

A

The #1 Apple II Magazine

PAINTWORKS GOLD FOR THE IIgs

JUNE 1988
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\$3.95 CANADA, FOREIGN

MAKING MUSIC



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DR KENNETH BUCHHOLZ
WWW.APPLE2ONLINE.COM



For everyone who ever wished their Apple II could turn into a Mac-Intosh, we've got some great news.

It's called GEOS. And it turns any Apple IIe, IIc or compatible into a ProDOS-compatible, mouse-driven, icon-loaded, graphical operating powerhouse that packs all this power into one package: A desktop file manager, four applications, three utility programs, five desk accessories, six fonts and an interrupt management card.

GEOS (Graphic Environment Operating System) opens your Apple to an infinite number of graphically-oriented applications. Like writing, painting, desktop publishing, calculating—in fact, GEOS can do just about anything a Mac can do.

The kernel at the core of your Apple.

What changes your Apple at its very core is the herculean GEOS kernel, which supports printer drivers, input drivers and proportionally-spaced fonts. It also supports pull-down-menus. Icons. Dialogue boxes. Cutting and pasting data within and between applications. And switching directly from one application to another.

It supports peripherals, desk accessories—in short, it supports just about everything you'd ever want to do with a computer.

And all this without missing a beat. That's because the interrupt management card makes sure you never miss a key stroke, no matter how fast your fingers fly.

Everything's controlled from the deskTop.

The GEOS deskTop lets you control and manipulate virtually everything from icons to RAM disks. And the way you control everything is very simple:

Point and click.

When GEOS offers you options, you just point to your answers and click your mouse or joystick.

You want to copy a file? Point and click.

You want to print a file? Point and click.

You want to delete a file? Point and click, and drop it in the waste basket.

The deskTop also keeps you organized. Art, documents—everything is stored and filed on the GEOS deskTop. View files as icons or text. Even sort files by type, name, date or size.

And you can keep yourself organized on up to four different disk devices: 5¼", 3½" hard disks and RAM disks. All at the same time or in any combination.

A few bits off the old Mac.

But if you really want to get Mac-like, open up geoWrite 2.1. The "What You See Is What You Get" word processor that lets you center, justify, search and replace text. You can move blocks of copy. Cut and paste. Use headers and footers and even display your text in fonts of different styles and sizes—**bold**, *italic*, plain, outline or underline—right on the screen. And since they're the exact same bit image fonts as the Mac, the documents off a LaserWriter or ImageWriter are indistinguishable from a Mac's.

If your spelling isn't up to par, fear not: geoSpell scans your script and fixes your faux pas in context right before your eyes. And for all the documents you've already written on another word processor, there's Text Grabber, which converts your non-GEOS files into geoWrite format.

For those form letters that need to address themselves to different people, there's geoMerge, the text manager that supports everything from simple mail features to conditional paragraphs.

Put that all together with geoLaser's PostScript support, and all of a sudden the documents on that little Apple of yours are looking

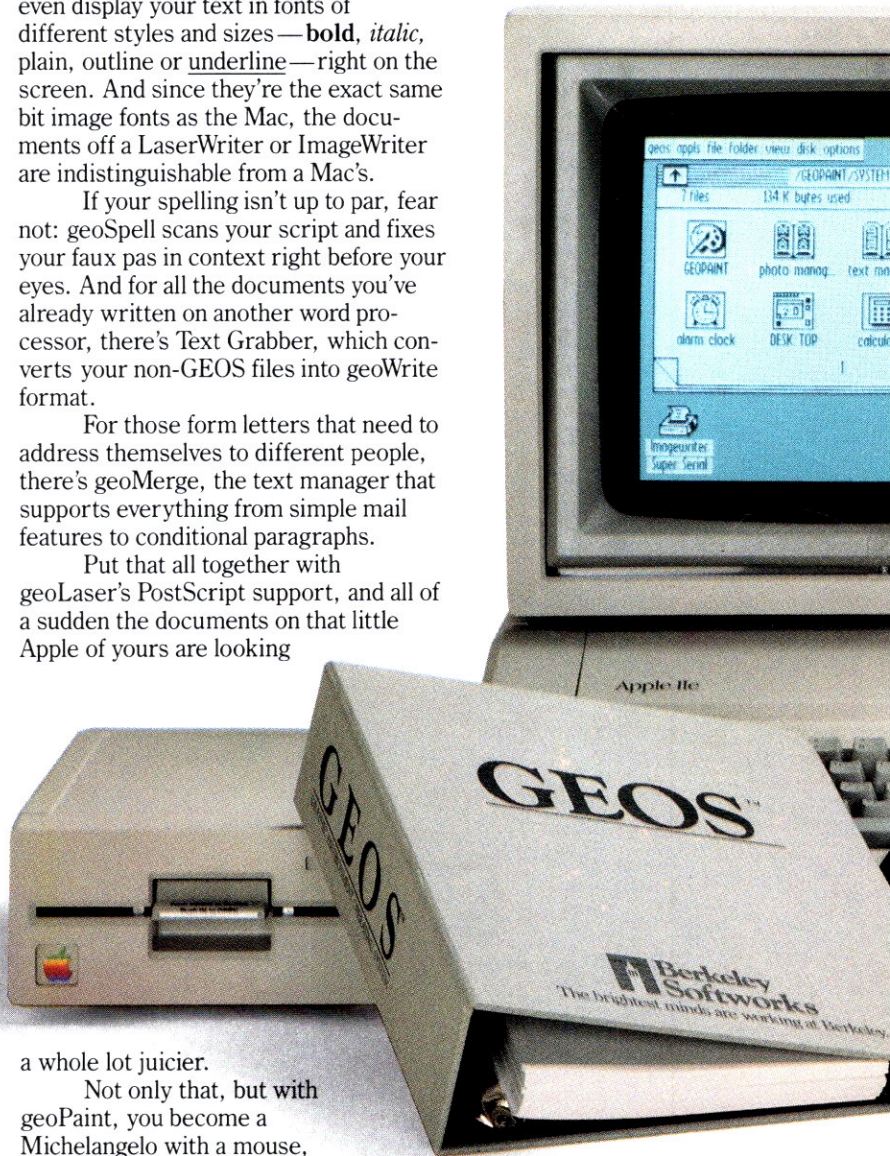
a whole lot juicier.

Not only that, but with geoPaint, you become a Michelangelo with a mouse, sketching and painting on an 8½" × 11" page with 32 brushes, 32 patterns and all kinds of textures.

You can invert, mirror and rotate images. Zoom in to edit pixel by pixel, or preview the entire page. Insert pictures into your geoWrite documents. Or save them in your GEOS Photo Album for use later.

There's even a set of pop-up desk accessories for that helping hand in any application. There's an alarm clock that

WORD



keeps you punctual. A notepad that keeps your memos. And a calculator that keeps your accountant honest.

Polish up your Apple with GEOS.

There are even more GEOS applications on the way. Spreadsheets, databases, desktop publishers—you name it. All of them importing and exporting to



The brightest minds

Apple IIe, IIc, IIgs are trademarks of Apple, Inc. GEOS, geoWrite, geoPaint, geoLaser, Text Grabber, geoSpell, geoMerge and Berkeley Softworks are tradenames of Berkeley Softworks. AppleWorks, WordPerfect and MultiScribe are tradenames of companies other than Berkeley Softworks.

DING.

GEOS™ for 128K, 80 column Apple II computers.

- True graphical operating system.
- Data file compatibility with GEOS applications for other systems, such as Commodore C64 and C128.
 - Dialogue boxes.
 - Proportional fonts in 5 styles.
 - Supports variety of printer interface cards, input devices (such as mouse or joystick), hardware clock cards, printers and disk drives.

joystick), hardware clock cards, printers and disk drives.

- Keyboard shortcuts.

1. deskTop™

The graphic interface from which you operate the powerful GEOS system.

- Graphic representation of disk catalog & GEOS operations.
- Supports ProDOS files (list, copy, run, etc.).
- Supports hierarchical file structure (directories): Create, copy and move directories.
- View files in either icon or text mode.
- Automatically sorts files alphabetically or by size, type or date.
- Open, copy or delete files in seconds: Copy or delete entire directories in one step. Select several files at once to perform multi-file operations.
- Formats, verifies and erases disks.
- Simultaneously supports combinations of up to 4 disk devices: 5-1/4" drives, 3-1/2" drives, hard drives and RAM drives.
- Applications and desk accessories stored in the "system folder" are listed in drop down menus, and can be run from any directory.
- Double-clicking data file automatically searches for parent application on each disk.

2. geoWrite 2.1™

All the GEOS-compatible tools that a writer needs to make professional documents.

- "What You See Is What You Get" orientation.
- Point and click text selection: Perform moves, copies, deletions and changes on blocks of text.
 - Supports LaserWriter through geoLaser.
 - Multiple proportional fonts in a variety of point sizes same bit images as the Mac.
 - Variable styles (**bold**, *italic*, outline, underline).
 - Cut, copy and paste text or graphics from other programs, like geoPaint.
- Left, right and full justification.
- Adjustable margins from 0.25" to 8.25".

- Automatically scans geoDictionary and personal dictionary.
- Single or all occurrence replace options.
- Edit and update personal dictionaries at any time.
- Ability to scan the geoDictionary and the personal dictionary independent of the geoWrite document.

4. Text Grabber™

- Convert existing word processing documents to the GEOS environment from other word processing programs, such as AppleWorks, WordPerfect and MultiScribe.
- Reformat new files with ease.
- Files from other word processors are ported with formatting commands intact.
- After converting files into geoWrite documents, you can change fonts, formats, styles and paste in graphics.

5. geoMerge™

- Create personalized form letters, merge names and addresses or conditionally include whole paragraphs.
- Print merged documents directly to the printer or create geoWrite files.
- Merge data can be entered manually, typed into a geoWrite file, or be created by other GEOS applications, such as geoDex and geoFile.

6. geoPaint™

- Create charts, diagrams or full page images up to 8 1/2" x 11".
- Zoom in for detail work.
- Cut, copy and paste images to and from other GEOS applications/documents.
- Preview entire page.
- Keyboard shortcuts.
- 14 separate graphic tools:
 - Scroll to an adjacent area in your picture, or use window tool. Select any area of the page and: Move, Copy, Clear, Invert, Rotate, Mirror (horizontally and vertically). Pattern Fill: 32 distinctive painting patterns. Stop pattern fill at any time. Spray Paint: Gradually paints the current pattern for shading effects. Ruler: Measure in inches or pixels. Line: Create separate or connected lines. Brush: 32 different brushes to choose from, each brush paints in the current pattern. Pencil Eraser: Erase a small section or the whole screen. Text: Display text in a variety of GEOS fonts (bold, underline, italics, outline, inverted). Edit text before pasting into picture. Rectangles: Draw rectangles open or filled with the current pattern. Ability to constrain rectangle to a square. Ellipses: Draw ellipses open or filled with the current pattern. Ability to constrain ellipse to a circle. Undo: Undo the last command.

7. Desk Accessories

- Available from within any application.
- Notepad.

- Calculator.
- Alarm Clock.
- Photo Manager (scrapbook for collecting pictures).
- Text Manager (scrapbook for collecting text).

8. geoLaser™

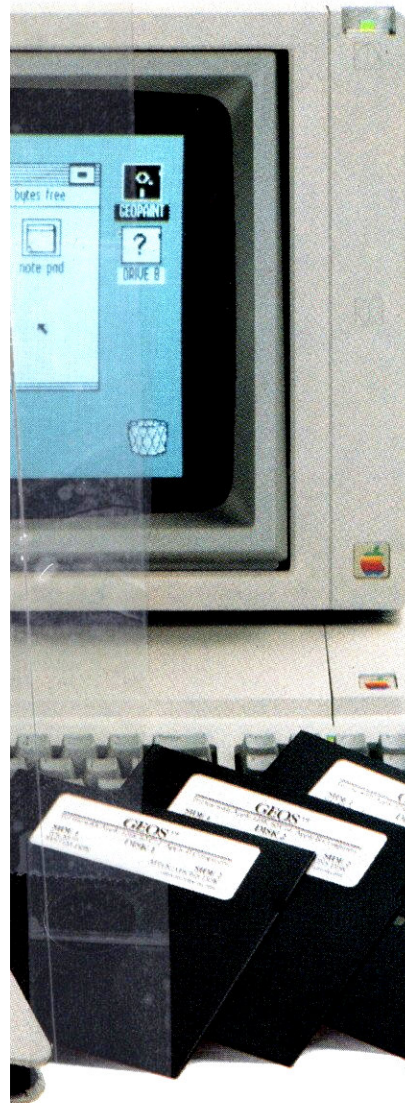
- Produce near-typeset quality output on an Apple LaserWriter.
- Create multi-column and windowed pages with the overlay print option.

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\$2.50 US/\$5.50 Foreign for shipping and handling.
Allow six weeks for delivery.

*GEOS requires 128K and 80 column card.



With GEOS, any Apple IIe, IIc* or compatible becomes a menu/icon driven powerhouse.

and from each other, so that you can manage everything with one integrated system.

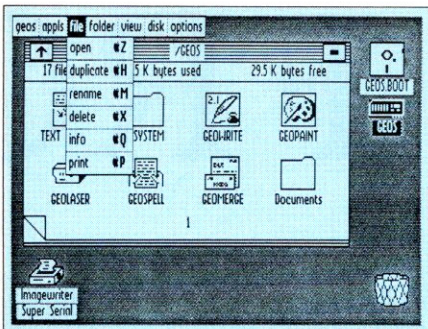
So the next time someone asks you which Apple is the one that's famous for its mouse, icons and desktop publishing, don't stammer. Don't hesitate. Don't even blink.

Just load up your Apple II with GEOS, look them straight in the eye, and say, "Mine."

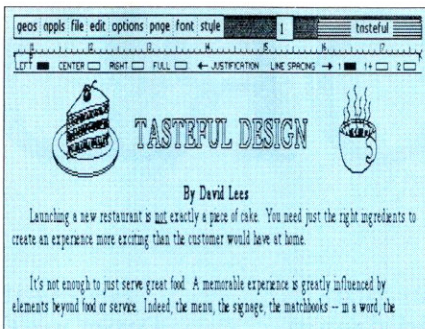
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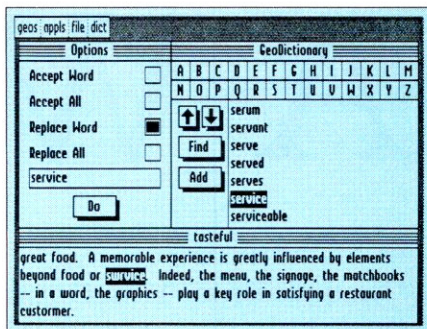
**NAME AN
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FAMOUS FOR
ITS MOUSE,
ICONS, GRAPHIC
APPLICATIONS
AND DESKTOP
PUBLISHING.**



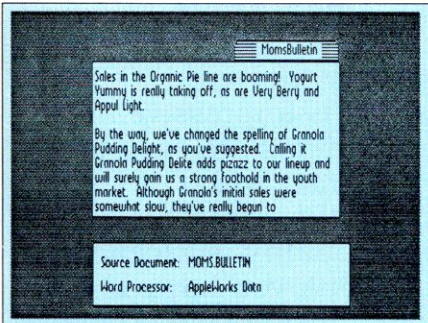
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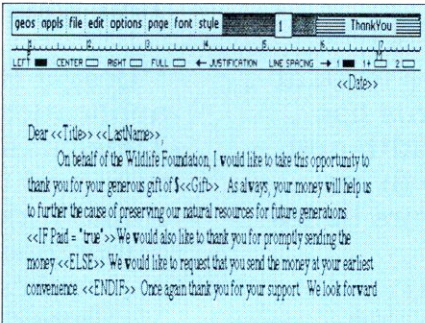
2. WYSIWYG ("What you see is what you get") word processing.



3. Contextual spell checking.



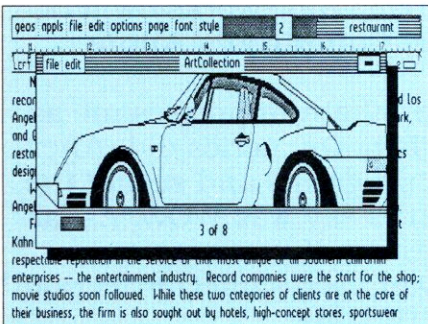
4. Text conversion and importing.



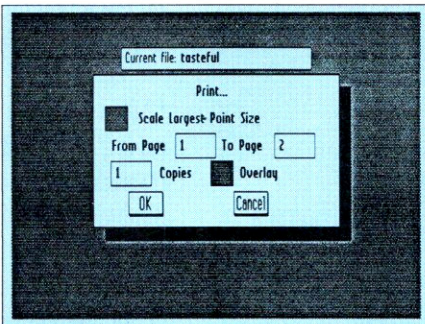
5. Sophisticated mail merging.



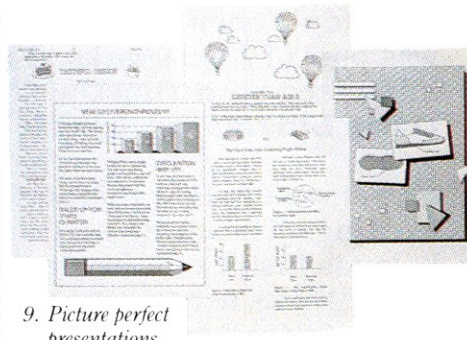
6. Hi res graphics editing.



7. Handy desk accessories.



8. LaserWriter printing.



9. Picture perfect presentations.



A WORD FROM

“Beagle Bros’ TimeOut series puts every enhancement you could dream of right inside AppleWorks.”

Paul Statt, inCider

“TimeOut DeskTools does its work at blinding speed . . . Beagle Bros has done its homework...the breadth and quality of this opening salvo in the AppleWorks enhancement wars bodes well.”

Charles Rubin, A+

“TimeOut Graph works seamlessly; if you didn’t know better, you’d swear it was part of AppleWorks...I’m very impressed with TimeOut.”

Owen Linzmayer, Nibble

“I personally find this series very exciting...The entire series of programs belongs inside of every serious AppleWorks user’s repertoire!”

Marc Apfelstadt, Call-APPLE

“The TimeOut series is the best thing to come along for AppleWorks users.”

Lee Hayward, TAWUG

“The TimeOut series programs are excellent AppleWorks enhancements.”

**Warren Williams,
NAUG AW Forum**

“TimeOut UltraMacros is incredible. TimeOut QuickSpell is a work of true genius...I love this program.”

Tom Weishaar, Open-Apple

“Beagle Bros’ foray into the applications arena is impressive...The TimeOut series add-ons are easy to use...and they interact with AppleWorks perfectly...TimeOut SuperFonts print quality is excellent, and makes you think you have a Macintosh hidden inside your Apple II...The TimeOut series is a major breakthrough for AppleWorks owners.”

Gregg Keizer, Compute!’s Apple

“It is rare a program impresses me as much as the TimeOut series did. After installing the programs and seeing the speed, all I could say was WOW. As far as I am concerned, if you use AppleWorks you need TimeOut. Period!”

Jay Wilbur, Uptime

“TimeOut ‘fits’ AppleWorks like a glove and in no time you get the feeling that it ‘belongs’ with AppleWorks...TimeOut SideSpread is terrific...TimeOut FileMaster is indispensable.”

**Ib Thorsteinsson, Robert Grist and
Lorne Walton, Apples B.C. News**



M THE WISE.

“Fabulous!”

Howard M. Adkins, Tucson, AZ

“Installation was a breeze.”

Charles O. Ward, Centreville, VA

“I think you have come as close to a perfect concept as I have seen in computer software.”

Robert L. Davidson III, Princeton, NJ

“The TimeOut series is the best set of AppleWorks add-ons that I have had the pleasure to use in the three years I've been using AppleWorks.”

Chuck Newby, San Diego, CA

“Your TimeOut series is EXCELLENT! It is far better than other add-ons!”

Eric C. Mueller, EAFB, AK

“It is so completely integrated into AppleWorks that it's easy to forget that it's an add-on.”

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“I think that you have really changed the complexion of AppleWorks from a reasonable compromise for the amateur computist to a flexible and powerful program. The whole thing is quite elegant.”

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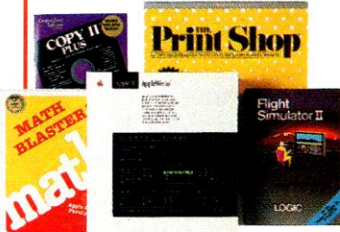
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The Laser 128EX is 3 times faster than an Apple IIe or IIc.

The Laser 128EX Apple-compatible computer has all the built-in features of the popular Laser 128, plus more. MORE FEATURES, MORE MEMORY, MORE SPEED AND MORE EXPANDABILITY. The Laser 128EX is designed for the serious computer user, and it's ready-to-run — plug it in, insert your program and take-off. This machine is built to race.

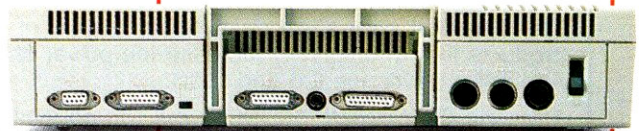


Speed through the largest software library in the world.

The Laser 128EX runs Apple IIe and IIc software at speeds never before achieved. Its built-in 192K RAM (128K — User and 64K — Video) memory and triple speed processor lets you run programs at a world class pace. The Laser 128EX is a machine designed for leading performance.

The 128EX has everything built-in, including a disk drive and interfaces to all your peripherals,

including serial and parallel printers, a modem and mouse, joysticks, external 3 1/2" and 5 1/4" drives, and even a color RGB or monochrome monitor. Only the Laser 128EX has all these performance features built-in.



The Laser 128EX is expandable!

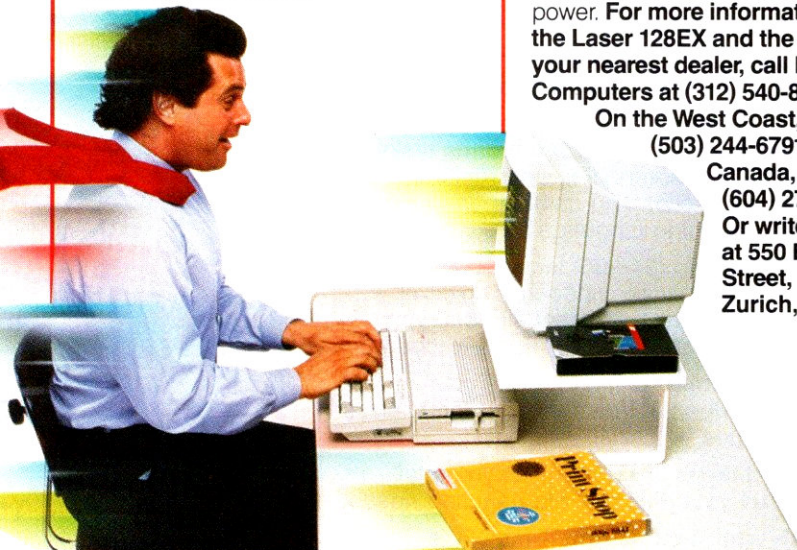
Boost the internal memory of the 128EX over 1Mb with its fully socketed RAM board. And, it has an expansion slot to let the computer grow with your increasing demands.

The Laser 128EX performs like a top-of-the-line Apple, but is priced like a Commodore.

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On the West Coast, call (503) 244-6791. In Canada, call (604) 273-2828. Or write to us at 550 E. Main Street, Lake Zurich, IL 60047.



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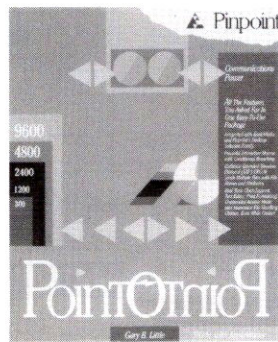
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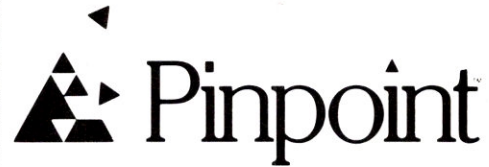
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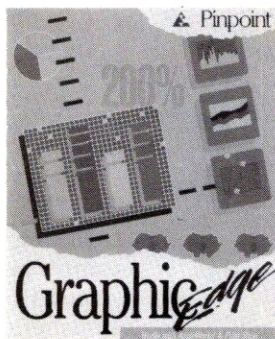


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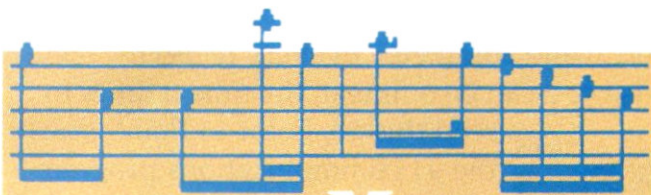
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MAKING MUSIC

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MIDI MAKES MUSIC

BY ROB SWIGART
Apple Computer now offers MIDI hardware that lets you connect your IIGs to a music synthesizer. Here's a look at what MIDI is and what's available MIDI-wise for other members of the Apple II family.

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SERIOUS SOFTWARE FOR MUSIC MAVENS

BY LARRY McCLAIN
This medley of sequencers and note-editing software for the Apple II puts multitrack perfection within the grasp of middle-class technohermits everywhere.



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STUDENT-RUN BBS

BY PHILIP INGBER
The trials and tribulations of setting up a student-run bulletin-board system, as told by a teacher who created one and the students who helped him

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APPLEWORKS RESOURCES, PART III

BY LEE HAYWARD
In this final installment of a three-part series, here's a roundup of AppleWorks resources, from books to newsletters to users' groups.

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HELP FILE
Beginning with this month's issue, Claris Corporation, the publisher of AppleWorks, answers our readers' AppleWorks questions.

TELECOMMUNICATIONS

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MODEMS, MUSIC, AND YOUR APPLE II

BY MICHAEL FISCHER
Where to find music files and MIDI information on-line



EDUCATION

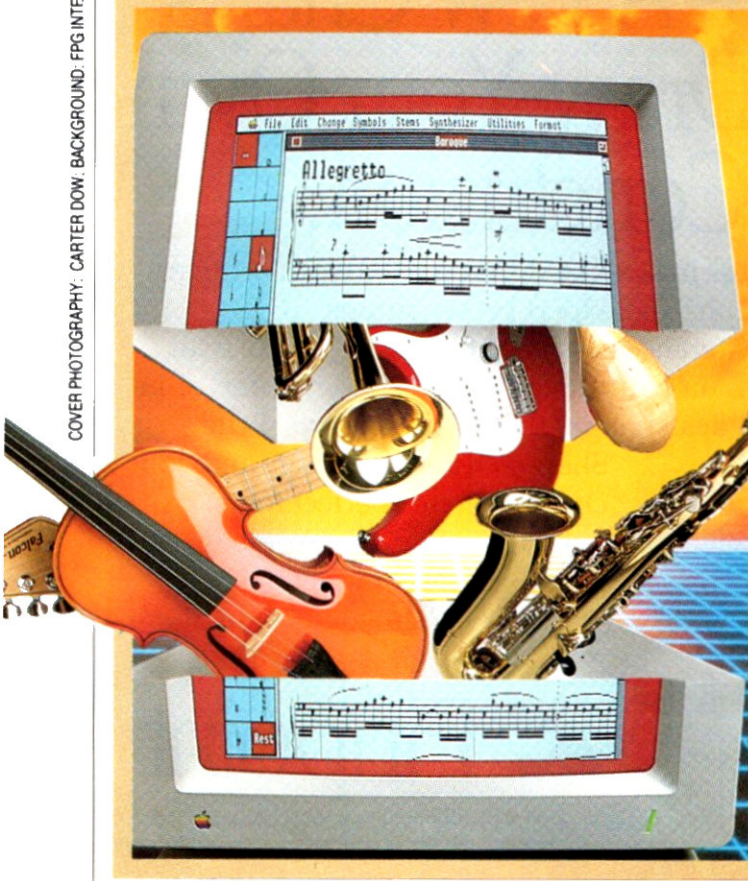
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THE LEARNING CURVE

BY DAVID D. THORNBURG
Thornburg describes a homebrew music connection—how to hook up your Apple II to your compact-disc player.



