) in normal mode, 90° rotation, double size, side by side, and black/white inversion • Variable word length, number of stop bits and parity selection • Crystal controlled circuits are used to provide ultra accurate baud rates.

Clock Calendar Features • ProDos, DOS and AppleWorks compatible. Displays time and date on the AppleWorks screen • Automatically time and date stamps AppleWorks files • 20 year auto recharging nickel-cadmium battery • Realtime interrupts • Built-in on screen time and date settings (no software needed) • Does not use phantom slots.

Serial Pro is perfect for Apple IIe, II+, IIGS or compatible owners in need of a serial port or clock/calendar or both. But unlike other multifunction cards on the market, Serial Pro does not use phantom slots, so all the slots in your computer are useable.

Serial Pro comes complete with manual, cable and instructions for connecting to all the leading printers and modems.
Serial Pro **$159**

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A solid-state hard drive.

The MemorySaver ROM disk system converts your present GS memory card into a solid-state hard disk drive that maintains all files, even when the power is off.

MemorySaver installs into the GS memory slot in place of your current memory card and your memory card installs onto MemorySaver.

COMPATIBILITY – *without blocking Slot 7!*

MemorySaver can be used with the most popular memory cards available for the Apple IIGS. We currently support Apple's 1Mb card, Orange Micro's RamPak 4GS™, Applied Engineering's GSRAM™ and many others. *Plus*, our new front-card extension option now allows you to use your GSRAM™ without blocking Slot 7. Call for updated information on compatibility with your memory card.

Expandability and flexibility.

Your MemorySaver ROM disk system can be expanded to 8 Mb, giving you room for all of your favorite programs. You can even put two RAM cards on MemorySaver. Depending on how much memory you add to your system, your MemorySaver provides up to *16 times* more ROM disk space than other ROM disk cards. You may select ROM disk sizes in 32K increments and set aside only the memory you need for your ROM disk. Best of all, no special hardware or software is required to modify your ROM disk (copy-protected programs cannot be used).

NEW! 2 Megabyte RAM card now available!

Our new **MultiRam™ GS** offers up to 2 Mb of RAM and *perfect* MemorySaver compatibility. Two MultiRam GS cards on your MemorySaver can provide up to of 4 Mb of ROM disk power!

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MultiRam GS (256K)	**$189.95**
MemorySaver/MultiRam GS Bundle	**$319.95**

For a brochure describing all of Checkmate's products, see your favorite dealer or call us directly.

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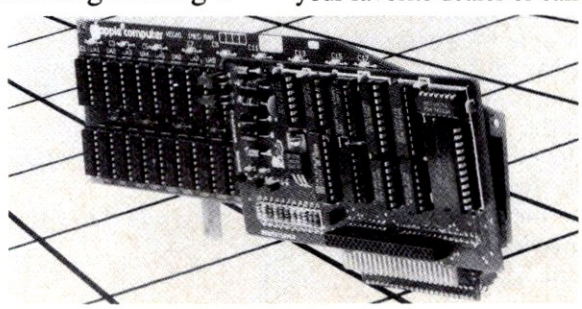

MemorySaver with the Apple IIGS 1 Mb card (not included)

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Checkmate Technology, Inc.

509 S. Rockford
Tempe, AZ
85281
(800) 325-7347
(602) 966-5802

MasterCard VISA AMERICAN EXPRESS

PRODUCT ROUNDUP

instructional material. The game uses two thousand words, and you can add your own word lists.
List Price: $34.95 each; lab pack of five disks, $66.95; lab pack of ten disks, $130
Requires: Apple II Plus, IIe, or IIc; 48K RAM; one 5¼-inch disk drive. Copy-protected.
Junior Software
P.O. Box 2643
Delray Beach, FL 33447
(305) 272-0361
CIRCLE READER SERVICE NO. **510**

PS INC.

PS Inc., which stands for "Problem-Solving, Inc.," is a problem-solving educational-software series. In the series, PS Inc. is a company whose business is based on the solution of challenging problems. The series teaches problem-solving strategies in an interactive format that places students in a business setting where the rewards for learning are job promotions.

The six titles currently available are Choose the Operation, Evaluate Information, Find the Pattern, Guess and Check, Plan and Reason, and Work Backward. Each title, appropriate for grades 5 and up, provides optional interactive tutorial instruction, help branches, and varying levels of difficulty. Ten additional titles are scheduled for release this year.
List Price: $44.95 each; all six titles, $250; Lab Packs available for $16.50 extra for each duplicate title purchased.
Requires: Apple II Plus, IIe, or IIc; 48K RAM; one 5¼-inch disk drive. DOS 3.3; copy-protected.
CPI Software
145 East 49th Street
New York, NY 10017
(212) 753-3800
CIRCLE READER SERVICE NO. **511**

MASTERY IN MUSIC

Six new music-software tutorial programs are now available from Mastery In Music: Guitar Master, Flute Master, Clarinet Master, Saxophone Master, Trumpet Master, and Singing Master. All the programs have exercises that you can personalize by choosing key signatures, time signatures, note types, and note ranges. Each program comes with a manual of more than 60 pages containing program instructions, basic music facts, and detailed lessons.
List Price: $39.95 each
Requires: Apple II Plus or IIe; 64K RAM; one 5¼-inch disk drive; Mockingboard or AE Phaser. DOS 3.3; Guitar Master copy-protected; other programs not copy-protected.
Mastery In Music Software
P.O. Box 1027
Bend, OR 97709
(503) 388-7654
CIRCLE READER SERVICE NO. **512**

CHESS GAMES

Two new chess games from Enlightenment, Inc., are now available: Guide to Chess Openings and 50 (annotated) Classic Chess Games.

Guide to Chess Openings by Jeremy Silman, one of the country's top chess players, is designed for intermediate-level players interested in serious tournament play. The program has tutorial material covering up to

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- Design and print mailing labels with "Print Shop™" graphics and text.
- Make bookmarks which feature graphics, borders and text. They're great for school projects.
- P.L.U.S. allows you to transfer "Newsroom™" Clip Art graphics into "Print Shop™" graphics and vice versa.

P.L.U.S. comes on a non-copy protected disk and has a manual which describes each of the utilities. To get a copy of P.L.U.S., **order product number PS01 for only $39.95.**

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Norfolk, NE 68701

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PRODUCT ROUNDUP

30 moves deep, and a 500K database of animated chess moves and commentary. The package also contains the chess-opponent program called the Coffeehouse Chess Monster, featuring human vs. human, computer vs. computer, or human vs. computer modes of play.

The 50 (annotated) Classic Chess Games, by American Open champion Paul Whitehead, covers the games of the great chess Masters from the late 1800s up to the current era.

List Price: Chess Openings, $59.95; Classic Chess Games, $19.95
Requires: Apple II Plus, IIc, IIe, or IIGS; 64K RAM; one 5¼-inch disk drive. Copy-protected.
Enlightenment, Inc.
1240 Sanchez Street
San Francisco, CA 94114
(415) 641-9131

CIRCLE READER SERVICE NO. **513**

APPLIED SCIENTIFIC'S APPLICATION TEMPLATES

Several application templates for AppleWorks are now available from Applied Scientific.

Accountant allows you to track personal cash, check, and credit-card transactions.

Accounts Payable is similar to Accountant; it is designed for small businesses, however.

Accounts Receivable records buyer, purchase-order number, order and shipping dates, item, salesperson charges, payments, and current balance. Reports include current accounts receivable, overdue accounts, shipping, and mailing labels. The Accounts Receivable template can track inventory and print invoices and bills on standard forms, and it can be customized.

Payroll tracks information for hourly, daily, weekly, or monthly employees. Items covered include pay rate, regular time and overtime, vacation and sick time, other earnings, gross earnings, taxes, other deductions, and reimbursements. It can calculate quarterly, year-to-date, and end-of-year totals.

Financial Calculator calculates simple and compound interest, present value of a future payment or annuity, future value of an annuity, monthly loan payments, treasury security and bond yields, and ten-year loan amortization.

Investment Portfolio summarizes stock, mutual-fund, bond, and certificate-of-deposit holdings. The template tracks security name, exchange, date bought/sold, number of shares/bonds, buy and sell price, commission, original and current value, bond yield, gain and loss, dividend and coupon payments, capital-gain status, and original as well as current portfolio value.

List Price: $29.95 each
Requires: Apple IIc, IIe, or IIGS; 128K RAM; one 5¼-inch disk drive (two recommended); AppleWorks; 80-column monitor; printer (132-column) and numeric keypad recommended. Not copy-protected.
Applied Scientific
416 Arnold
Bozeman, MT 59715
(406) 586-1157

CIRCLE READER SERVICE NO. **514**

TIPS AND TECHNIQUES

Readers share tips for the II

APPLEWORKS TITLES

If you're using AppleWorks and want to place the same title, say your name, on everything you print, I have a tip for you. Select the Specify information about your printer(s) option from the Other Activities menu and then indicate you want to change printer specifications. When the Change Printer menu appears, select the Interface cards option. AppleWorks asks you to enter a printer-command string, which is normally Control-I 80N for an ImageWriter.

Instead, enter the title string you want to use. Since AppleWorks prints the printer-command string before the main document is printed, the string appears at the top of the first page of anything you print.

HANS MAHNCKE
HONG KONG

WELCOME TO LA LA LAND

Here's a giant Easter egg from the new Print Shop GS. As you enter the command to leave the program, hold down the open-apple key. Doing so leads you to the La La Land menu, where you get to meet the developers of the program. If you want to know whom you're meeting, just move your mouse arrow over his or her face, and a name will appear.

GARY LITTLE
SENIOR TECHNICAL EDITOR

ASSIST GOES TO THE MACINTOSH

Apple IIGS owners who have only one 3.5-inch disk drive can cut their disk-duplicating time dramatically if they also have access to a Macintosh with an internal 800K drive and the latest version of Copy II Mac from Central Point Software. (Standard Apple utilities require multiple disk swaps to make a single-drive copy.)

To make copies, first disconnect the drive from the GS and connect it to the external-drive port on the Macintosh (with the power off, of course). Then run Copy II Mac to make a copy of the disk. Unlike the Macintosh operating system and most Mac software, Copy II Mac works with disks correctly, at least for the purposes of making copies in the "sector" or "bit copy" modes.

ROBERT W. DLUGOKIENSKI
NAPERVILLE, IL

PRINT THIS PAGE—ONLY

When printing from the AppleWorks word-processing program, the This page option appears to allow you to print just one page. In actuality, everything from the current page to the end of the document prints. There is, however, a way to print just one page. At the beginning of your document, bring up the Printer Options screen by typing open-apple/O. Then enter PE (for Pause Each Page) and press Esc to return to the document. When you want to print a single page, simply move the cursor to the page, type open-apple/P, and choose the This page option. When the printer stops printing at the end of the first page, press Esc to exit. If you're unsure of what page is going to print, type open-apple/K before printing, and AppleWorks will show you where the page breaks will occur.

VINCENT D. O'CONNOR
BABBITT, MN

DUAL MONITORS

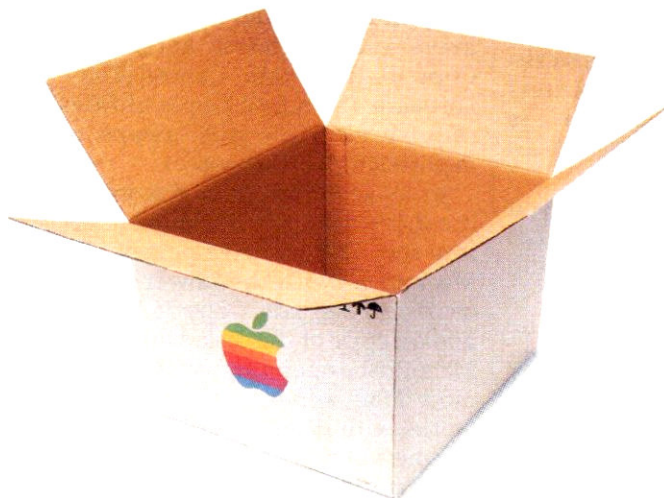
A cable from Radio Shack allows you to hook up two monitors to the computer at the same time. This cable is ideal if you want to play games in color and do word processing on a monochrome monitor. The catalog number for the cable is 42-2436, and, although the packaging says it's a "phono cable," it works just fine.

