

A+ EDITORS SELECT THE **96 BEST SOFTWARE PROGRAMS** FOR THE APPLE II

**DECEMBER 1987**

\$2.95 US

\$3.95 CANADA

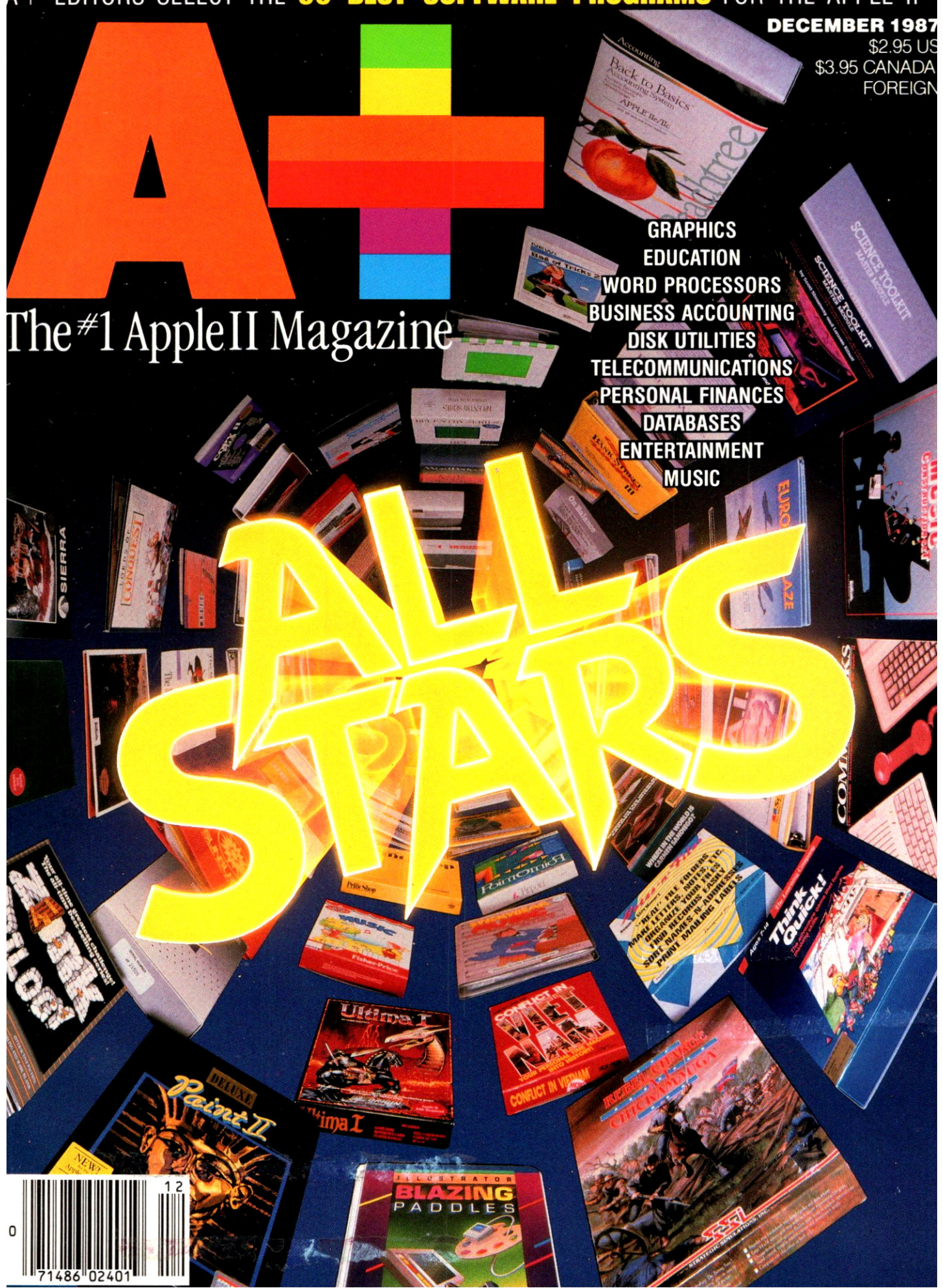
FOREIGN

# A+

## The #1 Apple II Magazine

- GRAPHICS
- EDUCATION
- WORD PROCESSORS
- BUSINESS ACCOUNTING
- DISK UTILITIES
- TELECOMMUNICATIONS
- PERSONAL FINANCES
- DATABASES
- ENTERTAINMENT
- MUSIC

# ALL STARS



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DELUXE

# Paint II

BY DANIEL SILVA

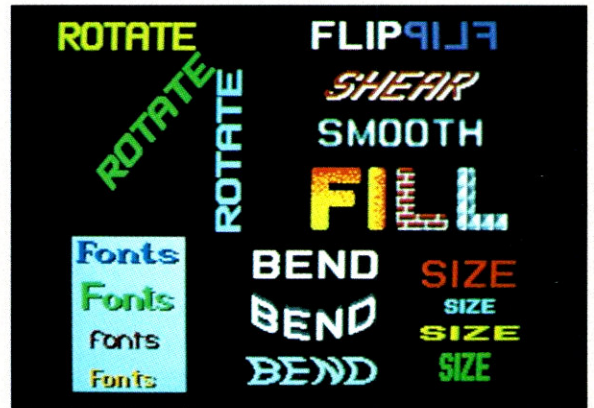


  
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Fill any area with a custom pattern or gradient color blend. Create tile or textile designs in seconds!



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**INTRODUCING DELUXEPAINT II.** The images above were all produced with the most advanced paint program ever created for a personal computer. The only paint program that lets you zoom in to see your painting in four levels of detail, create custom gradient color ranges from a 4,096-color palette, freeze an image and paint over it, and do dozens of other things you never knew a personal computer could do. The program is DeluxePaint II. The result is more than just a pretty face.

**GREAT GRAPHICS**... the best reason to buy an Apple IIgs. And the best reason to buy DeluxePaint II. With DeluxePaint II you can master the third dimension with the exclusive 3-D perspective tool. Soften jagged edges and color transitions with the smoothing tool. And give life to static pictures by cycling through a range of colors. Computer graphics have never been so easy. Or so powerful.

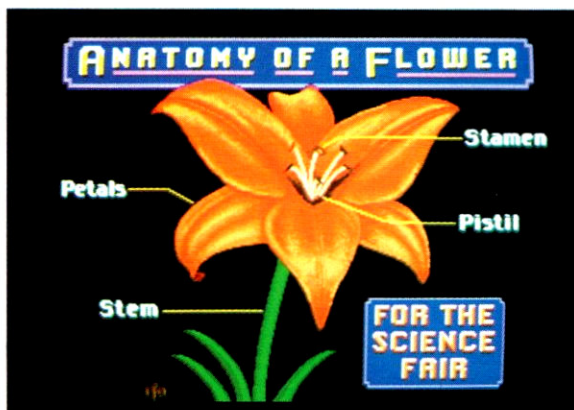
**"THE BEST GRAPHICS PRODUCT OF THE YEAR."** We didn't say it. The Software Publishers' Association did — and gave us the award to prove it.

## DELUXEPAINT II. MORE THAN JUST A PRETTY FACE.

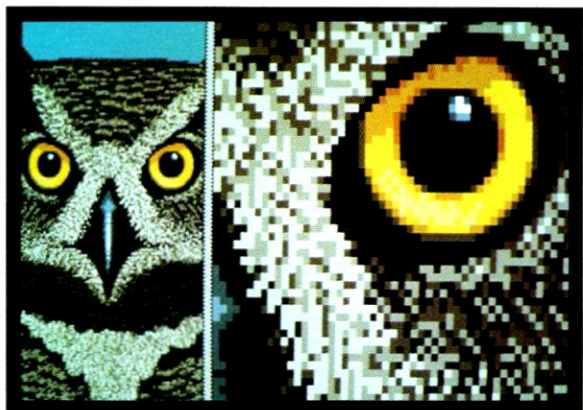
# T PROGRAM THAT CAN DO ALL THIS!



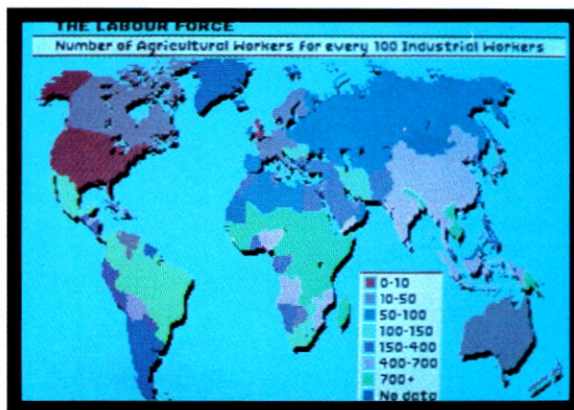
Enter the third dimension. Turn 2-D into 3-D with a click and get a new perspective!



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Zoom in through four levels of magnification and put the gleam in the owl's eye.



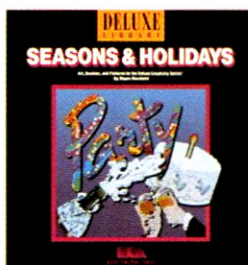
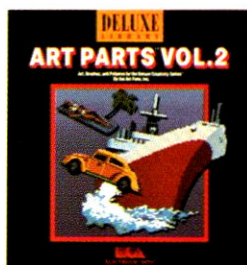
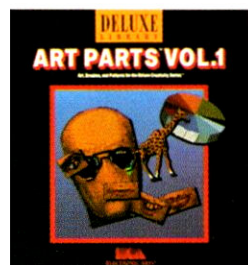
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DeluxePaint II requires 768K of RAM. The upgrade offer is only available directly from Electronic Arts. Send check or money order for \$49.95 (or VISA/Mastercard information) AND THE FRONT COVER OF ANY APPLE IIGs PAINT PROGRAM MANUAL (no facsimiles accepted) to ELECTRONIC ARTS, DELUXEPAINT IIGs UPGRADE, 1820 Gateway Drive, San Mateo, CA 94404. Allow 4-6 weeks for delivery.

TO ORDER DELUXEPAINT II: Visit your retailer. If you can't find DeluxePaint II there, call 800-245-4525 (in CA 800-562-1112), and place a direct order on your VISA or Mastercard. To order by mail, send check, money order, or VISA/Mastercard information to Electronic Arts Direct Sales, P.O. Box 7530, San Mateo, CA 94403. The regular direct-order price is \$99.95; add \$3 for shipping and handling (\$5 Canadian). There is a 30-day money-back guarantee on direct orders. Allow 6-8 weeks for delivery. Apple IIGs is a trademark of Apple Computer, Inc. Paintworks Plus is a trademark of Activision, Inc. DeluxePaint II is a trademark of Electronic Arts.



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*"Without a doubt, DeluxePaint II is the best paint program ever to appear for an Apple II!"*

*—A+ Magazine*

"I've yet to try a paintbox program on any computer which could come within a light year of Delu

"I saw a demo of DeluxePaint II and was totally stunned. DeluxePaint II beats the pants off Paintwor

*—Michael J. Herriges, Vi*

"Okay, I'm guilty—I'm one of those people who 'jumped the gun and bought Paintworks Plus.'...I ackn  
I made a serious mistake."

*—Frank Mellott, Pl*

**INTRODUCING DELUXEPAIN™ II  
FOR THE APPLE II GS...**

# LASER 128EX

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8 - 5, M - F. Or order the 128EX direct from Central Point at 9700 SW Capitol

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# LASER 128EX

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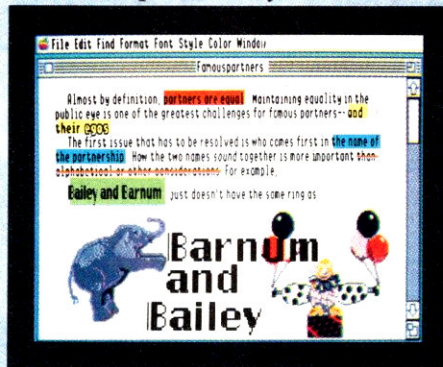
And now every *Paintworks Plus* package includes *Clip Art Gallery*, a library of over 650 vivid color images, FREE.

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***Writer's Choice elite* — your words never looked so good.**

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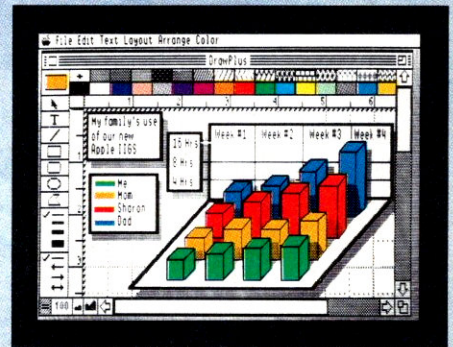
Multiple windows let you work with several documents at the same time. Cut and paste lets you move text around — with a click of the mouse.

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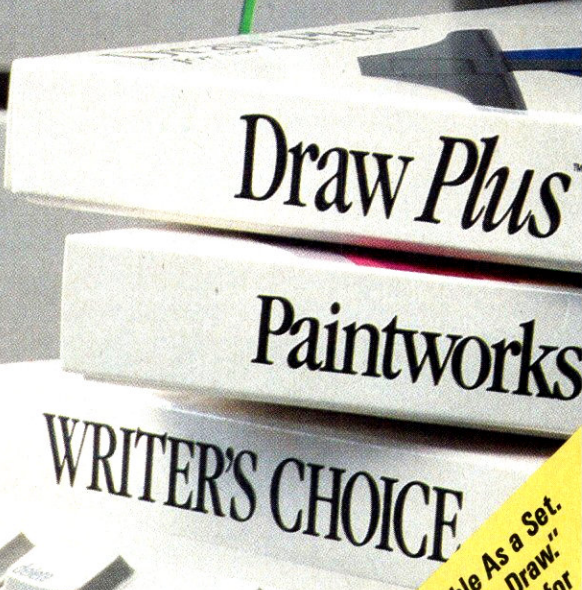
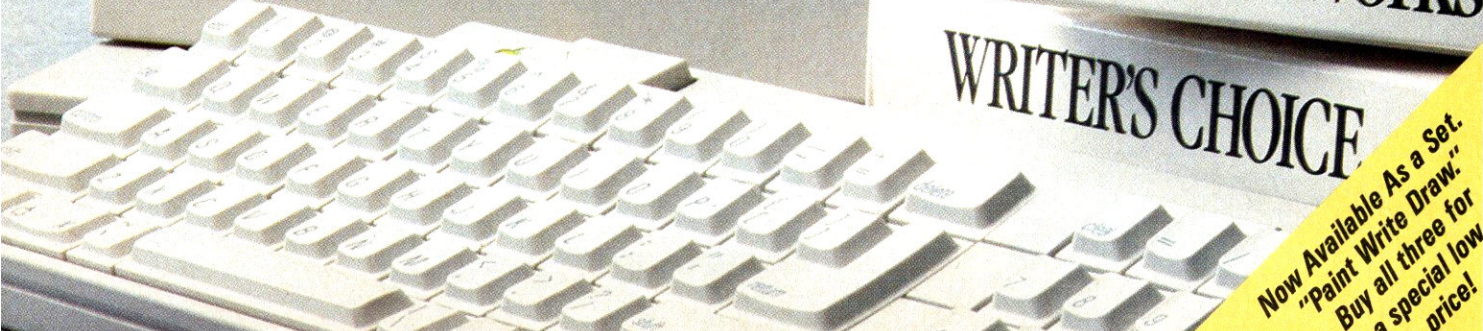
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1987 - Expanding Scenery disk coverage; East Coast, Japan, & Europe



1986 - Flight Simulator II for the 68000 computers



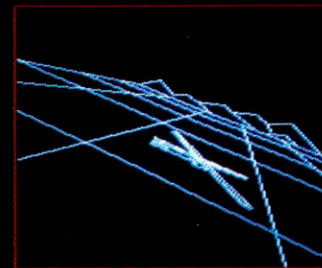
1985 - High-performance Jet flight simulator for the IBM, Commodore 64, and Apple II computers



1982/1983 - Microsoft Flight Simulator & Flight Simulator II



1979 - 3D graphics applied to the original FS1 Flight Simulator for the new Apple II and TRS-80 computers



1977 - SubLOGIC's 3D graphics package in BASIC and M6800 Assembly Language

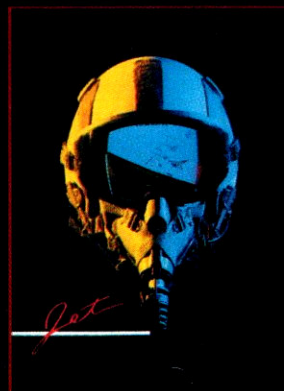
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We invite you to help us celebrate our first decade of success, and share in our anticipation of the next ten years to come. SubLOGIC tenth-anniversary promotional shirts and posters are available at your dealer or directly from SubLOGIC. See your dealer, or write or call us for more information.

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The #1 Apple II Magazine

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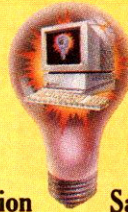
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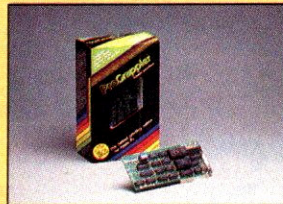


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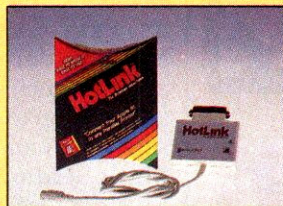


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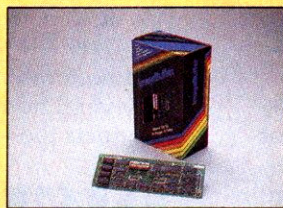
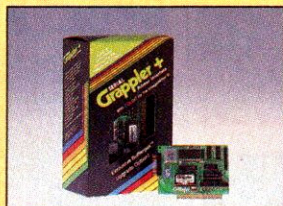


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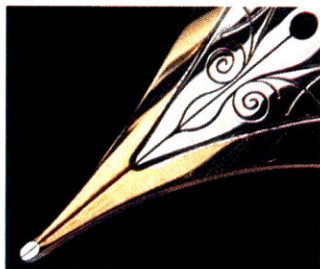


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## Word Processors

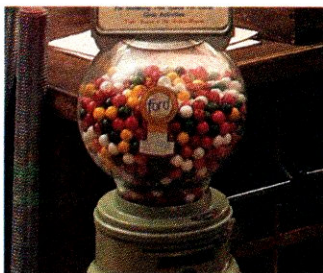


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BY DAN McNEILL

Our word-processing expert names Word-Perfect 1.1, Perfect Writer 2.0, and Multiscribe GS 2.0 as the best. He gives several honorable mentions as well.

## Business Accounting



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BY CHARLES RUBIN

Longtime A+ contributor Charles Rubin selects Back to Basics, BusinessWorks, and the BPI Entry Series as the best small-business software.

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BY ROBERTA SCHWARTZ AND MICHAEL CALLERY

The A+ graphics team selects Blazing Paddles, Dazzle Draw, Deluxe-Paint II, Take 1, Animate, and several "classic" All-Stars.

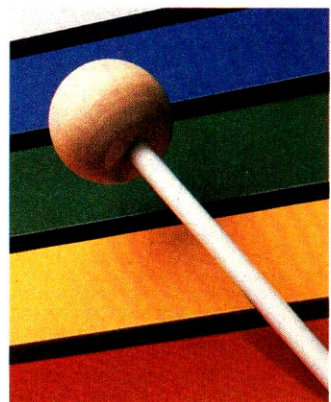


## MUSIC

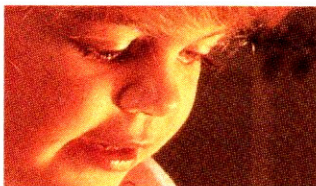
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BY LARRY McCLAIN

McClain, once an aspiring rock star, gives thumbs-up to IIGs music software, namely The Music Studio, Instant Music, KidsTime II, and Music Construction Set. He gives All-Star status and honorable mentions to several non-CS products too.



## Education



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BY JENNIFER BRAWER

Our education editor chooses 18 All-Stars in seven curriculum areas.

## Telecommunications

65

BY MICHAEL FISCHER

Fischer picks Point-to-Point, MouseTalk, Talk is Cheap, and FreeTermGS as the best software to get you on-line and names a few runners-up as well.



## DISK UTILITIES



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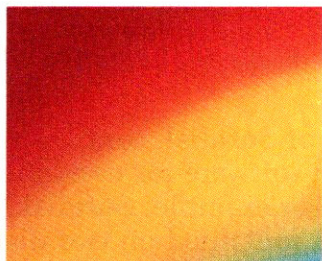
BY GARY B. LITTLE

A+'s senior technical editor says you can't strike out with these utility players: ProSel, Copy II Plus, Diversi-Copy, MouseFiler, and Bag of Tricks 2. Little also names a couple of runners-up.

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**BY STEVE HIGH**  
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**BY PETER O'DELL**  
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**BY GARY B. LITTLE AND LISA RALEIGH**

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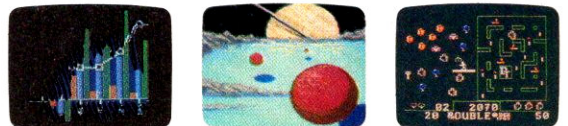
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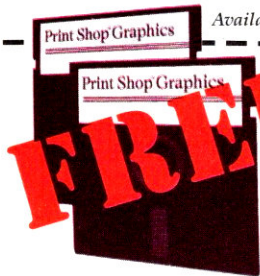
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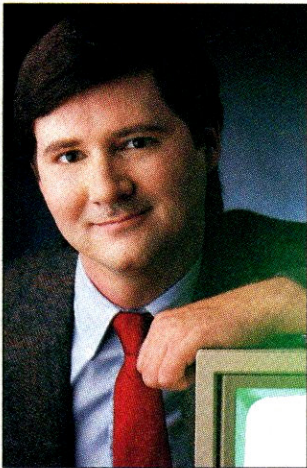
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## THE A+ ALL-STARS

As you can probably tell from looking at the cover and table of contents, this month's *A+* is different. A lot of you write in or call us to request our recommendations about software for your Apple II computer. To let you know what we deem the best software programs for the Apple II series, we have created this special *A+* All-Stars issue.

Many of you may have heard the claim that thousands of programs are available for the Apple II series of computers. I have heard estimates go as high as ten thousand software programs, which would make it the largest body of software for any computer. This figure is a bit misleading, however. Keep in mind that the 11-year-old Apple II was the original personal computer and had a five-year head start on the IBM Personal Computer series.

A lot of the software for the Apple II series consists of Applesoft BASIC programs designed for the Apple II Plus and IIe many years ago; these programs are not up to the level of quality that people have come to expect today. I estimate that out of the ten thousand commercial programs ever created for the Apple II, only about two thousand, or 20%, are really any good by today's standards. In order to further narrow down the field, we decided to sort through the thousands of programs out there to determine which programs were not just OK, or even just good, but were so good that you couldn't go wrong with them.

The *A+* All-Stars represent 96 programs that our panel of writers and editors has determined to be the best of

their breed in each of the ten major categories of Apple II software: word processing, graphics, education, telecommunications, business accounting, music, disk utilities, databases, personal finance, and entertainment. Although there are other worthwhile types of software, these are the software areas that—judging from your letters and calls—you're most interested in.

Because of the tremendous amount of Apple II software we had to sort through and review for this special issue, we assembled a blue-ribbon panel of editors and software reviewers to

***The A+  
All-Stars  
represent  
96 top  
software  
packages  
available  
to the II.***

evaluate the software. We selected the reviewers based on their expertise about the Apple II software available in a particular category. The word-processing All-Stars were selected by computer writer Dan McNeill, who wrote last year's cover story about word-processing

programs; the graphics All-Stars were selected by graphic-arts teachers Roberta Schwartz and Michael Callery, the authors of our popular "Speaking of Graphics" column; the education All-Stars were selected by our on-staff education specialist, Jennifer Brawer, who has recently taken over the "Teacher's Toolbox" column; the entertainment All-Stars were selected by our "GamePort" columnist Bob Lindstrom, who is rapidly gaining a reputation as one of the nation's leading entertainment-software authorities; and the telecommunications All-Stars were selected by Michael Fischer, our telecommunications columnist, a familiar name to GENIE and CompuServe users. The list goes on, but this glance should give you an idea of the amount of care,

# EDITOR'S PAGE

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# EDITOR'S PAGE

planning, and teamwork that went into producing this special issue.

Of the 96 All-Stars, only 11 were for the Apple IIcs, which goes to show that most of the best programs are still for the IIe and IIc computers. Here is a breakdown of how many All-Stars we selected in each of the ten categories: word processing had 11 All-Stars; graphics had 10, education had 18, telecommunications had 7, business accounting had 4, music had 11, disk utilities had 7, databases had 5, personal finance had 3, and entertainment had 21. (These add up to 97, and not 96, because AppleWorks appears twice.) We didn't set any quotas for the number of All-Stars in any category; the reviewers were simply told to identify the programs in their category that they felt were of superior quality. The comparatively large number of All-Stars in the education and entertainment categories attests to the importance and popularity of these software categories in the Apple II market. The relatively few All-Stars in the database, accounting, and personal-finance categories are probably attributable to the dominance of AppleWorks.

To keep you up to date on what programs make the All-Star list during the rest of the year, we will be starting a new department in next month's

issue that will update the All-Stars list each month. The new department, which will immediately follow "Product Round-up," is part of a new product-guide section we are developing for the back section of each issue. We'll tell you more about that next month.

Another change we're making to better serve our readers is to designate a group of "domain editors" who are each responsible for a particular area of Apple II computing. Jennifer Brawer, who holds a Masters degree from Stanford in educational psychology, will become our education editor; Roberta Schwartz and Michael Callery will become our graphics editors; Bob Lindstrom will become our entertainment editor; Charles Rubin will become our small-business editor; and Michael Fischer will become our telecommunications editor. All of these editors are top experts in their field who will keep track of the latest developments in their domain and present regular material in A+ to keep you informed. Our new editorial structure will let us provide more in-depth information in each of these important domains and is yet another sign of our commitment to maintaining A+'s number 1 position as a source of information about the entire Apple II family of computers. +

FRED

FREDERIC E. DAVIS/EDITOR IN CHIEF



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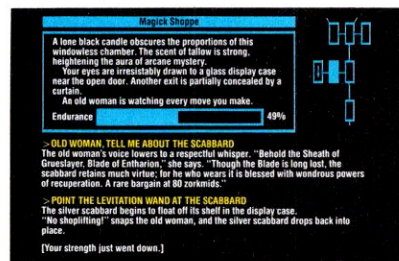
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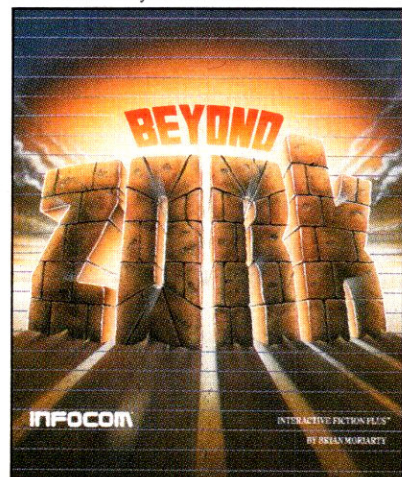
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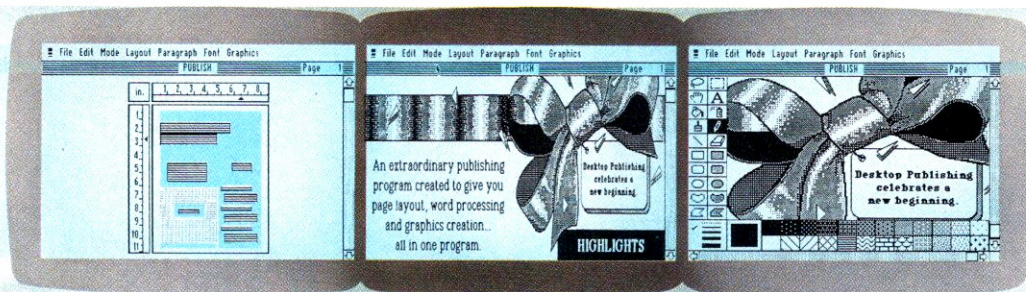


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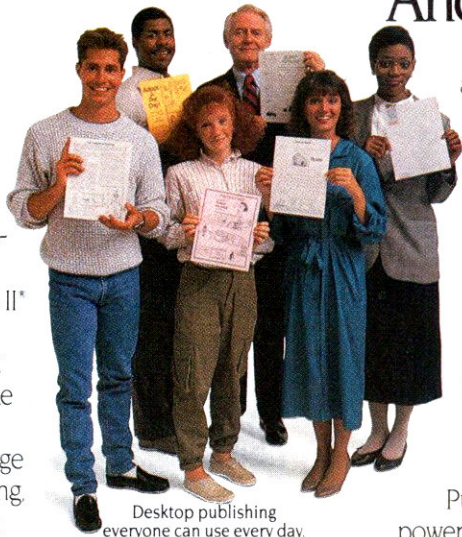
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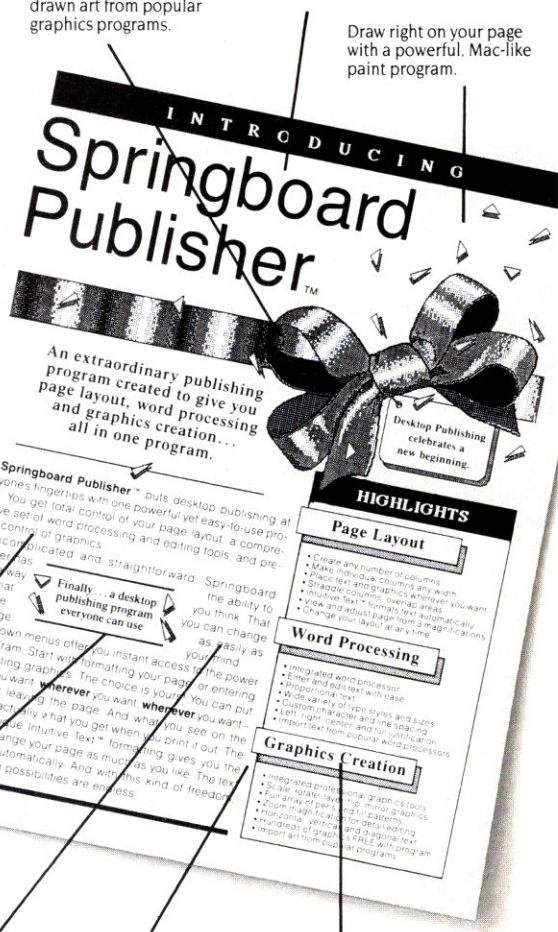
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**The Rib Cage**  
 The rib cage is the part of the skeleton that protects the heart and lungs. It is made up of 24 bones. The rib cage is divided into the ribs, the costal cartilages, and the sternum.

**The Rest of the Body**  
 The rest of the body is the part of the skeleton that supports the arms and legs. It is made up of 124 bones. The rest of the body is divided into the arms, the hands, the feet, and the legs.

**Anterior View of the Skeletal System**

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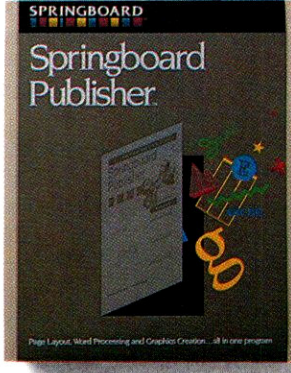
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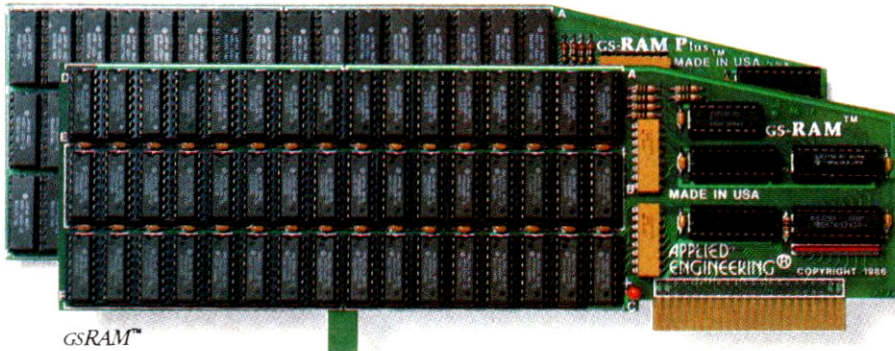
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Remember the 16K cards for the II+ and the 64K cards for the IIe? At the time, that much memory seemed like a lot. But when the owners of these memory cards came to us for more memory, many had to throw away their smaller Apple memory cards or try to sell them. Most of our customers told us that had they known about Applied Engineering's larger memory cards when they bought their Apple, they would have purchased them at the same time.

GSRAM and GSRAM Plus are available now, allowing up to 8 MEG of memory expansion. That's 8 times the memory capacity of Apple's card and just look at the benefits that only GSRAM and GSRAM Plus have over Apple's card:

- Lower cost
- Has 6 RAM banks (Apple's card has 4)
- Has memory expansion port
- Has ROM expansion port
- No configuration blocks to set
- No soldered in RAM chips
- Expandable to 8 MEG
- Expands AppleWorks internal limits
- Built-in Hi-Res self-diagnostic software
- 5 year hassle free warranty (Apple has a 90 day warranty)
- Made in USA

## GSRAM for More AppleWorks Power

Only GSRAM and GSRAM Plus eliminate AppleWorks internal memory limits, increasing the maximum number of records available from 6,000 to over 25,000 and only GSRAM and GSRAM Plus increase the number of lines permitted in the word processing mode from 6,000 to over 15,000. And only GSRAM and GSRAM Plus offer a built-in printer buffer so you can continue using Appleworks while your printer is printing. GSRAM and GSRAM Plus even expand the number of lines in the clipboard from 255 to 2047 and will auto segment large files so they can be saved on two or more disks. You can

even have Pinpoint or Macroworks and your favorite spelling checker in RAM for instant response. GSRAM and GSRAM Plus will even display the time and date right on the AppleWorks screen. Nothing comes close to enhancing AppleWorks so much.

## Turn Your IIGS into a Giant

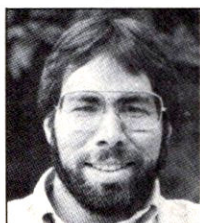
Simply plug GSRAM into the IIGS memory expansion slot and you've got up to 8 megabytes of RAM at your fingertips—all of it instantly and automatically recognized by the IIGS. GSRAM is compatible with all IIGS software, including AppleWorks, as well as BASIC®, ProDos, DOS 3.3, PASCAL®, "C" and CP/M®.

## Grow by Bytes or Megabytes

We offer GSRAM in two configurations so you can increase your memory 256K at a time (GSRAM) or a megabyte at a time (GSRAM Plus). Both offer full compatibility, lower cost than other boards, and easy expandability. And both are extremely low in power consumption. A fully expanded GSRAM operates at only 375 ma, and GSRAM Plus at only 270 ma (even with 6 megabytes on board!)

## GSRAM—for Normal Memory Requirements

GSRAM is available with 256K, 512K, 1 MEG or 1.5 MEG of memory already on board. If you don't need the full 1.5 MEG now, you can choose a GSRAM with less memory and expand it up to 1.5 MEG in the future—or upgrade to GSRAM Plus for a small charge.



Steve Wozniak, the creator  
of Apple Computer

"In quality, performance, compatibility, expandability and support, Applied Engineering's GSRAM and GSRAM Plus are number one."

With an optional piggyback card, you can expand GSRAM even higher than 1.5 MEG! (Other cards are only expandable to 1 MEG.)

## GSRAM Plus—for Growing by Leaps and Bounds

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GSRAM Plus can be expanded up to 8 MEG with an optional piggyback card.

## Easy Expansion

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## ACTIVISION AND COPY PROTECTION

Dear A+: I recently had the misfortune to use two of Activision's programs, Paintworks Plus and The Music Studio. Perhaps I should say "try to use"—the programs' copy protection prevents them from working on non-Apple drives.

My 3.5-inch drive, which I bought via Central Point Software, works perfectly with non-copy-protected software. When I tried both of the Activision disks on another IIGs, they worked fine with Apple's Uni-Disk 3.5 drives but not with my drives. Activision's software crashes shortly before the program turns control over to you.

Incidentally, the software refuses to run on any drive if an old Disk II controller card or mouse card is present.

I do not put my 3.5-inch drive at fault. I feel that Activision is at fault for using a form of copy protection that prevents its software from working. It is not alone in this respect—Electronic Arts' DeluxePaint II has the same problem and sometimes doesn't work even on pedigreed Apple 3.5 drives. The company is courteous enough to offer an unprotected version that runs on any configuration—after you mail in \$20 and wait 4-6 weeks.

Is it fair to charge extra for the high crime of using non-Apple drives? Although these companies' warranties and licenses deny any responsibility to the consumer, I feel the firms are morally responsible to provide a working version of their software to any purchaser—at the standard price.

I have never liked copy protection, but this makes me sick.

ANDY MCFADDEN  
SUNNYVALE, CA

*You'll be happy to know that Activision has done away with copy protection on its "productivity" and "creativity" products. See "NewPlus" further on in this issue for the full scoop.—Editors*

## SHANGHAI DEFENSE

Dear A+: The letter to the editor by Mr. Jones (A+, October 1987) commenting unfavorably on Shanghai and your review of that game is, I believe, an overstatement of an unfortunate situation. To me and my family, Shanghai is an excellent game, well worth the price.

Although I have had some problems with it—e.g., lines left on the screen after tiles have been removed, program/keyboard freeze, and the like—they occurred after I'd tried to save a game several times, restart, recall a saved game five or

# LETTERS TO THE EDITOR

six times, or "bounce" between different modes of the game. I attribute these problems to growing pains we must learn to accept with a new computer such as the IIGs. When I just play Shanghai in normal modes, I have no difficulties.

There is one problem Mr. Jones did not mention. When you "win," your reward should be a fire-breathing dragon on your screen. You won't get it unless you "prefix" the volume by selecting Open from the File menu and then Cancel, which returns you to the game on the screen. My phone call to Activision afforded this solution and prompted the remark, "We do not know why Shanghai does not automatically go into animation when you win a game."

Like Mr. Jones, I find Activision unresponsive to letters—in my case, five in the past five months—but the company's personnel are helpful on the phone. The bottom line remains: Shanghai is great; A+ is great. Keep charging!

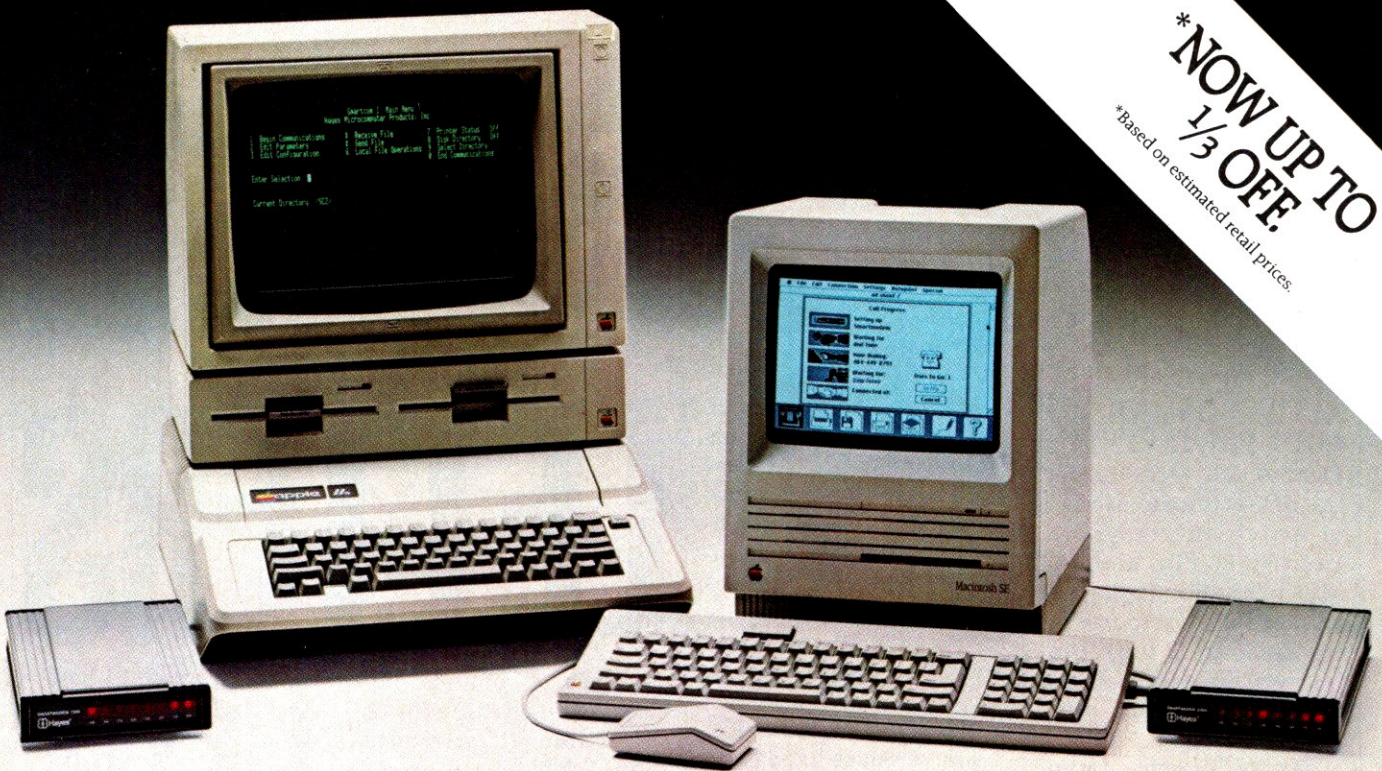
ROBERT D. MOSER  
VIRGINIA BEACH, VA

## WHICH APPLE II?

Dear A+: I have been a subscriber since Vol. 1 Issue 1. You provide the best variety of Apple information, and I save every issue.

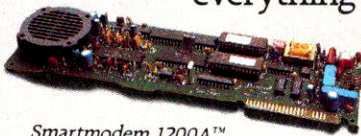
I do have a problem, however. I am a very proud owner of an Apple II Plus. We have been together since 1980, and I do not want to give it up for a Iie, or Iic, or IIGs. I have added RamFactor 256K and 80-columns, have purchased AppleWorks and a modem, and have subscribed to GENIE. That is about as up to date as I know how to go. My problem is that now I have AppleWorks up and almost working and want to add some enhancements such as templates or 1040 Works or DB Master—the brochures all say they are for the Apple II, but then in small print

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Last but not least, there's another feature that Hayes 2400 and 1200 bps modems offer that will make them even more compatible with Apple computers, and that's a new low price.

**Hayes.**

# LETTERS

(too small for grandmothers to read easily), they say "except II Plus" or "II/e, IIc only." I would like to start an effort to have advertisers use a formal indication of what Apple II they are referring to when they say they have a product for all Apple IIs.

Also, I am writing to ask you for names and addresses of owners of Apple II Plus computers with whom I can communicate by letter or electronically or through GENIE. My desire is to urge our slowly diminishing group to "hang in there" by banding together.

PHYLLIS DELPH  
SANTA ROSA, CA 95405

*The best way to locate fellow Apple II Plus users is to leave public messages on the Forum or Bulletin Board sections of any of the major information services (GENIE, CompuServe, The Source, Delphi). You may also want to contact your local Apple users' group and set up a special-interest group.*

—Editors

## IGs PRINTER OPTIONS

Dear A+: I am pretty mad at the software developers that are currently writing programs for the Apple IIGs. I think it is very unfair that software such as GraphicWriter, Multiscribe, Music Construction Set, and others do not include print options for Epson or other types of printers.

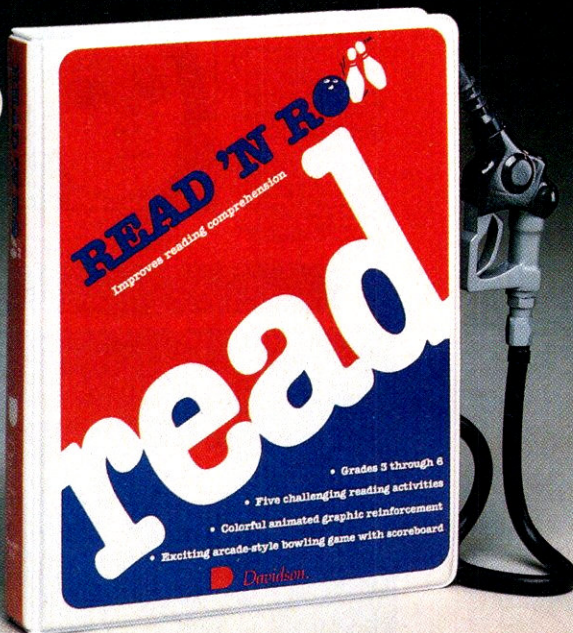
Why are these programs set up for printing only on an ImageWriter or LaserWriter? I have an Epson FX80, and I don't want to buy a new printer. The software developers could increase their market by including these printers.

JOHN DEMARCO  
SHRUB OAK, NY

*One of the last GS tool sets Apple completed and released was the Print Manager (May 1987), and many new GS applications that needed it shipped just after this date. Apple, of course, included drivers only for its own ImageWriter and LaserWriter printers, so these are the only printers that these early GS desktop applications worked with.*

# HIGH GRADE FUEL.

NEW

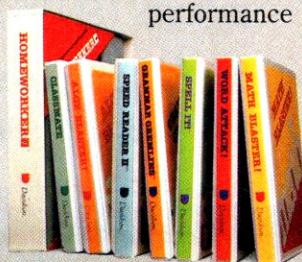


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# LETTERS

Apple has now released documents showing developers how to write GS printer drivers and will even license the source code to the ImageWriter driver for study purposes. As a result, we're likely to see printer drivers for other popular printers from third parties soon.

When you do get a new driver, by the way, install it by putting it into the SYSTEM/DRIVERS/ subdirectory of your ProDOS 16 boot disk. When the time comes to print from a desktop application, select Choose Printer (usually in the File menu) and choose the appropriate driver.

A+ will endeavor to keep readers informed as to the availability of printer drivers for the GS.—Editors

## ON BALANCE AMPLIFICATION

Dear A+: I just finished reading your September issue and feel I must write about the review of Brøderbund's On Balance. Your review had some incorrect and incomplete information that needs to be corrected.

The original version was copy-protected, but no longer. I recently bought On Balance and ended up with this version. On the first day of use, I somehow managed to damage the program disk. I mailed my disk and proof of purchase to Brøderbund and received both the 5¼- and 3.5-inch un-copy-protected versions in just two weeks. Considering that I'm overseas, this customer support is incredibly fast.

You can save data to either disk format, but On Balance is memory-intensive, so using a 3.5-inch disk drive does not increase the data limits of the program. You can initially set up 200 accounts, 23 account groups, and up to 850 transactions per month. The more accounts you add, the less room there is for transactions or vice-versa. Using excessive account memos greatly decreases the number of accounts and transactions that the program can handle. In my setup, I have more than 90 accounts and 14 groups and can add nearly 700 transactions every

month, so I do not see anyone running out of memory before the end of each month.

On Balance can work with a mouse and run on an Apple IIGs. The mouse is not sensitive enough for my liking, but with the open-apple commands available, moving through the program is quick and easy.

I do not care for programs that fail to work with ProDOS, a hard-disk drive, or a RAMdisk, but On Balance is an exception. This pro-

gram has room for improvement for just those reasons, but after attempting to use three other personal-finance programs, I have concluded that On Balance's speed and ease of use make On Balance a clear winner that I will be using for a long time to come.

RICK HANNON  
A.P.O. SAN FRANCISCO

We agree that On Balance is a winner and have selected it as one of our A+ All-Stars. See the section on personal finance in this issue for more details.

The Midnight Special is leaving at 12 AM on track 9—from your Apple II computer!

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# LETTERS

## MORE MULTICOLUMN-PRINTING THOUGHTS

Dear A+: I agree completely with Mark Shields (*A+*, September 1987, page 106) that his method of creating multicolumn text layout with AppleWorks is superior in efficiency and flexibility to the one Charles Rubin described (*A+*, July 1987, pages 75-79). I would merely add that you can apply Shields' method with any good word-processing program capable of controlling page layout and printout page by page.

During the '86-'87 school year, I edited a small faculty newsletter. I started out with my usual word-processing program, Word Juggler, which allows direct and thorough control of the printer through a combination of easy internal commands and escape sequences. Essentially, you can do any text manipulation the printer can do (I use

an ImageWriter II) in multicolumn format, such as proportional spacing in the NLQ mode, wide lettering for headlines, full justification—even color—and do it conveniently by treating each column as a separate page, the heart of Shields' method.

But this level of control provides no graphics, and Word Juggler's

*Multiscribe adds multiple fonts, font editing, and importation of graphics.*

Preview function, although good for standard text, gives little idea on the screen of enhancements such as proportional spacing. For later issues of the newsletter, I created files with Word Juggler and then moved them to Multiscribe, where I used the font editor to create a masthead and gained access to a greater variety of fonts for headlines. Again I used Shields' method, printing each column separate-

ly. I discovered, however, an improvement on my earlier procedure. Instead of using tractor-feed paper, which tends to misalign when you roll it backward to the top of the page, it is best to use single sheets. Still, you have to be very careful about aligning the paper in the printer exactly the same way for the second column as for the first.

Also, with the ImageWriter II, if the printhead is not forced to realign (there are several ways to do this), the first line of text in the second column will be skewed. Since Multiscribe uses a graphics screen, it can display proportional spacing, although not center, full, or right justification. Other programs, including Multiscribe GS, now sport enhanced graphics-handling capabilities such as importing double-hi-res drawings, and some can incorporate AppleWorks text files. GraphicWriter handles both columns and graphics directly, is a full WYSIWYG program, and sells for half the price of AppleWorks.

Passing the paper through the printer twice, as Shields recommends, makes AppleWorks more

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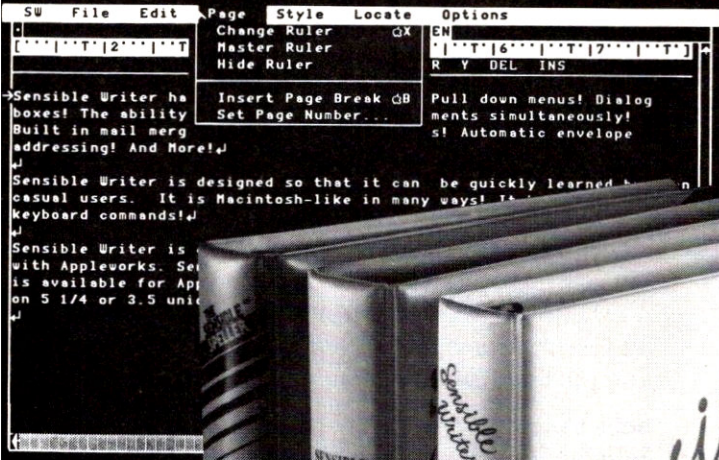
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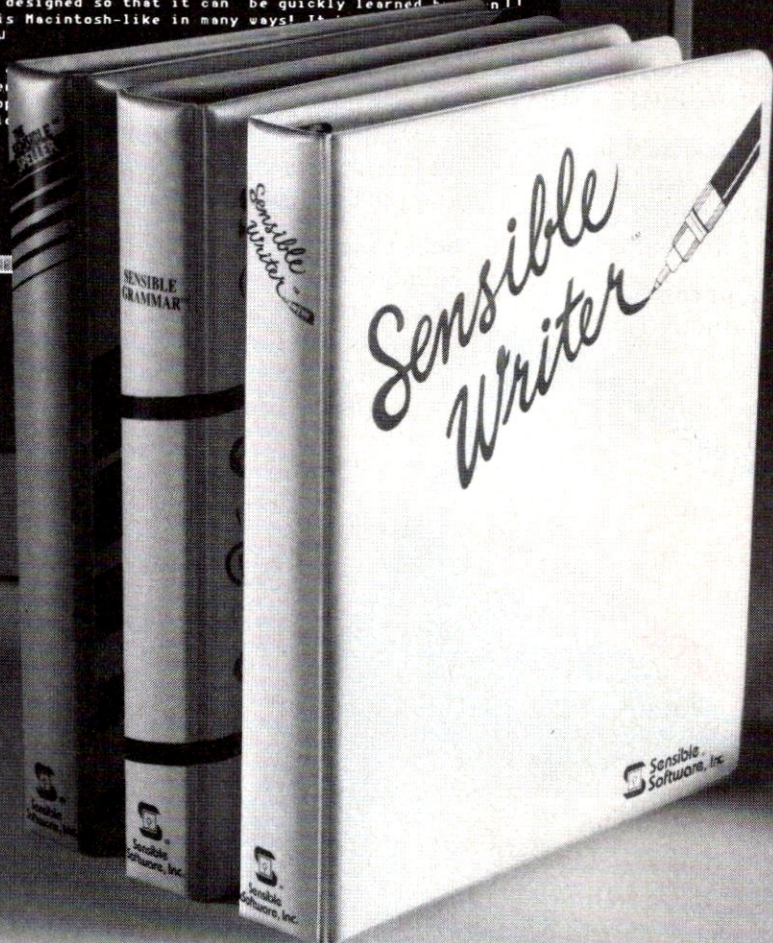
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This comprehensive program saves you embarrassment by checking your papers for grammatical and other writing errors. Featuring a Macintosh-style user interface, it is easy for you to use because it is AppleMouse compatible and also has keyboard commands for speed.

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**Sensible Speller** is easy to use. It shows you misspellings in context, suggests the correct spelling, and allows immediate replacement of misspelled words with correct ones.

**Sensible Speller** is compatible with Appleworks and most ProDOS word processors. Supplied on UniDisk 3.5 as well as 5 1/4" disk, it is available for Apple II computers including IIgs. A non-ProDOS version is also available. Each is \$125.

**Stedman's Medical Dictionary**, **Sensible Technical Dictionary™** and **Black's Law Dictionary™** are available separately on diskette for use with the **Sensible Speller**. Each is \$39.95. **Sensible Speller ProDOS** now allows you to merge the dictionaries together.

**Now for Macintosh**

\*Sensible Writer, Sensible Grammar and Sensible Speller ProDOS work with the following programs, AppleWorks (Apple Computer, Inc.); Catalyst (Quark Inc.); Mouse Desk (International Solutions); Sensible Grammar and Sensible Speller ProDOS also work with the following word processors, AppleWriter-ProDOS version (Apple Computer, Inc.); Format II Enhanced-ProDOS (Kensington Microware); MouseWord (International Solutions); Mouse Write-text files (Roger Wagner Publishing); PFS:Write-ProDOS (Software Publishing, Inc.); Sensible Writer (Sensible Software Inc.); Word Juggler (Quark Inc.); Word Perfect (SSI Software); Zardax-ProDOS (Computer Solutions) and others. Sensible Speller ProDOS also works with HomeWord-ProDOS (Sierra On-Line); MultiScribe (StyleWare, Inc.); Word-Talk (Computer Aids) and WritingWizard (Scarborough Systems). Owners of trademarks indicated in parentheses. Black's Law Dictionary (West Publishing, Inc.).

**Sensible Software, Inc.**

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# LETTERS

flexible and powerful at handling multicolumn layouts than some entry-level newsletter programs such as The Newsroom. With the more convenient printout enhancements and printer control of programs such as Word Juggler, the process is streamlined more than with AppleWorks. And Multiscribe adds multiple fonts, font editing, and now importation of graphics. Most of these features can be added to AppleWorks with other products, such as Power Print, but with less convenience.

J. K. SWINDLER  
FULTON, MO

## MORE GS COVERAGE

Dear A+: I have noticed through many sources, including your magazine, that the Apple IIgs is outselling the IIe and IIc. I realize the Apple IIc was not enough to trigger a separate magazine. I believe, however, that because the Apple IIgs offers such enhanced features, you should either expand your GS coverage or create a separate entity. Limiting the coverage of GS-specific news is a letdown to GS users, like me, who learn about Great Software through your magazine. At least devote as much coverage to it as you did to the Macintosh.

With Christmas just around the bend, Apple Computer should release ProDOS 16 Version 2.0 and the Loader.

Please consider the above information because I believe it could only increase your subscription volume and make more money for you. Corner the market before it is too late.

BRIAN M. LEXVOLD  
STERLING, IL

*Starting with our November 1986 issue, we made a commitment to be keeping our readers informed about the IIgs. A+ has covered all the significant products for the IIgs as they have become available. We have devoted more coverage to the GS than any other magazine and in that sense have already "cornered" the market.—Editors*

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The Echo IIb speech synthesizer is compatible with the Apple® IIe, II+ and the new Apple IIgs. It offers both text-to-speech and natural sounding speech capabilities. Its unique text-to-speech program gives the Apple an unlimited vocabulary. The Echo IIb also features distinctive natural sounding speech in a female voice. The fixed vocabulary of 720 words is supplied on disk and can easily be added to BASIC programs.

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Runs on Apple II series (except IIgs) with 64K, 2 disk drives, monochrome screen. Supports joystick, Apple mouse or Koala pad. Output to Hewlett-Packard, Apple or Houston Instruments plotters using Apple Super Serial Card or built-in serial port.

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**Introducing  
PC Transporter.<sup>TM</sup>  
The Apple<sup>®</sup> II expansion  
board that lets you  
run MS<sup>®</sup>-DOS programs.**

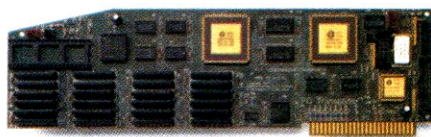
Now your Apple II can run over 10,000 programs you could never use before. Like Lotus<sup>®</sup> 1-2-3<sup>®</sup>, MultiMate<sup>®</sup>, dBASE III PLUS<sup>®</sup>, Even Flight Simulator<sup>®</sup>.

With PC Transporter, MS-DOS programs run on your Apple II like they do on IBM<sup>®</sup> PC's or compatibles. With one important difference. PC Transporter runs most of those programs *three times faster* than an IBM PC/XT<sup>®</sup>.

Plus, to speed through number-crunching tasks, you can use our optional 8087-2 math co-processor chip. It plugs into a socket on the PC Transporter.

**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<sup>®</sup> or IIgs<sup>™</sup> 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

### 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

##### 5.25" IBM Format 360K

##### Drive Systems

**Single-Drive System** 269.00

**Dual-Drive System** 399.00

**Half-Height Drive** 135.00

(add to Single-Drive system to make Dual-Drive)

**IBM-Style Keyboard** 139.00

(required for Apple II Plus. Requires IBM Keyboard Cable.)

**IBM Keyboard Cable** 34.00

**Sony RGB Monitor** 499.00

**Analog RGB Cable** 39.00

(for use with Sony monitor)

**Digital RGB Cable** 39.00

(for use with Sony monitor)

**Digital RGB Adapter** 24.00

**ColorSwitch** 44.00

(included with IIGS Installation Kit)

**128K ZIP** 40.00

**PC Transporter** per set

**Memory Expansion**

**Chip Set**

**8087-2 Math**

**Co-processor** 229.00

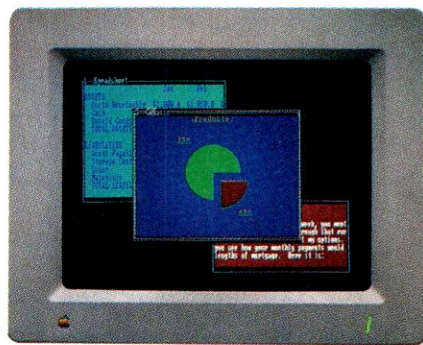
**Chip**

**Heavy Duty** 69.00

**Power Supply**

(IIe and II Plus only)

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.

storage and a 143K Apple 5.25" drive for MS-DOS storage.