COVER PHOTOGRAPHY: CARTER DOW; BACKGROUND: FPG INTERNATIONAL



T E N T S

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TEACHERS' TOOLBOX

BY JENNIFER BRAWER

A profile of San Jose High Academy's music lab, which offers state-of-the-art MIDI music education

GRAPHICS

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SPEAKING OF GRAPHICS

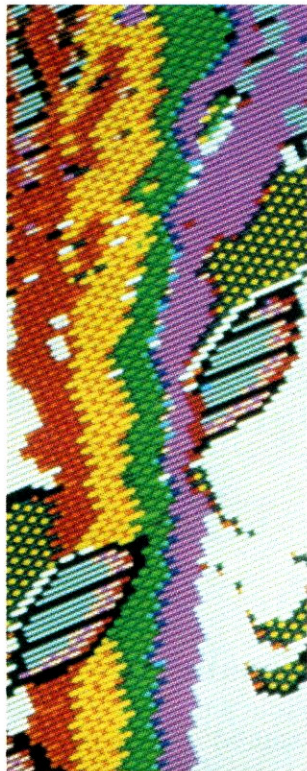
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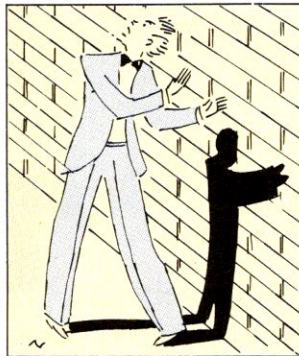
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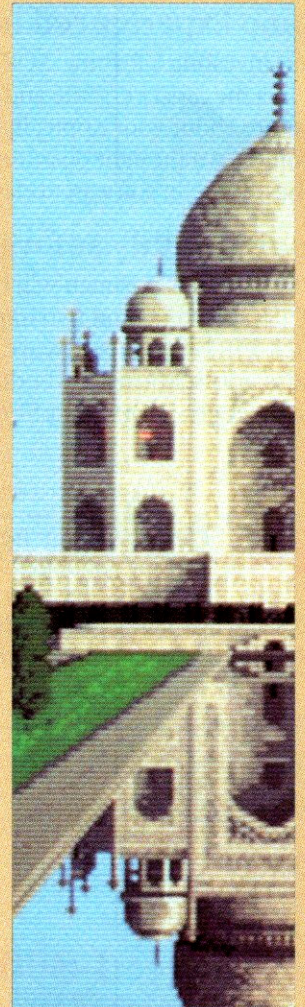
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BY ROBERTA SCHWARTZ AND MICHAEL CALLERY

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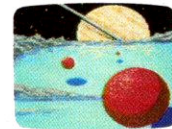
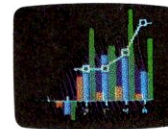
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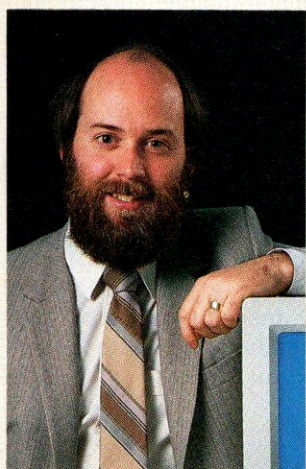
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THE MUSIC MACHINE

A couple of years ago, Apple Computer became very interested in computer music. I'm not certain what triggered this interest, but I'm sure the fact that high-profile professionals such as Herbie Hancock and Todd Rundgren were jamming with Apple IIs and Macintoshes had something to do with it.

The Apple II line has been a major beneficiary of Apple's commitment to computer music. The Apple IIs include a built-in Ensoniq digital-oscillator chip, the same chip that the professional-quality Mirage Digital Sampling Keyboard and the Ensoniq Piano

use. And last January, Apple Computer started selling a MIDI interface for facilitating communication with instruments that adhere to the international MIDI standard.

As you will read in this issue's cover stories, independent developers are also embracing the Apple II music market. Besides Apple's own product, other MIDI devices are available, as are several software titles for professional and aspiring musicians.

CD-ROM, Where Are You (Part II)

I have just returned from Microsoft's CD-ROM conference in Seattle, where Apple Computer announced its new \$1199 CD-ROM drive for the Apple II and Macintosh. Apple's announcement was the highlight of the conference, and I expect to see plenty of applications soon that exploit the CD-ROM medium. But will any of them work with the Apple II?

As usual, most of the independent developers seem to be more interested in MS-DOS or Macintosh "platforms" (Apple's new word for computer, ap-

parently) and are ignoring the Apple II. This emphasis is particularly surprising, since I expect many of the early CD-ROM applications to be of interest to educators and students, and we all know what computers these people buy.

I almost choked when Peter Cook of Grolier Electronic Publishing, during an excellent demonstration of the Macintosh version of the Grolier encyclopedia CD-ROM, said that the reason Grolier was going with a Macintosh product (instead of an MS-DOS product) was Apple's dominance in the education market. Apple is dominant all

right, but with the Apple II!

The Apple II line has been a major beneficiary of Apple's commitment to computer music.

At least two companies are doing some good work with CD-ROM and the Apple II, however. Software Mart of Austin, Texas, is working on an Apple II version of the retrieval software for its Visual Dictionary CD-ROM. The Visual Dictionary consists of hundreds of images—from cross-sections of submarines to anatomical diagrams—with arrows pointing to areas of interest. If you click the mouse on an arrow, the name of the area is displayed and spoken in English and French. This product will be useful as a dictionary or as a tool for teaching a foreign language.

Education Systems Corporation of San Diego, a pioneer in CD-ROM development, has written hundreds of Apple II educational programs and placed them on a single CD-ROM disc. Using special classroom-management software, students can load any of these programs over a network. ESC is currently adapting its system to work with the Apple CD-ROM drive and the AppleTalk network, which we looked at in

EDITOR'S PAGE

EDITOR'S PAGE

last month's issue of *A+*.

What the Apple II world really needs in order to foster more development is a general-purpose retrieval engine to make sifting through the 500 megabytes of information on a CD-ROM disc much easier. In other words, we need an Apple II version of the current Macintosh software darling, Hypercard. C'mon, software developers, you can do it.

RAM Prices

Many of you have written to us complaining that some of our advertisers are not honoring the prices they publish for memory cards. Take my word for it—it's not their fault. Given the mandatory two- or three-month delay between ad-copy preparation and publication, and the volatility of RAM-chip prices lately, consider any prices you see to be estimates only.

The price for a set of eight 256K dynamic RAM chips (the ones most

Apple II memory-expansion cards use) has risen from about \$16 last November to about \$64 at the time I wrote this editorial in March, a whopping 400% increase in the span of a few months.

There are two reasons for the rapid increase in RAM prices. First, Japanese firms are the primary sources of RAM chips, and the yen appreciated by 28% against the dollar between November and March. Second, the U.S. government has been trying to protect domestic chip manufacturers by pressuring Japan to stop dumping cheap chips in this country. The Japanese are responding by reducing 256K-chip production, even though there is still a high demand for these chips. Economics 101 tells us that reducing supply of a popular product must lead to higher prices.

Where will it end? I really have no idea. Just be thankful that we're nowhere near the \$600-for-16K days of 1979.

Best Reviewer

We're proud to announce that Bob Lindstrom, our entertainment editor, has received a Journalism Recognition Award from the Soft-

ware Publishers Association. The SPA honored Bob as Best Software Reviewer at its spring symposium last March. Congratulations, Bob!

AppleFest

I'm really looking forward to AppleFest '88 in Boston, May 20-22. A show like this one acts as a magnet for Apple II enthusiasts, so I expect to spend many enjoyable hours meeting product developers and *A+* readers. Those who attend will certainly not be disappointed—I expect several important new products to be unveiled. On the hardware side, look for GS accelerator boards, low-cost 2400-baud modems, stereo digitizers, hard-disk drives, and perhaps new versions of Apple or Apple-compatible computers. As for software, look for desktop-publishing applications and at least two AppleWorks-like integrated programs. Hopefully most of this stuff will also be available for sale at the show! See you there. +

GARY B. LITTLE/EDITOR

PART 1



"Find Red Square" Contest!

Find Red Square in Moscow and enter to win a real trip for two to Europe. See the SubLOGIC Product Chart at your dealer or write SubLOGIC for complete details and contest rules.



"WESTERN EUROPEAN TOUR"

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We start out in London by flying over the Parliament building. Look closely and you can see the faces of Big Ben.

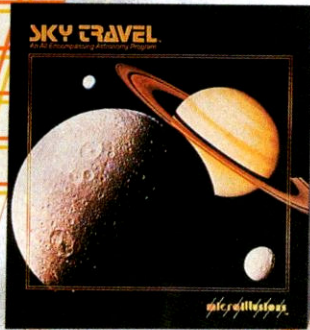
Our next view offers a glimpse of the majestic Tower Bridge and Tower of London at dawn. Other British highlights include Buckingham Palace, Westminster Abbey and Stonehenge.

Check back with us next month as we fly to Paris, France.



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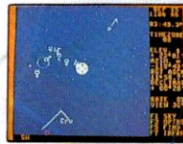
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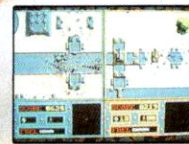
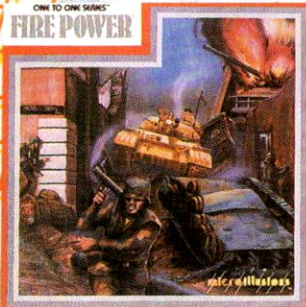
Haley's Comet in the southern sky



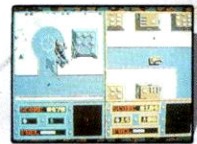
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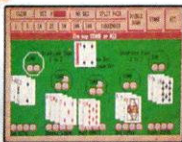
Helicopter patrols add another challenging dimension



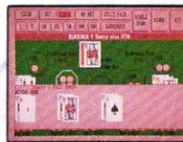
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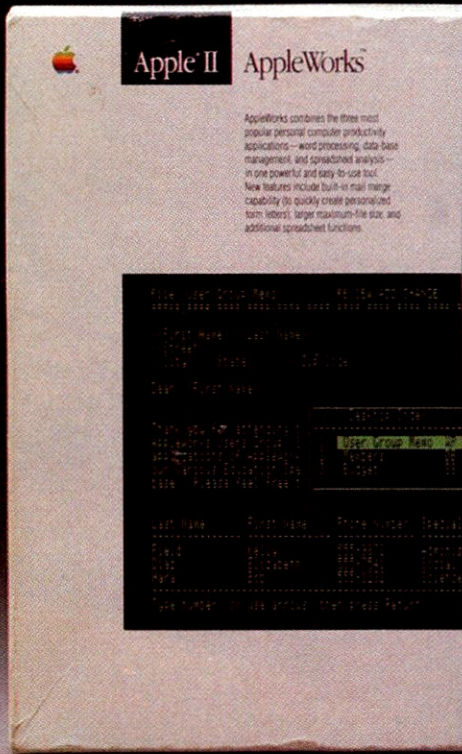
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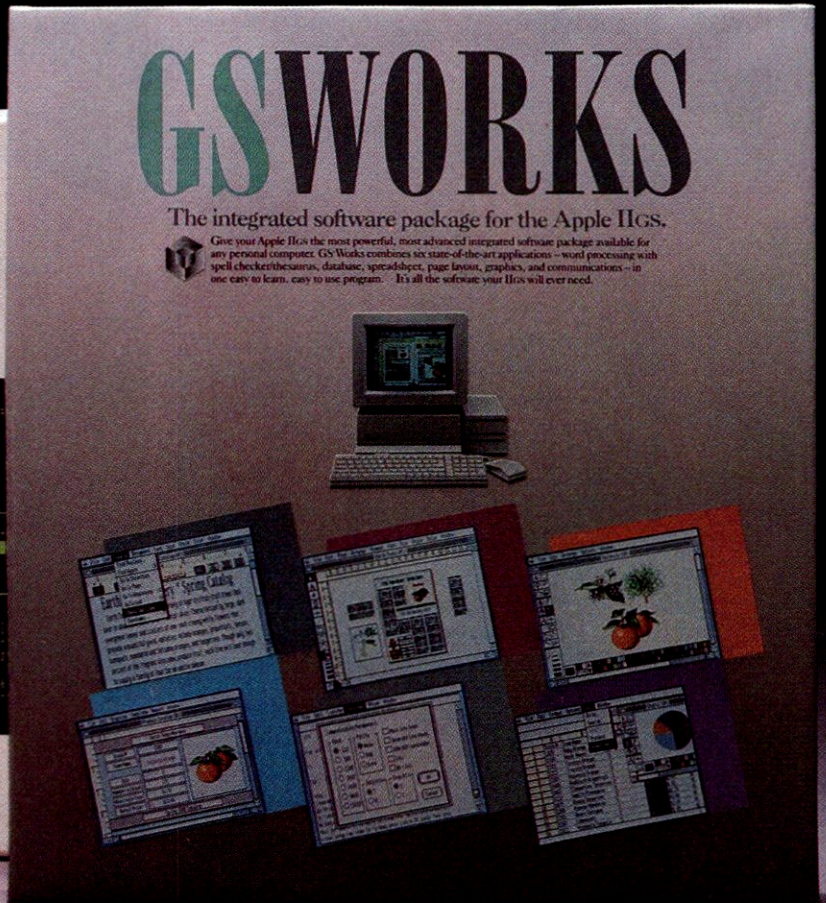
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Better because it combines these six productivity applications in a seamless, window-based environment. To give you an integrated package so advanced — yet so easy to use — that it has no equal on any personal computer. Not even Macintosh™ or IBM™.

Better because it's all the software you'll ever need for your Apple IIgs.

Upgrading The Three AppleWorks Applications . . .

GSWorks reads AppleWorks files as easily as it reads its own. So you can move from AppleWorks to GSWorks without missing a byte.



But GSWorks improves on the three AppleWorks applications by giving them all the features of true IIgs software. All GSWorks applications work the same way, using pull-down menus and WYSIWYG ("what you see is what you get") document display. Making GSWorks easy to learn, easy to use.

And each GSWorks application is so powerful, so complete, it could stand alone with the best IIgs software in its field.

Our high-powered word processor lets you create stylish documents using different fonts, print styles, and character sizes. With special features like automatic mail merge and the most advanced on-line spell checker/thesaurus ever available for an Apple II computer.

The versatile database lets you create forms, search and sort data, and print reports by just pointing and clicking. So you can keep track of even your most complicated information without complicated commands.

And for number-crunching, there's our mouse-based spreadsheet, with fast, intelligent recalculation and a host of number formatting features. And automatic color charting, when you want to make a splash with your figures.

. . . And Adding Three Of Our Own.

To give you *the* integrated software package for the Apple IIgs, we've added three new applications that fully exploit the advanced graphics, increased power, and enhanced communications connectivity of the IIgs.



Our state-of-the-art page layout application gives you the sort of desktop publishing power previously available only for Macintosh and IBM. To help you create professional-quality publications quickly and easily.

The GSWorks graphics application is revolutionary, combining the best features of draw and paint programs. With it, you'll have illustration capabilities never before available on a personal computer.

Finally, there's our communications application, connecting your IIgs to a whole world of on-line communications services. And letting you send and receive files from other computers.

What Integration Is All About.

What really makes GSWorks special is that it's much more than the sum of its parts. It's not just six great applications in a single box. It's six great applications in a single program.

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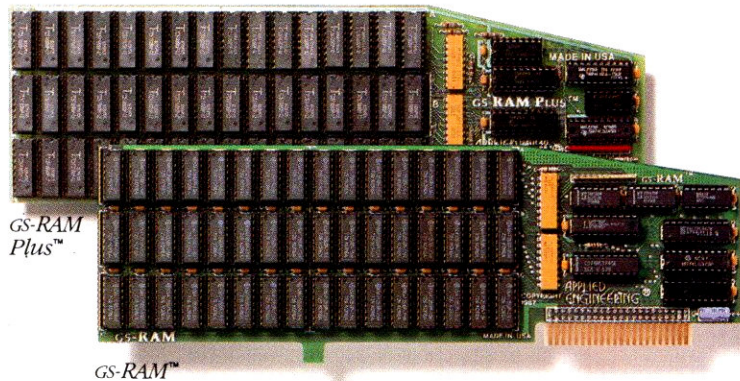
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Applied Engineering's Expander program eliminates AppleWorks internal memory limits allowing it to recognize up to 8 megabytes of desktop workspace. You can increase the limits from only 7,250 lines to 22,600 lines in the word processor and from 6,350 records to 22,600 records in the database. The Expander allows all of AppleWorks, including print functions, to automatically load into RAM. The clipboard size will increase from 255 to 2,042 lines maximum. GS-RAM will automatically segment larger files so you can save them onto multiple floppies. And

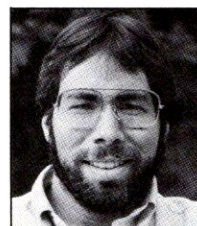
GS-RAM provides a built-in print buffer that allows you to continue working in AppleWorks while your printer is still processing text. You can even load Pinpoint or MacroWorks and your favorite spelling checker into RAM for instant response.

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We offer GS-RAM in two configurations so you can increase your memory 256K at a time (GS-RAM) or a megabyte at a time (GS-RAM Plus). Both are IIGS compatible and both come with our powerful enhancement software. GS-RAM can hold up to 1.5 MEG of 256K chips and GS-RAM Plus can hold up to 6 MEG using 1 MEG chips. And since both use standard RAM chips (not high-priced SIMM's), you'll find expanding your GS-RAM or GS-RAM Plus easy, convenient, and very economical. For further expansion, you can plug a 2 MEG "piggyback" card into the GS-RAM's expansion port for up to 3.5 MEG of total capacity. Or up to a whopping 8 MEG on GS-RAM Plus. If a GS-RAM owner outgrows 3.5 MEG, he can easily upgrade to GS-RAM Plus for a nominal charge.

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BETTER THAN MANUALS

Dear A+: Thank you for publishing Steve Miller's excellent article "Preparing a Tax-Deduction Database" in your February 1988 issue.

I have an Apple IIgs. It is my first computer. Every time I want to use it, I have to start all over with the manuals that came with it. They are so poorly written and so hard to follow that I feel frustrated when trying to get any work done. Miller's article, in contrast, is so easy to follow, so complete in its explanations, that it was a joy to use.

ARLETTE IRVING
ROSEBURG, OR

SOME QUIBBLES

Dear A+: In response to the review of The Desktop Manager in Walter Mossberg's "Desk Accessories" article in the February 1988 issue, I would like to point out that TDM does follow Apple's desk-accessory guidelines. TDM is a CDA; it is accessible from the Control/open-apple/Escape menu, just like any other CDA.

Second, Mr. Mossberg mentions the "foreign" screen destination .CONSOLE. It is new to Apple II people, but if they are doing any programming, they'd better get used to it. In Apple's APW and GSBASIC, both .CON-

SOLE and .PRINTER exist, and, in fact, GSBASIC has a .MODEM.

Third, Mossberg specifically mentions that "TDM works only on a GS and only if ProDOS 16 is booted first"; isn't this limitation also true of other DAs for the GS?

The main advantage of CDAs over NDAs is that users can access the former from almost anywhere, even from ProDOS 8 programs.

MARK JACKSON
CHICAGO, IL
Author Walter Mossberg replies:

As I said in my article, TDM is a sophisticated, capable program whose accessories are generally more powerful than those of the other two packages I reviewed. TDM doesn't install like a standard classic desk accessory, and, unlike standard CDAs, it's intended to be invoked with its own user-customizable "hot keys." But Mr. Jackson is correct that TDM can also be invoked like other CDAs, from the CDA menu. Users can employ the two methods interchangeably or disable the hot keys entirely and just rely on the open-apple/Control/Escape sequence for invoking it like other CDAs. Also, like other CDAs, it can be used from any program as long as you've initially booted ProDOS 16, not just graphics-based, mouse-driven programs. These are certain strengths.

LETTERS TO THE EDITOR

TDM doesn't load fully into RAM at bootup, which is a plus for some users with limited disk space. And TDM has on-line help and some unique, useful accessories. Among these are a printer manager, a powerful screen-saving and screen-printing facility, and a pickup-and-paste facility for moving material between applications.

But, as the article noted, some of the things that set TDM apart from more standard CDA packages also may make it tougher for some buyers to use. Jackson may be right that users who do programming had "better get used to" terms such as .CONSOLE instead of screen, which the TDM add-on Disk Manager uses. But most IIGS users don't program and should not have to get used to arcane terms when ones such as screen are available. Also, some of the editing and cursor-movement commands in the TDM accessories deviate from what AppleWorks users will expect, and these vary even among the TDM accessories. But the on-line help compensates. All in all, TDM is a strong system.

MUSICAL DISAPPOINTMENT

Dear A+: I am surprised at the enthusiasm shown for Activision's program The Music Studio for the Apple IIgs. Every reviewer seems to think it is superior to Electronic Arts' Music Construction Set, but, having used both programs, I must disagree. The Music Studio does use the Ensoniq sound chip to a greater extent than does Music Construction Set, but that is the only advantage I can see. The Music Studio allows note stems in only one direction, making complex scoring difficult to read, and selecting various notes is a cumbersome process at best. Music Construction Set at least allows bidirectional stems. The print quality of The Music Studio is

LETTERS

very poor, with measures broken in the middle of lines and poorly printed notes. Music Construction Set, on the other hand, produces a very readable printout (on an ImageWriter II), although with a fixed measure size.

I am a music teacher and frequently use Music Construction Set to prepare exercises for my students. I cannot produce an adequate printout with The Music Studio. Of course, Music Construction Set has a few problems: no Quit option, blocked access to the Control Panel, no text capability for titles, and so on, but I find it superior for my purposes overall.

I am somewhat disappointed that the major publishers of music software for the Mac, IBM, and

Atari ST computers have not yet produced more sophisticated scoring and MIDI programs for the IIGs. Electronic Arts announced Deluxe Music Construction Set, but as yet it is available only for the Mac. Surely the IIGs is capable of doing sophisticated scoring and taking MIDI input (with the right interface, of course). Many music teachers need a good, relatively inexpensive program that is capable of printing full scores, instrumental parts, and the like, and I hope that the software will be available to do these things.

JAY E. ROGERS
DOWNEY, CA

As you've probably noticed, the cover story of this issue concerns making music with the Apple II. Our main stories concern Apple's new MIDI interface and compositional software. Now that Apple is putting its muscle behind that market, more MIDI software is sure to follow.—Editors

ALL-STARS OMISSION

Dear A+: I am concerned about what I consider a major omission from your list of software All-Stars for Apple II-series computers. Specifically, I was quite surprised to find that no mention was made of Managing Your Money (MECA) in the section on personal-finance software. I've been a satisfied user of this comprehensive and sophisticated program for several years and cannot understand how it can be omitted, especially in light of the programs that appeared as personal-finance All-Stars.

The program was perhaps one of the most ambitious ever written for the Apple IIe when it first appeared, and its publisher should be recognized for helping to raise the overall level of sophistication of software for the Apple II line (which, as a whole, lags far behind software for other, more powerful, computers). The only real complaint I have about the program is that it stretches the standard Apple IIe (and its predecessors) to its limit and, as a result, tends to run quite slowly on minimal systems that use only 140K drives. Any user with a hard-disk drive, a large RAMdisk, or two 800K drives would agree that the program is truly exceptional. On an Apple IIGs with a hard-disk drive (my current

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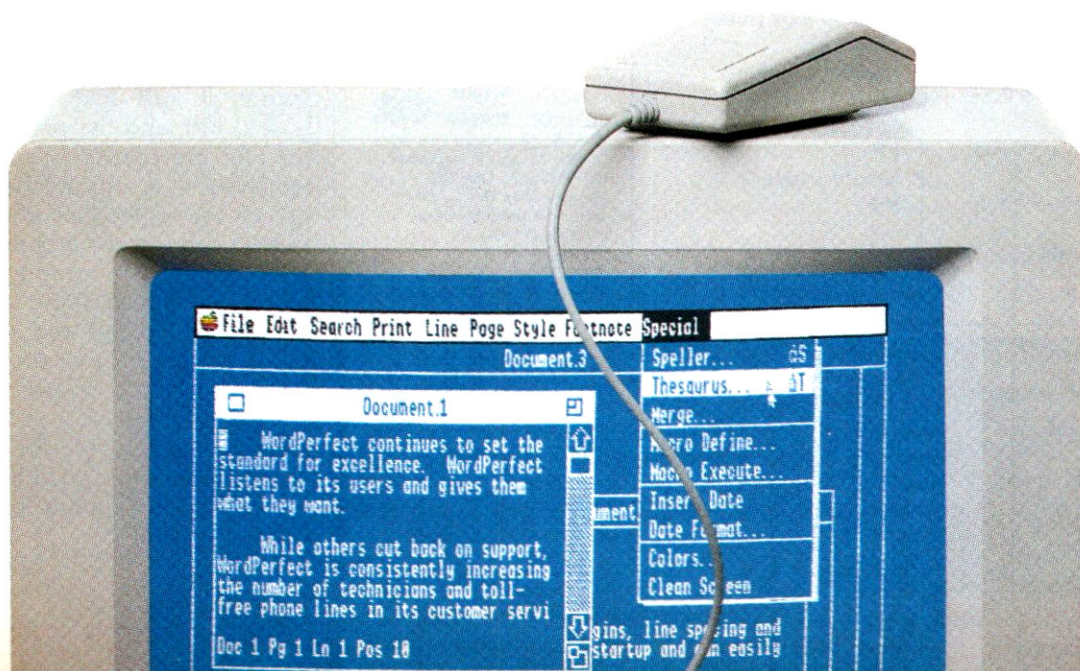
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system), this program is a real joy and makes keeping track of your personal finances fun. That the program is a best-seller in the PC/compatibles market argues for its value on appropriate hardware. I would hate to see MECA drop its support for its Apple II version of Managing Your Money because of lukewarm support from the Apple II community, and I fear that your complete failure to even mention it in your article severely lowers the visibility of what I consider to be an outstanding (dare I say All-Star) product.

KIRK L. MOON, JR.
SAN FRANCISCO, CA

Our reviewer felt that Managing Your Money suffered from being a conversion from an IBM PC format, rather than being optimized for the Apple II from the ground up.

—Editors.

PBI PRAISE

Dear A+: I would like to commend your magazine for its caring and knowledgeable approach to Apple II owners and users. It is one of the few publications I read cover to cover every month. Keep up the good work.

I would also like to express, to the public, my complete praise of PBI Software, Inc. I purchased a copy of Strategic Conquest for my Apple IIGs, based on an advertisement in A+. When I received the game, it still had some bugs. I called PBI, and the person I talked to told me that if I sent the disk back, the company would replace it at no cost. In less than a week, I had a new copy in hand. After playing the game for a couple weeks, it again developed some bugs. Once more I called PBI and sent in the disk. Within two weeks, I had another new disk. So far, this one is working wonderfully. I have never had a company give such excellent service and support. PBI can definitely count on me to spend more money with it.