JOHN LAW
ST. LOUIS, MO

Please send your Apple II tips to A+, 110 Marsh Drive, Suite 103, Foster City, CA 94404; ATTN: Tips and Techniques. We pay $25 for each tip we publish, so be sure to include your name, address, and Social Security number.

APPLEFEST

It takes a whole convention center to hold everything that came out of this box.



The Hynes Convention Center in Boston, to be precise. Because that's where you'll find AppleFest® 1988 – the biggest, most exciting Apple® gathering ever. AppleFest 1988 will draw thousands of people from all walks of life to Boston.

Parents and educators will be there to see the spectacular new software available for the Apple II family of computers. People who work at home will be there to see what's happening in the Personal Office, including the latest offerings for both the II and the Macintosh. And people who don't even own a computer will be there to discover how Apple 'creativity' programs on the IIGS can help them compose music or paint a picture.

Naturally, there'll be terrific keynote speakers like Del Yocam and Steve Wozniak. And the AppleFest Conference will feature top industry leaders and editors from all the major Apple II and educational computing magazines, including this one.

There'll be lots of hands-on opportunities, demonstrations of all the latest software and hardware offerings from Apple and the vast array of third party suppliers – free Apple IIGS computer giveaways, too.

So make plans to be at AppleFest 1988 in Boston from May 20 to 22. You'll see everything that came out of the box.

Yes, I'd like more information about AppleFest 1988.
☐ Exhibiting ☐ Attending

Name

Company

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One Forbes Road, Lexington, MA 02173

Or call:
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APPLEFEST '88 BOSTON

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A quick guide to products we prefer

PRODUCT ALL-STARS

The products listed in "Product All-Stars" are those that A+ contributors have favorably reviewed or those that A+ editors deem to be exceptional, although we may not have formally evaluated them. When A+ has reviewed a product, however, the issue date (e.g., 12/87) appears at the end of the product description. When the issue date is followed by a "PS," it means the product appeared in "Product Spotlight" and not in a feature-length review.

SOFTWARE

ACCOUNTING

Back to Basics
This professional three-module accounting system handles receivables, payables, and general ledger for small to medium-sized businesses. Its greatest virtues are ease of use and a predefined chart of accounts (users also can create their own). (12/87) **List Price:** $195. **Requires:** Apple IIe, IIc, or IIGS; 64K RAM. *Peachtree Software, 4355 Shackleford Road, Norcross, GA 30093; (800) 247-3224*

BusinessWorks
This complete accounting package includes receivables, payables, general ledger, inventory, and payroll modules that you can use alone or as an integrated system. Priced like other fully functional accounting programs but much easier to use. Exports AppleWorks spreadsheet or database files. (12/87) **List Price:** System Manager module, $95; accounting modules, $195 each; BusinessWorks Bundle (all modules except Payroll), $495. **Requires:** Apple IIe, IIc, or IIGS; 128K RAM; at least one 3.5-inch disk or a hard-disk drive. *Manzanita Software Systems, 1 Sierra Gate Plaza, Suite 200-A, Roseville, CA 95678; (916) 781-3880*

BPI Entry Series
Separate modules for general ledger, payables, receivables, payroll, and inventory comprise this longtime Apple accounting favorite. Does not maintain a historical monthly ledger record, so it can't produce an annual budget. No on-line help is available, and the manual is more utilitarian than instructional, but widespread popularity should ensure that local support is available. (12/87) **List Price:** $295 per module. **Requires:** Apple IIe, IIc, or IIGS; 128K RAM. *Computer Associates International, 2195 Fortune Drive, San Jose, CA 95131; (408) 432-1727*

Q-Mar General Ledger Template
This AppleWorks template provides a less-expensive general-ledger option for AppleWorks owners. (12/87) **List Price:** $89.95. **Requires:** Apple IIe, IIc, or IIGS; 128K RAM; AppleWorks. *The Q-Mar Group, 5677 Oberlin Drive, San Diego, CA 92121; (619) 455-7513*

DATABASE PROGRAMS

DB Master
Larger, more capable, and with better report generation than AppleWorks, DB Master has abilities that soar above those of the AppleWorks database module. This program's bulky power can be difficult to get off the ground, however, and it is not suitable for merely routine tasks. (12/87) **List Price:** standard, $179, professional, $295. **Requires:** Apple IIe, IIc, or IIGS; 128K RAM. *Stone Edge Technologies, P.O. Box 200, Maple Glen, PA 19002; (215) 641-1825*

ProFILER 3.0
Combining some of the best attributes of AppleWorks and DB Master, ProFILER 3.0 provides 65,000-record capacity with an exceptionally good mouse- or keyboard-driven user interface. Simplicity of use comes at the expense of some features, though. (12/87) **List Price:** $129. **Requires:** Apple IIe (enhanced), IIc, or IIGS;128K RAM. *Pinpoint Publishing, 5865 Doyle Street, #112, Emeryville, CA 94608; (800) 633-2252; in CA (415) 654-3050*

Notes•n•Files
Satisfies the common database need of keeping track of names and addresses. Not a full-fledged database, but effective. Simple, even fun, to use, with desktop interface and clever icons. (1/88) **List Price:** $129.95. **Requires:** Apple IIGS, 512K RAM. *DataPak Software, 14011 Ventura Blvd., #507 Sherman Oaks, CA 91423; (818) 905-2201*

DISK UTILITIES

ProSel
A startlingly comprehensive collection of more than a dozen disk utilities from disk-file manager to sector editor, file finder, and Mr. Fixit directory repairman. A bargain available only by mail. (12/87) **List Price:** $40. **Requires:** Apple II Plus, IIe, IIc, or IIGS; 64K RAM. *Glen Bredon, 521 State Road, Princeton, NJ 08540*

Copy II Plus
Yes, Copy II Plus does duplicate copy-protected software, but it also includes a library of disk utilities. Works with both DOS 3.3 and ProDOS disks, allows file copying between the two, and takes care of necessary conversions. Also copies smaller disk to image file on larger disk. (12/87) **List Price:** $39.95. **Requires:** Apple II Plus, IIe, IIc, or IIGS; 64K RAM. *Central Point Software, 9700 SW Capitol Highway, Suite 100, Portland, OR 97219; (503) 244-5782*

Diversi-COPY
Uses all available RAM to make the fastest disk copy east (or west) of Silicon Valley. A multiple-copy option allows you to read once and write many times, a boon to users'-group disk librarians. (12/87) **List Price:** $30. **Requires:** Apple II Plus, IIe, IIc, or IIGS; 64K RAM. *Diversified Software Research, Inc., 34880 Bunker Hill, Farmington, MI 48018-2728; (313) 553-9460*

MouseFiler
Macintosh-like mouse-driven menus and windows make MouseFiler the disk-file-management favorite of double-clickers everywhere. Efficient to use and skillfully executed. (12/87) **List Price:** $69.95. **Requires:** Apple IIe (enhanced), IIc, or IIGS; 128K RAM. *Harbor Software, Inc., 403 Great Road, Suite #8, Acton, MA 01720; (617) 263-1870*

Bag of Tricks 2
The ultimate utility for recovering data and files from 5¼-inch damaged disks. Four modules examine sectors for unusual patterns, format individual tracks, edit individual sectors, and recover DOS 3.3 or ProDOS directories. (12/87) **List Price:** $49.95. **Requires:** Apple II Plus, IIe, IIc, or IIGS; 64K RAM. *Quality Software, 21610 Lassen Street, #7, Chatsworth, CA 91311; (818) 709-1721*

Universal File Conversion
This program moves files among ProDOS, DOS 3.3, Apple Pascal, and Apple CP/M disks. (12/87) **List Price:** $34.95. **Requires:** Apple II Plus, IIe, IIc, or IIGS; 64K RAM. *Quality Software, 21610 Lassen Street, #7, Chatsworth, CA 91311; (818) 709-1721*

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Disk-caching program for the IIGS speeds 3.5-inch disk operations by copying disk data blocks to RAM. Cache size is configurable and survives a hard reset. (12/87) **List Price:** $35. **Requires:** Apple IIGS; 512K RAM.*Diversified Software Research, Inc., 34880 Bunker Hill, Farmington, MI 48018-2728; (313) 553-9460*

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Little creatures wander a grid while gobbling meals of arithmetical operations, equalities, inequalities, prime numbers, and factors. (12/87) **Grade Level:** 3 and above. **List Price:** 5¼-inch disk, $49; 3.5-inch disk, $55. **Requires:** Apple II series; 64K RAM. *MECC, 3490 Lexington Avenue North, St. Paul, MN 55126; (612) 481-3500*

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New graphics and pull-down menus give this basic math classic a classy new look. Test maker, retake option, student record keeping, report capabilities, and problem-solving activities make it a valuable teaching tool. (12/87) **Grade Level:** 1–6. **List Price:** single-user, $49.95; five-disk lab pack, $129.95. **Requires:** Apple IIe (enhanced), IIc, or IIGS; 128K RAM. *Davidson & Associates, Inc., 3135 Kashiwa Street, Torrance, CA 90505; (213) 534-4070*

Green Globs and Graphing Equations
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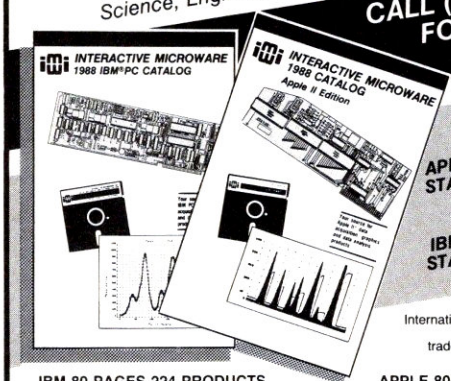

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A fun and challenging way for younger students to improve problem-solving and decision-making skills. Run from cute slime worms while dealing with intellectual opportunities hidden in the game. (12/87) **Grade Level:** 2–9. **List Price:** $49.95. **Requires:** Apple II series; 64K RAM. *The Learning Company, 6493 Kaiser Drive, Fremont, CA 94555; (800) 852-2255*

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Students design games and then teach the computer how to beat human opponents. This program explores principles of artificial intelligence central to the study of cognitive science and advanced computer programming. (12/87) **Grade Level:** 6–12. **List Price:** single-user for IIe or IIc, $87.45; five-disk lab pack for IIe or IIc, $137.45; single-user IIGS, $87.45. **Requires:** Apple IIe or IIc with 128K RAM; IIGS with 256K RAM. *Scholastic, Inc., 730 Broadway, New York, NY 10003; (212) 505-3000*

LANGUAGE ARTS

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An amazing program that guides students through creative and organizational phases of writing and then gathers student-provided information into a rough outline. Also offers techniques for evaluating document readability. (12/87) **Grade Level:** 7–12. **List Price:** $120. **Requires:** Apple IIe (enhanced), IIc, or IIGS; 64K RAM. *Conduit, The University of Iowa, Oakdale Campus, Iowa City, IA 52242; (319) 335-4100*

Show Time
Simulation lets students write script, give stage directions, choose cast, design set, score music, and rehearse production. **Grade Level:** 6-9. (12/87) **List Price:** $49. **Requires:** Apple II series, 64K RAM. *MECC, 3490 Lexington Avenue North, St. Paul, MN 55126; (612) 481-3500*

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This simulation of a journalism career rewards good grammar, spelling, punctuation, and proofreading skills with financial and professional success. The game is challenging, the competition ruthless, and the pay lousy. Just like real life. (12/87) **Grade Level:** 10 and above. **List Price:** $44.95. **Requires:** Apple II Plus, IIe, IIc, or IIGS; 48K RAM. *DesignWare, 185 Berry Street, San Francisco, CA 94107; (415) 546-1866*