### 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.

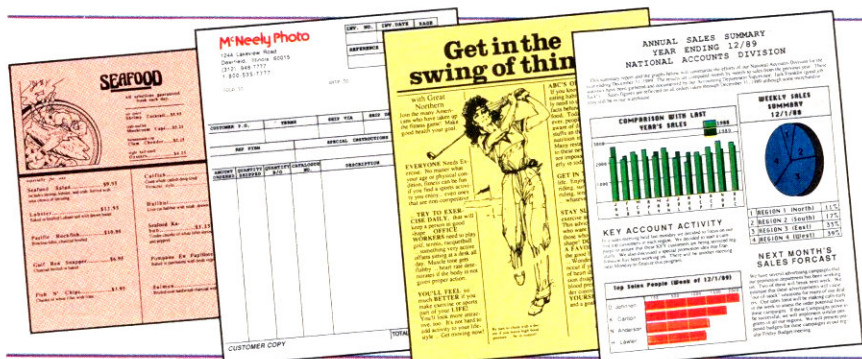
See your dealer. Or call Applied Engineering any day between 9 a.m. and 11 p.m. CST at 214-241-6060.

**AE Applied Engineering**  
The Apple enhancement experts.

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A Division of AE Research Corporation.

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## Introducing **PUBLISH IT!** A full-featured desktop publishing powerhouse with word processing, layout, and graphics.

Even if you have no design skills or publishing experience, you can get results in less than an hour with **PUBLISH IT!** Use our Quick-Start Mini-Manual and go to press. It's that simple.

Your computer display shows you exactly how your finished documents will look. Use the program's built-in layout tools to reposition and resize elements on the page. Once it's perfect, just press a key and print out on your dot matrix or laser printer.\*

For all its state-of-the-art ability, **PUBLISH IT!** is incredibly easy to learn—refreshingly so. **PUBLISH IT!** combines the familiar Macintosh User Interface, our Quick-Start Mini-Manual, a full complement of Help Screens, and the practical **WYSIWYG (What-You-See-Is-What-You-Get)** display—all designed to get you up and running in less than one hour!

### SPECIAL FEATURES:

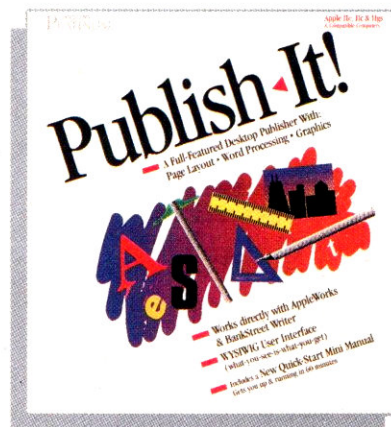
- **Macintosh User Interface:** It's familiar and easy. Pull-down menus, icons, scroll bars and dialogue boxes help you learn and use the program quickly. Your display screen shows you exactly what your final product will look like when you print—What-You-See-Is-What-You-Get.
- **Flexible Page Layout:** With your mouse or joystick, and keyboard, you can

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- **Text Importing:** Load documents from APPLEWORKS, BANK STREET WRITER\*\* or any other word processor in standard ASCII format directly into **PUBLISH IT!**
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- **Graphics Importing:** Directly import graphics and illustrations from any standard Apple\*\* double-high-resolution drawing program—including

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- **Plus, you get worksheets, special time-saving features, and much more!**



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# NEWS PLUS

*Apple releases Finder for the Gs, AppleFest draws crowds, Activision removes copy protection, and other updates*

## WE'VE FOUND THE FINDER

The long-awaited Finder for the Apple IIGs is finally here! For those who are not familiar with the Macintosh program of the same name, the Finder is a startup program that lets you select pro-

grams to run and perform various disk- and file-maintenance chores, such as copying and renaming. It uses the familiar menu/window desktop interface the Macintosh popularized. One flashy feature of the Gs Finder is the ability to set the color of any icon (an icon represents a file or subdirectory). By carefully color-coding icons, you can spot important files quickly.

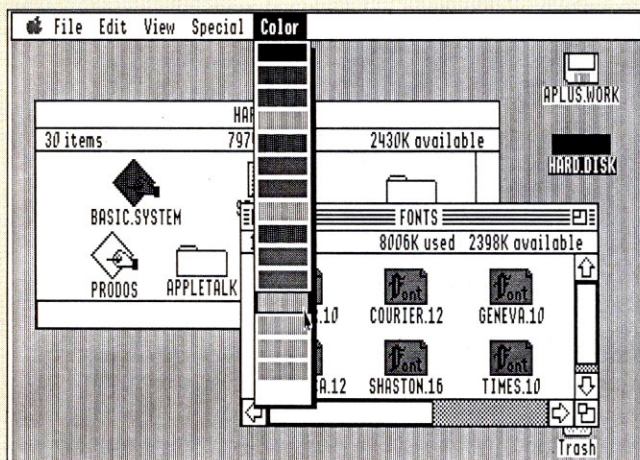
The DeskTop program that Apple shipped with the Gs beginning in September 1986 is quite similar to the Finder. A major difference, however, is that the Finder is a ProDOS 16 application, so it runs only on the Gs.

The Finder now comes on the system disk, which you receive when you buy a new Gs. Don't expect to be able to use the Finder unless you buy a Gs memory-expansion card, however—it requires at least 512K of RAM. When you boot the system disk on a minimal 256K system, the system bypasses the Finder and displays a simple program-launcher dialog box instead.

If you purchased your Gs before the Finder was available, you can get it for free by asking an authorized Apple dealer to update your system disk (system disk 3.1 and later versions contain the Finder).

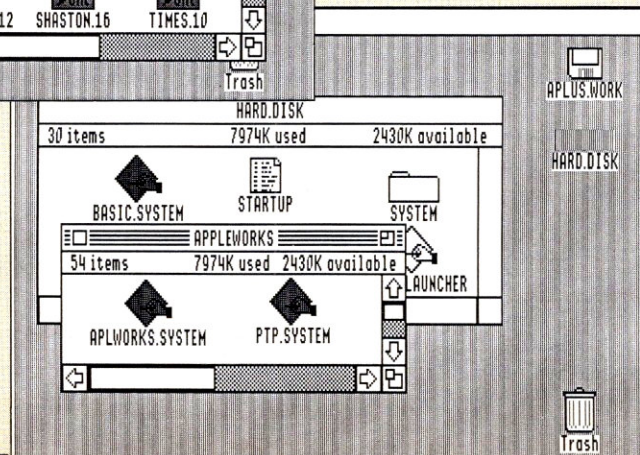
## CODING FOR DOLLARS

CodeQuest '87 is still under way. This annual programming contest began July 1, 1987, and runs until January 31, 1988. Prizes will total more than \$5000, and winners will also receive "generous" contract fees, as well as the glory of having their work published in one or more of the magazines published by Magazines On Disk, the sponsor of the contest. Categories include games, graphics, music, education, home applications, business programming, and utilities. For further details, write to Magazines On Disk, P.O. Box 30008, Shreveport, LA 71130-0008; (318) 221-8718.



You can use the Color menu (above) to choose a color for any Finder icon.

The Finder represents each disk directory as a window (right), and each file as an icon.



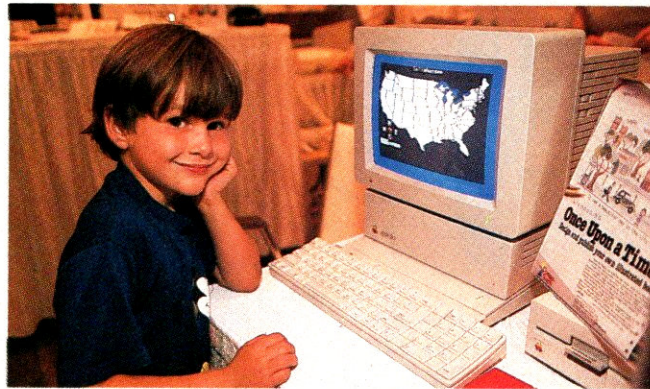
# NEWSPLUS

## APPLEFEST REPORT

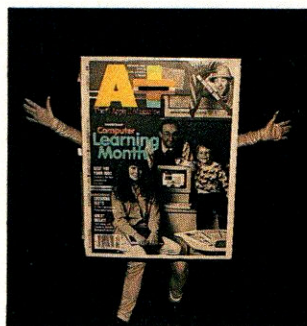
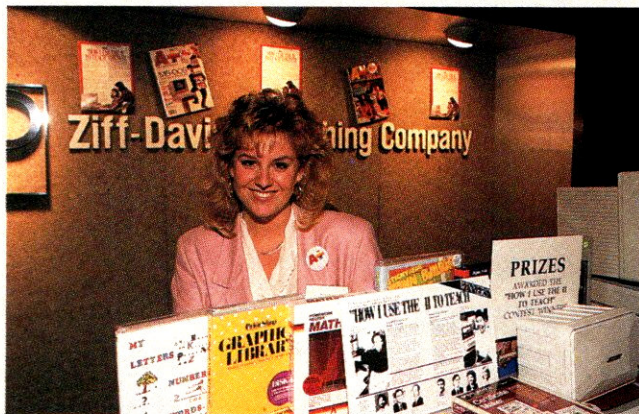
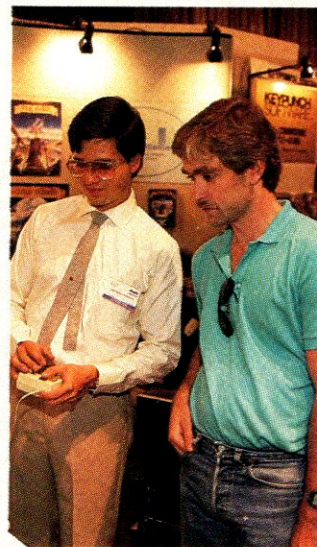
The revival of AppleFest was a success! AppleFest—an Apple II exhibition that disappeared from the scene four years ago—came back as a three-day show in mid-September in San Francisco, drawing approximately 20,000 attendees. More than 100 exhibitors showed off products for the entire II family. Not bad for a supposedly aging technology. The next AppleFest will take place May 20–22 in Boston. According to the show's promoters, most of the exhibit space for that show is already sold out.

The product highlights from September's AppleFest generally fell into the categories of enhancement hardware and graphics/desktop-publishing software. Here are a few of the highlights (much of this stuff is vaporware as we go to press but might be available by the time you read this).

■ Perhaps the most exciting hardware announcement was the Zip Chip accelerator from Zip Technology. The Zip Chip (\$129 introductory price) is a replacement for the 6502 (or 65C02) microprocessor of the II, II Plus, IIe, and IIc. (A similar replacement for the



65816 on the GS was announced but is not expected to be available for quite a while. Meanwhile, MDIdeas was showing a very early prototype of a card-style GS accelerator.) With the Zip Chip installed, you can run all your software about four times faster than before. The chip works its magic by using an 8K memory cache stored on the same silicon wafer as the microprocessor component of the chip. The advantages of using it instead of a traditional card-based accelerator such as the Applied Engineering TransWarp



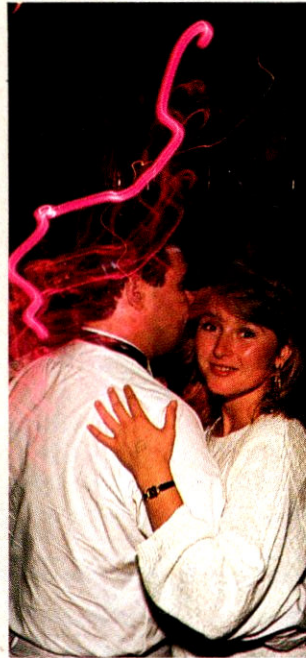
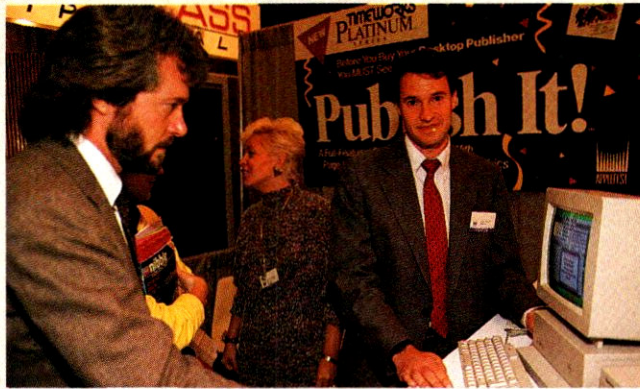
are clear: No slot is required, and the chip consumes much less power than a card does. Ironically, a prototype version of a similar chip, called the RocketChip, was being shown privately at the show by Bits and Pieces Technology. Two models are planned: a 4-MHz version and a 6-MHz version (for a four- or sixfold speed increase).

■ Another breakthrough product was the first internal 2400-bps modem ever available for the Apple II.

The product is called the Epic and is made by Epic Technology. The card is equivalent to the standard Super Serial Card/Hayes Smart-modem combination, so it should work with existing communications programs without modification. The modem card has been expertly engineered and is smaller than most 1200- or 300-bps modems that we have seen. The best feature, however, is the price: only \$175! An external version of the card is also available for \$189.



AppleFest attracted all types of Apple II users and gave them an opportunity to try out a host of new products. In the A+/Ziff-Davis Publishing booth, they got to see the prizes awarded to the winners of our "How I Use the II to Teach" contest. And industry insiders got a chance to loosen up at the A+ party.



■ The other interesting hardware products at AppleFest were for the IIGs. There were two new advanced sound digitizers, FutureSound (\$279) from Applied Visions (we caught it playing a great version of the "Jetsons" theme song) and Digitizer Professional (\$149.95) from MDIdeas.

And Digital Vision, Inc. showed the Apple IIGs version of its popular ComputerEyes, a \$249 color/monochrome video digitizer.

■ Two new, interesting memory cards for the IIGs were also available. The MemorySaver from Checkmate Technology (\$149.95) is not actually a memory card; it is a holder for your existing IIGs memory card that is able to power the card from a transformer and/or battery. As a result, you don't lose the contents of a RAMdisk even if you turn off the IIGs. You can also connect two RAM cards (such as Apple's or Applied Engineering's) to MemorySaver—convenient if your GS memory card has no memory-expansion option and you need more memory.

The memory card, MegaRAM from Parallax, is a one-megabyte card that costs only \$189.95. You can use it with an EPROM expansion card with a capacity of 896K (\$89.95 unpopulated); you can configure the memory on the expansion card as a ROMdisk and boot it when you turn the GS on.

■ On the software front, Brøderbund Software announced Show Off, a \$59.95 presentation-graphics program, and released the IIGs version of The Print Shop, also \$59.95.

■ WordPerfect Corporation showed its professional word-processing program for the GS (also called

WordPerfect and priced at \$179) and said the release date had been moved back from September to November.

■ Softsync demonstrated its \$59.95 Personal Newsletter desktop-publishing program, which runs on an Apple IIe (enhanced), IIc, or IIGs.

■ On the next aisle, TimeWorks showed off its impressive desktop publisher, Publish It (\$99.95). It works on the same machines as Softsync's product does but requires a mouse or a joystick.

■ Milliken Publishing Company introduced Medley (\$195), an extremely sophisticated desktop-publishing program for the IIGs (requiring a megabyte of RAM) that appears to be a few months from completion.

■ Although this software wasn't really announced at the show, word about a possible IIGs version of the new Macintosh product HyperCard began circulating on the eve of AppleFest. Bill Atkinson, author of HyperCard and MacPaint, let it slip on The Computer Show, a nationally syndicated talk show, that a GS version of HyperCard is in the works.

# NEWSPLUS



## SOME SERIOUS ENTERTAINMENT

Entertainment-software sales aren't doing too shabbily, thank you very much. This bit of news comes from a couple different quarters. The Software Publishers Association, for instance, tracks software sales in 15 different categories and found that recreational software currently ranks fourth in sales—behind word-processing pro-

grams, database-management programs, and spreadsheet programs. The SPA survey, which included 42 producers of recreational software, found that Apple II entertainment software sales rose 90% year to year. This increase isn't quite as dramatic as the 98% jump IBM entertainment software enjoyed, but it's nothing to sneeze at, nonetheless.

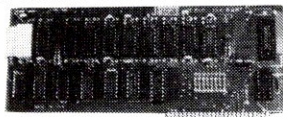
Activision, Inc., would probably agree. Activision, a leader in the IIGs software market, recently

announced its first quarterly profit in four years. The fiscal improvement follows on the heels of a major management shake-up that took place last January when company founder James Levy left the company and Bruce Davis became Activision's president. At the end of June, the company said it had earned \$524,474 on sales of \$8.7 million—a vast improvement over the loss of \$1.9 million on sales of \$4.6 million in the company's year-earlier period.

ILLUSTRATIONS BY MAX SEABAUGH

## 80C/64K CARD \$49.95    12" MONITOR \$69.95    1200B MODEM \$119.95

### 16K RAM Card for Apple II and II+

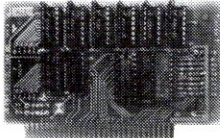


The JE860 RAM Card (Language Card) allows the Apple II and II+ computers to expand from 48K to 64K. Complete with instructions.

**JE860. . . . . \$39.95**

### Extended 80-Column Card

**Appleworks Compatible!**

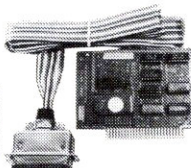


The JE864 is an extended 80-column/64K RAM card • Ideal for word processing • Ultra High Resolution Graphics capability • Complete with instructions

**JE864. . . . . \$49.95**

### Parallel Printer Card

for Apple II, II+ and IIe

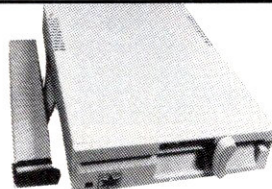


The JE880 is a parallel printer interface for most of today's dot matrix printers • 64K Buffer card for JE880 is also available (JE883, below) • Complete with instructions

**JE880 Printer Card . . . . . \$49.95**  
**JE883 64K Buffer for JE880 . . . . . \$49.95**

### 5 1/4" Half Height Disk Drive

for Apple II, II+ and IIe



• Direct drive • 143K formatted storage • 35 tracks • Super quiet • Works with Apple Controllers or other Apple compatible controllers (JE875, see below) • Complete with connector — just plug into your controller

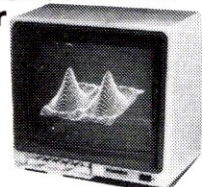
**ADD12 Disk Drive (for II, II+ and IIe). . . . . \$99.95**  
**JE875 Controller Card (for II, II+ and IIe). . . \$49.95**  
**ACC Adapts std. Apple drives for use with IIc \$14.95**

### 5 1/4" Half-Height Disk Drive for Apple IIc

Same specs as ADD12 (above) except no controller needed.  
**ADD2C Disk Drive (for IIc) . . . . . \$109.95**

### Franklin 12" Monochrome Green Monitor

for Apple II, II+, IIe and IIc



• Composite video output • Bandwidth: 18MHz • Resolution: 800 lines @ ctr. • Power consumption: 15-18W  
Size: 12" W x 11 1/2" D x 12" H  
Weight: 17.25 lbs.

**SMON (Franklin 12" Monitor). . . . . \$69.95**  
**AMON (Casper 12" w/Tilt Swivel Base). . . . . \$99.95**

### Cooling Fan for Apple II, II+ & IIe

• Line surge suppression  
• Snaps on the side of Apple II, II+ and IIe enclosures  
• Eliminates overheating  
• Switch on front serves as power switch for fan and computer • Includes two additional AC outlets



**APF. . . . . \$29.95**

### Switching Power Supply for Apple II, II+ and IIe

• Can drive four floppy disk drives and up to eight expansion cards • Short circuit and overload protection • Fits inside the Apple computer • Fully regulated • Apple type plug-in power cord included • Data included



**KHP4007. . . . . \$34.95**

### 2400/1200/300 Baud External Modems for Apple II, II+, IIe, IIc and IIGS

• Hayes command command compatible • Bell 103/212A compatible • Auto-dial/auto-answer • Auto-protocol selection • FCC approved • 1-year warranty • Software not incl. • Serial card needed for operation (See AP140, below)



**1200C 1200/300 Baud Ext. Modem. . . . . \$119.95**  
**2400E 2400/1200/300 Ext. Modem. . . . . \$219.95**  
**AP140 Super Serial Card for Apple II, II+ & IIe \$ 79.95**

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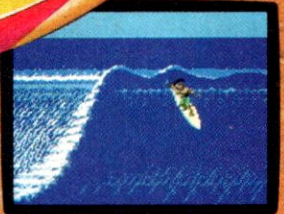
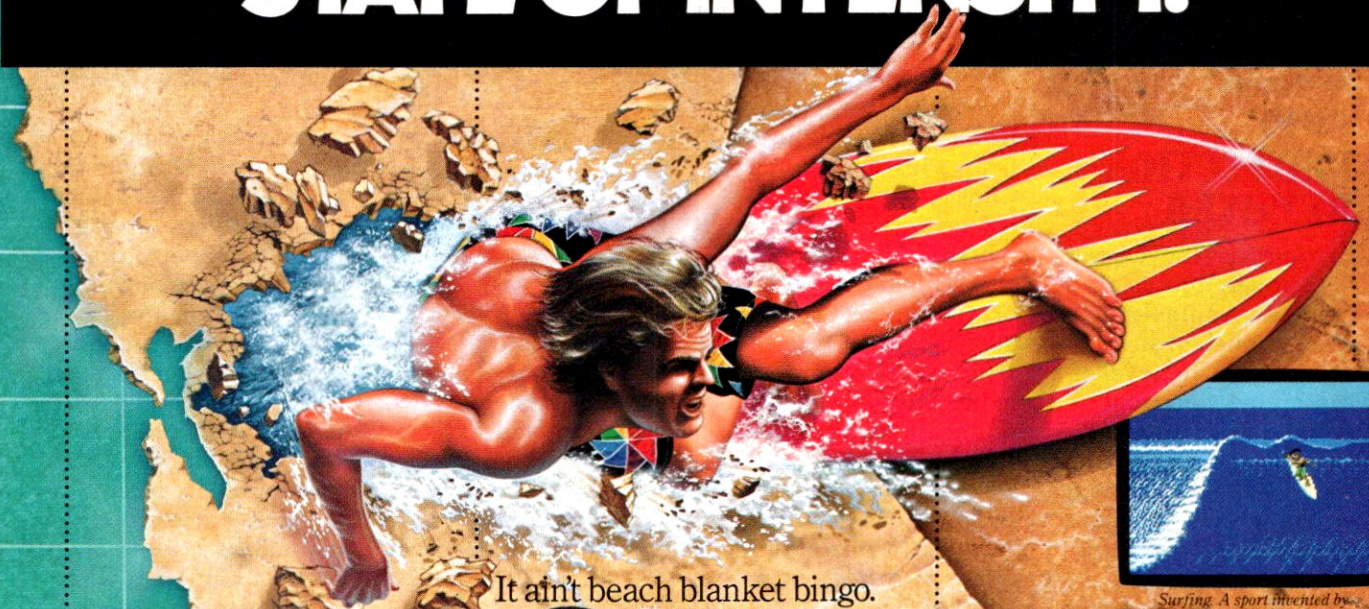
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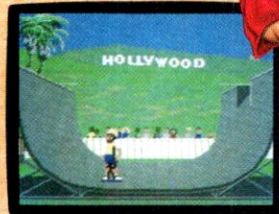
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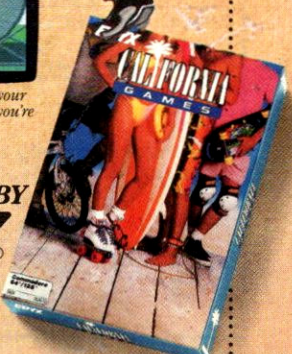
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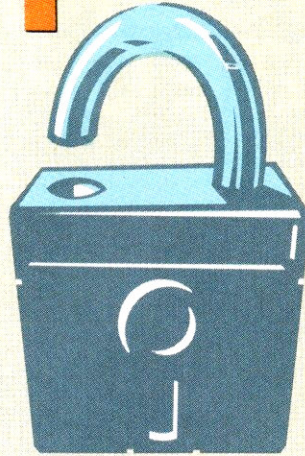
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CIRCLE 147 ON READER SERVICE CARD



# NEWS PLUS



## COPY PROTECTION REMOVED

In a surprise move last September, Activision, a longtime Apple II software publisher, announced the removal of copy protection from its entire line of "productivity" and "creativity" software. Activision's line of entertainment programs remains protected, however.

The list of deprotected

software includes three recent titles for the Apple IIs: Paintworks Plus, Draw Plus, and Writer's Choice *elite*. Activision's protection scheme for these programs involved checking for the presence of an original key disk during start-up, but this scheme proved annoying to hard-disk users. Reports also surfaced that the copy-protection scheme did not work properly with Central Point Software's 3.5-inch drives or Apple's own UniDisk 3.5.

Activision probably made its decision for two reasons: to reduce the technical-support burden that goes with any form of copy protection and to compete more effectively with similar, unprotected products (notably

StyleWare's Multiscribe GS).

Activision mailed notices in early October to all registered users of affected software, giving them the opportunity to upgrade to the new unprotected versions for \$10 per title. If you didn't send in your registration card, you can still participate by sending \$10 to Activision along with your purchase receipt, the front cover of the manual, or a cutout of the product number on the back cover.

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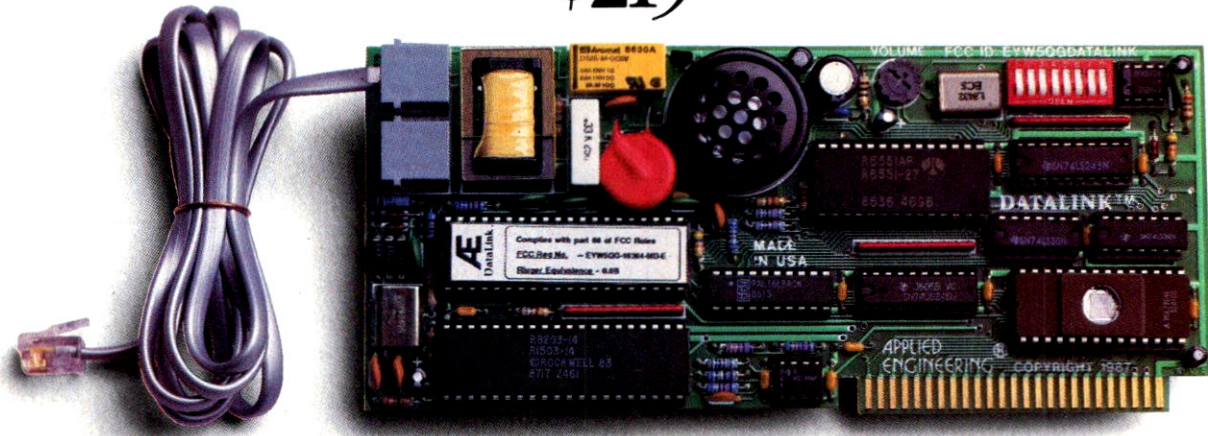
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# NEWSPLUS

*Your **gs BASIC**  
programs can  
take advantage  
of the entire  
**gs memory space.***

## gs BASIC RELEASED

Apple has released a version of the BASIC programming language specifically for the Apple IIgs. It's called gs BASIC and, like Applesoft, it is an interpreted BASIC, meaning you don't have to compile source code before running a program—you simply load a source program file from disk and run it. As a result, you can create and debug programs more quickly than you can with a compiled BASIC.

The gs BASIC interpreter is a ProDOS 16 program, and the programs you create with it can take advantage of the entire gs memory space. (Applesoft programs are limited to a paltry 48K space.) It has symbolic interfaces to the functions in the gs toolbox ROM, so you can call them with the same names assembly-language, Pascal, and C programmers use.

The chief programmer for gs BASIC was John Arkley, one of Apple's earliest employees, who is no stranger to BASIC. In 1979 John worked on a version of Apple II BASIC dubbed BASIC 3, which was essentially a disk version of Applesoft. He was responsible for the PRINT USING module, which programmers use to simplify the formatting of output to

the screen or printer. For one reason or another, BASIC 3 never saw the light of day. It did, however, form the foundation for Business BASIC for the Apple III.

Several months before the public announcement of the IIgs, Apple decided to dust off Business BASIC and convert it into what is now gs BASIC. Arkley ended up doing more than a simple conversion—he completely rewrote Business BASIC. His effort included redesigning all number-crunching subroutines to work with the SANE (floating-point) and Integer Math tool sets built into the gs.

One module that Arkley didn't change very much was his coveted PRINT USING command. Still robust after all these years!

Apple IIgs BASIC is available from the Apple Programmer's and Developer's Association, 290 S.W. 43rd Street, Renton, WA, 98055; (206) 251-6548. The price is \$50 to APDA members (the fee to join APDA is \$20 per year). A gs BASIC source-code compiler is available for \$125 from TML Systems, 4241 Baymeadows Road, Suite 23, Jacksonville, FL, 32217; (904) 636-8592.

# NEWSPLUS

## UPDATE

### \$150 MILLION FOR SCHOOLS

What could U.S. schools do with \$150 million for computer education? They could buy products, train teachers, and share information about computers in the curriculum. At least those are the goals behind the Computer Education Assistance Act, a piece of legislation that was introduced last March by Senator Frank Lautenberg (D-NJ).

As this issue of *A+* was going to press, the Senate had just come back from its late-summer recess, and Lautenberg's bill (S. 838) was going on to the committee level, having just gone through the public-hearing stage.

If this bill successfully wends its way through the legislative process, it will provide schools with that \$150 million to assist them in acquiring hardware and software, to fund teacher-training institutes through the National Science Foundation, and to disseminate advice about how to integrate computers into the curriculum. If you are interested in finding out more about the Computer Education Assistance Act, you should contact your senator in Washington, D.C. The number for the Capitol switchboard is (202) 224-3121.

In an article about Direct Memory Access (DMA) in the September issue of *A+*, we indicated that Orange Micro's RamPak 4Gs memory-expansion card must be fully populated to four megabytes before it can work with DMA devices such as the AST VisionPlus video digitizer. Actually, the amount of memory installed has no bearing on its performance. As indicated in the article, RamPak 4Gs works perfectly when you're digitizing images in black and white. It does not work with AST's color-digitizing software, however.

If you read David Thornburg's recent columns about Prolog and are interested in getting an Apple II version of this programming language, here's a new, improved address and phone number for the British company that sells it. Write to Logic Programming Associates, Studio 4, The Royal Victoria Patriotic Building, Trinity Road, London, England, SW18 3SX (phone: 01441 8712016). The price is \$75.

Oops! Amazing what can happen when you move a number closer or further away from a decimal point. A reader

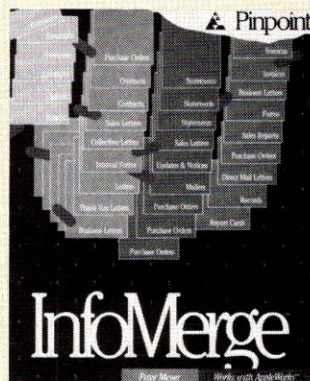
*If S. 838 is passed, it will give U.S. schools \$150 million to spend on computer education.*

has correctly pointed out that in our August 1987 "AppleWorks Report," "Working with @IF," we made just such a mistake. Our example concerned giving an employee a 2% bonus under certain conditions. However, rather than using a multiplier of 0.02, we used 0.2, which would result in a 20% bonus and happier employees. We also omitted a closing parenthesis. The correct formula is

```
@IF(@OR(C3>150000,C3)=  
(B3*1.5)),(C3*0.02),0)
```

Sunburst Communications has released updates to its M-ss-ng L-nks programs: Classics Old and New, MicroEncyclopedia, and Young People's Literature. The new versions allow greater customization and have improved printing and editing features. The updates are available without charge to current owners of M-ss-ng L-nks. At the same time, Sunburst has released M-ss-ng L-nks: Science Disk, which introduces students to 63 different

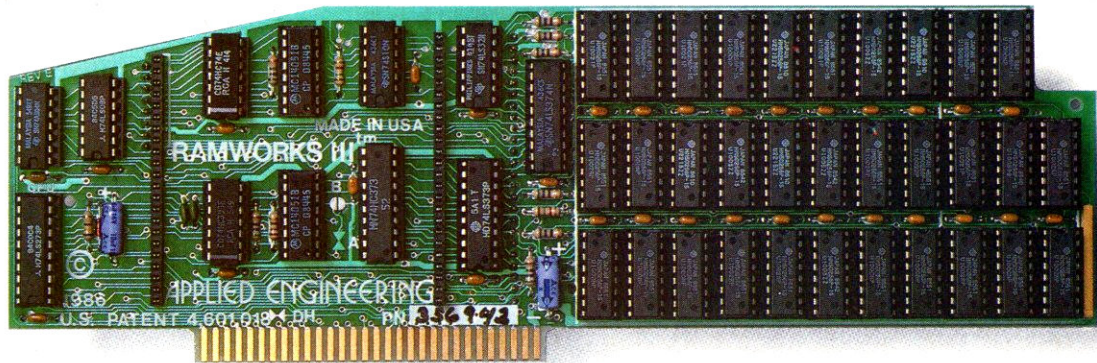
passages on science topics, each with letters or words missing. By filling in the missing information, students build a vocabulary of scientific concepts and facts. The Science Disk is available for \$65. For further information, contact Sunburst at (800) 431-1934.



Pinpoint Publishing has been practically giving away InfoMerge, its mail-merge and database-reporting program. According to the company, it ordered an oversupply of InfoMerge and so is anxious to unload it for about a fifth of its original price. Rather than spending the original \$79, you can get InfoMerge for \$15—if copies are still available by the time this issue comes out. Since Pinpoint ordered a five-year supply, chances are you can still get a copy for this special price. Call Pinpoint at (800) 633-2252, ext. 580. Operators are standing by. +

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printer to stop before returning to AppleWorks. And auto segments large files so they can be saved on two or more disks. You can even have Pinpoint or MacroWorks and your favorite spelling checker in RAM for instant response.

RamWorks, nothing comes close to enhancing AppleWorks so much.

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

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

## **Highest Memory Expansion.**

Applied Engineering has always offered the largest memory for the Iie and

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

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

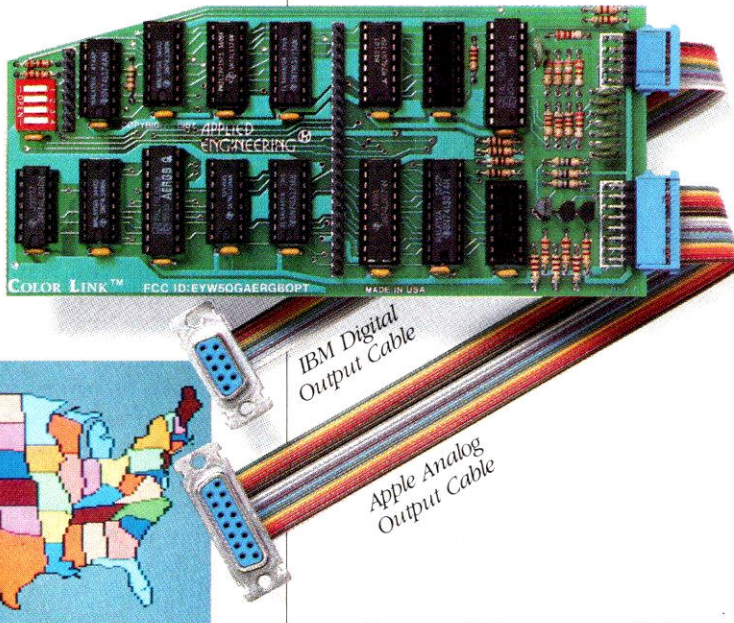
## **The Ultimate in RGB Color.**

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



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

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A+ magazine said "Applied Engineering's RamWorks is a boon to those who must use large files with AppleWorks...I like the product so much that I am buying one for my own system." inCider

magazine said "RamWorks is the most powerful auxiliary slot memory card available for your IIe, and I rate it four stars...For my money, Applied Engineering's RamWorks is king of the hill."



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

*Steve Wozniak, the creator of Apple Computer*

Apple experts everywhere are impressed by RamWorks' expandability, versatility, ease of use, and the sheer power and speed that it adds to any IIe. With a RamWorks in your Apple, you'll make IBM PC's and AT's look like slowpokes.

- Can use 64K or 256K RAMs
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- Self diagnostics software included
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- Much, much more!

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**T**he Apple line plays host to more than 45 word-processing programs. They come in near-tropical variety, and culling the best of the best is not simple. Three in particular are so effective and accommodating, however, that no list of *A+* All-Stars would be complete without them. They are WordPerfect, Perfect Writer, and Multiscribe GS.

These programs are all very different. The first is a command-oriented program, the third a Mac-like one, and the second an interesting hybrid of the two. Together, they cover the spectrum of Apple word processing today.

Despite their differences, all excel in major criteria for this category: power, ease of use, and ease of learning.

Power is the most important measure. A powerful word-processing program is like a Hindu god with 15 hands instead of 2. It bestows possibilities. The program may perform such desirable services as footnoting, indexing, and table-of-contents generation, and it may even carry out exotic tasks such as print spooling. It may also come with spelling-checker, thesaurus, and other software, further extending its range.

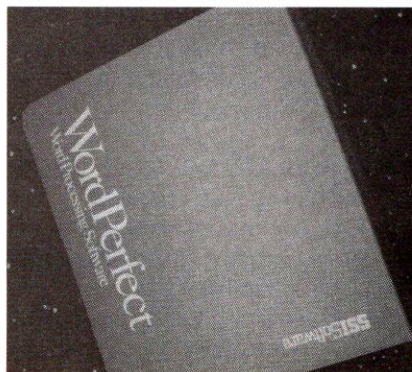
Ease of use is the personality of the software. An easy-to-use word-processing program is ingratiating, anticipating your needs and making its powers accessible. It provides shortcuts and macros. It offers direct ways to execute common

### **A+ All-STARS** BY DAN McNEILL

tasks, such as moving the cursor. It displays your work accurately and gives you other useful feedback. Finally, it has a satisfying "feel" to it. It confers a sense of mastery.

Ease of learning is the least important criterion, since it applies only to a temporary state, but it still matters. An easy-to-learn program has clear and complete documentation, including a tutorial, and does not require extensive memorization of commands. It may have further aids, such as a keyboard template to fit above function keys.

In these regards, WordPerfect, Perfect Writer, and Multiscribe GS



constitute the apex—or, rather, the great high ridge—of the Apple II word-processing programs.

#### **WordPerfect 1.1**

The command-oriented WordPerfect is the most traditional of the three, yet it is also a highly responsive item with an array of pleasing faculties. You cannot go wrong with it, and you may find it to be exactly what you want.

The software overflows with fine features. For instance, it offers print spooling, a rare capacity. It allows soft hyphenation. It does automatic footnotes, renumbering them when you add or delete them. It inserts the date automatically at the cursor. It boxes paragraphs, although you must type the boxes in, key by key. It capitalizes selections instantly and likewise generates all-lowercase letters. It performs hanging and double indents, for paragraph-size quotes. It allows proportional spacing, creates subscripts and superscripts, and handles fonts if your printer permits.

WordPerfect has extras as well. It comes with a 50,000-word spelling checker that alerts you to identical words in sequence, such as "the the." In addition, the program has a mail-merge feature, so you can create form letters.

For all its breadth, WordPerfect is a treat to operate. It has many features that gladden a writer's eye, such as word count. It moves the cursor in myriad ways, such as to a line located a specified number of lines down the page or to a selected

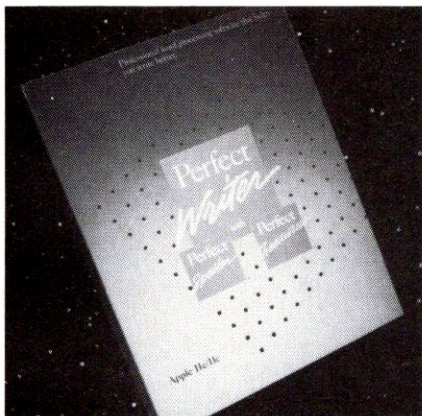
# ALL STARS

block of text. Among its delete functions are Delete to the End of a Line, and Delete to the End of the Page. For phrases and formats, it offers macros that you can chain together.

The trade-off for all this sophistication is a marked lack of speed. WordPerfect also abounds in instructions and thus is not the easiest program to learn. It comes with a template that fits above the keyboard and indicates the function keys, however. Its documentation is excellent, and it offers on-line help for the stranded. WordPerfect comes from WordPerfect Corporation, 288 West Center Street, Orem, UT 84057; (801) 227-4000. It runs on an Apple IIe or IIc with 128K of RAM and costs \$179.

## Perfect Writer 2.0

At first sight, Perfect Writer seems to be a program in transition, part command-oriented, part Mac-like. Yet unlike many compromises, which sacrifice the essences



on both sides, Perfect Writer has managed to retain them. The program melds power with a graceful interface.

The Mac influence is clear. The software offers a WYSIWYG display, unless you specify otherwise, and a ruler across the top. It also has pop-up menus, very similar to the Mac's, which you negotiate by pressing the arrow keys or typing the first letter of the command.

Perfect Writer is an impressive formatter. It does indexing, tables of contents, and footnotes, and can print footnotes either in the text or at the end. It offers hanging and double indents and permits three kinds of bullets: dashes, asterisks, or filled circles. It automatically numbers paragraphs, for outlines. Its headers and footers can alter-

nate for odd and even pages and contain not only the number of the page but of the current chapter and subchapter as well. It turns selected prose into all caps or all lowercase, and it can automatically transpose two adjacent characters, for swift typo correction. It lets you split the screen into two windows, for multiple-document editing, and even comes with a format for verse.

Perfect Writer offers a 50,000-word spelling checker and an equally ample thesaurus. In addition, it is compatible with spreadsheet, database, and telecommunications programs from its manufacturer.

Perfect Writer is easy both to learn and to use. Its documentation is clear and easy to understand. Moreover, the pop-up menus serve as convenient training tools. You can start writing soon after you first boot up the program, and once you assimilate the commands, you can move on to the mnemonic shortcuts at your own speed.

Perfect Writer is a product of Thorn EMI Computer Software, Inc., 285 Mill Road, Chelmsford, MA 01824; (617) 256-3900. It requires an Apple IIe or IIc with 64K of RAM and retails for \$139.

## Multiscribe GS 2.0

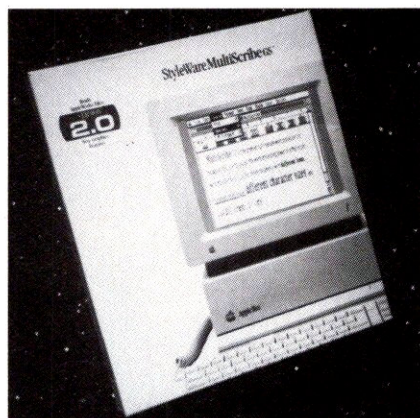
Multiscribe GS is the first IIGS word-processing program to attain real stature. It has the floating-on-air feel of a true Macintosh program, and if it lacks such features as automatic footnoting, it compensates elsewhere.

Multiscribe GS employs the mouse and has an eye-pleasing Macintosh-type display: pull-down menus, scroll bar, ruler (in color), WYSIWYG, fonts, styles (including subscript and superscript), and sizes.

The program takes after MacWrite in many ways. For instance, it lets you select a word by double-clicking on it and allows you to scroll window by window by clicking above or below the scroll box. It offers numerous shortcuts, reports the space left on the disk, and displays the current page number. But that's just the beginning.

Multiscribe GS 2.0 exceeds MacWrite in many other ways. It lets you select a whole line by triple-clicking it. It has Select All. It can display as many as eight windows for multidocument editing, and it lets you zoom them in and out. Its automatic Stack Windows function arranges up to three windows on the screen, one atop another, like playing cards.

Moreover, MultiScribe allows you to work in any font size from 6 to 48 point, through its Larger and Smaller commands, which increase or decrease selected text by one point. In addition, its Style menu lets you deselect styles one at a time, so that, for instance, you can



go directly from bold italic shadow to bold italic, rather than dropping down to Plain Text and then rebuilding.

Multiscribe GS prints with either a vertical or horizontal orientation, in color or black and white, in multiple quality levels. It also reads AppleWorks files directly.

The software has two features the average writer may not need but that are still a pleasure: color and graphics. The Color menu can contain two pure colors and up to 15 dithered ones, and the Edit Colors command lets you choose from among 4096 colors in which to work.

Multiscribe GS 2.0 also has an impressive graphics capacity. It lets you paste in bit-mapped pictures, whose size is limited only by available memory. You can manipulate these pictures easily: resize, reshape, and move them, as well as place them behind or in front of text. Most intriguingly, you can draw right on MultiScribe GS documents. You can pull out filled and hollow rectangles, curved rectan-

gles, and ovals, in six different pen sizes and any color.

This program is a delight. It comes from StyleWare, Inc., 5250 Gulfon, Suite 2E, Houston, TX 77081; (800) 233-4088 or (713) 668-0743. It requires an Apple IIGS with 512K of RAM and costs \$99.95.

#### Honorable Mention

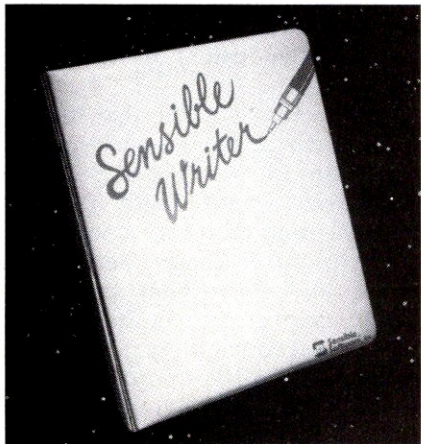
Three other word-processing programs deserve special notice:

**AppleWriter II.** AppleWriter II has a fine array of features, including footnoting; split screens; optional invisible comments; and its own programming language, which lets you set up form letters, perform arithmetic, and create numerous macros.



AppleWriter II is a product of Apple Computer, Inc., 20525 Mariani Avenue, Cupertino, CA 95014; (408) 996-1010. It runs on an Apple IIe or IIc with 128K of RAM and costs \$149.

**Sensible Writer.** Sensible Writer is a Macintosh-like program directly compatible with AppleWorks. Among other things, the program handles mail merge, locks documents, boasts a clever Undo command, and has an Append command, so you can append one

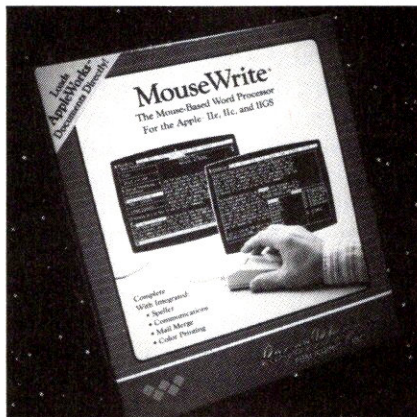


# ALL STARS

document to the end of another.

**Sensible Writer** is from Sensible Software, Inc., 335 East Big Beaver, Suite 207, Troy, MI 48484; (313) 528-1950. It requires an Apple IIe (with an 80-column card), IIc, or IIGS with 128K RAM and retails for \$99.95.

**MouseWrite.** MouseWrite is a fast, versatile Mac-like program without full WYSIWYG but with numerous potent features such as print spooling and the capacity to read AppleWorks and DOS 3.3 files, plus a 61,000-word spelling checker, telecommunications module, mail merge, macros, and expandable desktop accessories.



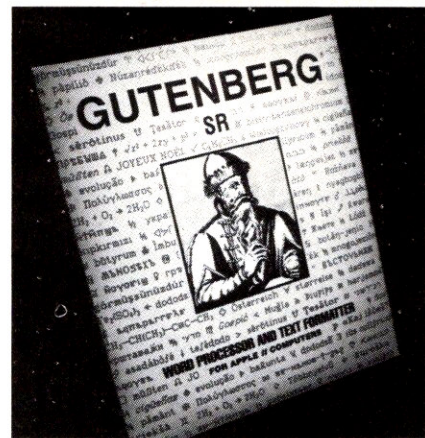
MouseWrite is a product of Roger Wagner Publishing, Inc., 1050 Pioneer Way, Suite P, El Cajon, CA 92020; (619) 442-0522. It runs on an Apple IIe, IIc, or IIGS and costs \$149.95.

#### Special Achievement

Several Apple word-processing programs that do not qualify as general-purpose programs still merit attention for their particular excellence:

**Best Output Program: Gutenberg, Sr.** This remarkable product comes with the Latin, Greek, Cyrillic, and Hebrew alphabets, and options for Cree and Syriac. It lets you create characters, fonts, and technical symbols and has a paint feature. It can connect directly to typesetting systems.

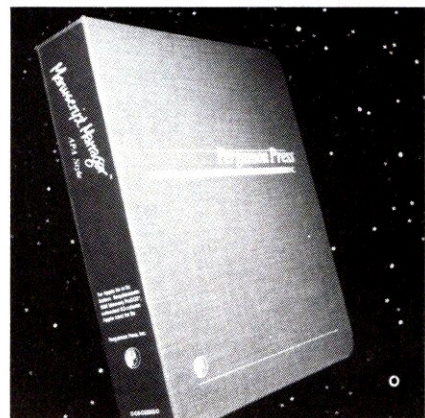
Gutenberg, Sr. is a product of Gutenberg Software, 47 Lewiston Road, Scarborough, Ontario M1P 1X8 Canada; (416) 757-3320. It



works on an Apple IIe, IIc, or IIGS with 64K RAM and costs \$230 until a new version comes out in early 1988—\$360 thereafter.

#### Best Special-Purpose Program: Manuscript Manager/APA Style.

This sturdy software formats prose according to the conventions of the American Psychological Association and can even check elements of your style according to APA dictates.



Manuscript Manager/APA Style is from Pergamon Journal, Inc., Maxwell House, Fairview Park, Elmsford, NY 10523; (914) 592-7700, ext. 312. It runs on an Apple IIe (with an 80-column card), IIc, or IIGS with 128K of RAM and retails for \$175.

#### Best Home Word-Processing Program: Bank Street Writer Plus.

The new upgrade offers pull-down menus and a 60,000-word spelling checker and thesaurus. Close on its heels, in second place, is HomeWord Plus, which is extremely easy to learn and use by virtue of its iconic interface.

Bank Street Writer Plus is a product of Brøderbund Software, 17 Paul Drive, San Rafael, CA 94903; (415) 492-3200 or (415) 492-3500. It

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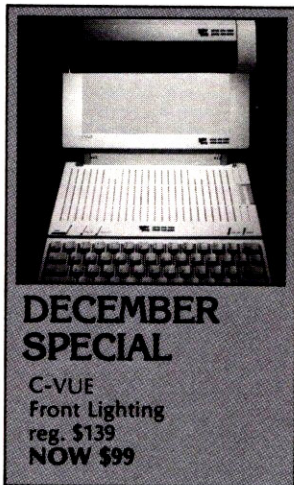
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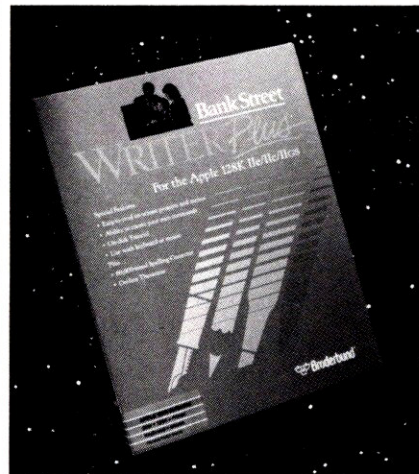
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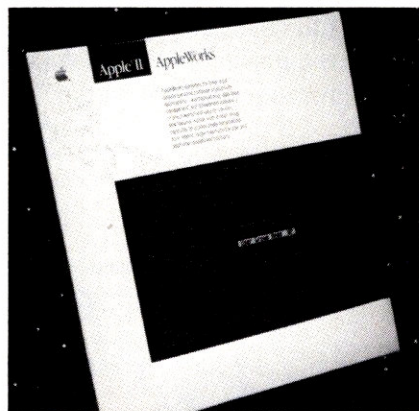


# ALL STARS



requires an Apple IIe (with an 80-column card), IIc, or IIGS with 128K of RAM and costs \$79.95. HomeWord Plus is from Sierra On-Line, Inc., P.O. Box 485, Coarsegold, CA 93614; (209) 683-6858. It runs on an Apple IIe or IIc with 128K of RAM and retails for \$69.95.

**Best Integrated Program with Word Processing: AppleWorks.** A classic. It's fast and gets the job



done for thousands upon thousands of users.

AppleWorks comes from Apple Computer, Inc., 20525 Mariani Ave., Cupertino, CA 95014; (408) 996-1010. It requires an Apple IIe (with an 80-column card), IIc, or IIGS with 128K of RAM and costs \$249. **+**

Dan McNeill's most recent book is COMPUTE!'s Quick and Easy Guide to Desktop Publishing (COMPUTE! Books). McNeill lives in Culver City, California.

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perform scores of other functions like mail merge, macros, on-screen formatting, super/subscript, automatic page numbering, and more.

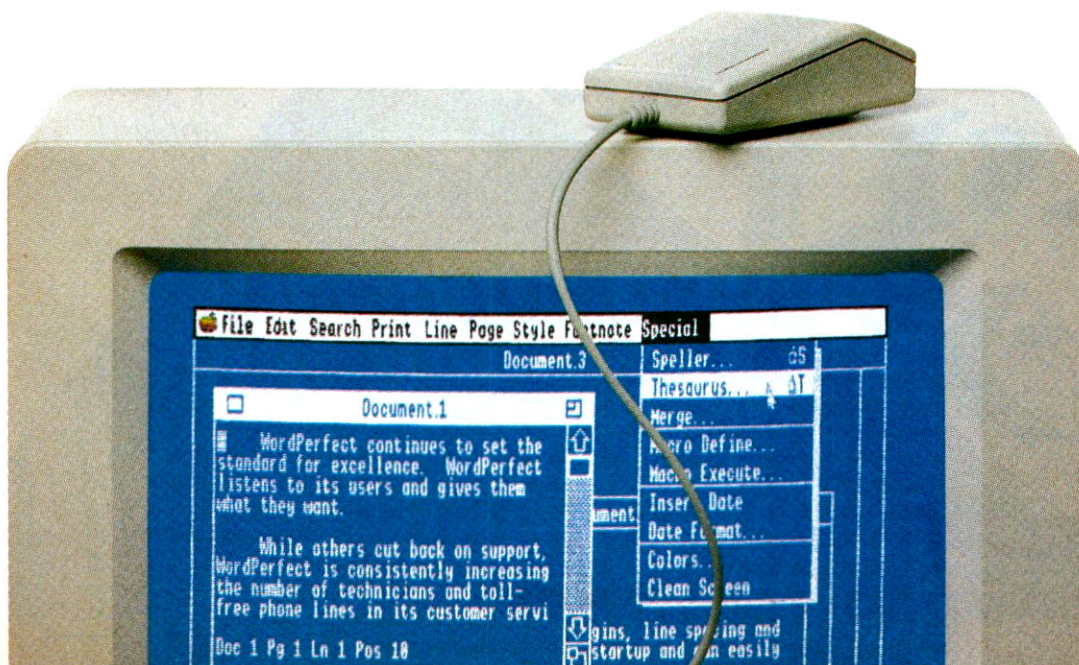
## WordPerfect Flexibility.

In addition to running on the IIGs, WordPerfect is available for the IIe/IIc (with a 50,000-word dictionary). And files from both versions can be interchanged with WordPerfect files generated on other machines, including IBM®PC compatibles and some minicomputers.

No other word processor lets you flex the word processing muscle of your IIGs like WordPerfect. For more information, including special programs for educators, call or write WordPerfect Corp., 288 West Center St., Orem, Utah 84057 (801) 225-5000.

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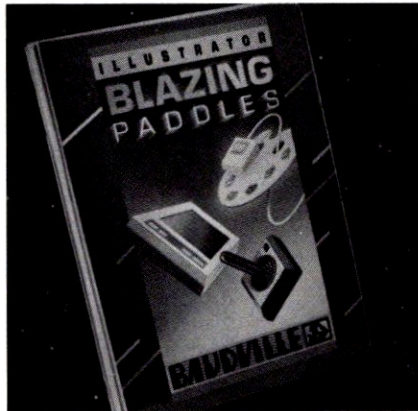
# ALL STARS

Another year is on the way out. 1987 brought us the maturation of the Apple II GS, and you can be sure that 1988 will bring us more dazzling graphics programs. For now, however, rather than predicting what lies ahead, let's look back. Join us in a salute to the best Apple graphics software—our choice for the All-Stars.

We've divided our preferences into categories of graphics applications: paint programs, print utilities, animation programs, and so on. Our only criterion, besides excellence, was that the program currently be available for purchase. We've made a special effort to mention not only the programs and their publishers but, whenever possible, the authors and programmers as well—they are the unsung heroes of the computer world. Here goes.

## Blazing Paddles

Our choice for best standard-hires paint program is Blazing Paddles, written by Michael Darooge and programmed by Edward

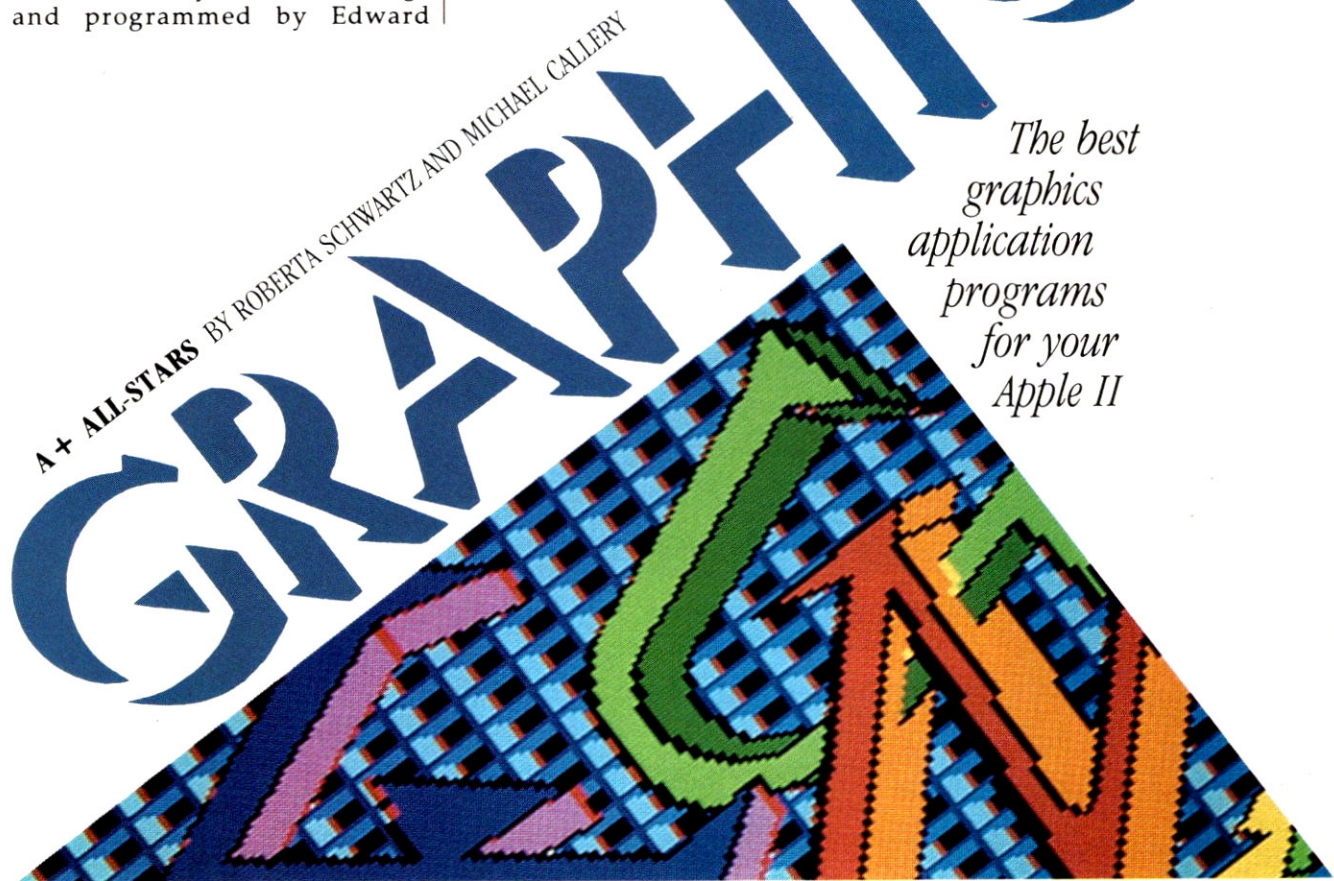


McCullough and David Walker. This program offers a variety of options, is incredibly easy to use, and works with an assortment of input devices. Blazing Paddles deserves a

salute for being one of the few graphics programs that lets you see your entire graphic as you work. An iconic menu frames the screen. Select a color and a tool, and the menu disappears. Once you have started working, a click of a mouse or a similar action with a graphics-tablet pen, paddle, or other input device brings back the menu frame. While you are selecting your next tool and/or color, you can see most of your picture inside



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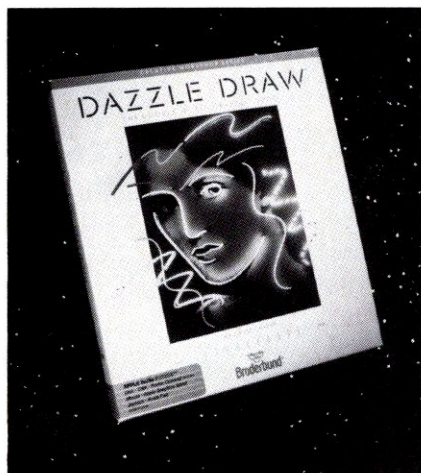
A+ ALL-STARS BY ROBERTA SCHWARTZ AND MICHAEL CALLERY



this frame—extremely helpful when you are deciding which colors to use.