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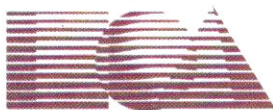
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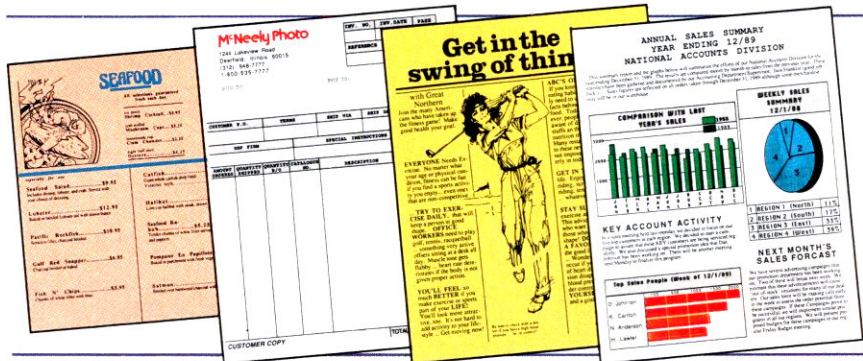
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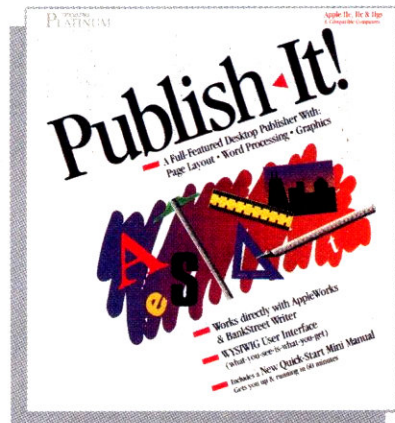
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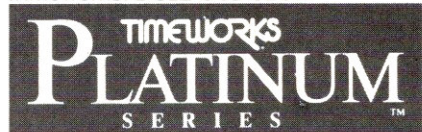
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NEWS PLUS

AppleFest goes east, Pinpoint targets the IIGs desktop-publishing market, more network news, and other industry updates

APPLEFEST ENCORE

If you're on the East Coast and missed AppleFest in San Francisco last September, you might want to take a trip to Boston at the end of May to catch the springtime version of this Apple-only show.

Notice that we said "Apple-only," not "Apple II-only." The promoters of AppleFest patted themselves on the back last September for putting on the first Apple II convention in several years, but the fact is that the Macintosh will also be featured this time around. "The show and conference remain predominantly Apple II-oriented. But we (at Apple's suggestion) are offering information about Macintosh 'solutions' to home business and school needs where it seems most appropriate," says a spokesperson for AppleFest promoter Cambridge Marketing, Inc.

C'est la guerre. We Ap-

ple II types are used to this stuff, and none of this Macintosh talk should deter us from having a grand time at AppleFest, checking out the latest goodies for the Apple II.

AppleFest runs from May 20 to 22 at Hynes Convention Center in Boston. More than 150 companies will exhibit there, and, if you sign up for the conferences, you can choose from more than 50 hour-long sessions on topics such as desktop publishing, database management, telecommunications, and AppleWorks. Education will be covered much more thoroughly this time around, with roundtables on nine curricular areas in addition to panel discussions on educational topics. There also will be day-long workshops in AppleWorks and desktop publishing on the Apple II.

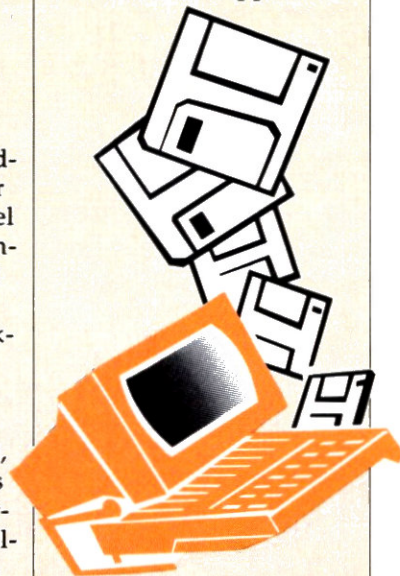
It will cost you \$15 to get in to see the exhibits, \$50 for both the exhibits and three days of conferences, and \$125 for an all-day seminar in addition

to all the conferences and exhibits. For further information, call (800) 262-FEST, or (617) 860-7100 in Massachusetts.

Drop by the A+ booth and meet editor Gary Little, executive editor Lisa Raleigh, education editor Jennifer Brawer, entertainment editor Bob Lindstrom, graphics editors Roberta Schwartz and Michael Callery, and telecommunications editor Michael Fischer. Or come to the panel discussions in which we're participating.

IIG—ALIVE AND WELL IN THE RUMOR MILL

Well, we didn't quite make it with our last AppleFest rumor. We said we'd heard rumblings that Apple would finally introduce the Apple II



NEWSPLUS

version of its network at the September show. AppleTalk for the Apple II didn't appear until six months later, when Apple finally made it public on March 1 of this year, however.

Our past record doesn't discourage us from floating the latest AppleFest rumor, though—and all you IIc fans ought to love this one. We hear that Apple will announce at AppleFest a new IIc model with built-in 3.5-inch drives, a megabyte of memory, and perhaps GS speed. If this configuration sounds a lot like that of the Laser 128EX, we think that's exactly the point. Apple probably hasn't overlooked the fact that Central Point Software is selling a ton of its IIc clones with expanded memory and built-in accelerator.

PINPOINT PUBLISHING

Watch for Pinpoint to become the latest publisher to target the IIcs desktop-publishing market. Pinpoint's product, tentatively called Pages, will make an AppleFest debut and will cost less than \$200, possibly even less than \$150, according to Greg Hastings, Pinpoint's president. Interestingly, Pinpoint will ship both Macintosh and GS disks in the same box, recognizing that GS and Mac computers are cohabiting more frequently, particularly now that

Apple's network for the Apple II is about to become available (AppleTalk requires you to buy a Macintosh to hook all your IIs together and makes it possible to run both Macs and IIs from the same file server.) Watch *A+* for a full review once this product becomes available.

STILL SELLING AFTER ALL THESE YEARS

Apple II software sales continue to chug along—to the tune of \$220 million last year, according to the Software Publishers' Association. The SPA report is based on figures that 101 software publishers submitted to the accounting firm of Arthur Andersen & Company. Of course, Apple II programs didn't make up the bulk of the \$2.9 billion personal-computer software market this study measured. The biggest slice of the pie (almost 77%) went to IBM software. Apple II software garnered about 7.5%, and the Mac pulled in about 9.4%.

Here are some interesting facts and figures from this study:

- Not surprisingly, the Apple II dominated the education market, comprising 57% of the \$153 million in educational-software sales.
- Apple II productivity software chalked up almost \$80 million in



sales—an interesting figure, considering the huge chunk we believe AppleWorks to comprise. We have it on good authority that Apple sold about 150,000 copies of AppleWorks last year, so at \$249 a pop at the retail level, that comes to more than \$37 million.

•The gap between Apple II and Macintosh software sales isn't particularly huge. At \$273 million, the Mac-software total is about 24% higher than the total for the Apple II. And since most Mac software costs twice as much as software for the II, you can see that the Apple II is still holding its ground in unit sales. The Mac, however, is still on the upswing in terms of volume, so we can expect it to show formidable gains. While year-to-year figures were not available at press time, we'll soon have access to them and be able to tell you something

about growth rates in both markets.

- It should be no big shock that educational sales were highest during the summer (July through September), when educators had a chance to browse through catalogs and stores. Educational sales remained strong through the end of the year, however, perhaps reflecting back-to-school buying and Christmas/home-education sales.
- The final three months of the year were the biggest for recreation and productivity. Must be adventure-game stocking-stuffers and AppleWorks going out with all those Christmas systems. The final quarter was also the biggest for Apple II software sales as a whole—with a total of \$67.2 million, or about a third of the year's total. The second quarter, May through June, was the slowest time, with less than 20% of the sales.

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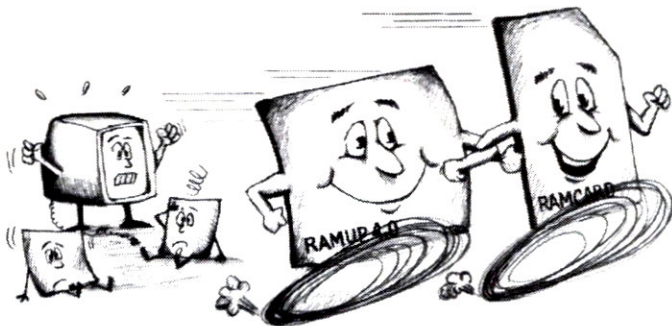
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NEWSPLUS

Watch for Claris to lead the way in Mac software for the lower grades.

COPY-PROTECTION REMOVAL

Electronic Arts has announced that all new "creativity" titles it publishes will be free of copy protection and that it will remove copy protection from all existing Deluxe products. (In the Apple II market, the only Deluxe product is DeluxePaint for the IIGs.) If you purchase an existing copy-protected Deluxe product, Electronic Arts will replace the program free of charge within 90 days if you send proof of purchase. After 90 days, the company requires a standard \$7.50 replacement fee. In addition, customers who have taken advantage of Electronic Arts' backup offer (\$20 for a non-copy-protected backup copy) or upgrade offer (\$57 for a non-copy-protected upgrade) will receive their order and a \$20 gift certificate for purchasing a creativity title directly from Electronic Arts.

Electronic Arts also has a promotion running through June 30, 1988, during which time you can buy two pieces of software from the company and receive a third one free. You can obtain more information by calling (800) 245-4525.

CLARIS TARGETS EDUCATION

The new version of AppleWorks (called AppleWorks/Network) from Claris Corporation was the showcase Apple II software product at the official unveiling of the AppleTalk network in March. The occasion also provided the opportunity for Claris to publicize the role education plays in the company's overall business strategy.

Claris management considers education a primary market for all its products, but AppleWorks and AppleWorks/Network are all you can expect Claris to be marketing for the Apple II. So if Claris plans to pursue the education market but doesn't plan to acquire or produce more Apple II products, what could the company have in mind? How about Mac programs for K-12 classrooms? That's exactly what Claris has on its agenda. Apple may be too fearful to push the Mac into elementary education (although it's become quite bold at the secondary level), worrying that it might upset the appletart in its strongest market. But Claris doesn't seem as concerned about protecting the Apple II franchise. Watch for Claris to lead the way in Mac software for the lower grades.

NEWSPLUS

ANNOUNCING MORE NETWORKABLE PROGRAMS

Since our May networking cover story, several companies have announced products that will work with Apple's network.

Watch for the following programs to become available in network versions:

- DeskWorks, a set of Macintosh-like desk accessories for the Apple IIGs from Styleware. (713) 668-1360.
- TopDraw, a structured graphics program also from Styleware.
- MultiScribe GS, a text and graphics package from Scholastic, Inc. (212) 505-3561.
- Command.Com Apple-Share Utilities, a utilities package available from Pinpoint Publishing. (415) 654-3050.
- Graphic Edge for Apple-Share, a charting, graphing, drawing, and desk-top-presentation program also from Pinpoint Publishing.
- II Write, a word-processing program from Random House Publishing. (212) 572-2433.
- Sensible Speller, an electronic spelling checker from Sensible Software, Inc. (313) 528-1950.
- The TimeOut Series, including Desktools, Filemaster, Graph, Quickspell, Sidespread, Superfonts, and Ultrama-cro available from Bea-

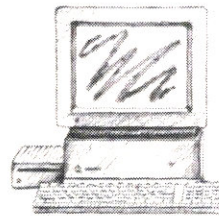
gle Bros, Inc. (619) 296-6400.

- Tut's Typer, a typing-instruction program available from Roger Wagner Publishing Company. (619) 442-0522, ext. 0524.
- Curriculum Manager, a comprehensive delivery system for integrating software into curricula by Ideal Learning, Inc. (214) 929-4201.
- The Game Show, an educational game in a quiz-show format available from Advanced Ideas. (415) 526-9100.
- Memory Master, a network system from Electronic Learning Systems. (904) 375-0558.
- Information Lab IIGs: Life and Earth Science, a research database available from Addison Wesley Publishing Company. (415) 853-2512.

IT'S ABOUT UPTIME

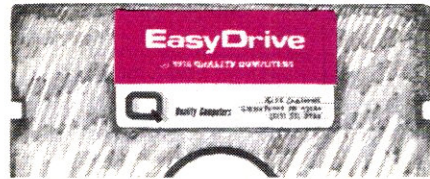
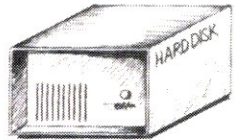
UpTime, the monthly disk magazine, is looking for beta-testers to shake out any nasty bugs lurking in the programs it intends to publish. If you're interested, send your qualifications in writing to *UpTime*, 174 Bellevue Avenue, Newport, RI, 02840 (Attn: Mike Amarello). The magazine, by the way, has a whole new look, complete with pull-down menus and icons. Although you still don't need a mouse to use it, it sure wouldn't hurt to have one.

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NEWSPLUS

UPDATE

Activision is offering owners of Paintworks Plus and other Apple IIGs paint programs the opportunity to upgrade to Paintworks Gold.

Registered owners of Paintworks Plus can obtain the Paintworks Gold disk and manual for \$20 through May 31, 1988, or for \$40 thereafter. Owners of any other IIGs paint program can receive Paintworks Gold for \$40. Those who wish to upgrade should send a check for the proper amount plus \$3.50 (and 6.5% tax for California residents) and page 1 of their existing paint-program manual to Paintworks Upgrade, Activision, Inc., P.O. Box T, Gilroy, CA 95021-2249. Paintworks Gold's normal price will be \$99.95. (For more information, see "Go for the Gold" in this issue.)

Responding to questions from some of our readers, Brøderbund has sent the following information on Dazzle Draw. In the earlier version of Dazzle Draw, the slide show does not work on the IIGs, and pictures print out on the ImageWriter II in a size smaller than they should. According to Ulla Thomsen of Brøderbund, Version 1.1 has overcome both of these problems.

If you have had either

problem with your version of Dazzle Draw, you can obtain an update by returning the original program disk to Brøderbund and briefly stating that you need an update to Version 1.1 of the program. (Brøderbund, 17 Paul Drive, San Rafael, CA 94903; (415) 492-3500.)

One of our readers has pointed out that some of the information we presented in "Printer and Modem Interface Cards" (March 1988) was incorrect. The table on page 38, "Serial Graphic Printer Cards," states that the Apricorn Graphics Parallel Printer Card does not allow mixed graphics dump, emphasis, or inversion. According to reader William L. Holland of Ladson, South Carolina, however, the card handles these functions "quite well."

Since our May review of The Graphics Studio, the product's publisher, Accolade, has moved. Accolade's new address is 550 South Winchester Boulevard, Suite 200, San Jose, CA 95128; the new phone number is (408) 985-1700.

Techware, Inc., mentioned in David Thornburg's March 1988 "Learning Curve" column, has moved. The company's P. O. box number remains the same, but Techware's new phone number is (407) 695-9000.

CARMEN STRIKES AGAIN!



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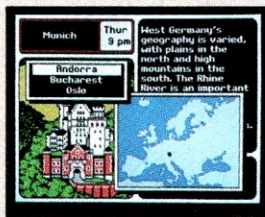
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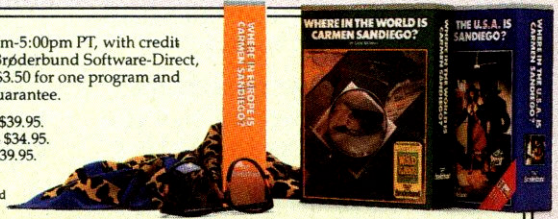
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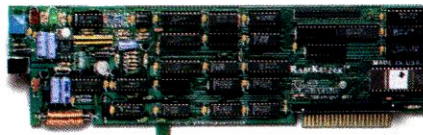
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RamKeeper lets you keep programs and data in permanent, "electronic hard disk" memory. Turn your Apple IIcs on and you're ready to work.

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Our sealed Gel/Cell battery

stays *outside* your computer case. With other systems, the batteries are installed under the IIGs power supply where a leak could ruin computer circuitry.

Put two memory boards in the same slot.

You might have bought your IIGs with Apple's memory card. But now you want the features of Applied's GS-RAM™ card. RamKeeper efficiently resolves the dilemma.

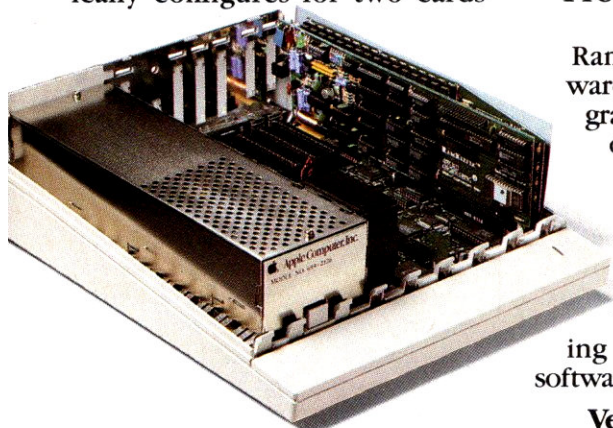
You can use RamKeeper with your current IIGs memory card *and* add another memory card — all in the same slot. Just attach your current memory card to one side of your new RamKeeper card, connect the second card to the other side and plug RamKeeper into the slot.

Of course RamKeeper works fine with just one memory card. But you can use two and still keep Slot 7 open with our optional Slot-Mover.

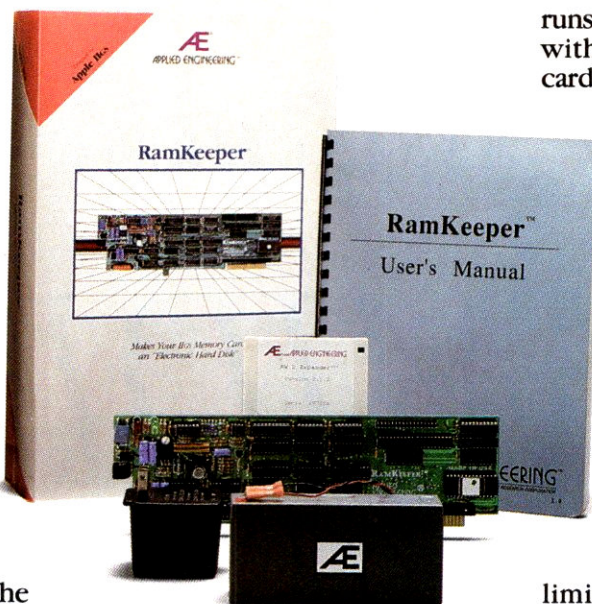
Makes all of your memory usable memory.

RamKeeper can power up to 16 Meg of memory. Other systems are limited to only 8 Meg. In addition, RamKeeper lets you mix and match different types of cards. For example, you can have a GS-RAM Plus™ using 1 Meg RAM chips and an Apple card using 256K RAM chips. Other systems are limited in the combinations they allow.

RamKeeper firmware automatically configures for two cards



RamKeeper is easy to install. Just plug it in. Even when you use two memory boards, you don't have jumpers. You can have two memory boards but use only one slot.



It all comes with RamKeeper ... board, Gel/Cell battery pack, easy-to-understand instructions, and Applied's powerful AppleWorks Expander software.

when the second card is installed. Other systems make you manually move jumpers.

RamKeeper configures memory linearly. Other systems don't, so they create memory gaps that can cause program crashes or keep some programs from using as much as half of your memory.

You easily decide how much memory you'll devote to ROM and to RAM from the IIGs Desk Accessories menu. You can configure Kilobytes or Megabytes of instant ROM storage for your favorite programs. And you can change ROM size any time without affecting stored files.

Protected from program crashes.

RamKeeper controlling firmware is in an EPROM. A program crash can't take out the operating software. With other systems, operating software is installed in RAM from a floppy. If the program crashes, it can take the operating software with it; and reinstalling the disk-based operating software destroys data in memory.

Verifies data security.

RamKeeper firmware uses optional startup checksums to verify that no data has been lost while power was off. The firmware also

runs ROM and RAM memory tests without disturbing data on the card.

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Applied's powerful AppleWorks Enhancement software is free with RamKeeper. It makes AppleWorks faster and far more powerful by eliminating AppleWorks internal memory limits. Word processor limits go from only 7,250 lines to 22,600 lines. Database limits go from 6,350 records to 22,600 records. The clipboard size limit is increased from 255 to 2,042 lines. It even automatically segments large files so you can save them on multiple floppies. No other company expands your IIGs' AppleWorks internal limits.

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MIDI MAKES MUSIC

Musical Apples have been commonplace for years, but until Apple announced the Apple MIDI interface at MacWorld Expo in January, the company maintained a polite distance from what appears to be something of a shotgun marriage. Until now, Apple has left it to third parties to offer MIDI cards and connectors, software and keyboards.

Now Apple has blessed the union with MIDI hardware of its own.

MIDI, or Musical Instrument Digital Interface, offers computer owners, both professional musicians and home-computer hobbyists, an industry-standard interface that allows Apple computers to communicate with MIDI-equipped keyboards, synthesizers, and drum machines. Because the standard is now accepted everywhere, all peripheral musical devices can communicate through standard 5-pin DIN-type connectors and cables. MIDI instruments adhere to a standard data structure for controlling the timbre, vibrato, duration, and other aspects of a note as well.

The MIDI connector itself is deceptively simple. It may be a card that fits into a slot in the Apple II Plus, IIe, or IIGS. It may also be a simple device connected to a serial port, such as Apple's own MIDI interface or Passport's MIDI Pro Interface for the IIc or Laser 128. The

COVER STORY BY ROB SWIGART

The basics of making music with your Apple II-series computer

Apple product is nothing more than a box, somewhat smaller than a package of cigarettes, with an eight-pin miniconnector on one end that plugs into the Macintosh or Apple IIGS serial port. On the other end of the box are MIDI IN and MIDI OUT connectors. The interface comes with all three cables and a small, nearly superfluous manual. Inside the interface is a clock chip to regulate the rate at which data flows from the computer to the instrument and back, and a simple device to isolate the two devices from one another electronically so a current surge from one cannot fry the other. This so-called opto-isolation also protects the system from ground noise.

The serial port on the IIGS and Macintosh operates at several different speeds. The MIDI-standard baud rate is 31.25K baud, which the Mac and IIGS serial ports can supply. The IIe and IIc can't handle this baud rate, however, which means that you can't use Apple's

MIDI box with the IIe or IIc, even if you have proper plug adapters. The clock in the interface sets this speed. This clock requires a small amount of power that it draws from the serial port.

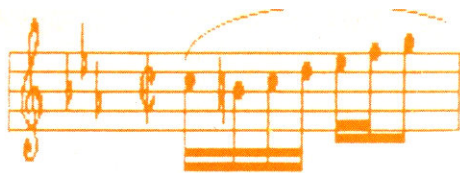
Some Caveats

Before you rush out to purchase a MIDI interface, though, thinking it will effortlessly connect you with the world of musical synthesizers, you should be aware of one or two considerations.

When you use a MIDI device with your computer, you need software for composition, sequencing, and editing music. Such software comes in a wide array of flavors and styles. Refer to the accompanying article, "Serious Software for Music Mavens," by Larry McClain for details.

MIDI interfaces don't do anything by themselves, even if you've got the appropriate software. They also need a MIDI synthesizer—a keyboard instrument, drum machine, or expander box—with which to communicate. Furthermore, not all electronic keyboards are MIDI-compatible.

Also, be aware that MIDI devices require power; some interfaces for the Macintosh, such as the Opcode Professional Plus, must be plugged into a handy electrical outlet to supply it. Others draw their power from the serial port. Because drawing power from the trickle avail-



able to the Apple II serial port can be dangerous (especially if a device draws too much!), Apple does not publish power information on the port, although the Apple MIDI Interface does use it. So other MIDI interfaces that draw on that power may run into problems, and you should probably avoid them. Your best bet is to get Apple's own interface, if you have a GS.

Three Kinds of Interfaces

I looked at three MIDI interface devices for this article. Other interfaces for the Macintosh also work with the Apple IIGs, but they all function in much the same way and do the same things as the products I discuss here. All three of these devices allow an Apple II to communicate with a Casio CZ-101 keyboard, a popular MIDI keyboard (recently replaced in the Casio product line by the HT-700), but they do have differences.

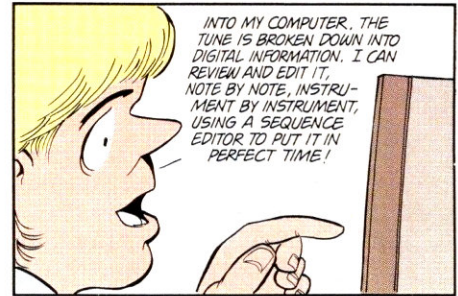
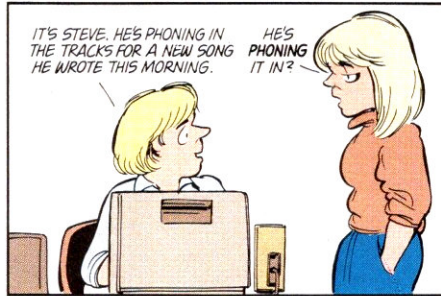
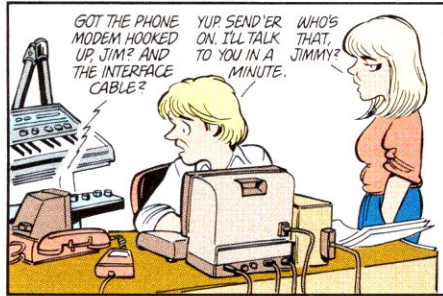
- Apple Computer's MIDI Interface draws its power from the Apple IIGs or Macintosh serial port and is a simple, rugged, self-contained unit. It offers only one input channel and one output channel, however, so if you want to use more than one MIDI instrument from your computer, the instruments must have a throughput jack (also called MIDI-thru) so you can daisy-chain them. Another drawback is that the Apple MIDI Interface does not work with older (pre-GS) Apple II computers.

- The Passport MIDI Interface is a card you can install in slot 2 of your IIGs or enhanced IIe (slot 3 in the II Plus). The card offers jacks for MIDI IN, MIDI OUT, and DRUM, in addition to IN and OUT RCA jacks for using tape sync, which—given the right software—writes a signal onto a track of a multitrack tape deck that synchronizes the other tracks.

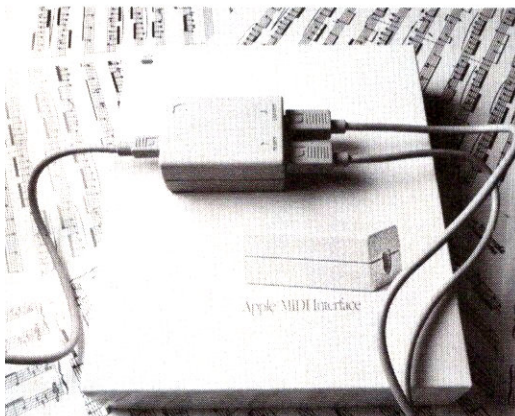
The most undesirable aspect of this card is that it faces the front of the computer, which means the MIDI jacks face the keyboard—handy for plugging in and unplugging the cables if you don't mind the lid's remaining off the computer. Unfortunately, the MIDI plugs



DOONESBURY by Garry Trudeau



MAKING MUSIC



The Apple MIDI Interface

do not fit through the holes in the back of either the IIGS or the IIE, so unless you want to take a crowbar or can opener to the back, you must at least leave the lid loose. Be aware that to use it with an enhanced IIE, you'll need at least 128K of RAM. Passport also sells the MIDI Pro Interface for the IIEc. Since it connects to the serial port, it has no problem with cabling.

- The Opcode Professional Plus interface, which is marketed for the

Macintosh, requires an external power supply and offers three output channels. Thus it can communicate with three different instruments at once, a useful feature if you have more than one MIDI instrument that does not have a throughput jack on the back. Although it is marketed for the Macintosh, the Professional Plus also works with the IIGS serial port. Opcode also makes the Studio Plus Two, which has two MIDI IN and six MIDI OUT connectors and front lights that let you know when you are sending and receiving. Other Macintosh MIDI devices also work with the GS—you should base your choice on features, such as this product's multiple output channels. Also pay attention to its power source—avoid Mac MIDI boxes that draw power from the serial port.

Software

Software, as it becomes available, will allow you to compose, edit, and sequence music. Because MIDI is now fashionable and Ap-

ple has lent it a seal of approval with its own MIDI product, software publishers may start rushing to claim they are MIDI-compatible.

A major caveat is that some MIDI devices may not work with some software. MIDI is really a software standard, with minimal hardware requirements, but some software may not be compatible with some MIDI interfaces. Therefore, you should probably discuss the compatibility of hardware and software with your software dealer and make sure the software you want works with the interface you have.