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Simulates experiences of westbound pioneers, circa 1840-1848. Surviving the hazards of nature, ill-health, and random fate requires analytical skills. (12/87) **Grade Level:** 5-12. **List Price:** 5¼-inch disk, $55; 3.5-inch disk, $59. **Requires:** Apple II Plus, IIe, IIc, or IIGS; 64K RAM. *MECC, 3490 Lexington Avenue North, St. Paul, MN 55126; (612) 481-3500*

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With a touch screen and fingers, young students practice Palmer Manuscript Penmanship along with letter-recognition and reading skills. (12/87) **Grade Level:** K-3. **List Price:** single-user, $75; ten-disk lab pack, $225. **Requires:** Apple II series, 64K RAM, Touch Window, color monitor. *Sunburst Communications, 39 Washington Avenue, Pleasantville, NY 10570; (800) 431-1934 or (914) 769-5030*

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Integrated productivity program especially for students includes word processing, outliner, calendar, flash-card maker, calculator, and grade keeper. (12/87) **Grade Level:** 10 and above. **List Price:** single-user, $89.95; ten-disk lab pack, $249.95. **Requires:** Apple IIe (enhanced) or IIc, 128K RAM. *Davidson & Associates, Inc., 3135 Kashiwa Street, Torrance, CA 90505; (213) 534-4070*

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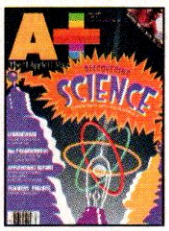

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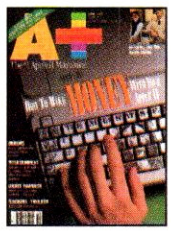

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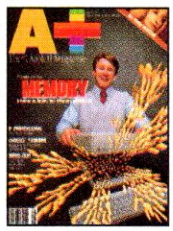

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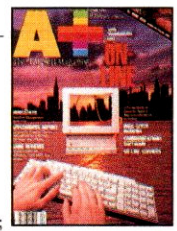

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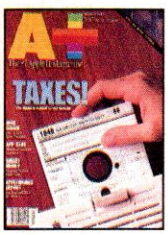

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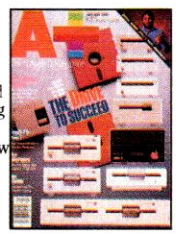

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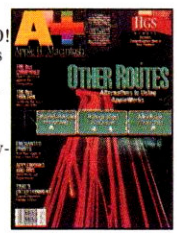

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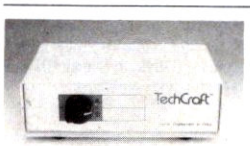

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Vividly written and inventively plotted, the three Zorks represent a watershed accomplishment in text adventuring. (12/87) **List Price:** $69.95. **Requires:** Apple II Plus, IIe, IIc, or IIGS; 48K RAM. *Infocom, 125 Cambridge Park Road, Cambridge, MA 02140; (617) 492-6000; (800) 262-6868 (mail-order department)*

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You awake from a cryogenic sleep and learn that the surface of the planet is in mortal danger. From a subterranean location, you guide robots into discovering what has befallen your world. A fascinating plot highlights this inventive text adventure. (12/87) **List Price:** $14.95. **Requires:** Apple II Plus, IIe, IIc, or IIGS; 48K RAM. *Infocom, 125 Cambridge Park Road, Cambridge, MA 02140; (617) 492-6000, (800) 262-6868 (mail-order department)*

The Wizard and the Princess
The first color graphic adventure. Though technically surpassed, The Wizard and the Princess still charms with quaint pictures and challenging puzzles. (12/87) **List Price:** $7.99. **Requires:** Apple II Plus, IIe, IIc or IIGS; 64K RAM. *ShareData, 7400 West Detroit Street, Suite 170, Chandler, AZ 85226; (602) 961-7519*

King's Quest I & II
Control an animated Little Man as he wanders through a fairy-tale kingdom in a variety of daring quests. A breakthrough in real-time, animated graphic adventures. (12/87) **List Price:** $49.95 (upgrade from IIe or IIc version to IIGS, $10). **Requires:** Apple IIe or IIc with 128K RAM or Apple IIGS with 512K RAM. *Sierra On-Line, Inc., P.O. Box 485, Coarsegold, CA 93614; (209) 683-6858*

Ultima I, III, IV
Epic in scope and fascinating in detail, this long-running series of fantasy/role-playing adventures continues to set new standards in Apple sword-and-sorcery swashbuckling. (12/87) **List Price:** Ultima I and III, $39.95; Ultima IV, $59.95. **Requires:** Apple II Plus, IIe, IIc, or IIGS; 64K RAM. *Origin Systems, distributed by Brøderbund, 17 Paul Drive, San Rafael, CA 94903; (415) 492-3500*

Wizardry I-III
The three Wizardry scenarios are renowned as the thinking man's role-playing game. With unique wit and devilish mapping challenges, Wizardry captures the illusion of life as does no other role-playing game. (12/87) **List Price:** Wizardry I, $49.95; Wizardry II, $34.95; Wizardry III, $39.95. **Requires:** Apple II Plus, IIe, IIc, or IIGS; 48K RAM. *Sir-Tech Software, PO. Box 245, Ogdensburg, NY 13669; (315) 393-6633*

The Bard's Tale I & II
Hack and slash never looked so good. Detailed, scrolling, point-of-view dungeons make Bard's Tale the glamour boy among role-playing games. The stunning graphics and sound of the IIGS version place it in a class by itself. (12/87) **List Price:** $44.95. **Requires:** Apple II Plus, IIe, or IIc with 64K RAM or Apple IIGS with 512K RAM. *Electronic Arts, 1820 Gateway Drive, San Mateo, CA 94404; (415) 571-7171*

Shanghai
The ivory tiles of the Mah Jongg board game are piled into a computerized classic. Whether you play it as solitaire or in the head-to-head competitive mode, matching and removing the brightly colored tiles is an endlessly hypnotic experience. (12/87) **List Price:** $44.95. **Requires:** Apple IIGS, 512K RAM. *Activision, P.O. Box 7287, Mountain View, CA 94039; (800) 227-9759; in CA (415) 940-6044*

Hacker II
View four simultaneous video monitors on a single Apple computer screen. Guide robots through a Soviet military installation and steal secret plans. Hacker II has the tension of an espionage film and the qualities of a software classic. (12/87) **List Price:** $39.95. **Requires:** Apple IIGS; 512K RAM. *Activision, P.O. Box 7287, Mountain View, CA 94039; (800) 227-9759; in CA (415) 940-6044*

Chessmaster 2000
Computerized chess the way it ought to be. Graphically attractive and strategically devastating, Chessmaster 2000 plays an excellent game of chess. (12/87) **List Price:** $39.95. **Requires:** Apple II Plus, IIe, IIc, or IIGS; 64K RAM. *Software Toolworks, Distributed by Electronic Arts, 1820 Gateway Drive, San Mateo, CA 94404; (415) 571-7171*

Lords of Conquest
Inspired by the board game Risk, this program gives down-home dictators the power, the prestige, and the perseverance to conquer up to 19 different worlds. (12/87) **List Price:** $39.95. **Requires:** Apple II Plus, IIe, IIc, or IIGS; 64K RAM. *Electronic Arts, 1820 Gateway Drive, San Mateo, CA 94404; (415) 571-7171*

Archon II
This elegant mix of board-game strategy and real-time arcade combat has players jockeying for mystical position in an ever-changing universe of force fields and magical influence. A sequel that's better than the original. (12/87) **List Price:** $14.95. **Requires:** Apple II Plus, IIe, IIc, or IIGS; 64K RAM. *Electronic Arts, 1820 Gateway Drive, San Mateo, CA 94404; (415) 571-7171*

Europe Ablaze
This compact and fast-paced simulation of WWII air battle is an easily mastered system of interlocking command menus that makes the complex statistics of war games accessible to newcomers. (12/87) **List Price:** $50 **Requires:** Apple II Plus, IIe, IIc, or IIGS; 64K RAM. *Strategic Studies Group, distributed by Electronic Arts, 1820 Gateway Drive, San Mateo, CA 94404; (415) 571-7171*

Rebel Charge at Chickamauga
One of the most evenly contested battles of the American Civil War becomes an intensely grand tactical war game. Introductory and advanced versions make it appealing to players of varying abilities. (12/87) **List Price:** $49.95. **Requires:** Apple II Plus, IIe, IIc, or IIGS; 64K RAM. *Strategic Simulations, Inc., 1046 North Rengstorff Avenue, Mountain View, CA 94043; (415) 964-1353*

Conflict in Vietnam
This war-game simulation raises and answers some questions about the unfortunate realities of U.S. military involvement in SE Asia. A well-written manual provides historical background and insight. (12/87) **List Price:** $39.95. **Requires:** Apple II Plus, IIe, IIc, or IIGS; 64K RAM. *MicroProse, 120 Lakefront Drive, Hunt Valley, MD 21030; (301) 771-1151*

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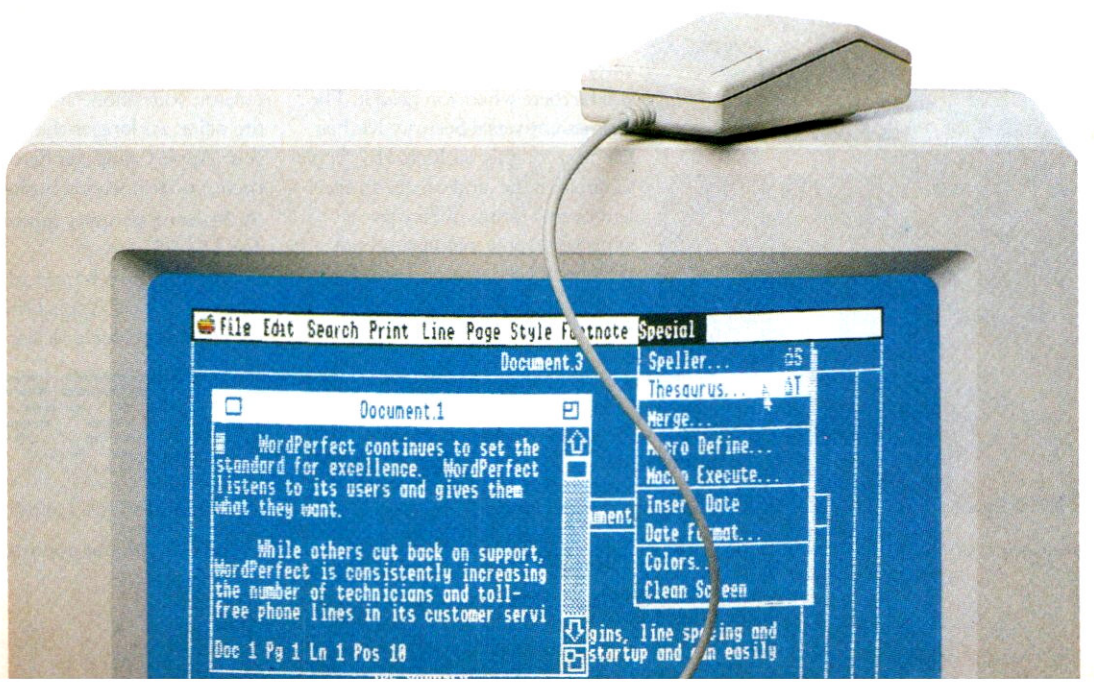

PRODUCT ALL-STARS

Wilderness
With scrolling 360-degree graphics and life-threatening dangers, Wilderness teaches you that it's not nice to challenge Mother Nature. (12/87) **List Price:** $29.95. **Requires:** Apple II Plus, IIe, IIc, or IIGS; 64K RAM. *Electric Transit, distributed by Spectrum Holobyte, 2061 Challenger Drive, Alameda, CA 94501; (415) 522-3584*