Blazing Paddles lets you load and manipulate standard Applesoft shapes and add them to your graphic (a precursor to clip art?), and it has a wonderful magnifying, or zoom, mode that scrolls as you work. With text, cut and paste, color mixing, and an undo function, Blazing Paddles outfeatures the competition.

Blazing Paddles is from Baudville, 1001 Medical Park Drive S.E., Grand Rapids, MI 49506; (616) 957-3036. It runs on an Apple II Plus, IIe, IIc, or IIGs with 64K of RAM, and its list price is \$34.95.



### Dazzle Draw

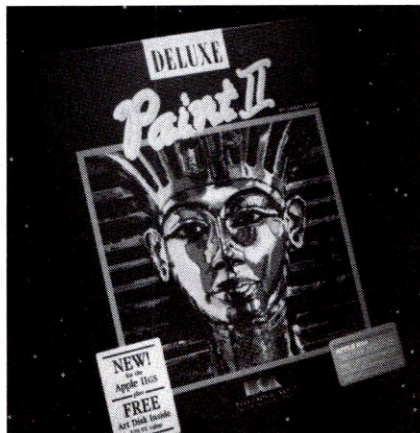
For best double-hi-res paint program, it's David Snider's Dazzle Draw, all the way. Judging from your submissions to "A+ Graphics Gallery," we're sure most of you agree. It was one of the first Apple II programs to emulate the Macintosh interface and use pull-down menus. Click on the menus, and they pull down like window shades, offering just about any tool you could wish for. It's all there: adjustable line widths, circles, squares, brushes of different sizes and shapes, text, fill, spray paint, zoom, patterns, pattern edit, cut, copy, paste, flip, invert, exchange colors, replace colors, mirrors, grid.

Dazzle Draw would be better if the program let you see the full screen while you were working. Unfortunately, the menu bar and tool windows obstruct your view, so you have to scroll as you work. Aside from that one serious flaw, we find that the program lives up to its name—it's dazzling.

Dazzle Draw is a product of Brø-

# ALL STARS

derbund, 17 Paul Drive, San Rafael, CA 94903; (415) 492-3200 or (415) 492-3500. It requires an Apple IIe, IIc, or IIGs with 128K of RAM, and its list price is \$49.95.



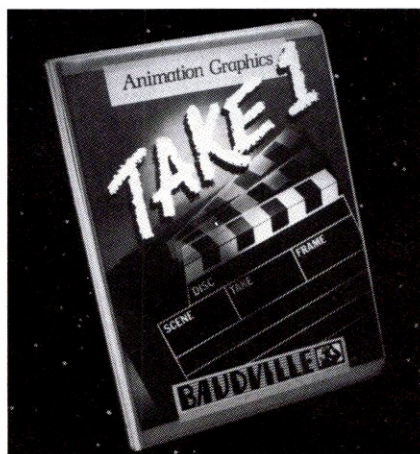
### DeluxePaint II

DeluxePaint II, by Dan Silva, has our vote as the best super-hi-res paint program. This program is the newest kid on the block, and it's a winner. We reviewed this program last month, so we won't go into detail about the program here. Suffice it to say that, with every possible feature you could wish for—and a few you may not have thought possible on an Apple II—DeluxePaint II belongs in the software library of every Apple IIGs user.

DeluxePaint II is from Electronic Arts, 1820 Gateway Drive, San Mateo, CA 94404; (415) 571-7171. It runs on an Apple IIGs with 768K of RAM and costs \$99.95.

### Take 1

Baudville did it again with Take 1, our pick as the best standard-hi-



res animation program. This dynamic animation program was written by Maurizio Barbatano and Michael Darooge. Edward McCullough and David Walker were the programmers. Here, too, outstanding features coupled with ease of use make a winner.

Using keystroke commands, you cut out objects from any hi-res picture to make "actors." You then move the actors around the screen, combine them with text and sound, add pauses, and "shoot a scene." One or more scenes put together with backgrounds make a movie. Thanks to Take 1's editing capabilities, you can back up and easily change any part of your movies.

In Take 1, text can be animated just like an actor. Scenes can have fade-ins and fade-outs. You can use pauses to stop action at a given frame and wait for a selected time delay or until the viewer presses a key or joystick button. Pauses can include sound effects such as footsteps, beeps, and crashes. Actors can be block shapes or sprites. (Sprites contain transparent holes that allow the background to show through. If the snapshot is a car, for example, the background will show through the windows of the car.) You create backgrounds with a full-screen hi-res picture editor that uses shape tables, text, actors, color fill, and a zoom pixel editor. Cut and paste options let you clip out any part of the screen, move it, flip it, and/or duplicate it. The program automatically compresses your finished background so that it takes up less disk space. With the Take 1 Tool Kit, you can convert your movies into professional-quality interactive presentations.

Take 1 and Take 1 Programmer's Toolkit are from Baudville, 1001 Medical Park Drive S.E., Grand Rapids, MI 49506; (616) 957-3036. They run on an Apple II Plus, IIe, IIc, or IIGs with 64K of RAM. Take 1 costs \$59.95, and Take 1 Programmer's Toolkit is \$60.

### Animate

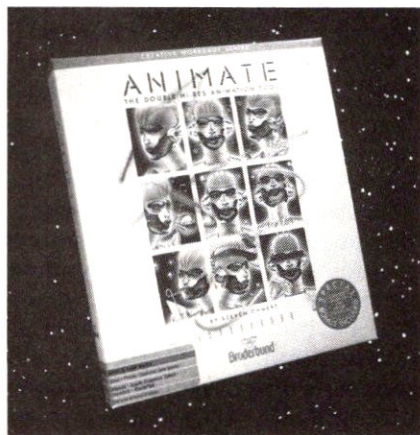
Our choice for best double-hi-res animation is Animate, a superb program by Steven Ohmert. Animate consists of Graphic Designer and Scene Designer. Graphic Designer is where you develop your characters and backgrounds, using a full complement of drawing and editing features. You start by draw-

# ALL STARS

ing your character shapes (man with arms down, man with arms out, man with arms up) and enclosing them in frames. Next, you put your frames in order, which defines a character. Once you've saved your characters to disk, you go to Scene Designer.

Here you load all the characters you want in a scene. You can also load a background you've created with Dazzle Draw. Next you define your characters' movements by setting paths. Finally, you add text and sound, and your animation is complete.

Animate has features similar to

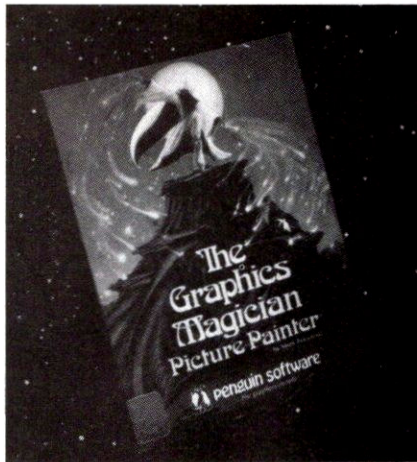


Take 1's, but it uses the same graphic interface as its sister program, Dazzle Draw. Pull-down menus combined with your choice of graphic-input device make the program as easy to use as an animation program can be.

Animate comes from Brøderbund, 17 Paul Drive, San Rafael, CA 94903; (415) 492-3200 or (415) 492-3500. It runs on an Apple IIe, IIc, or IIGS with 128K of RAM, and its list price is \$59.95.

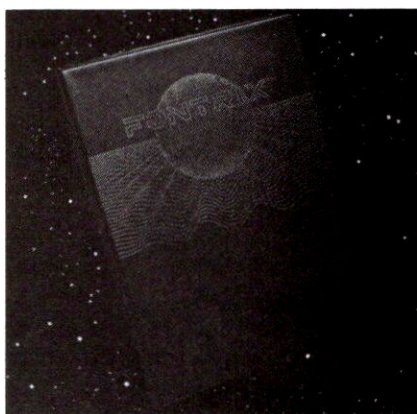
### Other All-Stars: The Classics

Some programs serve a need for a while, and then, as newer, similar utilities arrive, they are relegated to a closet shelf and gather dust. Other programs, however, stand the test of time. They do something uniquely or so well that you find yourself using them time after time. We consider these programs classics. They are the real All-Stars. **The Graphics Magician.** This program, by Mark Pelczarski, David Lubar, Chris Jochumson, and Steven Meuse, is probably the most enduring graphics program. This standard- and double-hi-res animation program offers both a game-style small-object animation mod-



ule and a paint-oriented sequential-picture module. Without the Graphics Magician, many commercial games and educational programs wouldn't exist. This program, although four years old, is still being used by professional developers. A special professional version is available.

The Graphics Magician is from Polarware, P.O. Box 311, Geneva, IL 60134; (312) 232-1984. It requires an Apple II Plus, IIe, IIc, or IIGS with 48K of RAM and costs \$39.95. **Fontrix.** Fontrix, by Steve Boker, was the first Apple II program to



let you combine text with graphics and print it on a full page. Fontrix's innovative use of an "extended" screen (it lets you scroll horizontally and vertically to see multiple hi-res-graphics screens), combined with its excellent printing module (it reduces the screen graphics so that multiple screens of text and graphics fit on one page), gave us desktop publishing on the Apple II

well before we got it on the Mac.

Fontrix lets you create newsletters and other printed materials; it has a powerful print utility that works with more printers than we knew existed; and you can use it with supplemental FontPaks of the most astonishing array of high-quality fonts in the Apple II world.

Fontrix comes from Data Transforms, 616 Washington Street, Denver, CO 80203; (303) 832-1501. It runs on an Apple II Plus, IIe, IIc, or IIGS with 48K of RAM, and its list price is \$75.

**Shape Mechanic and Font Mechanic.** Shape Mechanic and Font



Mechanic by Bert Kersey and Mark Simonsen are a matched pair that evolved from the older Apple Mechanic program. Apple Mechanic gave artists and programmers an easy alternative to creating shapes from scratch and provided a simple way to put text onto the Apple II hi-res screen by letting you use font shapes. Today, Shape Mechanic lets you capture any piece of a standard hi-res graphic and convert it into a shape. If you've tried to piece together a shape table from scratch or use a standard shape editor, you'll breathe a sigh of relief when you see the Shape Capture module. Terrific!

These two programs come from Beagle Bros Micro Software, Inc., 3990 Old Town Avenue, Suite 102C, San Diego, CA 92110; (619) 296-6400. They run on an Apple II Plus, IIe, IIc, or IIGS with 64K of RAM. Font Mechanic costs \$29.95, and Shape Mechanic is \$39.95.

**The Graphics Department.** The Graphics Department, by Mike McDonald, is beginning to show its age. It is, however, the most comprehensive and useful standard hi-res business-graphics program



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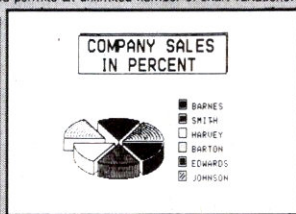
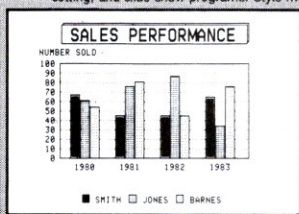
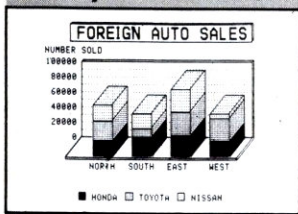
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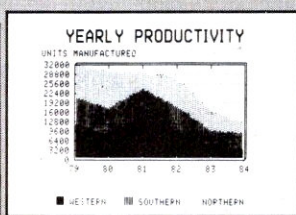
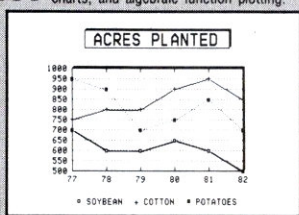
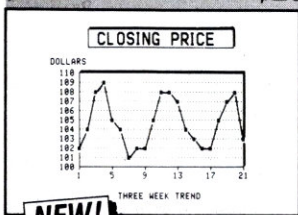
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Create beautiful vertical bar charts in two or three dimensions, stacked or side-by-side. 2D/3D pie charts with exploded slice and floating label capability. Terrific extras include drawing, type-setting, and slide show programs. Style menu permits an unlimited number of chart variations.



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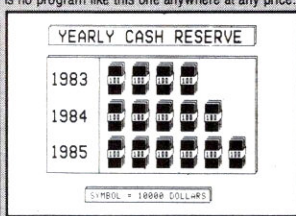
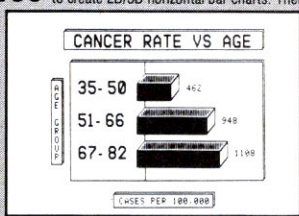
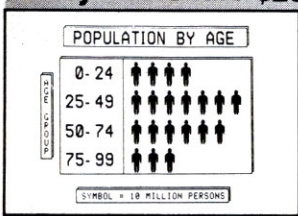
This program creates standard, connect-the-points, charts, with up to three curves per chart. Also included are area charts (stacked curves with shaded areas), best-fit straight line trend charts, and algebraic function plotting.



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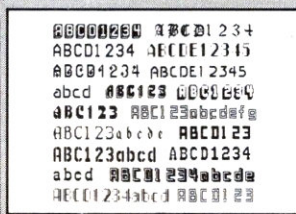
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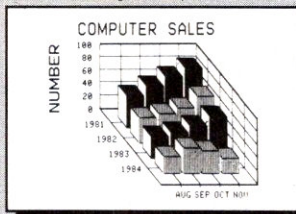
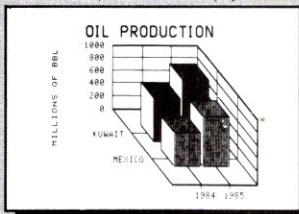
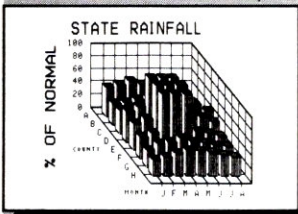
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Provides the freedom to add special notes or comments to your charts, anywhere you want. In 24 different lettering styles. Also great for making presentation quality viewgraphs, certificates, signs, ads, flyers, invitations, report covers.



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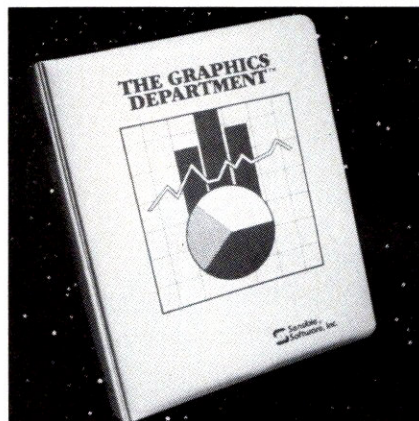
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# ALL STARS

we've seen, at a price that competes with the cost of programs with only half the features. Using the keyboard and mouse, you can enter and save data, create charts, and use your Apple II as a "slide projec-



tor" to display presentations.

The Graphics Department provides a complete set of graphics tools, including drawing tools such as line, rectangle, ellipse, paint (with 100 colors and patterns), cut and paste, and Applesoft shapes. The Lettering Kit contains 40 different monospaced and proportional fonts. Lettering options let you control lettering direction, character size, character kern, character color, font, and case.

The Slide Projector module lets you create slide disks. You can pick which slides from a slide disk should be shown, specify the order in which the slides are to appear, add subtitles to the slides, and set the amount of time a slide is displayed when you're using the Continuous Play mode. The Graphics Department is a must for anyone who needs to create business graphics in standard hi res.

It comes from Sensible Software, Inc., 335 East Big Beaver, Suite 207, Troy, MI 48484; (313) 528-1950; runs on an Apple IIe, IIc, or IIGS with 48K of RAM; and retails for \$124.95.

Well, that's it—our picks for the All-Stars. Happy New Year. +

Roberta Schwartz and Michael Callery are A+ contributing editors and the authors of our monthly "Speaking of Graphics" column.



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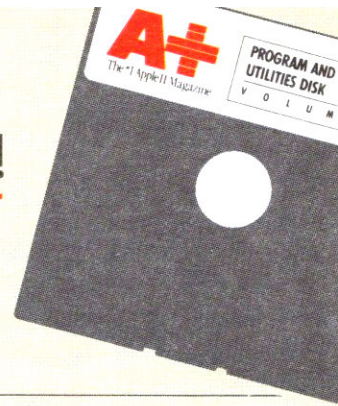
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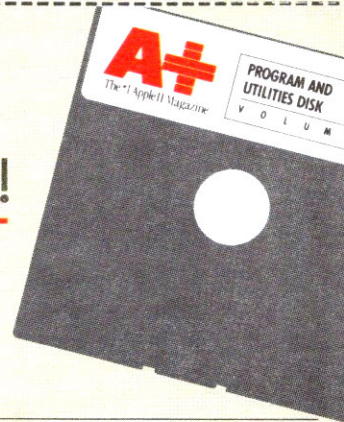
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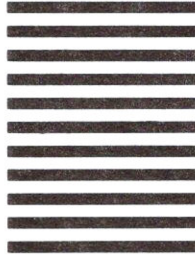
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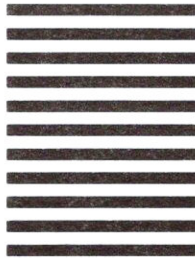
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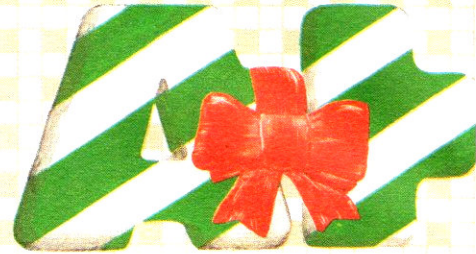
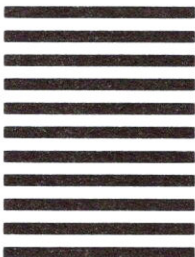
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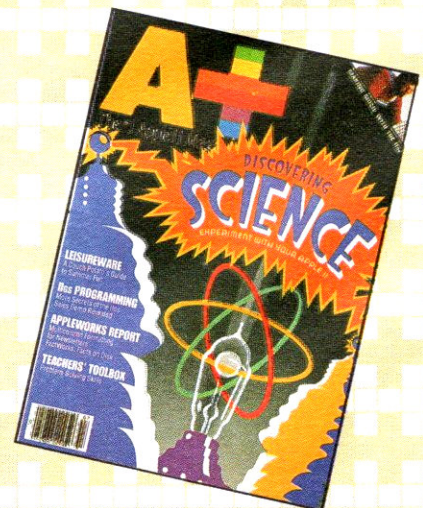
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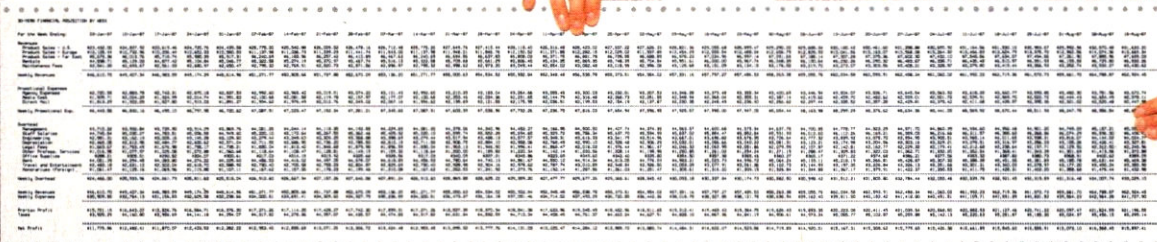
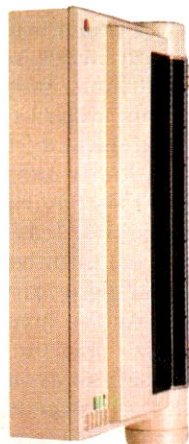
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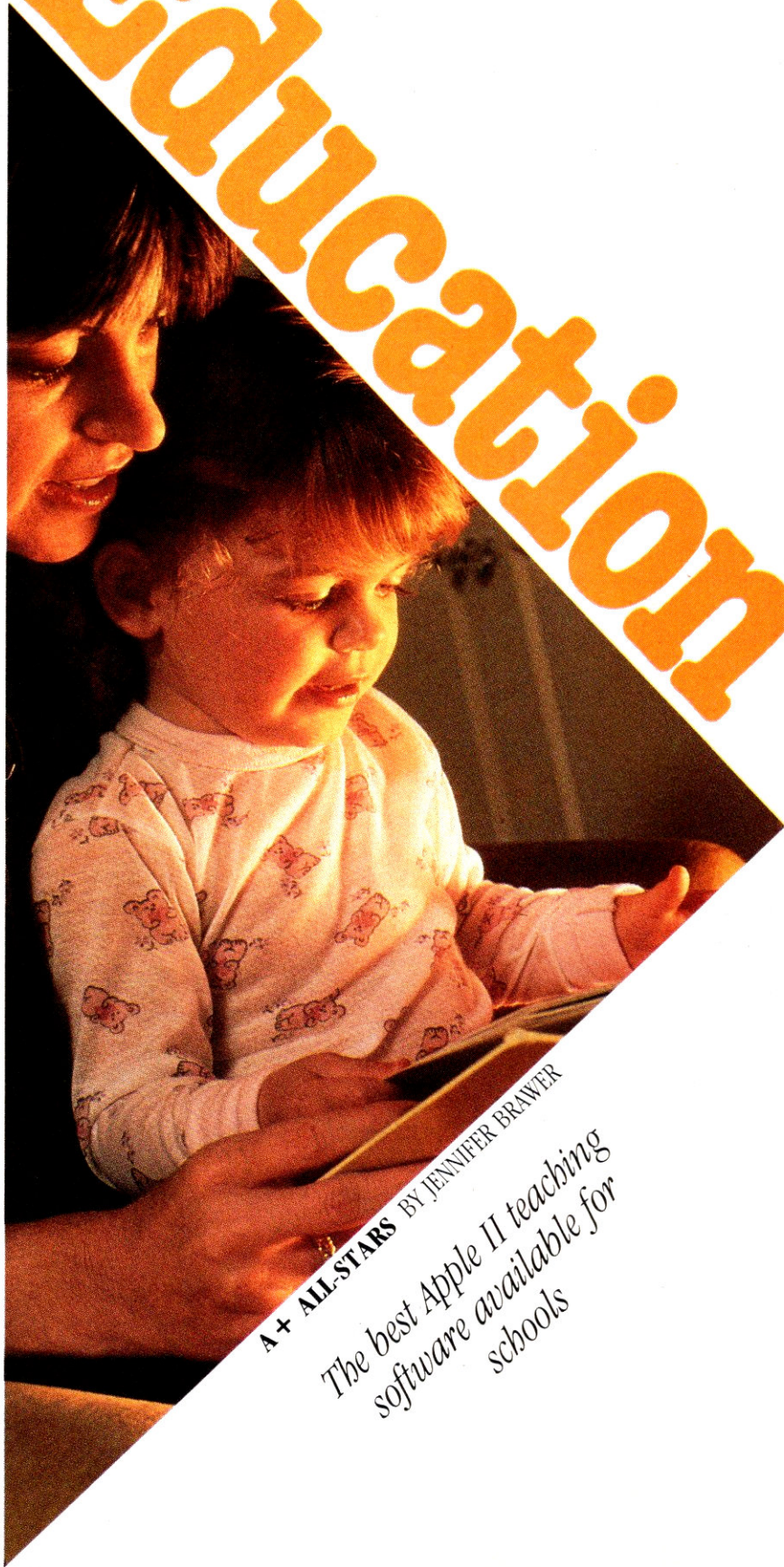


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ALL  
STARS

# Education



A+ ALL-STARS BY JENNIFER BRAUER

*The best Apple II teaching software available for schools*

Choosing educational-software All-Stars is a nearly impossible task. There are too many outstanding educational software packages and too few editorial pages. To make things more manageable, I am relying on the distinction between software developed for home use and software meant for classroom use. In this All-Star issue, I'll concentrate on classroom software and refer you back to *A+*'s October Computer Learning Month issue (page 38), where the article "A Sampler of Tried and True Titles" lists programs that qualify as All-Star products for educational use at home.

The programs I've selected here as *A+* All-Stars are a mixture of classics and newer, innovative products; a few titles are new releases. Most of the All-Stars are for classrooms only and supplement a distinct curricular area.

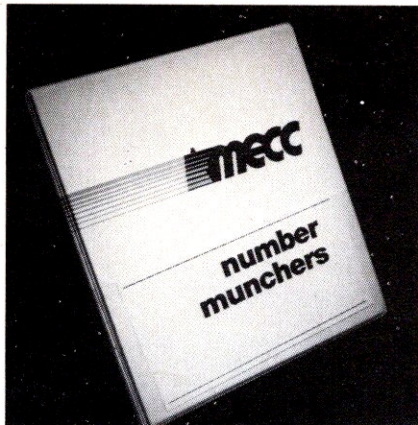
The education All-Stars fall into the following curricular areas: mathematics, science, problem solving, language arts, social studies, and early learning. A separate category for productivity software lists the best tool products. You'll notice two glaring omissions from these categories: music and art. Don't worry, though—we haven't left them out; see the Music and Graphics All-Stars sections in this issue for information on both of these categories.

## MATHEMATICS

**Number Munchers.** Number Munchers from MECC is a delightful mathematics game that takes place on a grid populated by Number Munchers (Munchus Digitus) and Troggles with names such as Troglus Normalus, Troglus Assitus, Troglus Laborus, Troglus Timidus, and Troglus Smarticus. Number Munchers are under student control, driven to meals of multiples, factors, addition, subtraction, multiplication, division, prime numbers, equalities, and inequalities. Troggles randomly jump in to complicate matters—they eat numbers and expressions, leave others as distractors, eat number munchers whole, and generally make things difficult. As the level of difficulty increases, extreme concentration is necessary to avoid all the Troggles and unexpected target values that pop up. Students



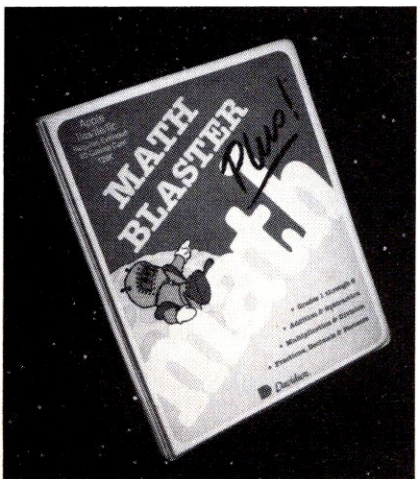
# ALL STARS



do get relief from the stress of high-level play, however. The program rewards success with graphic interludes showing great moments in Number Muncher history.

Number Munchers is available from MECC, 3490 Lexington Avenue North, St. Paul, MN 55126; (612) 481-3500. The program is appropriate for grades 3 and above and requires any Apple II series computer with 64K of RAM. The list price is \$49 for a 5¼-inch diskette and \$55 for a 3.5-inch diskette.

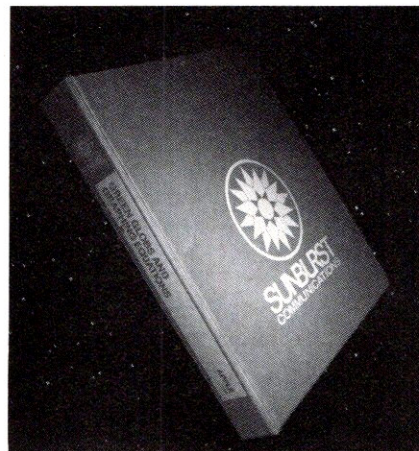
**Math Blaster Plus.** It's here! The new and enhanced version of the Davidson & Associates classic Math Blaster is even better than the original. The program covers the same subject area, basic math, but has had a face-lift. New graphics and pull-down menus give it a classy new look. Yet, knowing beauty is only skin deep, Math Blaster Plus does not rely on looks for success. A test maker, a retake option for difficult problems, student record-keeping and report capabilities, printed-graphics capabilities, and problem-solving activities are a few of the new features that make Math Blaster Plus a valuable teach-



ing tool. For the kids, the Blaster-naut game is tons of fun and lets them improve problem-response speed and accuracy.

Math Blaster Plus is available from Davidson & Associates, Inc., 3135 Kashiwa Street, Torrance, CA 90505; (213) 534-4070. The program is appropriate for use in grades 1-6 and requires an Apple IIe (with an extended 80-column card), IIc, or IIGS with 128K of RAM. The list price for the single-user version is \$49.95; the five-disk lab pack is \$129.95.

**Green Globbs and Graphing Equations.** I still have trouble comprehending that  $(2x - 3)(y + 8) = 12$  is a conic section. I'd do better with Green Globbs and Graphing Equations, which provides mathematical settings in which students can



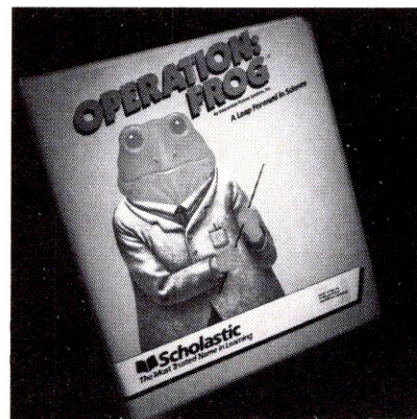
explore the relationship between just such equations and their graphs. The program has an enormous problem range that is appropriate for beginning algebra students working with graphs of straight lines, all the way to math-analysis students exploring trigonometric and discontinuous algebraic functions. Two tool programs let students graph equations and explore the effects of altering them. The package includes two games, Green Globbs and Tracker. In Green Globbs, students earn points for writing equations that pass through as many green globbs as possible. Tracker is a game in which graphs are hidden on a grid. Students gather clues to figure out the equation of the hidden graphs.

Green Globbs and Graphing Equations is available from Sunburst Communications, 39 Washington Avenue, Pleasantville, NY 10570; (800) 431-1934 or (914) 769-5030. The program is appropriate for grades 9-12 and requires any Apple II computer with 64K of RAM. The list price for the single-user version is \$65; the ten-disk Lab Pack is \$195.

## SCIENCE

**Operation: Frog.** If intestinal tracts, glands, and major blood vessels aren't your cup of tea but you need to know amphibian physiology, Operation: Frog is for you. The three segments of the program cover dissection and two levels of "reconstruction": beginner and expert. The program demands that the frog be dissected or reconstructed in logical order of position—you can't insert or remove the small intestine if you're working on the respiratory system, for example. A feature worth noting is the magnifying glass. Using the magnifying glass to inspect an organ calls up either an animated graphic of the organ's function or a diagram illustrating how an organ fits into one of the frog's systems.

Home and school versions of Operation: Frog are available. The school version comes with a complete reference guide, background materials on the high points in the history of frogs and toads, and a variety of student-activity suggestions. Operation: Frog is available from Scholastic, Inc., 730 Broadway, New York, NY 10003; (212) 505-3000. The program is appropriate for grades 4-10 and requires an Apple II Plus, IIc, or IIe with 64K of RAM. The list price for the single-user version is \$74.95; the five-disk Lab Pack is \$112.45.



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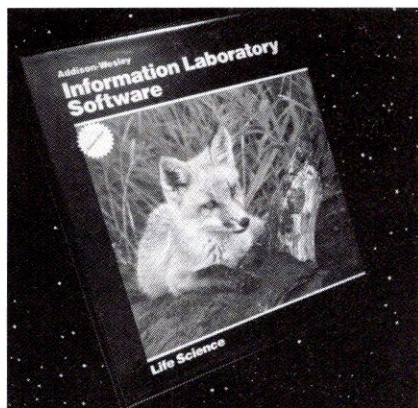


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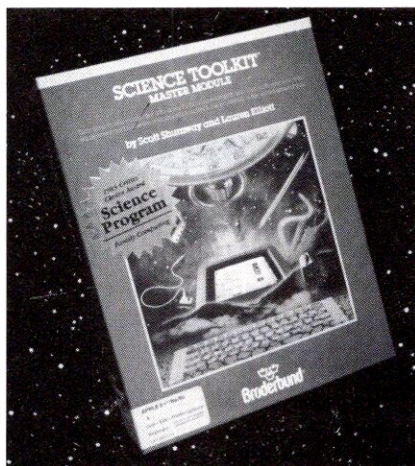
**Information Laboratory Software—Life Science.** The Information Lab Life Science database covers a broad range of topics—from abiogenesis to zygote—within subject areas that include the animal kingdom, theories about life, the scientific method, and fungi. Speaking of fungi, do you know the names of the famous fungi responsible for the potato famine in Ireland or the near demise of the French wine industry in the late 19th century?



The Information Lab is a powerful informational tool packed with a comprehensive selection of life-science information that students can search in any way they choose. The information is organized by subject area first and then by the interrelationships among life-science topics. The package includes Search Sheets, which illustrate a variety of conceptual approaches to life-science research. Each research task guides students through a major subject area, using a hierarchical model of the interrelated topics.

The Information Laboratory—Life Science is from Addison-Wesley Publishing Company, 2725 Sand Hill Road, Menlo Park, CA 94025; (415) 854-0300. The program is appropriate for grades 6–9 and requires an Apple IIGS with 512K of RAM and one 3.5-inch disk drive. The list price is \$80.

**Science Toolkit.** Science simulations are commonplace on computers, but Science Toolkit goes beyond simulation and turns the computer into a science laboratory. The package comes with software and “probeware,” instruments that connect to an interface box that plugs into the joystick port. Students use probes to measure phenomena such as light, speed, temperature, and centrifugal force.



The Master Module is the core program required to run a series of companion labs that investigate speed and motion, earthquakes, and the human body. The Speed and Motion Lab explores the physics of linear and rotational speed. The Earthquake Lab comes with a build-it-yourself seismoscope to measure harmonic and wave motion. With the Body Lab, you use the on-screen heart-rate monitor; response-time monitor; lung-volume meter; and another build-it-yourself tool, a spirometer, to see physiology concepts come to life.

Science Toolkit is available from Broderbund, 17 Paul Drive, San Rafael, CA 94903; (415) 492-3200 or (415) 492-3500. The program is appropriate for grades 4–12 and requires any Apple II computer with 64K of RAM. The list price for the Master Module single-user version is \$69.95; the school edition is \$89.95. The list price for each companion module is \$39.95.

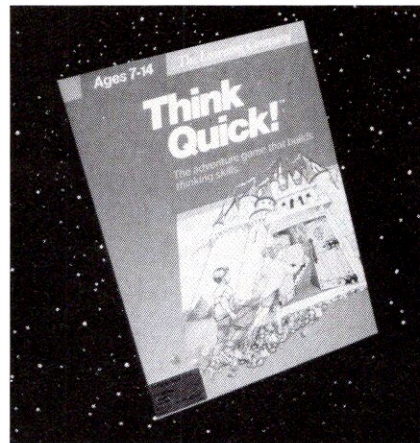
## PROBLEM SOLVING

**Think Quick.** For younger children, Think Quick is a fun and challenging way to improve problem-solving and decision-making skills. While you’re running from cute little slime worms hidden in Mystikar Castle, intellectual opportunities disguised as fun make the program highly motivational. Look out if you’re digested by a slime worm. It’s straight to the Slime Worm Belly, and it takes forever to get out! Flowers put the little fellows to sleep, so take every

opportunity to grab one—it may be the only way to beat the clock and avoid becoming lunch.

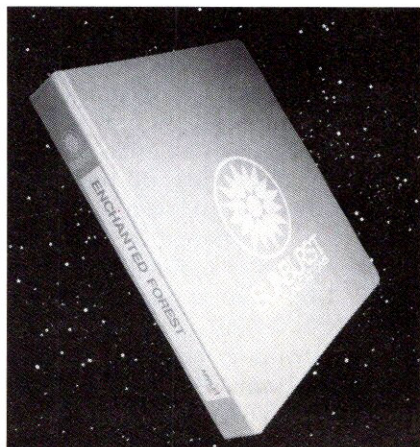
Think Quick is a new release from the Learning Company and is another example of the superior educational quality of TLC’s software line. For you Gertrude’s Secrets fans, Think Quick is equal in educational value and a superior visual experience.

Think Quick! is available from The Learning Company, 6493 Kaiser Drive, Fremont, CA 94555;



(800) 852-2255. It is appropriate for grades 2–9 and requires any Apple II computer with 64K of RAM. The list price is \$49.95.

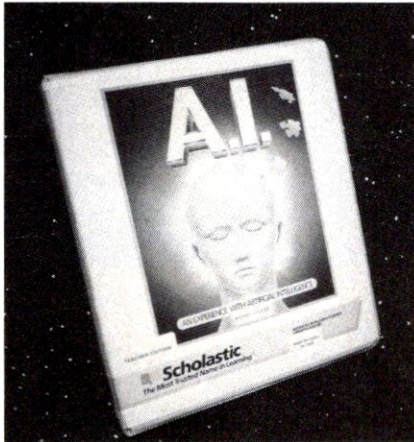
**The Enchanted Forest.** All of a sudden, there she is! The witch on her broomstick cackles and says three friends are now hidden in a pond disguised as geometric shapes. Playing in the Enchanted Forest has its risks, but that’s half the fun. The other half is practicing the mathematical concepts of negation, conjunction, and disjunction while trying to liberate forest animals from the witch’s spell. Friends who come to help free the animals are a prime target for the witch. The computer displays the



status of each pond. The challenge is to identify the logical connective that describes the set of shapes trapped inside. The correct answer frees whatever or whomever is trapped inside the pond.

Enchanted Forest comes from Sunburst Communications, Inc., 39 Washington Avenue, Pleasantville, New York, 10570; (800) 431-1934 or (914) 769-5030. The program is appropriate for grades 4-12 and requires an Apple II-series computer with 64K of RAM. The list price is \$65 for the single-user version; the ten-disk Lab Pack is \$195.

**A.I. An Experience with Artificial Intelligence.** A.I. An Experience with Artificial Intelligence is an introduction to the principles of



artificial intelligence. Students learn about A.I. by teaching game strategies to a "brain." During the process, they're exposed to two prominent domains of A.I. research: pattern recognition and decision theory. Programming a brain is the ultimate option. Students set game goals as well as the strategy for achieving the goals. The program is advanced, and the games are, at the very least, on an intellectual par with chess. To give you an idea about the level of complexity, game rules are best expressed in mathematical notation. The program explores principles of A.I. that are fundamental to the study of cognitive science and essential to the study of programming at the college level.

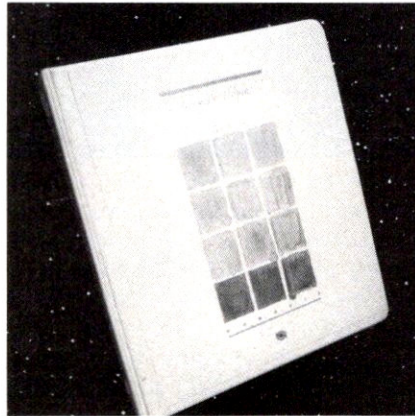
A.I. An Experience in Artificial Intelligence is available from Scholastic, Inc., 730 Broadway, New York, NY 10003; (212) 505-3000. The program is appropriate for grades 6-12 and requires an Apple IIe or IIc with 64K of RAM or a IIGS with 256K of RAM. The list price

# ALL STARS

for the single-user IIe/IIc version is \$87.45 and \$137.45 for the five-disk Lab Pack. The list price for the IIGS version is \$87.45.

## LANGUAGE ARTS

**Writer's Helper.** Writer's Helper is an amazing program that guides budding authors through the creative and organizational phases of



writing. Examples of techniques students can use include brainstorming, debating an issue, and using story trees. For each phase of the writing process, an interactive guide helps students find and organize a topic. The program also has a variety of techniques for evaluating the readability of student-generated documents. Not only does the program guide students through a range of writing techniques, but it also organizes information students provide into a rough-outline form that they can develop into a well-organized written document.

Writer's Helper is available from Conduit, The University of Iowa, Oakdale Campus, Iowa City, IA 52242; (319) 335-4100. The program is appropriate for grades 7-12 and requires an Apple IIe (with an 80-column card) or a IIc, both with 64K of RAM. The list price is \$120.

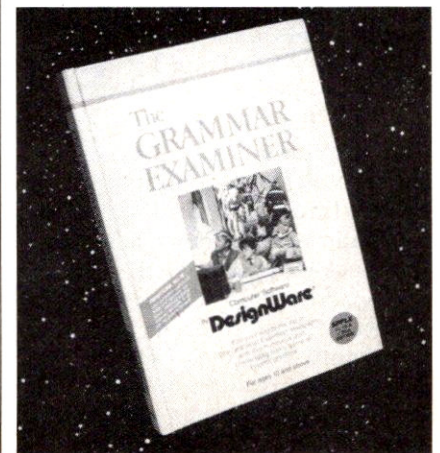
**Show Time.** Students don't get many opportunities to write and produce a play while in school. Show Time brings the stage to the computer and offers them the chance to become immersed in the entire process of a theater production. The package contains a word-processing program for writing the

actual script. Simple three-letter combinations give stage directions that guide the action and dialogue. The remainder of the options allow playwrights and producers to pick the cast, design the set, and score the music. Rehearsal is the time to change the cast, edit stage directions, or fine-tune dialogue and ideas. On opening night, the curtain goes up, and there is no going back—the only thing left is to go to McDonald's after school and wait for the reviews.

Show Time is available from MECC, 3490 Lexington Avenue North, St. Paul, MN 55126; (612) 481-3500. The program is appropriate for grades 6-9 and requires any Apple II computer with 64K of RAM. The list price is \$49.



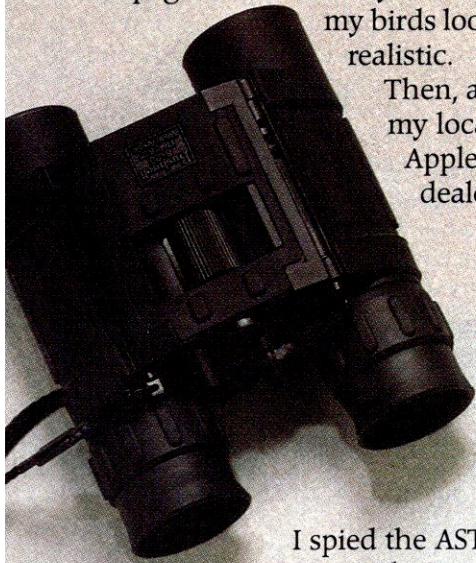
**Grammar Examiner.** A career in journalism isn't an easy ticket to fame and fortune, especially if you're employed by the Grammar Examiner. The game is challenging; the competition (look out for Mel, the computer) ruthless; and the pay terrible! Unfortunately, money is everything in this game, and it's extremely hard to come by. Random catastrophes can pop up and make a significant dent in your



# "Without realistic images, my newsletter was an endangered species."

The copy was vivid, but the images weren't exactly flying off the page. I needed a way to make my birds look realistic.

Then, at my local Apple® dealer,



I spied the AST-VisionPlus™ a board that could transfer live black and white or color images from a video camera or VCR onto my IIGs™ screen. I bought it immediately.

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I posed the camera in full view of my birdfeeder, patiently hoping against hope for the return of the blue-capped flycatching warbler. He did, by jove. And with a quick click of the mouse, I had it on camera. On computer. And on the front page of my newsletter.

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a rapturous flurry, capturing images for Christmas cards, T-shirts, flyers, personal stationery and invitations.

And in the midst of so much stretching, scrunching, recoloring and rearranging the

*My Asiatic water parrot looked more like a common ostrich. I wanted to bury my head in the sand.*

composition of my AST-VisionPlus images, I discovered my own set of wings. In my mind, I was free as a, well, you know.

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Grammar Examiner is available from DesignWare, P.O. Box 77186, San Francisco, CA 94107; (415) 546-1866. The program is appropriate for grades 10 and above and requires an Apple II Plus, IIe, or IIc with 48K of RAM. The list price is \$44.95.

### SOCIAL STUDIES

**Oregon Trail.** The first time I decided to take the Oregon Trail, I was glad it was only a simulation. My husband and I were the only ones to survive—two of my children drowned and one died of cholera. But the trip could have been worse. Unpredictable weather, vanishing trails, poor health,



lack of water, and disabled oxen are only a sample of the problems that can plague the 2400-mile trek.

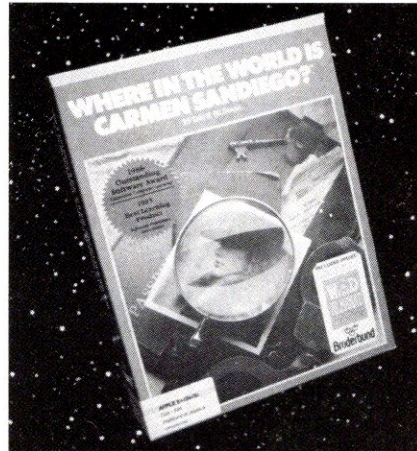
Oregon Trail is an excellent simulation of typical experiences of pioneers going west from 1840 to 1848. The format encourages students to engage in a variety of skills: decision making, problem analysis, perspective taking, and participation. The feature that makes Oregon Trail a particularly rich experience is the complexity of the underlying model. Weather, health, date of departure, amount of clothing, and luck are a few of the variables that change throughout the journey. As in real life, success is not guaranteed. Random disasters occur that illustrate the difficulty of America's westward

# ALL STARS

expansion and remind us of a time when people risked their lives to pursue their dreams.

Oregon Trail is available from MECC, 3490 Lexington Avenue North, St. Paul, MN 55126; (612) 481-3500. The program is appropriate for grades 5-12 and requires an Apple II Plus, IIe, or IIc with 64K of RAM. The list price is \$55 for a 5¼-inch diskette and \$59 for a 3.5-inch diskette.

**Where in the World Is Carmen Sandiego?** You have a new assignment: to catch Carmen Sandiego and her band of thieves. The hitch is that they might be anywhere in the world. When you start, you are



a rookie detective. The goal is to catch the thief, rise up through the ranks of the Acme Detective Agency to Ace Detective, and do it fast. Fortunately, the Crime Computer, the *World Almanac and Book of Facts*, and Police Dossiers are available and useful in unraveling the clues. Stalking, identifying, and catching the thief are no easy task. When you see a Suspicious Presence run across the screen, you know you're on the right track. Whatever you do, issue warrants for the right person. A mistake could cost you your job.

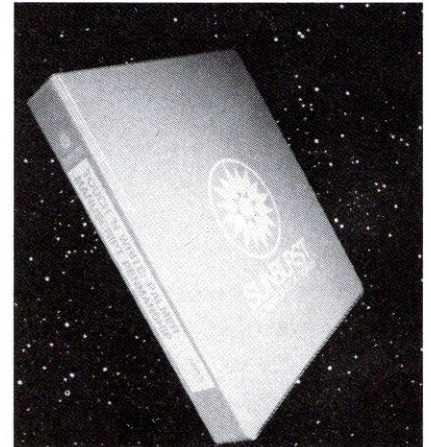
After reaching Ace Detective, retirement may be a bit boring. You can get back into the danger and intrigue by using an assumed name. After all, your previous success at catching thieves almost guarantees that your real name is on a hit list.

Where in the World Is Carmen

Sandiego is available from Brøderbund, 17 Paul Drive, San Rafael, CA 94903; (415) 492-3200 or (415) 492-3500. The program is appropriate for grades 4-9 and requires any Apple II computer with 64K of RAM. The list price for the single-user version is \$39.95; for the School Edition, \$49.95; and for the Lab Pack, \$99.95.

### EARLY LEARNING

**Touch 'N Write.** Preschool and kindergarten children absorb knowledge like a sponge. In their classrooms, introduction of concepts traditionally involves a multisensory approach. Touch 'n Write brings this technique to the computer. Using a touch screen and fingertips, children practice classic Palmer Manuscript Penmanship. They work on handwriting, letter-recognition skills, and eye movements for reading. Stroke and letter lessons let children work on the physical construction of letters in



the color of their choice. The lessons are reinforced with clever graphics or animation. A favorite option is the coloring book, which kids color with fingertips and the computer paintbox.

Touch 'N Write is available from Sunburst Communications, 39 Washington Avenue, Pleasantville, NY 10570; (800) 431-1934 or (914) 769-5030. The program is appropriate for grades K-3 and requires any Apple II computer with 64K of RAM, a Touch Window, one 5¼-inch disk drive, and a color monitor. The list price is \$75 for the single-user version and \$225 for the ten-disk Lab Pack.

### PRODUCTIVITY

**Bank Street Writer III.** Of all the word-processing programs avail-

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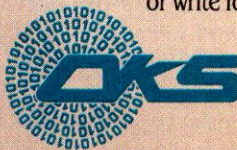
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\*Faster data accessing is made possible by the power of the Kache Plus Card's cache memory and its on-board microprocessor operating at 6 MHz.

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• Floppy disk controller for up to 6 floppy disk drives.  
• EEPROM Option

**Option Package #2** **\$45.00**

Memory upgrade to 512K capable of being configured as RAM disk, Cache Memory and/or Buffer Memory

**Option Package #3** **\$45.00**

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**Option Package #4** **\$55.00**

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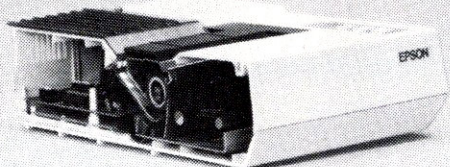
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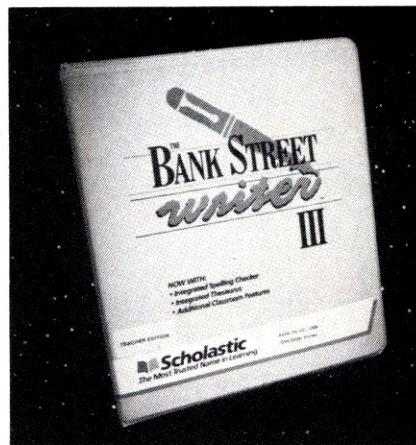
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able for Apple computers, Bank Street Writer III has features that make it the best for classroom and home use. The school edition includes 80-; 40-; and large-type, 20-column versions of the program. Besides the word-processing program, the package includes a spelling checker, a thesaurus that allows two search modes, definable function keys, and pull-down menus. Teachers can use the frozen-text feature to create text files that contain writing prompts and instructions that students can't alter. Classroom file-management



tools let teachers work with student files. The enhanced features of the program are for use in the 40- and 80-column versions only.

As a complement to the productivity aspects of Bank Street Writer III, the school edition contains documentation for a writing-process workshop that integrates computer technology with process-writing activities.

Bank Street Writer III is available from Scholastic, Inc., 730 Broadway, New York, NY 10003; (212) 505-3000. The program is appropriate for grades 2-12 and requires any Apple II computer with 128K of RAM. The list price is \$99.95; the Lab Pack \$162.45; and the network version \$499.64.

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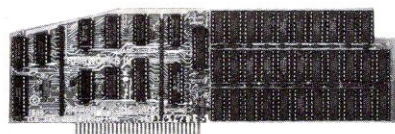
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# A Comparison Between the #1 Maker of Apple Memory Cards (Applied Engineering) and the #2 Maker (Apple Computer)

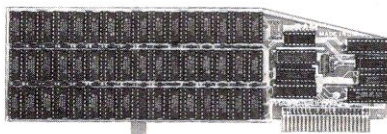
## FOR THE IIc



**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

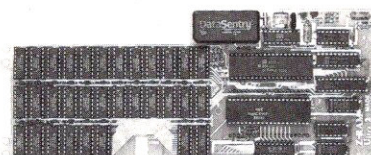
## FOR THE IIgs



**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 <sup>1</sup>	NO
Built-in CP/M Capability	YES <sup>2</sup>	NO
Maximum Total Functions	5	1
Software Standard	YES	YES
Made in	USA	Singapore
Warranty	5 years	90 days

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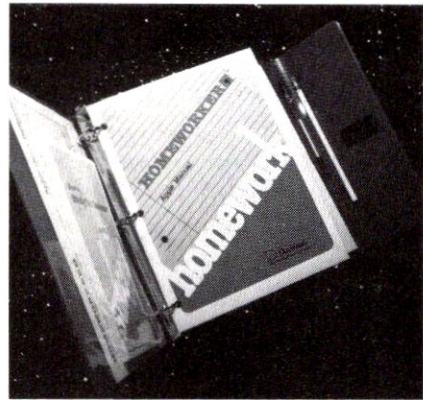
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Homeworker is from Davidson & Associates, Inc., 3135 Kashiwa Street, Torrance, CA 90505; (213) 534-4070. The program is appropriate for grades 10 and above and requires an Apple IIe (with an extended 80-column card) or a IIc, and 128K of RAM. The list price is

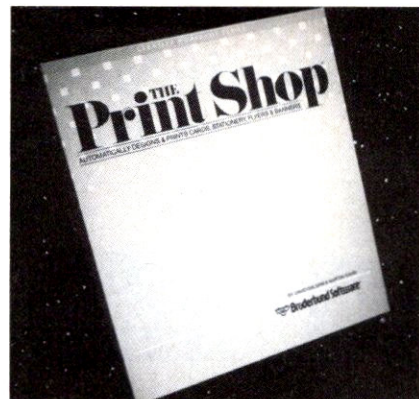


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The Print Shop is available from Broderbund, 17 Paul Drive, San Rafael, CA, 94903; (415) 492-3200 or (415) 492-3500. The program is appropriate for grades K-12 and requires an Apple II Plus, IIe, or IIc with 64K of RAM. The list price is \$49.95 for the single-user version and \$59.95 for the school edition.