You might consider, too, checking with music stores rather than computer dealers for MIDI software, hardware, and information. They usually know more about MIDI.

Keyboards, Drums, Expanders

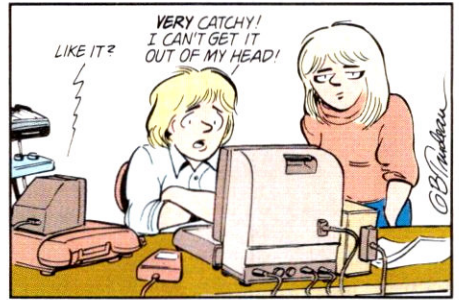
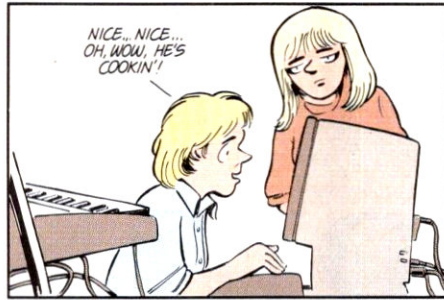
Besides the computer and its software, the most important element of the home musical-hardware complex is the instrument. Several are available, from small, inexpensive keyboards that you can get at discount stores to expensive professional synthesizers with enormous sound libraries and microprocessor controllers of their own.

The first things to look for in a keyboard, of course, are the MIDI jacks on the back. The keyboard must have MIDI IN, MIDI OUT, and possibly MIDI THRU (which allows you to add another instrument). Keyboards without MIDI are fun, but they cannot communicate with your computer.

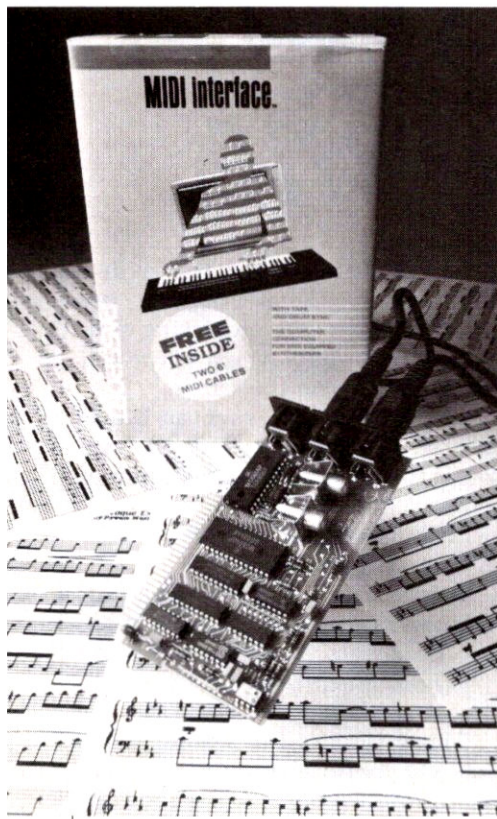
If you want the most from a key-

Opcode Professional Plus and Studio Plus Two





MAKING MUSIC



Passport MIDI Interface

board instrument, look for full-size piano keys. Many keyboards have smaller keys. The Casio HT-700, for example, is a fairly sophisticated synthesizer, but the keys are diminutive. Its sounds are great, but you won't improve your playing skills by using it.

Next consider whether you want so-called velocity sensitivity. The MIDI standard includes parameters for information on how hard and fast a key is depressed (as well as how long it is held and when it is released). Velocity sensitivity

gives a more human feel to the music, but it doesn't cover up your mistakes the way a keyboard without velocity sensitivity does.

Another premium keyboard option just becoming available on mid-priced keyboards is pressure sensitivity or aftertouch. This feature makes the keyboard respond to additional pressure you put on the keys after the note sounds. With the right synthesizer, a pressure-sensitive keyboard can permit you to place a little extra emphasis on a sustained note or make a synthesized saxophone growl realistically.

Expander boxes are also called synthesizer modules. They are essentially synthesizers without a keyboard, and you can play them from the computer or from another keyboard instrument. They may contain a library of "presets" and may allow you to play several different timbres (instrument sounds) in various combinations with many notes in the same voice (in other words, they can play chords or sound like an orchestra).

Drum machines are synthesizers that produce various percussion sounds and rhythmic patterns.

Yamaha, Casio, Roland, and others make keyboards and other instruments ranging in price from \$250 up to many thousands of dollars. The possibilities for creating interesting music through the MIDI interface are, as Apple likes to remind us, limited only by our imaginations. Even nonmusicians can have fun playing back a free-form composition through a synthesizer and stereo speakers. +

Rob Swigart is a Redwood City, California, author and software designer. See "GamePort" in this issue for a discussion of his new novel, Portal.

VITAL STATISTICS

Apple MIDI Interface

Apple Computer, Inc.
20525 Mariani Avenue
Cupertino, CA 95014
(408) 996-1010

List Price: \$99

Requires: Apple IIGs or Macintosh

Passport MIDI Interface with Tape and Drum Sync

Passport MIDI Pro Interface

Passport Designs, Inc.
625 Miramontes Street
Half Moon Bay, CA 94019
(415) 726-0280

List Price: \$199.95 each

Requires: Passport MIDI Interface

with Tape and Drum Sync:
Apple II Plus, enhanced IIe, or IIGs; Passport MIDI Pro Interface:
Apple IIc

CIRCLE READER SERVICE NO. 355

Opcode Professional Plus and Studio Plus Two

Opcode Systems
1024 Hamilton Court
Menlo Park, CA 94025
(415) 321-8977

List Price: Opcode Professional Plus, \$150; Studio Plus 2, \$275

Requires: Apple IIGs or Macintosh

CIRCLE READER SERVICE NO. 356



MAKING MUSIC

SERIOUS SOFTWARE

for Music Mavericks

If you're an Apple II aficionado who's musically inclined, take note. Multitrack perfection—the sort of thing that used to cost \$200,000 in a Los Angeles recording studio—is now within the grasp of middle-class technohermits everywhere. If you've got an Apple II with 128K—plus a \$300 synthesizer and a few bills to invest in software—you can already create sonic masterpieces that make the tracks on your old Yes albums seem like child's play.

But here's the rub: Unless you're as gifted as W. A. Mozart or George Gershwin, it's difficult to create brilliant music in seclusion. In other words, the hacker who churns out acres of Pascal code till 4 A.M. is liable to create music that is—well—pretty kooky and incomprehensible. And that's perfectly OK if you're creating music strictly for your own amusement. But if you're aiming for a wider pop audience, seek the counsel of a fellow musician. That way you'll be less inclined to sequence a funk version of "Jimmy Cracked Corn."

In contrast to the hobbyist and educational music packages that showed up as All-Stars in the December 1987 *A+*, the programs we'll look at here are geared more to professional musicians and "se-

COVER STORY BY LARRY McCLAIN

A medley of sequencers and note-editing programs

rious" home composers—and to charlatans like myself who daydream about sharing the stage with Belinda Carlisle and Prince.

Many music-composition programs require that you have a MIDI instrument hooked up to your computer. For a full rundown on MIDI, see the accompanying article in this issue, "MIDI Makes Music," which gives you the basics of making music with your Apple II-series computer.

As far as software is concerned, you have two main choices: sequencers and note editors. If you intend to compose and edit music with a MIDI-compatible keyboard, you'll want a sequencer. Sequencers "record" the music played on your keyboard and store it as MIDI-playable data files.

The numerical MIDI data makes sense to computers and MIDI specialists, but composers used to more traditional music notation

may feel more comfortable with a note editor. These programs are like musical word-processing programs that display conventional musical notes on the screen.

Some programs, such as Music Writer, integrate features of both program types for the maximum in musical flexibility.

APPLE II SEQUENCERS

Master Tracks Pro

Master Tracks Pro from Passport Designs is arguably the most "pro" of the Apple II sequencers—and you need an enhanced Apple IIe to run it.

Master Tracks Pro's Song mode lets you build a sonic juggernaut: up to 256 sequences using 1500 different steps. And the program's Quickstep step-time editor (see the accompanying glossary for definitions of MIDI-related terminology) even lets you convert real-time sequences to and from step-time files for visual editing. For real-time noodling on your synthesizer, the program offers 16-channel unlimited-track recording.

Perhaps its most cutting-edge feature is the MIDI Song Pointer for SMPTE sync applications. (SMPTE is the movie and television standard that enables composers to synchronize MIDI compositions to images on the screen.)



MAKING MUSIC



Passport's Master Tracks Pro

So if you have exactly two months to finish the film score for *Police Academy VI*, Master Tracks Pro is the Apple sequencer you'll probably want to rely on.

Music Writer

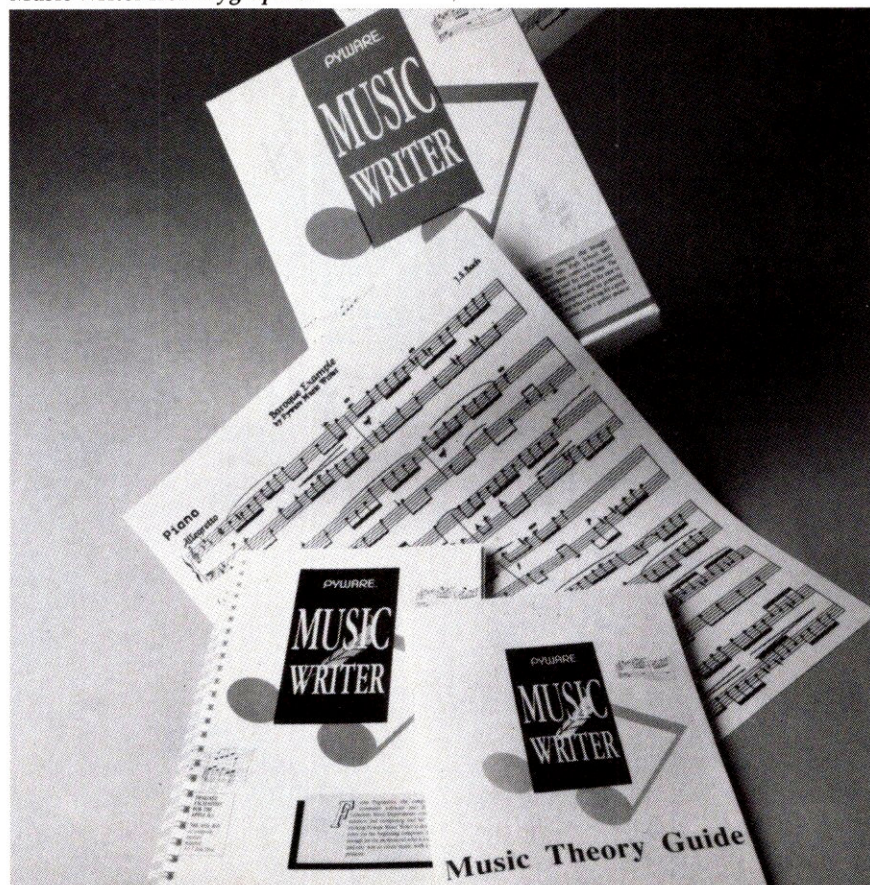
Music Writer from Pygraphics is the only sequencer I evaluated that comes in a version specifically modified for the IIGS. The IIGS version is a brand-new package and clearly one of the best. Although Music Writer's sequencer isn't the snazziest, no other program lets you do this much: quickly enter notation with a mouse, use a synthesizer for real-time and step-time recording, and print beautifully. Because it's so comprehensive, Music Writer for the IIGS is a memory hog, requiring 768K of RAM.

The manual's content and graphics stand head and shoulders above most of the competition. Music Writer's manual flows logically and gracefully: "Using the Mouse to Load a Grand Staff," "Entering Sequences via the Synthesizer," "Tune Editing," and "Printing Tips."

Not only does Music Writer allow you to print splendid sheet music, but the program is also available in several levels: Level 1 for music hobbyists (which prints 3 staves—*staves* is the highbrow

plural of the word *staff*); Level 2 for serious home musicians and music teachers (offering 6 staves that can print in score format), and Level 3

Music Writer from Pygraphics



for professional arrangers and composers who need full scores (featuring a mindblowing 32 staves). There is also a version of Music Writer for the IIe that comes in two flavors: Level 1 for sophisticated hobbyists (6 staves) and Level 2 for pro arrangers (32 staves). The IIe version performs the same tasks as the GS version does, but it doesn't have the graphically oriented interface. It does, however, require a mouse.

Sonus Sequencers

Sonus makes a trio of sequencers that have some powerful features in common. Both Super Sequencer 128 and GlassTracks are reminiscent of a fine sequencer called Texture, which no longer exists in an Apple version. The third Sonus package, Personal Musician, is for MIDI novices. All work with the II Plus, IIe, and IIGS, except for Super Sequencer 128, which doesn't work with the II Plus.



MAKING MUSIC

All three of these programs present you with an opening sequence screen that offers four choices (you select them with the Apple keyboard) that lead to successive four-somes. For example, selecting Super Sequencer's Edit Sequence option presents you with Name Sequence, Set Begin, Set End, and Exit—each of which is an avenue to more decisions.

Sonus' Personal Musician is designed to whet your appetite for the other two products. It requires just 64K to run and comes bundled with a Sonus MIDI interface and MIDI cables to help launch your compositional career. The manual contains a helpful MIDI glossary as well.

GlassTracks is an 8-sequence/8-track program that offers most of the sophisticated features of Super Sequencer: automatic transposition, auto-correction down to a 32nd note, step-time recording, and more. And both of Sonus' upper-end products have several stu-

dio-type features, including fast forward/reverse.

Super Sequencer 128 is Sonus' top-of-the-line Apple II product. It's a 16-sequence/8-track program that lets you arrange up to four songs in memory at one time. In addition to all the studio-whiz features of GlassTracks, Super Sequencer has a built-in MIDI system-exclusive librarian (see the glossary) for saving system-exclusive data to a disk.

Both GlassTracks and Super Sequencer are superior sequencers.

Dr. T

Dr. T's Keyboard Controlled Sequencer (Version 2.0) is a product that succeeds in spite of its hard-to-fathom, overly mathematical manual. If you made a score of 790 on your Math SATs, you might find this manual enlightening. Most musicians, though, will be completely baffled by it.

The program itself, however, is a well-designed sequencer. Like some of its top-drawer competitors,

Dr. T lets you enter music in three handy fashions: real-time from the synthesizer, step-time from the Apple keyboard, and step-time from the synthesizer. Its editing features—especially in the step-time area—are as slick and convenient as those of anything else on the market. But by the time you decipher the Dr. T manual, you'll probably be older than Dr. Seuss.

NOTE-EDITING PROGRAMS

MusicPrinter

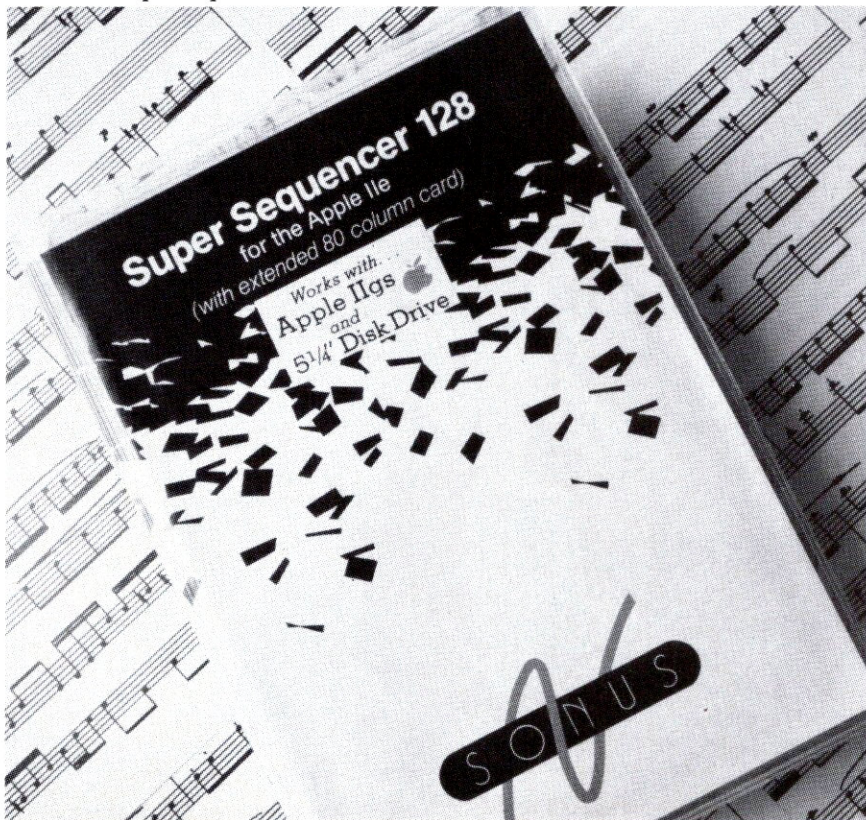
MusicPrinter is the unambiguous title of the newest of the Apple II note-editing packages. Despite its simple name, it's a powerful program that can handle the output needs of everyone from sixth-grade band instructors to world-class conductors.

MusicPrinter runs on all Apple IIs, including the IIGs. It requires only 48K of RAM plus an Epson, Okidata, or ImageWriter printer (or compatible) that can handle dot-addressable graphics. Even though you are able to enter notation from the Apple keyboard, it's faster to use a mouse, joystick, or KoalaPad.

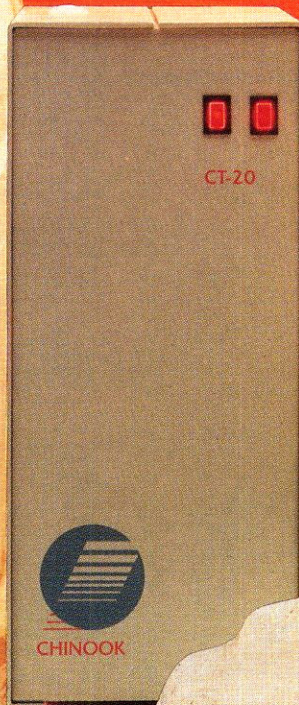
As you move through MusicPrinter's accessible, aesthetically pleasing manual, you'll discover why the program has been described as a deluxe "word processor for music." You must enter all notation item by item, rather than playing musical passages in real-time on the synthesizer for the software to capture. Yet the note-by-note approach is a virtually foolproof way to enter notes, sharps, flats, rests, and lyrics. MusicPrinter's spacious staff display makes editing a breeze.

If you've got a fairly fast mouse-clicking finger, it doesn't take long to enter a substantial number of measures with MusicPrinter. (A mouse is optional equipment for using this program.) The program can even spew forth a full conductor's score, complete with woodwind line, flute line, or whatever's needed—and it all lines up vertically, just like a hand-scribbled conductor's score.

The Sonus Super Sequencer 128



APPLE II OWNERS... YOU'VE BEEN OUT IN THE COLD TOO LONG



Announcing the CT-20 from Chinook Technology

For a while now, Apple II™ owners have been sort of, well, ignored. It seemed that all the exciting new products were developed for Macintosh™ systems rather than for Apple II's. Well, good news....those days are over. Now there's the CT-20 from Chinook Technology. Our 20 megabyte SCSI Winchester disk drive system was developed with only one thing in mind... you — the Apple II owner.

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Programs, Peripherals,

Apple Compatible Computers

Central Point Software			
Laser 128 Computer	379.	Laser 128 2nd Disk Drive (5 1/4", 1/2" height)	89.
<i>The Laser 128 includes an Expansion Slot, RGB Video Output, Parallel Printer Port, and a 10 Key Numeric Keypad!</i>			
Laser 128EX Computer	479.	Laser 128 800K 3.5" Drive w/Controller	259.
<i>The Laser EX includes a Built-in RAM Expansion Board, Universal Disk Controller, Built-In Expansion Slot, and Ports for all Peripherals!</i>			
		Laser 128 2-Slot Expansion Box	49.
		Laser 128 Cables	16.
		(Parallel, Serial, RGB or Modem)	
		Laser 128 Mouse	49.
		Amdek	
		Amdek Color 600 TRGB (Inc. Tilt & Swivel)	369.
		Taxan I18 Green	110.
		I19 Amber	115.

Backup Utilities & Boards

Alpha Logic Locksmith 6.0	36.	FWB Software	
Central Point Software		Disk Util II (IIgs)	52.
Copy II Plus (5.25" & 3.5" Bit Copy)	23.		

Business Software

Activision		PinPoint Speller/Document Checker Combo	61.
Writer's Choice Elite (Not Protected IIgs)	62.	PinPoint Toolkit	43.
List Plus (Merges w/Writer's Choice IIgs)	68.	Kl. Player	30.
Beagle Brothers Timeout Graph	55.	Command.Com	45.
Timeout SuperForts	45.	Graphics Edge	53.
Timeout QuickSpell	45.	Pinpoint IIe Upgrade Kit	19.
Timeout UltraMacros	37.	PinPoint Ram Enhancement	19.
Timeout SideSpread, FileMaster, or DeskTools	32.	ProFILER 3.0	74.
BPI Systems		Random House	
<i>(Accounting Systems for the IIe, IIc & IIgs)</i>			
BPI General Accounting ProDOS	139.	IIWrite (IIe, IIc, IIgs)	55.
BPI AR AP or Inventory ProDOS (ea.)	139.	IIFile (IIe, IIc, IIgs)	55.
BPI Payroll ProDOS	139.	Roger Wagner Publishing	
Broderbund On Balance	41.	Mouse Write (IIe, IIc, IIgs)	95.
Bank Street Writer Plus	55.	Sensible Software	
Claris Apple Works (IIe, IIc, IIgs)	Call.	Sensible Grammar ProDOS (3.5" & 5.25")	61.
Dac Software Dac-Easy Accounting	68.	Sensible Speller-Dos or ProDOS	71.
Datapak Graphicwriter 2.0 (IIgs)	85.	w/3.5 & 5.25"	
Notes 'N Files (IIgs)	74.	Sierra On-Line	
DHA Systems Software FastPak Mail	43.	Smart Money	55.
Electronic Arts DeluxeWrite	69.	Simon & Schuster	
Intuit Quicken	34.	Webster's Spelling Checker (ProDOS)	41.
Manzanita BusinessWorks		Software Publishing	
System Manager (Required)	69.	All Programs for IIe with 128K or IIc	119.
GL/AR/AP or Inventory Control	139.	PFS: Workmates (File/Report/Plan/Write)	69.
Payroll Module	139.	PFS: Write w/Speller	39.
BusinessWorks Bundle (Sys. Manager, G/L, A/P, A/R, Inventory)	299.	Softword GS File	61.
MECA		StyleWare, Inc.	
Managing Your Money 3.0 (IIe, IIc, IIgs)	96.	Multiscribe 3.0 w/Speller (128K IIe or IIc)	52.
Monogram		Multiscribe GS 3.0 (IIgs)	65.
Dollars and Sense (II+, IIe or IIc)	75.	DeskWorks	39.
Nolo Press Will Maker (Version 2.0)	36.	Picture Manager or Desk Accessories	26.
Peachtree Back To Basics		Multiscribe Fontpaks 1-8 (each)	15.
Accounting System: GL/AR/AP	135.	Timeworks Publish-It	69.
Pinpoint Publishing		VIP Software	
Pinpoint IIos Starter Kit	92.	VIP Professional (Apple IIc or Enhanced IIe)	152.
Pinpoint	50.	VIP Professional (IIgs Version)	183.
PinPoint Spelling Checker	43.	Word Perfect Corporation	
PinPoint Document Checker	43.	WordPerfect V.11 w/Speller (IIe & IIc)	89.
		WordPerfect (Apple IIgs)	89.

Entertainment Software

Access Software		Hayden Software Sargon III	15.
World Class Leader Board Golf	27.	Infocom	
Famous Courses of the World	14.	Border Zone, Bureaucracy, Hollywood Hyjinx,	
Accolade Mean 18 (IIgs) or Hardball (IIgs)	27.	Leather Goddesses of Phobos, Moon Mist,	
Famous Course Disk Vol. 2	12.	Nord & Bert, Plundered Hearts, Stationfall,	
Famous Course Disk Vol. 3 & 4	21.	The Lurking Horror, or Zork I (each)	25.
Hard Ball, Test Drive or Buble Ghost (IIgs)	21.	Hitchhiker's Guide to The Galaxy	15.
Activision		Sherlock	27.
Aliens, The Last Ninja or Rampage	24.	Beyond Zork or Beyond Zork (IIgs)	34.
Blackjack Academy	27.	The Zork Trilogy	34.
Firepower	18.	Micro League Sports	
GBA Championship Basketball (IIgs)	31.	Micro League Baseball	27.
GFL Championship Football or Championship Baseball	27.	General Manager/Owner Disk	21.
The Last Ninja (IIgs) or Hacker II (IIgs)	27.	Team Disk 1987	14.
Might & Magic or Faery Tale	34.	Microprose	
Adventure (IIgs)	34.	F-15 Strike Eagle or Silent Service	24.
Muscle Studio II (IIgs)	68.	Silent Service (IIgs) or Pirates	27.
Portal or Shanghai (IIgs)	31.	Mindscape	
Star Rank Boxing II	27.	Defender of the Crown (IIgs)	34.
Tass Times In Tonetown or Maniac Mansion	24.	Infiltrator II	24.
Artworx Dream 5.0	21.	Balance of Power	31.
Baudville Bridge Zone (IIgs)	31.	Bad Street Brawler or Into the Eagles Nest	24.
Ski Crazy	19.	Super Ice Hawkeye	24.
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Bulimia Ticket to London, Paris, Spain, or Washington D.C.	28.	The Tower Of Myrarglen (IIgs) or Alien Mind (IIgs)	34.
Data East Karate Champ or Kung Fu Master	15.	Strategic Conquest II (IIgs) or Cavern Cobra (IIgs)	31.
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Bards Tale (IIgs), Instant Music (IIgs), Music Construction Set (IIgs), Bards Tale II, Bards Tale III or Wasteland	37.	Leisure Suit Larry (APII or IIgs Ver.)	27.
It's Only Rock & Roll or Hot & Cool Jazz	23.	Thehexer (IIgs)	24.
ChessMaster 2000, Legacy of the Ancients, Deathlord, Chuck Yeager Flight Sim., Scrabble, PH Pegasus or World Tour Golf (IIgs)	30.	The Black Cauldron	37.
Strike Fleet or Marble Madness (IIe or IIgs)	26.	3-D Helicopter Simulation (IIgs)	24.
Dark Lord or Force 7	16.	Mother Goose	21.
EPYX California Games (IIe or IIgs), Dive Bomber, Destroyer (IIe or IIgs), Omnicron Conspiracy, Sub Battle Simulator (IIe or IIgs), Street Sports: Baseball, Street Sports: Basketball, Winter Games (IIgs), Home Video Producer, Sporting News Baseball, Sticker Maker, Street Sport Soccer, The Games: Winter Edition or World Games (IIe or IIgs)	27.	Police Quest or Police Quest (IIgs)	34.
Rad Warrior	18.	Simon & Schuster	
The Movie Monster Game	15.	Star Trek (Kobayashi Alternative)	21.
World's Greatest Baseball or Football Game	15.	Star Trek (The Promethean Prophecy)	27.
Winter Games or Summer Games II	17.	Sci-Tech Wizardry	34.
Firebird Elite	17.	Legacy of Lylgamy	34.
Guild of Thieves	27.	Return of Werdna	41.

Utilities & Languages

Absoft		The Byte Works ORCA/Pascal (IIgs)	72.
AC/Basic (16-bit BASIC Compiler for IIgs)	84.	ORCA/Pascal Desktop Debugger	80.
Apple Computer Apple Pascal V1.3	215.	ORCA/M 4.1	57.
Beagle Brothers Beagle Compiler	46.	ORCA/M GS	39.
Beagle G.P.L.E. or Super MacroWorks	31.	APW Desktop	34.
D-Code, Extra K, Power Print or Triple Dump (each)	25.	TML Systems TML Basic for the GS	84.
Borland Turbo Pascal 3.0 (Reg. CP/M)	48.	TML Pascal for the GS	84.
Funk Software Sideways Prodos & Dos 3.3	48.	TML Source Code Library for the GS	35.
Roger Wagner SoftSwitch (IIgs)	41.	TML Speech Toolkit	49.
Merlin 8/16 (IIe, IIc, IIgs)	79.	TML Pascal APW	84.
		Zedcor ZBasic 4.0	28.