Flight Simulator II
Faster and flashier than the original, Flight Simulator II enables Apple II owners to soar like a mechanical bird while keeping all office-chair wheels firmly on the ground. Includes a WWI air-combat mode for action fans. (12/87) **List Price:** $49.95. **Requires:** Apple II Plus, IIe or IIc; 64K RAM. *subLogic Corporation, 713 Edgebrook Drive, Champaign, IL 61820; (800) 637-4983 or (217) 359-8482*

The Seven Cities of Gold
Whether you see it as a graphics adventure or as a simulation of cultural invasion, The Seven Cities of Gold is a brilliant combination of fantasy and education. It simulates the explorations, and sometimes the slaughters, of 16th-century Spanish conquistadors. (12/87) **List Price:** $14.95. **Requires:** Apple II Plus, IIe, IIc, or IIGS; 64K RAM. *Electronic Arts, 1820 Gateway Drive, San Mateo, CA 94404; (415) 571-7171*

Loderunner
Run through a convoluted array of ladders and levels, stealing gold and eluding your pursuers. Loderunner offers more levels than you can imagine and a build-it-yourself construction set as well. Addictive, puzzle-solving game play. (12/87) **List Price:** $34.95. **Requires:** Apple II Plus, IIe, IIc, or IIGS; 48K RAM. *Brøderbund, 17 Paul Drive, San Rafael, CA 94903; (415) 492-3500*

Pinball Construction Set
One of the classics. All the electronic tools and parts you'll need to build your own on-screen pinball machines. The granddaddy of construction sets and still the best. (12/87) **List Price:** $14.95. **Requires:** Apple II Plus, IIe, IIc, or IIGS; 48K RAM. *Electronic Arts, 1820 Gateway Drive, San Mateo, CA 94404; (415) 571-7171*

Choplifter!
In addition to making the two-button joystick standard equipment for Apple-game players, Choplifter! brought humanity to the arcade game. Pilot a helicopter behind enemy lines and rescue wildly waving prisoners. They may be stick figures, but they'll steal your heart. Packaged with the pinball game David's Midnight Magic. (12/87) **List Price:** $14.95. **Requires:** Apple II Plus, IIe, IIc, or IIGS; 64K RAM. *Brøderbund, 17 Paul Drive, San Rafael, CA 94903; (415) 492-3500*

GRAPHICS

Blazing Paddles
The best standard-hi-res paint program, Blazing Paddles lets you see the entire graphic as you work. It works with a variety of input devices from mouse to light pen and has a full range of cut, paste, zoom, and color-mixing functions. (12/87) **List Price:** $34.95. **Requires:** Apple II Plus, IIe, IIc, or IIGS; 64K RAM. *Baudville, 1001 Medical Park Drive SE, Grand Rapids, MI 49506; (616) 957-3036*

Dazzle Draw
This double-hi-res paint program was one of the first to emulate the Macintosh interface. All the necessary art tools are here, although it would be better if it displayed the full screen. Menu bar and tool windows obstruct the view. (12/87) **List Price:** $49.95. **Requires:** Apple IIe, IIc, or IIGS; 128K RAM. *Brøderbund, 17 Paul Drive, San Rafael, CA 94903; (415) 492-3500*

DeluxePaint II
The best super-hi-res paint program, with every possible feature you could wish for and a few you may not have thought possible on an Apple II. It belongs in every IIGS software library. (12/87) **List Price:** $99.95. **Requires:** Apple IIGS; 768K RAM. *Electronic Arts, 1820 Gateway Drive, San Mateo, CA 94404; (415) 571-7171*

Take 1
Tools and keystroke commands bring animated life to hi-res graphics. The program animates graphics or text, allows integration of sound effects, and compresses hi-res backgrounds to economize on disk space. Take 1 Programmers' Toolkit helps convert animations into viewer-responsive interactive presentations. (12/87) **List Price:** Take 1, $59.95; Take 1 Programmers' Toolkit, $60. **Requires:** Apple II Plus, IIe, IIc, or IIGS; 64K RAM. *Baudville, 1001 Medical Park Drive SE, Grand Rapids, MI 49506; (616) 957-3036*

Animate
Thsi superb double-hi-res program provides tools and utilities for creating frame animation on the Apple II. Draw the frames and plot the object's path across the screen, and Animate does the rest. Animate has a pull-down-menu interface similar to that of Dazzle Draw and offers graphics compatibility with that program. (12/87) **List Price:** $59.95. **Requires:** Apple IIe, IIc, or IIGS; 128K RAM. *Brøderbund, 17 Paul Dive, San Rafael, CA 94903; (415) 492-3500*

The Graphics Magician
This most enduring of all Apple II graphics programs offers both a game-style animation module and paint-oriented sequential-picture module in standard- and double-hi-res modes. Four years old but still in use by professional developers. (12/87) **List Price:** $39.95. **Requires:** Apple II Plus, IIe, IIc, or IIGS; 48K RAM. *Polarware, 1055 Paramount Parkway, Suite A, Batavia, IL 60510; (312) 232-1984*

Fontrix
Fontrix was the first Apple II program to mix text and graphics on a full-page printout. It's suitable for creating newsletters, fliers, and other printed material. Works with an astonishing array of printers and additional FontPaks font disks. (12/87) **List Price:** $75. **Requires:** Apple II Plus, IIe, IIc, or IIGS; 48K RAM. *Data Transforms, 616 Washington Street, Denver, CO 80203; (303) 832-1501*

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For 128K Apple or compatible; printer recommended. Only $24.95 (includes shipping). Got IIGS or 256K RAM? 1040Works-X uses larger AppleWorks desktop to save steps and time, $27.95. Either on 3.5-inch disk, add $3. In NY add state/local tax. Sorry, no bank card orders.

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Virgin ideas

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

II cue #36

If your computer interferes with your TV, some simple solutions are to plug the computer and TV into separate AC circuits, move the two farther apart, to rotate or reposition your TV antenna, or to replace the TV's twin-lead antenna cable with 75 ohm TV cable. Other possible solutions are to wrap all the cables coming out of your computer around "ferrite cores," or to put line filters on your power outlets. For more, see "Mopping up EMI" in the November 1987 ***Open-Apple***, page 3.79.

From our fan mail:

I look forward to ***Open-Apple*** every month and figuratively devour it. It's a real fine publication, and has more than doubled the value of my Apple II.

Jim Upchurch
Montgomery, Ala.

Again, thank you for all the help you've provided. I really appreciate all the time you take to respond to most of the mail you receive. Keep up the good work but don't burn yourselves out.

Pete Ross
Wayne, Mich.

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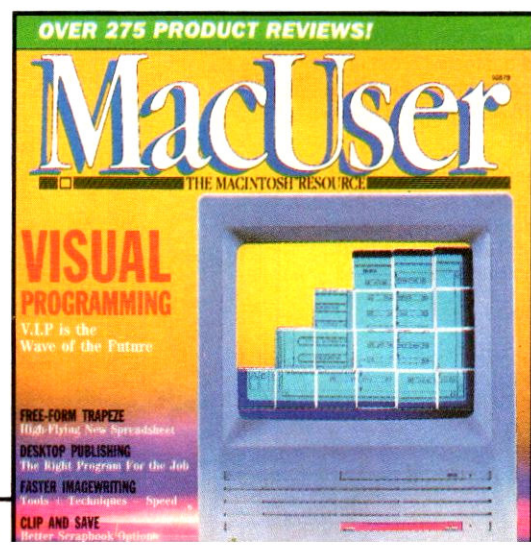

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pair. Shape Mechanic converts any standard-hi-res graphic to an Apple shape. Font Mechanic provides an easy way to put text on the Apple II graphics screen using font shapes. (12/87) **List Price:** Font Mechanic, $29.95; Shape Mechanic, $39.95. **Requires:** Apple II Plus, IIe, IIc, or IIGS; 64K RAM. *Beagle Bros Micro Software, Inc., 6215 Ferris Square, Suite 100, San Diego, CA 92121; (619) 296-6400*

The Graphics Department
Although it's showing its age, this program remains the most comprehensive hi-res business-graphics program available. A complete set of drawing tools and 40 different fonts aid in the creation of slide shows and other presentations. (12/87) **List Price:** $124.95. **Requires:** Apple IIe, IIc, or IIGS; 64K RAM. *Sensible Software, Inc., 335 East Big Beaver, Suite 207, Troy, MI 48484; (313) 528-1950*

Draw Plus
Draw Plus is a two-dimensional drawing program that can display up to eight drawing windows at a time. Its text commands are cramped into a dialog box, and it has a crude set of default fill patterns, but its rulers have a wide range of customizing options, and its icon library offers a handy place to store frequently used objects. (1/88) **List Price:** $89.95. **Requires:** Apple IIGS, 512K RAM. *Activision, Inc., P.O. Box 7287, Mountain View, CA 94039; (415) 960-0518*

TopDraw
This color drawing program contains more object-editing and -moving commands than you might expect for such a moderate price. It is limited to working within a single drawing window and has a weak Undo command but provides a rich set of colored pattern fills and a simple palette-editing option. **List Price:** $89.95 **Requires:** Apple IIGS, 512K RAM. *StyleWare, Inc., 5250 Gulfton, Suite 2E, Houston, TX 77081; (800) 233-4086; in TX (713) 668-0743*

Timeout Graph
This Timeout desk accessory for AppleWorks lets you create seven basic types of business graphs from AppleWorks spreadsheet data. **List Price:** $89.95 **Requires:** Apple IIe, IIc, or IIGS; 128K RAM. *Beagle Bros, Inc., 6215 Ferris Square, Suite 100, San Diego, CA 92121; (619) 296-6400*

Graphic Edge
A stand-alone graphing program that creates eight different chart types from AppleWorks spreadsheet data. **List Price:** $89. **Requires:** Apple IIe (enhanced), IIc, or IIGS; 128K RAM. *Pinpoint Publishing, Inc., 5865 Doyle Street, #112, Emeryville, CA 94608; (415) 654-3050*

HOME EDUCATION

READING AND LANGUAGE ARTS

Richard Scarry's Best Electronic Word Book Ever
Scarry's storybook characters present basic reading skills. **Grade Level:** 1–6. **List Price:** $29.95. **Requires:** Apple II Plus, IIe, or IIc; 64K RAM. *Mindscape, Inc., 3444 Dundee Road, Northbrook, IL 60062; (312) 480-7667*

Grammar Gremlins
Children learn basic rules of grammar as they take a trip through a haunted house. **Grade Level:** 3–6. **List Price:** $49.95. **Requires:** Apple II Plus, IIe, IIc, or IIGS; 64K RAM. *Davidson & Associates, 3135 Kashiwa Street, Torrance, CA 90505; (213) 543-4070*

Word Attack
Arcade-game instructional format introduces new words and their meanings. There are 675 words, 9 levels of difficulty, and an SAT preparation section. **Grade Level:** 4–12. **List Price:** $49.95. **Requires:** Apple II Plus, IIe, IIc, or IIGS; 64K RAM. *Davidson & Associates, 3135 Kashiwa Street, Torrance, CA 90505; (213) 543-4070*

Writer Rabbit
Children learn basic sentence and paragraph structure while playing a six-game sequence. The program allows children to write and print silly stories of their own creation. **Grade Level:** 2–4. **List Price:** $49.95. **Requires:** Apple II Plus, IIe, IIc, or IIGS; 64K RAM. *The Learning Company, 6439 Kaiser Drive, Fremont, CA 94555; (800) 852-2255*

Wordmaze
Players look for secret words hidden in a maze of scrambled letters. **Grade Level:** 3 and up. **List Price:** $49.95. **Requires:** Apple II Plus, IIe, or IIc; 48K RAM. *Mindscape, Inc., 3444 Dundee Road, Northbrook, IL 60062; (312) 480-7667*

Snoopy Writer
This program for beginning writers allows expression of ideas with the help of Snoopy and his friends. Children can write, edit, and print. **Grade Level:** 1–6. **List Price:** $39.95. **Requires:** Apple IIe, IIc, or IIGS; 64K RAM. *Random House Media, 201 East 50th Street, New York, NY 10022; (212) 572-2553*