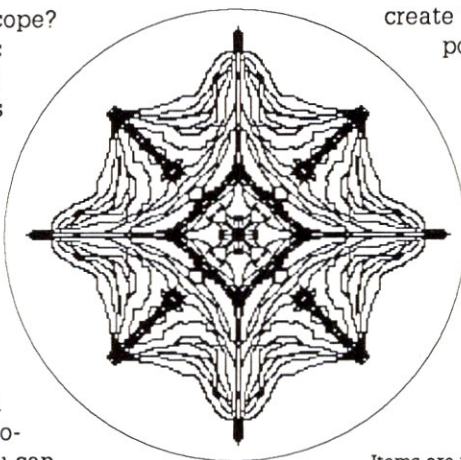
Print Shop Companion runs on any Apple II computer and requires The Print Shop. The list price is \$39.95. Graphics Library disks and the Holiday Edition also require The Print Shop; the list price for each is \$24.95. +

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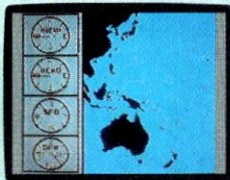
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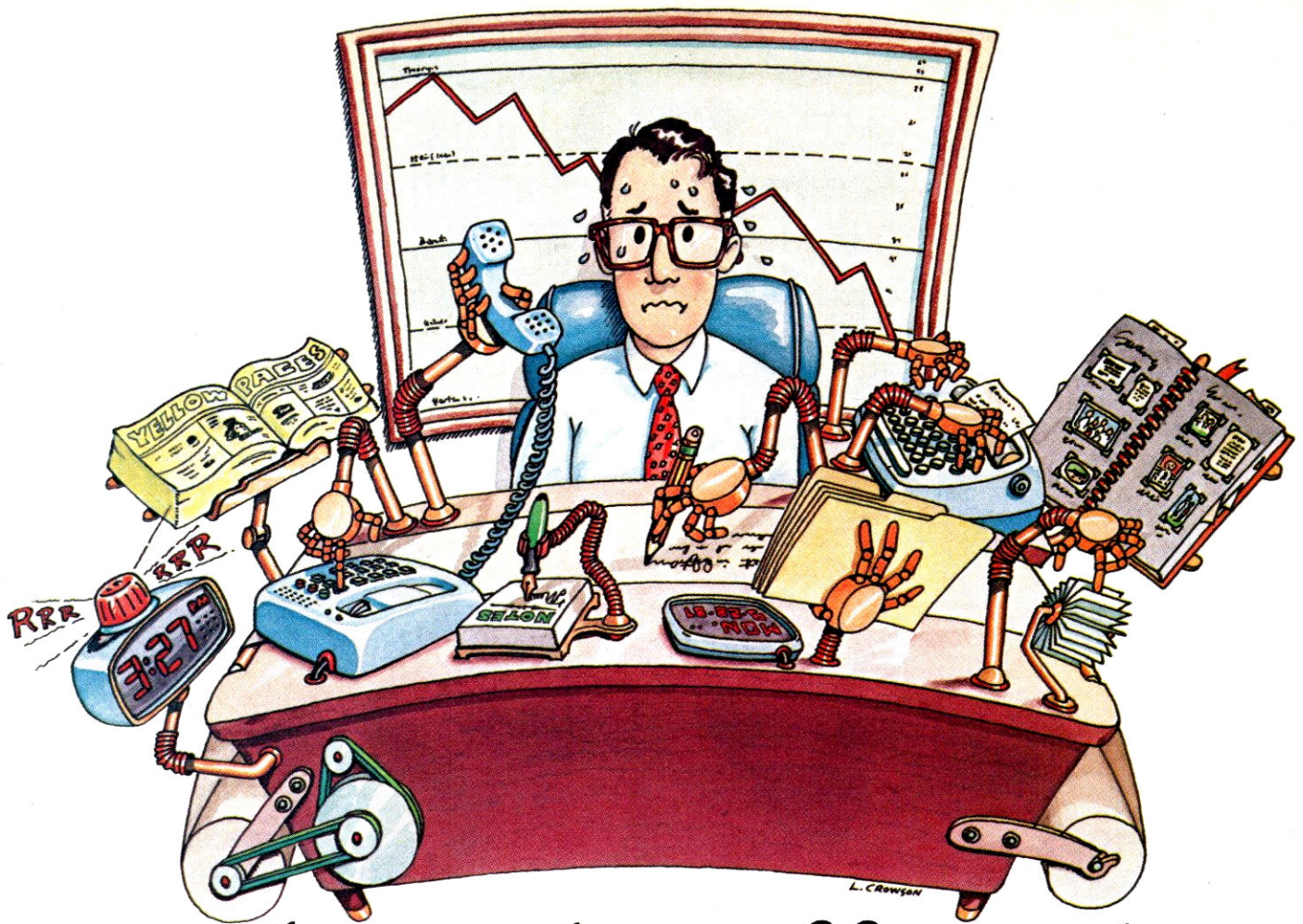
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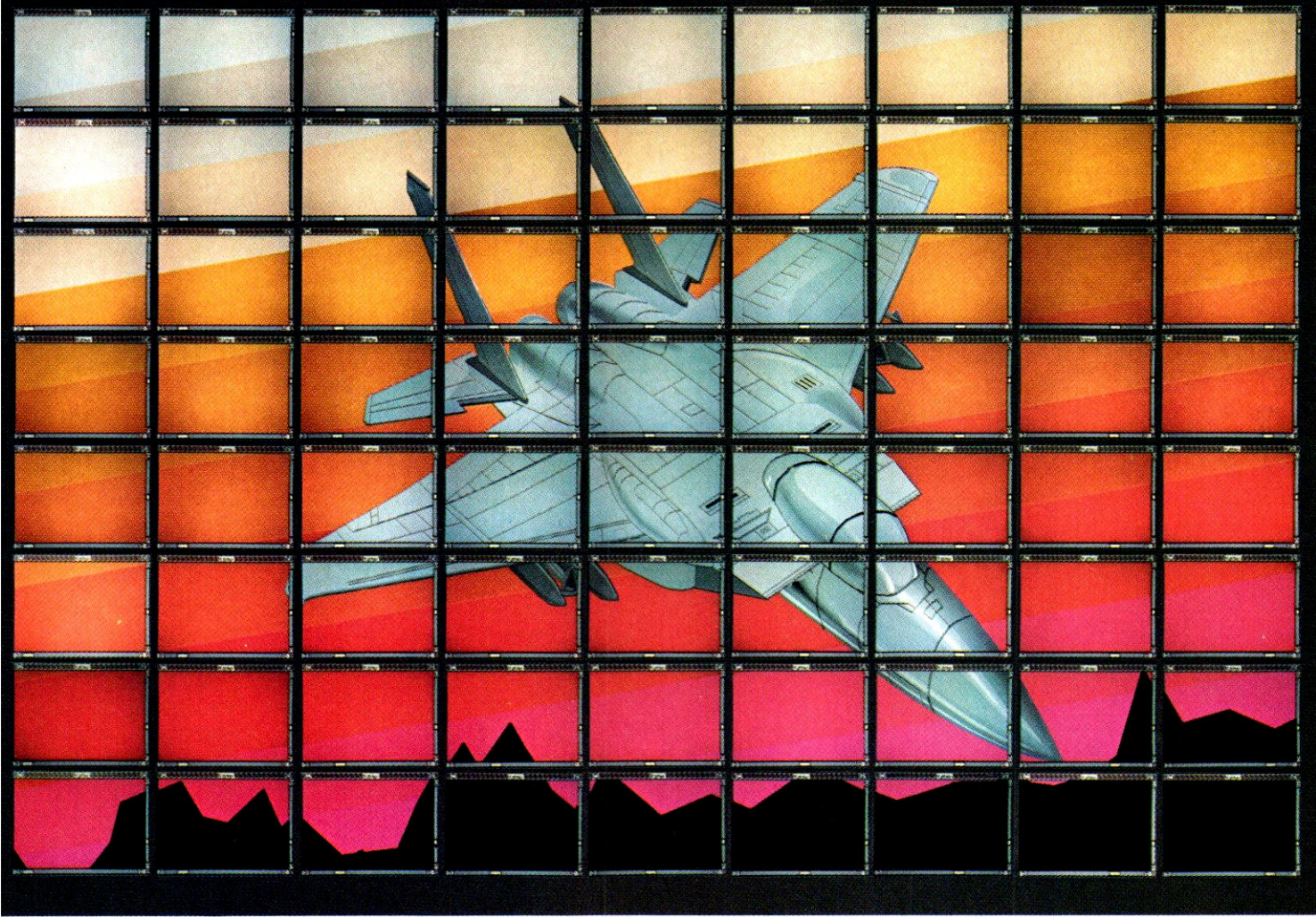
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*Drawing by Dale Crawford of StyleWare*

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A + ALL-STARS BY MICHAEL FISCHER

# Telecommunications

What distinguishes telecommunications All-Stars from the pack are features that represent advances in technology, most notably the ability to take advantage of the mouse interface and the incorporation of the Binary II standard.

Binary II is a file format, developed by A+ Senior Technical Editor Gary Little, that enables users to easily upload ProDOS files to and download them from information services without loss of file-attribute information such as file type, size, name, and the like. You need this information unless you're just transferring standard readable text files.

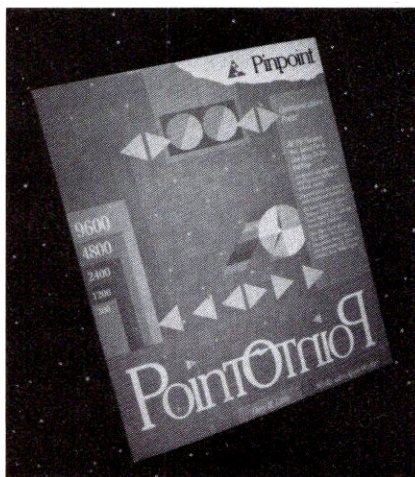
The products I single out here aren't the only ones that include these features, nor do all of them handle both the mouse and Binary II. These telecommunications programs are the best all-around players available, however, and have shown good stuff this past year.

I have four choices for the bests in telecommunications for 1987: Point-to-Point, MouseTalk, Talk is Cheap, and FreeTermGS. I've also picked three runners-up.

*The best programs for working on-line with your Apple II*

## Point-to-Point

Point-to-Point, a commercial program for the Apple IIe, IIc, and IIGS, is my telecommunications program of choice. It uses the AppleWorks file-card display and is one of the easiest programs to use and understand. Many of the program's major commands are dis-



played on the top line of the screen, so you don't need to memorize the commands for turning on the capture buffer, beginning Xmodem upload or download, or sending a text file or capture buffer to a remote computer.

Whenever you're using the capture buffer, Point-to-Point displays the amount of remaining space. When the buffer is full, the program automatically saves it to disk, in a file you've specified. If the file already exists, the program adds the new data to the end of the file.

Some people criticize the relatively small capacity of the Point-to-Point capture buffer—about 18,000 characters—but I consider the size, in conjunction with the automatic-save feature, an advantage. The combination ensures I will not lose much data if I experience a power loss.

Other features of the program are obviously designed to make your life easier. A review buffer contains the last 255 lines that have scrolled off the top of your screen. You can review them at any time and even copy them to the capture buffer. Many of the commands are

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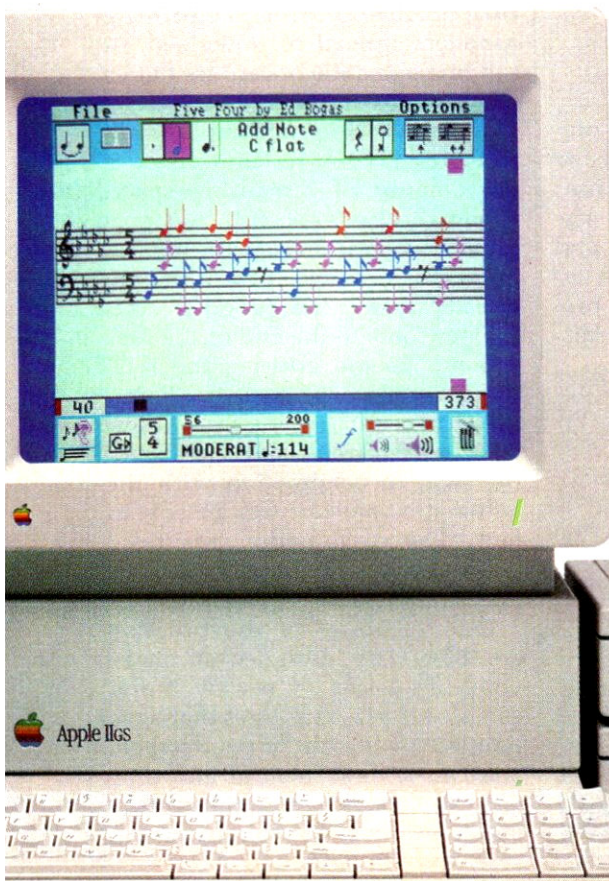
*ABKey*, a fun letter recognition/keyboard skill program, contains many levels of challenge.

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Software: *The Music Studio* by Activision.

CIRCLE 313 ON READER SERVICE CARD



based on mnemonics, such as open-apple/D (for Disk menu) and open-apple/S (to save the capture buffer).

The one criticism of Point-to-Point with which I agree is that it has a relatively weak text editor. It is a line editor, not a full-screen editor. Since I do most of my text editing off-line, usually using AppleWorks or another Apple II word-processing program, I find this weakness an insignificant flaw.

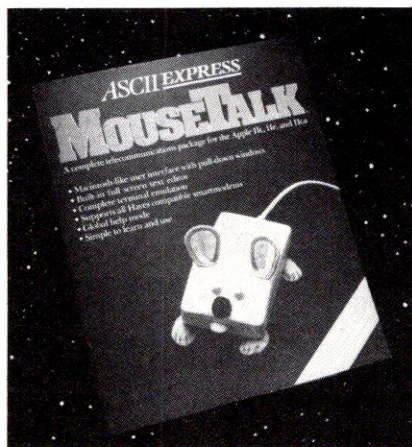
Point-to-Point comes from Pinpoint, 5865 Doyle Street, Emeryville, CA 94608; (415) 654-3050. It works with an Apple IIe, IIc, or IIGS with 128K of RAM and costs \$129.

### MouseTalk

My second-favorite telecommunications program featuring the use of a mouse is MouseTalk. This program operates with Mousertext characters and thus requires an enhanced Apple IIe, IIc, or IIGS. Because it uses Mousertext and other text characters on the text screen, rather than using graphics, it performs well and keeps up with the flow of data.

# ALL STARS

MouseTalk is easy to operate and contains many convenient features. It was the first Apple II telecommunications program I know of to have a review buffer. It provides a simple method of moving between the various ProDOS directory levels. My only real complaint about the file operation is that it doesn't follow the standard meth-



od built into the GS toolbox. As a result, I sometimes find myself inappropriately using GS-type operations while attempting to navigate through subdirectories to my file. One of the best features of MouseTalk is its full-screen editor. You scroll or select text with the mouse and cut, copy, and paste as you do with Apple IIGS and Macintosh word-processing programs. You also have apple-key equivalents of menu commands.

The major defect in MouseTalk is the lack of built-in Binary II file-transfer translation. Since Binary II is rapidly becoming the standard for downloading Apple II files, this omission is puzzling. The program's publisher does not promise to include Binary II in future releases of the program but states only that it is considering incorporation of this feature.

MouseTalk is a product of United Software Industries, Inc., 8399 Topanga Canyon Blvd., Canoga Park, CA 91304; (800) 332-7244 or (818) 887-5800. It works with an Apple IIe (enhanced), IIc, or IIGS with 128K of RAM. The program retails for \$99.95.

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# ALL STARS

## Talk is Cheap

Talk is Cheap, one of the real bargains in telecommunications software, is yours for only a \$30 shareware fee. Despite its low price, many "professional" telecommunicators use this program.

The shareware concept lets you try a program before you buy it. You can usually find it on a bulletin board or national telecommunications service and download it to your computer. If you like the program and use it, you are supposed to send payment to the program's author. The amount of the payment and the author's address typically appear in the documentation.

Talk is Cheap contains most of the features you expect in a commercial telecommunications program, including Xmodem upload and download with automatic Binary II conversion, and a copy buffer (but no review buffer). Two special features of the program are an extended macro-command language, which allows for extensive automation of functions, and Turbo Xmodem downloading.

Turbo Xmodem is a feature that, given certain conditions, can in-

crease your downloading speed by up to 100%. Turbo Xmodem requires that all downloading be to a RAMdisk. Since it cannot recover from a data-transfer error, you need quiet telephone lines to use it.

Don Elton, author of Talk is Cheap, provides frequent upgrades to the program and makes them available not only on the networks but on many Apple bulletin boards as well.

Talk is Cheap is available from information services and bulletin boards or directly from Don Elton, Carolina System Software, 3207 Berkeley Forest Drive, Columbia, SC 29209-4111 for \$30 as shareware. It works with an Apple IIe, IIc, or IIGS.

## FreeTermGS

The fourth program on my list of bests in telecommunications is a freeware program, FreeTermGS. Freeware means just that; you can get a copy of it for free or, if you download it from a network, for

the cost of your connect time.

My August 1987 "Telecommunications" column in *A+* contained a first look at FreeTermGS that is still accurate. The program is a true IIGS desktop-style program, proving that programmers can write a telecommunications program by using IIGS toolbox routines. The program's upper transmission-rate limit is 2400 bps, but, even at 1200 bps, display updating is somewhat sluggish. Future commercial, mouse-operated, menu-driven telecommunications programs are likely to follow MouseTalk's path and use the text screen and Mouse-text instead of the super-hi-res screen.

Freeterm can display control characters as the remote computer sends them. If you encounter errors in performing an Xmodem file transfer, a dialog box shows the type of error. You can find more information about each type of error in the program's documentation.

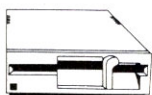
You can download FreeTermGS from most of the information services and also from some bulletin boards. It requires an Apple IIGS with 512K of RAM.

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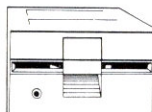
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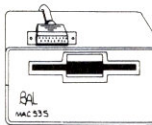
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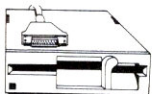
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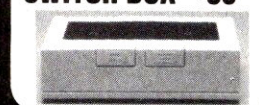
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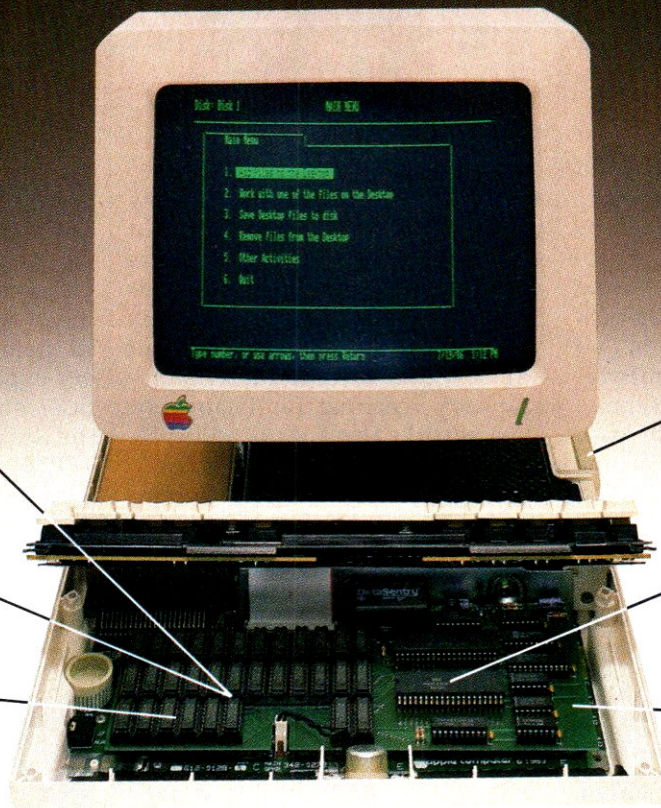
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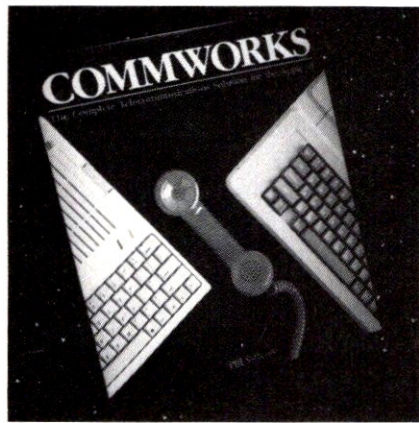
# ALL STARS

## The Second Stringers

Three other programs also merit consideration for the best in telecommunications.

**CommWorks.** CommWorks, together with Point-to-Point and MouseTalk, was one of the early GS-compatible telecommunications programs. It resembles Point-to-Point in many respects, including use of the AppleWorks file-card system for command selection and use of open-apple-key combinations to perform many functions.

CommWorks has not kept pace with other telecommunications programs, however. For example,



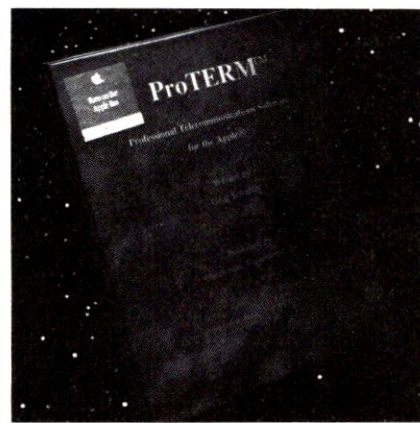
MouseTalk and Point-to-Point now both have review buffers, but CommWorks has not added this feature. I use my review buffer more than any other single feature; whenever I use a program without a review buffer, I find myself automatically reaching for it anyway. CommWorks also has not added Binary II download translation.

A significant feature of CommWorks is that it has full VT-100 terminal emulation.

CommWorks is a product of PBI Software, 1163 Triton Drive, Foster City, CA 94404; (415) 349-8765. It works with an Apple IIe, IIc, or IIGS with 128K of RAM and costs \$95.

**ProTERM.** The other major commercial telecommunications program that merits serious consideration is ProTERM, a program that first appeared in 1987. Many experienced telecommunicators currently use ProTERM.

ProTERM has both a review buffer and a copy buffer and automatically allocates the space between the two buffers according to how much memory it finds in your system. It uses any expanded memory it finds in the IIe auxiliary slot and a Checkmate Technology or Applied Engineering memory-expansion card for the Apple IIc. But the program can use other expanded memory (such as Apple's memory-expansion cards for the IIc or IIGS) only as a RAMdisk. One of the interesting features of ProTERM, AutoLearn, lets you create auto-log-on macros automatically.



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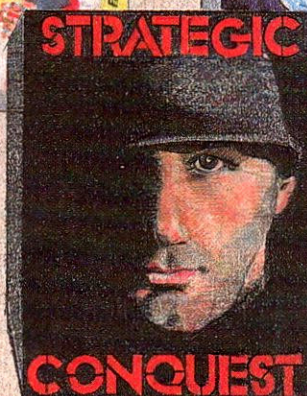
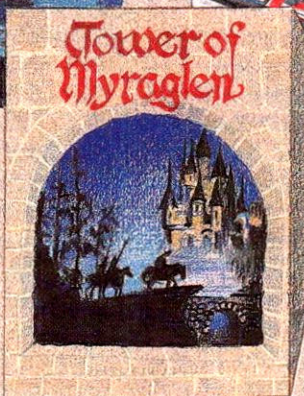
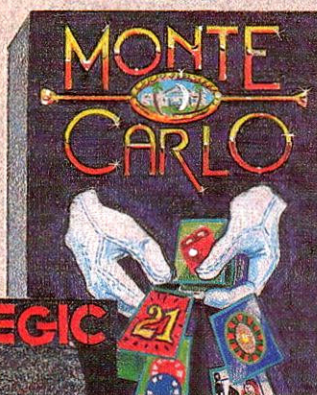
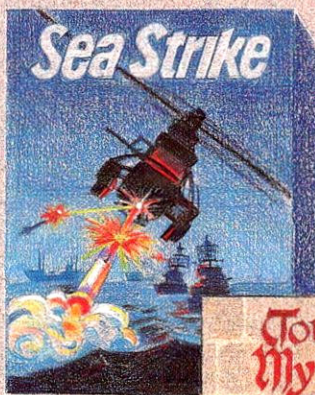
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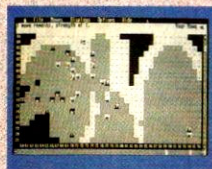
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# ALL STARS

You can use either internal or external modems with ProTERM. The program works with Hayes Smartmodem-compatibles as well as the Hayes Micromodem II, Hayes Micromodem Iie, Novation AppleCat, and Zoom Modem Iie.

ProTERM is a product of Checkmate Technology, Inc., 509 South Rockford Drive, Tempe, AZ 85281-3021; (800) 325-7347. It requires an Apple Iie, Iic, or IIGs with 64K of RAM and costs \$95.

**Maug Message Manager.** The final product on my list is neither a telecommunications program nor a commercial or shareware program. It is useful only if you are a member of the MAUG forum on CompuServe. But Maug Message Manager can save you hundreds of dollars a year, depending on how much you read and reply to messages on the MAUG message board.

Only a finite number of messages can be on the MAUG message board at any time. Whenever you add a new message, you push the oldest message off. You must call and read messages every two or three days to keep current.

Of course, reading, reviewing, and replying to messages while connected to CompuServe can be very expensive. (CompuServe charges \$6 per hour at 300 bps and \$12.50 per hour at 1200 or 2400 bps, plus network access fees ranging from \$.25 to \$2 per hour in the United States.)

Maug Message Manager processes the text file of messages that your telecommunications program has downloaded from MAUG. While you are off-line, you read messages as they are presented to you and write replies off-line. You then call back and, in one automated action, upload all your replies at once.

As you are reading a message, you can also place it in one of several disk text files or print it out. The program, written by a MAUG member, John R. Tierney, is of nearly commercial quality and costs only the price of the MAUG

connect time you need to download it. It requires an Apple Iie, Iic, or IIGs with 64K of RAM.

One feature that is common to many of the programs I've discussed in this article is the presence of the author, the publisher, or both on one or more of the national telecommunications services. You can send questions to them and receive answers back.

The two national services with the most representation appear to be CompuServe (MAUG) and GEnie (AART). Bill Blue (developer of MouseTalk), Don Elton (author of Talk is Cheap), and Gary Little (author of Point-to-Point and the Binary II standard) frequently check into both services. In addition, Pinpoint (publisher of Point-to-Point) maintains a support service on AART, and John Tierney (author of Maug Message Manager) can often be found on MAUG. +

*Michael Fischer works in the field of court administration in California and writes about Apple computers. His latest book is Apple IIGs Technical Reference, from Osborne/McGraw-Hill.*

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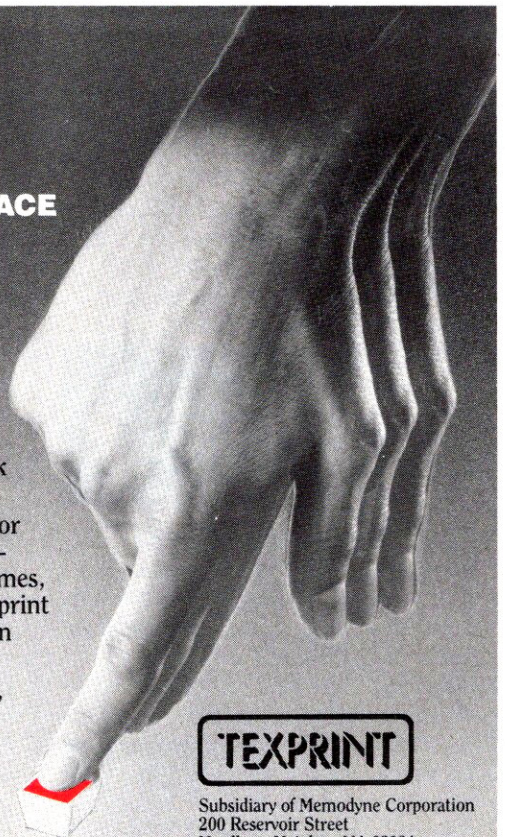
**Print-it!** is available from selected mail order companies, through your favorite computer dealer or directly from **TEXPRINT**<sup>2</sup> and comes complete with serial or parallel cable, push button and instructions. A **Save-it!** disk for transferring screen images to disk for slide shows is available separately.

<sup>1</sup> Apple DMP/IMAGEWRITER/IMAGEWRITER II/SCRIBE, C. Itoh, Canon, Epson, NEC, Okidata/Okimate series, Panasonic, Radio Shack, Star Micronics, and many more.

<sup>2</sup> Qualified educational and dealer discounts available.

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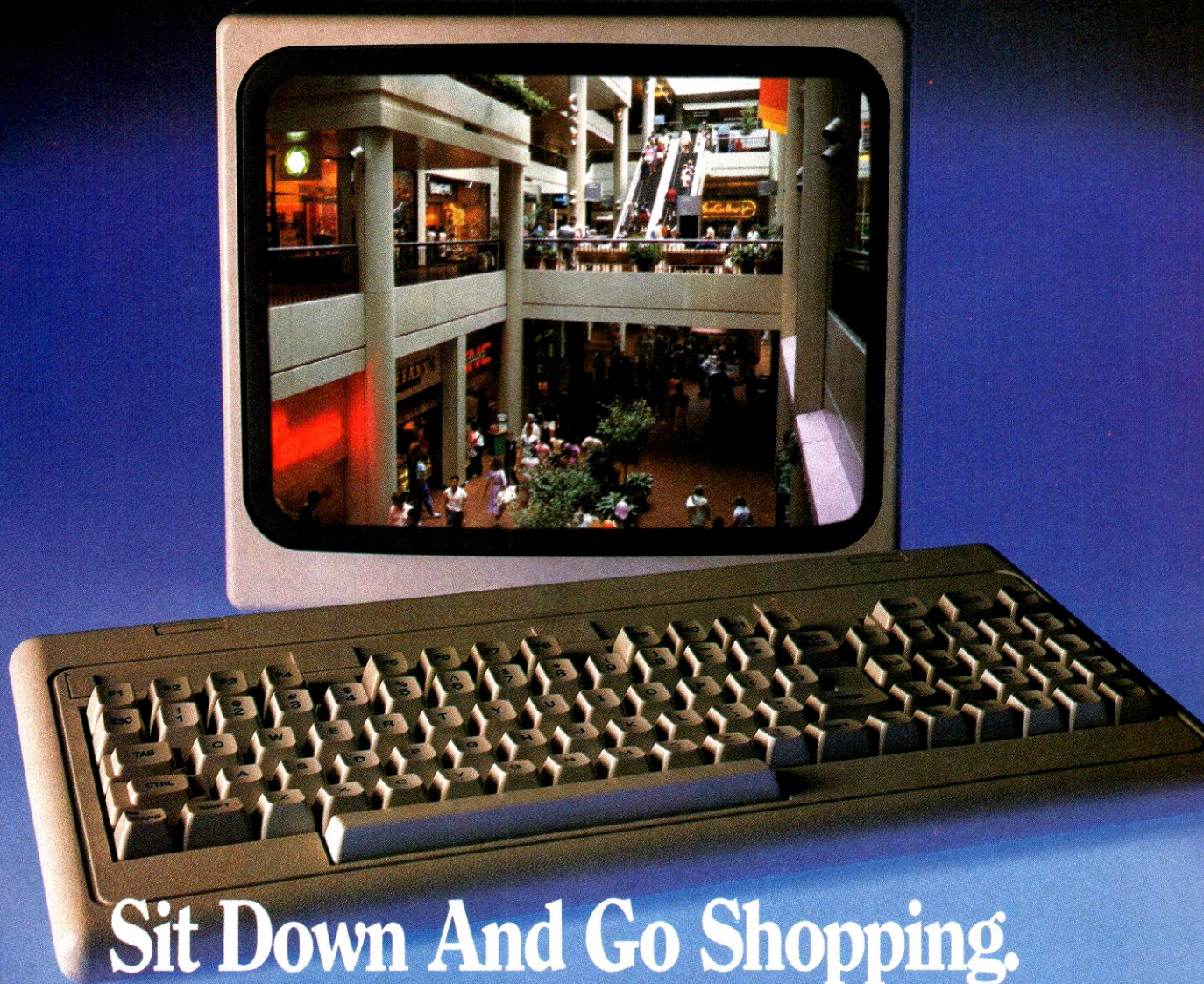
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ALL  
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Any Apple II owner who's running a business needs to track income and expenses, and a business accounting program is usually the way to go. Many small-business owners actually buy an Apple specifically to set up an accounting system, whereas others who begin businesses at home migrate to accounting from other applications. If your business is very small, you may be able to manage it with a personal accounting system such as one of those described in the personal-finance All-Stars article in this issue. These programs (called one-write systems) work like checkbook registers, in which you enter all transactions only once.

The accepted method of maintaining books for any serious business, from a corner store to a Fortune 500 firm, is called double-entry accounting. This kind of accounting balances assets (such as cash receipts or the value of equipment) and liabilities (such as outstanding loans or stock) against one another on each side of a ledger. The concept of double-entry accounting is that the two sides of the ledger are always in balance, so that the company always has assets equal to its liabilities. The standard measure of a company's financial position is a balance sheet that lists its assets and liabilities.

Bankers and accountants use balance sheets and income statements to evaluate a company's finances, so you must be able to prepare and understand these tools. That's why most accountants recommend double-entry accounting systems for their clients. Unfortunately, many Apple II owners haven't had accounting courses to prepare themselves for implementing a double-entry accounting system.

In searching for the All-Stars of business accounting in the Apple II world, I looked for programs that offered the standard features and functions of an accounting system while providing good introductions to the principles of double-entry accounting. I have found that most Apple II users need some kind of explanation of the double-entry method before they can suc-

# Business Accounting

A+ ALL-STARS BY CHARLES RUBIN

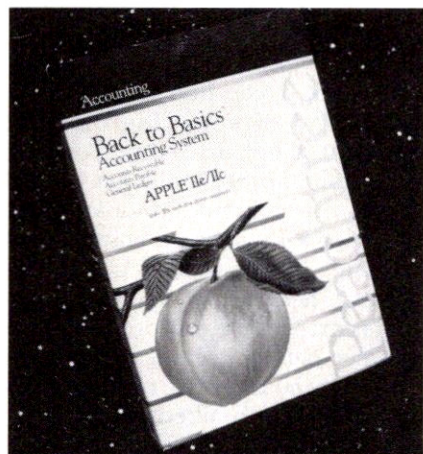
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managing business  
finances*



# ALL STARS

cessfully set up such a system.

Another criterion I used was ease of use. Even if you understand the basics of accounting, you shouldn't have to spend weeks getting a system running. And once the system is running, it shouldn't require a user with total recall to run it effectively. Beyond using these essential criteria, I sought the programs that were widely supported by local



dealers or that offered abundant technical support.

The three outstanding business accounting programs I located were Peachtree's Back To Basics, Manzanita Software's BusinessWorks, and BPI's Entry Series.

## Back To Basics

This program was originally sold as three separate modules that you could buy individually or at a discount in an all-in-one package. Peachtree now sells all the modules in one package only. Peachtree is one of the oldest companies in the personal-computer accounting-software business, dating back to 1975. The company makes a more complete accounting system with extra modules, but not for the Apple II line. Back To Basics is a professional accounting system that handles receivables, payables, and general-ledger bookkeeping for small to medium-sized businesses.

Winner of the 1986 and 1987 A+ Reader's Choice Awards, Back To Basics is popular for its ease of use and flexibility. You can run any of the modules as a stand-alone program, or you can integrate the payables and receivables into the general ledger. The general ledger can handle annual revenues up to \$10 million, but it is limited to 254 accounts and 1700 entries per month. The receivables module can handle 300 customers, and the

payables module tops out at 115 vendors. Payroll and inventory modules are not available for Back To Basics. Because of these limits, this package appeals mainly to smaller businesses.

The main virtue of Back To Basics is its ease of use. The package is designed to get a business running within a day. All three modules have a well-designed interface that uses menus and prompts for selecting and confirming options. You can press Escape to back out of a menu, an entry, or a set of entries. It is difficult or impossible to make unwitting errors with this program, as it always asks you to confirm the choices and entries you make. Once you're up to speed on the program, you can select the Advanced mode, which disables some of the prompts that ask you to double-check your entries.

Another convenient feature is a predefined chart of accounts in the general-ledger package. The program comes with a few dozen account names and numbers already entered and divided into logical groups for proper accounting. You can choose to create a completely different chart of accounts from scratch or customize the predefined one.

The program has no on-line help, but the Back To Basics manual is excellent in describing principles of double-entry accounting as well as the installation and use of the program. Its 38-page introduction to accounting principles was written by a Harvard Business School professor.

The bulk of the manual contains walk-through tutorials and reference guides for each software module. The extremely useful last section of the manual shows how to use the programs in various accounting situations. Written by a CPA and an accounting professor, the section covers 39 specific accounting situations, including retirement of plant assets and issuance of stock.

Back To Basics is available on many different computers, so its manual is generic. A separate hard-

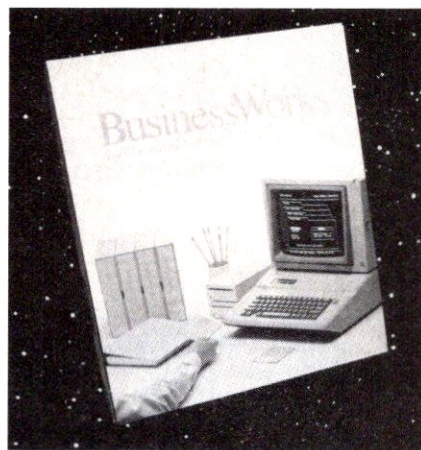
ware booklet describes specific commands, program capacities, and installation procedures on the Apple II. Back To Basics can't use a hard-disk drive, and it requires you to use a new data disk for each module every month.

Peachtree offers a toll-free technical-support line; it charges by the minute for support calls. Back To Basics is widely distributed, and since the same program runs on a variety of computers, many dealers should be able to offer good local support. The program carries a 30-day money-back guarantee.

Back to Basics comes from Peachtree Software, 4355 Shackelford Road, Norcross, GA 30093; (800) 247-3224. It runs on an Apple II Plus, IIe, IIc, or IIgs with 64K of RAM and costs \$195.

## BusinessWorks

BusinessWorks is a complete, full-featured accounting system that offers general-ledger, payables, receivables, inventory, and payroll modules. With a required System Manager module, you can use any of the accounting modules alone, or you can integrate them all into a complete system. Responding to encouragement from Apple, Manzanita Software designed BusinessWorks so it works with either two UniDisk 3.5-inch disk drives



or one UniDisk or 5¼-inch drive and a hard disk.

One nice feature of BusinessWorks is its ability to save data in the AppleWorks spreadsheet or database format, so you can analyze your accounting data in AppleWorks. In fact, Manzanita says the biggest single reason people buy the system is its ability to integrate with AppleWorks.

In contrast to Back To Basics, whose users are primarily individ-

uals with small businesses, half of BusinessWorks' users are companies with more than \$1 million in annual revenues. The program can handle companies with up to \$20 million in annual sales. It can maintain records on an unlimited number of separate companies (if you use a high-capacity disk to store the data), and it can handle up to 1000 accounts and 20,000 entries per month.

BusinessWorks has many advanced features. You can specify

# ALL STARS

and print a series of reports at once with a single command and take advantage of a full-year budgeting feature for both revenue and expense accounts. You can also produce instant reports on the current status of your books at any time. The payables module lets you

make partial payments and can do automatic check reconciliation, and the payroll module can print government reports such as W-2 forms.

Although it is powerful and full-featured, BusinessWorks manages to be very easy to use. It has a file-card interface like the one in AppleWorks and uses similar menus, prompts, and selection features, so AppleWorks users will be comfortable with it quickly. In addition, it has context-sensitive on-line help. If you don't understand what kind of entry the program needs at a certain point, you can type open-apple/? and get a help screen that describes the particular response for which the computer is waiting. You can also get more-general help about specific functional areas of the program. Help screens usually include page-number references for the module's users' manual. Excellent error messages help with incorrect entries.

One common problem with accounting systems is the variety of accounts they define and the difficulty of remembering account codes. BusinessWorks has a unique feature called Show Windows, which displays all the accounts in its chart of accounts. If you can't remember an account code, you can pop up a window and then select the account you want by highlighting it and pressing the Return key.

BusinessWorks has an excellent set of manuals that thoroughly describe the program's operation. They include tutorial and reference sections, and each module's manual begins with a section explaining the accounting principles you must understand before using the module.

BusinessWorks is priced about the same as other accounting systems with a full set of modules, but it is far easier to set up and use than its competition. The company offers free technical support via a toll-free number for the first 90 days you own any module; unlimited technical support is \$150 per year after that.

BusinessWorks comes from Manzanita Software Systems, 1 Sierra Gate Plaza, Suite 200-A, Roseville, CA 95678; (916) 781-3880. It requires an Apple IIe, IIc, or IIGS with 128K of RAM. The System Manager module is \$95, Payroll is

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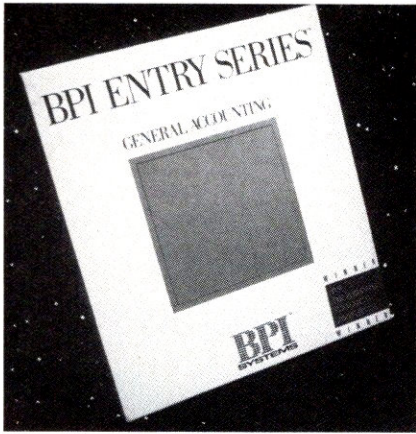
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\$445, and the other modules are \$395 each.

### BPI Entry Series

A longtime favorite of Apple II-using accountants, the BPI Entry Series is marketed by Computer Associates of San Jose, California. The Entry Series includes separate modules for general ledger, payables, receivables, payroll, and inventory. You can run the modules individually or integrate them into a complete system. As with BusinessWorks, you can transfer data from the BPI Entry series to the AppleWorks spreadsheet for further analysis.

This set of modules is relatively easy to use, although not quite as easy as BusinessWorks. The Entry Series doesn't provide on-line help, nor does its documentation provide an orientation about principles of double-entry accounting, so you're pretty much on your own in this respect.

# ALL STARS

Like BusinessWorks, this program lets you maintain the books on several different businesses at a time, simply by using a separate data disk for each client. The program does not maintain a historical record of each month's ledger, so, unlike BusinessWorks, it can't produce a full-year budget.

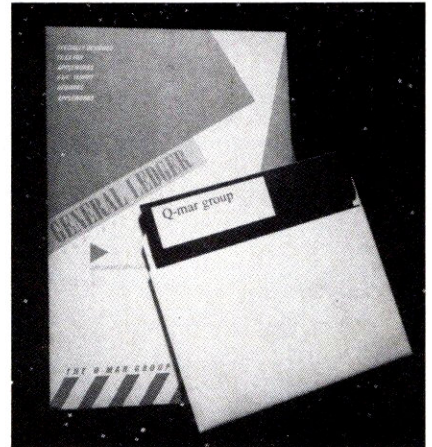
On the other hand, the Entry Series is the most widely distributed of the full-featured accounting programs for the Apple II, so local support should be easy to find. If not, Computer Associates International offers 60 days of free telephone support for each module (although it has no toll-free number for this service), and you can buy a year's worth of support at a toll-free number for \$95.

The BPI Entry Series is marketed by Computer Associates International, 2195 Fortune Drive, San Jose, CA 95131; (408) 432-1727. It runs on an Apple IIe, IIc, or IIGS with 128K of RAM and costs \$295 per module.

### AppleWorks Templates

Templates provide a less expensive accounting alternative for AppleWorks owners. Many larger users' groups offer general-ledger templates for AppleWorks, but these often have little or no docu-

mentation. The Q-Mar Group of San Diego, which produces an AppleWorks newsletter and a series of AppleWorks templates, sells a well-documented general-ledger template. The template's 80-page manual includes an introduction to accounting principles. Q-Mar will soon be releasing accounts-payable and accounts-receivable modules, which are expected to sell for \$69.95 each.



The Q-Mar General Ledger Template is available from The Q-Mar Group, 5677 Oberlin Drive, San Diego, CA 92121; (619) 455-7513. It requires an Apple IIe, IIc, or IIGS with 128K of RAM and costs \$89.95. +

*Charles Rubin is an A+ contributing editor and the author of five books about personal computing, the latest of which is Microsoft Works from Microsoft Press.*

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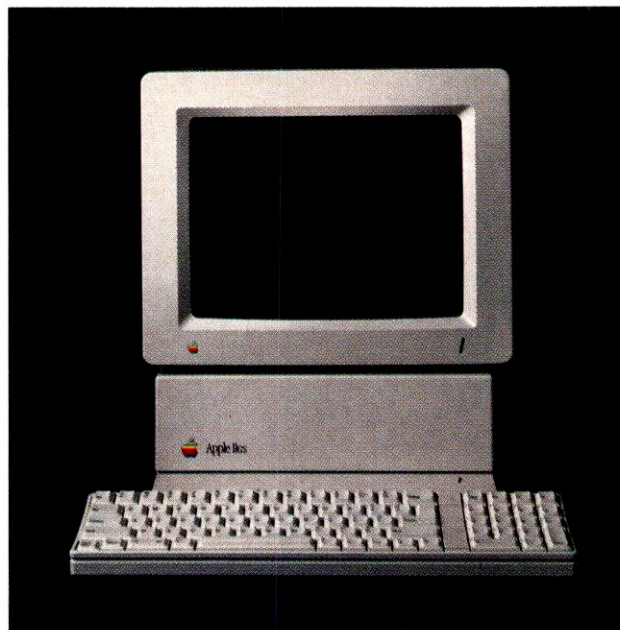
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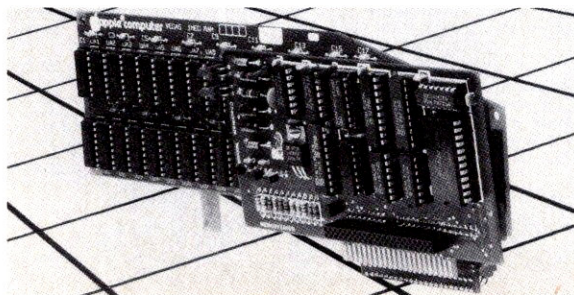
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# ALL STARS

For Apple II computer-music stalwarts, the arrival of the Apple IIGS was just as sweet and spirit-lifting as Roy Hobbs' final home run in the movie *The Natural*. Yes, we had suffered a string of drubbings from the Amiga and ST teams—and even our Macintosh pals were beginning to laugh at us behind our backs. You could almost hear them jeering, “The Apple II Tunemsmiths? Those has-beens are about as musically relevant as Perry Como and Tennessee Ernie Ford . . .”

Then, with one towering home run, the Apple IIGS turned the game completely around.

Thanks to the IIGS's amazing Ensoniq digital oscillator chip and the vivid hues of the RGB monitor, the Apple II family has leapfrogged from also-ran status back up to a contender's position in the Micro Music League. Although we IIGS owners have achieved only parity with Commodore and Atari (and the Mac) in terms of sequencing and other professional applications, we're really widening our lead in the educational market. The extraordinary sound and color of

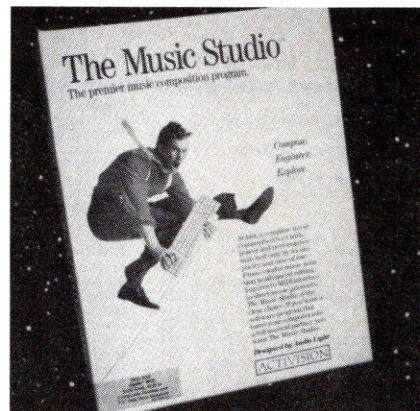
the IIGS are breathing new life into venerable Apple II music-software packages—especially in the realm of K-12 educational courseware.

This All-Stars segment focuses on music-education packages and didactic compositional packages (the primary purpose of which is to instruct and entertain, rather than do studio-caliber sequencing). Frankly, most of the serious sequencing software has moved over to the Mac, Amiga, and ST, never to return. It's in the role of teacher/entertainer that the Apple II family continues to reign supreme. Software for the II now brilliantly handles the job once reserved for the likes of Victor Borge and Leonard Bernstein: multifaceted musical mentor.

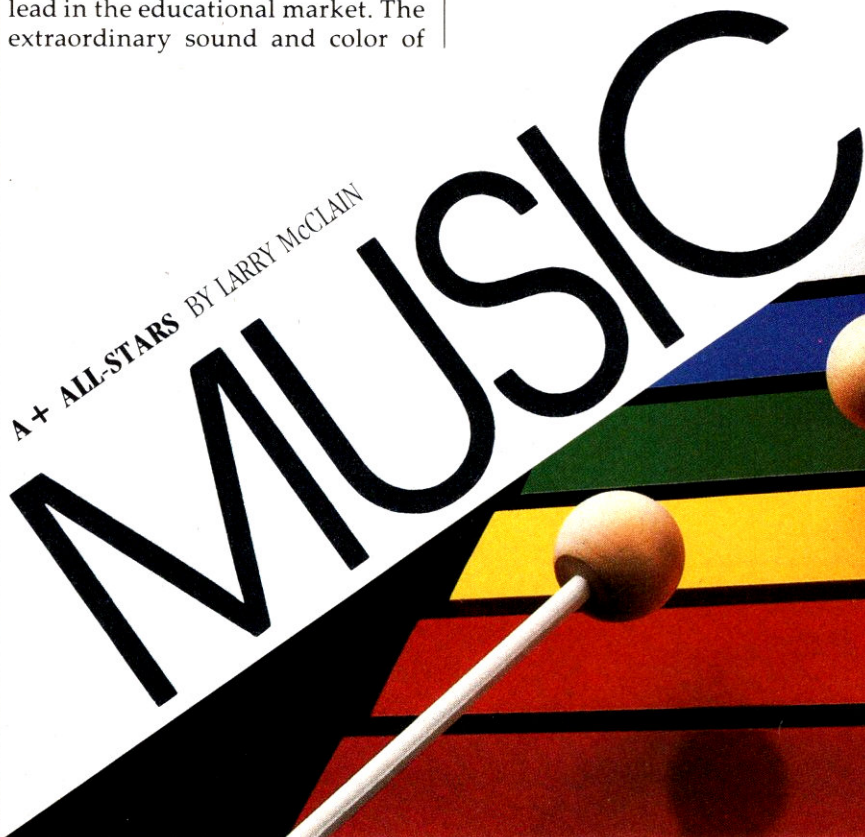
So without further whole rests, let's take a look at the All-Stars, beginning with an inspired line-up of GS packages.

## The Music Studio

The only thing about The Music



Studio that isn't top drawer is its lackluster intro song. Once you've weathered that, however, you're in for a treat. It's the most comprehensive GS compositional package around. Its easy-to-use pull-down/pop-up menus let you drag color-



The best tuneful software for the Apple II

A+ ALL-STARS BY LARRY McCLAIN



# ALL STARS

coded notes to a grand staff (both treble and bass clefs). The Music Studio takes full advantage of the GS's 15-voice capabilities—*voice*, in this context, is synonymous with timbre rather than human speech.

For example, you can use the mouse to drag down a color-coded C note in the tenor-sax voice, followed by a color-coded E in the vibes voice, and then by a G in the string-bass voice. If you stack this triad of notes vertically, you'll get a rich C-major chord in three voices. (You can stack up to 15 voices in complementary bass and treble chords, but the result sounds a bit crowded and experimental, à la John Cage!)

The program furnishes three sets of voices (classical, rock, and jazz), plus a set of vocal phonemes that let you create simulated voice-voices. (Confusing, eh?) That just means that you can add a layer of simulated a cappella singing—anything from Gregorian chant to doo-wop.

The Music Studio lets you transpose entire compositions from one key to another with just one mouse click on a pop-up menu. Its screen icons certainly make sense to musicians around the globe: a human ear for playback, a trash can for getting rid of stinko compositions. The Options menu allows you to rearrange musical blocks (Move Block, Copy Block, and so on) just as easily as most word-processing programs shift paragraphs.

Sometimes The Music Studio's elegance can be too much of a good thing. For instance, the mouse does a full run (or glissando) as you search the staff for a place to plunk your note. It sounds classy but sometimes makes note-placing confusing. Considering all its amenities, the software does have one surprising omission: It lacks automatic measure breaks.

These minor quibbles are like mere oboe squeaks in a masterpiece, though. The Music Studio is one of the few Apple II software packages with across-the-board appeal—to serious home composers and students alike.

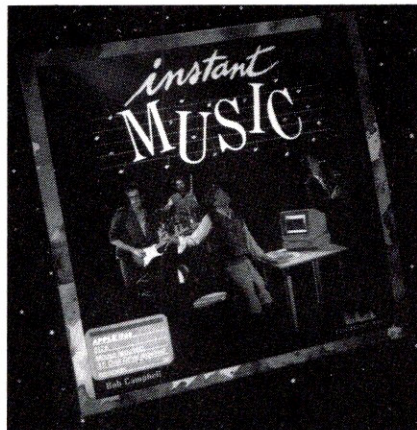
The Music Studio comes from Activision, P.O. Box 7287, Mountain View, CA 94039; (800) 227-9759; in CA (415) 940-6044. It requires an Apple IIGS with 512K of RAM and costs \$79.95.

## Instant Music

Seldom has a piece of music software offered so much unabashed fun as Instant Music, a IIGS package from Electronic Arts. The program lets even musical neophytes cut loose with what its creators call mousejamming—wild improvisations that never stray from a recognizable melody and beat, thanks to the program's nifty artificial-intelligence-type programming.

Here's a for instance:

When you call up a song called



"Fun 1962," the IIGS starts throbbing to a beat and melody reminiscent of vintage Jan & Dean. You simply click on the Mousejam icon and then start sliding the mouse around to create a surprisingly tuneful "jam." You can slide the mouse slowly (to add occasional nuance) or feverishly (to enhance every twist and turn along this playful dead man's curve).

Instant Music uses a nonstandard form of music notation rather than notes on a grand staff. Therefore, it's easier to jam just with existing tunes than to create your own sonic masterpiece. Whether you're jamming or composing, however, Instant Music serves up plenty of interesting sound clusters: four different digitized instruments at a time, each able to play three notes simultaneously.

The canned songs on Instant Music are fabulous. Most of them can best be described as "Herbie Hancock Meets the Night Court Theme Song." Weird, campy, and a lot of fun to jam with. Some folk and classical selections are also available for highbrows who prefer to jam along with a famous opus such as "The Sabre Dance."

If you tire of Instant Music's basic repertoire, you can also obtain two disks entitled *It's Only Rock & Roll* and *Hot & Cool Jazz*. The former contains 40 mousejam-ready songs chronicling the history of rock 'n' roll. The latter has dozens of jazz tunes, from turn-of-the-century Jellyroll Morton-type ditties right up to the present.

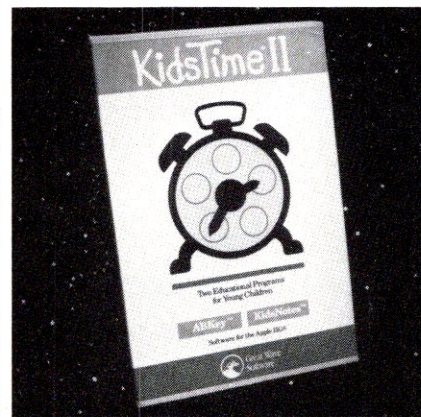
Instant Music is the only music package I've ever found that makes me immediately feel like Miles Davis, Eric Clapton, and Itzhak Perlman all rolled into one whenever I move my mouse.

Instant Music is a product of Electronic Arts, 1820 Gateway Drive, San Mateo, CA 94404; (415) 571-7171. It runs on an Apple IIGS with 512K of RAM and retails for \$49.95.

## KidsTime II

KidsTime II, a IIGS educational program for ages 3 through 10, might unfairly get lost in the shuffle. Although its ABKey section is a fairly routine, if colorful, learn-your-ABCs program, the real jewel here is KidsNotes, an imaginative music-education program that uses a grand staff and a simulated piano keyboard to assist young students.

Unlike most other Apple II com-



# ALL STARS

positional packages, KidsTime II doesn't require you to drag notes down to the staff. You just select the note duration you want, point to the appropriate piano key, and then click. It's actually faster than note-dragging. On playback, students see both a scrolling grand staff (with automatic measures) and piano keys that are highlighted in red as the melody moves along.

KidsTime II isn't as sophisticated as some of its musical GS brethren,

of course. For example, you have only three key signatures to choose from. But its parallel piano/grand-staff graphics make it very accessible for young children.

For kids who'd rather listen than compose, the program contains several familiar childhood refrains:

"Jack & Jill (Went Up The Hill)," "Here We Go Round (The Mulberry Bush)" and "Mom's Asleep (Let's Play Some Van Halen)." (Just kidding about that last selection!)

The documentation even has a section for harried parents entitled "Notes to the Musically Unsure." If you don't know a dotted quarter note from a quarter horse, this section is an oasis of reassurance.

The KidsNotes section of KidsTime II is a surprisingly full-featured GS music program. Most parents will find it just as fascinating as their young ones do.

KidsTime II is from Great Wave Software, 5353 Scotts Valley Drive, Scotts Valley, CA 95066; (408) 438-1990. It runs on an Apple IIGS with 512K of RAM, and its list price is \$39.95.

## Music Construction Set (GS)

Reviewers who give thumbs down to Music Construction Set are like film critics who knock *Star Wars* a decade after its release. *Star Wars* was an original that spawned



dozens of imitations. Likewise, Music Construction Set was the first Apple II program to popularize note dragging and Cut & Paste—features that many competitive products quickly latched onto.

Granted, the GS incarnation of Music Construction Set isn't as graphically imaginative as some of its competitors, and some of its voice selections now seem a bit dated (especially "Laser Gun"). It was the first kid on the block, however, to offer things like a chest-thumping opening song and one-click control over things like time and key signatures.

So let's give a pioneer an even break. Music Construction Set for the GS is still a standout product. It

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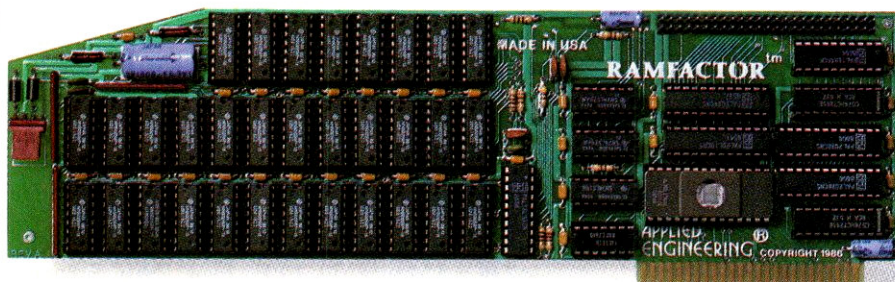
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Now anyone with an Apple II+, Franklin, Laser 128, Apple IIe or IIGs preferring to use slots 1 through 7 can now enjoy the speed and performance that they've been waiting for.

With RamFactor, you'll be able to instantly add another 256K, 512K, or a full 1 MEG on the main board and an expansion connector can address an additional 16 MEG of memory for possible future expansion. Since virtually all software is automatically compatible with RamFactor, you'll immediately be able to load programs into RamFactor for instantaneous access to information. You'll also be able to store more data for larger word processing documents, bigger data bases, and expanded spreadsheets. And with the battery back-up option, you can switch on your Apple and your favorite software will be up and running in less than 1 second!



## Very Compatible

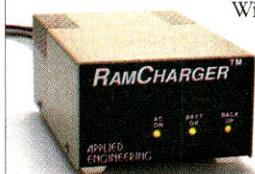
All the leading software is already compatible with RamFactor. Programs like AppleWorks, Pinpoint, BPI, Managing Your Money, Dollars and Sense, SuperCalc 3A, PFS, MouseWrite, MouseDesk, MouseCalc, Sensible Speller, Applewriter IIe, Business Works, ReportWorks, Catalyst 3.0 and more. And RamFactor is fully ProDos, DOS 3.3, Pascal 1.3 and CP/M compatible. In fact, no other slot 1-7 memory card is more compatible with commercial software.

## AppleWorks Power

There are other slot 1-7 cards that give AppleWorks a larger desktop, but that's the end of their story. But RamFactor is the only slot 1-7 card that increases AppleWorks internal memory limits, increasing the maximum number of records in the database and lines permitted in the word processor, and 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 any ProDos clock. RamFactor will automatically segment large files so they can be saved on 5¼", 3½", and hard disks. All this performance is available on the Apple II+,

IIe, Franklin, or Laser 128 when used with an 80 column display. RamFactor, no other standard slot card comes close to enhancing AppleWorks so much.

## The "Instant On" Apple.



With the RamCharger battery backup option, RamFactor will retain programs and data during power failures or even

when you turn your computer off. And because RamFactor plugs into slots 1-7, it's the only memory card that can cold boot an Apple without using slow floppy or hard disks. An available "Y" cable allows one RamCharger to power two RamFactors.

## Powerful Program Switcher

With RamFactor, you can organize memory into multiple work areas and switch between them. Each work area can contain different programs and even different operating systems. Now you can switch from one program to another or even switch from AppleWorks to DOS 3.3 to CP/M to Pascal to ProDos in under a second. And with our battery back-up option, you can have permanent storage for up to 20 years.

## Features:

- 256K to 1 MEG on main board. Expansion connector for possible further expansion to 16 MEG.
- Fully Apple II Memory Expansion compatible
- Compatible with Apple IIe, II+, IIGs, Franklin and Laser 128
- Battery back-up option allows you to turn on your Apple and run your favorite programs in less than 1 second!
- Automatically recognized by ProDos, DOS 3.3, Pascal, and standard CP/M
- Built-in RamDrive™ software (a true RAM disk not disk caching)
- Systems are directly bootable from RamFactor if desired
- Built-in self diagnostic software
- Automatic expansion with AppleWorks 1.3 or 2.0
- Allows Apple II+ and IIe to run your AppleWorks without buying any additional software
- Accelerates AppleWorks
- Displays time and date on the AppleWorks screen with any ProDos clock
- Fits any I/O slot except slot 3
- Fully socketed and user upgradeable
- Much, much more

RamFactor with 256K	\$239
RamFactor with 512K	\$289
RamFactor with 1 MEG	\$369
RamFactor with 2-16 MEG	CALL
RamCharger backup option	\$179
"Y" cable	\$24

(Allows one RamCharger to power two RamFactors.)

Order RamFactor today . . . with 15 day money back guarantee and our "no hassle" five year warranty. See your dealer or call (214) 241-6060, 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 if outside U.S.A.

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remains the most foolproof of the note-dragging programs because you hear only one tone, *after* you've clicked the note into place.

The simplicity and innovation that made Music Construction Set a winner on the IIe are still alive and kickin' on the GS.

Music Construction Set (GS) comes from Electronic Arts, 1820 Gateway Drive, San Mateo, CA 94404; (415) 571-7171. It runs on an Apple IIGS with 256K of RAM and retails for \$49.95.

## A Quintet with Class

Now let's take a look at the exemplary music programs that don't require an Apple IIGS to bring music to your ears.

**The Music Class.** The Music Class is a five-part, ten-disk music-instruction series for second graders

on up to collegians. It's better to move through the series sequentially rather than skip around. (Like a wise guy, I tried to jump right into Part 3 and got rather confused!) The proper sequence is Fundamentals, Rhythm, Ear Training, Music Symbols, and Note Reading.