Accessories

Apple Computer Apple Mouse IIe	125.	Turbo Mouse (Reg. or ADB)	89.
Apple Mouse IIc	89.	Kraft Kraft Universal 3 Button Joystick (II+, IIe, IIc)	34.
Applied Engineering		Koala Technologies	
TimeMaster H.O.	85.	Koala Pad Plus w/Graphics Exhibitor	84.
IIc System Clock	55.	MDIdeas	
IBM Style Keyboard	120.	Conservor (IIgs Switched Surge Suppressor w/Fan)	119.
CH Products		SuperSonic (Stereo Card for IIgs)	52.
Hayes Mach II Joystick (Beige or Platinum)	29.	SuperSonic Digitizer (IIgs)	52.
Hayes Mach III Joystick (Beige or Platinum)	52.	Mouse Systems A+ Mouse (IIc)	67.
Hayes Flight Stick	36.	A+ ADB Mouse (IIgs)	87.
Curtis Curtis Emerald	54.	MousTrak	
Curtis Ruby	60.	MousePad 7"x9" Size	8.
Curtis Ruby Plus	40.	MousePad 9"x11" Size	9.
Curtis Diamond Plus	40.	MousePad II (Low Friction)	9.
DataDesk		Orange Micro	
DataDesk ADB-101 Enhanced Keyboard (IIgs)	149.	Juice Box (IIgs Switched Surge Suppressor w/Fan)	69.
Kalmar		SMT	
Teakwood Rolltop Disk Case (Holds 50)	18.	No Slot Clock (II+ & IIe)	42.
Kensington		Street Electronics	
Mouse Pocket (Reg. or ADB)	8.	Echo IIb Speech Synthesizer (II+, IIe, IIgs)	109.
Mouseway (Mousepad)	8.	Crickit IIc	125.
Apple IIgs Dust Cover or Imagewriter I or II Cover	10.	Ribbons Unlimited	
Mouse Cleaning Kit w/Pocket	17.	Available colors: black, blue, brown, green, orange, purple, red, yellow, silver or gold	
Disk Drive Cleaning Kit (3.5" Drives Only)	34.	ImageWriter Ribbon-Color	4.
Apple Security System	34.	ImageWriter Ribbon-Black six pack	20.
Printer Muller 80	51.	ImageWriter II - 4 Color Ribbon	9.
Printer Muller 132	21.	ImageWriter Rainbow Pk. (6 Colors)	20.
A/B Box (IIgs)	63.	Thunderware	
System Saver (Platinum or Beige)	69.	ThunderScan Apple (IIgs, IIe, and IIc)	179.
System Saver (IIgs)	79.		

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Computer SAT Revised Version	34.	Kidstime II (IIgs)	24.
Baudville Guitar Wizard	19.	SpaceLace	20.
Ted Bear Discovers...Rainy Day Games	19.	Harcourt, Brace, Jovanovich	
Britannica		Computer SAT	27.
Algebra 1, 2, 3, or 4	25.	Learning Company	
Algebra 5 & 6	24.	Reader Rabbit (IIgs)	41.
Designasaurus (IIgs)	24.	Writer Rabbit (IIgs), Think Quick (IIgs) or Rockys Boots (IIgs)	37.
Broderbund Geometry	68.	Magic Spells (IIgs)	24.
Science Tool Kit Master Module	55.	Gertrude's Secrets (IIgs)	31.
Science Tool Kit Module I, II or III Type!	31.	Think Quick or Writer Rabbit	31.
Variable Feasts	34.	Reader Rabbit or Magic Spells	27.
Where in the World is Carmen Sandiego?	27.	Gertrude's Puzzles or Secrets	31.
Where in the USA is Carmen Sandiego?	31.	Math Rabbit	27.
Where in Europe is Carmen Sandiego?	31.	Robot Odyssey I or Rocky's Boots	34.
Compu-Teach		Mindscape Crossword Magic	34.
Once Upon A Time	25.	Perfect Score SAT	48.
Stepping Stones Level I	25.	PinPoint	
Stepping Stones Level II	25.	Micro Cookbook (IIe or IIc)	31.
See the U.S.A.	37.	Bon Appetit	37.
Davidson & Associates		Simon & Schuster	
Apple II and IIgs Versions Available:		Speed Reading Tutor IV	27.
Alge-Blaster, Classmate or Math Blaster Plus	31.	Speed Reader Tutor IV (IIgs)	34.
Grammar Gremlins or Read 'N' Roll Homeworker	55.	Typing Tutor IV (IIe, IIc, or IIgs)	34.
Speed Reader II	43.	Spinmaker Kindercomp, Gold Homework Helpers Writing or Math (IIe or IIgs Ver.)	26.
Spell-It or Word Attack!	31.	Typing Made Easy	34.
Math & Me	25.	Facemaker: Golden Edition	27.
Designware		Kidwriter	27.
Grammar Examiner	25.	Terrapin Enhanced Terrapin Logo V3.0	69.
Body Transparent	25.	Weekly Reader	
States & Traits	25.	Stickybear Series: Sticky Bear ABC, Car Builder, Basic, Drawing, Math I, Math II, Math Word Problems, Numbers, Opposites, Parts of Speech, Printer, Reading, Reading Comprehension, Shapes, Spellgrabber, Typing, Townbuilder, Vocabulary Development, or Writer (each)	25.

Modems

Anchor Automation		Practical Modem 2400 SA	199.
Signalman Lightning 2400	299.	Prometheus Pro Modem 1200 (External)	239.
1200E	119.	Pro Modem 1200G (Non Expandable)	139.
2400E	159.	Pro Modem 2400 (External)	309.
Applied Engineering		Pro Modem 2400G (Non Expandable)	179.
DataLink Modem (300/1200 Baud Internal Modem IIe, IIc, IIgs)	175.	Pro Modem 1200A (Single Card)	169.
Hayes		Pro Modem 300c	105.
Hayes Micromodem IIe (Internal)	165.	Supra Corporation	
Hayes Smartmodem 1200A (Internal)	265.	Supra Modem 2400 (Hayes Compatible)	149.
Hayes 300 Baud Smartmodem IIe w/Smartcom I	187.	U.S. Robotics	
Hayes 1200 Baud Smartmodem	299.	U.S. Robotics Sportster 1200	119.
Hayes 2400 Baud Smartmodem	449.	U.S. Robotics Courier 1200	199.
Practical Peripherals		U.S. Robotics Courier 2400	319.
Practical Modem 1200 SA	129.	U.S. Robotics Courier 2400E	379.
		U.S. Robotics Courier HST 9600	689.

Blank Media

5 1/4" Blank Diskettes		Bulk (Sony) 3 1/2" DS/DD (box of 10)	16.
BASF 5.25" SS/DD (box of 10)	8.	Centech 3 1/2" DS/DD Color Disks (box of 10)	19.
Verbatim 5.25" SS/DD (box of 10)	10.	Sony 3.5" DS/DD (box of 10)	18.
Sony 5.25" SS/DD (box of 10)	9.	Fuji 3.5" DS/DD (box of 10)	20.
Maxell 5.25" SS/DD (box of 10)	10.	Maxell 3.5" DS/DD (box of 10)	20.
3M 5.25" SS/DD (box of 10)	11.	Verbatim DS/DD (box of 10)	19.
3 1/2" Blank Diskettes		3M 3.5" DS/DD (box of 10)	20.
BASF 3.5" DS/DD (box of 5)	9.	C. Itoh 3.5" DS/DD Color Disks (box of 10)	25.

Printers

Brother		Microline 192Plus (200cps Dot Matrix 10")	339.
M-1109AP ImageWriter Comp.	249.	Microline 193Plus (200cps Dot Matrix 15")	489.
Epson LX-800	229.		
FX-86e	419.	KXP-1080 I/M2 (144 cps) NLQ Mode	199.
FX-286e	529.	KXP-1091 I/M2 (192 cps) NLQ Mode	229.
EX-1000	569.	KXP-1092 I (240 cps) NLQ Mode	329.
LQ-1000	739.	Seikosha	
Okidata		Seikosha SP 1000 (ImageWriter Compatible)	219.
Microline 182P (120cps Dot Matrix 10")	249.		

Disk Drives & Hard Disk SubSystems

American Micro Research (Micro Sci)		"SD Series - Slack" Platinum IIe, IIgs	
A5 D Half Height 5 1/4" Drive (IIgs Daisychain)	165.	20 MB w/SCSI card	675.
A.5 Half Height (II* & IIc)	139.	43 MB w/SCSI card	895.
A.5C Half Height (IIc)	139.	60 MB w/SCSI card	955.
Micro Sci C2 Controller	52.	First Class Peripherals	
Applied Engineering		Sider 20MB Hard Drive	549.
Transdrive 360K	215.	Sider 40MB Hard Drive	839.
Transdrive Dual 360K	319.	B-Sider 60MB Tape Backup	839.
Transdrive Half Height 360K	109.	Blank Tape 5 Pack	65.
Central Point Software		Revision D (Chip/Software for CP/II)	52.
Universal Disk Controller	79.	Hi-Tech Peripherals	
Central Point 800KB Drive	185.	Full Height 5 1/4" Drive for Apple IIe (Beige)	139.
Universal Disk Controller/800KB Drive Bundle	259.	Half Height 5 1/4" Drive for Apple IIe or IIc (Beige)	139.
CMS		Half Height 5 1/4" Drive for Apple IIe or IIc (Platinum)	149.
"Compact Series" Beige IIe, IIgs		Half Height 5 1/4" Drive Platinum for IIcs	169.
20 MB w/SCSI card	765.	Apple IIc Drive Adaptor	15.
40 MB w/SCSI card	1075.	Mitac AD-3C Slimline IIc	129.

Graphics Packages

Activision Draw Plus (Not Protected IIgs)	62.	Data Transforms Printrix I.I	46.
Paint/Write/Draw (Not Protected IIgs)	115.	Monster Font Pack	21.
Clip Art Gallery (Req. PaintWorks Plus IIgs)	21.	Electronic Arts DeluxePaint II (IIgs)	69.
GameMaker Bundle	34.	DeluxePrint II (IIgs)	37.
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Postcards (IIe & IIc)	18.	Graphics Scrapbook Chapter #1, #2, or #3	17.
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Walt Disney Card & Party Shop	27.	Intracorp Bumper Sticker Maker	34.
Walt Disney Comic Strip Maker	27.	Business Card Maker	37.
Baudville 816/Paint (Works On All Apples)	46.	PBI Software Visualizer (IIgs)	56.
Award Maker Plus	25.	Visualizer IIe	52.
Take 1 Deluxe	37.	Scholastic SuperPrint (IIgs)	31.
Animation Library or Zany Characters	19.	Spinmaker T-Shirt Shop	34.
Beagle Brothers Beagle Graphics	36.	T-Shirt Shop Graphics	15.
Mimix Disk #1, #2 or #3 (each)	19.	Springboard Newsroom	39.
Berkeley Software GEOS	64.	Springboard Publisher (IIe, IIc, IIgs)	84.
Broderbund Toy Shop	34.	Certificate Maker	26.
Dazzle Draw	41.	Certificate Maker Library #1	20.
Drawing Table (IIgs)	62.	Fonts For Springboard Publisher	26.
Print Shop Enhanced or Fantavision	34.	Newsroom Clip Art Collection Vol. 1 or 3	20.
Print Shop (IIgs) or Fantavision (IIgs)	41.	Newsroom Clip Art Collection Vol. 2	26.
Print Shop School Edition	48.	Laser Drivers	26.
Dazzle Draw School Edition	48.	Style Sheets/Newsletters	20.
Print Shop Companion	27.	Works of Art Education, Holidays or Assortment (each)	26.
Print Shop Graphics Library I, II, III or Holiday Ed.	17.	StyleWare, Inc. TopDraw (IIgs)	58.
Beagle Brothers Beagle Graphics	36.	Unison World Printmaster Plus	37.
Print Shop Graphics Library Party Edition	24.	Art Gallery I or Art Gallery II	19.
Show Off (IIgs)	41.	Art Gallery Fantasy	19.

Communication Software

Activision Teleworks Plus	68.	Pinpoint Point-To-Point	74.
Cheekmate Technology		United Software Industries	
ProTERM (IIgs, IIe, IIc)	80.	ASCII: Express Pro: Prodos or Dos 3.3	74.
CompuServe CompuServe Starter Kit	24.	ASCII: Express Mousetalk	61.

Accelerators/Ramcards/Z-80/80 Column Cards

Apple Computer		Z-RAM Ultra 1 (256K or 512K)	Call
Apple IIe Extended 80 Col. Card	89.	Z-RAM Ultra 2 or 3 (256K to 1MB)	Call
Apple IIe Enhancement Kit	49.	GS-RAM (256K to 1.5 Meg)	Call
Applied Engineering		GS-Ram Plus (1MB to 6MB)	Call
Ramkeeper or SlotMover (Option)	Call	Phasor (II*, IIe, and IIgs)	145.
RamWorks Basic (256K or 512K)	Call	Trans Warp Accelerator (II* and IIe)	179.
RamWorks III (64K to 3 MB)	Call	ViewMaster 80 (II*)	135.
2 Meg Plus RamWorks Expander (1 or 2MB)	Call	Z-80 Plus (II*, IIe, IIgs)	129.
PC Transporter (384K to 768K)	Call	Cheekmate Technology MemorySaver (IIgs)	125.
PC Transporter Installation Kit (IIe or IIgs)	Call	Orange Micro RamPak 4GS (512K Exp. to 4MB w/Utilities)	229.
RamFactor (256K to 1MB)	Call		

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Applied Engineering BufferPro 32K	94.	Printech II (Parallel Interface)	37.
BufferPro 128K or 256K	Call	Thirdware Finger Print GSi	69.
Serial Pro (II*, IIe, IIgs)	119.	Finger Print Plus	
Parallel Pro (II*, IIe, IIgs)	85.	(Specify Cables: Parallel, Serial or ImageWriter II-II* & IIc)	89.
Orange Micro ProGrappler (Apple IIe or IIgs)	84.	FingerPrint IIc (Internal or External Ver.)	74.
Serial Grappler Plus	84.	Finger Print G* (With Parallel Cable II*, IIe, IIgs)	55.
Grappler C/Mac/GS	84.		
Hot Link	54.		

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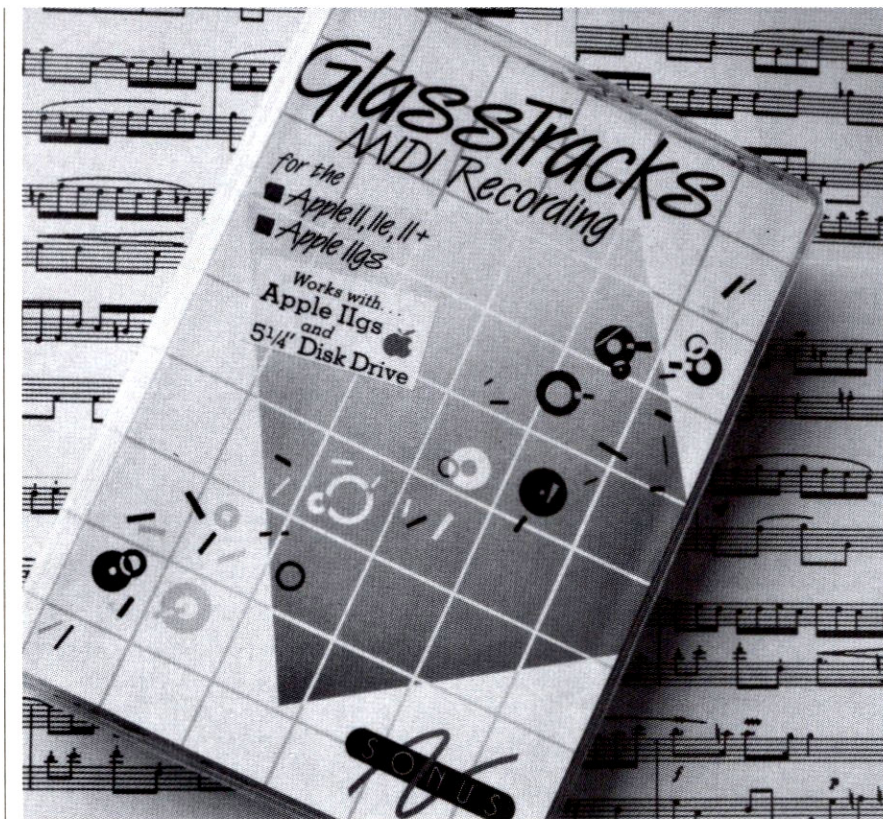
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MAKING MUSIC



Polywriter Utilities is a separate package that links Passport's sequencer programs (including Master Tracks Pro) with Polywriter. Since Master Tracks Pro is more of a full-fledged sequencer than Polywriter, you can use MTP to create your really fancy compositions and then (via Polywriter Utilities) ship the data over to Polywriter for sheet-music output.

Given Apple's interest in fostering the music market, you can expect that Apple will be evangelizing MIDI music software for the IIGs (but not for the IIe and IIc, since Apple's MIDI box doesn't work with those systems). So watch for more GS-specific compositional software in a league with Music Writer. +

Larry McClain is an ad-agency copywriter in Southern California who once tried to be a rock star. He's a former staff writer for Popular Computing and ex-editor of HARD-COPY, a DEC-oriented magazine.

GlassTracks from Sonus

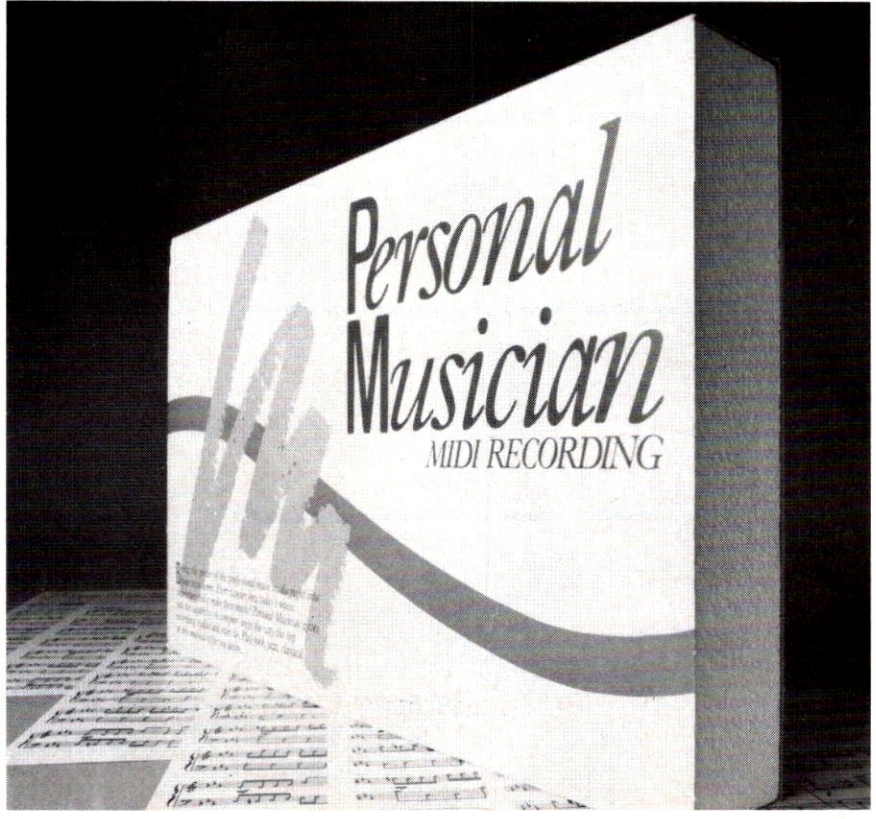
MusicPrinter is a decidedly professional music-output package, ideal for copyists and arrangers who are already accustomed to entering lots of notes and rests for a living—with a pen.

Polywriter

With Passport's Polywriter, anyone who plays music can now write music. Polywriter lets you cut loose on the synthesizer and then turns that performance data into music notation that appears on the monitor. You can then edit to your heart's content: transpose keys, add or delete notes, or perhaps type in a set of brand-new song lyrics. Once you're satisfied, you print out a hard copy of the opus.

It's obviously a faster way to input music than MusicPrinter's, but the hard copy is more jagged. (The Apple II Plus, IIe, and IIGs versions of Polywriter work only with dot-matrix printers; the IIc version works with ImageWriter and Scribe printers.)

Personal Musician from Sonus



HOT. MEAN. RADIO- ACTIVE.

AUGUST 20, 2087

Nothing could be worse than this god-forsaken, radioactive desert.

More Sniperdroids! All tracking me with them death glares. And them Uzis. They're weird trigger-twitchin' folks. I suspect it's them poisoning the water.

Or maybe it's those Leather Thugs. Heck, I don't know anymore. I heard they have a bunch of civilians cut off east of Ranger Center, which is where I'm headed. Hope not. They want me dead. Like every other mutant this side of Vegas.

The worst part is, I'm getting to be as bad as they are. You wouldn't believe some of the ways I've learned to kill. I hang out in sewers, and my best friend is a MAC 17 submachine gun.

Gramps talked about life before the nuclear war. All I know is I don't want others living this way. Gotta rebuild this desert right. Gotta make it so you can sleep with your eyes closed.

WASTELAND™. A new role-playing game from the creators of the Bard's Tale™ series.



3 WAYS TO ORDER: 1) Visit your retailer. 2) Call 800-245-4525 from U.S. or Canada, 8am to 5pm PST to order by VISA/MC. 3) Mail check (U.S.\$) or VISA/MC #, cardholder name, and exp. date to Electronic Arts Direct Sales, P. O. Box 7530, San Mateo, CA 94403. Apple II version \$49.95, plus \$3 shipping/handling. CA residents add 6.5% sales tax. Allow 1-3 weeks for U.S. delivery.

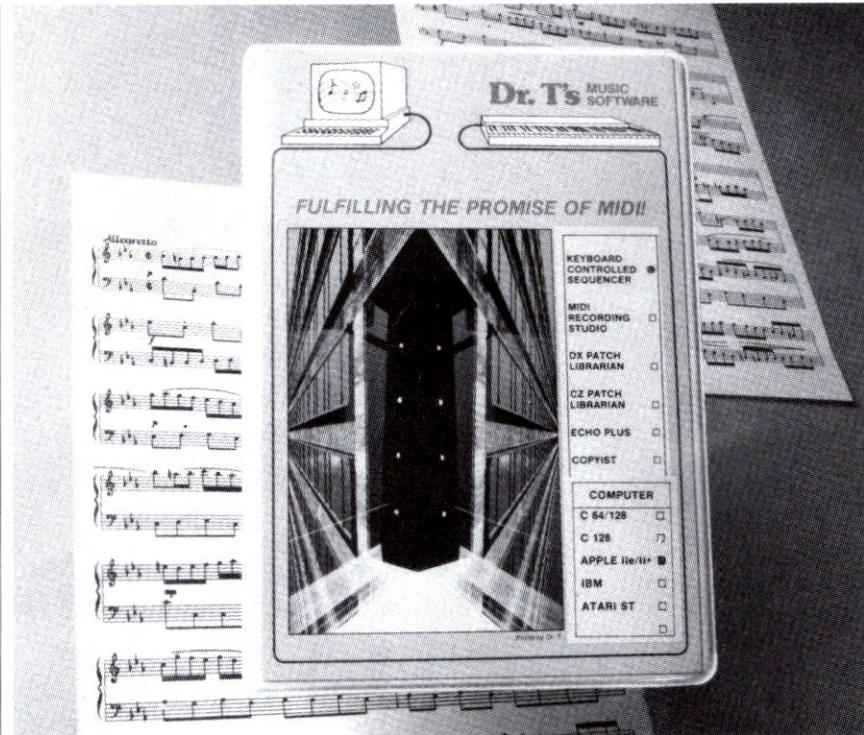
CIRCLE 103 ON READER SERVICE CARD



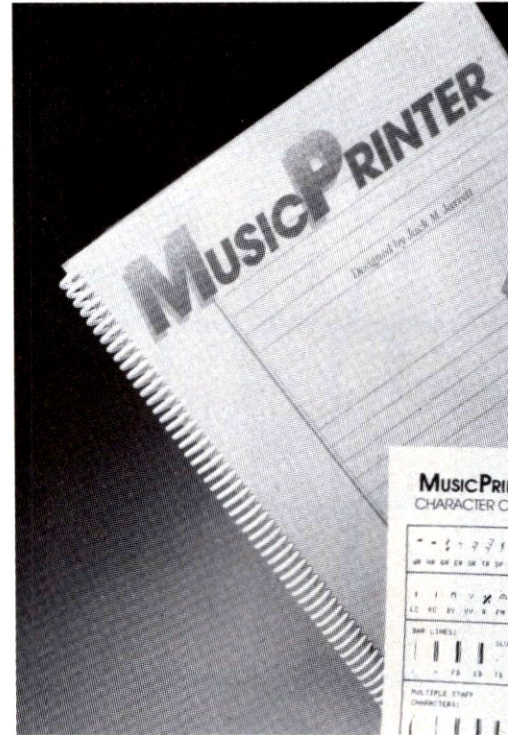
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MAKING MUSIC



Dr. T's Keyboard Controlled Sequencer



MusicPrinter from Temporal Acuity Products

GLOSSARY OF SEQUENCER TERMS

Channel. Any one of 16 available MIDI data paths.

Real-Time Recording. The most common method of recording a sequence by simply playing the notes on your synthesizer. What you enter is exactly what you'll hear on playback.

Sequence. A segment of music you enter into memory for modification with sequencing software.

Step-time recording. A method of entering notes (of designated duration) into the sequence, either via the synthesizer or Apple keyboard. If you designate eighth notes, each press of a key will place one eighth note in the sequence.

System-exclusive data. Two of MIDI's 16 channels are reserved for entering and saving performance data that's exclusive to the synthesizer in use—e.g., sounds that only a Yamaha DX-7 can make.

Tracks. The number of sound layers you can work with at any given time, similar to the tracks on analog tapes (4-track, 8-track, etc.).

VITAL STATISTICS

Music Writer for the Iie

Pygraphics
P.O. Box 639
Grapevine, TX 76051
(817) 481-7536
(800) 222-7536

List Price: Level 1, \$295; Level 2, \$595

Requires: Apple Iie, 128K RAM, one 5¼-inch disk drive, mouse, MIDI interface.

CIRCLE READER SERVICE NO. 357

Music Writer for the IIGS

Pygraphics
P.O. Box 639
Grapevine, TX 76051
(817) 481-7536
(800) 222-7536

List Price: Level 1, \$119; Level 2, \$295; Level 3, \$595

Requires: Apple IIGS, 768K RAM, one 3.5-inch disk drive, mouse, MIDI interface optional.

CIRCLE READER SERVICE NO. 358

Super Sequencer 128

Sonus Corporation
21430 Strathern Street, Suite H
Canoga Park, CA 91304
(818) 702-0992

List Price: \$229.95

Requires: Apple Iie or IIGS, 128K RAM, one 5¼-inch disk drive, MIDI interface card, MIDI-equipped synthesizer.