Microzine
An award-winning computer-learning library that comes on a disk. Individual disks cover a wide range of academic subject areas and grade levels. **List Price:** $49.95. **Requires:** Apple II Plus, IIe, or IIc; 48K RAM. *Scholastic, Inc., 730 Broadway, New York, NY 10003; (212) 505-3020*

Snake-o-nyms & Word Flip
A word game that uses synonyms and antonyms and increases in speed as scores get higher. **Grade Level:** 2 and up. **List Price:** $34.95. **Requires:** Apple II Plus, IIe, IIc, or IIGS; 48K RAM. *Milliken Publishing, 1100 Research Blvd., P.O. Box 21579, St. Louis, MO 63132; (314) 991-4220*

MATHEMATICS

Alien Addition
Children can practice basic addition while they roam through space. **Grade Level:** 1–5. **List Price:** $46. **Requires:** Apple II Plus, IIe, IIc, or IIGS; 48K RAM *DLM Teaching Resources, One DLM Park, Allen, TX 75002; (800) 527-5030*

Quations
Players build math skills as they create equations on a Scrabble-like screen. Up to three can play. **Grade Level:** 4 and up. **List Price:** $49.95. **Requires:** Apple II Plus, IIe, IIc, or IIGS; 48K RAM. *Scholastic Software, 730 Broadway, New York, NY 10003; (212) 505-3020*

Math Rabbit
Children develop counting, addition, subtraction, and multiplication concepts and number-recognition skills as they play circus games. Math Rabbit in a clown costume, number trains pulled by elephants, and music make the program visually exciting and fun. **Grade Level:** K–2.**List Price:** $39.95. **Requires:** Apple II Plus, IIe, IIc, or IIGS; 64K RAM. *The Learning Company, 6439 Kaiser Drive, Fremont, CA 94555; (800) 852-2255*

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stranded, you must solve math and logic problems. **Grade Level:** 6 and up. **List Price:** $34.95. **Requires:** Apple II Plus, IIe, IIc, or IIGS; 48K RAM. *Milliken Publishing, 1100 Research Blvd., P.O. Box 21579, St. Louis, MO 63132; (314) 991-4220*

Webster's Numbers
This program teaches the basics of counting to the very young. Concepts are presented in a magical place where children race balloons, play with mosquitoes in mazes, and build with shapes. **Grade Level:** Preschool–2. **List Price:** $39.95. **Requires:** Apple II Plus, IIe, IIc, or IIGS; 64K RAM. *EduWare Services, 185 Berry Street, San Francisco, CA 94107; (415) 546-1866*

Fay: That Math Woman
Fay helps children visualize math concepts by putting their answers on a number line. **Grade Level:** K–3. **List Price:** $29.95. **Requires:** Apple II Plus, IIe, IIc, or IIGS; 48K RAM. *Didatech Software, Ltd., 3812 William Street, Burnaby, BC Canada V5C 3H9; (604) 299-4435*

GENERAL SCIENCE

Dinosaur Dig
Learn all about your favorite dinosaurs while playing games that give names, dates of existence, and size of specific dinosaurs. Children self-test their knowledge with flash cards. **Grade Level:** 3 and up. **List Price:** $49.95. **Requires:** Apple II Plus, IIe, or IIc; 48K RAM. *Mindscape, Inc., 3444 Dundee Road, Northbrook, IL 60062; (312) 480-7667*

The Secret of Science Island
Player must unlock the secrets of survival after being shipwrecked right at the start of the hurricane season. Secrets are revealed for each correct answer to a science riddle. **Grade Level:** 4 and up. **List Price:** $39.95. **Requires:** Apple II Plus, IIe, IIc, or IIGS; 64 or 128K RAM (two versions) *Grolier Electronic Publishing Company, Sherman Turnpike, Danbury, CT 06816; (800) 858-8858 or (203) 797-3500*

The Halley Project: A Mission in our Solar System
A simulated mission through our solar system is guided by mastery of astronomy concepts. Data collection, analysis, synthesis, and hypothesis testing are encouraged by this program. **Grade Level:** 5–12. **List Price:** $44.95. **Requires:** Apple II Plus, IIe, IIc, or IIGS; 64K RAM. *Mindscape, Inc., 3444 Dundee Road, Northbrook, IL 60062; (312) 480-7667*

ENRICHMENT/GENERAL ENTERTAINMENT

Mr. & Mrs. Potato Head
Allows players to mix and match body parts to create their own potato people. Disk also includes three memory games to sharpen concentration skills. **Grade Level:** Preschool–3. **List Price:** $29.95. **Requires:** Apple IIe, IIc, or IIGS; 64K RAM. *Random House School Division, 400 Hahn Road, Westminster, MD 21157; (800) 638-6460; in MD (301) 848-1900*

Sea Voyagers
An interactive game that chronicles the lives of New World Explorers. Players learn historical facts such as voyage routes, accomplishments, and countries of origin. **Grade Level:** 3 and up. **List Price:** $49.95. **Requires:** Apple II Plus, IIe, or IIc; 48K RAM. *Mindscape, Inc., 3444 Dundee Road, Northbrook, IL 60062; (312) 480-7667*

Great States Race
Players fly across the USA in hot-air balloons and answer questions about state capitals, cities, famous people, and other topics of interest. **Grade Level:** 4–6. **List Price:** $34.95. **Requires:** Apple II Plus, IIe, IIc, or IIGS; 48K RAM. *Milliken Publishing, 1100 Research Blvd., P.O. Box 21579, St. Louis, MO 63132; (314) 991-4220*

Car Builder
In this program, you can design, build, and test custom cars that you create. The design capabilities cover the chassis, engine, and body. **Grade Level:** 8 and up. **List Price:** $39.95. **Requires:** Apple II Plus, IIe, IIc, or IIGS; 48K RAM. *Weekly Reader Software, 245 Long Hill Road, Middletown, CT 06457; (203) 638-2400*

French Micro Scrabble
Scrabble in French that allows four players to compete at different skill levels. Program contains a 20,000-word spelling checker. **Grade Level:** 9th and up. **List Price:** $39.95. **Requires:** Apple II Plus, IIe, IIc, or IIGS; 64K RAM. *Gessler Educational Software, 900 Broadway, New York, NY 10003; (212) 673-3113*

Stickers
This flexible program encourages creativity and problem solving. Children select and position sticker items in pictures of their own design. **Grade Level:** Preschool–5. **List Price:** $34.95. **Requires:** Apple II Plus, IIe, IIc, or IIGS; 64K RAM. *Springboard Software, Inc., 7808 Creekridge Circle, Minneapolis, MN 55435; (612) 944-3915*

Crosscountry USA
A simulated big-rig driving experience that teaches geography, map reading, and money management. The goal is to deliver vital commodities to major U.S. cities with out getting caught for speeding. **Grade Level:** 5 and up. **List Price:** $39.95. **Requires:** Apple II Plus, IIe, IIc, or IIGS; 64K RAM. *Didatech Software, Ltd., 3812 William Street, Burnaby, BC, Canada V5C 3H9; (604) 299-4435*

INTEGRATED

AppleWorks
AppleWorks has plenty of features that users want. The people's choice, hardworking and affordable. It gives you spreadsheet, database, and word-processing capabilities in one tidy package. (12/87) **List Price:** $249. **Requires:** Apple IIe, IIc, or IIGS; 128K RAM. *Claris Corporation, 20525 Mariani Avenue, Cupertino, CA 95014; (415) 960-1500*

Foundation
Although difficult to learn, Foundation, an integrated program with a relational database, is worth it. Appropriate for almost any data-processing application. Some file-compatibility with AppleWorks. (12/87) **List Price:** $300. **Requires:** Apple IIe, IIc, or IIGS; 128K RAM. *Foundation Corporation, 506 West Armitage, Chicago, IL 60614; (312) 880-5761*

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A/D SPECIFICATIONS
- 0.3% accuracy
- On-board memory
- Fast conversion (.078 MS per channel)
- A/D process totally transparent to Apple (looks like memory)
- User programmable input ranges are 0 to 10 volts, 0 to 5, −5 to +5, −2.5 to +2.5, −5 to 0, −10 to 0.

The A/D process takes place on a continuous, channel sequencing basis. Data is automatically transferred to its proper location in the on-board RAM. No A/D converter could be easier to use.

D/A SPECIFICATIONS
- 0.3% accuracy
- On-board memory
- On-board output buffer amps can drive 5 MA
- D/A process is totally transparent to the Apple (just poke the data)
- Fast conversion (.003 MS per channel)
- User programmable output ranges are 0 to 5 volts and 0 to 10 volts

The D/A section contains 8 digital to analog converters, with output buffer amplifiers and all interface logic on a single card. On-card latches are provided for each of the eight D/A converters. No D/A converter could be easier to use. The on-board amplifiers are laser-trimmed during manufacture, thereby eliminating any requirement for off-set nulling.

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Our 8 channel signal conditioner is designed for use with both our A/D converters. This board incorporates 8 F.E.T. op-amps, which allow almost any gain or offset. For example, an input signal that varies from 2.00 to 2.15 volts or a signal that varies from 0 to 50 mV can easily be converted to 0-10V output for the A/D.

The signal conditioner's outputs are on a high quality 16 pin gold I.C. socket that matches the one on the A/D's so a simple ribbon cable connects the two. The signal conditioner can be powered by your Apple or from an external supply.

FEATURES
- 4.5" square for standard card cage and 4 mounting holes for standard mounting. The signal conditioner does not plug into the Apple, it can be located up to ½ mile away from the A/D.
- 22 pin .156 spacing edge card input connector (extra connectors are easily available i.e. Radio Shack).
- Large bread board area.
- Full detailed schematic included.

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MUSIC

The Music Studio
A comprehensive IIGS music-composition program with pull-down menus and mouse-driven note entry. Color-coded notation indicates which of 15 instrumental timbres are in use. (12/87) **List Price:** $79.95. **Requires:** Apple IIGS, 512K RAM. *Activision, P.O. Box 7287, Mountain View, CA 94039; (800) 227-9759; in CA (415) 940-6044*

Instant Music
Unabashed musical amusement for nonmusicians, Instant Music lets you move your mouse to play along with a variety of digitized sound tracks. Uses nonstandard musical notation of colored bars instead of notes and staves. Results can be weird, campy, and a lot of fun. (12/87) **List Price:** $49.95. **Requires:** Apple IIGS; 512K RAM. *Electronic Arts, 1820 Gateway Drive, San Mateo, CA 94404; (415) 571-7171*

KidsTime II
This music-education program uses a grand staff and simulated keyboard to assist youthful composers. In KidsNote option, you choose note duration and click on the on-screen piano key for pitch, and the note is entered on the staff. Not as musically sophisticated as other IIGS programs, but accessible for younger musicians. For ages 3-10. (12/87) **List Price:** $39.95. **Requires:** Apple IIGS; 512K RAM. *Great Wave Software, 5353 Scotts Valley Drive, Scotts Valley, CA 95066; (408) 438-1990*

Music Construction Set (for IIGS)
The digitized sonics of the IIGS add new interest to this venerable Apple composition program. Not as graphically imaginative as some of the competition, but simplicity and innovation make it the most foolproof of note-dragging programs. (12/87) **List Price:** $49.95. **Requires:** Apple IIGS; 256K RAM. *Electronic Arts, 1820 Gateway Drive, San Mateo, CA 94404; (415) 571-7171*

The Music Class
Children are taught such music fundamentals as rhythm, ear-training, note-reading, and music symbols in this five-part, ten-disk package. Clever animated characters keep the subject lively. (12/87) **List Price:** $195. **Requires:** Apple II Plus, IIe, IIc, or IIGS; 64K RAM. *Coda Music Software, A Wenger Company, 1401 East 79th Street, Bloomington, MN 55420; (800) 843-1337*

Note-Us
MIDI support spices up this drill-and-practice program for sight-reading and interval recognition. (12/87) **List Price:** $129.95. **Requires:** Apple II Plus, IIe, IIc, or IIGS; 48K RAM. *Computers & Me, Ltd., 10 Ashbrook Road, Exeter, NH 03833; (603) 772-4399*