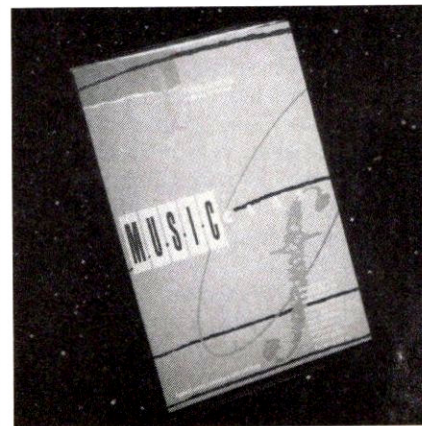
Although The Music Class was written by distinguished music professors of the University of Akron, the series is never lofty or dry. Matter of fact, it features clever on-screen characters such as Mr. Metro Gnome (whose tapping foot teaches you the difference between 4/4 and 3/4 time) and an animated cat that teaches basic intervals.

Teachers will appreciate the many on-disk tutorials and the automatic record-keeping feature of The Music Class. Because each student has a separate password, teachers can track the performance of as many as 125 budding talents.

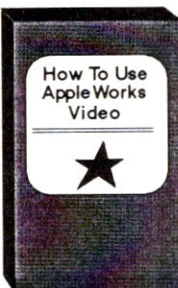
Although Mr. Metro Gnome was a tough taskmaster for me (3/4 time had me stymied for a while), I can vouch that The Music Class is both a whimsical and a comprehensive training series.

The Music Class is a product of Coda Music Software, a Wenger Company, 1401 East 79th Street, Bloomington, MN 55420; (800) 843-1337. It requires an Apple II Plus, IIe, IIc, or IIGS with 64K of RAM and costs \$195 for the entire series. **Note-Us.** Note-Us has intensive drills in sightreading and interval recognition—lessons spiced up aurally by MIDI-equipped synthesizers. The program's easy-to-read spiral-bound documentation helps move students briskly through the basics: scales, arpeggios, major and minor chords—followed by a lot of the practice that ultimately makes perfect.

Note-Us comes from Computers



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### Applied Engineering

Datalink Modem	179
GS Ram 256k	139
GS Ram 512k	169
GS Ram 1meg	229
GS Ram 1.5 meg	289
GS Ram + 1meg	359
Ramworks 3 256k	179
Ramworks 3 512k	209
Ramworks 3 1meg	279
Ramfactor 256k	189
Ramfactor 512k	229
Ramfactor 1meg	289
Battery Backup	149
Power supply	59
ZRam Ultra 2 256k	209
ZRam Ultra 2 1meg	309
ZRam Ultra 3 256k	259
ZRam Ultra 3 1meg	359

### Hardware

Laser 128	395
Laser 128 EX	495
Koala Pad +	82
System Saver	72
Bose Speakers	199

### Disk Drives

Pico IIe IIc 5.25	139
Laser 5.25	138
Laser 3.5	179
Laser Controller	98
<b>Orange Micro</b>	
Prograppler	80
Hotlink	59
Image Buffer 64k	59
Juice Box	59
Rampack 512k	149
Rampack 1meg	349
Rampack 2meg	749

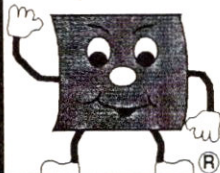
### Ribbons

Imagewriter	4
Prowriter	4
Epson 80	4
Epson 100	5
Okidata	4
Imagewriter 4part	10
Disk Notcher	10
Disk Cleaner	7
Universal Joystick	27
Drive IIe/IIc adapter	19

### Apple Software

Paintworks +	59
816 Paint	55
Print Shop	47
Fantavision	47
Graphic Writer	109
Music Cont.	42
Deluxe Paint II	70
Instant Music	39
Visualizer	70
VIP Pro	199
Mouse Write	116
SpringBoard Pub	99
Top Draw	79
Multiscribe GS	72
Mouse Talk	69
Word Perfect	109
Fontworks	28
Dollars & Sense	70
Manage y Money	95
Supercalc 3a	111
Mathtalk	32
Think Quick	29
Home Acct 128k	49
Appleworks 2.0	199

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# RAMUP™

**\$39.95**

**RAMUP/ram-ep/noun:** The latest RAM utility memory expansion software that lets RamCard owners easily load and manage several software applications at one time.

In plain English, RAMUP means you can get all your favorite programs to team up and work together.

In even plainer English, RAMUP means you're the boss. With RAMUP, you'll never hear your computer say "Just a minute" to you. With RAMUP, it's either "Right now" or "You got it."

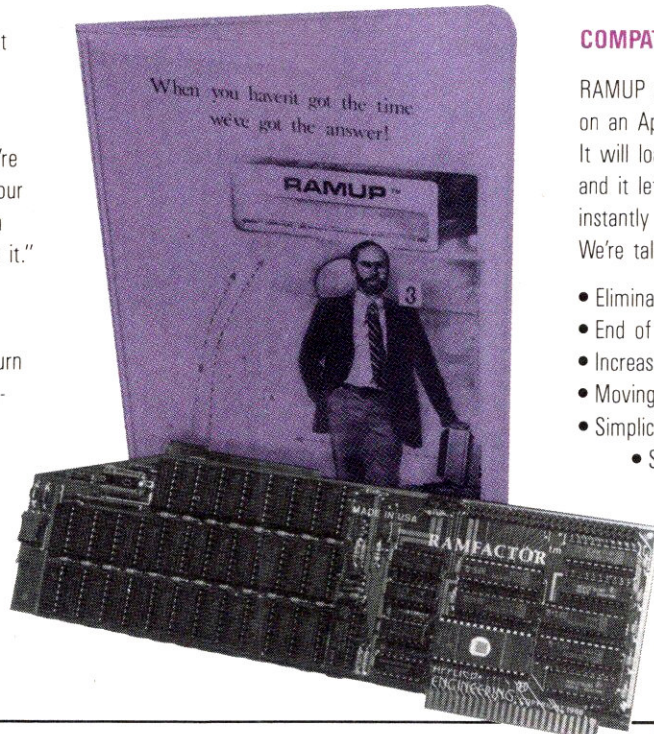
## INSTANT ACCESS

You can stop disk swapping. RAMUP can turn Control-Open-Apple-Reset into Control-Open-Apple-ACCESS. RAMUP lets you boot from your RamCard and it allows you to flip — at will — from one program to another. In a flash.

## COMPATIBLE WITH YOU

Talk about friendly! You don't need to know about programming or even about pathnames to use RamCards. These powerful accessories pay the returns on your RAM hardware investment.

If you are looking for a source that really knows, sells, stocks and supports AE, call us — *Quality Computers*.



## COMPATIBLE WITH YOUR HARDWARE

RAMUP automatically configures itself to run on an Apple IIe, IIc, IIGS and Laser computers. It will load just about any ProDOS software, and it lets you boot other software then instantly return to programs on your RamCard. We're talking about these major advantages:

- Elimination of disk access
- End of the floppy shuffle
- Increases productivity
- Moving from program to program — at will
- Simplicity
  - Speed
  - INSTANT ACCESS!

**RAMUP \$39.95**

RAMUP Time Trial	With Ramup	Without
AppleWorks to Sensible Speller	2.6 Sec.	30 Sec.
Sensible Speller to Grammer	1.3 Sec.	29 Sec.
Power on to AppleWorks	2.8 Sec.	22 Sec. *
Control A- Reset to AppleWorks	2.9 Sec.	28 Sec. **

\*Requires Battery backup option  
 \*\*Requires Ramfactor (or apple [slot] compatible) Memory Expansion

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Item	Price	Item	Price
Ramworks III 1mg	\$249	Ramcharger	\$133
Ramfactor 1mg	\$278	Transwarp	\$208
Ultra II 1mg	\$293	Datalink	\$175
Ultra III 1mg	\$364	Serial pro	\$119
GSram 1mg	\$234	Parrell Pro	\$119
GSram+ 1mg	\$349	256K-PC Transporter	\$ 33 call

## OTHER ITEMS

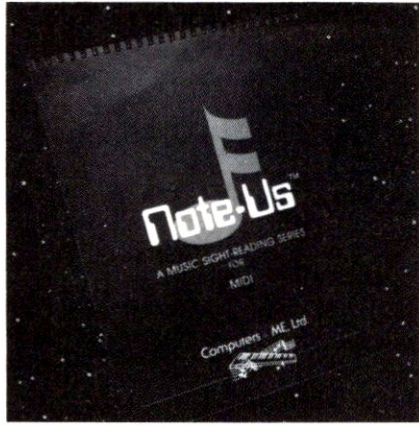
Item	Price
CMS 40 meg - Network!	\$945
Midideas	call
Pinpoint	call
Beagle Bros - TIME OUT	call
Delux Paint	\$ 69

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& Me, Ltd., 10 Ashbrook Road, Exeter, NH 03833; (603) 772-4399. It runs on an Apple II Plus, IIe, IIc, or IIGs with 48K of RAM and retails for \$129.95.

**MIDI Music Tutor.** This program covers the same basic terrain as Note-Us but comes with a special Record Keeper disk: four utilities



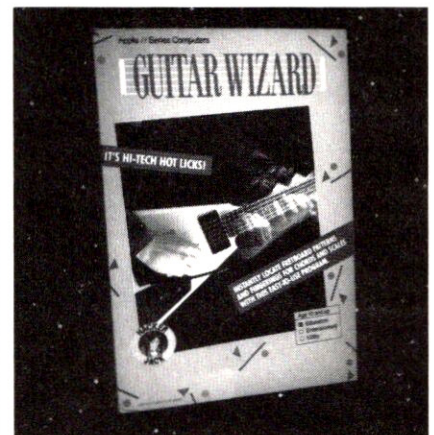
that let teachers maintain exhaustive records and quickly modify lesson content. For schools that have made sizable investments in pre-GS machines, both Note-Us and MIDI Music Tutor let students hear chords and intervals in all their glory—something that unaided II Plus and IIe computers aren't very good at.

MIDI Music Tutor is from Passport Designs, Inc., 625 Miramontes Street, #103, Half Moon Bay, CA 94019; (415) 726-0280. It requires an Apple II Plus, IIe, IIc, or IIGs with 64K of RAM and costs \$229.95.

**Guitar Wizard.** Most music software is extremely keyboard-oriented, probably because it's easier for beginning students to map out exotic augmented or 13th chords on a keyboard than on, say, a guitar.

Unless you've got Guitar Wizard, that is.

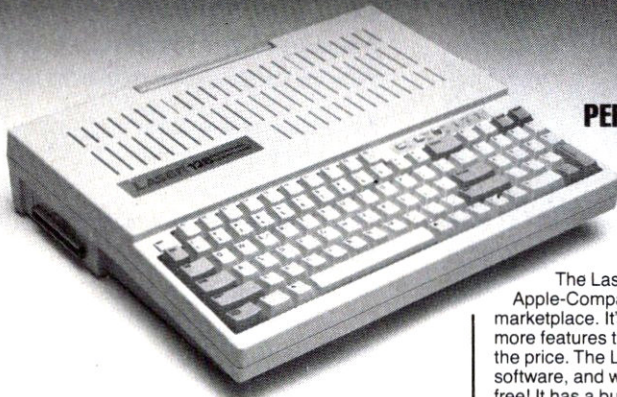
I defy any would-be Yngwie Malmsteen or Eddie Van Halen to



come up with a guitar chord or scale that *isn't* on the Guitar Wizard disk. It's astonishingly complete, full of scale runs and unusual chord voicings you seldom see in guitar books.

Guitar Wizard has four basic ar-

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The Laser 128 is the most affordable Apple-Compatible computer on the marketplace. It's a great little machine with more features than an Apple for about half the price. The Laser 128 runs Apple IIe/IIc software, and we give you ten programs—free! It has a built-in disk drive and features parallel, serial, modem and mouse interfaces. It even has an expansion slot to add more capabilities to your computer. The Laser 128 is a very popular machine because it's Apple compatible and it's a great deal at the low price of: **\$395**

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### New Laser 128EX Now Available

The Laser 128EX is a high performance Apple-compatible computer with all the features of the Laser 128, plus a triple speed processor and is internally expandable to over 1Mb. The Laser 128EX is 3 times faster than an Apple IIe or IIc and at only **\$499**

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Laser Mouse . . . . .	<b>\$ 59</b>	RGB Color Monitor Cable . . . . .	<b>\$ 19</b>
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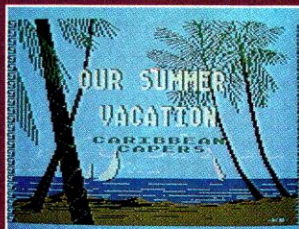
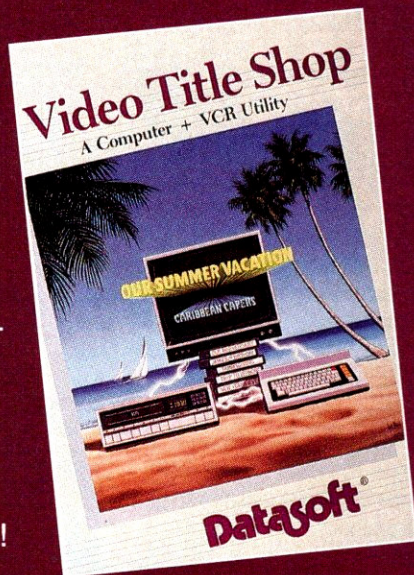
**HOW TO ORDER: VISIT YOUR RETAILER OR CALL 800-245-4525 FOR DIRECT VISA OR MASTERCARD ORDERS (IN CA CALL 800-562-1112).** The direct price is \$29.95 for the C-64 version and \$39.95 for the Apple version. To buy by mail, send check or money order to Electronic Arts Direct Sales, P.O. Box 7530, San Mateo, CA 94403. Add \$3 for shipping and handling (\$5 Canadian). There is a 14-day, money-back guarantee on direct orders. Screen shots represent the C-64 version. Other versions may vary.



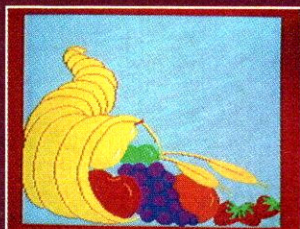
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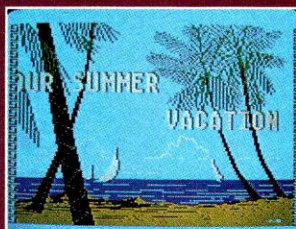
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ease of study. Chord Wizard helps you locate chords at different positions on the neck. Scale Wizard displays fingerings, intervals, and notes for a whole slew of scales. Fretboard Wizard teaches the rudiments of fretboard harmony and open tunings. And for advanced axmen and axwomen, Improvisation Wizard suggests scales for your next blistering solo.

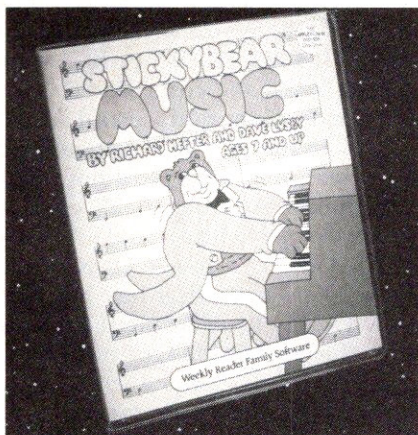
So, whether you're a novice picker or a seasoned player, Guitar Wizard is almost as educational as having Yngwie, Eddie, and Chet Atkins as next-door neighbors.

Guitar Wizard is a product of Baudville, 1001 Medical Park Drive S.E., Grand Rapids, MI 49506; (616) 957-3036. It requires an Apple II Plus, IIe, IIc, or IIGS with 64K of RAM and retails for \$29.95.

### Honorable Mentions

Here's a quick summary of some other noteworthy music packages for the Apple II family:

**Stickybear.** Stickybear Music and Stickybear Music Library, although not as comprehensive as KidsTime II, are nonetheless more kid-friendly than most instructional

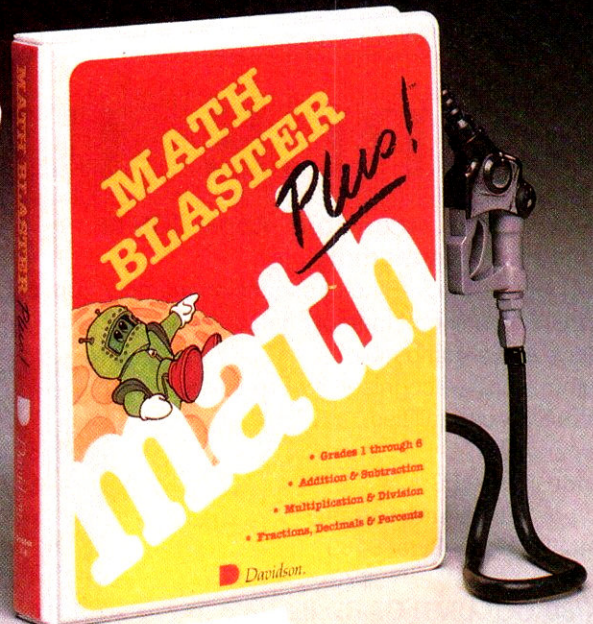


packages for the 7-and-up crowd. Stickybear Music uses the space bar (in lieu of a mouse) for placing notes on the grand staff. The notes are big and fat, helping young kids follow along.

Stickybear Music is a Weekly Reader Family Software product developed and distributed by Optimum Resource, Inc., 10 Station Place, Norfolk, CT 06058; (203) 542-5553 or (800) 327-1473. It re-

# HIGH GRADE FUEL.

**NEW**

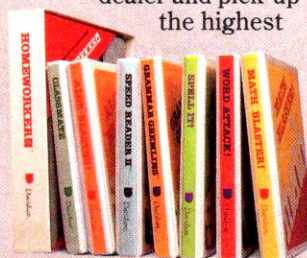


Davidson's new Math Blaster Plus is the highest octane math software program you can buy for your kids. Built by teachers to grow with kids—from addition and subtraction to multiplication, division, fractions, decimals, and percents.

Math Blaster Plus pumps in confidence and motivation, prints out Certificates of Excellence, and improves kids' grades from 1st grade through 6th.

With four motivating learning activities, exciting graphics and color, and a new action-packed arcade-style game, Math Blaster Plus makes learning fun. And, it has new pull-down menus that are easy to use with keyboard or mouse.

So pull into your local software dealer and pick-up the highest



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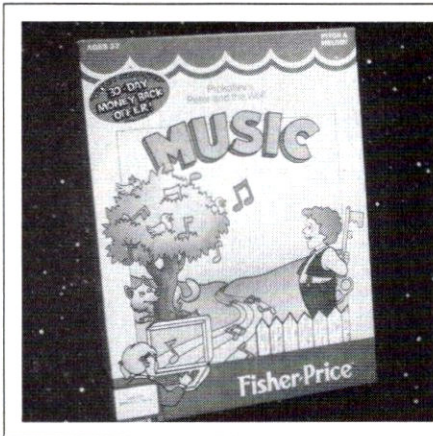
\*NO PURCHASE NECESSARY. Offer ends Dec. 31, 1988. Void wherever prohibited or restricted by law. Odds of winning will be determined by total number of entries received.

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Davidson.

# ALL STARS



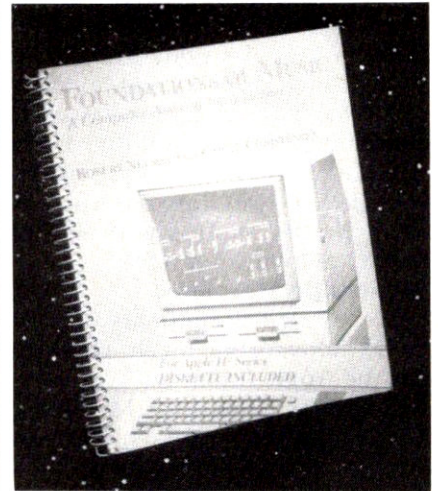
quires an Apple II Plus, IIe, IIc, or IIGS with 48K of RAM and retails for \$39.95.

**Peter and the Wolf Music.** This one is expressly for children 3 through 7, using Prokofiev's famous piece to give kids an intro to pitches, chords, and melody.

Peter & the Wolf Music comes from Fisher-Price Learning Software, 1 Kendall Square, Cambridge, MA 02139; (617) 494-1222. It runs on an Apple II Plus, IIe, IIc, or IIGS with 64K of RAM and retails for \$39.95.

**Foundations of Music.** Despite its rather stodgy title, *Foundations of Music: A Computer-Assisted 'Introduction* is a beautifully written and produced textbook with accompanying floppy. If you're looking for full-fledged *chapters* (instead of quickie definitions) on scales, intervals, and the like, this book/floppy combo is ideal.

Foundations of Music is from



Wadsworth Publishing Company, 10 Davis Drive, Belmont, CA 94002; (415) 595-2350. It runs on an Apple II Plus, IIe, IIc, or IIGS with 48K of RAM and costs \$31.25.

### En Garde, Commodore and Atari!

Just 18 months ago, Amigas and STs were on the verge of dominating the micro music field, getting ready to drive the Apple II clan from America's music classrooms. Now the Apple IIGS has brought new vitality to an Apple II application that was in danger of becoming humdrum. Maybe that's why Woz, that diehard music fan, scrawled his name so proudly on the machine that put us "back in the high life again." +

*Larry McClain is an ad-agency copywriter in Southern California who once tried his best to be a rock star. He's a former staff writer for Popular Computing and ex-editor of HARD-COPY, a DEC-oriented magazine. An Apple IIGS was provided for this review courtesy of Net Profit Computers, Anaheim, California.*

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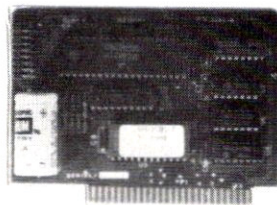
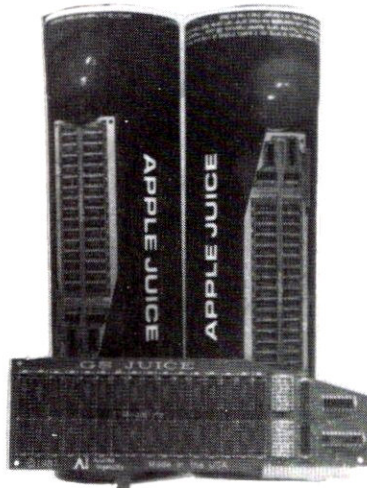
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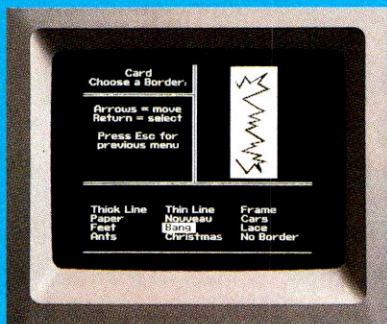
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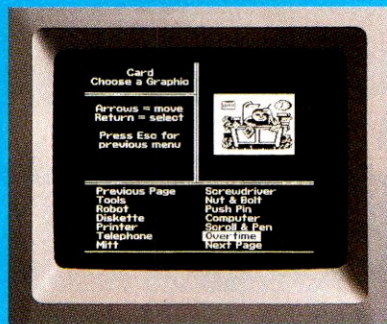


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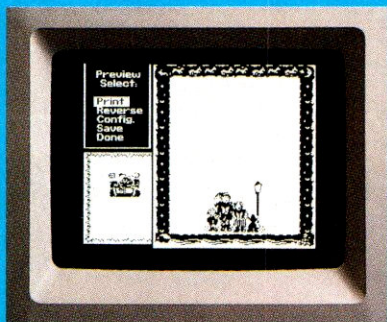
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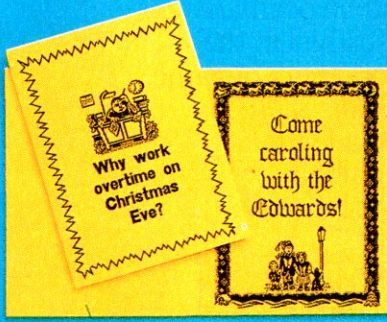
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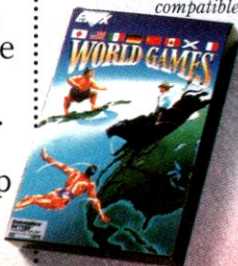
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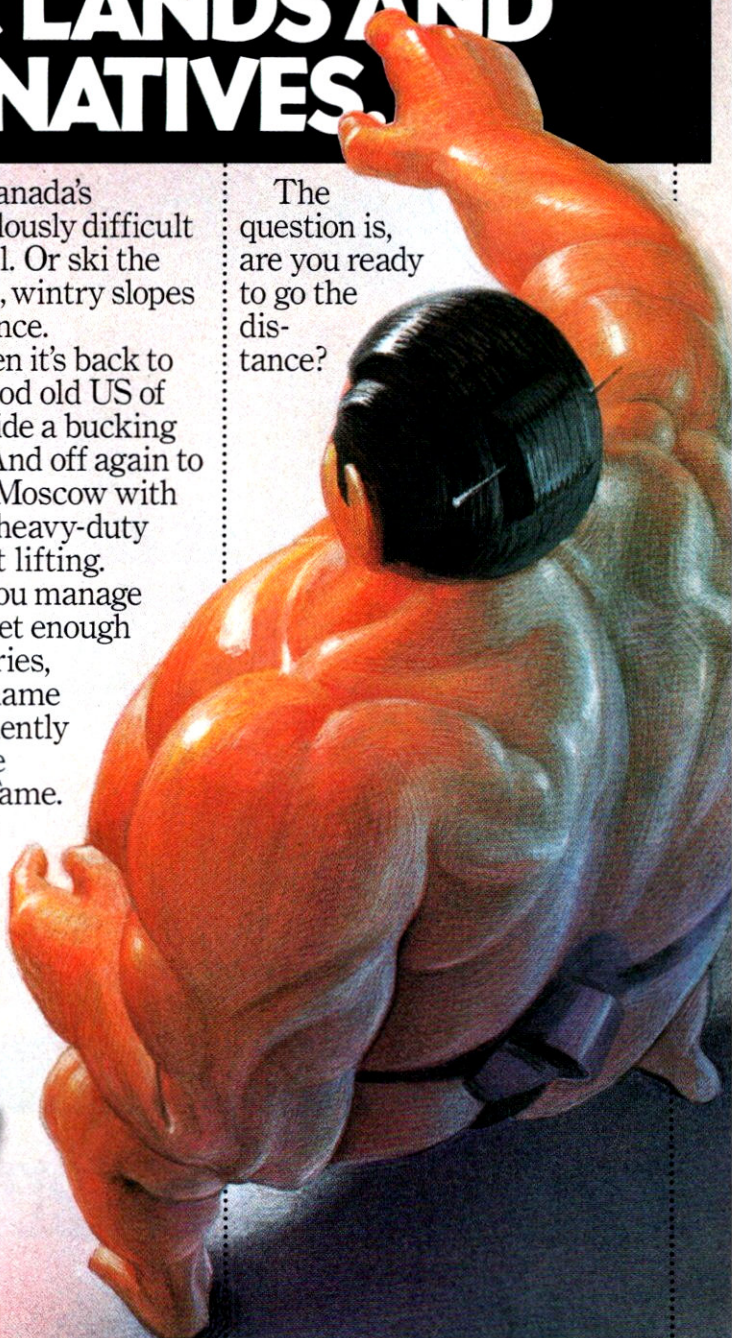
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# DISK UTILITIES

A+ ALL-STARS BY GARY B. LITTLE

## ALL STARS

*The best programs for  
disk management*

Every all-star team needs quality utility players, players capable of substituting for injured or slumping first-stringers so that the team can continue to win. It's just not possible to assemble a perfect lineup that does it all, day to day and year to year, without fail. This verity holds whether your team is the Los Angeles Lakers, New York Yankees, Chicago Bears, or that prized collection of software that makes your Apple II so valuable to you.

Disk utilities are particularly important to Apple II users, especially users with high-capacity 3.5-inch drives or hard-disk drives that are littered with dozens, perhaps hundreds, of files. Such utilities perform a variety of useful chores that major application programs usually don't handle adequately: general disk and file maintenance (cataloging, copying, deleting, renaming, locking, verifying, and so on), disaster recovery (fixing damaged disk blocks and scrambled catalogs, restoring deleted files), and other miscellaneous activities (searching for files and editing disk blocks).

In this article, I describe the very best disk utilities available for the Apple II today. Interestingly, none

of Apple's standard programs (Filer, System Utilities, DeskTop, and Convert) are good enough for inclusion. I suspect, however, that many A+ readers are still using them, simply because they come free with the ProDOS operating system. Believe me, you'll become much more productive if you switch to the best third-party disk utilities, so read on.

### ProSel

ProSel is a startlingly comprehensive software system that includes more than a dozen disk-utility programs, as well as a popular program-selector utility, from which it derives its name.

The module you'll use most often is called Cat Doctor. Similar to Apple's Filer program, it is much more powerful and convenient. It performs a variety of operations on groups of files or on entire subdirectories. The basic operations are Catalog, Copy, Lock, Unlock, De-

lete, Verify, Rename, Wipe (it zeros all disk blocks the file uses), Sort Directory, Change File Date, Create Directory, and Show Volume Names.

One of Cat Doctor's strong features is that it can display a tree diagram that shows how the various subdirectories on a disk are interconnected; you can then move to a subdirectory of interest by positioning the cursor over its name and pressing Return.

The Copy module is for making copies of entire disk volumes. A unique feature of Copy is that it copies between disk volumes of different sizes, provided the destination volume is the larger one. This ability is useful for quickly copying all the files on a disk to a RAMdisk, for example.

ProSel also sports a deluxe disk-zap program called Block Warden for reading, writing, and editing individual blocks on a disk volume. Block Warden understands many advanced commands, including one for disassembling the contents of a block and another for directing it to display, in order, the contents of the blocks a particular file uses.

Another ProSel utility I find par-

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# ALL STARS

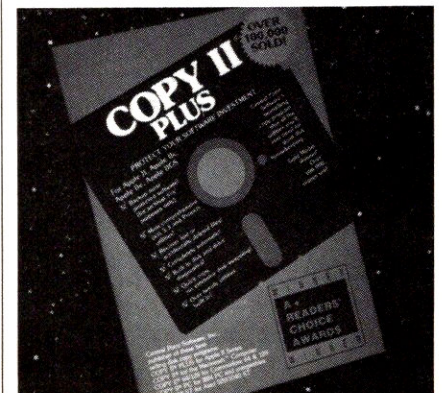
ticularly useful, now that my ten-megabyte hard disk is almost full, is Find File. It scans a disk volume, looking for a file whose name you've provided. When it finds a match, you can either display the file in hexadecimal form or as lines of text (if it's a text file), run it (if it's a system file or an Applesoft program), or continue searching for another file with the same name in another directory.

And there's more—much, much more. Mr. Fixit is a disaster-recovery tool for fixing damaged directories. Even if you manage to destroy your entire volume directory, Mr. Fixit can usually rebuild it, at least enough to let you use all files stored in subdirectories. Beach Comber effectively speeds up disk activity by restructuring the disk so that directories are packed together and files occupy contiguous blocks. Backup is for quickly making archival backup copies of disk volumes, and Restore is for transferring backups back to the original volumes.

At \$40, ProSel is truly a bargain, but don't rush down to your software store to buy it. It is available only by mail from Glen Bredon, the Rutgers mathematics professor who wrote it (521 State Road, Princeton, NJ 08540; [609] 924-5976). It runs on an Apple II Plus, Iie, Iic, or Iigs with 64K of RAM. For technical support, you leave messages for Bredon on the CompuServe information service.

## Copy II Plus

Copy II Plus initially earned its reputation as a superb utility for making backup copies of copy-pro-



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tected software. It continues to provide that function, but it additionally offers a more traditional set of disk utilities.

Longtime users of Apple II software will think they've been transported back to 1979 when they boot up Copy II Plus, because screen messages and menus appear in all uppercase text on the 40-column screen. But fear not, the program is far better than its ancient user interface implies.

The major commands in Copy II Plus are Copy (files or volume), Catalog, Delete, Lock/Unlock, Rename, Alphabetize Catalog, Format, Verify, View Files, Disk Map (shows block usage on a 5¼-inch disk), Undelete Files, and Create Subdirectory. Like ProSel's Cat Doctor, it shows a directory tree diagram when you select a file operation; it lets you move to any directory without typing a complete pathname.

Three features of Copy II Plus distinguish it from similar programs. One is that it works with both ProDOS- and DOS 3.3-formatted disks. In fact, you can even copy files from one type of disk to

another—Copy II Plus automatically takes care of making all necessary conversions.

Another unique feature of Copy II Plus is that it lets you specify the order in which files are to be copied. This provision is especially convenient if you're attempting to arrange files in logical groups in a directory. Most file-copying programs copy files only in the order in which they appear in the source directory.

Yet another special feature is the ability to copy a smaller disk to an image file on a larger disk. After making this copy, you can make multiple copies of the smaller disk by repeatedly copying the image file to blank disks.

Copy II Plus comes from Central Point Software, 9700 SW Capitol Highway, Suite 100, Portland, OR 97219; (503) 244-5782. It requires an Apple II Plus, IIe, IIc, or IIGS with 64K of RAM and costs \$39.95.

# ALL STARS

## Diversi-COPY

Diversi-COPY has one goal in life: to make copies of entire disks as quickly as possible. Much to the delight of single-drive users (especially 800K-drive users), it has achieved this goal.

The problem with most disk-copying programs is that they require multiple passes to make a copy because they can't get at enough RAM memory to hold an entire disk, meaning that you must insert and eject disks several times during the copying process. Diversi-COPY is able to use all memory in the computer, even expansion memory that other programs ignore (such as extended memory in the IIGS or multiple auxiliary memory banks and memory in I/O slots in the IIe). So if you have a IIe with a RamWorks card with plenty of memory, or a GS with a one-megabyte OctoRAM, for example, you can copy an entire 800K disk in just one pass.

Diversi-COPY has a multiple-copy option, which simplifies the making of several copies from one master. When this option is active, you transfer your original disk into

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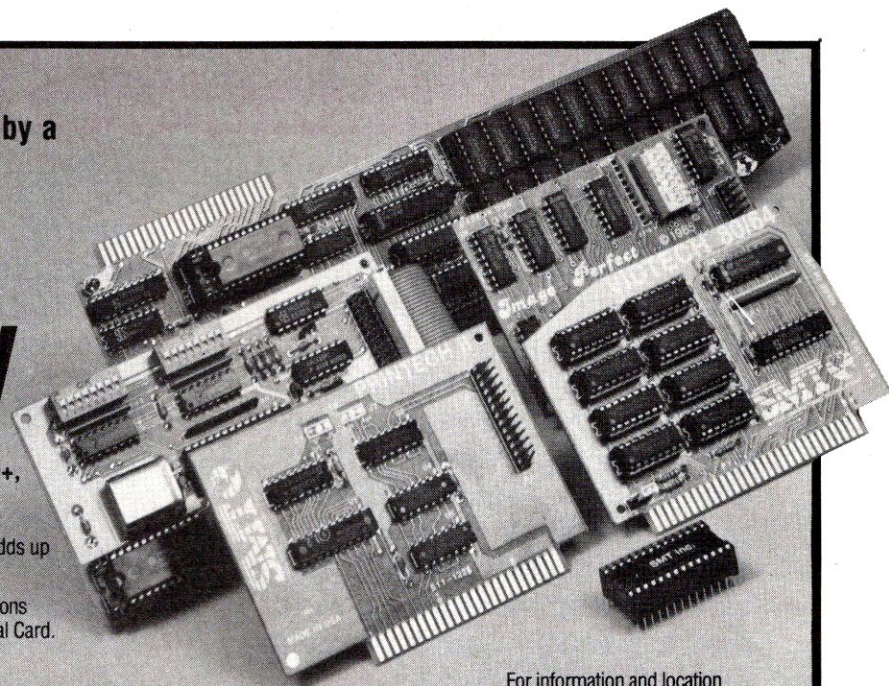
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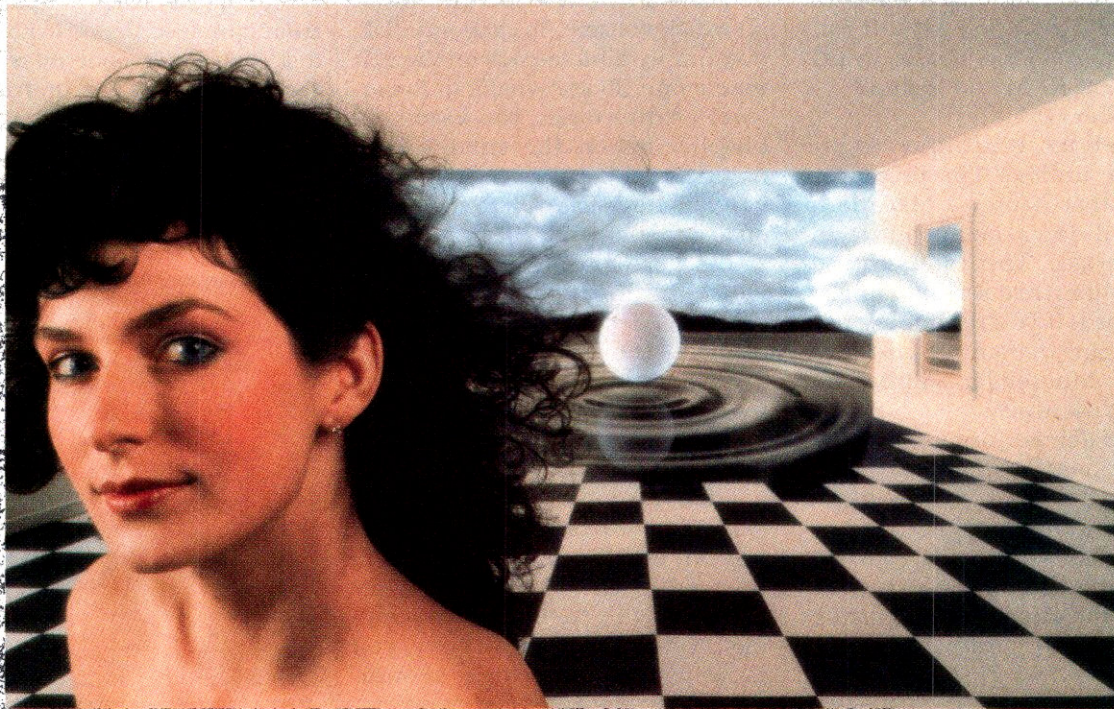
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memory once and then keep copying the memory image to blank disks until you are done—a wonderful alternative to buying a multithousand-dollar disk-duplicating machine.

Diversi-COPY is a product of Diversified Software Research, Inc., 34880 Bunker Hill, Farmington, MI 48018-2728; (313) 553-9460. It runs on an Apple II Plus, IIe, IIc, or IIGs with 64K of RAM and costs \$30.

#### MouseFiler

MouseFiler is unique to the group of utilities I'm presenting here, in that it uses a Macintosh-style pull-down-menu and window interface. This interface uses the 80-column text screen for maximum speed. If you're a mouse user who delights in pointing and clicking, then MouseFiler will be your favorite disk utility.

MouseFiler performs the standard functions you might expect: renaming, deleting, and copying files; formatting, copying, and renaming disk volumes. It can also compare two files or disks to see if they are the same, a useful feature if you need to verify that you've updated a certain file or disk.

# ALL STARS

An attractive feature of MouseFiler is the ease with which it lets you move through the directories on a disk volume. To catalog a disk, you simply double-click on the volume name. To see what's in lower-level subdirectories, you keep double-clicking on the subdirectory names in the path. At any time, you can move back up to the previous subdirectory level by clicking in the close box of the window in which the directory appears.

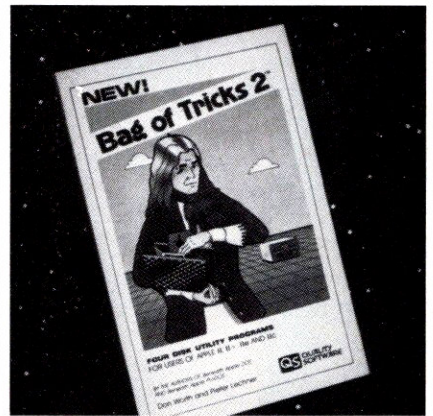
MouseFiler uses a Clipboard to facilitate the copying of files. To copy a group of files, you first highlight their names by dragging the mouse across them and then select the Copy item from the File menu. Finally, you highlight the name of the destination subdirectory or disk and select the Paste item from the File menu. Very slick. As with the other file-copying utilities mentioned above, you can copy entire directories at once.

MouseFiler is a product of Harbor Software, Inc., 403 Great Road, Suite #8, Acton, MA 01720; (617) 263-1870. It runs on an Apple IIe (enhanced), IIc, or IIGs with 128K of RAM and retails for \$69.95.

#### Bag of Tricks 2

Bag of Tricks is the ultimate utility for recovering data and files from damaged disks. If you have a disk you can't boot or a file you can't load, then Bag of Tricks may be your salvation. It works with ProDOS, DOS 3.3, DOS 3.2, Pascal, and CP/M disks.

Bag of Tricks has four modules. TRAX examines sectors on a 5¼-



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CIRCLE 288 ON READER SERVICE CARD

102 A+ MAGAZINE DECEMBER 1987

# ALL STARS

inch at the lowest level and displays sector overhead data as well as the actual file data. This overhead data encapsulates each data block on disk and serves to frame and identify the block properly. TRAX automatically flags unusual patterns, enabling you to isolate problems easily.

The INIT module can format individual tracks on a 5¼-inch disk, which is useful if your disk drive can't read a particular sector in a track. By using INIT, you can reformat the track (usually enabling access to the bad block) and restore the data in the other blocks of the track. You can then try to reconstruct the bad block by using the ZAP module. This module is a general utility for reading, writing, and editing individual blocks on a disk.

The fourth module, and probably the most useful, is Fixcat. It is for recovering DOS 3.3 catalogs or ProDOS directories that you may have totally or partially lost on your medium. It is powerful and can often recover a directory without any user intervention.

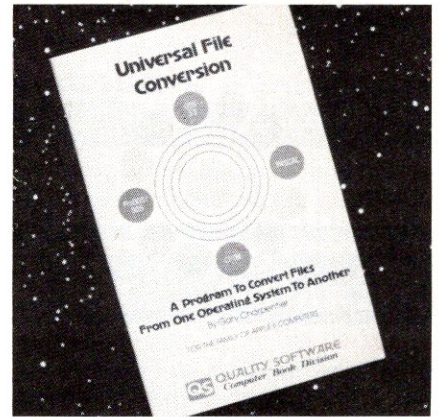
Bag of Tricks comes with a comprehensive 158-page book that explains how to use each module. It also includes a useful tutorial on how to approach a typical disk-recovery session.

Bag of Tricks 2 comes from Quality Software, 21610 Lassen Street, #7, Chatsworth, CA 91311; (818) 709-1721. It works with an Apple II Plus, IIe, IIc, or IIGS with 64K of RAM and costs \$49.95.

#### Honorable Mentions

**Universal File Conversion.** With this program you can transfer files from one Apple operating system to another. The operating systems with which it works are ProDOS, DOS 3.3, Apple Pascal, and Apple CP/M. If you're just using ProDOS and DOS 3.3, you can simply use Copy II Plus instead, but if Pascal or CP/M disks frequent your drives, by all means consider Universal File Conversion.

Universal File Conversion is a product of Quality Software, 21610 Lassen Street, #7, Chatsworth, CA 91311; (818) 709-1721. It works



with an Apple II Plus, IIe, IIc, or IIGS with 64K of RAM and costs \$34.95.

**Diversi-CACHE.** This program doesn't perform disk- or file-maintenance operations, but it deserves recognition nevertheless. Diversi-CACHE is a caching program for the Apple IIGS with an Apple 3.5 Drive. It speeds up 3.5-inch disk operations by copying disk data blocks to RAM when the operating system first reads them. The second time the operating system requests the block, it bypasses disk access and takes the data directly (and more quickly) from where it was cached in memory. The advantage of using a cache over utilizing a RAMdisk is that you don't have to transfer your files to RAM at the beginning of a session or save changed files back to disk at the end of a session.

Diversi-CACHE installs itself as a Classic Desk Accessory, and the cache size is changeable. One of Diversi-CACHE's wonderful features is that it survives a hard reset (Control/open-apple/Reset), which most RAM-based CDAs do not.

Diversi-CACHE comes from Diversified Software Research, Inc., 34880 Bunker Hill, Farmington, MI 48018-2728; (313) 553-9460. It runs on an Apple IIGS with 512K of RAM and costs \$35.

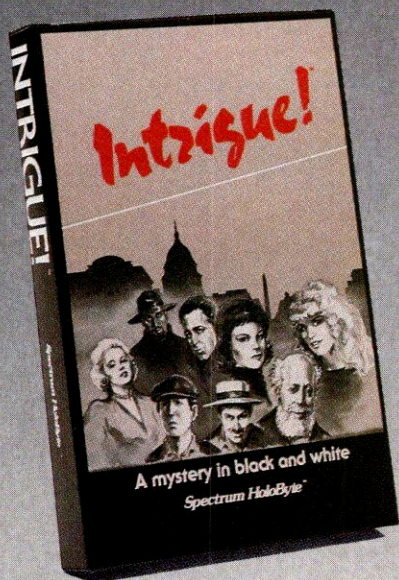
#### All-Star Wrap-up

So there you have it—the best disk utilities on the market today. The next time your superstar software falters or twists its knee on a bad disk block, trot these utilities out to save the day. +

Gary Little is A+'s senior technical editor. His latest book is *Exploring the Apple IIGS*, from Addison-Wesley Publishing Company.

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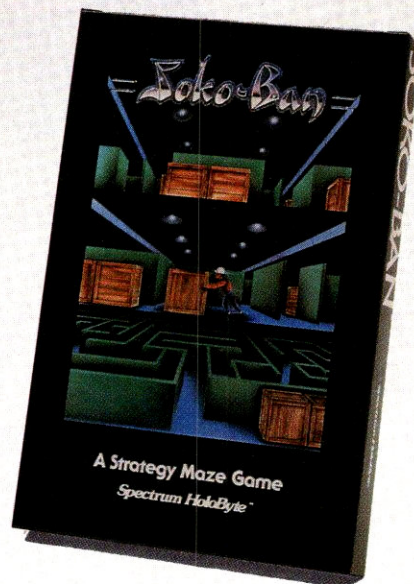
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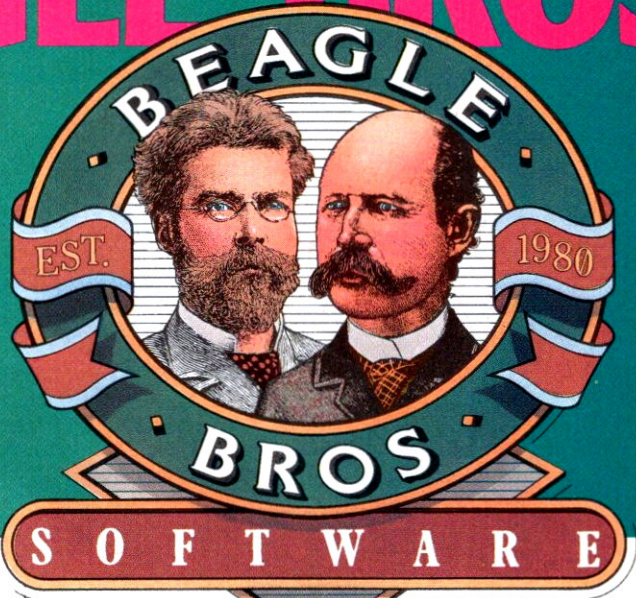
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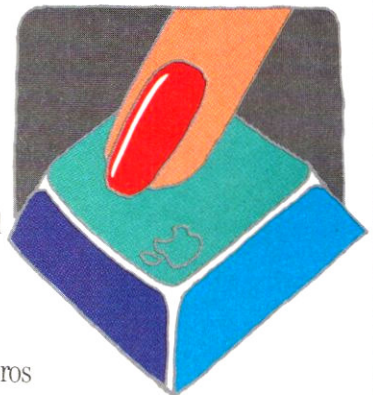
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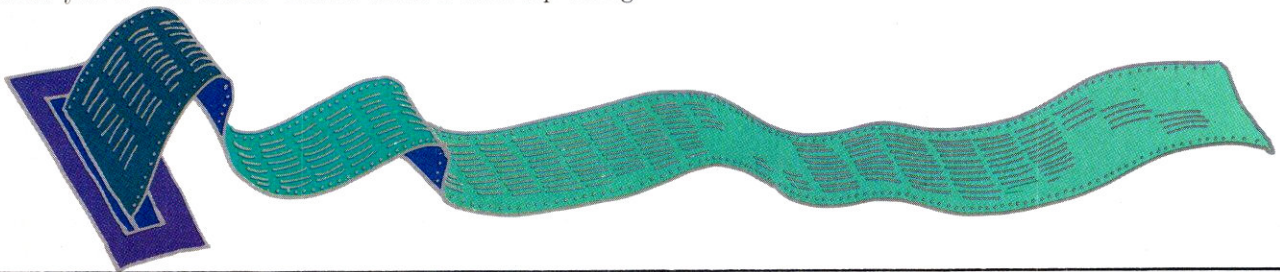
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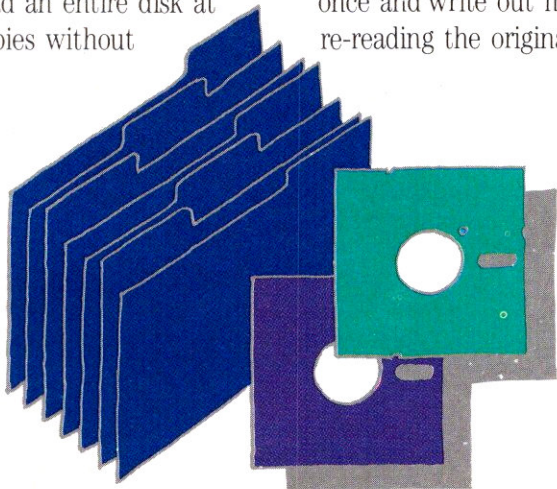
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of the entire spreadsheet or any portion. Works on most dot matrix printers.



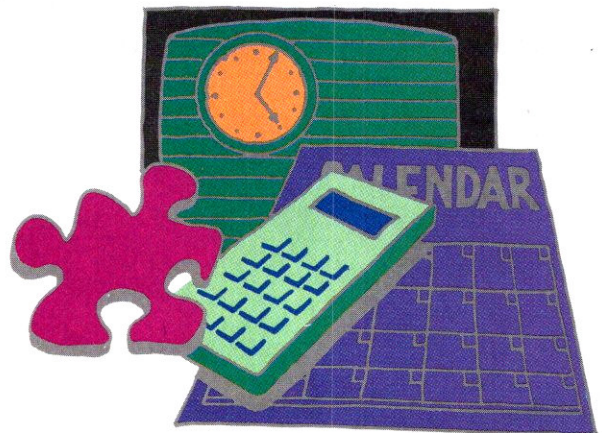
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ALL  
STARS

# Database

A+ ALL-STARS BY STEVE HIGH

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In the early 1980s, DB Master dominated the database category of the Apple II best-seller charts. This product eventually died because of lack of marketing and technical support and because of competition from a new generation of database products such as PFS:File; Quick File; and, preeminently, AppleWorks.

The new database products were optimized for personal productivity rather than hard-core data processing. Purists, who found AppleWorks disgustingly easy to use, complained that it wasn't a database program at all, but simply a "file manager."

If so, the market for file managers turned out to be pretty brisk.

Actually, you hear less of this sort of talk than you used to, primarily because cheap memory and enhancements by Applied Engineering and Apple Computer have made the AppleWorks database module much more powerful than it was when first introduced. The influential and reliable technical newsletter *Open-Apple* wrote last March that AppleWorks "sorts and retrieves data fast enough to make mainframes blush."

So why use anything else? Well, despite its very high performance, AppleWorks is missing, by design, many of the features a mainframe data-processing manager would expect to find, such as indexing, multiple field attributes, merge/purge, and essentially unlimited reporting options.

Nevertheless, many Apple II owners use the AppleWorks database module as a stand-alone program to manage large and complex bodies of information, finding that its speed, power, and convenience allow them to work around missing features. But the fact remains that AppleWorks is better used as a personal productivity tool—a file manager, if you will—than as a professional data-processing tool for such things as payroll, invoicing, and inventory control.

With this frame of reference in mind, here are my picks for the database All-Stars.

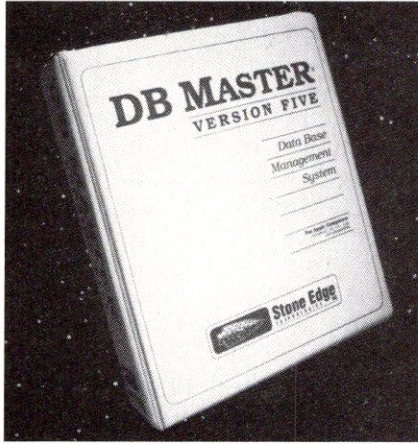
#### DB Master

The original developer of DB Master has obtained the marketing rights to the product and has substantially revised it. The new PRO-DOS-based product is called DB



Master Version Five.

In a refreshing display of candor, Stone Edge Technologies (the successor company to StoneWare) shipped a version of DB Master for several months that was admittedly unfinished and labeled "pre-release." (The final version became



available shortly after this article went to press.) DB Master is most suitable for previous owners of DB Master or others who are experienced in the ways of complex database programs (such as Ashton-Tate's dBase).

Even the prerelease version has some significant advantages over AppleWorks. DB Master allows up to 200 fields per record, compared to 30 in AppleWorks, and permits up to 250 characters per field, compared to about 70 characters in AppleWorks. To handle all of these fields and characters, DB Master allows up to 30 screens per record. In addition, a single DB Master file can be as much as ten megabytes in size on a hard disk, whereas AppleWorks runs out of steam at about 6 megabytes.

The DB Master report generator is better than AppleWorks for creating, or filling in, forms. Unlike the AppleWorks labels-style report format, DB Master is not limited to 15 lines (2½ inches) and can print out invoices, bills of lading, and similar forms up to four pages in length when you have 60 lines to a page.

In AppleWorks, you have to worry about only three different types of fields: date, time, and everything else—and you worry about them only to the extent that you type date or time in the appropriate field names and omit those words from all other field, or "category," names.

# ALL STARS

DB Master, by contrast, has 13 field types. Depending on your attitude, this variety is either a curse or a blessing. You need to specify which of these types you want, as you name the categories in your database file. The program has three kinds of date fields alone, including two that the computer automatically fills in.

You can have DB Master date and time fields calculate days and hours elapsed between two events. This important function is not easily available in AppleWorks. In addition, all of DB Master's math functions are present in the database as well as in the report generator, so you can enter a formula into a field that automatically calculates a value.

I have to say, however, that if you are used to AppleWorks and want to switch over to DB Master, you'll find the experience like going to the garage to start your car in the morning and finding instead a small plane parked there with an instruction manual in the cockpit. To be sure, the Piper can fly over buildings, which your car cannot, but even after you learn how to do it, you will find that the plane is hard to park and that it's simply not suitable for most routine trips.

The standard version of DB Master costs \$179, and the prerelease of DB Master Version Five Professional (with relational capabilities) sells for \$295. Far greater than its retail cost will be the time cost of learning and using it, however, so you should be positive that you need its advanced features before abandoning AppleWorks.

In the prerelease version I reviewed, DB Master offers only partial file-transfer capabilities. You can convert only old DB Master files to Version Five, print Version Five files to disk, and then read them into AppleWorks. The publisher says, however, that the final version lets you import AppleWorks database files as well as export DIF and ASCII files.

DB Master comes from Stone Edge Technologies, P.O. Box 200, Maple Glen, PA 19002; (215) 641-

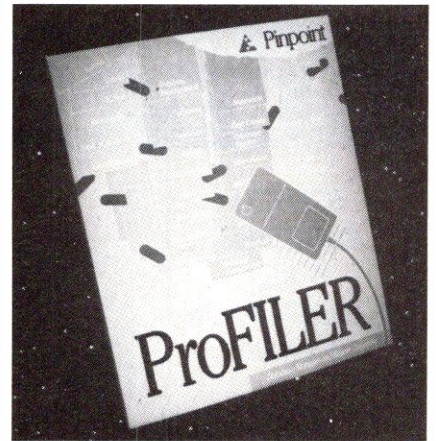
1825. It requires an Apple IIe, IIc, or IIgs with 128K of RAM.

## ProFILER 3.0

An alternative database program that combines some of the best of both AppleWorks and DB Master is ProFILER 3.0 from Pinpoint Publishing. Like all of Pinpoint's programs, this one has an exceptionally good user interface. It is very Mac-like in appearance, but, in recognition of the small mouse population in the Apple II world, it is also convenient to use with just the keyboard.

ProFILER reads from and writes to AppleWorks files, albeit a little clumsily. This feature could be available without the necessity of pathname typing, but at least it's present.

ProFILER is able to handle 65,000 records, Pinpoint Publishing claims, each record with up to 250 fields. In this respect, the product is in the DB Master class. On the other hand, you can modify ProFILER databases at will, adding or deleting new categories without risking data loss, an AppleWorks feature that ProFILER's manufacturer wisely imitated.



ProFILER has a useful search-and-replace command, something you'll find in the AppleWorks word-processing module but not in the database module. One AppleWorks feature missing from ProFILER is multiple record layout. In ProFILER, you can view only one record at a time. Mail merge, a vitally necessary business function, is available now in both AppleWorks and DB Master but missing from ProFILER. You use AppleWriter II to produce form letters with ProFILER.

The AppleWorks database module handles about 5000 records,

# ALL STARS

provided you have enough RAM. With Applied Engineering's software patch, you can have about 15,000 records, again provided you have enough RAM. If size is the only AppleWorks limitation that concerns you, ProFILER may be an excellent alternative for you, since it can import your already overgrown files and let you make them even bigger. ProFILER does not give you the sheer control over your data that you get from DB Master, however. The trade-off here is between number of features and simplicity of use. ProFILER is attractively priced at \$129.

To integrate some additional features with ProFILER, you can add Pinpoint's popular desk accessories, providing pop-up access to a calculator, notepad, and other handy tools.

ProFILER is from Pinpoint Publishing, 5865 Doyle Street #112, Emeryville, CA 94608; (800) 633-2252; in CA (415) 654-3050. It runs on an Apple IIe (enhanced), IIc, or IIgs with 128K of RAM.

## Integrated Programs

Two programs that compete not only with the AppleWorks data-

base module but also with its word-processing and spreadsheet modules are DoReMe and Foundation. Of the two, I find DoReMe easier to use, but the program is, unfortunately, DOS 3.3-based. This factor disqualifies it, in my view, from consideration as a high-powered database. A ProDOS version is supposed to be under development, and it may emerge as a major AppleWorks competitor, as DoReMe seems to contain an excellent blend of power and ease of use.

Two other DOS 3.3 database programs that should be revised to run under ProDOS are Bank Street Filer, a well-designed, easy-to-use file manager, and 9 to 5, a more ambitious program that includes most AppleWorks features as well as some things missing from AppleWorks, such as the ability to do date math.

**Foundation.** Foundation is a powerful integrated program that runs

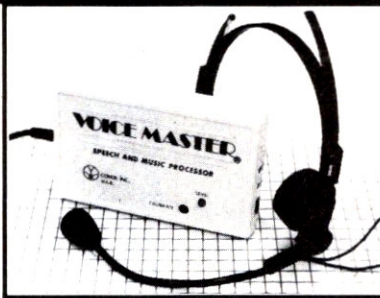
under a proprietary operating system, GigaDOS. Despite this peculiarity, Foundation can read AppleWorks directly and print ProDOS text files to disk. One of the first things you notice about Foundation is its rapid disk-access time, a consequence of its unique operating system.

The next thing you realize is that Foundation is difficult to learn how to use and, I suspect, difficult to remember how to use. In appearance, it is something like Lotus' Symphony, which most people find bewildering if they don't use it constantly.