CIRCLE READER SERVICE NO. 359

GlassTracks

Sonus Corporation
21430 Strathern Street, Suite H
Canoga Park, CA 91304
(818) 702-0992

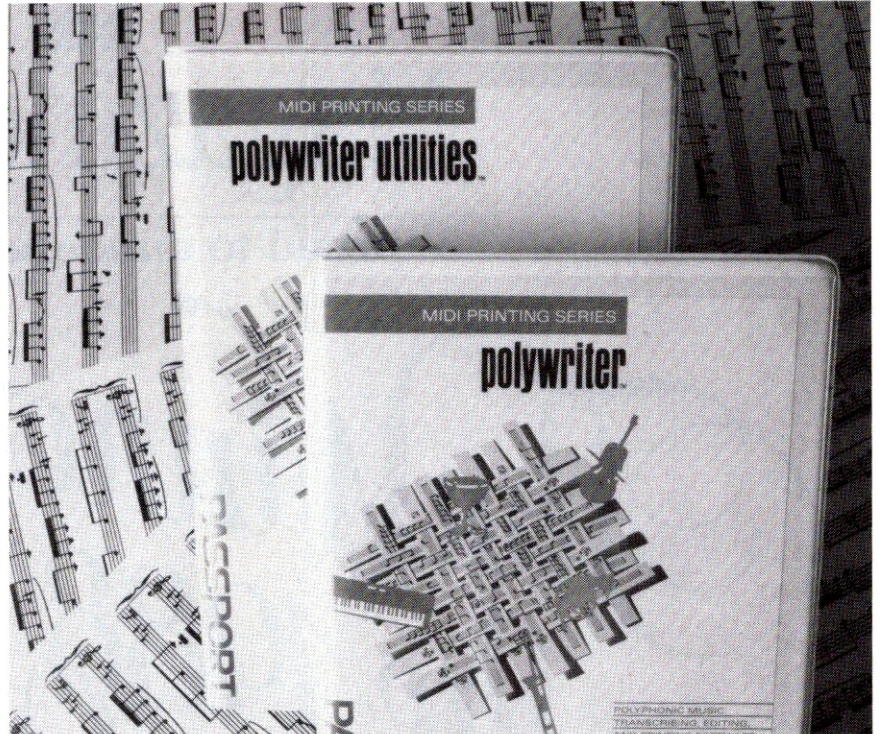
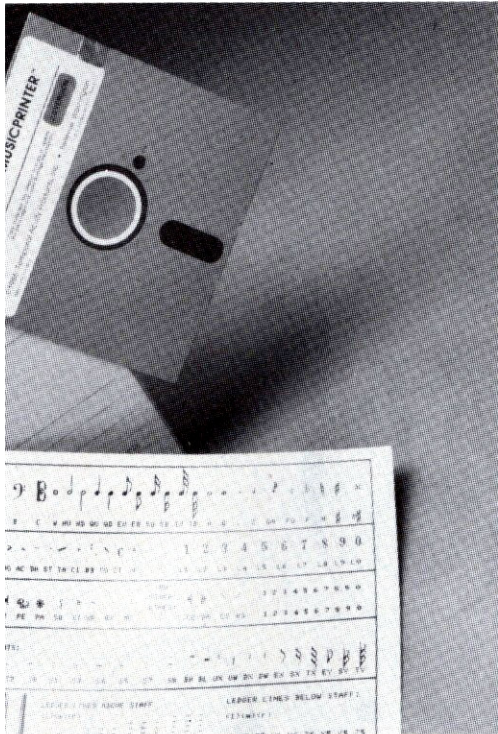
List Price: \$99.95

Requires: Apple II Plus, Iie, or IIGS; 64K RAM; one 5¼-inch disk drive; MIDI interface card; MIDI-equipped synthesizer.

CIRCLE READER SERVICE NO. 360



MAKING MUSIC



Polywriter and Polywriter Utilities from Passport Designs

Personal Musician

Sonus Corporation
21430 Strathern Street, Suite H
Canoga Park, CA 91304
(818) 702-0992

List Price: \$129.95 (includes Sonus MIDI interface card and MIDI cables)

Requires: Apple II Plus, IIe, or IIGs; 64K RAM; one 5¼-inch disk drive; MIDI-equipped synthesizer.

CIRCLE READER SERVICE NO. **361**

Master Tracks Pro

Passport Designs, Inc.
625 Miramontes Street
Half Moon Bay, CA 94019
(415) 726-0280

List Price: \$299.95

Requires: enhanced Apple IIe, 128K RAM, one 5¼-inch disk drive, Passport MIDI interface card, MIDI-equipped synthesizer.

CIRCLE READER SERVICE NO. **362**

Dr. T's Keyboard Controlled Sequencer, Version 2.0

Dr. T's Music Software
66 Louise Road
Chestnut Hill, MA 02167
(617) 244-6954

List Price: \$175

Requires: Apple II Plus or IIe, 64K RAM, one 5¼-inch disk drive, MIDI interface card, MIDI-equipped synthesizer.

CIRCLE READER SERVICE NO. **363**

MusicPrinter 2.0

Temporal Acuity Products, Inc.
300-120th Avenue N.E.
Bellevue, WA 98005
(206) 462-1007

List Price: \$149

Requires: Apple II Plus, IIe, IIc, or IIGs; 48K RAM; one 5¼-inch disk drive; Epson, Okidata, or ImageWriter printer (or compatible) equipped for dot-addressable graphics; mouse optional.

CIRCLE READER SERVICE NO. **364**

Polywriter

Passport Designs, Inc.
625 Miramontes Street
Half Moon Bay, CA 94019
(415) 726-0280

List Price: \$299.95

Requires: Apple II Plus, IIe, IIc, or IIGs; 64K RAM; one 5¼-inch disk drive; dot-matrix printer that can produce graphics; Passport MIDI interface.

CIRCLE READER SERVICE NO. **365**

Polywriter Utilities

Passport Designs, Inc.
625 Miramontes Street
Half Moon Bay, CA 94019
(415) 726-0280

List Price: \$99.95

Requires: Apple II Plus, IIe, IIc, or IIGs; 64K RAM; one 5¼-inch disk drive; dot-matrix printer that can produce graphics; Passport MIDI interface.

CIRCLE READER SERVICE NO. **366**



Magazine

is proud to announce

*The Winners of
the 1988
Readers' Choice
Awards*

The ballots have been counted—and your voices have been heard. A+ Magazine's Apple II experts have chosen the winners of the Fourth Annual Readers' Choice Awards. What makes these awards so meaningful is that you, the dedicated users who buy and use Apple II products, have chosen the best Apple II products of 1988.

Look for these outstanding Apple II products at your favorite computer retailer.

PICK OF THE CROP
BY BOB LINDSTROM

*A synthesizer, sound generator,
sampler, and speakers, plus
a book for MIDI musicians*

PRODUCT SPOTLIGHT

THE RIGHT (AND LEFT) SOUND

All it takes to enjoy the stereo ecstasy of the Apple IIcs is two speakers, room for an external amplifier, and a hefty checkbook to make it all possible. There must be an easier way.

The Yamaha DM-01 dual-powered speaker set offers Apple owners an affordable and compact way to add stereo sound to their IIcs.

Each of these diminutive boxes combines speaker and amplifier in a single unit. Both speakers contain a four-inch driver and a 5.5-watt amplifier. Each DM-01

comes equipped with its own power cord, on/off switch, and volume and low-boost tone controls.

The speakers come with adapter cables that connect the phono-jack input of the speakers to the output RCA jacks of most IIcs stereo cards.

Yamaha DM-01 Dual-Powered Speaker Set

List Price: \$99.95

Yamaha Music Corporation,
USA
6600 Orangethorpe
Buena Park, CA 90620-1396
(714) 522-9240

CIRCLE READER SERVICE NO. 401



AU-AU-AUDIO DIGITI-TI-TIZER

If you want to give your IIcs the high-tech stutter of Max Headroom or turn the bark of the neighborhood pooch into the Mongrel Tabernacle Choir, FutureSound will do the job.

With this multifunction audio digitizer and stereo card, the IIcs becomes a computerized 15-track, stereo tape recorder. You can record sounds through line inputs or with the supplied microphone. Eight-bit maximum sampling rates vary from 19.4 kHz (stereo) to 31.5 kHz (monaural). Sample length is limited by available RAM.

The sound-sample editing software displays a graph of the waveform and lets you cut and paste parts of the sound or add special effects such as echo, fade, or that Max-like stutter.

FutureSound is the only audio digitizer for the IIcs that currently uses Apple's AIFF (audio interchange file format) for digitized audio. You can use AIFF samples created with FutureSound as instruments in Electronic Arts' Instant Music. Applied Visions also provides several routines for integrating FutureSound data into programs created in the C programming language.

The audio output of FutureSound decodes two-channel stereo from the IIcs's Ensoniq sound chip. The output can go to an external amplifier or stereo headphones.

FutureSound List Price: \$279

Requires: Apple IIcs, 512K RAM, one 3.5-inch disk drive.

Applied Visions
Suite 2200

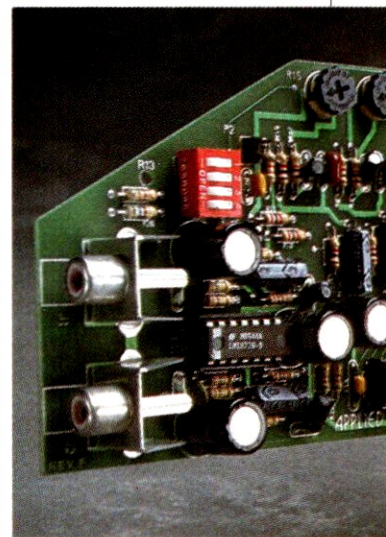
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Cambridge, MA 02139
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PHASORS READY, CAPTAIN

Apple IIe owners who have been jealously eyeing and earing the built-in musical muscle of the IIcs might want to strike up the bandwidth with Applied Engineering's Phasor, a card that brings 12-voice stereo music, speech, and sound effects to the Apple II Plus or IIe. (The Phasor also works in a cs.)

The Phasor installs in any Apple II internal slot except



slot 3. The board has a four-watt amplifier that can be connected directly to speakers or headphones. You can also use it with an external amplifier.

Software that comes with the Phasor includes a selection of ready-made music files, a musical-note editor, a sound-effects editor, and a text-to-speech program. The users' manual explains how you can integrate sounds, speech, and music into your own programs.

Applied Engineering also lists more than two dozen programs that are compatible with the Phasor, such as Electronic Arts' Music Construction Set, Broadside from SSI, and the newly released Ultima V from Origin Systems.

Phasor

List Price: \$179

Requires: Apple II Plus, IIe, or IIGs; 64K RAM; one 5¼-inch disk drive.

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An array of 20 digitized percussion sounds is available in the HT-700's built-in rhythm box, so you can create your own rhythm tracks and drum patterns.

The unit is powered by six D-cell batteries or an optional AC power supply.

For those who prefer full-size keys instead of the small ones of the HT-700's minikeyboard, Casio manufactures the HT-3000, which includes all the HT-700's features in a 61-key, full-size keyboard.

Casio HT-700, HT-3000

List Price: HT-700, \$399.50; HT-3000, \$749

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A MIDI PRIMER

MIDI does not stand for "Musical Innovations to Drive you Insane." But even musicians who are conversant in computer technobabble can run screaming from their first encounter with the musical instrument digital interface.

In *MIDI for Musicians*, author Craig Anderton, editor of *Electronic Musician* magazine, clarifies the history, the technology, and the practicality behind the MIDI standard.

Whether the question is as simple as how to plug a keyboard into a MIDI system or as intricate as the meaning of individual bits in the MIDI data stream, Anderton covers the large and small issues. Although he sometimes tells more than the average musician may want to know, Anderton provides ample warning

when his writing is just about to stray into high-tech territory.

Although some of the specific information on MIDI computers and instruments is slightly outdated in this 1986 publication, Anderton's rundown on the basics of MIDI remains lucid and enlightening.

MIDI for Musicians

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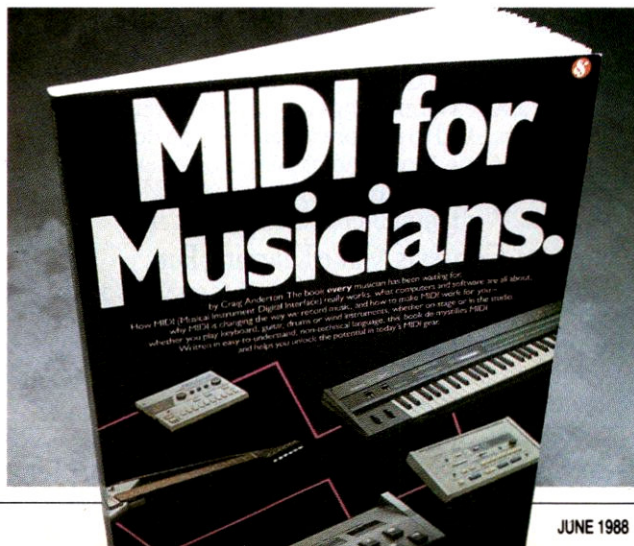
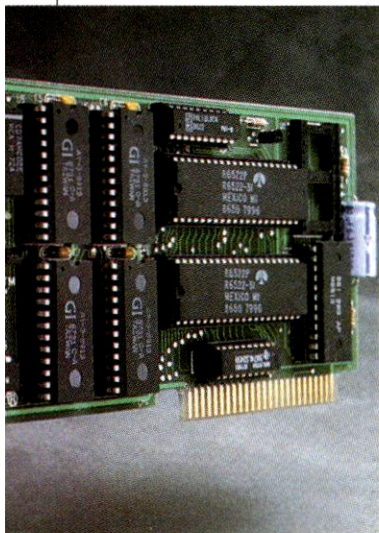
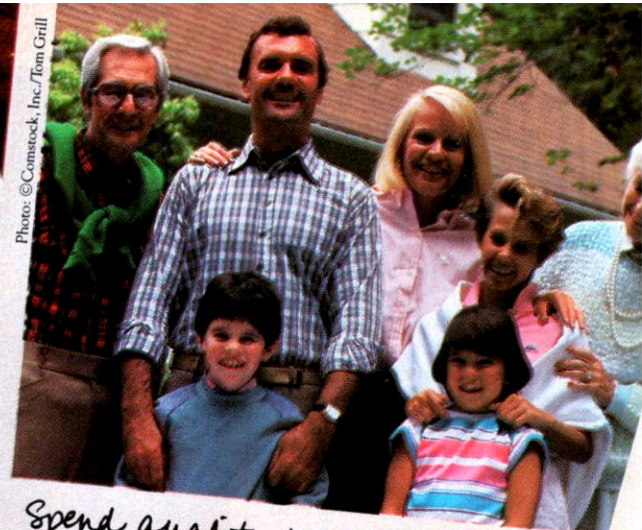


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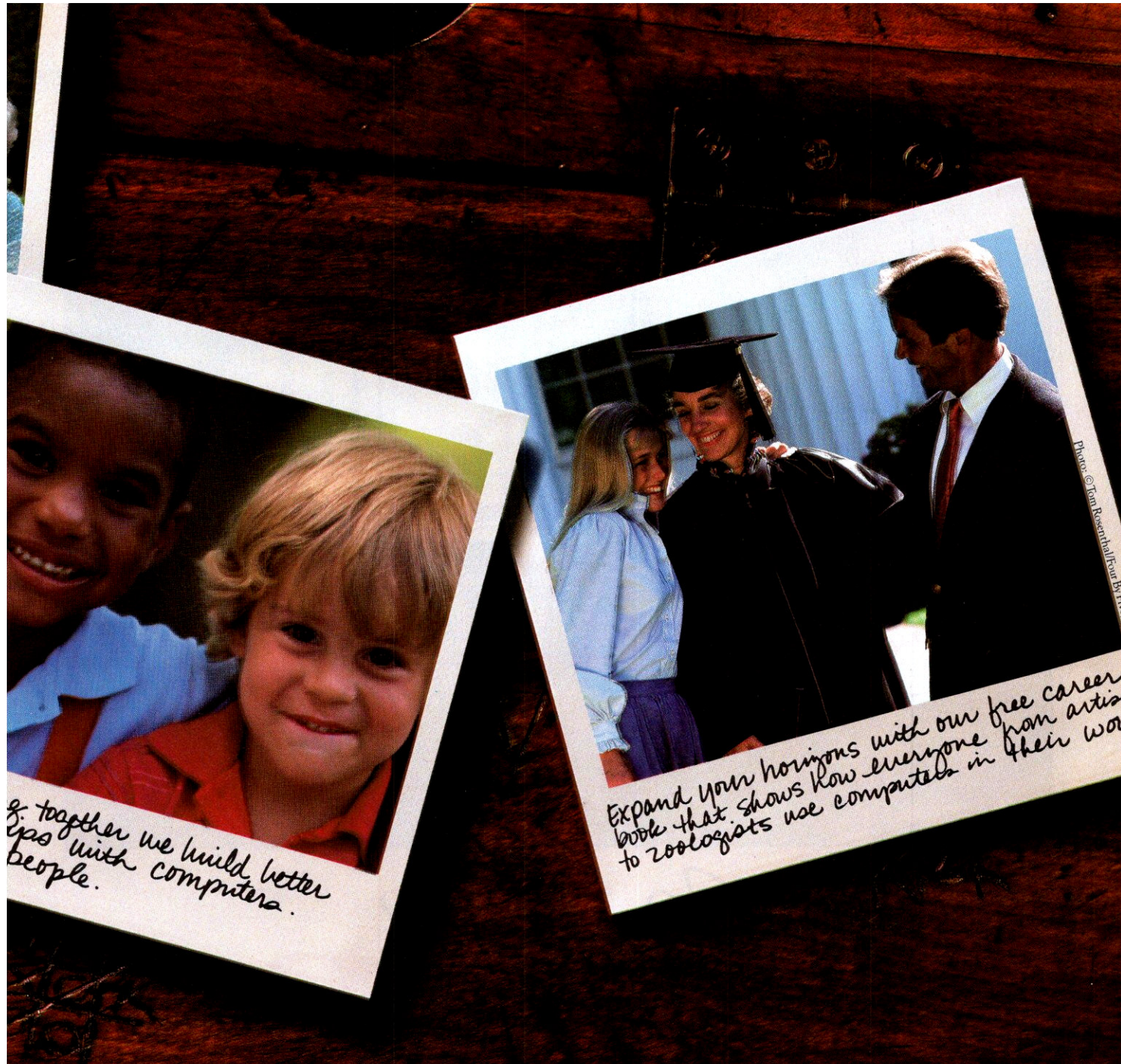


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Activision's Paintworks Plus was one of the first true Apple IIGS products available (see *A+*, May

GRAPHICS

BY ROBERTA SCHWARTZ AND
MICHAEL CALLERY

*Great new features,
power, and ease of use
make Paintworks Gold
really shine.*

1987). It combined what has become the standard paint-program tools and editing functions (thanks to MacPaint on the Macintosh) with incredible ease of use—and color! Except for the absence of scroll bars, Paintworks Plus used the textbook Apple Desktop Interface. You could use Paintworks Plus without ever cracking the users' guide. It was, and still is, a competent paint program.

Other GS paint programs that ar-



Figure 1: To distort an image, select it with the lasso or marquee tool, and handles will appear in the corners. Then choose Distort from the Select menu and "pull" on the handles.

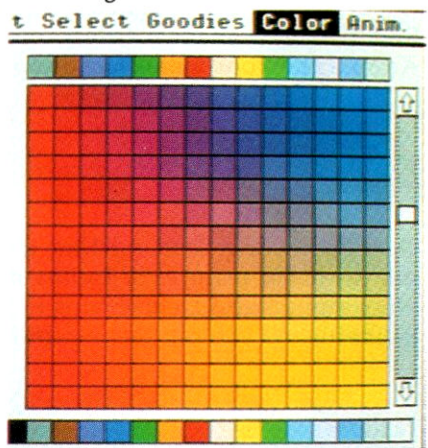


Figure 2: The Goodies menu is almost entirely new and offers features that make Paintworks Gold a real standout.



Figure 3: This picture was created entirely with clip art that comes packaged with Paintworks Gold.

Figure 4: You can quickly create palettes with the Gradient Palette selection from the Color menu. We started with the default palette and dragged red to the upper left corner and yellow to the bottom right to obtain this result.



rived later offered more features. One in particular, DeluxePaint II, began to steal the show. But all that glitters is not gold—along with DeluxePaint's astounding range of features came a complicated, difficult-to-use interface (see *A+*, November 1987).

Staking the Claim

Activision, publisher of Paintworks, was not about to stand still and let DeluxePaint II capture the paint-program market. Luc Barthelet and Henri Lamiroux of Version Soft, developers of the original Paintworks Plus, redesigned the program. They added many features while retaining the classic interface, so Paintworks Plus evolved into Paintworks Gold. (Gold doesn't replace Paintworks Plus, though. Activision will sell both.)

We should preface our description of Paintworks Gold with one

caveat: In order to use the program, you need a whopping 1.25 megabytes of memory. Memory prices have risen dramatically in the past several months, so be sure you can afford more RAM before you decide to buy Paintworks Gold.

Striking Gold

If you've used Paintworks Plus, your first impression when you start Paintworks Gold is that very



Figure 5: Paintworks Gold's color menu

little is new. You see a few new tools and a couple of new menu items. The screen is blessedly simple and deceptive, but Paintworks Gold is a powerful program.

The tool palette, running down the left side of the screen, includes the usual hand, lasso, paintbrush, pencil, and so on. A closer look reveals two new tools with somewhat enigmatic icons. One, called Cotton, resembles a grid tool but is actually equivalent to DeluxePaint II's Brush-mode menu. It allows you to transform a brush into a smoothing, blending, or smearing tool. The other tool—called Search Color—allows you to identify which color-palette entry appears in any area of a painting.

Filled polygons are conspicuously absent from the tool palette. That's just an illusion, however. The polygon tools—square, circle,

and so on—now default to filled polygons. To draw an empty, or transparent, polygon, you must specify a hollow shape by selecting the box marked with an asterisk from the color palette. The color/pattern palette bridges the bottom of the screen, and it has the new “hollow” color as well as four new slots for dithered fill patterns.

Underneath the drawing tools, three small palette sections determine line width, magnification level, and the way you want the enlarged pixels to appear in the magnified view (pixels can appear with or without a grid, and pixels next to each other can appear as a solid line or color, or they can appear as distinct separate squares).

Besides the apple, File, Edit, Goodies, and Color menus, you'll find two new menus: Select and Anim. (The Font menu has disap-

The screen is blessedly simple, but Paintworks Gold is a powerful program.

peared, but its functions are now on the Edit menu.) The contents of these menus are quite different from what the Paintworks Plus menus contain.

File

The File menu now has an Auto Load command to let you specify a picture for automatic loading when the program starts. A nice touch, especially if you want to return day after day to the same work in progress. The new Choose Printer and Page Setup commands work with Apple's standard printer interface. (The program also comes with

print drivers for Epson printers, which you can access through these new menu items when the drivers are in the Drivers folder of your system.) When you save a picture, you have a choice of saving it in the Paint, Screen, or Apple Preferred format, making your pictures compatible with all other super-hi-res paint programs.

In addition to the usual Undo, Cut, Copy, Paste, and Clear, the Edit menu contains Paste Adj(usted) Color, which allows you to cut and paste between pictures with different palettes while retaining some semblance of the cutout's original colors. The expected Invert, Flip, and Rotate instructions are gone from the menu (they've migrated to the Select menu); commands for editing patterns and choosing fonts are in their place under Edit.

GOLD COMPARED

Does Paintworks Gold outshine the competition among IIGS paint programs? Here's a comparison chart showing the major features of Paintworks Gold vs. its sister product, Paintworks Plus, as well as competitors from other companies: DeluxePaint II from Electronic Arts, Graphics Studio from Accolade, and 816/Paint from Baudville. As you can see, except for the memory requirement, Gold looks pretty good.

Feature	Paintworks Gold	Paintworks Plus	DeluxePaint II	Graphics Studio	816/Paint
Standard Tools	■	■	■	■	■
Lasso	■	■			■
Zoom Autoscroll					■
Second Page	■		■	■	
3-D Transformations	■		■		
Tile Symmetry			■		
Color Masking	■		■		
Object Masking	■				
Free Rotation	■		■		
Color Cycling	■		■	■	■
Full-Screen Animation	■	■			
Access to All Fonts	■	■		■	■
Inclusion of Clip Art	■		■		
Inclusion of Slide Show				■	
Hi-Res Conversion					■
Copy-Protection				■	
640-Mode Colors	16	None	4	4	16
Memory Required	1.25MB	512K	768K	768K	512K
Adherence to Standard Interface	Excellent	Excellent	Good	Poor	Very Good
Price	\$99.95	\$69.95	\$99.95	\$69.95	\$75.00

Select

The Select menu contains all the things you can do with a selection, and you can do a lot: invert, fill, flip, free-rotate, resize, bend, distort, and use as a brush. These editing features work not only with selections you make by using the marquee tool but also with those you make with the lasso. Unlike those of DeluxePaint II, these features are presented in a comfortable, Apple sort of way. After you've made a selection with the lasso or marquee and selected, for example, Distort from the Select menu, handles appear around your selection (see figure 1). You just pull on the handles to achieve the desired distortion.

Goodies

The Goodies menu is almost entirely new (see figure 2). It contains extensive commands: Hide Menu Bar, Hide Fat Window, Hide Tools, Show Coordinates, Show Origin, Use As, Turn Grid On, Show Page, Brush Mirrors, Show Page 2, Copy 1 to 2, Use Page 2 for Doc, and Show Page 2 behind. Yes, page 2!

Given these selections, Goodies is where Paintworks Gold really shines. In our book, a paint program just doesn't score if it doesn't offer two features: a full screen and a second page. In Paintworks Gold, to see the entire screen as you work, all you have to do is press the space bar, and the menus disappear. What a pleasure to be able to paint any area of the screen without scrolling.

The program also offers two pages to work on interactively. A second page is essential for testing effects, trying different colors, merging parts of two documents, and so on. In Paintworks Gold, you can work with the second page in two ways: It can be an independent document or a "scratch pad" for experimentation. When you use it as a scratch pad, the second page is dynamically linked with the first page. It uses the same palette, has the same resolution, automatically scrolls to the same position, and closes when the other page closes. If you use it as a document, the second page is totally independent of the other; each page can have different palettes, use different resolutions, and retain its own placement on the page. In either case, you can freely cut and paste from

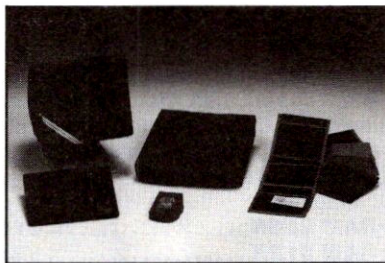
The Goodies menu is almost entirely new, and is where Paintworks Gold really shines.

one page to the other.

You can also use the second page as the background for the first. Erasing parts of page 1 to the background color reveals the second-page image behind it. This feature

is useful for creating animations. To be sure that the text and graphics appear in the same place on each image, simply make a template on the second page and create each new graphic on page 1—much like using tracing paper.

Another benefit of a second page is that it lets you work comfortably with clip art. You can load the clip art onto the second page and then copy and paste it onto your working drawing on the first page. Speaking of clip art, Paintworks



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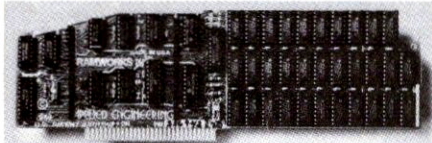


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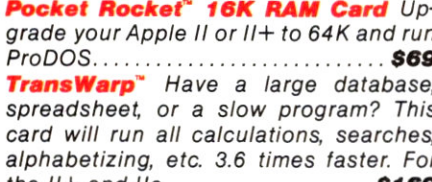
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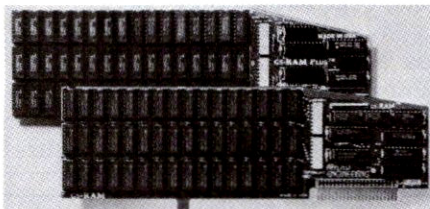
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Gold comes with a second "art" disk. This disk isn't just a sampling of beautiful images created with the program (although it contains two impressive full-screen graphics); it's an extensive collection of true clip art—small images, ranging from books to grapes, that you can use to enhance your own creations. Roberta created figure 3 entirely from some of that clip art.