MIDI Music Tutor
This drill-and-practice package of music fundamentals incorporates a Record Keeper that enables teachers to maintain student performance records and modify lessons. Works with MIDI instruments. (12/87) **List Price:** $229.95. **Requires:** Apple II Plus, IIe, IIc, or IIGS; 64K RAM. *Passport Designs, Inc., 625 Miramontes Street, #103, Half Moon Bay, CA 94019; (415) 726-0280*

Guitar Wizard
Four basic areas of study comprise this guitar-tutorial program. Locates chords in different positions; displays fingerings, intervals, and notes for various scales; teaches basics of fret-board harmony and open tunings; and suggests scales appropriate for improvisation. Astonishingly complete. (12/87) **List Price:** $29.95. **Requires:** Apple II Plus, IIe, IIc, or IIGS; 64K RAM. *Baudville, 1001 Medical Park Drive SE, Grand Rapids, MI 49506; (616) 957-3036*

Stickybear Music
To accommodate less-agile young hands, this music-education program uses the space bar instead of a mouse to position notes in the staff. Notes are big and fat for youngsters to follow. For ages 7 and up. (12/87) **List Price:** $39.95. **Requires:** Apple II Plus, IIe, IIc, or IIGS; 48K RAM. *Weekly Reader Software, Optimum Resource, Inc., 10 Station Place, Norfolk, CT 06058; (800) 327-1473 or (203) 542-5553*

Peter and the Wolf Music
Prokofiev's famed instrumental story gives children an introduction to pitches, chords, and melody. For ages 3-7. (12/87) **List Price:** $39.95. **Requires:** Apple II Plus, IIe, IIc, or IIGS; 64K RAM. *Fisher-Price Learning Software, 1 Kendall Square, Cambridge, MA 02139; (617) 494-1222*

Foundations of Music: A Computer-Assisted Introduction
A beautifully written textbook, with accompanying computer disk, on scales, intervals, and other music fundamentals. (12/87) **List Price:** $31.25. **Requires:** Apple II Plus, IIe, IIc, or IIGS; 48K RAM. *Wadsworth Publishing Company, 10 Davis Drive, Belmont, CA 94002; (415) 595-2350*

PERSONAL FINANCE

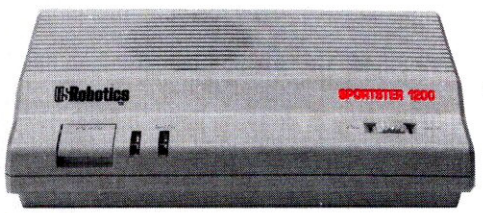
Quicken
One of the easiest checkbook-balancing programs. Quicken has data-entry screens that look like a checkbook and checkbook register. It follows the AppleWorks file-folder interface and can export data to AppleWorks. (12/87) **List Price:** $49. **Requires:** Apple IIe, IIc, or IIGS; 128K RAM. *Intuit, 540 University Avenue, Palo Alto, CA 94301; (800) 624-8742; in CA (800) 468-8481*

On Balance
This checkbook-balancing program accepts keyboard or mouse input and reports information in statistical or bar-graph form. On Balance automatically fills in the account category based on the initial letters you type. (12/87) **List Price:** $99.95. **Requires:** Apple IIe (enhanced), IIc, or IIGS; 128K RAM. *Brøderbund, 17 Paul Drive, San Rafael, CA 94903; (415) 492-3500*

Dollars & Sense
With some of the hardheaded attitudes of a human CPA, Dollars & Sense lacks the flexibility of the competition, but it has more features. Doesn't export data directly to AppleWorks but can write DIF-format files (which can be imported into AppleWorks). (12/87) **List Price:** $119.95. **Requires:** Apple IIe (enhanced), IIc, or IIGS; 128K RAM. *Monogram, 367 Van Ness Way, Torrance, CA 90501; (213) 533-5120*

TELECOMMUNICATIONS

Point-to-Point
With an AppleWorks-like file-card display and transmission-protocol support that includes Binary II, Point-to-Point is the telecommunications program of choice. A new full-screen editor makes it even easier to use. (12/87) **List Price:** $129. **Requires:** Apple IIe, IIc, or IIGS; 128K RAM. *Pinpoint Publishing, 5865 Doyle Street, #112, Emeryville, CA 94608; (415) 654-3050*



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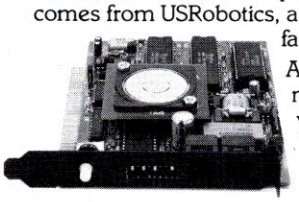

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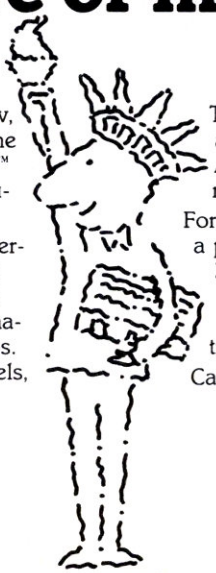

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PRODUCT ALL-STARS

MouseTalk
Easy to use and mouse-driven, MouseTalk boasts a review buffer and full-screen text editor. It oddly omits the Binary II transmission protocol, however, and file operations do not follow IIGS conventions. (12/87) **List Price:** $99.95. **Requires:** Apple IIe (enhanced), IIc, or IIGS; 128K RAM. *United Software Industries, Inc., 8399 Topanga Canyon Blvd., Canoga Park, CA 91304; (800) 332-7244 or (818) 887-5800*

Talk Is Cheap
This shareware includes Xmodem and Binary II protocols, along with an extensive macro-command language for automation of on-line functions. Turbo Xmodem downloading (to a RAMdisk) can speed data reception by 100%. Available from bulletin boards and data services. (12/87) **List Price:** $30 shareware. **Requires:** Apple IIe, IIc, or IIGS; 128K RAM. *Don Elton, Carolina System Software, 3207 Berkeley Forest Drive, Columbia, SC 29209-4111; written inquiries only*

FreeTerm GS
A true IIGS desktop terminal program with transmission limit of 2400 bps. Screen updates are slow. (12/87) **List Price:** Free. **Requires:** Apple IIGS, 512K RAM. *Available from bulletin boards and data services.*

CommWorks
One of the earliest communications programs to work with the IIGS. CommWorks resembles Point-to-Point but lacks review buffer and Binary II protocol support. Includes VT-100 terminal emulation. (12/87) **List Price:** $95. **Requires:** Apple IIe, IIc, or IIGS; 128K RAM. *PBI Software, 1163 Triton Drive, Foster City, CA 94404; (415) 349-8765*

ProTERM
Works with a wide variety of modems but has only limited expansion-RAM support. AutoLearn feature creates log-on sequences automatically. (12/87) **List Price:** $95. **Requires:** Apple IIe, IIc, or IIGS; 64K RAM. *Checkmate Technology, Inc., 509 South Rockford Drive, Tempe, AZ 85281-3021; (800) 325-7347*

MAUG Message Manager
If you participate heavily in the MAUG forum on CompuServe, this software can save you hundreds of dollars per year in connect fees. The price is the connect time you need to download it from MAUG. (12/87) **Requires:** Apple IIe, IIc, or IIGS; 64K RAM.

WORD PROCESSING

WordPerfect 1.1
Remarkably full-featured, WordPerfect 1.1 offers such niceties as print spooling, automatic footnoting, subscripts and superscripts, fonts, a 50,000-word spelling checker, and mail merge. The cost of this sophistication is a marked lack of speed and a steep learning curve. (12/87) **List Price:** $179. Apple IIe or IIc; 128K RAM. *WordPerfect Corporation, 288 West Center Street, Orem, UT 84057; (801) 227-4000*

Perfect Writer 2.0
This word-processing program combines a command-line interface with Mac-like menus and WYSIWYG text display. Perfect Writer is an impressive text formatter that's easy to learn and use and includes a 50,000-word spelling checker and thesaurus. (12/87) **List Price:** $139. **Requires:** Apple IIe or IIc; 64K RAM. *EMI Computer Software, Inc., 285 Mill Road, Chelmsford, MA 01824; (617) 256-3900*

MultiScribe GS 2.0
The first IIGS word-processing program to attain real stature. Lacks some features, such as automatic footnoting, but otherwise the mouse-driven design takes after and sometimes exceeds MacWrite. Variable fonts and the ability to cut and paste graphics make Multiscribe GS a delight. (12/87) **List Price:** $99.95. **Requires:** Apple IIGS; 512K RAM. *StyleWare, Inc., 5250 Gulfton, Suite 2E, Houston, TX 77081; (800) 233-4088 or (713) 668-0743*

AppleWriter II
A fine array of word-processing features include footnoting, split screens, and a programming language to set up form letters, perform math operations, and create macros. (12/87) **List Price:** $149. **Requires:** Apple IIe or IIc; 128K RAM. *Claris Corporation, 20525 Mariani Avenue, Cupertino, CA 95014; (415) 960-1500*

Sensible Writer
A Mac-like word-processing program that is compatible with AppleWorks, Sensible Writer offers features such as mail merge, Undo, Lock Document, and Append Document. (12/87) **List Price:** $99.95. **Requires:** Apple IIe (enhanced), IIc, or IIGS; 128K RAM. *Sensible Software, Inc., 335 East Big Beaver, Suite 207, Troy, MI 48011; (313) 528-1950*

MouseWrite
Mac-like design lacks full WYSIWYG capability but includes AppleWorks and DOS 3.3 file compatibility, 61,000-word spelling checker, telecommunications module, macros, and expandable desktop accessories. (12/87) **List Price:** $149.95. **Requires:** Apple IIe, IIc, or IIGS; 128K RAM. *Roger Wagner Publishing, Inc., 1050 Pioneer Way, Suite P, El Cajon, CA 92020; (619) 442-0522*

Gutenberg, Sr.
Allows users to create characters and fonts. Comes with Latin, Greek, Cyrillic, and Hebrew alphabets. Connects directly to typesetting equipment. (12/87) **List Price:** $230; new version scheduled for early 1988 release, $360. **Requires:** Apple IIe, IIc, or IIGS; 64K RAM. *Gutenberg Software, 47 Lewiston Road, Scarborough, Ontario M1P 1X8, Canada; (416) 757-3320*

Manuscript Manager/APA Style
Formats texts and checks writing style according to American Psychological Association conventions. (12/87) **List Price:** $175. **Requires:** Apple IIe (enhanced), IIc, or IIGS; 128K RAM. *Pergamon Journal, Inc., Maxwell House, Fairview Park, Elmsford, NY 10523; (914) 592-7700, Ext. 312*

Bank Street Writer Plus
This newly updated word-processing program is ideal for home use. (12/87) **List Price:** $79.95. **Requires:** Apple IIe, IIc, or IIGS; 128K RAM. *Brøderbund Software, 17 Paul Drive, San Rafael, CA 94903; (415) 492-3500*

Print-it!™

THE *PROVEN* APPLE COMPATIBLE PRINTER INTERFACE

The *ONLY* way to get fast, "snapshot" printouts from ANY screen, at ANY time, with ANY software program then AUTOMATICALLY RESUME OPERATION... at the Touch of a Button

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Print-it! is available from selected mail order companies, through your favorite computer dealer or directly from TEXPRINT[2] and comes complete with serial or parallel cable, push button and instructions. A **Save-it!** disk for transferring screen images to disk for slide shows is available separately.