The Foundation database is relational, however—something that no other Apple II program can claim. DB Master Professional, when finished, is supposed to have relational capability, but whenever the final version is ready, all the other programs mentioned in this article may well also have additional enhancements. As it exists at this writing, Foundation is more powerful than DB Master. A Foundation database file can poll other database files and automatically load data from them. You can also "re-

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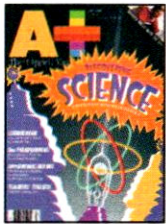
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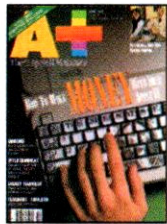
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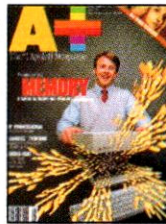
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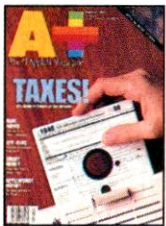
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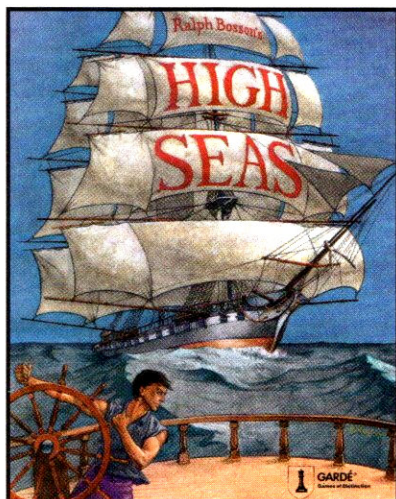
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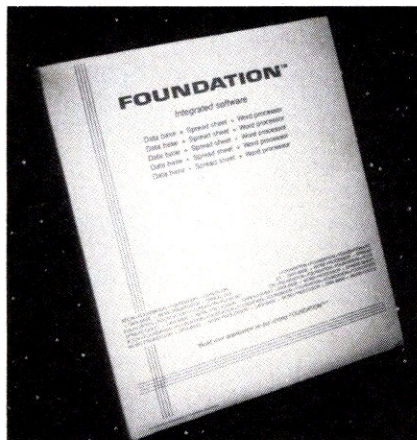
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# ALL STARS

late" or link data in a Foundation spreadsheet document to a Foundation database.

Foundation is impressive. The only major AppleWorks feature that it is obviously missing is the ability to view multiple records on the screen. Like most database programs, Foundation prints a report



to screen instead. A Foundation database is harder to modify than one you've created in AppleWorks or ProFILER, although you can create a new database with fields you forgot to include the first time and then move the old data into it.

You can use the Foundation database to construct a full-scale accounting, general-ledger, and payroll program. You can link your checkbook file to an accounts-payable database so that when you enter a check, the accounts-payable file is automatically posted. In fact, you can use Foundation for almost any data-processing application you are clever enough to know how to do.

Foundation is a product of Foundation Corporation, 506 West Armitage, Chicago, IL 60614; (312) 880-5761. It runs on an Apple IIe, IIc, or IIcs with 128K of RAM and costs \$300.

## AppleWorks

Foundation will not replace AppleWorks as the most popular personal productivity tool for the Apple II. AppleWorks has more features than most people use, and Foundation has more features than AppleWorks, with a corresponding price tag in complexity. The in-

stalled base of AppleWorks users is many times greater than that of all the other programs I've mentioned here combined. Many people are pushing its database module to its limits and beyond, and it is a good idea to talk to some AppleWorks experts—every users' group has dozens—before concluding that the program won't do what you want it to. In addition to soliciting lots of free advice, you might also consider paying somebody to set up an AppleWorks system for you.

AppleWorks comes from Apple Computer, Inc., 20525 Mariani Avenue, Cupertino, CA 95014; (408) 996-1010. It requires an Apple IIe, IIc, or IIcs with 128K of RAM and costs \$249.

## Honorable Mention

**Notes•n•Files.** An honorable mention of interest to GS users is Notes•n•Files from DataPak Software. With it you can create simple fixed-form mailing-list databases to which you can attach short notes or messages. Although you can't refer to it as a full-featured database manager, Notes•n•Files satisfies a common database need—keeping track of names and addresses—very well. It uses the standard desktop interface and clever icons (a photocopy machine to represent



printing and a filing cabinet to represent a database, for example), meaning it is easy—and even fun—to operate.

Notes•n•Files comes from DataPak Software, 14011 Ventura Blvd. #507, Sherman Oaks, CA 91423; (818) 905-2201. It runs on an Apple IIcs with 512K of RAM and costs \$129.95. +

*Steve High is a public-relations professional whose clients include Applied Engineering and Bob Lissner, the author of AppleWorks.*

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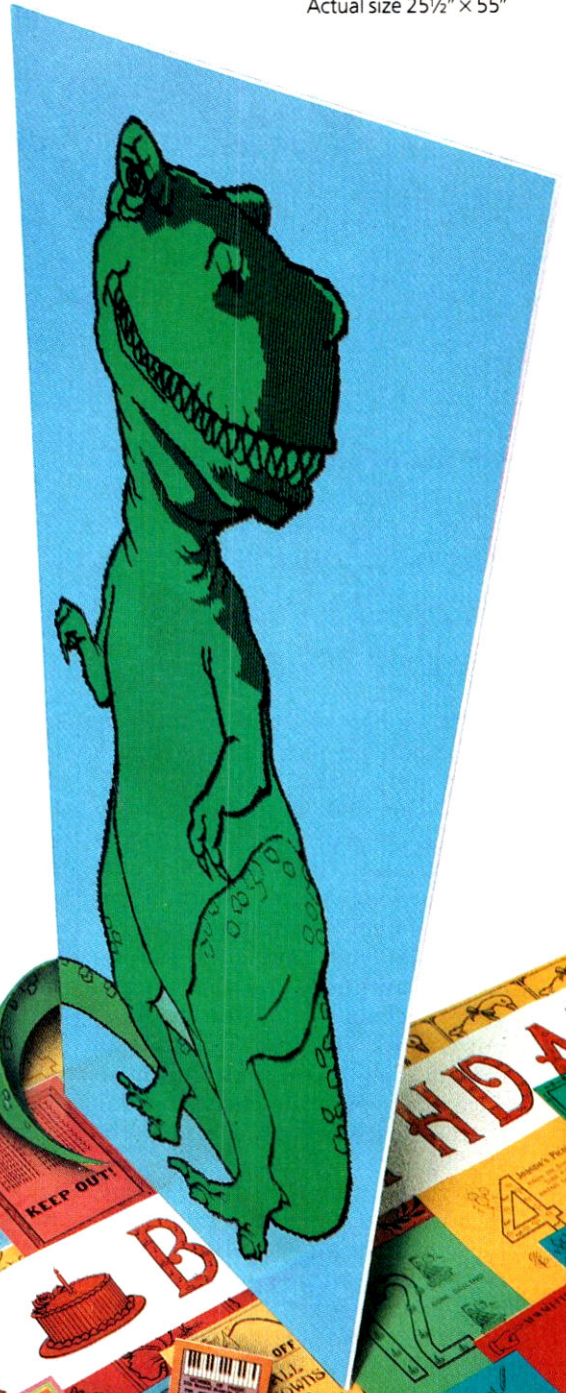
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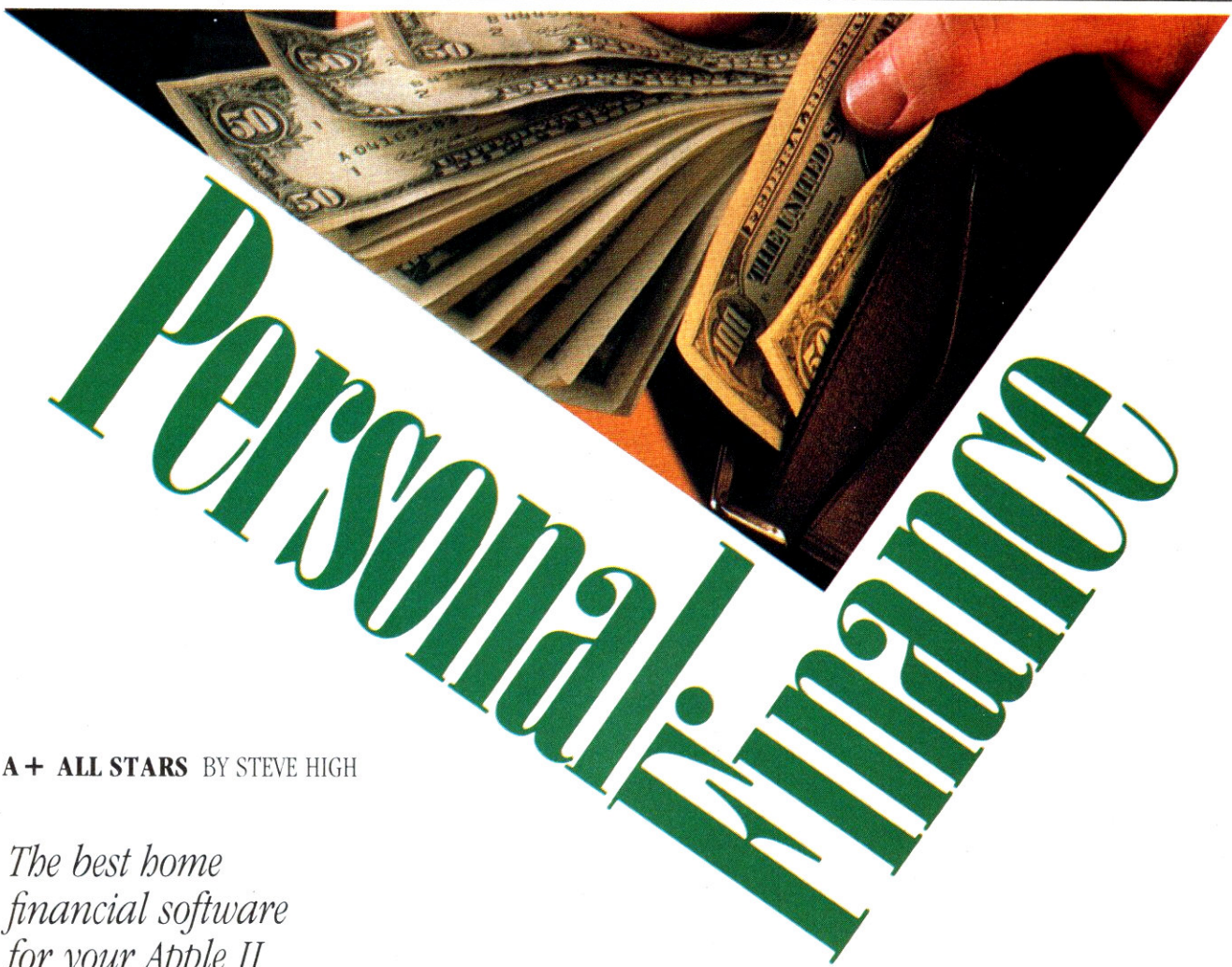


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**A+ ALL STARS** BY STEVE HIGH

*The best home financial software for your Apple II*

**T**he best of the best home financial software packages help you balance your checkbook, budget family expenses, and prepare your records for tax time. They require almost no knowledge of, or aptitude for, accounting. This approach is good, because if you have such knowledge or aptitude, you can balance your checkbook on the back of your bank statement, and you probably even keep a running balance after you write checks or mug the automatic-teller machine in the small hours of the night.

A good home financial package, in my view, is one that helps people who would otherwise be calling the bank all the time to find out how much money they had and, what is worse, taking the bank's word for it.

I don't know about your bank, but mine has been making so many multimillion-dollar loans to governments in Latin America that I make tellers show me two pieces of identification before they cash a

check. Dealing with banks is never a day at the beach, and your Apple, used correctly, is a potent self-defense weapon.

Since you can handle the basics of home finance rather easily with AppleWorks, with its unrivaled speed, why look elsewhere? Well, personally, I don't. But I spend four or five hours daily working with AppleWorks, so I'd rather use it for almost everything else than learn new software.

Building the database and spreadsheet files that turn AppleWorks into a home finance machine requires more than a beginner's knowledge of the program, however. Also, the data-entry job, which tends to involve the least computer-literate members of the family, is less intuitive with AppleWorks than in either Quicken or On Balance, my choices for the best products in the personal-finance category.

Checkbook-balancing programs sell well because people seek relief from a nasty job. Paradoxically,

however, the first thing you have to do after buying one is a lot of work. Since all computerized home-finance solutions require heavy-duty data entry, you might want to think that aspect over before you buy one. And since the chances are excellent—I would say overwhelming—that you'll someday want that hard-won data available for use in another computer program, think long and hard before you buy a program that has no data pathway out of it. Both On Balance and Quicken offer just such an exit, as does Dollars and Sense, my choice for runner-up.

Almost all home accounting programs use checks that you can order specially for printing on your computer, but many more people buy home accounting packages than actually go to the next step of ordering checks. It's sort of like memberships in a physical-fitness club: If everybody who paid to join actually exercised, you'd have human gridlock in the showers, but that doesn't seem to happen. Inci-

# ALL STARS

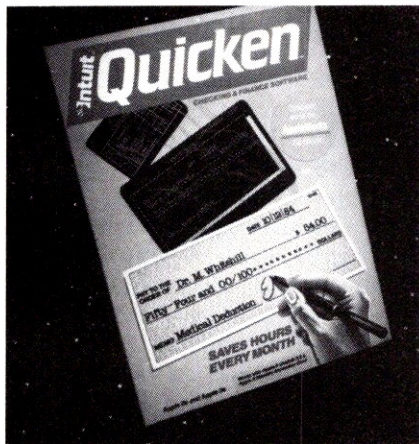
dentally, you can also print checks from the AppleWorks database by using a labels-style report, if you're so inclined, but if you want to print out the check amount twice, the way banks seem to like, you'll have to type it in twice, in two separate categories. Both Quicken and On Balance automatically use your single amount entry to fill out both blanks on the check.

The real advantage to printing out checks with your computer is that it guarantees that you'll get the same information in your computer that appears on your check. Granted, it's hard to do in a bar or a grocery checkout line, but it's a pretty groovy way to pay bills at the end of the month.

## Quicken

In Quicken, you enter a check by filling in a blank that looks just like a check, and, to fill out the check register, you type into a blank that looks just like a check register.

Quicken provides helpful prompts and data-entry shortcuts



that are simply missing from the general-purpose AppleWorks. For example, after you enter check number 1001, these programs automatically supply check number 1002 in the next record, on the reasonable assumption that check 1002 is what comes next. Now, that's not always the way things work at our house, since my wife and I don't always agree on whether to add new checks from the top or the bottom of the stack, but it's a reasonable and helpful guess from the computer just the same.

Quicken also keeps a running balance for you every time you enter a check and it has a feature called Memorize and Recall that works sort of like AppleWorks

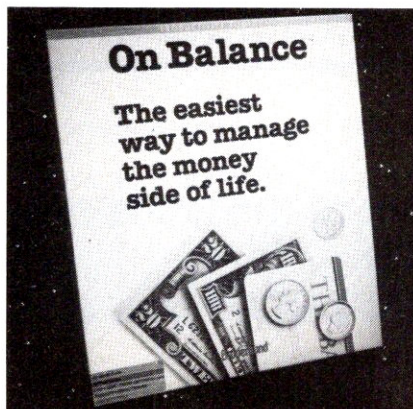
standard values, only more so. You can use it, for example, to automatically code all checks to Alpha-Beta as Food. Used thoughtfully, Memorize and Recall can simplify data entry.

Of the best programs, Quicken may be the easiest to use. It follows the AppleWorks file-folder interface closely, and, if you know how to fill out a check, you pretty well know how to use Quicken. Quicken saves to disk after each entry, which I found a bit overprotective, notwithstanding the megabytes I've lost in my time through forgetting to save. If you insist on being a Real Man, the manual tells you how to set up an auto-load utility with a short BASIC program that cons Quicken into saving to your RAMdisk, where you can lose your data all at once.

Quicken is a product of Intuit, 540 University Avenue, Palo Alto, CA 94301; (800) 624-8742; in CA (800) 468-8481. It runs on an Apple IIe, IIc, or IIGS; requires 128K of RAM; and retails for \$49.

## On Balance

On Balance, like Quicken, has automatic check numbering. Another helpful feature in On Balance that Quicken lacks is in the Account category. If you enter food in the account memo, the next time you type in an F, the program automatically fills out food. On the other hand, if you make out a check to Disneyland and put fun in the memo, the program will look for Fo or Fu before completing the word. Quicken's Memorize and Recall feature can do the same thing, but



it is not automatic.

Both On Balance and Quicken offer a utility for exporting data to AppleWorks. You need to create an AppleWorks spreadsheet, as directed, and then run the utility.

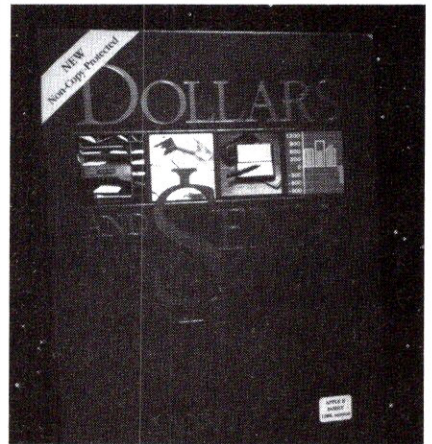
On balance, I like On Balance better than Quicken. It has a mouse-based interface but also works intuitively with the arrow and Return keys if you don't have a mouse, and it reports information in both statistical and bar-graph form, a happy feature you won't find in Quicken.

Both Quicken and On Balance have only a limited ability to classify records for taxes or expense statements. You can look at only a single classification at a time. If simplicity is what you're looking for, however, a simple "taxable/non-taxable" code on each check entry might be all you need.

On Balance is from Brøderbund Software, 17 Paul Drive, San Rafael, CA 94903; (415) 492-3200 or (415) 492-3500. The \$99.95 product runs on an Apple IIe with an Extended 80-Column Card, IIc, or IIGS and requires 128K of RAM.

## Dollars and Sense

If you really think you need more features than you can find in On Balance or Quicken, or Apple-



Works, you should probably look at Dollars and Sense, the runner-up in this category. It comes from Monogram, 367 Van Ness Way, Torrance, CA 90501; (213) 533-5120; sells for \$119.95; and requires an Apple II Plus with 48K of RAM or an Apple IIe, IIc, or IIGS with 128K of RAM.

Although not really AppleWorks-like, Dollars and Sense is internally consistent with concise on-screen documentation. Enter-

ing data is reasonably easy, and the program automates data entry of check numbers and dates. On the other hand, if you want to put something other than a check number in the Check # category, (such as "other"), you won't be able to. More restrictive than this limitation is the requirement to modify the preexisting chart of accounts, or use it as is, before you can categorize your checks. In AppleWorks, you can put down any old thing and then standardize



later with the open-apple/Ditto command.

Like a real CPA, Dollars and Sense doesn't stand for any of that guff.

Dollars and Sense doesn't have a direct AppleWorks export utility, but it does permit saving data to a

DIF file. This method is actually better, in many ways, than the approach of the Quicken and On Balance utilities because it allows immediate access to the AppleWorks database module, as well as to the AppleWorks spreadsheet module, VisiCalc, SuperCalc3a, or anywhere DIF is spoken.

If you accidentally use the wrong data disk in Dollars and Sense, you can kiss your old data good-bye, because Dollars and Sense will format it out of existence. In this respect, Dollars and Sense is true to its MS-DOS antecedents. Apart from that bit of gratuitous violence, Dollars and Sense seems to have made a more successful adaptation to the world of Apples and ProDOS than most of its competitors have.

But Quicken and On Balance are far more convenient and more forgiving about errors.

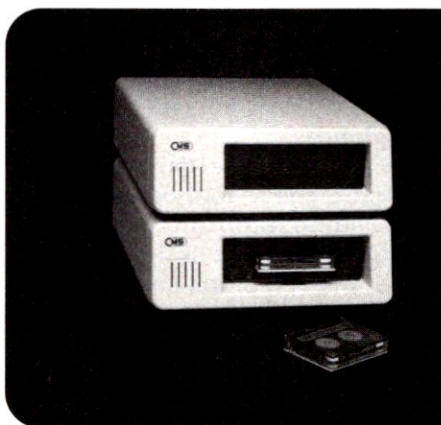
What these programs are superbly good at is balancing your checkbook. This allegedly trivial function is occasionally ridiculed, but it seems to me that any program worth its salt should be able to do it easily and without complaint before graduating to more exotic functions. Don't forget that the same MBAs who sneer at using a computer to balance your checkbook are the ones who worked for my bank when it was making dumb loans to failing farmers, useless supertankers, and third-world gangster governments.

On Balance has an inspired tag line—"for the money side of life"—which suggests, correctly, that it is the perfect program for users who don't want to make a career out of waiting for programs to load, learning to use alien commands, and agonizing over a quarter of a point of lost T-Bill interest. Quicken is a close second. If you need more horsepower, Dollars and Sense is a decent bet, and you should also look at honest-to-goodness accounting programs, discussed elsewhere in this issue, such as Manzanita Software's Business Works.

Finally, when all else fails, AppleWorks. +

*Steve High is a public-relations professional whose clients include Applied Engineering and Bob Lissner, the author of AppleWorks.*

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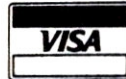
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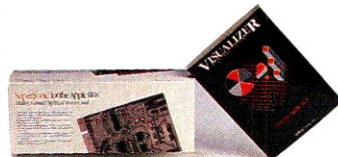
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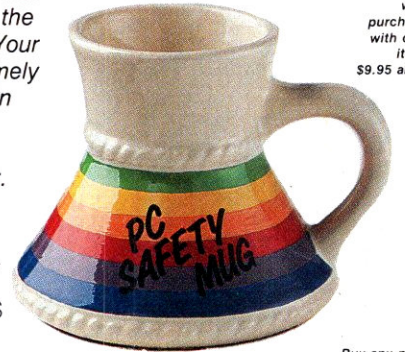
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# Entertainment

**A+ ALL-STARS** BY BOB LINDSTROM

*The best leisure-time software for the Apple II*

Come with me on a walk down Random Access Memory lane.

A decade of spreadsheets and databases and word-processing programs has taken Apple personal computers from one garage in Silicon Valley to millions of homes around the world. In those ten years, Apple computer owners have recalculated millions of cells, searched countless fields and spell-checked innumerable text files.

And they've booted up lots of games.

Although VisiCalc is recognized widely as the business application that put Apples on desks, application software didn't do it alone. More than a few Apples were picked because their owners were transfixed by Bill Budge's Raster Blaster (BudgeCo), intrigued by Scott Adams' Adventureland (Adventure International), or taken to joystick-driven distraction by Olaf Lubeck's Apple Panic (Brøderbund).

Almost as soon as there was an Apple computer, there were Apple-computer games.

Breakout, Hammurabi, Hunt the Wumpus

—as much fun as those first titles happened to be, they

quickly became primitive relics compared to Micro-soft Decathlon or Space Eggs (Sirius).

Perpetually on the razor's edge of programming virtuosity, the creators of Apple II games have shown that you *can* teach an old computer new tricks. If the catchphrase "Apple II Forever" remains one of the few constants in the randomized universe of micro-computer technology, it is partly because game programmers have been among those pioneers always uncovering new capabilities in the Apple hardware.

Choosing a handful of All-Star games from the thousands that have been published was no easy task. To narrow the field, I disqualified games that were no longer in print. They unfortunately included many arcade classics, such as the unsurpassed line of Sirius Software games such as Nasir Gebelli's Gorgon and Mark Turmell's Beer Run.

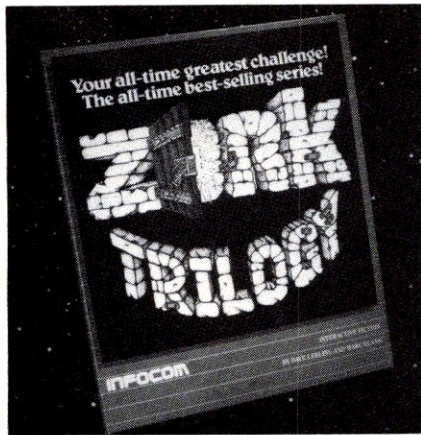
# ALL STARS

Then I faced the hard work of narrowing the field. Traveling through those software shelves from floppy disk to floppy disk became a sentimental journey. Replaying a familiar game recalled the excitement I'd experienced when the program was released and provided a reminder of the astonishment I felt when I realized an Apple II computer could do *that!*

After several hours of sniffing, wistful smiles, renewed acquaintances, and uncontrolled swearing (some games are killers no matter how much you have played them), this list emerged. It's subjective and opinionated and doubtless omits some programs that I really intended to include. But no matter—here they are: the *A+* All Stars of Entertainment.

## ADVENTURE GAMES

**Zork I-III.** Text adventuring began underground with Crowther and Woods' *Adventure* (also known as *Colossal Cave*), but it was the *Great Underground Empire* of Marc Blank and Dave Lebling that pointed the genre toward the future. Cleverly conceived and written, the *Zork* adventures are as timeless

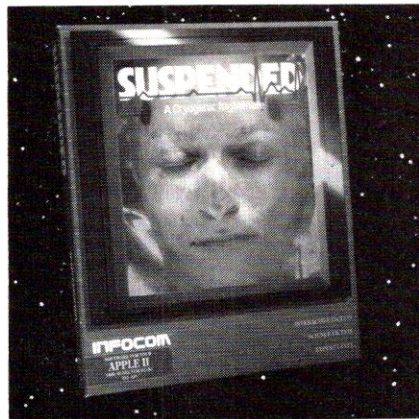


as Grimm's fairy tales, and solving them is like winning the Triple Crown of adventure.

The *Zork* Trilogy comes from Infocom, 125 Cambridge Park Road, Cambridge, MA 02140; (617) 492-6000 or (800) 262-6868 (mail-order department). The games run on an Apple II Plus, IIe, IIc, or IIgs with 48K of RAM and cost \$69.95 each.

**Suspended.** The conceit of text adventuring is that the player can control his universe from a keyboard. Most games just take it for granted. Michael Berlyn's *Suspended* was one of the first text ad-

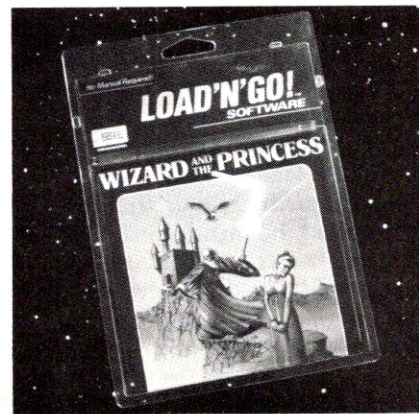
ventures to offer an explanation. You are an intelligence directing the life-support system of a planet, but something has gone seriously wrong, and people are dying on the surface. Only you can guide a group of robots toward the solu-



tion. Since you are pure mindstuff, the robots act as your eyes and hands and report back to you through a computer system. Neat, huh? *Suspended* sets up a dramatic situation so potent that you become completely, believably involved in the plot.

*Suspended* is a product of Infocom, 125 Cambridge Park Road, Cambridge, MA 02140; (617) 492-6000 or (800) 262-6868 (mail-order department). It requires an Apple II Plus, IIe, IIc, or IIgs with 48K of RAM and retails for \$14.95 (available by direct mail from Infocom).

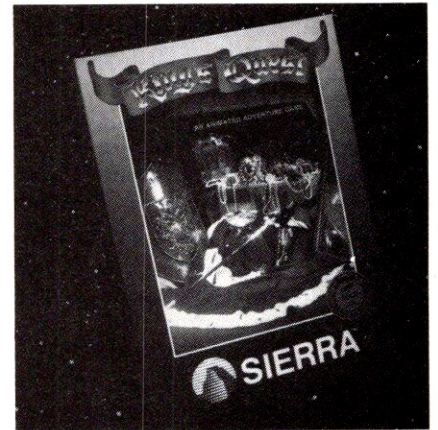
**The Wizard and the Princess.** At first, adventuring was text only. Then Roberta Williams decided to do something about it. She added pictures of each location and in-



vented the graphic adventure. Although her later projects (such as the monumental *Time Zone*) were larger and more complex, *The Wizard and the Princess* is the most delightful (and manageable) of Williams' early creations.

*The Wizard and the Princess* is from ShareData, 7400 West Detroit Street, Suite 170, Chandler, AZ 85226; (602) 961-7519. It runs on an Apple II Plus, IIe, or IIc with 64K of RAM and costs \$7.99.

**King's Quest I-III.** After adding graphics to adventures, Williams decided to add animation. The result was *King's Quest*, the first fully animated, joystick-controlled graphic adventure. Two sequels followed. Although moving a *Little Man* through numerous loca-



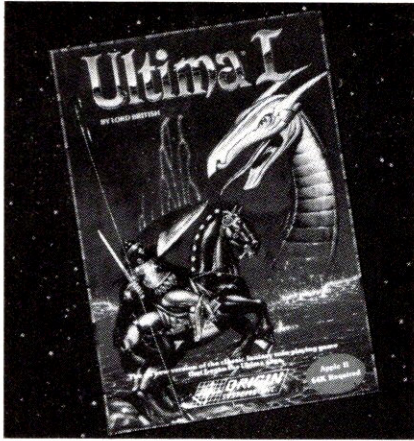
tions is more time-consuming than typing *GO DOOR*, the result is charming and challenging.

*King's Quest I and II* (III scheduled first quarter 1988) are products of Sierra On-Line, Inc., P.O. Box 485, Coarsegold, CA 93614; (209) 683-6858. They require an Apple IIe or IIc with 128K of RAM or a IIgs (for the IIgs version) with 512K of RAM. The list price is \$49.95 each (\$10 for upgrade from IIe/c to IIgs version)

## FANTASY/ROLE PLAYING

**Ultima I-IV.** Richard Garriott, aka Lord British, was an Apple-game trailblazer with *Akalabeth*, a hit in the days when software hung in plastic bags on computer-store walls. The basic design concepts of that program—tile graphics, monster combat, point-of-view dungeon exploration—grew into *Ultima*, one of the longest-running series in computer-game history. Epic in scope and fascinating in detail, the *Ultimas* games are essen-

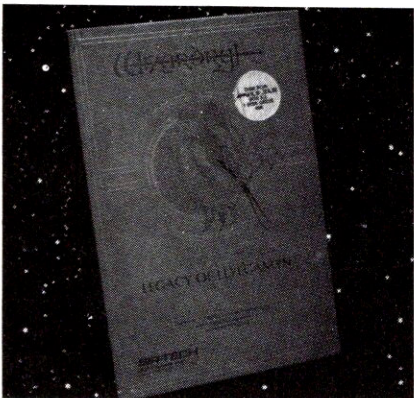
# ALL STARS



tial to any software library.

Ultima I, III, and IV come from Origin Systems, 340 Harvey Road, Manchester, NH 03103; (603) 644-3360. They are distributed by Brøderbund Software, 17 Paul Drive, San Rafael, CA 94903; (415) 492-3200 or (415) 492-3500. They run on an Apple II Plus, IIe, IIc, or IIcs with 64K of RAM. Ultima I and III cost \$39.95 each; Ultima IV is \$59.95. (Ultima II is currently out of print, but copies may be available at retail software outlets.)

**Wizardry I-III.** Robert Woodhead and Andrew Greenberg stole sleep from Apple-computer owners with Wizardry: Proving Grounds of the Mad Overlord. Somehow, Woodhead and Greenberg had given their computerized characters the illusion of life. Players stayed up nights getting to know and love their party members. And as two sequels followed, they took their best characters with them. No other role-playing game has



matched the personality or the deliciously devilish wit of the Wizardry series.

Wizardry I-III come from Sir-Tech Software, P.O. Box 245, Ogdensburg, NY 13669; (315) 393-6633. They run on an Apple II Plus,

IIe, IIc, or IIcs with 48K of RAM. Wizardry I costs \$49.95, II is \$34.95, and III is \$39.95.

**The Bard's Tale I and II.** Hack-and-slash role playing meets graphic grandeur in Michael Cranford and Brian Fargo's Bard's Tale games. Although not as epic as Ultima or as inventive as Wizardry, BT I and II hypnotize the senses with stunning animated visuals. Just roaming down the scrolling streets of Skara Brae is a thrilling experience. Add the stunning graphics and sound of Bard's Tale I



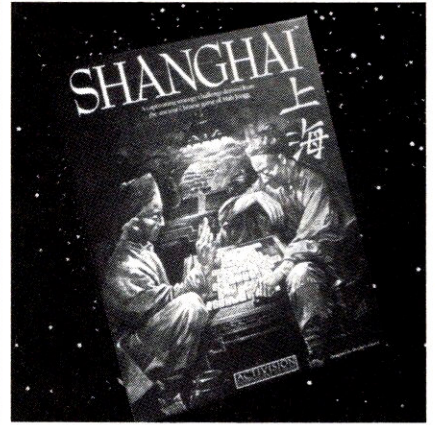
on the Apple IIcs and encountering a party of monsters becomes melee madness.

The Bard's Tale I and II are from Electronic Arts, 1820 Gateway Drive, San Mateo, CA 94404; (415) 571-7171. They require an Apple II Plus, IIe, or IIc with 64K of RAM (or a IIcs with 512K of RAM for the IIcs version) and cost \$44.95 each.

## STRATEGY

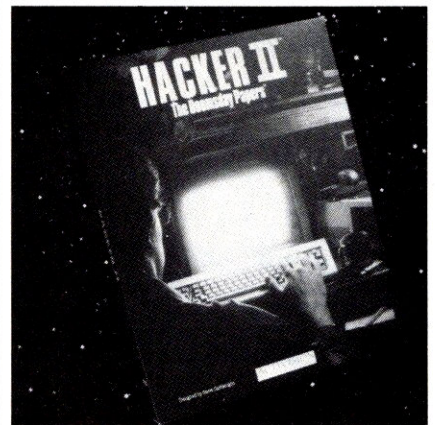
**Shanghai.** Designer Brodie Lockard took the game pieces of Mah Jongg and piled them into a classic. Something like an Oriental version of solitaire, Shanghai may be the ultimate in Relax and Enjoy computer games. Programmer Ivan Manley brought Shanghai to the IIcs with elegant visuals that are as pleasing to the eye as the game is pleasing to the mind. And for those who can't live without tension, a timed-competition mode lets head-to-head opponents test their quicksilver playing techniques.

Shanghai for the IIcs is from Activision, Inc., P.O. Box 7287, Moun-



tain View, CA 94039; (415) 960-0410. It requires an Apple IIcs with 512K of RAM and costs \$44.95.

**Hacker II.** Like Suspended, Steve Cartwright's Hacker II creates a dramatically convincing reason for being at the computer. In Hacker II you remotely maneuver robots through an enemy security installation and track their movements on your video monitors. Animated screen graphics persuasively simulate four video monitors. After a few hours of scanning those screens, you'll swear the installation really exists, along with the animated guard patrolling its hallways. Good puzzles, split-second strategy, and 11th-hour surprise.

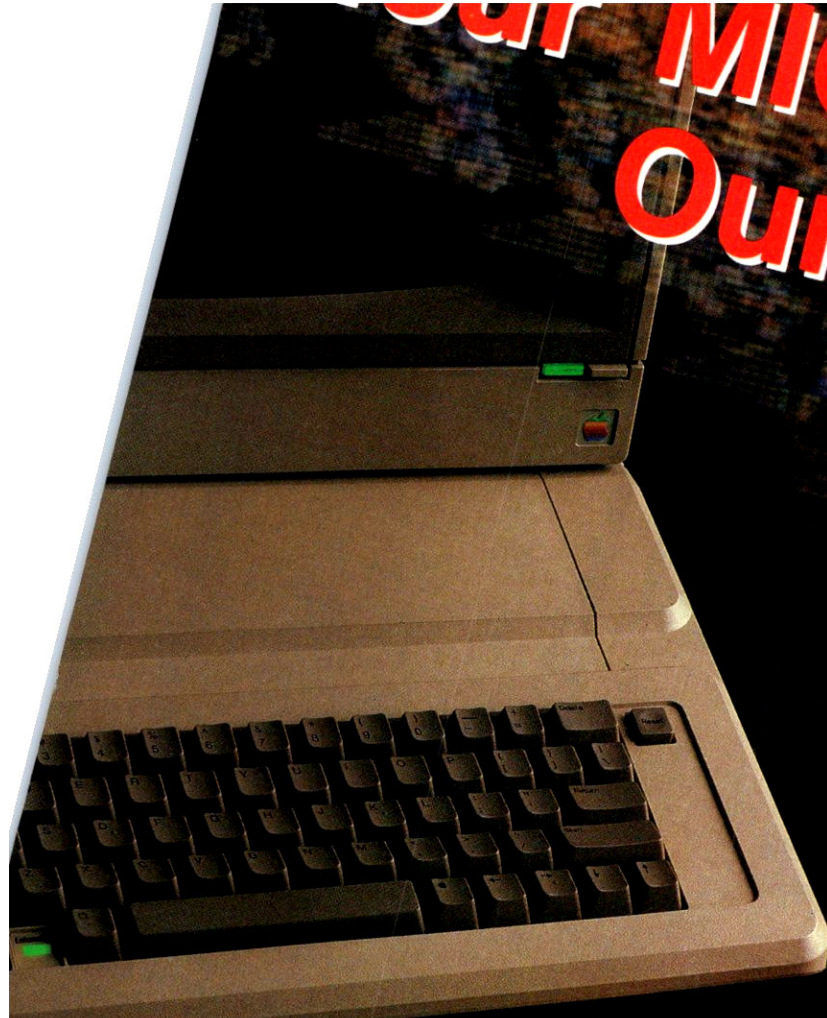


Hacker II comes from Activision, 2350 Bayshore Parkway, Mountain View, CA 94043; (415) 960-0410. It requires an Apple IIcs with the old ROMs and 512K of RAM and retails for \$39.95.

**Chessmaster 2000.** Computerized chess—the way it ought to be. Graphically vivid and strategically accomplished, Chessmaster 2000 is a ready, willing, and able-to-win chess opponent.

Chessmaster 2000 is a product of Software Toolworks, 13557 Ventura

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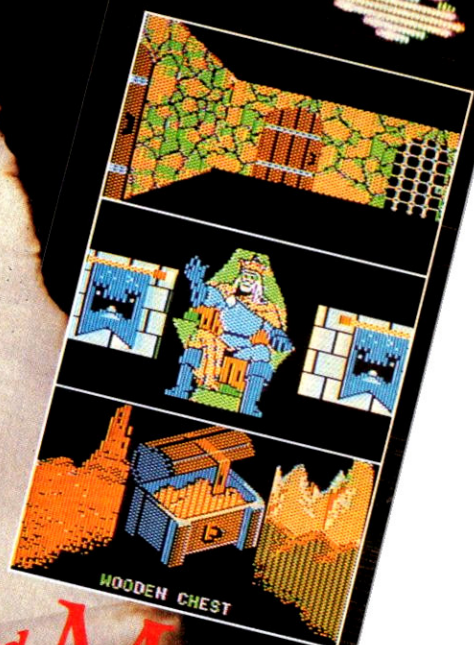
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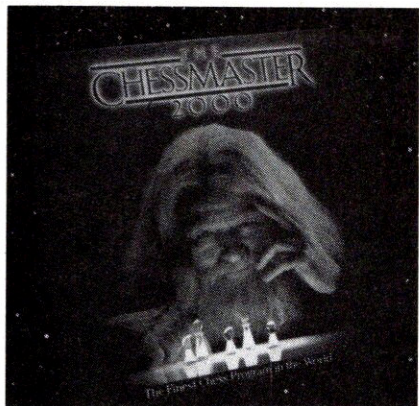


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Boulevard, Sherman Oaks, CA 91423; (818) 907-6789. The game is distributed by Electronic Arts, 1820 Gateway Drive, San Mateo, CA 94404; (415) 571-7171. Chessmaster requires an Apple II Plus, IIe, IIc, or IIGs with 64K of RAM and costs \$39.95.

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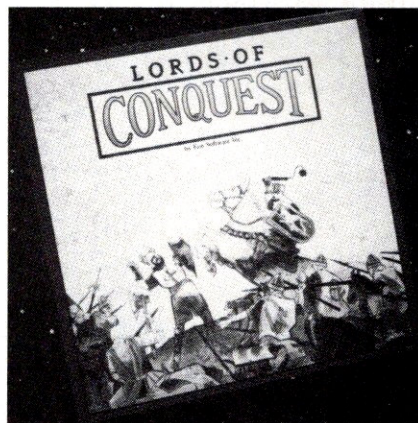
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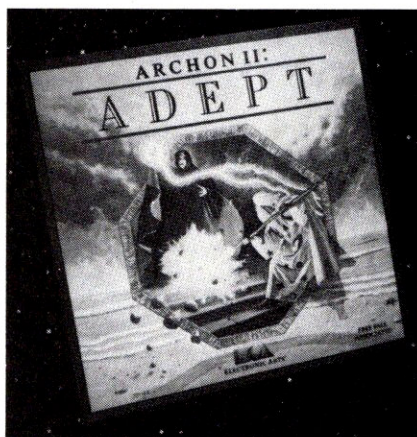
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Drive, San Mateo, CA 94404; (415) 571-7171. It runs on an Apple II Plus, IIe, IIc, or IIGs with 64K of RAM and retails for \$39.95.

**Archon II: Adept.** A sequel that's better than the original, Archon II is Jon Freeman, Paul Reiche III, and Anne Westfall's elegant mix of board-game strategy and arcade action. In a world of varying energies that can aid or cripple your influ-

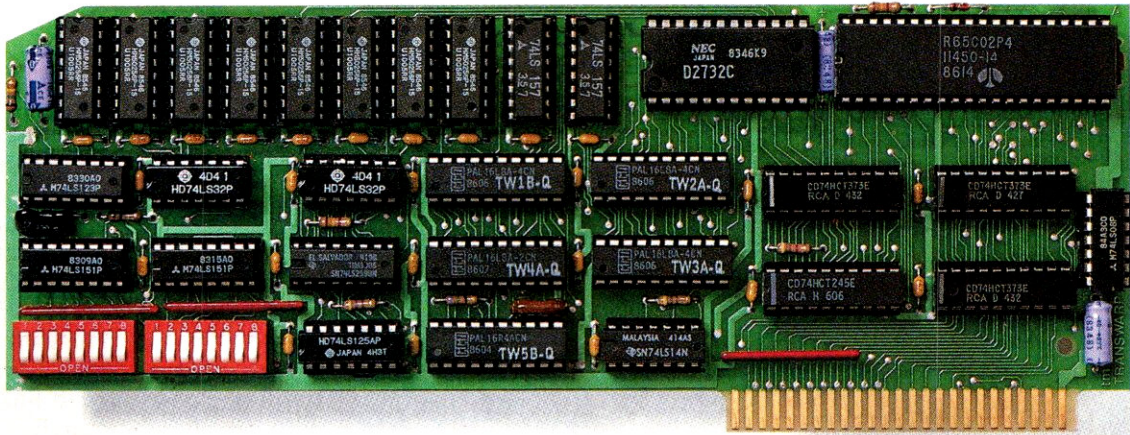


ence, you marshal a militia of fantasy characters. Jockey for position on a constantly shifting game board. When creatures go head to head, the game turns to joystick-controlled combat action.

Archon II: Adept is from Electronic Arts, 1820 Gateway Drive, San Mateo, CA 94404; (415) 571-



# To boldly go at speeds no Apple has gone before.

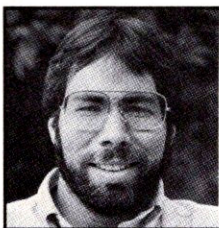


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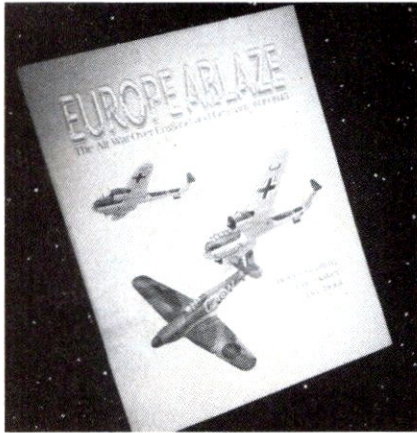
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7171. It runs on an Apple II Plus, IIe, IIc, or IIgs with 64K of RAM and costs \$14.95.

**Europe Ablaze.** The volumes of statistics that make war games authentic can also make them unplayable for ordinary mortals. Strategic Studies Group of Australia



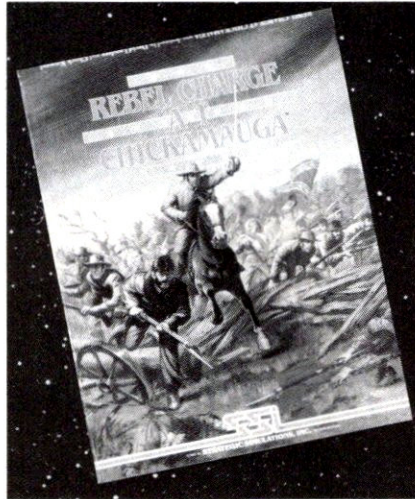
created a system of menus that makes this simulation of WWII air combat accurate, fast-paced, and easy to learn.

Europe Ablaze comes from Strategic Studies Group, 1747 Orleans Court, Walnut Creek, CA 94598; (415) 932-3019. In the U.S., it is dis-

# ALL STARS

tributed by Electronic Arts, 1820 Gateway Drive, San Mateo, CA 94404; (415) 571-7171. It requires an Apple II Plus, IIe, IIc, or IIgs with 64K of RAM and costs \$50.

**Rebel Charge at Chickamauga.** Chuck Kroegel and David Landrey



made a war game for the rest of us. The Battle of Chickamauga was one of the largest and most evenly contested battles of the American Civil War. This grand tactical simulation contains introductory to advanced versions of the game and dynamically captures the intensity of the two-day battle. Robert S. Billings' superb owners'-manual essay brilliantly sets the historical scene.

Rebel Charge at Chickamauga is a product of Strategic Simulations, Inc., 1046 North Rengstorff Avenue, Mountain View, CA 94043; (415) 964-1353. It runs on an Apple II Plus, IIe, IIc, or IIgs with 64K of RAM and retails for \$49.95.

**Conflict in Vietnam.** With the memory of Vietnam still with us and revived in recent films about the war, Ed Bever and Sid Meier's war-game/simulation has a fascinating way of answering as well as raising some questions about U.S. involvement in S.E. Asia. An intelligently written manual explains the historical context, and a solidly designed game replays the victories and the sometimes surprising defeats.

Conflict in Vietnam is from Mi-

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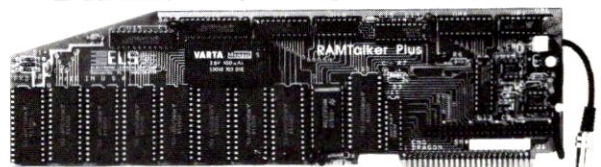
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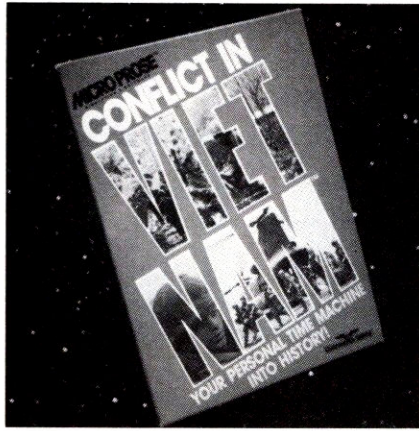
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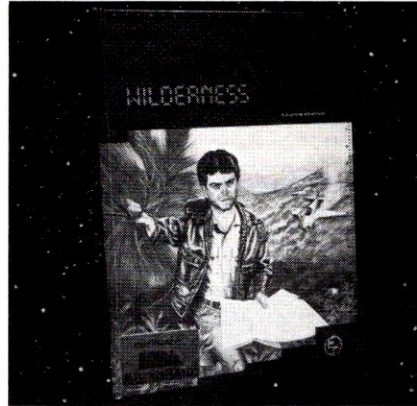
croProse, 120 Lakefront Drive, Hunt Valley, MD 21030; (301) 771-1151. It requires an Apple II Plus, IIe, IIc, or IIgs with 64K of RAM and costs \$39.95.

## SIMULATION

**Wilderness.** This blend of adventure and simulation puts you in the middle of the Sierra Nevadas with nothing but the supplies you can salvage from a crashed airplane. Take on the elements, wild animals, and threatening terrain as you use survival techniques to find the safety of the ranger station. Scrolling graphics give you a 360°

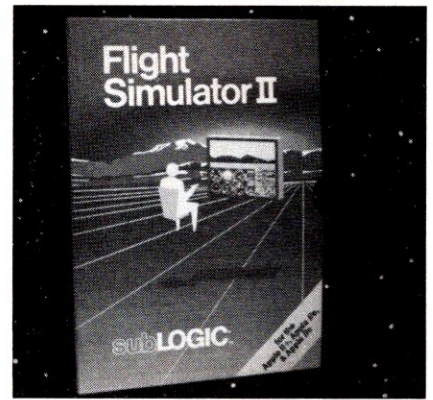
view of the surroundings.

Wilderness comes from Electric Transit but is distributed by Spectrum Holobyte, 2061 Challenger Drive, Alameda, CA 94501; (415)



522-3584. It requires an Apple II Plus, IIe, IIc, or IIgs with 64K of RAM and retails for \$29.95.

**Flight Simulator II.** Bruce Artwick's original got a facelift and speed-up in this revised version of



the popular flight simulator. For those who don't want to deal with the totally authentic details of the simulation, a World War I arcade mode lets you go ape in the air.

Flight Simulator II is from Sub-Logic Corporation, 713 Edgebrook Drive, Champaign, IL 61820; (800) 637-4983 or (217) 359-8482. It runs on an Apple II Plus, IIe, IIc, or IIgs with 48K of RAM and costs \$49.95.

**The Seven Cities of Gold.** The Spanish Conquistadors braved natural hazards and distrustful natives in their 16th-century quest for untold riches. Bill and Dan Buntten and programmer Jim Rushing teach you history while you think



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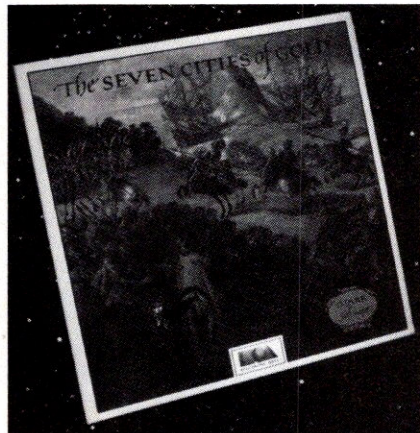
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you're playing an adventure game. As the natives surround you in their village, you may find you're not as much of a humanitarian as you thought you were. With good graphics and animation, this excellent simulation has a way of revealing as much about the player as it does about history.

The Seven Cities of Gold comes



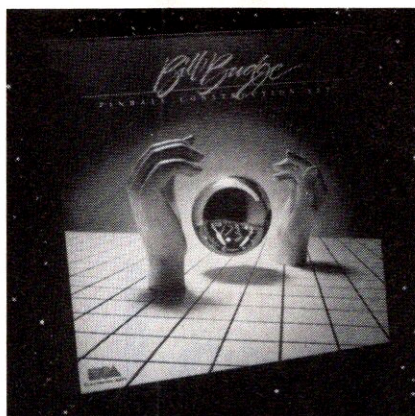
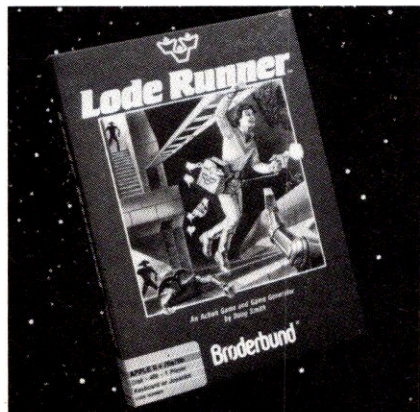
from Electronic Arts, 1820 Gateway Drive, San Mateo, CA 94404; (415) 571-7171. It runs on an Apple II Plus, IIe, IIc, or IIGs with 64K of RAM and costs \$14.95.

### ARCADE

**Loderunner.** More levels than you can imagine and a build-it-yourself (if you can) construction set. Race your Little Man across levels and up ladders, collecting objects and avoiding baddies in pursuit. Swift animation and addictive, puzzle-solving game play.

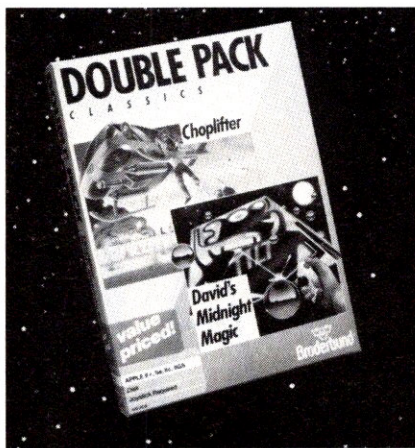
Loderunner is from Brøderbund Software, 17 Paul Drive San Rafael, CA 94903; (415) 492-3200 or (415) 492-3500. It runs on an Apple II Plus, IIe, IIc, or IIGs with 48K of RAM and retails for \$34.95.

**Pinball Construction Set.** The father of construction sets from the master of computer pinball, Bill



Budge. The computer gives you all the pieces to build your own pinball machines. Enjoy the fruits of your bumper- and bell-infested creativity. Pinball Construction Set is from Electronic Arts, 1820 Gateway Drive, San Mateo, CA 94404; (415) 571-7171. It requires an Apple II Plus, IIe, IIc, or IIGs with 48K of RAM and costs \$14.95.

**Choplifter!** Dan Gorlin gave arcade games a heart in this unique game. Fly a chopper behind enemy lines and rescue hostages. Incredible as it seems, the waving white figures on the ground convey an urgent, surprisingly touching desperation. The aircraft and tanks



that oppose you aren't just raster-scanned baddies; they represent a malicious force. Arcade story-telling par excellence.

Choplifter! comes from Brøderbund Software, 17 Paul Drive, San Rafael, CA 94903; (415) 492-3200 or (415) 492-3500. It runs on an Apple II Plus, IIe, IIc, or IIGs with 64K of RAM. It is packaged with another program, David's Midnight Magic, and together they cost \$14.95. +

*Bob Lindstrom is an A+ contributing editor and author of our monthly "Gameport" column.*

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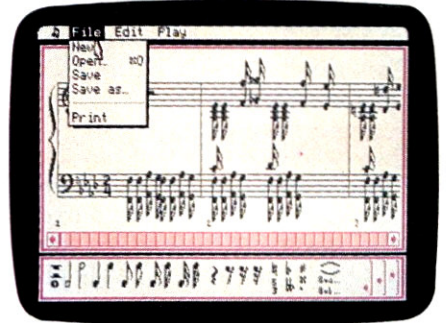
# ALL STARS

# Apple II GS

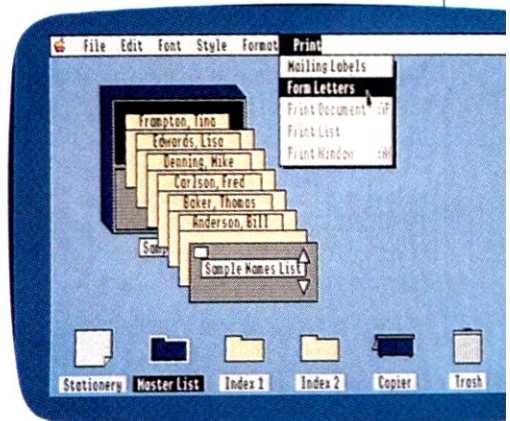
MUSIC: INSTANT MUSIC



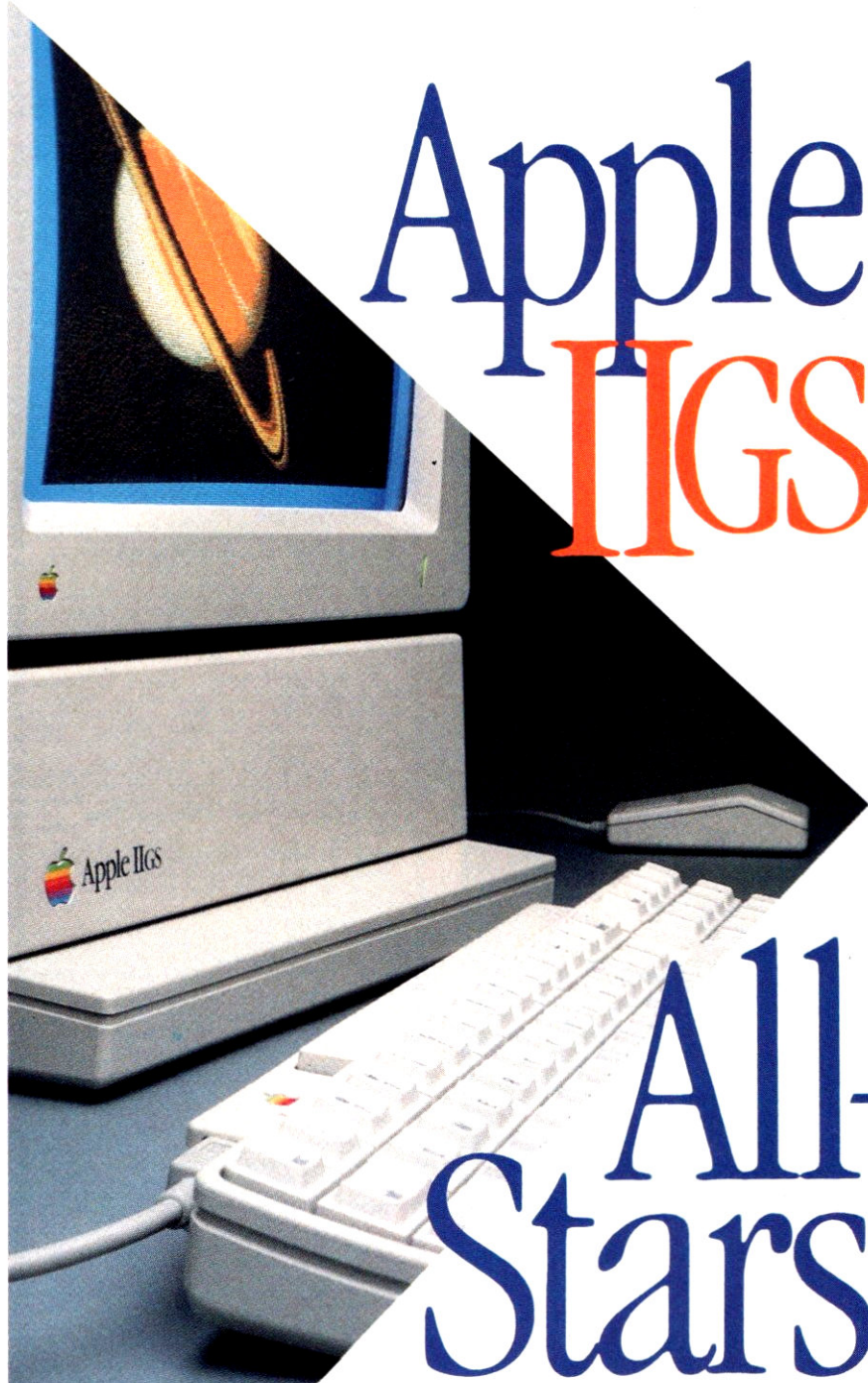
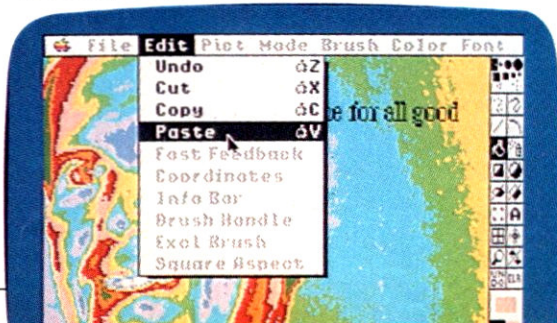
MUSIC: MUSIC CONSTRUCTION SET



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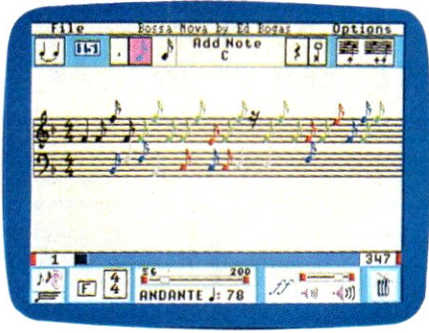
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# ALL STARS

MUSIC: THE MUSIC STUDIO



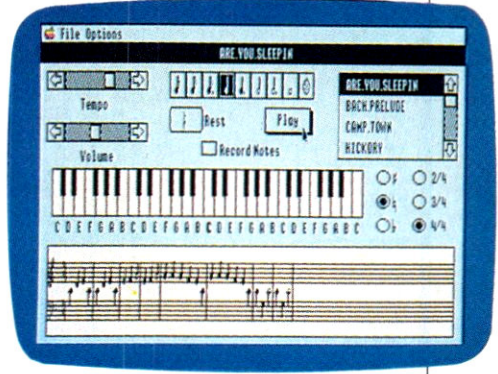
The Apple IIGS has been out for just over a year and has inspired the development of many new and innovative software programs. Some of these titles are so exceptional they've made our All-Stars list. Of the 96 programs selected as the best of Apple II software in this issue, 11 of them were designed specifically for the IIGS. Here's a visual round-up of the GS programs you'll find described elsewhere in this issue; captions indicate the section in which you'll find a full description.