Color

The Color menu now stretches almost to the bottom of the screen. This program has so many new color features that we're at a loss to describe them all. We're also at a loss to think of anything else that can be done with color, aside from letting us have multiple palettes on the same screen. The GS is capable of doing so, but we guess we'll have to wait for Paintworks Gold Plus for this feature.

The original Paintworks Plus color-editing features and color table, a permanent repository for up to 128 palettes, are here intact, and so are color sets, in which you can make gradient fills (blending colors into one another) or specify as many as four color sets for use in color-cycle animation.

You'll love the new Gradient Palette command. Your screen fills with a grid containing 196 gradations of color from any four colors you select. You can then transfer any of these gradations to the palette you're working with. Want a gradient of red to yellow? Just drag red into one corner and yellow into another (see figure 4). Gorgeous. You can save your new custom colors in the color table or stash them in another grid called Preferred Colors, a place to keep permanently the 196 colors you use most.

Want more? Using the Sort Palette option, you can arrange the colors in your palette from darkest to lightest. What's most impressive here is that the program automatically adjusts your image so that the change of the colors' palette positions doesn't change the colors in your picture.

Perhaps the neatest new feature in the Color menu is "slippy" colors. If you identify a color as slippy, you can't lasso or select it—it slips through the noose. This feature lets you lift an object off a complex background.

Masking is another feature that

For now, this paint program is about as close as you can get to that elusive pot of gold.

really comes in handy. When you mask one or more colors, you can't draw or paint over them. Even better, you can mask a selection. Suppose you want to put a sun partially behind a building. No problem. Simply mask the building and draw the sun right on top of it—the sun will automatically go around (and therefore appear behind) the building.

There's more (see figure 5), including transparent colors, but we'll let you discover the rest.

Animation

The Anim. menu is where you can create full-page animation or do color cycling. If you appreciate the compressed-image animation capabilities of Paintworks Plus, you'll be glad to know they're here too, in an improved form. Now you can change the speed of full-page animation without recompressing your images.

The program also handles color cycling well. Using Color Sets from the Color menu, you define up to four sets of colors from the current palette. These colors then cycle independently of each other—each with its own timing.

Six Forty

Apple gave developers a method for creating colorful 640-mode graphics. By correctly assigning colors to the palette area of GS memory, the 640 mode can show 16 colors. Until now, however, only 816/Paint let you take advantage of this feature; other paint programs use only the basic 4-color palette of the 640 mode. Now Paintworks Gold also shows 16 colors, making the 640 mode as colorful as the 320 mode. Furthermore, you can instantly switch between modes without reloading your picture, as you must in DeluxePaint II, or quitting and restarting the program, as you must with 816/Paint. Paintworks Gold even lets you transfer palettes from one mode to the other so your graphic retains its integrity (except for lines or fonts

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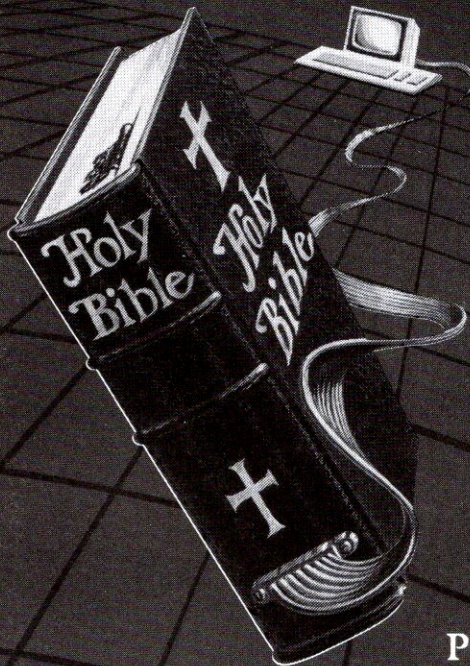
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that are only one pixel wide—they get lost in the transition).

We Like It

Old-time GSers will remember that the original release of Paintworks Plus had more than its share of bugs. We've been working with Paintworks Gold, in one form or another, for nearly six months now and have experienced only a few problems. Bugs are insidious things, and with the first release of any program, especially one as complicated and sophisticated as this one, some critters seem always to be lurking. In our area, the word is "If a program can be crashed, Roberta will crash it."

Well, she didn't crash this one, but she did witness some unwelcome "special effects" as she created the graphic in figure 3. After she had done a lot of copying and pasting, switching between page 1 and page 2, and moving in and out of the Magnify mode, the hand icon began to assume the role of the lasso. At one point, half the picture duplicated itself on the bottom half of the page. Later, about 1/8 of the top and 1/8 of the bottom of the picture were replaced with white boxes. Finally, part of the bottom of the graphic permanently affixed itself to the top of the graphic. Fortunately, Roberta had conscientiously been saving her document along the way, so these shenanigans did no harm.

We tend to think the problem is more with the GS than with the program; our experience has been that extensive copying, cutting, and pasting seem to play havoc with the way the GS manages memory. These problems haven't shaken our faith in this program, but they do prompt us to warn you: Be careful and save often, especially before doing something dramatic such as a three-dimensional transformation on the whole screen! Also, take heed of the manual's instructions if you're installing the program onto a hard disk. The program must be installed in the root directory. Michael put it into a folder, and his computer crashed unceremoniously.

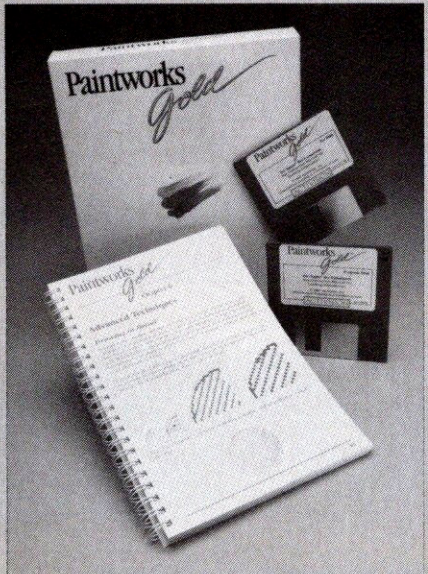
For now, this paint program is about as close as you can get to that elusive pot of gold. Although we like DeluxePaint II, we find using so many command keys to be difficult; having always to refer to the

quick-reference card or users' guide dries up our creative juices. We needed our manuals to master all the features of Paintworks Gold, but after a short time, we relegated them to the bookshelf. The manual, by the way, is well written and fully illustrated and includes instructive step-by-step tutorials.

With a generous \$20 trade-in offer (\$40 after May 31, 1988) for registered owners of Paintworks Plus, \$40 for owners of other paint programs (see this month's "NewsPlus Update" for details), and a reasonable \$99.95 list price, this program belongs in the library of every Apple IIGS owner. +

Roberta Schwartz and Michael Caltery are A+'s graphics editors and authors of our monthly "Speaking of Graphics" column.

VITAL STATISTICS



PAINTWORKS GOLD

A paint program for the Apple IIGS that merges powerful features with ease of use—an unbeatable combination

CPU: Apple IIGS

RAM: 1.25 megabytes

DISK DRIVES: one 3.5-inch (two recommended)

OTHER: mouse; printer optional (works with ImageWriter, ImageWriter II, Epson series of printers in Draft mode)

OPERATING SYSTEM: ProDOS 16

COPY PROTECTION: no

LIST PRICE: \$99.95; upgrade for registered owners of Paintworks Plus, \$20 through May 31, 1988 (\$40 thereafter); upgrade for owners of any other IIGS paint program, \$40 (upgrade address: Paintworks Upgrade, Activision, Inc., P.O. Box T, Gilroy, CA 95021-2249 [add \$3.50 for shipping and handling; CA residents add 6.5% sales tax])

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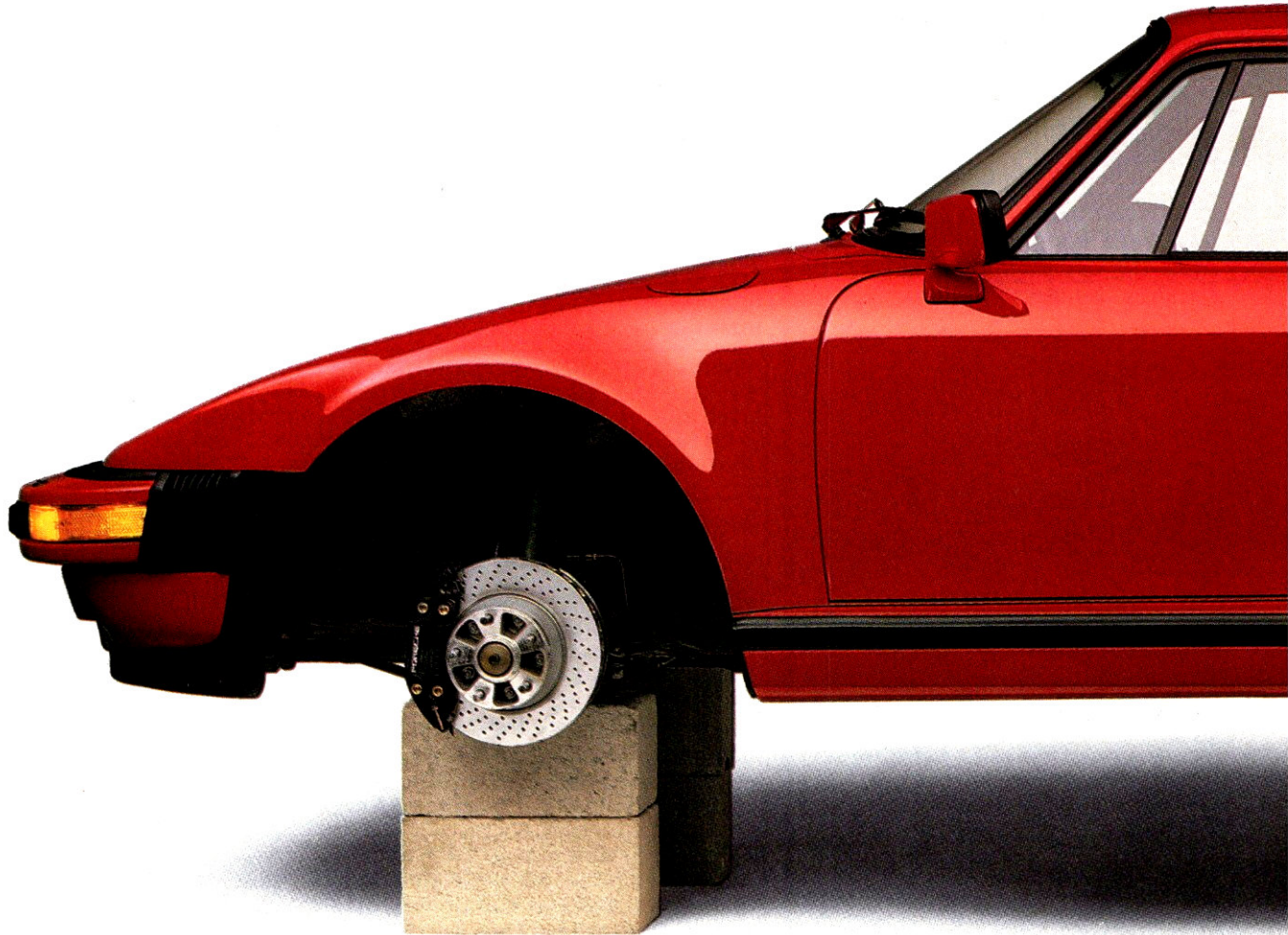
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A+ MAGAZINE JUNE 1988 59

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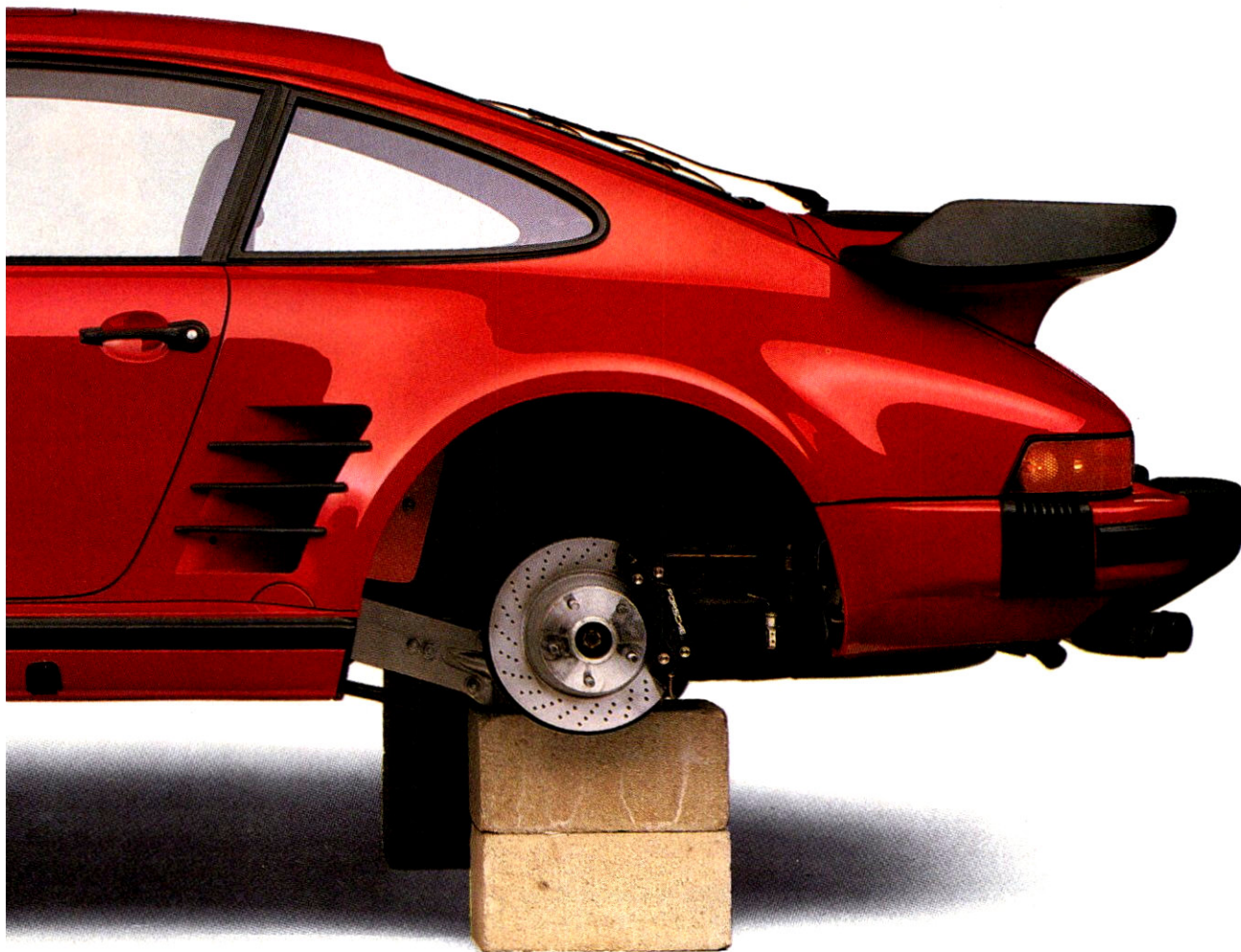
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TELECOMMUNICATIONS BY PHILIP INGBER WITH ALLEN FIRSTENBERG AND RAY PINI

Trials and tribulations of setting up a **STUDENT-RUN**

It's been more than a year since the decision was made to give Nyack High School students the ability to telecommunicate with each other.

The original intent was to create a schoolwide bulletin board/database for use as a teaching tool for telecommunications, instead of paying the expensive prime-time fees of CompuServe and other information services. We noticed that many of the students in the computer classes were beginning to purchase modems for their Ii computers and other systems and had started to dial into some "local" area BBSs. They had found communication with each other over the data lines wasn't as easy as it appeared to be, however.

The plan we developed, then, allowed students to access the

school's board from home, killing two birds with one stone—this arrangement provided not only a teaching tool but also a cheap computer BBS system for students that was truly local. Thus, the Nyack High School BBS was conceived.

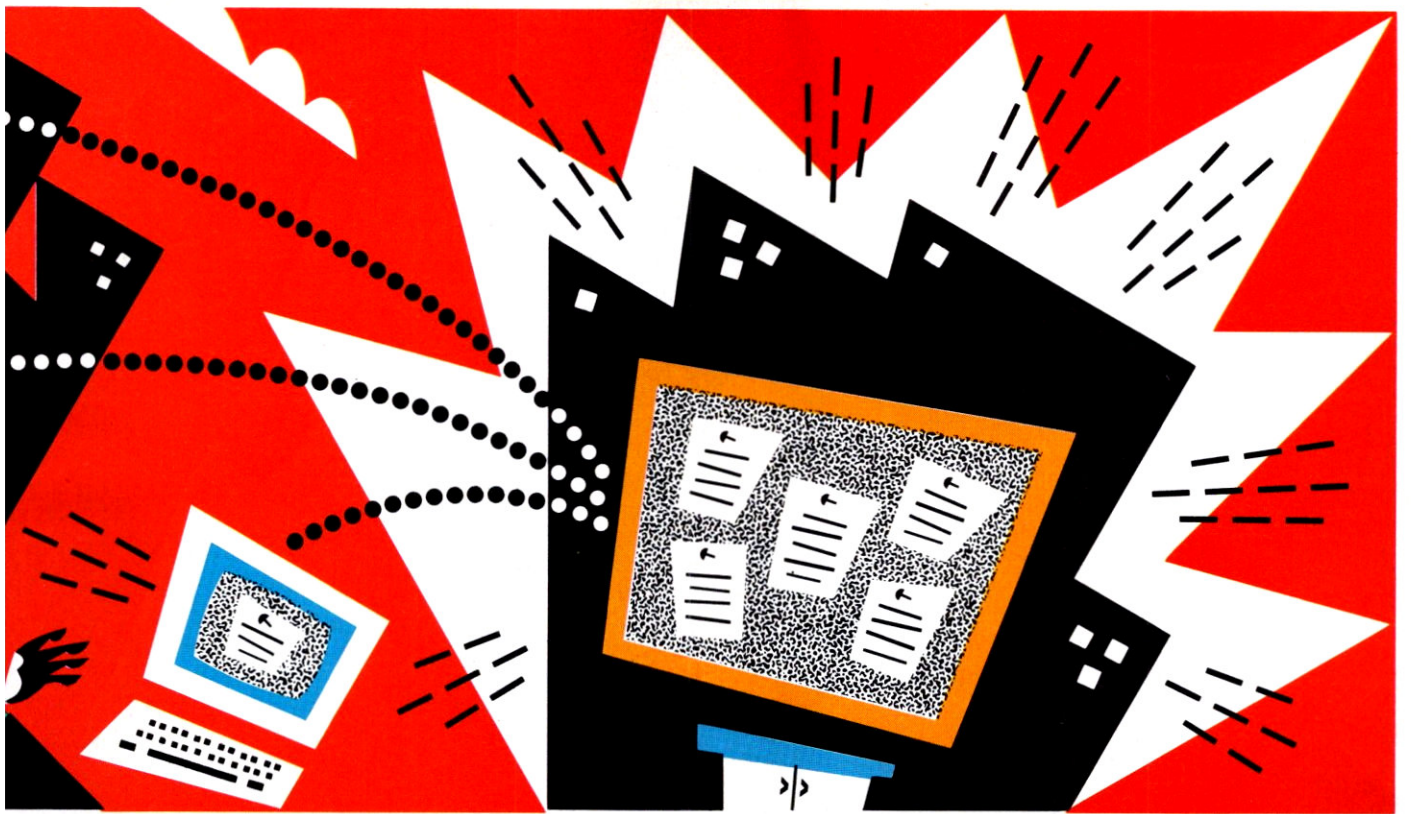
Getting off the Ground

Looking into the matter a little further, we realized that getting this project off the ground wasn't going to be as simple as it had first appeared. I had little prior experience with programming BBSs, and my only knowledge of telecommunications involved dialing CompuServe occasionally.

The major stumbling block seemed to be a severe lack of information and great confusion about how to get it. Many magazines had articles on BBSs, but few addressed

the problem of how to get started, so a few students and I began to look at some other BBSs within our area code (914). Most of them seemed to be using versions of GBBS, by Greg Schaefer. Since so much support seemed to be available for this software, including a BBS support network, it seemed to be the logical choice. Since I'm a programmer at heart, however, I felt I should look at the possibility of generating some original BBS software.

We quickly arrived at the decision to buy the software after I bought a book on how to write a BBS system. The programming task would have required a commitment beyond the amount of time I could donate to the project. At a suggestion from another computer



BBS

High school BBS gives students access from home to school-wide bulletin board/database.

coordinator in a neighboring district, I bought GBBS Pro, with the assurance that it was everything we needed to get started—and much more.

With the manual in front of me, I began to build the system. Two disk drives, an Apple IIe with 128K of RAM, and a Hayes Micromodem IIe (300 bits per second) seemed to give me a bare-bones system—enough to get everything configured and running from the keyboard for testing and modifying.

The manual was actually good at explaining how to configure the system disks to get a minimal BBS running, but it gave me little or no help on how to customize the BBS. A good place to start was the message base—should it have one large base or a few subboards? Sub-

boards won out, but the trade-off was more configuring and more time consumption. Out of that decision came a sysop board, where I posted messages from me to the nonexistent (at that time) users; a joke board; and a Nyack High School Board, for posting important messages. I also created a few other boards for individual departments in the high school, including an Apple board for technical aid and a General board for loose use—i.e., gossip.

Quick Configuration

I configured the system quickly and was becoming encouraged at my rapid success. GBBS Pro configuration disks are all menu-driven, so the process flew along. There were a few missing pieces in my logic, however. In setting up the

subboards, the manual informed me, I had to set security flags so that the boards could be either Read, Write, or Read/Write. What were security flags? Good question, since the manual had only two sentences on the subject.

Apparently, the concept of security is familiar to all sysops who have had much experience with boards but not that obvious to new sysops struggling with new concepts. After consultation with the BBS support service and waiting about two weeks for a response that didn't come, we determined through experimentation that each subboard in the system accessed a string of 0s and 1s that was specified as a user's status string. For example, if the joke board required that flag 7 be set to a 1, only users

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with this code (0000001) could access the board. Confusing? You bet. In addition, the string can be 32 characters long. Also, some of the flags are reserved for sysop use. After much time and reconfiguring, I was finally able to make some sense of the security/status-flag system, but I'm not convinced that I know all the nuances after more than a year of working with it.

Satisfied that everything was configured properly, I set the modem according to the manual (since all modems aren't created equal), booted the system, and got to the main screen of the BBS, whence I could travel through the system, merrily posting messages for myself to read. There were no users yet, but I knew of some very interested students willing to help test the system, namely the two students, Allen and Ray, who helped prepare this article.

Open for Business

After thoroughly testing the system over the phone lines, we had a general feeling of satisfaction that all was OK, so we opened for business at 300 bps. Since the computer labs couldn't free up a system to be

The problem was brewing beneath the surface, where my two coauthors were planning a takeover.

dedicated to the BBS, the board shared regular classroom use with a IIe. Eventually, this setup became unworkable, so the board hours were reset from 4 P.M. to 8 A.M. so the equipment could be free for schoolday use.

This situation seemed satisfactory at first, but two problems kept appearing. First, disk storage was entirely inappropriate. Apple 5¼-inch disks hold only 140K. Subtract from that the room necessary to hold the system (one drive), and you're left with very little room for messages, let alone any special services you want to establish. Since I was using a ten-megabyte ProFile hard-disk in the computer lab primarily for my own administrative work, I pondered the possibility of partitioning off a piece for the

board. The advantages seemed to outweigh the risks, so after a few days of reconfiguring (again), we were on-line with about five megabytes of disk space to play with.

The second problem was the 300-bps speed. At first, Ray, Allen, and the few users were amazed at the speed, but after only a few weeks, we felt as if we were crawling through the messages at a "see Spot run" prereading pace. So, along came a friend with a spare 300/1200 Signal-Express modem for our use. Along with that new piece of equipment came another reconfiguration.

By now, the reconfiguring process was old hat and nearly automatic, but our high confidence levels suffered a rude awakening. After we booted it, the board gave all appearances of dialing itself in an endless loop. Not only was the board dialing itself, but it was also answering itself, as a flurry of screens flew by. Only a quick Reset could bring this idiocy to a halt—back to the drawing board.

Returning to the trusty manual to find our particular modem settings was a lesson in frustration.



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*Hurry! Entries must be postmarked by
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II TO TEACH™ CONTEST

Official Contest Rules

NO PURCHASE NECESSARY

1. All entries must be 500 words or less, typed and double-spaced. Multiple entries, mailed in separate envelopes, will be accepted. On each entry include your name, address, daytime telephone number, and the name of the category you are entering (Regular Classroom or Special Education). The publisher of *A+* magazine will have the right to publish any entry in *A+* magazine and in any collection of entries. Mail completed entries to:

"II to Teach" Contest
A+ magazine
950 Tower Lane, 18th Floor
Foster City, CA 94404

Entries not fulfilling the above requirements will be disqualified.

2. Contest begins April 15, 1988, and is promoted and advertised in *A+* magazine and related publications. All entries must be postmarked by July 15, 1988, and received no later than July 21, 1988. All decisions will be made by September, 1988, and winners will be announced in the November issue of *A+*.

3. For each category there will be a total of four prizes awarded as follows:

- Grand Prize:** Complete Apple IIgs computer system
- 1st Prize:** \$400 worth of Apple II-compatible software
- 2nd Prize:** \$300 worth of Apple II-compatible software
- 3rd Prize:** \$200 worth of Apple II-compatible software

4. Winners will be selected by a panel of industry experts and *A+* magazine editors from all submissions that meet entry requirements. Decisions will be based equally upon content, originality, practicality, and results of educational applications described. The judges' decisions are final.

5. The *A+* "How I Use the II to Teach" contest is open to all individuals of at least 18 years of age who are residents of the U.S., its territories and possessions, with the exception of employees (and their families) of Ziff-Davis Publishing Company and its properties, and their advertising and promotion agencies. Void where prohibited or restricted by law.

6. For a complete winners' list, send a stamped, self-addressed envelope to: *A+* magazine, "II to Teach" Contest, 950 Tower Lane, 18th Floor, Foster City, CA 94404. Refer to the November, 1988 issue of *A+* magazine for winners' names.

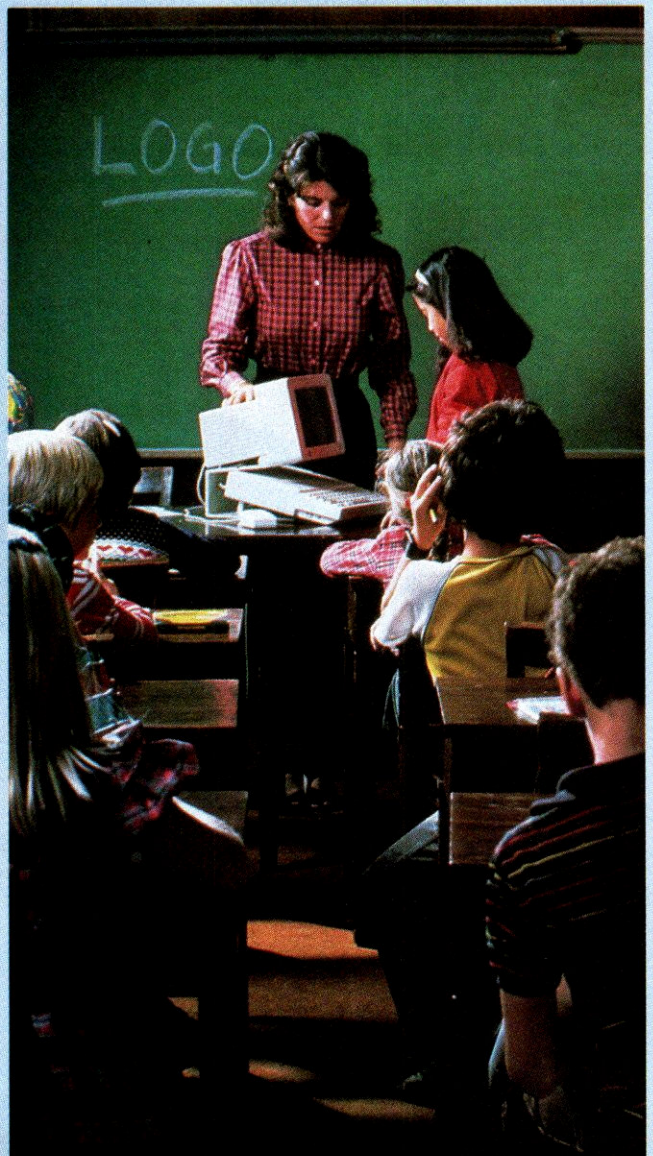


PHOTO COURTESY OF APPLE COMPUTER, INC.