1 Apple DMP/IMAGEWRITER/IMAGEWRITER II/SCRIBE, C. Itoh, Canon, Epson, NEC, Okidata/Okimate series, Panasonic, Radio Shack, Star Micronics, and many more.
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CIRCLE 343 ON READER SERVICE CARD

HomeWord Plus
With easy-to-understand icons to get you going, HomeWord is an attractive program for home users. (12/87) **List Price:** $69.95. **Requires:** Apple IIe, IIc, or IIGS; 128K RAM. *Sierra On-Line, Inc., P.O. Box 485, Coarsegold, CA 93614; (209) 683-6858.*

HARDWARE

ACCELERATORS

TransWarp
This venerable accelerator runs your IIe or II Plus software up to 3.6 times normal speed. It speeds up both main and auxiliary memory on the IIe, so it's ideal for AppleWorks number crunching. (8/86) **List Price:** $219. **Requires:** Apple II Plus or IIe. *Applied Engineering, P.O. Box 798, Carrollton, TX 75006; (214) 241-6060*

AUDIO/SOUND/SPEECH

Supersonic
A stereo-output card that connects to the GS Ensoniq chip. Output can be directed to a hi-fi stereo, headphones, or speakers. (7/87) **List Price:** $59.95. **Requires:** Apple IIGS. *MDIdeas, 1163 Triton Drive, Foster City, CA 94404; (800) 843-5722; in CA (800) 573-2746*

Supersonic Digitizer
This card plugs into the Supersonic card. You can use it to digitize incoming sound so that it may be played back through the Supersonic. (7/87) **List Price:** $59.95. **Requires:** Apple IIGS, Supersonic card. *MDIdeas, 1163 Triton Drive, Foster City, CA 94404; (800) 843-5722; in CA (800) 573-2746*

Phasor
A stereo music, sound, and speech synthesizer with 12 sound channels and 4 white-noise generators. Comes with software for composing songs and generating speech. **List Price:** $179. **Requires:** Apple II Plus, IIe, or IIGS. *Applied Engineering, P.O. Box 798, Carrollton, TX 75006; (214) 241-6060*

Echo IIb
A speech synthesizer that can translate ASCII text to understandable speech. Includes software that makes the chore of adding speech to your own Applesoft programs very easy. (2/84) **List Price:** $129.95. **Requires:** Apple II Plus, IIe, or IIGS. *Street Electronics, P.O. Box 50220, Santa Barbara, CA 93150; (805) 565-1612*

CLOCKS

TimeMaster H.O.
A versatile ProDOS-compatible clock that comes with plenty of software that shows how to use it with DOS 3.3, Pascal, and CP/M. Keeps track of the time and date to the millisecond and has a BSR port for X-10 home-control modules. (12/85) **List Price:** $99. **Requires:** Apple II Plus, IIe, or IIGS. *Applied Engineering, P.O. Box 798, Carrollton, TX 75006; (214) 241-6060*

No-Slot Clock
This unique device installs underneath a ROM chip on the motherboard. It comes with software for patching ProDOS to recognize the chip. (7/87) **List Price:** $59. **Requires:** Apple II Plus, IIe, or IIc. *Systems Technology Manufacturing (SMT), 1145 Linda Vista Drive, San Marcos, CA 92049; (619) 744-3590*

DIGITIZERS

ThunderScan
A low-cost device that replaces the ribbon cartridge in a standard ImageWriter printer and transforms the printer into a high-quality scanner. **List Price:** $249. **Requires:** Apple IIe, IIc, or IIGS; 64K RAM. *ThunderWare, Inc., 21 Orinda Way, Orinda, CA 94563; (415) 254-6581*

DRIVES/CONTROLLERS

Universal Disk Controller
This controller card can attach two 3.5-inch drives, two 5¼-inch drives, or one of each, to your system. (1/87) **List Price:** $90. **Requires:** Apple II Plus, IIe, or IIGS. *Central Point Software, 9700 SW Capitol Highway, Portland, OR 97219; (503) 244-5782*

Chinon 800K Drive
A low-cost 3.5-inch drive that works with the Universal Disk Controller. You can also attach it directly to the disk port on a Macintosh. (1/87) **List Price:** $199. **Requires:** Apple II Plus, IIe, or IIGS. *Central Point Software, 9700 SW Capitol Highway, Portland, OR 97219; (503) 244-5782*

HARD-DISK DRIVES

CMS SC20
A SCSI hard-disk drive with 20 megabytes of storage and an optional 40MB tape backup system. Can be shared by multiple Apple IIs and Macintoshes. (11/87) **List Price:** $895. **Requires:** Apple II Plus, IIe, or IIGS. *CMS Enhancements, 1372 Valencia Avenue, Tustin, CA 92680; (714) 259-9555*

Sider D2, D4
The most popular hard-disk drive for the Apple II family, the Sider works with all major Apple II operating systems. A tape backup unit is optional. (11/87) **List Price:** 20MB unit, $695; 40MB, $995. **Requires:** Apple II Plus, IIe, or IIGS. *First Class Peripherals, 3579 Highway 50 East, Carson City, NV 89701; (800) 982-3232; in NV (702)883-4000*

ProApp 20
This versatile hard-disk drive works with DOS 3.3, ProDOS, and Pascal. You can have a coresident Mac partition. (11/87) **List Price:** $850. **Requires:** Apple II Plus, IIe, IIc, or IIGS. *ProApp, Inc., 1989A Palomar Oaks Way, Carlsbad, CA 92009; (800) 225-6442; in CA (800) 843-0426.*

MEMORY CARDS

RamFactor
Plugs into a standard expansion slot (1–7) and holds up to 1MB (in 256K increments). ProDOS automatically recognizes it as a RAMdisk. Comes with AppleWorks enhancement software and battery backup option. (8/86) **List Price:** $239 for 256K. **Requires:** Apple II Plus, IIe, or IIGS. *Applied Engineering, P.O. Box 798, Carrollton, TX 75006; (214) 241-6060*

RamWorks III
Plugs into the auxiliary slot and holds up to 1MB (in 256K increments). You can add more memory with a piggyback card. Comes with AppleWorks-enhancement and RAMdisk software for all major operating systems. Works with ColorLink RGB video option. (8/86) **List Price:** $179 for 64K. **Requires:** Apple IIe. *Applied Engineering, P.O. Box 798, Carrollton, TX 75006; (214) 241-6060*

GS-RAM
Holds up to 1.5MB (in 256K increments) and features ROM and RAM expansion ports. Includes AppleWorks-enhancement, disk-caching, and printer-buffering software. (5/87) **List Price:** $169 for 256K. **Requires:** Apple IIGS. *Applied Engineering, P.O. Box 798, Carrollton, TX 75006; (214) 241-6060*

OctoRAM
Holds up to 2MB (using 256K SIMMs) or 8MB (using 1MB SIMMs). The SIMM RAM packages are the same as those on newer models of the Macintosh and are very easy to install. (5/87) **List Price:** $149.95 for 256K. **Requires:** Apple IIGS. *MDIdeas, 1163 Triton Drive, Foster City, CA 94404; (800) 843-5722; in CA (800) 573-2746*

RamPak 4GS
This card holds up to 4MB, in 256K increments. It uses 256 × 4 RAM chips and comes with disk-caching software. (5/87) **List Price:** $189 (512K). **Requires:** Apple IIGS. *Orange Micro, 1400 North Lakeview Avenue, Anaheim, CA 92807; (800) 223-8029; in CA (714) 779-2772*

RamStakPlus
Holds up to 1MB (in 256K increments) and has four ROM sockets that hold EPROM (256K maximum) or EEPROM (128K maximum) chips. Software is included for programming the EEPROMs. You must burn your own EPROMs. (5/87) **List Price:** $129 for 256K. **Requires:** Apple IIGS. *AST Research, 2121 Alton Avenue, Irvine, CA 92714; (714) 553-0340*

Z-Ram Ultra 3
Holds up to 1MB (in 256K increments) and has an on-board clock/calendar and a Z-80B microprocessor for CP/M applications. Comes with AppleWorks expansion and RAMdisk software. (8/86) **List Price:** $ 329 for 256K. **Requires:** Apple IIc. *Applied Engineering, P.O. Box 798, Carrollton, TX 75006; (214) 241-6060*

MultiRAM CX
This card holds up to 512K (in 256K increments). It comes with AppleWorks expansion software. (8/86) **List Price:** $179.95 for 256K. **Requires:** Apple IIc. *Checkmate Technology, 509 South Rockford Drive, Tempe, AZ 85281; (800) 325-7347; in AZ (602) 966-5802*

MemorySaver
This unique card plugs into the GS memory slot and acts as a receptacle for two GS memory cards (it works with most brands). Also has a remote-power and battery option for maintaining data on the memory cards even after you turn off the Apple or experience a power loss. **List Price:** $149.95. **Requires:** Apple IIGS. *Checkmate Technology, 509 South Rockford Drive, Tempe, AZ 85281; (800) 325-7347; in AZ (602) 966-5802*

QCard
This low-cost card holds up to 256K (in 64K increments). It comes with AppleWorks-expansion and RAMdisk software. You can piggyback additional memory onto it. (11/87 PS) **List Price:** $129.95 for 256K. **Requires:** Apple IIe. *Checkmate Technology, 509 South Rockford Drive, Tempe, AZ 85281; (800) 325-7347; in AZ (602) 966-5802*

MultiRAM RGB
Holds up to 1MB (in 256K increments) and has Apple-compatible RGB video circuitry built in. Comes with AppleWorks-expansion software and DOS 3.3 and ProDOS RAMdisk software. You can piggyback additional memory to it. (8/86) **List Price:** $189.95 for 64K. **Requires:** Apple IIe. *Checkmate Technology, 509 South Rockford Drive, Tempe, AZ 85281; (800) 325-7347; in AZ (602) 966-5802*

MODEMS

AppleMate
A low-cost, 1200-bps Hayes-compatible internal modem. (4/87) **List Price:** $127. **Requires:** Apple II Plus, IIe, or IIGS. *Sunnyvale Communications Company, P.O. Box 3565, Sunnyvale, CA 94088; (800) 558-5741, in CA (800) 835-9009*

DataLink
A 1200-bps Hayes-compatible internal modem. Comes with communications software in ROM and on disk. **List Price:** $219. **Requires:** Apple II Plus, IIe, or IIGS. *Applied Engineering, P.O. Box 798, Carrollton, TX 75006; (214) 241-6060*

ProModem 1200A
A 1200-bps Hayes-compatible internal modem with extended software in ROM. (4/87) **List Price:** $295. **Requires:** Apple II Plus, IIe, or IIGS. *Prometheus Products, 4545 Cushing Parkway, Fremont, CA 94538; (415) 490-2370*

ProModem 300c
A 300-bps Hayes-compatible modem, specially designed to attach to the serial port of the IIc. **List Price:** $119. **Requires:** Apple IIc. *Prometheus Products, 4545 Cushing Parkway, Fremont, CA 94538; (415) 490-2370*

MULTIFUNCTION CARDS

SlotBuster II
This card has a bevy of optional features: a parallel-printer port, serial-printer port, modem port, speech synthesizer, clock, and BSR controller, to name a few. None of these devices take up a phantom slot, as many other multifunction cards do. (9/87) **List Price:** $149.95 with 8K buffer; additional options available from $19.95 to $57.95. **Requires:** Apple II Plus, IIe, or IIGS. *RC Systems, 121 West Winesap Road, Bothell, WA 98012; (206) 672-6909*

PARALLEL CARDS

ProGrappler
This is the latest revision of the granddaddy of parallel-interface cards. It works with a variety of printers, and its firmware facilitates the printing of screen images. (4/87 PS) **List Price:** $119. **Requires:** Apple II Plus, IIe, or IIGS. *Orange Micro, 1400 North Lakeview Avenue, Anaheim, CA 92807; (800) 223-8029; in CA (714) 779-2772*

SERIAL/PARALLEL CARDS

Print-It!
This card comes with a small red button that you can attach to your keyboard. When you press the button, your program halts, and the current screen image prints immediately. The card works with more than 50 printers, both parallel and serial. **List Price:** $199. **Requires:** Apple II Plus, IIe, or IIGS. *Texprint, 200 Reservoir Street, Needham Heights, MA 02194; (800) 255-1510; in MA (617)449-5808*