Not pictured are FreeTerm GS, which is one of the telecommunications All-Stars, and Diversi-CACHE, which gets an honorable mention as an All-Star disk utility.

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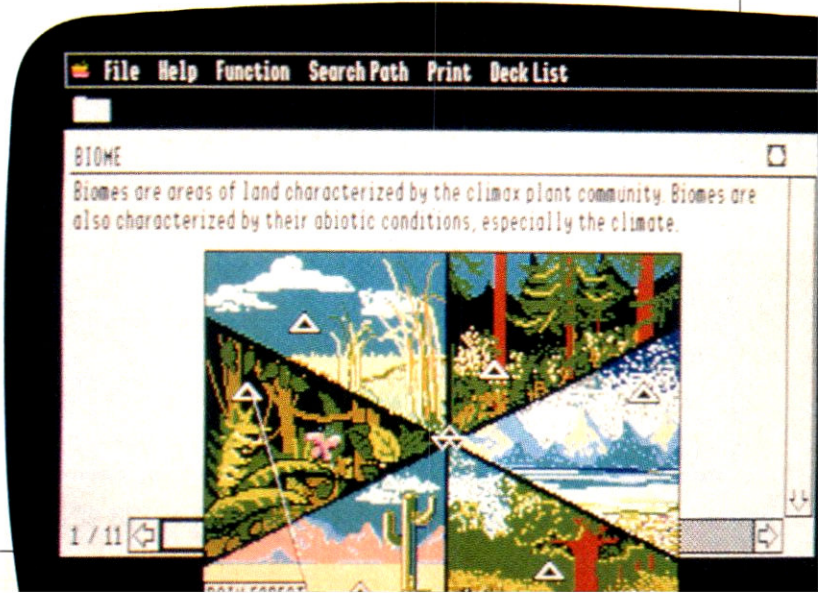
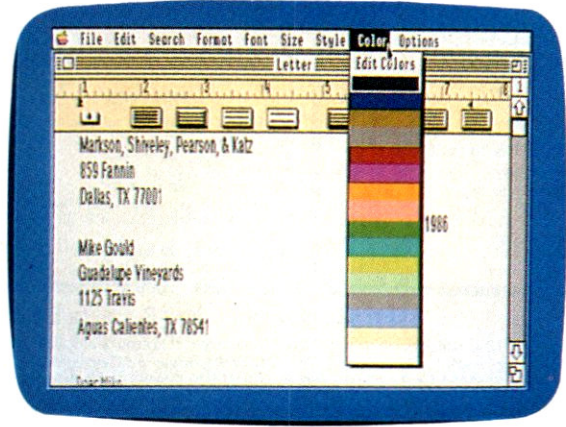


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# LASER 128EX

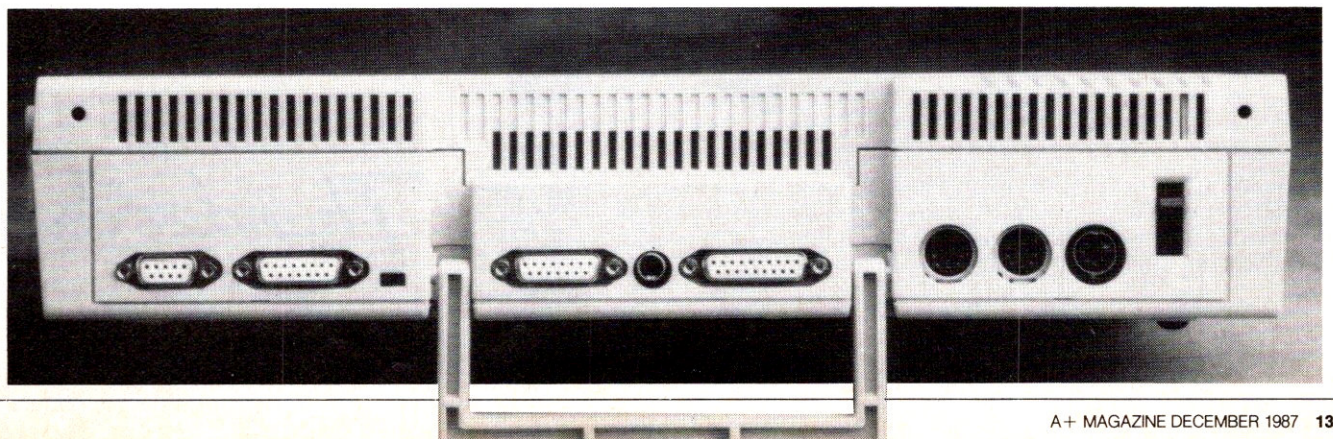
## Plenty of Power for the Price

Apple II-compatible computers are easy enough to build, but difficult to clone legally. In addition to the copyrighted firmware embedded in ROM, certain features of the color video circuitry and disk drive controller are protected by patent. Along with endless rounds of litigation, Apple II clones have also been plagued by software incompatibility and consumer resistance. (Apple owners may gripe about the company, but they're a loyal bunch.)

The greatest market advantage for the clones has been low price. The original Laser 128—built by Video Technology and sold primarily by Central Point Software—cost about half the price of a comparably equipped IIc or IIe. The redesigned Laser 128EX adds important features, for only a small price increase.

### The Box

The most visible difference in the 128EX is the plastic case. The original 128 was a utilitarian box molded in battleship gray. Some would call it ugly, compared to the sleek, stylish lines of the IIc. The new Laser has rounded edges and a bold diagonal treatment of the ventilation slots. Approximately 15 inches wide, 13 inches deep, and three inches thick, the case is noticeably bigger than an Apple IIc, and at 11.7 pounds, the Laser is no laptop. A "carrying handle" is really a tilt support, letting cooling air circulate under the case and positioning the keyboard at a pleasant angle. Like the IIc, the Laser has a separate DC power supply—a heavy little brick on the end of a long cable. It puts out 17 volts at 1.8 amps.



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## 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'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

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## CAT PRINTS

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FOR APPLE II

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CIRCLE 114 ON READER SERVICE CARD

The feel of the Laser's keyboard has been improved with this new model. In addition to a full numeric keypad, there is a row of ten function keys that act as common control-character commands. Since the Open- and Solid-Apple symbols are proprietary to Apple Computer, the Laser has open and solid Triangle keys in the same positions.

#### Any Port in a Storm

On the back panel are a mouse/joystick port, a parallel "Centronics" printer port, a switch that toggles between standard and Dvorak keyboard layouts, an RGB video port, a composite video output ("phono jack"), an external disk drive port, a modem port, a serial printer port, a power socket and the on/off switch. (See photo on previous page.)

On the left side of case there is a 50-pin slot, just like one of the slots on the motherboard of an Apple II Plus or IIe. The system treats it as Slot 7, and most Apple II series cards—for example a Z-80 card (Microsoft CP/M version 2.23 or higher required), a Sider hard disk, or a memory card such as the AST Sprint Disk or the Applied Engineering Ram-Factor—can be plugged right into it. (The Apple Memory Expansion card reportedly has not worked reliably on the Laser 128.) A snap-on dust cover protects this slot if you are not using it.

Since a card plugged into the side slot sticks out rather precariously, there is some danger of damage—especially if the card is jarred loose while the power is on. For an additional \$50 you can get a Laser Expansion Box, which is a sheet-metal casket that provides two slots (5 and 7) with a separate power supply and a safety interlock switch.

#### ROM Wasn't Built in a Day

Specifications may be interesting to techies, but what a user wants to know is: "Will it run my software?" With the Laser 128EX, the answer is almost certainly yes. Our evaluation unit had version 4.1 of the Laser ROM, which incorporates all-new boot code (thanks to a legal settlement with Franklin Computer, which claimed ownership of the old one).

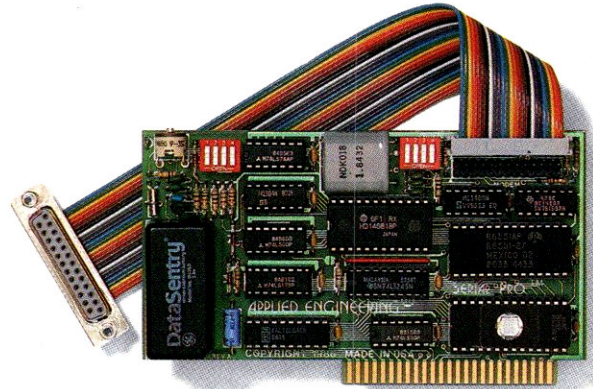
The latest ROM is more compatible with software written in compiled BASIC—such as many MECC educational programs—that caused problems on earlier versions. I could not find anything in an extensive software library that would not run on the 128EX, whether DOS 3.3, ProDOS, or funny-DOS. The only exception was the rather quirky VIP Professional spreadsheet, which did not recognize the Laser's expanded memory. The manufacturer has a list of over 700 programs that have been tested for compatibility with the Laser.

#### Under The Hood

The 128EX offers three new features that greatly enhance its value, compared to a plain Apple IIe, IIc, or the earlier Laser 128.

First, there is a built-in memory expansion card. The standard 128EX will be sold with 128K of RAM, so you will have to add your own chips. (A spokesman for Central Point said the company is currently evaluating the possibility of having machines equipped with 256K, 512K, or 1 Megabyte of dynamic RAM.) The expansion memory (1 mb) can be used for a RAM disk only. There are 32 sockets, in four banks of eight, for type 41256 DRAM chips. The price of these chips

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- 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.

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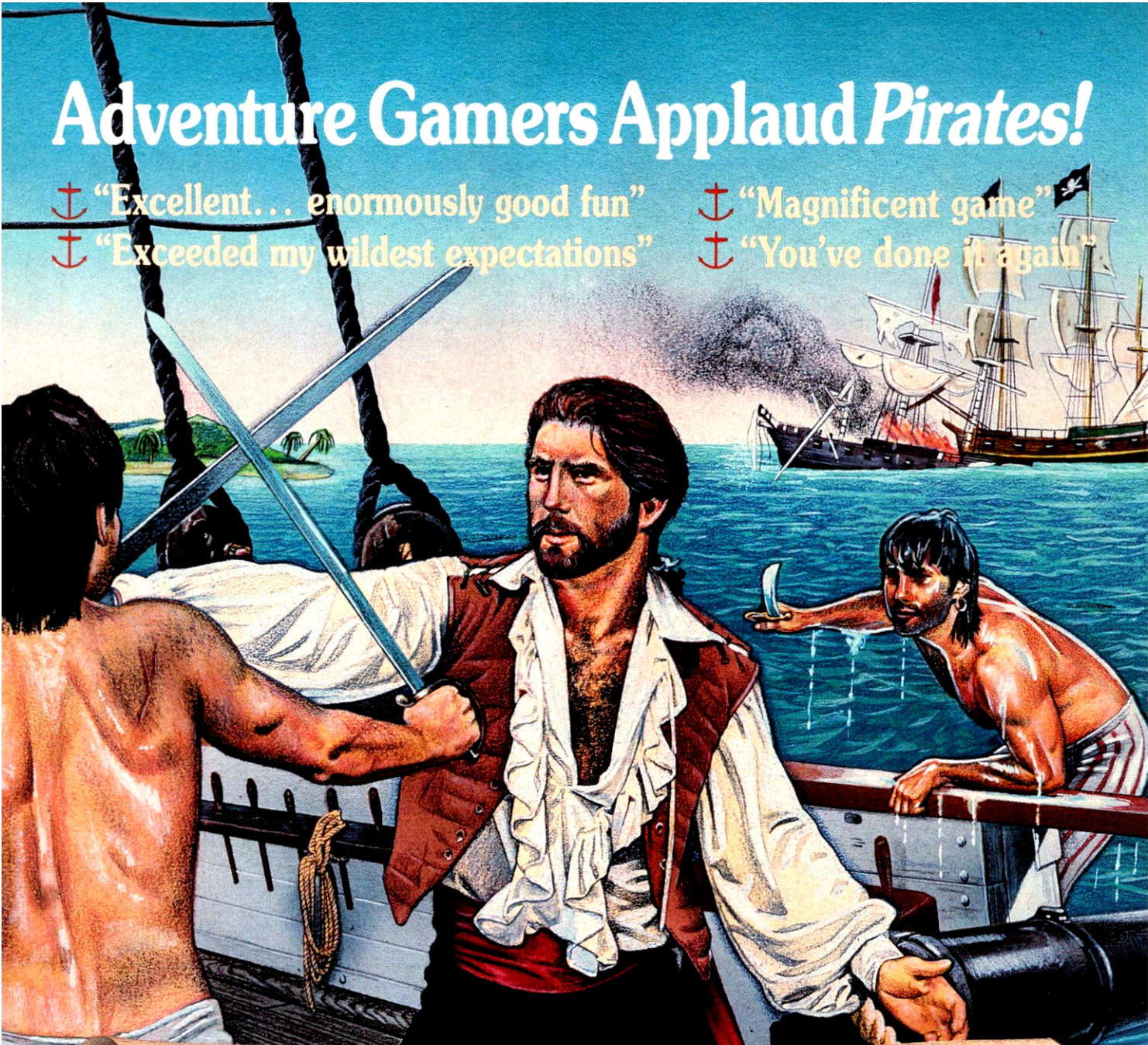
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⚓ "Magnificent game"

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varies from day to day, and from one side of town to the other, but at this writing they were widely advertised for under \$3 each in small quantities. At such prices, it should be possible to add a full megabyte for about \$90. You can open the case by removing nine screws and detaching the keyboard connector cable. On production model 128EX's the metal shield over the RAM board will have a hinged cover to make chip installation a bit easier.

**T**he expanded memory is recognized by AppleWorks version 2.0, which loads everything but the printer drivers into a RAM-disk and uses the rest of the space to extend the desktop.

Central Point's Universal Disk Controller is also built into the 128EX. This makes it possible to plug a low-cost 800K, 3.5-inch drive directly into the external disk drive port. "Low cost" here means about \$175 less than an Apple UniDisk 3.5, which costs close to \$400. Single-sided 400K Mac drives will also work, and you can find them for very low prices as well, since Apple has abandoned them for 800K drives.

#### Faster than a IIGs

The 128EX has also a built-in accelerator. A roughly equivalent accelerator for the Apple IIe would cost more than \$200 extra. You can select the built-in accelerator either on power-up, or by pressing control-reset or open-Triangle-control-reset while holding down the 2 key (for 2.3 MHz) or the 3 key (for 3.6 MHz). The default option is the normal 1 MHz speed of the 65C02 microprocessor. You can return to subsonic speed by holding down the 1 key during a reset. By comparison, the Apple IIGs runs at 2.8 MHz.

#### Options, Options

By pressing Control-P-Reset you enter a Port Configuration program that allows you to set the parameters of the serial ports, and also to select fine or coarse scaling for the mouse.

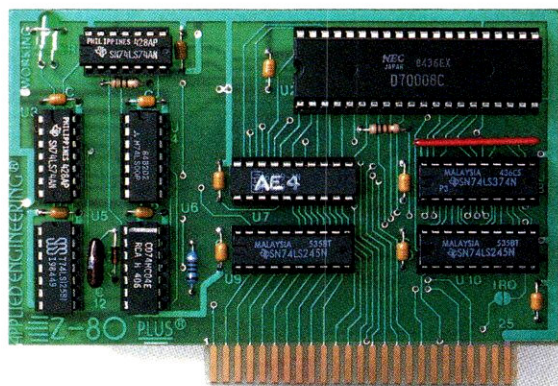
Toggle switches under the ROM trapdoor control the way the computer treats Slots 5 and 7. When Slot 5 is set to "internal," the RAM card is enabled. When Slot 5 is "external," the second slot of the expansion box is enabled instead. When Slot 7 is "internal" the Universal Drive Controller is enabled, and you can plug in a 3.5-inch drive. When Slot 7 is "external" the Laser's side slot is active. Users with an extensive collection of cards and peripherals may be inconvenienced by the need to open the trap door and flip switches from time to time, but most new owners can simply leave the factory settings untouched.

Central Point offers an extensive collection of cables and peripherals for the Laser, including a mouse (\$79), an external 5¼-inch drive (\$150), a 3.5-inch drive (\$225), and a monitor (\$125). At \$25, the RGB cable is a particularly good deal, since it lets you use the computer with IBM-type digital RGB monitors. This gives you crisp 80-column text and sharp, reasonably good color (with occasional glitches in some programs).

#### By the Book

One thick softcover manual covers both the Laser 128 and the 128EX. The illustrations are small and lacking in detail, but there is a complete set of pin-outs for all the ports and connectors, and a detailed reference section for Microsoft BASIC (which is essentially identical to Applesoft.) The documentation would be improved by addition of an index. Video Technology

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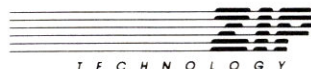
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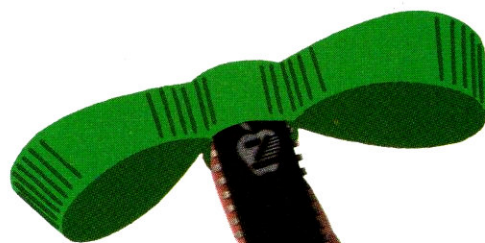
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will also publish a detailed Technical Reference Manual for the 128EX.

Central Point bundles its superb utility program, Copy II Plus, with every Laser it sells. Copy II Plus is overdue for a friendlier, more up-to-date user interface, but it is still indispensable for quickly formatting disks (DOS 3.3 or ProDOS), cataloging volumes, copying files, and backing up protected software. Purchased separately, Copy II Plus lists for \$39.95. (See a more detailed description of Copy II Plus in the disk utilities All-Stars section of this issue.)

### The Critic's Wish List

Considering the feast of features offered by the Laser 128EX, it may seem ungenerous to want even more, but it certainly would have been nice to have a built-in clock/calendar. However, both the No-Slot Clock from SMT and the IIC System Clock from Creative Peripherals are compatible with the Laser. Also missing is a 16-pin motherboard game-port connector required by some electronic interface devices. The keyboard feel could still be improved; it isn't nearly as good as the IIE's or the Franklin's. And, finally, it would be reassuring to have a national Laser User Group, well supported by both Video Technology and Central Point. Owners of clones need a lot of technical support to cope with the inevitable compatibility problems, and "official" Apple users groups tend to treat clone owners as second-class citizens (at best).

### The Bottom Line

At Central Point's price of \$499, the Laser 128EX is a steal. At the suggested list price of \$579 it is still a remarkable value. It has all the features most school and home users are ever likely to need. Although the sheer number of features may be rather intimidating to a beginner, this is an ideal starter system. I would recommend it for someone who wants to explore the world of Apple II computing but cannot afford the high cost of a fully-equipped IIE. For users who do not yet require the advanced features of a IIGS, the Laser 128EX may be the most cost-effective solution. +

Michael Markowitz is a computer engineer for a Southern California aerospace company. He has been writing about Apple II computing since 1983.

## VITAL STATISTICS

### LASER 128EX

A low-priced Apple II compatible packed with high-end features, including an accelerator board, RAM card and Universal Disk Controller.

**CPU:** 65C02 with selectable speeds of 1, 2.3 or 3.6 MHz

**RAM:** 128K; can add an additional 1Mb for RAMdisk memory

**DISK DRIVES:** one 5¼-inch (internal); port for 5¼-inch or 3.5-inch external drive

**OTHER:** One parallel printer port; two serial ports (printer and modem); digital RGB video port (also compatible with some LCD flat-panel displays); mouse/joystick port; 40/80 column display; one card slot (expandable to two); Microsoft BASIC in ROM

**LIST PRICE:** \$579

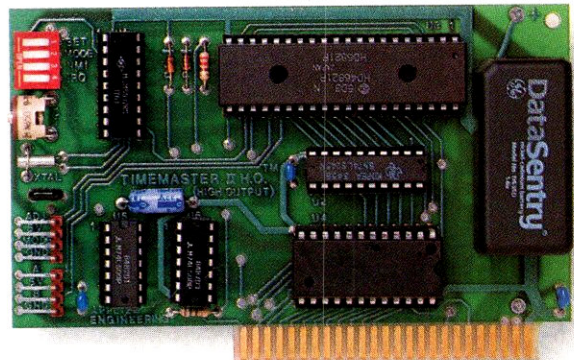
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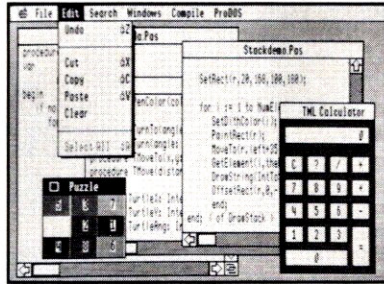
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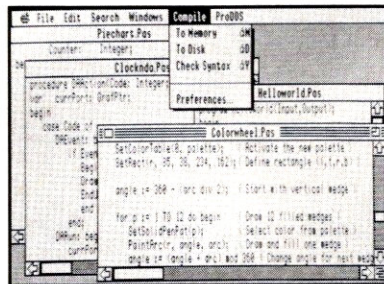
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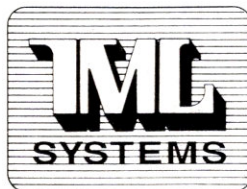
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- ✓ Complete documentation with TML Pascal and TML BASIC source code examples on disk.



# BULLET- PROOFING YOUR SPREADSHEETS

In early 1986 the controller for James A. Cummings, Inc., a Florida construction company, was working on a spreadsheet model for a bid on a \$3 million office complex when he discovered he'd forgotten to include \$254,000 in overhead costs. He had placed the amount into a column of figures, not realizing he'd put it into a cell outside the range specified by his formula. Consequently, the project was underbid by \$254,000, and although the company sued the spreadsheet publisher, arguing that a "latent defect" caused the underbid, the general consensus was that the controller had made a common spreadsheet error. (The suit was eventually dropped.)

Hopefully you'll never make an error of that magnitude, but research has shown that one out of every three business spreadsheets has some kind of error in it, and the sad fact is that all of these errors are preventable. Most happen either because users don't allot time for verification and error checking when creating a spreadsheet, or they simply don't know how to do proper error checking. Let's look at the common errors spreadsheet users make, and how to find and prevent them. Although the examples will all deal with AppleWorks, the

*Some simple suggestions for preventing those spreadsheet errors that can shoot your business calculations full of holes*

information is valid regardless of what spreadsheet you use.

#### **Keystroke Errors**

This has to be the most common type of spreadsheet error there is. Keystroke errors in a word processing document are normally only a minor annoyance; after all, a missing or misspelled word rarely leads to disaster. But a misplaced decimal, mistyped cell reference, or extra zeros can easily cost a business a

lot of money, and the larger the spreadsheet, the more likely it is that keystroke errors will occur.

One way to help prevent this type of error is to use the AppleWorks pointing feature when entering formulas that cover a range of cells. This technique minimizes errors because it provides an alternative to manually keying in formulas. For example, suppose you're totalling a column of figures beginning with cell J5, and ending with cell J14, with the result going in cell J16. With the cursor in J16, enter @SUM( and then move the cursor to cell J5. Next, enter a period (.) to start the range of cells to be summed, then move the cursor down to cell J14 so that the range covers all the cells you want totalled. Finally, press RETURN, enter a ) (the closing parenthesis), and press RETURN.

Another way is to add macro capability with a macro add-on program such as Super MacroWorks from Beagle Bros or Key Player from Pinpoint. You can then place your most used formulas in macros and simply use the macro. This saves you keystrokes, and in doing so reduces the chance of making keystroke errors.

Be consistent when building your spreadsheet; go from left to

right, and top to bottom. Many mistakes occur when you get lost or have to move around a lot in the spreadsheet.

### Formatting

The way AppleWorks handles values when the layout (open-apple/L) or standard values (open-apple/V) commands are used is another source of spreadsheet errors. Using either of these commands, you can set a fixed format for values entered so that from 0 to 7 decimal places are displayed, regardless of how many decimal places are in the numbers entered. What many people forget is that if you enter a number with more decimal places than you have formatted for, AppleWorks will round off and display the number to the number of decimal places specified in the formatting command, but will store and calculate the actual number entered.

Let's assume you have a column formatted as a value format, fixed, with the number of decimal places set to zero. If you enter 19.49 in the first cell and 321.77 in the second cell, what is displayed is 19 and 322.

## SPREADSHEET STYLE

Whether or not you're using AppleWorks, you'll need to consider the fundamentals of spreadsheet creation when building your own spreadsheets. For further information, here's a book that covers those basics: *The Elements of Spreadsheet Style*, by John M. Nevison. The book is published by Brady Books/Prentice Hall and costs \$12.95.

When you add them, the actual result will be 19.49 plus 321.77, or 341.26, but what will be displayed is 341. In this instance the difference may seem too small to worry about, and it is. But in a large spreadsheet these small errors between what's actually calculated and what's displayed can quickly mount. Make sure you're aware of how your formatting affects your figures, and that you're getting the results you want.

### Standard Order of Operation

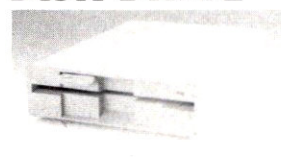
When you first learned how to do math problems with more than one type of operation in it (problems that have some combination

of addition, subtraction, multiplication, and division), you were taught the standard order of operation. This states that, when calculating an equation, exponents are to be calculated first, then multiplication and division, then finally addition and subtraction, with operations of equal precedence performed in order from left to right. This is the way Applesoft and most other computer languages, as well as most spreadsheets, calculate formulas. For some reason, however, AppleWorks doesn't. Instead, it performs the operations in the order they're entered from left to right, with operations in parentheses being calculated first. This is a source of much confusion to many AppleWorks users.

Suppose you wanted to calculate the formula  $20 + 17 * 4$ . If you enter this into a cell just as it is, AppleWorks will return an answer of 148. If you add parentheses to make the formula  $20 + (17 * 4)$ , the answer changes to 88, the way the rules of arithmetic state it should have been calculated in the first place. Because of this, you need to make sure that any formulas you

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enter are calculated in the correct order. If you're unsure, use parentheses to specify the order.

### Order of Recalculation

An area that can be confusing to users and create numerous problems is the order of recalculation. The order of recalculation determines whether calculations are done down rows first, then across columns, or across columns and then down rows. The default for AppleWorks is down columns, and then across rows. When setting up your spreadsheet, you must make sure that when cells are dependent on other cells, the cells with the source material are calculated first. For example, if you have formulas in row 1 that are dependent on values in row 5, your order of calculation must be rows first, then columns.

You also have to be consistent in creating your spreadsheet. Don't have some sections that require columns to be calculated first, while other sections require rows to be calculated first.

### Simultaneous Equations

Simultaneous equations are a real problem for AppleWorks, because it won't calculate them correctly without some help from the user. A good example of a simultaneous equation is a commission policy that dictates that the salesman's commission is a percentage of the net profit of a sale, when the net profit is defined as the gross profit minus the salesman's commission. This is a simultaneous equation because the net profit is dependent on the commission, which in turn is dependent on the net profit. This is quite common in a business where the salesmen are paid straight commission.

**T**he problem with AppleWorks is that it does not properly calculate simultaneous equations automatically. You must manually calculate (open-apple/K) simultaneous equations until the figures no longer change. If you don't, you'll have incorrect answers.

Let's use the commission example to see just how much of a difference this can make. Assume your salesman has monthly sales with a gross profit of \$40,000, and that the commission is ten percent of the net profit. Assuming you enter your formulas first and that you

have the recalculation set to automatic, the first time you enter the gross profit into the spreadsheet you'll get the following result:

==== A ==== B == C ====	
1 Monthly Sales Commissions	
2	
3 Gross Profit	40000.00
4 Commission	0.00
5	
=====	
6 Net Profit	40000.00

Obviously this is incorrect. If you recalculate once using open-apple/K, results will change as follows:

==== A ==== B == C ====	
1 Monthly Sales Commissions	
2	
3 Gross Profit	40000.00
4 Commission	4000.00
5	
6 Net Profit	36000.00

Still incorrect. If you continue to recalculate until the results in cells C4 and C6 no longer change, you will have manually recalculated six times, and finally get the following result:

==== A ==== B == C ====	
1 Monthly Sales Commissions	
2	
3 Gross Profit	40000.00
4 Commission	3636.36
5	
=====	
6 Net Profit	36363.64

The only way to prevent errors with simultaneous equations is to either avoid them, which often is just not feasible, or to recognize them and manually recalculate until your figures no longer change.

### Circular Errors

Circular errors occur when a formula refers to itself either directly or indirectly. For example, if you had the formula  $+A1+B1*2$  in cell A1, you would have a circular error, since the formula in the cell refers to the cell itself. Circular errors cause the results of the formulas to be artificially high, since it increases itself every time you recalculate, which if you have the automatic calculation feature on is every time you enter a number or formula. To see how quickly a mistake of this type can cause you trouble, if you enter the formula

above into cell A1, and the number 2 into cell B1, A1 will be 4. If you enter seven additional formulas or numbers into the spreadsheet, the value of cell A1 will have increased to 1020!

Some spreadsheets will warn you if you make a circular error, but AppleWorks will continue on, blissfully unaware that anything unusual has happened. You must be careful and check each formula as it's entered to be sure you've entered it correctly. If you're working and suddenly find a figure that seems to be extremely high, suspect a circular error and check the formula in the cell. Check all the cells referred to in the formula if the formula does not refer to the cell that it's in, since you could have an indirect circular error rather than a direct error. An example of this would be where you have the formula  $B1*2$  in cell A1, and  $A1+A4$  in cell B1. While the formula in cell A1 doesn't refer directly to the cell itself, it does so indirectly because the formula in cell B1 refers to cell A1.

You can't prevent every error, so you need to take steps to catch those that slip by you. The best way is to check your spreadsheet as you go along, not just after it's complete. Check each formula as it's entered, and then as each section of the spreadsheet is finished use the zoom command (open-apple/Z) to view your formulas on the screen. Test your formulas using data for which you either already know the answer (such as historical data) or with data you can easily verify using a calculator or pencil and paper. Alternatively, enter a one (1) for every data entry: This makes checking your calculations relatively easy. You need to do the same thing to the entire spreadsheet once you've finished.

If you're converting from a manual system to a spreadsheet, run the manual system and the spreadsheet concurrently for a few months. All too often a business begins doing its bookkeeping on a spreadsheet without any method of double checking the figures. This is asking for trouble. Using both a manual system and a spreadsheet may create extra work for a while, but it allows you to fine tune your spreadsheet and work out any bugs while you still have a

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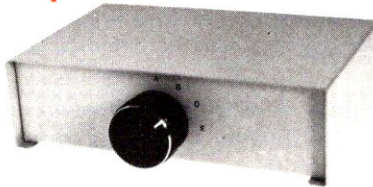
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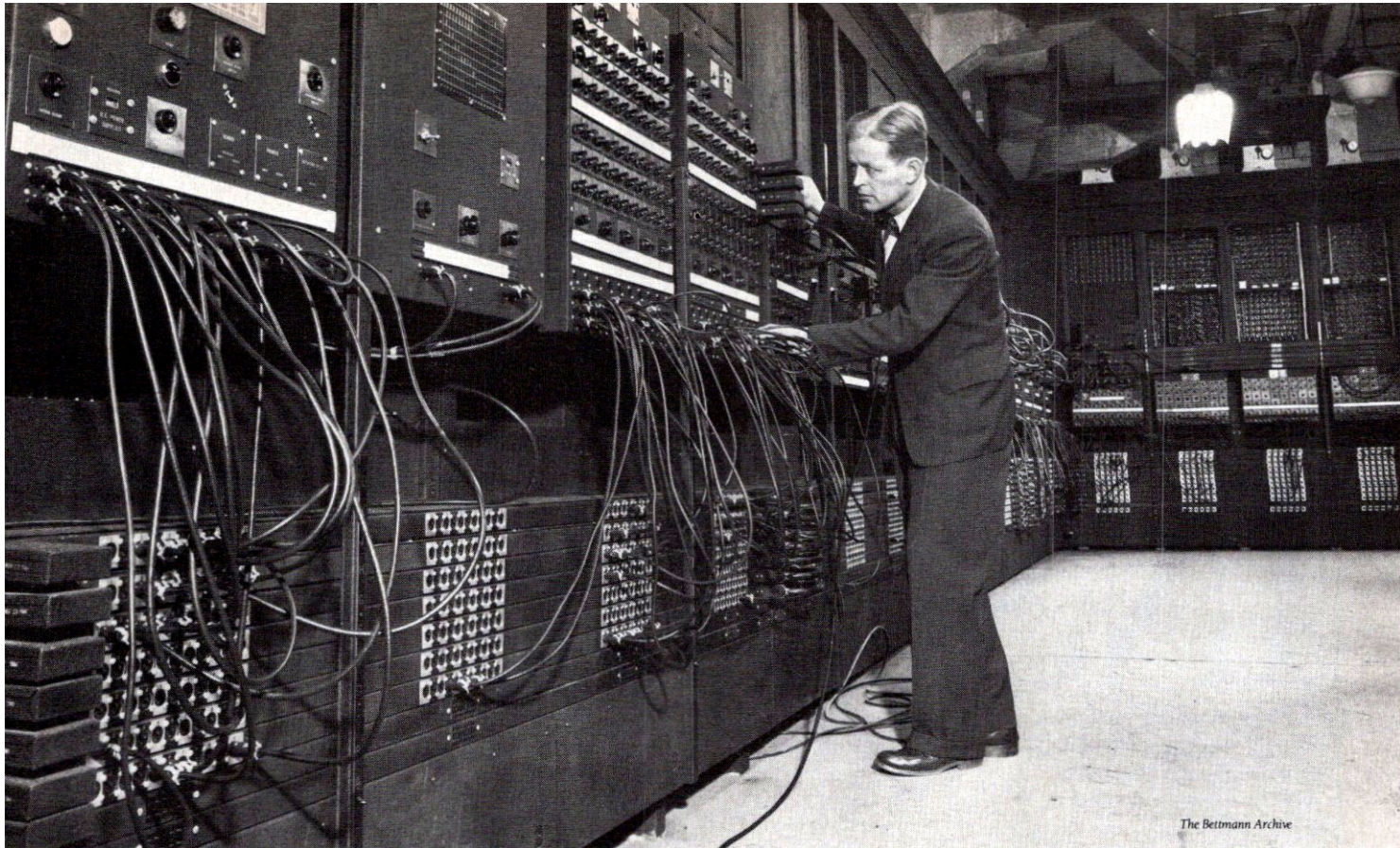
You can set column widths and cell formats to catch errors. For example, AppleWorks places pound signs (#) in cells with numeric values that exceed the cell width. You can use this feature to catch numbers that are too large. If you know that no result should be larger than 999, and you have the format set to display numbers to two decimal places, then set the column width at six characters. Any number in that column that exceeds 999.99 will cause the cell to display #####, and alert you to a possible error.

Another way to visually catch mistakes is to use a graphics program to graph the results of your spreadsheet, such as Visualizer II and IIGS from PBI Software, Inc. or Graphic Edge from Pinpoint. Mistakes can be difficult to find when you're staring at 20 or 30 columns of figures. Graphing helps you to view the overall pattern, making it easier to spot errors. It won't locate the source of any error that may exist; you have to do that yourself. But it does make finding bad data, model flaws, and formula flaws a lot easier.

Finally, make sure that the models your spreadsheet is based on are correct. You can have all the formulas typed in correctly and all the data keyed in correctly, yet if the underlying assumptions are wrong it's all for nothing.

A spreadsheet is a powerful tool, but like any tool, it's only as good as the person who uses it. Make sure when you're designing a spreadsheet, you allot time for error-checking and verification. Don't be someone who doesn't have the time to do it right the first time, but does have time to do it over. +

Vince O'Connor is a freelance writer and programmer with over 10 years of experience. He is also co-owner of MAH Software Services, which provides training, consulting, and custom programming for small businesses.



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*Ten questions  
to ask about*

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This nightmare may never happen to you, but the truth is that most standard homeowners' and renters' insurance policies are woefully inadequate. The majority of policies cover losses due to theft, fire, and vandalism but don't cover damage caused by power surges—electrical fluctuations usually caused by brownouts or lightning—or accidental damage—losses caused by someone tripping over the power cord, for example. They also generally fail to cover either commercial or user-written software. All that's insured are the disks on which the software is stored.

Whether you're examining your current policy

or searching for a new one, you can't make an informed choice without knowing what questions to ask. Following are ten questions whose answers can help you choose your coverage wisely.

### **1. Are Peripherals Covered?**

You may be required to supply a list of peripherals—printers, additional disk drives, add-on cards—and their serial numbers if you want them covered. If you don't supply such a list, the policy may cover only the basic unit.

### **2. Is Commercial Software Covered?**

This point is especially crucial if you use your computer for moonlighting or as a supplement to one at work. If you want more than just new, blank media if your programs are destroyed, make sure the policy

states that the programs themselves will be replaced if damaged or destroyed.

### **3. Is User-Developed Software Covered?**

This type of coverage may be difficult to find. For example, both State Farm and Allstate exclude user-developed software in their coverage. Nationwide, however, provides up to \$3000 coverage that includes programs you create. Find out how the company determines what a user-created program is worth. Reimbursement will probably be based on the cost of a similar commercially available program, but settlement may take into account your time and skill in writing the program.

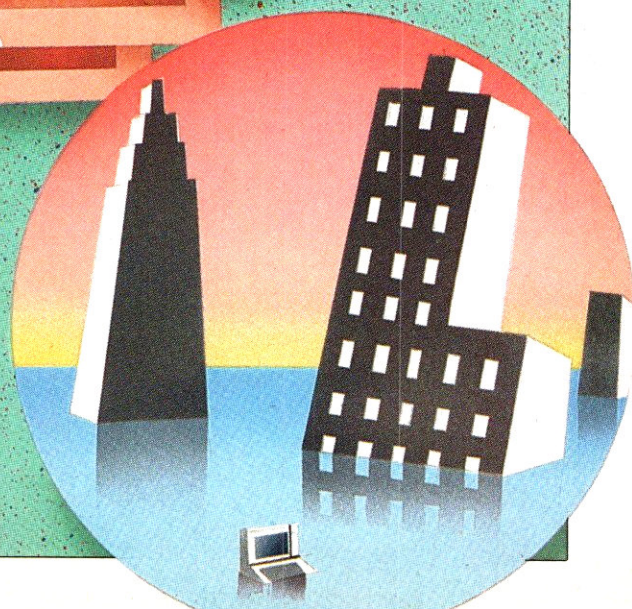
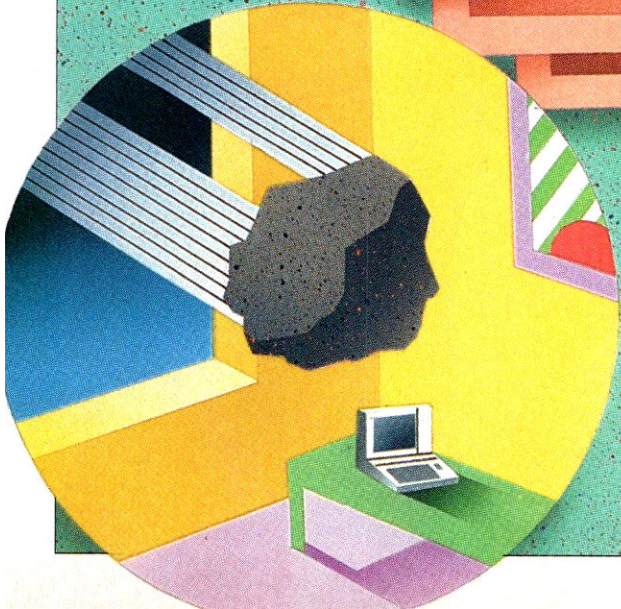
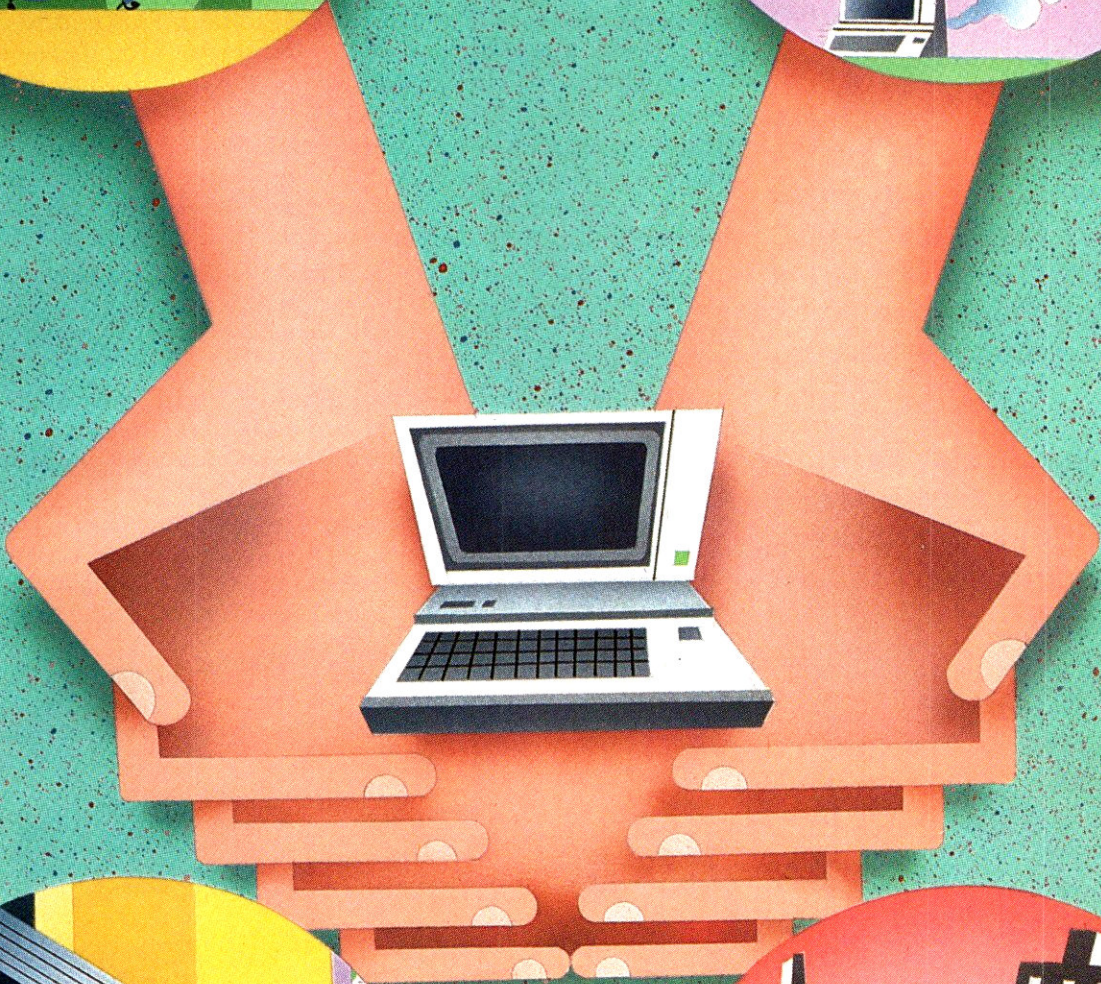
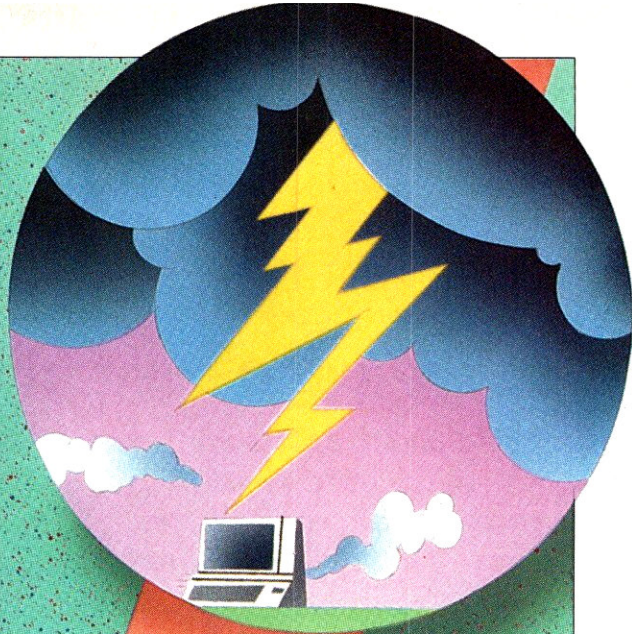
### **4. Does Coverage Include Home-Based Business Use?**

Whether you work

full-time out of a home office or simply moonlight, many companies, such as American Family and Covenant, will not cover a home computer used primarily for business. You need to check the wording of the policy carefully, however, since not every insurance company defines business use in the same manner. American Family doesn't consider that a home computer is being used for business as long as the business is located outside the home. For example, if you're a teacher using your home computer to keep track of students' grades, your computer will be covered. But if you're a free-lance writer working from an office in your home, it won't be covered.

### **5. What Type of Policy Do I Need?**

Some insurance companies, such as Nationwide, include computer coverage in their standard homeowners' policy, but most require a special endorsement. These are specially written and added to your policy, much as are traditional endorsements for additional coverage on items



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If you use your computer for business and your insurance company is one that doesn't cover a home-based business, one option is to get an inland marine floater. This is a category of insurance originally developed to cover dockside equipment and that later grew to cover such items as goods in transit, construction equipment, and valuable papers. These policies, often referred to as data-processing policies, generally cover all computer hardware; software; the media the software is stored on; and the data, or "valuable papers," stored on your hard or floppy disks. They let you protect against accidental erasure, damage caused by unauthorized access to your system, and employee theft and damage—such coverage does not come cheaply, though. Still, the cost of the insurance is small compared to the cost of losing your system when it's your sole source of income.

You can get endorsements on inland marine policies just as you can on your homeowners' policy. One common endorsement is the 10% endorsement, which pays up to 10% of the value of the policy for software and extra expenses, such as the cost of renting equipment until yours is repaired or replaced. Also covered is the cost of hiring someone to reenter lost data.

You might also want to check out Safeware, an insurance company that handles only computer-related coverage. It offers policies that insure home computers used as either personal or business computers. It doesn't normally cover user-created soft-

ware, but otherwise it offers complete hardware and software coverage.

## 6. What Type of Coverage Is Available?

Coverage is almost always one of two types: all risk or named peril. All-risk coverage means that the policy covers damage by any cause except causes specified in the policy. Causes normally not covered include normal wear and tear, illegal acts committed by the policyholder, acts of God, and nuclear war. Named peril is just the opposite. Such a policy doesn't cover damage by any cause unless that cause has been specified in the policy. All risk is the more common of the two, but make sure to ask, and then read your policy after you get it to avoid any unpleasant surprises.

## 7. What Is the Annual Premium?

The cost of covering your computer can vary greatly from company to company. For example, Transamerica charges \$1.25 per \$100 worth of coverage, whereas Kemper charges \$1.50 per \$100, and American Family charges \$0.60 per \$100. This type of price comparison isn't as clear-cut as it seems, however.

The method insurance companies use in determining the cost of coverage can vary, making it difficult to compare one company's prices with another's. Some companies may charge for every \$1000 or \$3000 worth of coverage, instead of for every \$100. Others don't charge if coverage is under a certain figure. State Farm, for example, does not charge for the first \$3000 worth of coverage. Rates can also vary according to where you live, the type of home you own or rent, the type

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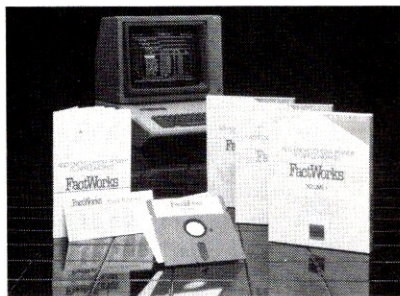
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<b>State Farm</b> (309) 766-2311	1 State Plaza Bloomington, IL 61701	YES	YES	NO	YES
<b>Nationwide</b> (614) 249-7111	1 Nationwide Plaza Columbus, OH 43215	YES	YES	YES	YES
<b>Kemper</b> (312) 540-4000	Kemper Center Long Grove, IL 60049	YES	YES	YES	YES
<b>Covenant</b> (203) 527-3311	95 Woodland Street Hartford, CT 06101	YES	YES	YES	NO
<b>Safeware, The Insurance Agency, Inc.</b> (800) 848-3469	P.O. Box 02211 Columbus, OH 43202	YES	YES	NO	YES
<b>American Family Mutual Insurance</b> (608) 249-2111	3099 E. Washington Ave. Madison, WI 53704	YES	YES	YES	NO
<b>Allstate</b> (312) 291-5000	Allstate Plaza Northbrook, IL 60062	YES	YES	NO	YES
<b>Transamerica</b> (213) 742-4242	1150 South Olive Los Angeles, CA 90015	YES	YES	NO	YES

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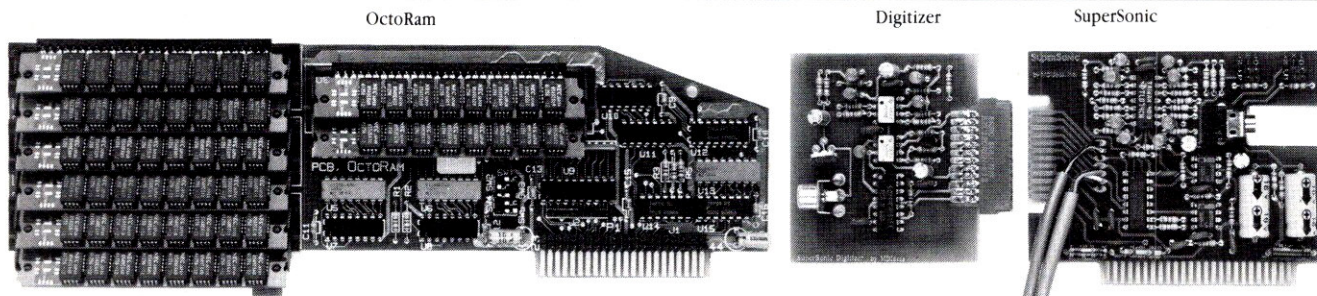
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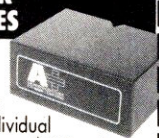
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Once you've chosen the coverage that best fits your needs, you'll need to make an inventory of all your equipment (including add-on cards and peripherals such as a mouse, joysticks, and the like) and software, both commercial and any you've written yourself. Keep all your receipts, since you'll be required to supply proof of ownership, should you ever need to file a claim. Also keep a record of all serial numbers, and pictures of your equipment, if that's possible.

The table accompanying this article describes the coverage eight insurance companies offer. Rates may vary, depending on where you live and what kind of home you rent or own, and are subject to change. Remember, when taking out any insurance policy, to make sure you read and understand it. Insurance can't prevent damage to your computer, but it can make it a lot less painful than it would be otherwise. +

*Vincent O'Connor is a freelance programmer and writer specializing in computer and health issues.*

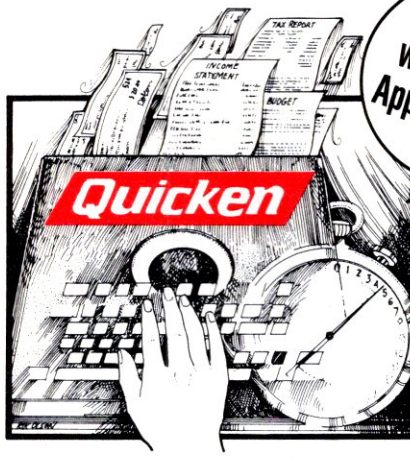
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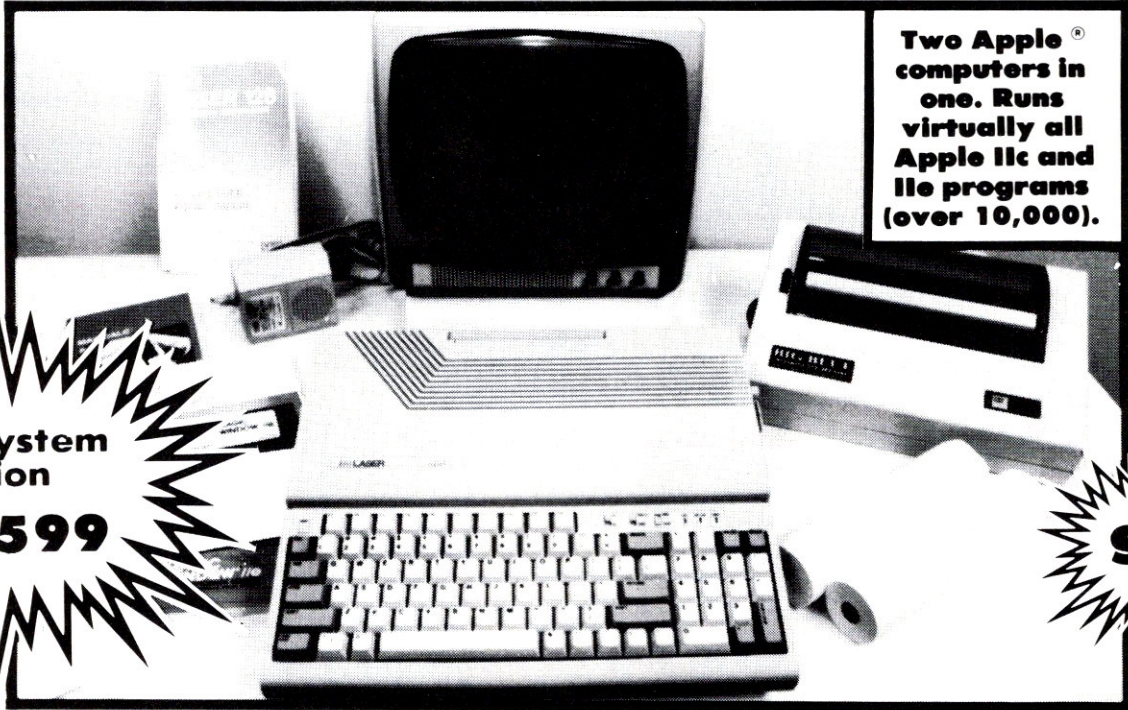
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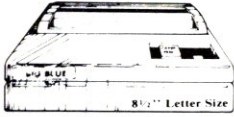
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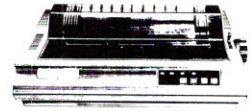


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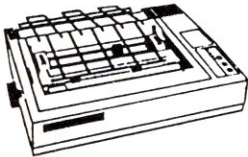
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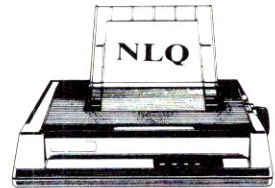
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**FEATURE REPORT**  
BY CHARLES RUBIN

## MANAGING SPREADSHEET COMPLEXITY

Spreadsheets often begin as simple tables containing a few rows and columns and then grow increasingly complicated as time goes by. I call this phenomenon "spreadsheet creep." A household budget starts off with basic line items for food, rent, utilities, and so forth, and then swells as you realize you'd like to track individual utilities separately or break down your sources of income further.

The situation is even worse with a company budget, where you buy new pieces of equipment, add employees, retire debts, or develop new sources of sales. Somehow, each change in income or expenses—or each change in the way you think about income or expenses—is reflected in the spreadsheet until its rows and columns march across several screens. Scrolling to find specific cells becomes more difficult, and the possibilities for error multiply as the original row and column titles become increasingly distant from your data-entry areas.

AppleWorks spreadsheets are likely to become more complex as

you discover new ways to use them, but complex spreadsheets don't necessarily have to be unwieldy ones. Several strategies can help you keep them under control. **Divide and Conquer**

The best way to prevent or eliminate spreadsheet creep is to break your model down into logical components. Rather than having one huge model for a whole budget, create a series of subordinate models for discrete portions of the budget and then consolidate the bottom line from each subordinate model into a summary model. This strategy has numerous advantages. Small, subordinate models are easier to work with, because you don't have to scroll around as much to view the data they contain. Models that deal with specific aspects of a budget allow you to focus more closely on that particular budget area: You might include line items in a subordinate model that you'd leave out of one big model because of space or complexity considerations, and you'll be more likely to modify subordinate models as your needs change.

In a more powerful spreadsheet program such as Multiplan or SuperCalc 3a, you can consolidate information between models by putting each model into a separate file and then using linking or consolidation commands to transfer the information between files. The AppleWorks spreadsheet module doesn't allow you to link formulas between separate files, but you can use a single spreadsheet file to store all the models you'll need for a particular project. Since all the models will be in the same file, you'll be able to use cell references to transfer data from the bottom line of each subordinate model to a summary model. And, with some judicious formatting, you'll be able to add to or change any of the models in the file at will without affecting the formatting or calculations of the other models.

As an example, let's look at an annual expense/income report for Acme Manufacturing. The summary budget provides summaries of expenses and income in broad categories such as Rent, Utilities, Salaries, Sales, and so on, as shown in

## FEATURE REPORT

the summary model in figure 1.

For each of the line items in the summary area, the values have been transferred from subordinate models elsewhere in the file. The row for Rent shows totals from a subordinate spreadsheet that tracks rents for several different Acme locations; the Utilities row shows the totals from a model that shows expenses for electricity, water, gas, garbage, and other services. A summary area like this lets you have a complex financial tracking system without having to work around the complexity each time you want some quick answers. If you want just an overview of total expenses and income, you can find it in one small, convenient area, but if you want to look closely at expenses or income in any particular area, you can view the model that shows those details.

Here are the basic steps for building a spreadsheet that contains a summary area and several subordinates:

Beginning at the upper left corner of a new spreadsheet file, enter the row and column labels for each summarized item in the budget. The area may look like the one in figure 1. You don't need to enter any values into this matrix, because you'll transfer them via cell references from the totals rows of the subordinate areas you'll create later.

Let's assume the summary area occupies a rectangle from cells A1 through P22. Your first instinct in creating subordinate areas might be to place them directly below or directly to the right of the summary area, but doing so will cause problems later. If you place the subordinate areas directly below the summary area, they will occupy the same columns as material in the spreadsheet. If you ever want to add, delete, widen, or narrow a column in any of the subordinate areas or the summary area, that same column will be affected in all the areas below or above it. You would have the same problem if you placed subordinate areas to the right of the summary area, except that the difficulty would arise if you added or deleted rows in any of the areas.

To eliminate this problem, create each subordinate area on a diagonal to the consolidation area. Using this layout (see figure 2), you will be able to insert or delete rows or columns in any of the areas without affecting rows or columns in any other area.

Since you know that the bottom right corner of the summary area is cell P22, you know you can make the next cell on the diagonal, cell O23, the top left corner of the first subordinate area. In this first cell, enter a title for the area that is slightly different from its row label in the summary area. If the first area is for rental expenses, name it "Rental Fees," instead of just "Rent," as it was in the summary area. By using a unique name, you'll be able to use the Find command later to jump quickly to this area.

Enter the row and column labels you need for the first subordinate area; then determine its lower right corner and continue creating subordinate areas on the diagonal until you are finished. Be sure to include a row for totals in each area, as it will be the row whose values you transfer to the summary area

at the top of the file. You can copy some repetitive labels, such as the monthly column labels, from the summary area and place them in the subordinate areas to avoid re-typing. (Use the Within Worksheet option after typing the Copy command to highlight the specific cells containing the month labels.)

Once you've entered all the labels for the subordinate areas, you can go through each area and enter the necessary values, after which you can easily transfer the totals from each subordinate area to the summary area. Just note the cell locations of the totals rows in each subordinate area and enter the locations that correspond to the appropriate line item in the summary area. If the Rental Fees totals are in cells S30 through AD30, for example, enter these cell references in cells B4 through M4 (the Rentals expense line) in the summary area.

When you're done entering the cell references to transfer the totals to the summary area, all that remains is to enter Sum formulas to produce the grand totals of expenses and income for the entire budget. When the entire worksheet is done, you'll be able to add, de-

Figure 1: The summary model in a corporate budget consolidates totals from several subordinate models.

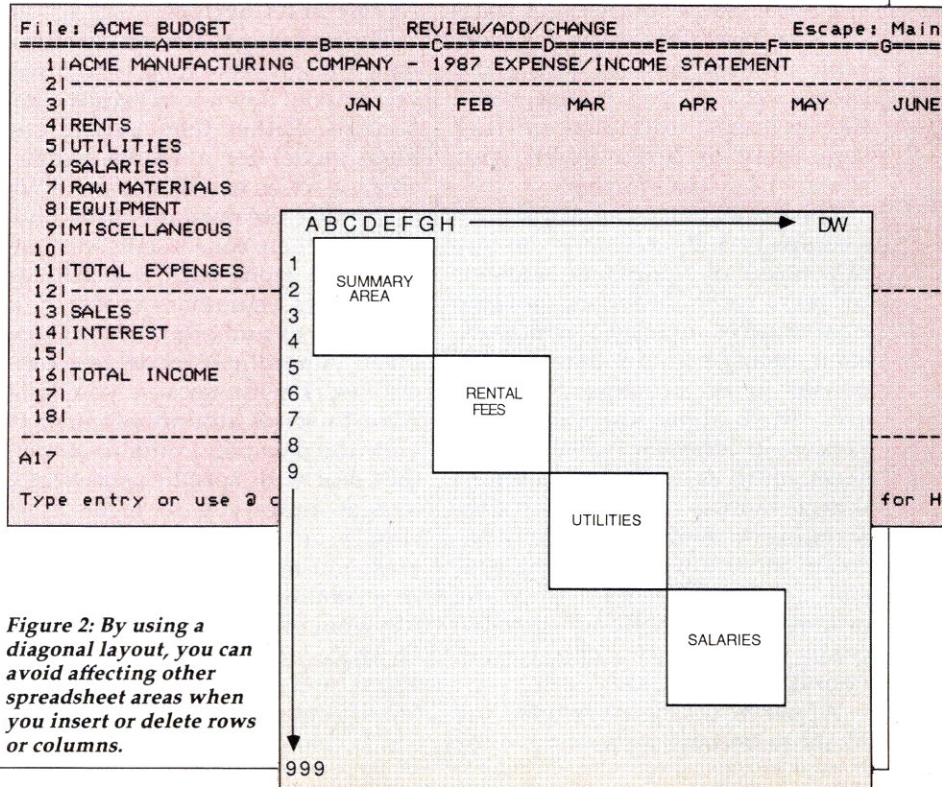


Figure 2: By using a diagonal layout, you can avoid affecting other spreadsheet areas when you insert or delete rows or columns.

## FEATURE REPORT

lete, or change figures in any subordinate area and have the changes automatically reflected in the summary. When new expenses within categories crop up, you can add them, or you can add whole new subordinate areas and add extra rows in the summary area to accommodate them.

The AppleWorks spreadsheet contains 127 columns, so you should have room to create about 8 subordinate areas (showing 12 months of data each, plus columns for labels and totals), using the diagonal formatting system. If you run out of columns, you can always double up subordinates beneath each other, since you're far more likely to add or delete rows (containing new expenses or income sources) than columns (which contain expenses by month).

### Keeping Your Bearings

Even if you use the consolidation feature above or if your spreadsheets are much less complex, your spreadsheet is still likely to be too large to be appear on the screen all at once. Therefore, as you scroll down or to the right to view off-screen data, you'll lose sight of the row and column titles at the top and left of the model. Without titles to guide you, you'll have a hard time knowing if you're entering data in the proper cell. The simple way around this problem is to use the Fixed Titles command (open-apple/T), which lets you fix row and column titles at the edges of the screen no matter how far down or to the right you scroll.

To use the Fixed Titles command, position the cursor in the row below or the column to the right of the titles you want to lock onto the screen, and then type the Fixed Titles command. (If you want to fix both top and left titles, treat them as an L-shaped area and place the cursor at the first cell inside the corner of the L.) A prompt will ask whether you want to fix titles at the top, the left side, or both locations on the screen. Choose the option you want and press Return, and the titles will be fixed. When you scroll down the screen, the titles at the top of the screen will remain there; if you scroll to the right, the titles at the left of the



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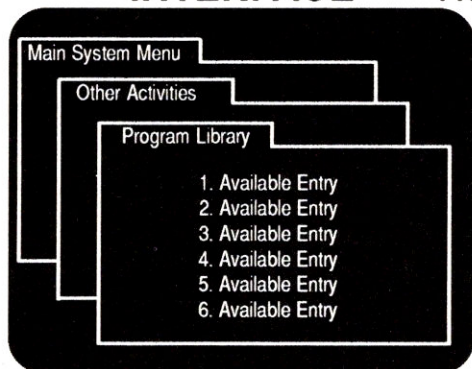
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screen will remain there. Although this option is called Fixed Titles, it fixes any group of cells on the screen, whether they contain values or labels.

### Fast Moves

Even if you cut down the size of individual models by using the consolidation method, you'll still have to scroll around quite a bit to locate individual cells in different areas. If you know the exact coordinates of the cell to which you want to move, using AppleWorks's Find command is a fast way to get there. Just type open-apple/F, choose the Coordinates option, type the cell's coordinates, and type Return. The cursor will move to that cell. If the Find command's entry line contains text from a previous search, you can use the Control-Y or open-apple/Y command to delete it.

If you don't know the coordinates, you probably remember a key word from the title of each subordinate area, and you can use it as the search key when you use the Find command. Even if you use a word such as Rent, and AppleWorks finds the word in the summary area first, you can tell it to find the next occurrence until it locates the label on the area where you want to be.

Finally, you can always use the Ruler command (open apple and a number key from 1 to 9) to move vertically through the spreadsheet. The Ruler moves only through the areas of the spreadsheet where you have entered labels or numbers (so typing open-apple/9 won't move you to row 999, unless you have data in row 999), but it also moves the cursor only up or down in its current column.

If your cursor is in column A, it will move up or down in that column as you use the Ruler command, which may not be too helpful if you use the diagonal format I've described.

Good luck in using these tips and strategies to manage the increasing size and complexity of your AppleWorks spreadsheets. +

A revised edition of *Contributing Editor Charles Rubin's best-selling book, AppleWorks, was released in the fall by Microsoft Press.*

# EASY (SUPER) MACROS

While all you Super MacroWorks users wait for your upgrade to the latest Beagle Bros macro utility, Timeout UltraMacros, here's a set of related word-processing macros to keep you busy.

Three basic macros are included here: one resets tabs, one provides an inside return address and date for a letter, and the other prints an address on an envelope and deletes the file containing the address from the disk. Two other macros call these macros to perform even more complex routines. Once you've mastered these macros, we'll look at how you can further automate things by adding only eight "words" to the beginning of one of them.

You will want to use the record-a-macro feature (open-apple/X) for these experiments. Once you have perfected the macros, you can compile them by using Super MacroWorks' built-in compiler. You'll be using the forced-print macro (solid-apple/P), so if you haven't compiled the macros that came with the program, you will need to enter this macro along with the ones listed here.

Let's begin by creating a macro to change the tab settings to suit them to regular correspondence. When you bring up a fresh screen for a word-processing file, AppleWorks gives you tabs at every fifth position, starting at 6 (11, 16, 21 . . .). To change these settings in a "live" process, first type open-apple/T. You then have the option of setting, clearing, or removing tabs.

To clear all the tab stops, type R for Remove. Then move to column 4 with the right-arrow key, type S, move to column 30 with the right-arrow key, and type S again. Press Escape to go back to the REVIEW/ADD/CHANGE screen. (I know these aren't the settings *The Complete Secretary's Handbook* recommends, but you're using them just for the sake of example.)

Macro T (see figure 1), which you activate by typing solid-apple/

T, achieves the same result as the procedure just described but uses a slightly different method. You can write a macro that mimics the above actions precisely, but keeping track of the exact number of spaces as you move toward column 30 is difficult. Instead, the macro "presses" the Tab key six times to carry the cursor to column 31 and then "types" the left-arrow key to take it back to column 30.

Open-apple/T, R, S, and the Escape "token" (more Beagle Bros jargon—don't let it scare you) in macro T perform just as they would "live." Open-apple/left takes the cursor to column 1, because nothing else is on this line.

*Figure 1: Change the information in macros E and N to correspond to your address. The ! in these macros serves as a delimiter, so the compiler can separate the macro from identifying comments. If you are testing the macros in the temporary mode, do not include the delimiter or any material that follows it.*

```
T: (awp) <tab> <tab> <tab> <tab> <tab> <tab>
<left> <oa-T>RS<esc> <oa-left> <right>
<right> <right> <oa-T>S<esc> <oa-left> !
sets tabs to something reasonable for
word processing
```

```
N: (awp) <tab> <tab> 7 Brian Road <rtm> <tab>
<tab> South Windsor, CT 06074 <rtm> <tab>
<tab> <date> <rtm> ! return adr for letter
after tabs set
```

```
B: (awp) <sa-T> <sa-N> <rtm> <rtm> <rtm>
<oa-Z> Dear ! begin a letter
```

```
Ctrl-A: (awp) <sa-P> <spc> <esc> 4 <rtm>
<rtm> 3 <rtm> <right> <rtm> ! special print
macro that prints to current printer and
erases last file added to desktop
```

```
E: (awp) <esc> <rtm> 3 <rtm> <rtm> env <rtm>
<oa-O> lm <rtm> 0 <rtm> rm <rtm> 0 <rtm> <esc>
O'Dell <rtm> 7 Brian Road <rtm> South
Windsor, CT 06074 <rtm> <rtm> <rtm>
<rtm> <rtm> <rtm> <rtm> <rtm> <rtm> <rtm>
<oa-O> lm <rtm> 4.5 <rtm> <esc> <oa-C>
<right> <right> <rtm> <sa-Ctrl-A> ! Enve-
lope address macro with addressee info
stored on Clipboard!
```

The <right> token is for convenience only. In practice, you can replace the three right tokens with three <spc> (space) tokens, or simply three spaces. Open-apple/T, S, and the Escape token set the tab in column 4. Open-apple/left completes the steps for resetting the tabs, and the ! lets Super MacroWorks know the macro is finished. The text after the ! is a comment.

You can use macro N, after you've used macro T, to set the two special tab positions. The second tab marks the starting column for the return address. All my formal letters start with the return address and date indented to column 30, followed by the inside address and salutation.

Let's take the process further. Macro B calls macros T and N, in that order. The inside address and vertical spacing in a letter usually vary, so attempting to program them in is pointless. You can nevertheless add part of the salutation: Dear.

Simply add three <rtm> (Return) tokens, an optional open-apple/Z to keep track of carriage returns, Dear (and a space). Now when you type solid-apple/B, AppleWorks automatically begins your letter. You still need to add the inside address and determine the vertical spacing, though.

## The Next Envelope, Please

Printing envelopes is simple with macros such as Ctrl-A and E (see figure 1).

In Super MacroWorks, solid-apple/P prints the current file to the current printer without your having to answer any questions. Macro Ctrl-A calls macro P, which is defined by Super MacroWorks, and then goes through the steps necessary to delete the file it just printed.

Macro E builds on macro Ctrl-A. It automates several steps that occur just after you've typed a letter, printed it, placed an envelope in the printer, and copied the inside address to the Clipboard. First, it types Escape to exit to the main menu and presses Return to take you to the Add Files menu. It then types 3 and Return to select a new word-processing file. AppleWorks then asks for a name, and the macro responds with env, short for en-

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*velope*. Another Return takes you into the new screen.

Next, the macros sets the left and right margins to zero, types the return address, and moves the cursor down nine lines. Finally, it sets the left margin to 4.5 inches, copies in the address on the Clipboard, and invokes macro Ctrl-A to print the envelope.

Load macro E and test it; remember to put the envelope into the printer before you run the macro.

### In Your Own Write

Here is something to experiment with after you have macro E working perfectly. Immediately after `<awp>`, insert the following information:

```
<OA-C> <right> <rtn> <up> <up>  
<up> <up> <rtn> .
```

Now load a letter file. Put an envelope into your printer and put the cursor onto the last letter of the last line of the inside address. Type closed-apple/E and watch as AppleWorks copies the address information to the Clipboard and prints the envelope in one step. This method works with addresses of only four lines because the macro has only four `<up>`'s.

If you want to save these macros, you have to compile them. Use the AppleWorks word-processing module to substitute these macros for the ones that came with Super MacroWorks. (See your manual for details on the procedure.) If you want, you can change the identifying character command—just remember to change references to it in other macros. +

*Peter O'Dell writes for magazines in the amateur (ham) radio field and teaches meditation, in addition to holding a full-time sales job.*

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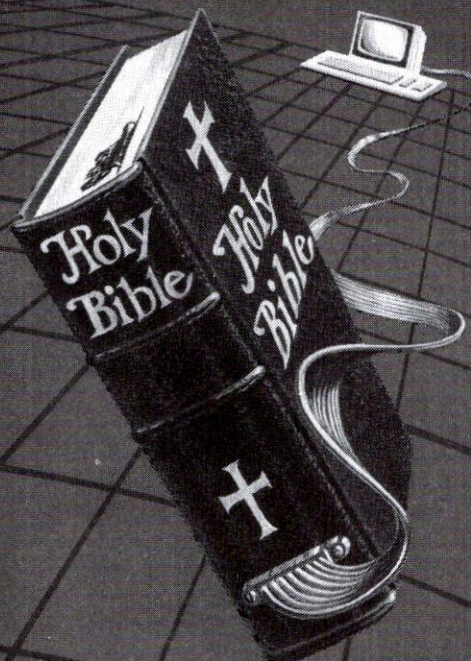
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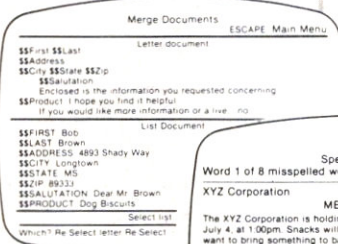
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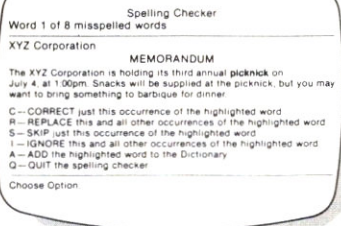
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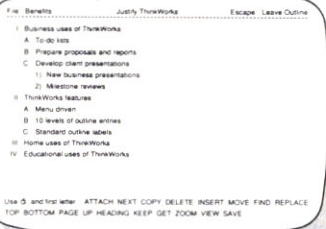
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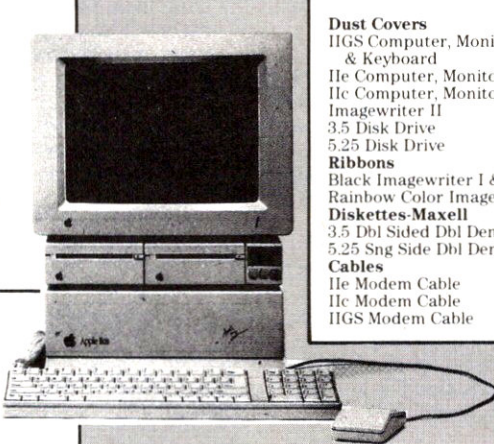
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# The Learning Curve

BY DAVID D. THORNBURG

## THE COLOR OF COMPUTING

### *The educational implications of multibued software*

The first personal computer I ever bought was a Commodore PET with 8K of RAM. I had some friends who had just gotten original Apple II machines and who thought I had made the wrong choice because their computer could display color and mine couldn't. In fact, the only features I wanted that the PET didn't have were high-resolution graphics and a decent keyboard. Color didn't matter to me that much, and the quality of the PET's built-in display put the Apple II to shame.

Before getting my PET, I had access to another personal computer, the Alto. This computer was a research machine created at the Xerox Palo Alto Research Center, where I was working at the time. The Alto (which I started using in the mid-70s) was similar in many respects to the Macintosh Plus, except that it had a larger display. As with the original Macintosh, the Alto also had a monochrome display.

Because I had been so used to working with computers that had no color capability, I didn't get excited about color on personal computers until I saw the color capabil-

ities of the Atari 800 computer.

The Apple II colors didn't impress me at the time, and prior to the release of the Apple IIGS, I never recommended Apple products to people who thought color was important.

Anyone who has used high-resolution color on the Apple II and then worked with computers such as the Apple IIGS or some of the

The poor quality of the original Apple II color can be traced to a trick that allowed Steve Wozniak to provide color capability on a computer with a very small amount of RAM. The high-resolution display of the Apple II accommodates 280 columns of 192 dots, or 53760 dots overall. Each dot corresponds to a bit of data in RAM, and each dot is either on or off.

Suppose that you were a computer designer in the mid-70s and wanted to allow users to make each dot any of four colors. This capability would require two bits of information per pixel or, for the display resolution of the Apple II, 16K of RAM for the display alone. Since RAM was expensive at that time, Wozniak devised a technique that allowed color to appear on this display with only 8K of RAM.

The original Apple II has colors because each adjacent dot lands on a different-colored phosphor on the display screen. For example, even-numbered dots

might appear purple (assuming they appeared in isolation), and odd-numbered dots might appear green. If two adjacent dots are on at the same time, the apparent color will be white.

This method of creating color by using artifacts in the display technology allows the creation of colored images with a fraction of the



older "good" color computers (such as the Atari 800) realizes that the Apple II color capabilities leave a lot to be desired. First, the choices are quite limited. Second, if you put one color next to another one, the boundary between the two "bleeds" produces another color altogether, in a phenomenon called dithering.

memory that would be necessary if each pixel were allowed to have several colors. It also produces side effects such as color bleeding and other problems that we have come to associate with the original Apple II. Given the year the II was designed, however, the trade-off turned out to be worth it.

### Computers in Education

Some educators and many educational-software developers think that color is quite important. Because of the dominance of Apple II

computers in the classroom, software developers have learned to live with the limited color palette of the Apple II and have done the best job they could to bring color to their programs.

Although I agree that color has the power to increase the impact of visual communication, I seriously question the long-term value of color in most educational software. First, you'd never want to teach color discrimination and identification with an Apple IIe. The

choice of colors is too limited, and each color monitor displays a given color differently. It is better to explore color topics with printed materials that let all students see the same colors.

I admit that color can make a display more attractive, but in many programs the indiscriminate use of color only ends up detracting from the image. (The exception is when color serves as an attribute in a pattern-recognition or pattern-matching task.) Despite these limitations, most educational-software developers insist on using as much color as they can, as though it were necessary to capture and maintain interest in their programs.

### Color as a Gimmick

From my point of view, color is a gimmick that covers up a real defect, the lack of good display resolution. Given the narrow gap between the price of a Macintosh and that of an Apple II, I have to assume that using color in this way is a conscious choice on the designers' part and not the result of any technological limitation.

A child sitting in front of a computer for extended periods of time has to read materials whose resolution is far inferior to that of the printed page. Even the Macintosh screen pales in comparison to the quality of most handouts that teachers run off on mimeo machines. If we believe that student computer use is going to increase over the next few years, we need to start paying more attention to display quality.

### Color and the IIGS

The Apple IIGS was Apple's first offering that promised a reasonably priced solution to the display-quality issue. The commercial focus on this computer has not been on resolution, however; it has been on color. The rich palette of the IIGS more than atones for Apple's past sins in this area, but, from the standpoint of educational computing, I'd rather have seen the development energy devoted to the creation of an equally spectacular monochrome display mode.

I keep both a monochrome and a color display connected to my IIGS and find that the monochrome display is far easier on my eyes.

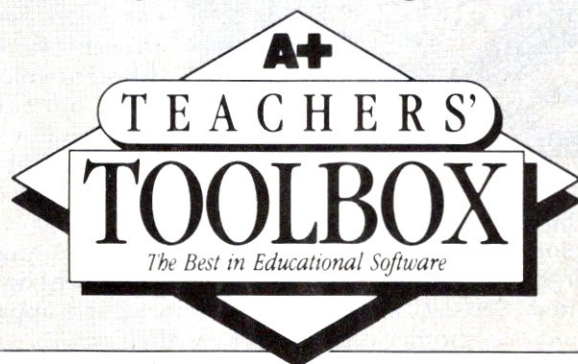
Judging from the software that has appeared for this computer, most software developers have

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gone wild with the color capabilities of the IIGS rather than focus on the creation of easy-to-read displays. The rationale probably has to do with the high visual impact of a color display in store demonstrations. Color sells, and monochrome is boring. The fact that a display filled with riotous color can tire the eyes over time doesn't occur to purchasers; the dazzle of the display makes the sale.

### The Misuse of Color

As an extreme example of this problem, consider the word-processing programs now available for the Apple IIGS. Almost every IIGS word-processing program I have seen lets you create documents in color. Never mind that most people don't have color printers or that our culture has not validated the communicative power of colored text—the software developers have created color word-processing programs because doing so is feasible, not because it is desirable.

This use of color reminds me of many people's first response to word processing on the Macintosh. Because the Mac can handle many different typefaces, many neophyte Mac users feel compelled to use as many different typefaces in a document as they can. The result is so cluttered that the information value of the text is diminished rather than enhanced. Fortunately, most Mac users quickly learn that a document should be limited to a few typefaces and typestyles and that these faces and styles should clarify the communication, not confuse it.

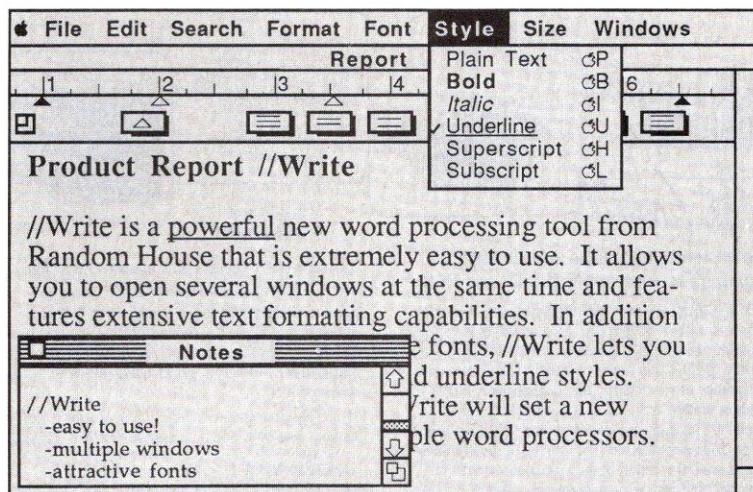
Suppose we all had color printers on our desks. Would the IIGS color word-processing programs help us present clearer messages than their monochrome counterparts? I don't think so. Remember that the communicative value of different typefaces is the result of many centuries of development and refinement. The same cannot be said for color. Typeface quality depends on screen resolution, which adds to my argument that resolution is more important than color.

### The Reality of Schools

Here is one last reason for suggesting that color may be oversold as a tool for educational computing. It is a reason that has nothing to do with intrinsic value, with at-

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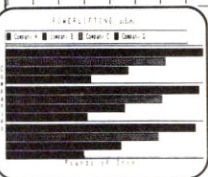
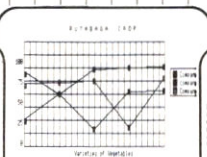
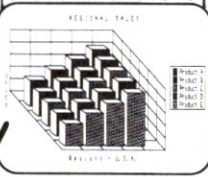
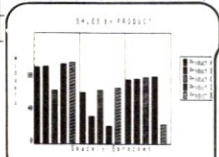
#### System Requirements:

// Write runs on the Apple IIe/c (128K) and Apple IIgs. Requires only one disk drive. All functions can be used with the keyboard or with a mouse.

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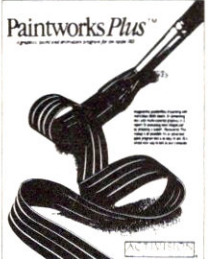
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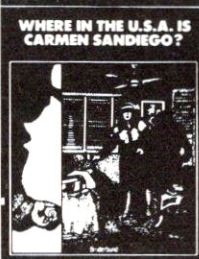
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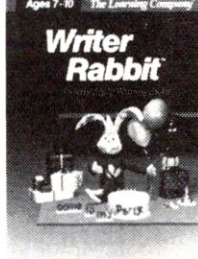
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*Software developers have created color word-processing programs because doing so is feasible, not because it is desirable.*

tractiveness, with students' color blindness, or any of the issues I've explored above.

It has to do with money.

In my travels around the country, I get to see hundreds of classrooms. With few exceptions, the computers in these rooms have monochrome displays. Monochrome displays are much less expensive than color monitors, and the reality of school equipment budgets dictates that costs be kept as low as possible.

Therefore, even if computer color were as wonderful an educational tool as some developers think it is, any developers who ignore the reality of today's classroom do so at their own risk. Software that asks students to look at the green triangle is useless on a black-and-white display.

### A Partial Solution

Developers who want to ensure effective use of their software in classrooms should consider the following solution: Programs can ask if you're using a color or a monochrome monitor. Based on the answer, the program's messages can change, and the color-dependent aspects can use a fill pattern or shade as an attribute instead.

I've seen good use of such a technique in some programs. One that comes to mind is Commodore 64 Logo. If you are using a monochrome monitor, the language can operate in a monochrome mode in which the resolution of the graphics effectively doubles. This type of trade-off between resolution and color (which is admittedly easier for computers with dedicated display processors) provides the best of both worlds.

Developers must ask themselves whether they are creating software to show off their talents or to meet the needs of their customers. Sometimes these goals are in conflict. +

## THE ANSWER TO SEPTEMBER'S CHALLENGE

*Fast execution determines two winners.*

This is my last "Computer Calisthenics" column in *A+*. It has been an enjoyable two years. I'd like to thank *A+* for giving me this space, all of you who read the column and tried the puzzles, and the literally thousands of you who entered the contests. I'm sorry I couldn't award every one of you prizes.

The September challenge asked for a multiple of 7 whose square had eight digits of the form *ababbcc*, where *a*, *b*, and *c* were different digits. This puzzle generated more entries than for any other contest since I started this series long ago in *Dr. Dobb's Journal*. I got letters from all over the U.S., Canada, Europe, and the Far East. The ages of entrants ranged from 13 to something in the 80s claimed by one fellow.

Many readers had trouble getting their programs to recognize the correct answer when they made the assumption that the *SQR* function would provide an integer. A comparison such as `IF SQR(A/7) = A/7 THEN ...` might not work, whereas `IF ABS(SQR(A/7) - A/7) > .00001 THEN ...` does. The problem is that the Apple stores floating-point numbers in binary format, which produces round-off errors. You need either a version of BASIC that uses binary coded decimals (BCD) or a modified comparison such as the preceding.

Of the hundreds of entrants, all but two or three found the correct answer. Most of their programs execute in anywhere from 15 to 60 seconds. A smaller group added a



bit of insight that sped up their programs considerably—theirs run in 8 to 12 seconds. Two very clever programmers made quantum leaps in their algorithms, so I declare two winners this time. George Sandor, of Ottawa, Ontario, Canada, submitted an Applesoft BASIC program that runs in less than three seconds.

The only program that came even close to this time was the Applesoft BASIC program of John Everett, of Waynesboro, Virginia. Everett's program is beautiful in its simplicity, shorter, and easier to understand. It runs in less than five seconds.

Where people fell down in trying to solve this puzzle was in trying to generate all the eight-digit numbers and then extracting their digits and comparing. Or else they generated the digits but produced too many. Or they converted to strings to compare digits and then converted back again.

Let's look at Everett's program first. One clever thing he did was notice that a square, *any* square, whose last two digits were the same, could end in only 00 or 44. Thus, where many entrants generated *C* from 0 to 9 in their three nested loops, he generated only 0 and 4, reducing the number of loops from 10 to 2. Also, instead of trying to produce the candidate for square by converting to strings and building a new number, he saw that if you have three digits, *A*, *B*, and *C*, the new number is formed by

$$A * 10100000 + B * 1011100 + C * 11$$

Not only is the *SQR* operation

inaccurate, but it is also slow on an Apple II. Everett's program calls it only three times. It checks for whether the candidate is a perfect square by taking the square root of the number and seeing if that is an integer. It does so not by an equality, which might fail the comparison, but by checking whether the difference between the actual square root and the INT of that number is less than some tiny number (.00001 in this case).

Here's where the numbers come from in statement 150: 22 is 10100000 MOD 49 (the remainder when the number is divided by 49), 34 is 1011100 MOD 49, and 11 is 11 MOD 49. Statement 160 then checks for whether the number to be generated is evenly divisible by 49—if it is the square of a multiple of 7, that is.

For Sandor's program, I print a listing that traces what it's doing,

*I'd like to thank the  
literally thousands  
of you who entered  
my contests. I'm sorry  
I couldn't award every  
one of you prizes.*

together with embedded documentation. Running this program even with that "tracing" in place takes less than five seconds, faster than with any other entry save Everett's. In order to achieve the less-than-3-second run—and print out only the solution—remove statements 180, 190, and 1065. The program requires this additional explanation:

Lines 110-170 find all possible last two digits *cc* of a square *ababbcc*. You need only look for squares of 0 to 25, since all other squares *repeat* the sequence of last two digits. That is, for any given *x*, the last two digits in  $x^2$ ,  $(50 - x)^2$ ,  $(50 + x)^2$ , and  $(100 - x)^2$  are the same. Here is the proof:

$$(50 - x)^2 = 2500 - 100x^2 + x = 100^2(25 - x) + x$$

$$(50 + x)^2 = 2500 + 100x^2 + x = 100^2(25 + x) + x$$

## JOHN EVERETT'S WINNING PROGRAM

```
100 FOR C = 0 TO 4 STEP 4
110 FOR B = 0 TO 9
120 IF B = C THEN 210
130 FOR A = 1 TO 9
140 IF A = C OR A = B THEN 200
150 M = A * 22 + B * 34 + C * 11
160 IF M - 49 * INT (M / 49) < > 0 THEN 200
170 NUMB = A * 10100000 + B * 1011100 + C * 11
180 ROOT = SQR (NUMB)
190 IF ABS (ROOT - INT (ROOT + 0.5)) < .00001 THEN GOSUB 240
200 NEXT A
210 NEXT B
220 NEXT C
230 END
240 PRINT "7 * ";ROOT / 7;" = ";ROOT;" ";ROOT;" * ";ROOT;" = ";NUMB
250 RETURN
```

7 \* 1084 = 7588; 7588 \* 7588 = 57577744

## GEORGE SANDOR'S WINNING PROGRAM

```
100 H = 100:T = 10
110 FOR I = 0 TO 25
120 X = I * I: REM Find all squares for 0-25
130 P = X - H * INT (X / H)
140 M = INT (P / T): REM Tens digit
150 N = P - T * M: REM Ones digit
160 IF M = N AND D(M) = 0 THEN D(M) = 1:L = L + 1:C(L) = P
170 NEXT I: REM If tens digit = ones digit, save last two digits P
    from statement 130 into C(L)
180 PRINT "L=";L: REM L is number of double digits possible
190 FOR I = 1 TO L: PRINT "C(";I;")=";C(I): NEXT I
1000 A = 10100000:B = 1011100:D = 49:S = 7:SM = 10 ^ - 4
1010 FOR I = 1 TO L
1020 X = C(I)
1030 FOR J = 1 TO 9
1040 X = X + A
1050 RM = X - S * INT (X / S): REM Remainder on division by 7
1060 Y = X + RM * B
1065 PRINT "Y=";Y;" is divisible by 7"
1070 RN = Y - D * INT (Y / D): REM Remainder on division by 49
1080 IF RN = 0 THEN GOSUB 2000
1090 IF RM + S < = 9 THEN RM = RM + S: GOTO 1060: REM Gives the next
    number in the series that is divisible by 7
1100 NEXT J
1110 NEXT I
1999 END
2000 REM Subroutine to test for perfect square
2020 Z = SQR (Y)
2030 IF ABS (Z - INT (Z + 0.05)) > SM THEN RETURN: REM If
    difference is too big, cannot be a perfect square, so return
2040 REM Test that digits A, B, and C are different, where:
2050 REM digit A=J, digit B = RM, digit C = C(I)
2060 IF J = RM OR J = C(I) OR RM = C(I) THEN RETURN: REM If any two of
    A, B, or C are the same, then not an answer, so return
2070 PRINT "The number Z=";Z;" is a solution,"
2080 PRINT "where ";Z;"*";Z;" = ";Y
2090 RETURN
```

The number Z=7588 is a solution, where 7588\*7588 = 57577744

$$(100 - x)^2 = 10000 - 200x^2 + x = 100(100 - 2x) + x$$

Hence, the last two digits of these squares are the same as the last two digits of *x*.

In line 1050, because *B* (= 1011100) leaves a remainder of 6 on division by 7, adding it to any number *x* reduces the remainder on division by 7 by 1 each time you add *B*. So, if you add *RM \* B*, you get a remainder of 0 on division by 7. The key to the program is to make one test at a time:

1. Divisibility by 7 (statement 1050)
2. Divisibility by 49 (statement 1070)
3. Being a perfect square (statement 2030)
4. Digits *A*, *B*, and *C* being unique (statement 2060)

The "full" program shows each criterion applied in turn. +

*Michael Wiesenber*g is the author of *Puzzled Programmers*, a book of new computer puzzles published by Microsoft Press.

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- Alphanumeric, 1 to 250 characters
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- Yes/No—only accepts "Y" or "N"
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- Add Date—date when record was added
- Edit Date—last date when record edited
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- 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
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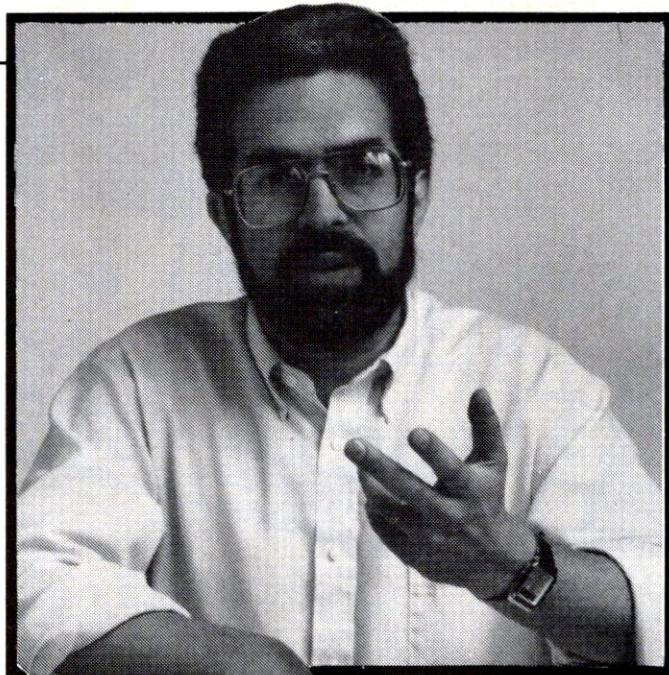
### Computed Fields:

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
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CIRCLE 267 ON READER SERVICE CARD



# TIPS AND TECHNIQUES

*Readers share tips for the II*

## CATALOG TIPS

One feature of BASIC.SYSTEM/ProDOS that I find quite useful, especially when I have a lot of files in a directory, is the ability to CATALOG the directory by file type. That is, you can tell the system to display only the names of files with a specified type. To do this, add the suffix ,Txx to the normal CATALOG command, where xxx represents the standard 3-character mnemonic for the file type (BAS, DIR, AWP, TXT, etc.), or the hexadecimal version of the file-type code number itself.

For example, to list all Applesoft programs in the current directory, use the command CATALOG, TBAS. CATALOG can also be followed by a pathname or partial pathname, so you can catalog by file type in any directory without having to change the current prefix first.

DR. KENNETH BUCHHOLZ  
WASHINGTON, NJ

## APPLEWORKS SHORTCUT

I'll bet most people don't know that you can return to the AppleWorks main menu from anywhere in the program in just two keystrokes: open-apple/Q followed by Esc. (Open-apple/Q is usually for switching between open files.) You can take advantage of this hint to simplify macro commands—no more multiple Esc tokens to guarantee a return to the main menu.

On a related point, if you're just

about to print a document but you want to make a last-minute change, you can quickly return to the document with open-apple/Q followed by Return (the proper filename is always highlighted).

MERRY PERRY  
BALTIMORE, MD

## APPLEWORKS IN COLOR

If you have an ImageWriter II and AppleWorks, you can easily print text in color. The key is to add a custom printer to your printer list and replace the Boldface Begin and End codes with ones that enable and disable color printing. You use the standard codes for the other printing features.

Here is the one-time procedure for setting up the color-printer driver:

1. Choose Other Activities from the main menu and then choose Specify information about your printer(s).
2. Choose Add a printer (maximum of 3) and then Custom printer, name the printer ImageColor (or whatever you like), and access it from slot 1.
3. The answers to the configuration questions should be as follows:  
Needs line feed after each Return—No  
Accepts top-of-page commands—Yes  
Stop at end of each page—No

Platen width—8.0 inches  
Interface cards—Don't change if you're using a Super Serial Card, IIc, or IIGS port. For other interfaces, check your manual.

Printer codes:

5 chars./inch	Control-N
10 chars./inch	Control-O
	Esc N (that's "oh")
12 chars./inch	Esc E
15 chars./inch	Esc q
17 chars./inch	Esc Q
6 lines/inch	Esc A
8 lines/inch	Esc B
Boldface begin	Esc K
Boldface end	Esc K0 (that's zero)
Subscript begin	Esc y Esc w
Subscript end	Esc z Esc W
Superscript begin	Esc x Esc w
Superscript end	Esc z Esc W
Underline begin	Esc X
Underline end	Esc Y

(Note: Select the option that says Printer has start/stop underline commands.)

Finally, escape back to the main menu, and you're done.

When preparing your document, identify a passage to be printed in color just as you would for boldfacing it: Press Control-B (a ^ will appear) and then type a one-digit color code: 1=yellow, 2=red, 3=blue, 4=orange, 5=green, 6=purple. At the end of the colored text, type Control-B once again. When you print the document, specify that you want to print the file to the ImageColor printer.

Here is how two sample sentences appear with embedded color codes:

This is:

```
^1G^^2R^^3E^^4A^^5T^^6!  
^1Yellow^, ^2Red^, ^3Blue^,  
^4Orange^, ^5Green^, ^6Purple^
```

When you have two nonblack colors next to each other, you will have to boldface-end the first before beginning the next color. That is why there are two carets between the letters in the word GREAT in the first example.

Also, the boldface-end for a color should appear on the same line as the boldface-start. If it doesn't, you must place the color-code digit at the beginning of each subsequent line, up to and including the line with the boldface-end, which becomes inconvenient when you edit the document and paragraphs are reformatted.

TOM DELUCA  
HALE, MI

## HOW TO AVOID WASTED DISK SPACE

When you save a short program to disk on top of a longer one, DOS

3.3 does not free up the sectors that the disk file is no longer using. To avoid this problem, always delete the file before saving the program. (Editor's Note: This same problem does not occur if you're using ProDOS 8 or ProDOS 16.)

RAYMOND KOC  
SAN FRANCISCO, CA

## CLOSED-APPLE MOUSEPAINT ICON

I recently discovered an undocumented feature of Apple's MousePaint program. If you enter the text-entry mode by clicking on the big A, you can press Control-T to make a closed-apple icon appear in your text. This icon is the same as the one on the left side of the menu bar.

BARRY HAUSNER  
TEANECK, NJ

## ABOUT SHORTCUTS

The "About..." option (used to display program version and copyright information), conventionally the first item in the Apple menu of a GS super hi-res desktop application, can be selected without using

the mouse. Simply press open-apple/Control-2 from the keyboard—Control-2 is a keyboard equivalent for the first item in the Apple menu whether or not the programmer designated as such. This shortcut also works for non-GS-specific programs such as MouseTalk that use Apple's text-screen-based Mousetext toolkit for implementing pull-down menus.

TIM SWIHART  
FORT WORTH, TX

## FLUSH THAT BUFFER

When you're running a program on the GS with the Keyboard Buffering option on and you wish to use Control-C to stop a listing or Control-S to pause video output, make sure you clear the keyboard input buffer first. Do this by typing Control-Open-Apple-Delete. If you don't do this, and you've previously typed keys (perhaps accidentally) that the program hasn't dealt with yet, your Control-C or Control-S will be ignored because they're not at the beginning of the buffer.

EVAN C. MALONEY  
COS COB, CT

# Press return



**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

### Il cue #27

Copy protection is stupid. It not only harms customers, in the long run it harms authors and publishers. It's a bad marketing strategy. With the IIGs in particular I advise you to stay away from copy-protected software. It's dangerous stuff. It can mess up your system and mess up your disks. It multiplies your incompatibility problems. Each dollar you spend on unprotected software is a vote for less copy protection in the future. Support unprotected software! For more, see "How about a boycott?" in the August 1987 **Open-Apple**, page 3.50.

### From our fan mail:

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New Windsor, N.Y.

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# A+ MARKETPLACE

THE #1 SHOWCASE FOR PRODUCTS AND SERVICES IN THE APPLE II MARKET

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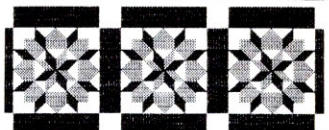
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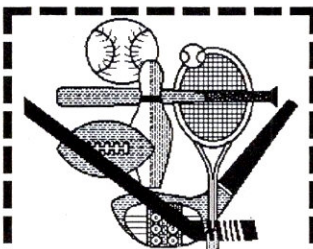
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# Rescue Squad

BY GARY B. LITTLE

## RESCUE SQUAD UPDATE

In the May 1987 "Rescue Squad," I answered a reader's question about TDD (telephone devices for the deaf) equipment for the hearing-impaired. Two readers have suggested other products that might be useful. Norman Williams, technical director of Hearing Impaired Technology, 3311 Riviera Drive, San Diego, CA 92109-6614, reports that he has developed AppleTDD (\$38) for use with the Novation Apple-Cat II modem. It is an interactive communications program, available via mail order only. On the hardware front, Stanley Sikorski of Krown Research, Inc., 10371 West Jefferson Blvd., Culver City, CA, 90232; (213) 839-0181 advises that Krown makes a TDD modem called the SM85 SMARTmodem. It is an external modem that connects to any computer through an RS-232 serial interface and can handle 45.5-bps Baudot TDD transfers as well as more traditional 300-bps ASCII transfers.

## AVIATION EDUCATION

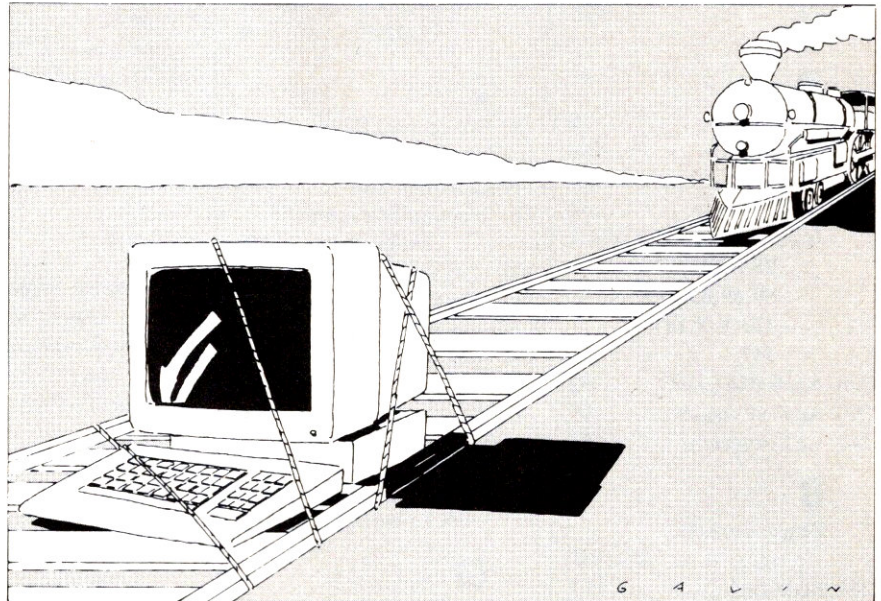
**Q.** Do you know of any software that is suitable for teaching students about aviation?

LILLIAN MURPHY  
PROCTORSVILLE, VT

**A.** The Federal Aviation Administration has a free set of programs for the IIe you might find useful. It is called Aviation Science Instruction Program (ASIP) and is an interactive, question-and-answer teaching program. To order the software, send seven 5¼-inch diskettes to:

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## PERFECT SQUARES

**Q.** I'm trying to write a program to determine whether or not a given number is a perfect square of a whole number. The program statement I've tried to use is

```
IF INT(SQR(X)) = SQR(X) THEN PRINT  
  'Perfect'
```

but it does not work for certain obvious solutions, such as 9 and 25. What's going on?

MARY LAYTON  
ST. LOUIS, MO

**A.** When Applesoft performs computations, it first converts all numeric operands to a special binary floating-point format. If the number cannot be represented exactly in this binary format, rounding errors will occur, resulting in a loss of precision. This situation leads to the strange results you've observed. The work-around solution to your problem is to test not for equality, but for "closeness." If you change your program statement to

```
IF ABS(INT(SQR(X))-SQR(X)) < 0.001 THEN  
  PRINT 'Perfect'
```

your program will work just fine.

## RETURNING TO THE DESKTOP

**Q.** It seems that after going to Applesoft BASIC from the GS DeskTop program, I have to reboot to return to the DeskTop. Is there an easier way?

GARY DAWSON  
ENGLEWOOD, CO

**A.** A portion of the DeskTop program installs itself as the ProDOS "quit code." As a result, you can return to it by typing BYE while you're in the Applesoft command mode. The same technique works if you're using the Finder program, which Apple now includes on the Apple II GS system disk instead of DeskTop.

## READING THE GS CLOCK

**Q.** How can I read the date and time from the GS clock and place the information in a variable so that I can use it in an Applesoft program?

DAVID POST  
WOOSTER, OH

**A.** The program in Listing 1 will do the trick for you. It uses the ReadAsciiTime function in the Miscellaneous tool set to obtain a standard 20-byte time string, then assigns it

to an Applesoft string variable. After entering the program at location \$300, call it by placing two statements in your program: CALL

768, TM\$ and TM\$=MID\$(TM\$,1). The format of the time string returned by ReadAsciiTime depends on the Month/Day/Year and

Hour/Minute/Second formats you've selected under the Clock option in the Control Panel. The default is a string of the form MM/

```

1          XC          ;Permit 65816 opcodes
2          XC
3
4          *****
5          * How to read the GS clock from *
6          * an Applesoft program.         *
7          *                               *
8          * CALL 768, TM$:TM$=MID$(TM$,1) *
9          *                               *
10         *           by Gary Little      *
11         *                               *
12         * [Merlin Assembler format]    *
13         *****
14
15         VARPNT EQU $83          ;Pointer to variable's data
16         CHKCOM EQU $DEBE       ;Check for comma
17         PTRGET EQU $DFE3       ;Find address of variable
18
19         * Define a macro for the 65816 JSL instruction:
20
21         JSL MAC
22
23         DFB $22          ;opcode for JSL
24         DA ]2           ;Bank offset address
25         DFB ]1          ;Bank number
26         <<<
27
28         * The subroutine begins here:
29
30         ORG $300
31
32         0300: 18          CLC
33         0301: FB          XCE          ;Enable 65816 native mode
34         0302: C2 30      REP $30      ;16-bit registers
35
36         0304: F4 00 00    PEA THE_TIME/256/256
37         0307: F4 2A 03    PEA THE_TIME ;Push address of string space
38         030A: A2 03 0F    LDX #$0F03 ;Function $0F, Misc. tool set
39         JSL $E1;0000     ;Call tool set dispatcher
40
41         030D: 22          DFB $22          ;opcode for JSL
42         030E: 00 00      DA 0000         ;Bank offset address
43         0310: E1          DFB $E1          ;Bank number
44         <<<
45
46         0311: 38          SEC
47         0312: FB          XCE          ;Back to emulation mode
48
49         * Stuff the result into the string variable:
50
51         0313: 20 BE DE    JSR CHKCOM     ;Skip over comma
52         0316: 20 E3 DF    JSR PTRGET     ;Find TM$ descriptor
53         0319: A0 00      LDY #0
54         031B: A9 14      LDA #20          ;Length always 20
55         031D: 91 83      STA (VARPNT),Y ;Save length
56         031F: C8          INY
57         0320: A9 2A      LDA #<THE_TIME
58         0322: 91 83      STA (VARPNT),Y ;Save pointer (low)
59         0324: C8          INY
60         0325: A9 03      LDA #>THE_TIME
61         0327: 91 83      STA (VARPNT),Y ;Save pointer (high)
62         0329: 60          RTS
63
64         032A: 00 00 00 59 THE_TIME DS 20 ;Time string returned here
65         032D: 00 00 00 00 00 00 00 00
66         0335: 00 00 00 00 00 00 00 00
67         033D: 00
68
69         60
70         --End assembly, 62 bytes, Errors: 0

```

Listing 1. A subroutine to load the current time string into an Applesoft variable.

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dd/yy hh:mm:ss XM, where MM=month, dd=day of month, yy=year, hh=hours, mm=minutes, ss=seconds, and XM represents AM or PM. Use the Applesoft string parsing commands to isolate portions of the time string you want to deal with.

## C COMPILER FOR THE II

**Q.** Is there a C compiler for the Apple II series?

MARK EDGAR

GEORGETOWN, TX

**A.** For one reason or another, C has never seemed to catch on with developers of Apple II software. Almost all commercial software for the IIe and IIc computers is written in assembly language, Applesoft, or Pascal.

This situation may change, at least for GS software developers, since Apple has published an "official" version of C that works with the Apple Programmer's Workshop. This version was developed by Megamax, Inc., and it runs on the GS only. It is available from APDA, 290 S.W. 43rd Street, Renton, WA, 98055; (206) 251-5222. It costs \$75, and you must be an APDA member to order it.

If you need a C compiler for pre-GS Apple II models, the only real choice is Aztec from Manx Software Systems, 1 Industrial Way, Eatontown, NJ, 07724; (201) 542-2121. It also works on the GS but does not take advantage of expanded memory or other unique GS features. Manx's top-of-the-line version is Aztec C65-c, which runs under ProDOS but is also capable of creating programs that run under DOS 3.3. It includes an assembler, a linkage editor, a text editor, a programming shell, and library utilities. The price is \$299.

Lower-priced versions are Aztec C65-d (DOS 3.3 only) for \$199 and C'Prime (a subset of C65-d) for \$75.

A spokeswoman for Aztec promises that a GS-specific version of Aztec is in the works and should be available in early 1988. +

*Gary Little is A+'s senior technical editor and author of several books about Apple computers. Please send your questions and problems to "Rescue Squad," A+, 110 Marsh Drive, Suite 103, Foster City, CA 94404. Because of limited space, we aren't able to publish responses to all inquiries we receive.*



for the Apple II GS

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▶ Your primary job function is:

	(1.) Own	(2.) Plan to Buy
Apple IIGS	A.	F.
Apple IIc	B.	G.
Apple IIe	C.	H.
Laser 128	D.	I.
IBM or clone	E.	J.

	(3.) Plan to Buy in 1-3 Months
Printer	K.
Additional Memory	L.
Modem	M.
Disk Drive-Hard	N.
Disk Drive-Floppy	O.

	Check one
Administrative/General Management	P.
Professional/Technical	Q.
Marketing/Sales	R.
Teaching/Education	S.

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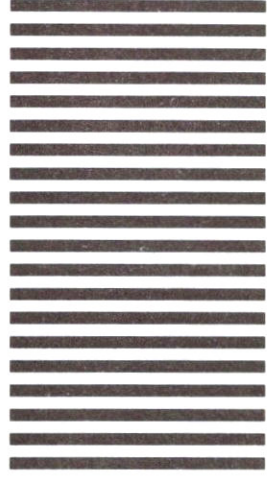
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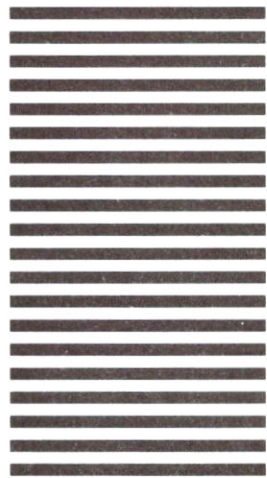
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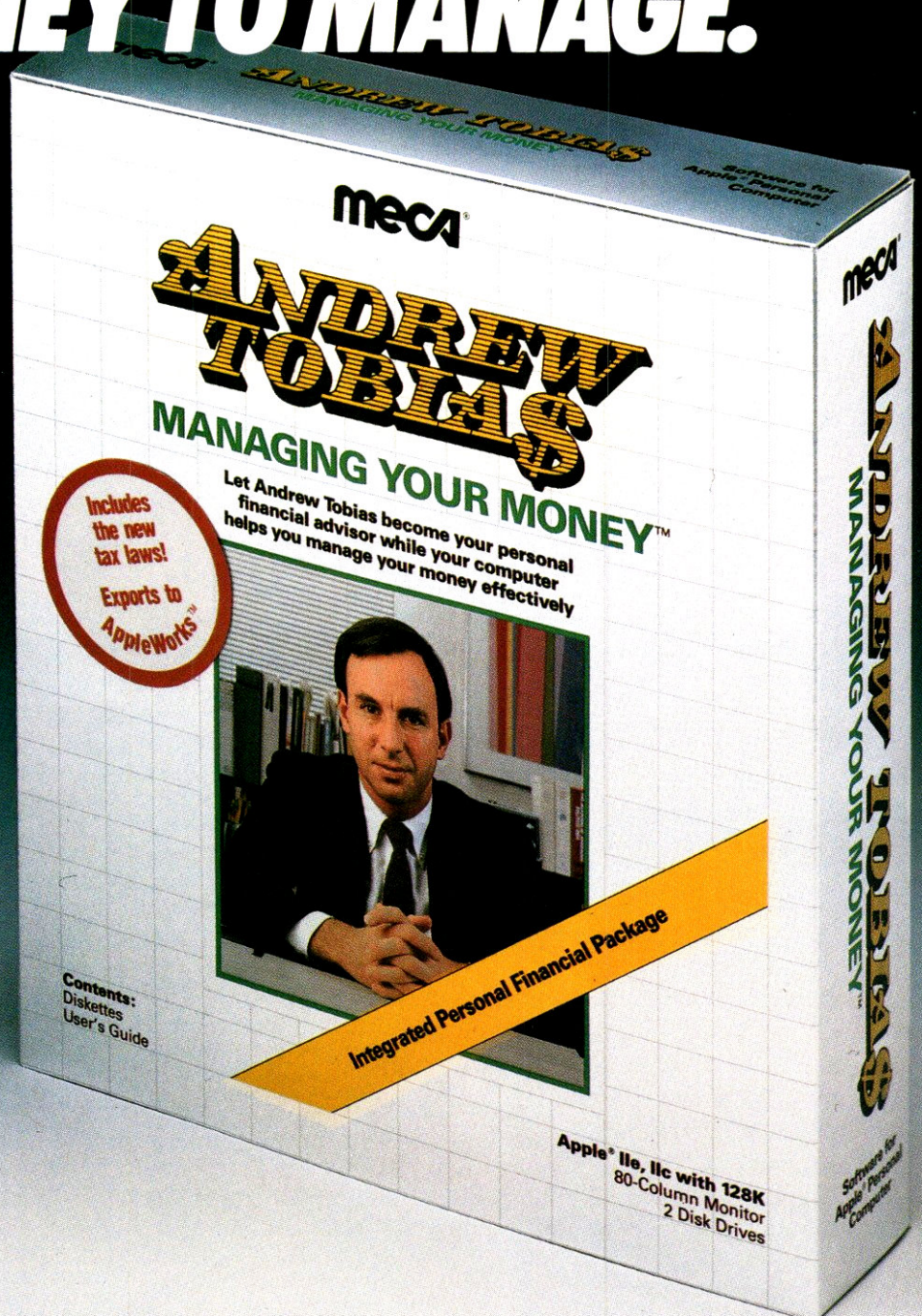




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# Introducing System Saver IIgs! The next generation.



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System Saver IIgs



Apple IIgs

Years ago, when Apple introduced the first Apple® II, we thought it needed a little help. Over ¼ million Apple II users thought so too. That's why they chose our original System Saver to organize, protect and cool their computers.

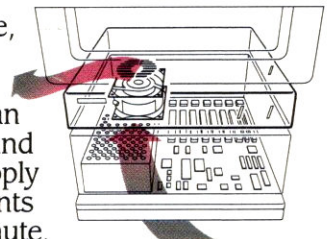
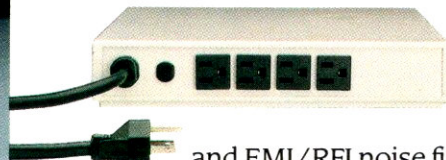
When Apple brought out their next generation Apple IIgs, we thought it deserved the same good treatment. That's why we're proud to announce *our* next generation – System Saver IIgs.

System Saver IIgs organizes your power with four outlets for your computer, monitor, and two peripherals. And it puts everything at your fingertips with two front-mounted switches. (One switch controls your computer and monitor. The other controls your peripherals.)

System Saver IIgs also protects your valuable equipment and data from dangerous power surges, spikes and noise. Surge suppression circuitry\* clips surges and spikes at a safe level, and EMI/RFI noise filtering smooths out disruptive line noise to make your IIgs more reliable and longer lasting.

Best of all, System Saver IIgs keeps your Apple cool – more quietly and efficiently than the optional internal fan offered by Apple. How? Well, the bottom of the System Saver IIgs forms a seal with the top of the IIgs case, so its whisper-quiet fan draws air *up and through* your computer, instead of just pushing it around inside. More powerful than the Apple fan, it pulls air through the back and bottom vents of the IIgs, over the power supply (the primary source of heat), and out the vents in the top at the rate of 17 cubic feet per minute. And there's nothing to install inside the computer, so it won't block two slots like the Apple fan.

System Saver IIgs, \$99.95, is available at Apple dealers everywhere. For a dealer near you, or for more information, call toll-free (800) 535-4242. In NY, call (212) 475-5200. CIRCLE 134 ON READER SERVICE CARD



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