SERIAL CARDS

Serial Grappler+
This interface card is for serial printers such as the ImageWriter. It features more than 30 text- and graphics-screen dump commands and takes advantage of the color features of the ImageWriter II. **List Price:** $89. **Requires:** Apple II Plus, IIe, or IIGS.*Orange Micro, 1400 North Lakeview Avenue, Anaheim, CA 92807; (800) 223-8029; in CA (714) 779-2772*

A+ MARKETPLACE

THE #1 SHOWCASE FOR PRODUCTS AND SERVICES IN THE APPLE II MARKET

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PERIPHERALS CATEGORY
continued on next page

MONITORS

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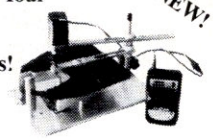

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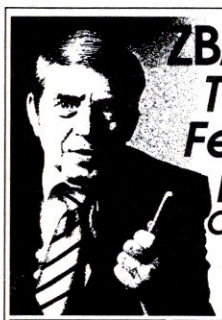

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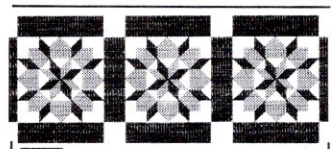

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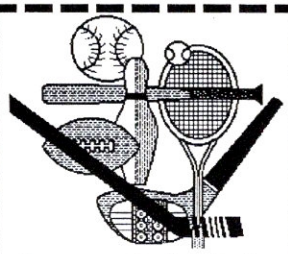

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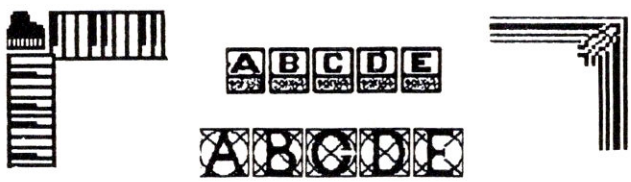

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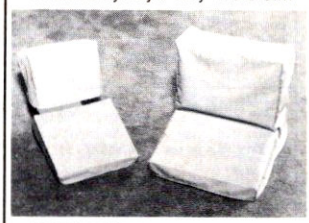

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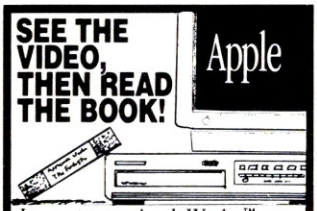

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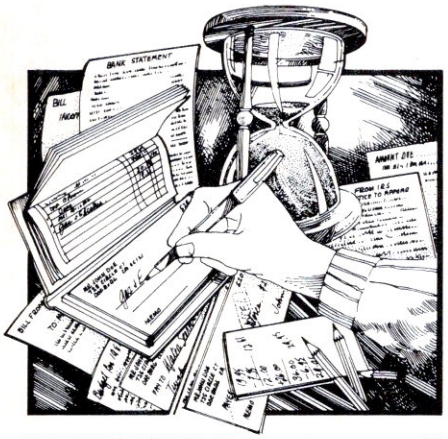

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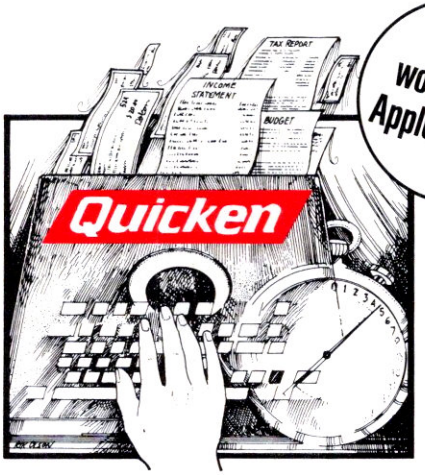

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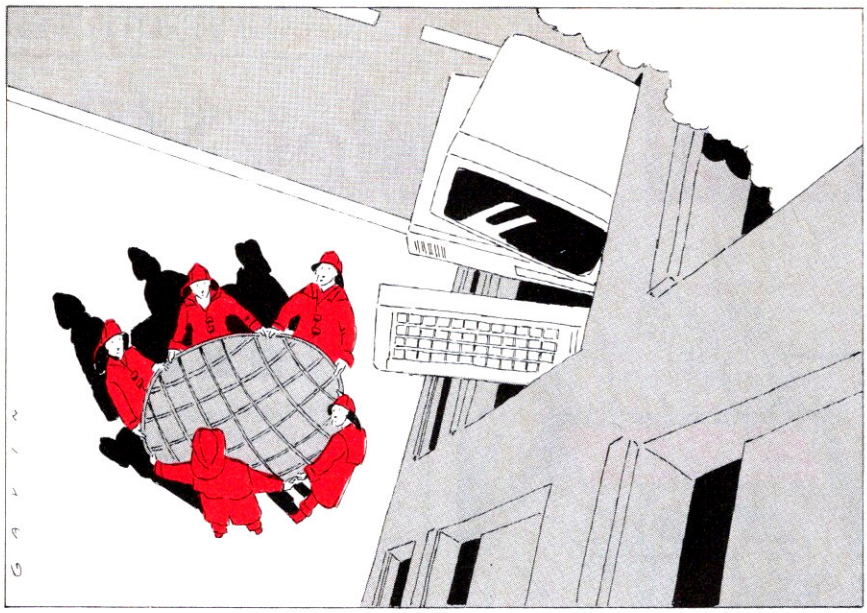

RESCUE SQUAD

BY GARY B. LITTLE

IIGS KEY DETECTION

Q. *I need some programming hints for the GS. How can you tell whether the open-apple key or the Option key is being pressed at the same time as another key? Are there character codes for these two keys?*

C.F. STEPHENS
ATLANTIC BEACH, FL

A. The open-apple and Option keys are modifier keys, not character keys, so they don't generate a signal at the standard keyboard input/output location ($C000). They are actually single-bit push-button inputs. To see whether they are off or on, check the high-order bit of the byte read from $C061 (open-apple) or $C062 (Option)—if the bit is 1, the key is being pressed.

Bit #	Function
7	Open-apple active
6	Option active
5	Modifier register updated without keypress
4	Keypad key active
3	Repeat active
2	Caps Lock active
1	Control key active
0	Shift key active

Figure 1: The key-modifier register at $C025 in the IIGS

This technique also works on the IIc and IIe (where the Option key is the solid-apple key). On the GS only, you can determine the status of these keys *at the time the character key was entered* by reading the key-modifier register at $C025 after reading the keyboard code. If bit 7 is 1, open-apple was active; if bit 6 is 1, Option was active. As figure 1 indicates, you can inspect other bits in the key-modifier register to determine the states of other modifier keys, such as Caps Lock, Control, and Shift. It is not possible to determine the status of these other modifier keys on the II Plus, IIe, or IIc.

Here is a short subroutine you can use to determine if the user is requesting help—it checks to see if open-apple is being pressed when either ? or / has been typed (? and / share the same keycap):

```
100 KB = PEEK (49152): IF KB<128 THEN 100
110 POKE 49168,0
120 IF PEEK (49249) < 128 THEN RETURN
130 IF NOT (KB=191 OR KB=175) THEN RETURN
140 REM Put Help stuff here
150 GOTO 100
```

This subroutine returns a keyboard code in the KB variable. You can convert it to a string variable with the CHR$ function.

WHERE'S AMDOS 3.5?

Q. I really enjoyed the "IIGS Survival Guide" article by Bob Lindstrom in last October's issue of A+. In it he referred to a program called AmDOS 3.5, which gets DOS 3.3 to work with 3.5-inch drives. Where can I get this program?

JIM DORIGATTI
DOVER, DE

A. AmDOS is now available from Gary Little (that's me) at 230 22nd Avenue, San Mateo, CA 94403. The price is $20. It also works with special DOS versions such as Pronto-DOS and Diversi-DOS and with drives that are connected to Central Point Software's Universal Disk Controller.

MEMORY EXPANSION AS RAMDISK

Q. *Is there any way I can configure the memory on an Apple IIGS Memory Expansion Card as a DOS 3.3 RAMdisk?*

THOMAS EAGLE
BROOKLYN, MI

A. You can easily use the GS Control Panel to partition an area of memory on the memory-expansion card for use as a ProDOS RAMdisk but not as a DOS 3.3 RAMdisk. The solution for diehard DOS 3.3 users is to use a driver program such as RAM 3.3 from RDC, Inc., 408 South Baldwin Street, Madison, WI 53703 (written inquiries only). Depending on the size of your memory card, RAM 3.3 adds one to eight RAMdisks to your system. Each RAMdisk uses 192K of memory, so if you have 1.5 megabytes of memory, you will have access to all eight drives. RAM 3.3 costs $40.

AT-HOME FORTRAN

Q. *I am taking a FORTRAN course in college and I want to do my homework at home on my IIc. Where can I find a FORTRAN compiler?*

CLIFFORD VASICEK
AUSTIN, TX

A. I am aware of only one FORTRAN compiler for the Apple II series, The Power System: FORTRAN/Apple II. The compiler costs $99 and is available from Pecan Software Systems, Inc., 1410 39th Street, Brooklyn, NY, 11218; (718) 851-3100. A slightly different version is available for the IIGS for the same price. ✚

ILLUSTRATION BY KERRY GAVIN

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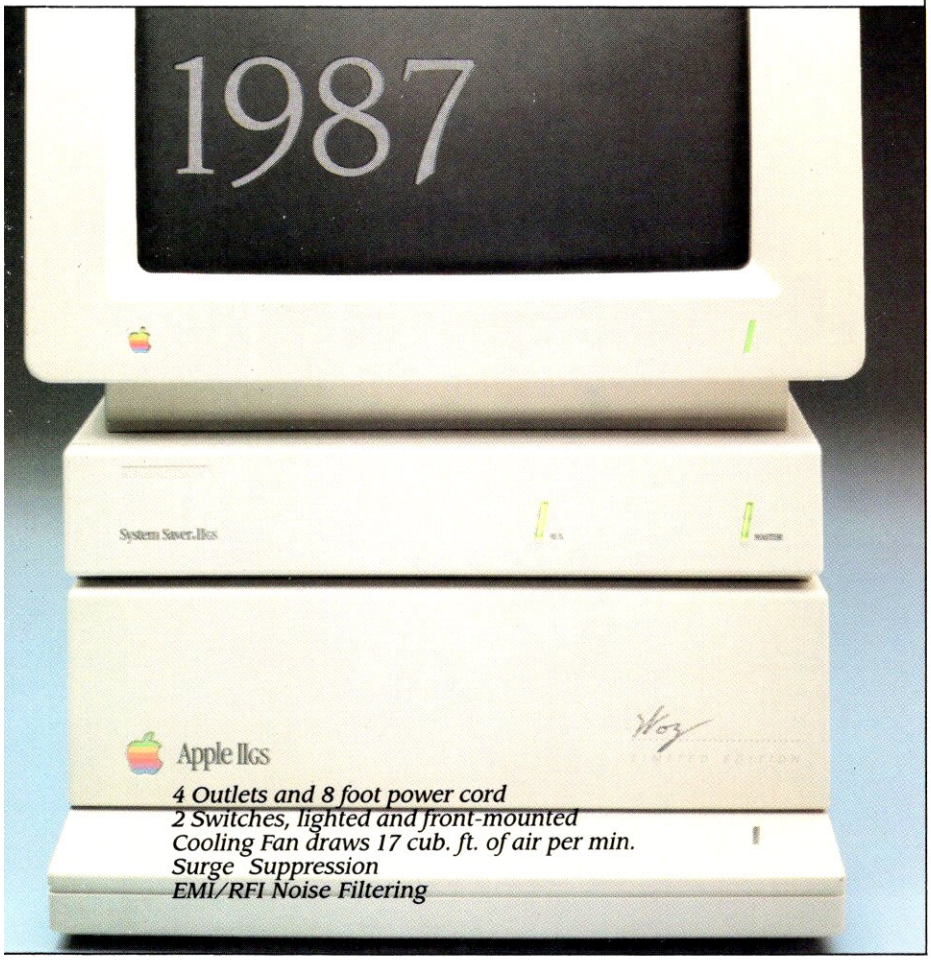

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