Did we have a Hayes-compatible? Was it a generic multispeed? Was it set DTE high or DCE high? What we needed was a short course in modem technology. Also we ran into a slight problem with the cable that came with the modem: Two pins were reversed on the RS-232 male end.

Luckily, the friend who'd donated the modem stepped in. Since he was in charge of telecommunications for a major airline in New York City, he assumed he wouldn't have any problem setting up the modem.

It was many days later, however, after many frustrating tries, that all our problems were solved, the modem was set properly, the cable problem was fixed, and we could "read" the incoming speed and have the modem adjust itself to match it. Not only that, but we also felt that we had a good basic understanding of modem terminology. What a difference 1200 bps made. The gossip was flying around the board, and along with the gossip came a few more subboards, including a trivia board and a debate board.

As more users came on-line, they began to ask for refinements to the board, such as the installation of a clock card and an interactive game.

Mutiny

Of course, just when you think things are going well, that's just when they begin to fall apart. The board, both software and hardware, was working well. The problem was actually brewing beneath the surface, where my two coauthors were plotting a takeover.

Although both Allen and Ray had had a bit to do with setting up the board, they didn't start working on it until January. As they increased their input into the board's operation, they exerted more and more influence over the actual board operations. Unbeknownst to me, a mutiny had taken hold over the holidays. The users began to

demand more power in making decisions that affected the board. Anyway, it was supposed to be a school board. Allen had lined up another board sysop from a neighboring school who agreed that it would be both a useful and an educational experience to turn the board over to the students, specifically Allen and Ray. After a debate on the subboard about what should be done, we held a vote, which necessitated reworking the voting section of the board (and every change to the board had its price).

As we'd expected, both Allen and Ray became cosysops with me. I wasn't ready to relinquish all control over the board, because I understood exactly how much personal time the board could take simply for maintenance chores.

At first, the students underestimated their job. Running a BBS isn't simply a matter of reading messages and assuring the extinction of all profanity. As more users came on-line, they began to ask for refinements to the board, such as the installation of a clock card, an interactive game, a "handle" section where they didn't have to use

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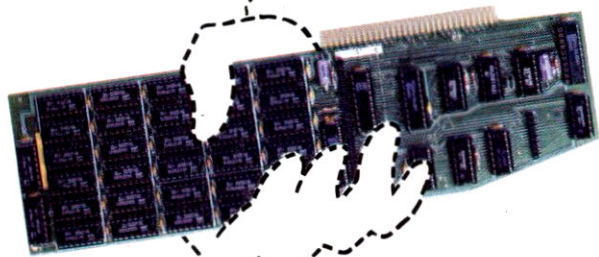
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real names, and the ability to move both forward and backward through the message base.

These requests meant that we had to modify the board. To save time, Allen and Ray began to divide the board duties. Allen now seems to handle much of the actual programming of the board. Since the board runs on a proprietary language called ACOS (which is really a combination of the best of Pascal and BASIC), Allen has had to become very familiar with the

manual. Ray's duties have evolved into keeping and updating the user files that deal with status and personal information. He makes determinations regarding clearance and admits new users after he voice-verifies them over the phone line. In addition, all of us have to ride shotgun over users who simply don't understand the rules of the board.

So, the takeover was complete. Along with the decision-making power now in the hands of the stu-

Along with the decision-making power now in the hands of the students, so is much of the actual day-to-day running of the board.

dents, so is much of the actual day-to-day running of the board—which isn't to say that the board is all work and no play.

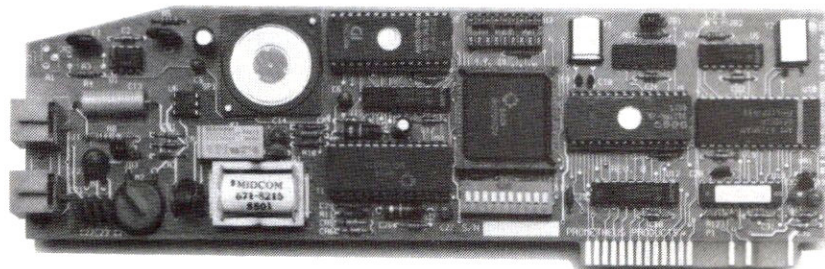
For instance, we have had on-line debates on any and all subjects. Some of our more popular past debates have been on topics as diverse as sex education in the schools, politics, fears, dented gumballs (do you believe that one?), and rather simple subjects such as The Meaning of Life. Some of these debates have sprung subboards of their own. Thanks to the efforts of Allen and Ray, politics has its own board (somewhere in the middle of the list, to avoid political pressure from the left or right).

At the time of this writing, the BBS has stabilized at 17 subboards, including topics such as the Movies, Sci-Fi/Fantasy, Quotables, Yell at the Sysop, and others. Of course these topics keep changing and were a result of about 25-30 subboards' being cut and pasted, depending on their popularity.

Of course, having two cosysops has had some advantages for me. I can now relax in the knowledge that the board will be self-perpetuating. For example, this past summer, I left the board under the auspices of the cosysops, knowing that they would take care of all of the problems. We left the board running on a full-day schedule, with only minor problems because of power outages and the like. The only downside to ignoring the board for an entire summer was that I had more than 1000 messages to read when I returned to the console, but most of the reading was enjoyable.

Some problems are sure to arise in the near future, one of which we are anticipating. Both Allen and Ray are seniors, so they will be leaving the school at the end of this academic year, and there is some

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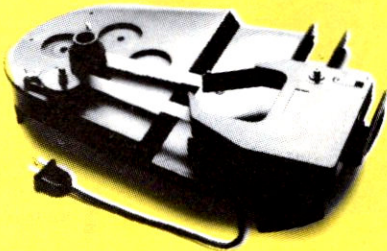
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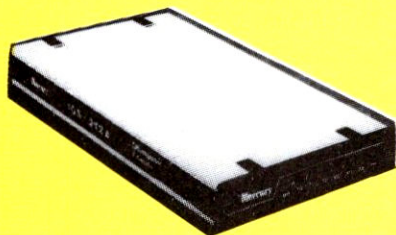
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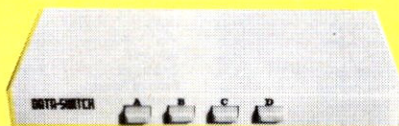


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rumbling beneath the otherwise calm surface of the board. Will the new cosysops be from among our candidates? Will it be a peaceful takeover? Who knows, but I'm sure the transfer will completely involve my free time. Of course, a new regime will change the entire flavor of the board, but isn't that the reason for having students run it in the first place?

As of now, things are relatively peaceful. We haven't had a problem in some time now, at least none I'm aware of. So my hat's off to "Fern O'Reason," "Lord Ariondus," "Bushido Blade," "Burger King," "Bilbo Baggins," "Drumsong," "Moonshadow," "End of Line," "The Prisoner," and all of the other nuts who take up all of my spare time. It wouldn't be the same without you, so keep calling. And as for Ray and Allen, just call them on the board (users #4 and #6). I'm sure they'll be more than happy to help you.

Please feel free to dial us for help, advice, or just some fun. We are the

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Philip Ingber is the K-12 Computer Education Specialist for the Nyack Public School District in New York. He has been involved with microcomputers in education for ten years and has been active in writing programs and curriculum for microcomputer courses. Two students coauthored this article with him: Ray Pini is a senior at Nyack High School. He has been working with computers for ten years, has been telecommunicating for four, and plans to major in physics in college. Allen Firstenberg, also a senior at Nyack High, has been using computers for nine years and telecommunicating for two. Allen is planning to major in computer science.

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A+ APPLEWORKS REPORT

*Books, cassettes,
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and questions from
our readers*

FEATURE REPORT

BY LEE HAYWARD

APPLEWORKS RESOURCES, PART III

AppleWorks has outsold every other piece of software for the Apple II line of computers. It has spawned contests pitting AppleWorks against Lotus 1-2-3 (frequent A+ contributor Charles Rubin, using AppleWorks, finished the task first) and has generated a variety of third-party support programs, magazines, accessories, books, and users' groups. In this final installment of a three-part series, let's look at some of the materials that can underpin our favorite program. (The first two parts, which ran in the April and May issues, dealt with AppleWorks-compatible software and educational resources, respectively.)

BEGINNING BOOKS

The AppleWorks manual can get you started, but if you need more information or clarification, you can choose from many independent books. They fall into three main categories: beginner level, advanced level, and applications. Many of the books have been updated recently to a second edition to reflect version 2.0 of the AppleWorks program, with its mail-merge capabilities and new spreadsheet functions.

The beginners' books generally treat each module of AppleWorks

separately. They are good for learning the basics of AppleWorks, usually starting with the word-processing module. They all use AppleWorks screen dumps to illustrate the author's points. I have found that new users have the most trouble with printing, especially labels. In addition, moving and copying, new concepts for first-time users, create a lot of problems—just two of the areas you'll want to look at when considering an entry-level book.

AppleWorks Made Easy

This book, by Carole Boggs Matthews, is my personal favorite among AppleWorks books. It is clear and well written. The author steps you through the creation of templates for use as a tutorial. A full index helps you find specific information. (\$18.95)

Applying AppleWorks

Applying AppleWorks is itself an example of someone's application of the AppleWorks program. Author R. W. Tamm used AppleWorks to write the book and printed it with a font-enhancement program and a few Print Shop touches. Because of its genesis, it doesn't have the polished look of most of the other books and at times looks crowded and confusing. It contains many applications

for teachers who are using AppleWorks to manage their classrooms and schools, however. (\$9.95)

The Manual

One of the first third-party AppleWorks manuals, by Robert Williams, *The Manual* doesn't contain screen dumps, but it does include an index for each separate module as well as a general index. Almost any other book would be a better choice for a beginner. (\$14.95)

AppleWorks: The Program for the Rest of Us

This book, by Michael Sloan, does a good job of explaining the basics of AppleWorks. It has a couple of noteworthy features, including an impressive appendix of printer commands for setting up custom printers for AppleWorks, along with step-by-step instructions for doing so. The glossary of terms is also useful. (\$19.95)

Using AppleWorks

This volume, by Arthur and Elaine Aron, has six chapters for beginners and then moves into more advanced applications by showing various business uses. The table of contents is complete, and there is an appendix—including some specific printer codes—on setting up custom printers. (\$19.95)

ADVANCED BOOKS

The more advanced manuals expect you to be familiar with the basic functions of AppleWorks. These books, in different ways, try to lead you further into understanding the workings of the program, going into more depth than do the beginners' books about each of the modules. Several books emphasize AppleWorks add-ons and additional software. Because of the quickly changing market and the nature of books, a lot of this information is dated—many of the products the books cover have been supplanted by more-recent releases.

AppleWorks Tips and Techniques

This advanced book, by Robert Ericson, is the one that impresses me most. I read Ericson's self-published paper "Notes for AppleWorks" when I first started using AppleWorks, and it woke me up to some of the possibilities of the program. These notes became the basis for his book. The just-released second edition includes some information on the new TimeOut series from Beagle Bros. The book covers the modules of AppleWorks separately, with tips, tricks, cautions, and solutions highlighted on every page. The extensive information on the spreadsheet module includes sets of macros. A disk of the macros and templates is available separately from the author. (\$18.95; disk files, \$12)

AppleWorks Tips & Traps

This book, by Dick Anderson, Janet McBeen, and Janice Gessin, is well written and contains applications for home, school, and office. As in the Ericson book, tips and traps appear on most pages. It has ideas and hints that don't appear in Ericson's book, so I highly recommend buying both. (\$18.95)

Command Performance: AppleWorks

This reference book, by Charles Rubin, contains an alphabetical listing of the major commands and features of AppleWorks. The book is an indispensable reference for anyone needing specific information on the various functions of this program. Highly recommended. (\$18.95)

AppleWorks Pocket Reference

As long as we're on the subject of reference books, \$3.95 will get you the *AppleWorks Pocket Reference* by Christopher Van Buren. This credit-card-size book actually fits most pockets and highlights the major functions of AppleWorks. Don't leave home without it. (\$3.95)

AppleWorks: Boosting Your Business with Integrated Software

This book by Charles Rubin (with a forward by AppleWorks' creator, R.J. Lissner) targets business users of AppleWorks. Well written, it contains many tips and ideas, as well as information about the limitations of the program. (\$18.95)

Extending AppleWorks

Mary and David Campbell present advanced techniques for business applications, in addition to advancing your knowledge of the three modules. They also cover the transfer of information within AppleWorks and provide a section on AppleWorks add-ons. (\$16.95)

Mastering AppleWorks

This book, by Elna Tymes, covers a lot of the same information the other books do. Its examples have a business orientation, and it includes a section of "business tools," or templates, that you can enter for business applications. There is a good chapter on DIF files and using DIF files, information that other volumes don't contain. (\$19.95)

APPLICATION BOOKS

Some books are now appearing without AppleWorks instructions or tutorials. Rather, they are books of applications for AppleWorks that you can type in and save to a disk. You need to be familiar with the workings of AppleWorks or refer to another book to get answers to specific AppleWorks questions.

AppleWorks Applications

AppleWorks Applications, by Lauren and Robert Flast, includes 25 business applications. None of them are extremely large or complex, but once you've entered the information, they are easy to expand and modify to meet your needs. (\$9.95)

Managing with AppleWorks

This book, by Ruth Witkin, contains business applications, in addition to beginner-to-intermediate AppleWorks information. (\$15.95)

Personal Money Management with AppleWorks

Another Witkin offering, this book contains applications for home/personal use. (\$18.95)

CASSETTE RECORDINGS

Are you tired of all this reading? If so, you can avail yourself of cassettes for individualized AppleWorks instruction.

AppleWorks Simplified

John de Beck's series of 14 lessons on 7 tapes is aimed at beginners, who can use it with a computer for step-by-step instruction. The entire package consists of the 7 tapes, 2 tip strips, a manual, and a data disk. The manual, oriented to teachers, contains a list of supplies, printouts from the data to be entered, and a true/false test for each chapter.

I found these tapes to be a fairly complete introduction to AppleWorks. The lessons were written before the advent of AppleWorks 2.0, so they don't cover mail-merge.

The pace is slow, so students can keep up. Each lesson is on a separate cassette side. The manual is not cross-referenced to a tape counter, so entire lessons need to be completed if several people are using the tapes. The entire series should take 25-30 hours to get through. (\$151; shipping and handling, \$15)

AppleWorks: Beyond the Basics

This trio of tapes by Warren Williams is produced by The National AppleWorks Users Group. The three tapes, one for each module of AppleWorks, are like the advanced books on the subject, in that they assume you know your way around AppleWorks and give you tips and extra information to enhance your use of the program. I have a little problem with the actual production of these tapes, but their content is informative. (Member price: \$8.95 each or \$24 for the set; nonmember price: \$9.95 each or \$27 for all three)

KEYBOARD TEMPLATES

Sometimes you need a specific command at your fingertips but don't have the time or resources to look it up, which is where keyboard templates come in.

TipStrips

Simplified Software makes TipStrips available with AppleWorks commands. They are two 5 x 15-inch cardboard strips with four sides of commands: word processing, database, spreadsheet, and ProDOS and utilities (the latter includes AppleWorks 2.0 mail-merge). (\$9.95; shipping and handling, \$1)

LeRoy's Cheatsheet

LeRoy's Cheatsheet is a 9 1/2 x 14 1/2-inch plastic-coated card with a keyboard cutout to fit over the keypad on the older versions of the IIe. I don't know if a GS or new-IIe version exists, although a tray is available for the IIc version. The overlay I purchased was written before AppleWorks 2.0 came into being, so mail-merge is not included on mine. This overlay is complete, including the commands as well as spreadsheet functions, layout possibilities, and other nice touches. The commands take advantage of Robert Ericson's tip of typing the first letter of a choice instead of using the arrow keys. (\$5.95)

APPLEWORKS ADDENDUM

AppleWorks has inspired so much third-party support that covering every AppleWorks-related product is difficult. A few pieces of enhancement software that deserve mention were overlooked in the first two installments of this series. They are:

- Reset.System, a shareware product, adds a reset protection to AppleWorks. This protection allows you to use Control/Reset to get out of lockups without losing data. (Living Legends Software, P.O. Box 4313, La Mesa, CA 92044; [714] 676-1940; \$5)
- Slalom is an inexpensive program from the Big Red Apple Club that allows sideways printouts, a valuable asset for those who use wide spreadsheets. (Big Red Apple Club, 423 Norfolk Avenue, Norfolk, NE 68701; \$5)
- Printrix is like a desktop-publishing program that uses AppleWorks files. It allows multiple fonts as well as two-column printouts and lets you add graphics to your AppleWorks printouts. Printrix provides the highest-quality printouts I've seen from AppleWorks. (Data Transforms, 616 Washington Street, Denver, CO 80203; [303] 832-1501; \$65)

NEWSLETTERS

Newsletters and periodicals provide hints, techniques, and ideas on a regular basis. Of course, A+ has its full "AppleWorks Report" department, but there are also some specific AppleWorks newsletters.

The AppleWorks Journal

The AppleWorks Journal, a merger of The Main Menu and AppleWorks Exclusive Reference journals, is a monthly journal that offers a variety of news and information for all users of AppleWorks. Edited by Christopher Van Buren, The AppleWorks Journal provides sample files to input, information to increase your knowledge of AppleWorks, and news and information on happenings in the AppleWorks world. (\$39.95 per year)

AppleWorks Forum

AppleWorks Forum is a publication of the National AppleWorks Users Group (NAUG). This newsletter has more pages each month than The AppleWorks Journal and includes full-page ads and club business. The Forum features reviews of software products in addition to providing general tips and techniques. (\$24 per year)

Open-Apple

This general Apple newsletter, published by Tom Weishaar, is an important source of AppleWorks

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FANTAVISION Broderbund	\$36	SHANGHAI	\$27
FONTWORKS/AUTOWORKS	\$37	SIDEWAYS Funk Software	\$43
GRAPHIC WRITER IIGS	\$108	Talkin' Trash Software IIGS	\$150
APPLE IMAGEWRITER II \$465		LASER 128EX—\$469	
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MUSIC CONSTRUCTION IIGS	\$34	Sonus Super Sequencer	\$197
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NEWSMAKER GS	\$55	PASSPORT Polywriter	\$205
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Apple UniDisk 3.5 w/Catalyst (IIc,IIe,II+)	\$339
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Genuine Apple 5 1/4" drive IIe,IIc,IIGS	\$236

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CITIZEN 120D \$189	MSP-10 \$289
OKIDATA 192 - p. \$315, s.\$389	#193 + p.\$465, s.\$532
PANASONIC KXP-10801 Scall	KXP-10911 \$209
Panasonic KXP-1592 \$439	KXP-1595 \$485
STAR NX-1000 Parallel	\$205

*** MODEMS ***

APP. ENG. DATALINK 300/1200bps Int. for II+/e/GS	\$169
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information. Weishaar's newsletter has served as a forum for discussions concerning AppleWorks, its use, and its future. *Open-Apple* is also one of the first places where patches for AppleWorks have been published. (\$24 per year)

USERS' GROUPS

Apple Computer, Inc., has never been a fountain of support for AppleWorks. Thus, users have had to turn to each other for help. A lot of local users' groups have AppleWorks special-interest groups (SIGs) that meet to support each other. The following national users' groups meet several needs.

NAUG

NAUG, The National AppleWorks Users Group, publishes the *AppleWorks Forum* newsletter I discussed above. It also sponsors a bulletin-board system (BBS), conducts workshops throughout the country, and distributes public-domain AppleWorks templates. Membership is free, but a newslet-

ter subscription is \$24.

Resources for AppleWorks

Resources for AppleWorks is the newest AppleWorks users' group. I started this group to serve as a source of high-quality public-domain templates. Our collection includes some of the better public-domain templates, organized by application. I will also be adding to the collection with contributions that meet guidelines for documentation and information. Membership in this group is also free with any template order. I don't plan a BBS for this group, although I'll be posting templates on the GENie information service.

TAWUG

TAWUG, The AppleWorks Users Group, serves as a clearinghouse for public-domain templates. This group has been collecting templates for about three years and has a collection of more than 64 disk sides of templates. TAWUG has an AppleWorks sub-board on the CacheWorks BBS.

Membership in this group is free with any template order.

APPLEWORKS CONVERSION SERVICE

Those of you who've purchased your computer during the last couple of years probably started with AppleWorks. Some of us used other software products before AppleWorks, however (yes, there were programs before AppleWorks). If you have data files on some other program, Burke Software Data Transfer Division will convert your PFS, DB Master, Data Factory, MECC Data Handler, and other files to AppleWorks. The minimum cost is \$59.95 for the first 1000 records and costs three cents per record after the first 1000. +

Lee Hayward is a media specialist at Arrowhead Elementary School in the Cherry Creek School District (near Denver) and is the chairman of the Resources for AppleWorks users' group.

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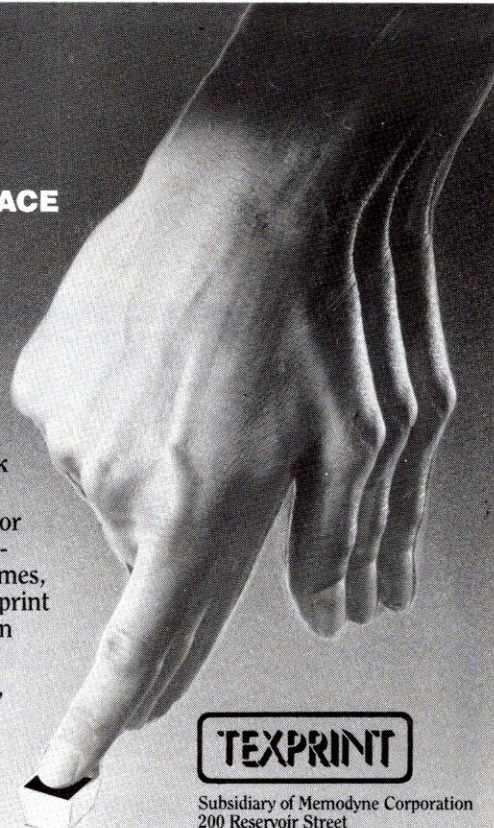
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- Supports over 50 printers¹—b/w, color, serial, parallel
- Includes 35 built-in print commands
- Operates as a normal printer interface when its snapshot features are not in use

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

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

2 Qualified educational and dealer discounts available.

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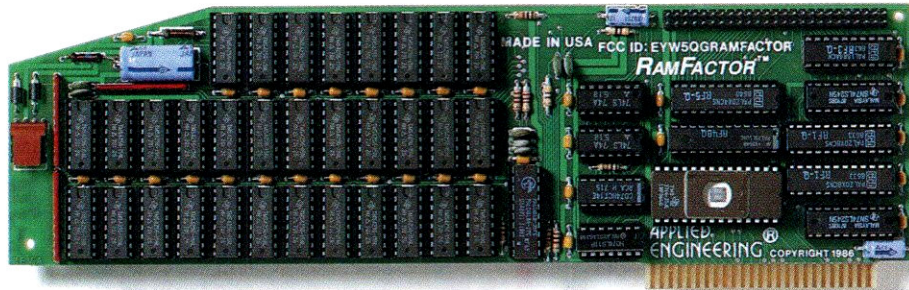


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RamFactor is automatically recognized as additional workspace memory by AppleWorks 1.3 and 2.0. In addition, RamFactor's memory can be used for creating the ultimate in program speed—a lightning-fast RAMdisk for the Apple IIGs, IIE, II+, Franklin and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

Apple Memory Expansion Card Compatible

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

2.0 AppleWorks Power

Other slot 1-7 cards can give AppleWorks a larger desktop, but that's the end of their story. RamFactor provides many more powerful functions. It's the only slot 1-7 card that increases AppleWorks 2.0 internal limits by increasing the maximum number of records in the database to 22,600, increasing the maximum number of lines permitted in the word processor to 22,600, and expanding the clipboard size to 2,250 lines maximum. RamFactor is the only standard slot card that will automatically load all of AppleWorks into RAM, dramatically increasing speed and

eliminating the time required to access the program disk. It will even display the time and date on the AppleWorks screen with a ProDOS clock. RamFactor will automatically segment large files so they can be saved on multiple 5¼" and 3½" floppies or a hard disk. All this performance is available for the Apple IIE, Laser 128, Franklin or 64K Apple II Plus when used with an 80 column card. No other standard slot card comes close to enhancing AppleWorks so much.

The "Electronic Hard Disk"



RamCharger is an optional battery back-up device, (about the size of a disk drive), that can plug into a connector on RamFactor. With Ram-

Charger added to RamFactor, your program will appear almost instantaneously when you turn on your computer. RamCharger contains LED's that let you know RamFactor's reserve power status. Since RamCharger has its own built-in power supply, it can retain RamFactor's memory indefinitely. Plus, RamCharger's battery will continue backing up RamFactor's memory for up to 10 hours during power failures. An optional "Y" cable is also available that allows one RamCharger to power two fully expanded RamFactors.

If 1 MEG Isn't Enough



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

Features

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- 256K to 1 MEG on main board with 256K

memory chips; expansion port supports up to 5 MEG with Expander option

- 100% Apple Memory Expansion Card compatible
- RamCharger battery back-up option available for permanent storage
- Reduces power strain to internal power supply with RamCharger option
- Fully socketed and user upgradeable
- Expands internal limits of AppleWorks 2.0
- Automatically recognized by ProDOS, DOS 3.3, Apple Pascal 1.3 and CP/AM
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- Graphic memory test included
- Allows Apple II+ to run AppleWorks 2.0 without buying additional software
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P.O. Box 515
Park Ridge, IL 60068
(312) 823-1357

Leroy's Cheatsheets
Cheatsheet Products
P.O. Box 111368
Pittsburgh, PA 15238
(412) 781-1551

AppleWorks Tips and Techniques sample disk
Robert Ericson
P.O. Box 16064
Rumford, RI 02916

The Manual: AppleWorks Management Information Source
3543 N.E. Broadway
Portland, OR 97232
(503) 287-1462

AppleWorks: Boosting Your Business with Integrated Software and Command Performance:

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Microsoft Press
16011 N.E. 36th, Box 97017
Redmond, WA 98073-9717

AppleWorks Applications, AppleWorks Made Easy, AppleWorks Tips & Tricks, Extending AppleWorks
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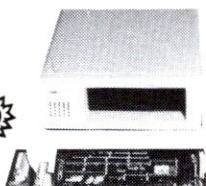
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for Apple IIe and IIGS



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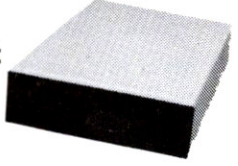


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6/88

QUESTIONS FROM OUR READERS

Claris, the publisher of AppleWorks, answers your AppleWorks questions.

STRAY POUND SIGNS

Q. *I am using the spreadsheet module in AppleWorks 2.0 and get pound signs (####) in some cells. What am I doing wrong?*

A. Nothing. AppleWorks displays #### when the number of digits in an entry exceeds the cell width. The remedy is to widen the column, using the open-apple/L command, so the entire number will be visible. Page 161 of the AppleWorks 2.0 manual explains how to adjust column width in your spreadsheets.

PRINTING LABELS

Q. *I cannot get my mailing labels to print properly. After printing one label, the printer form-feeds a full page before printing the next label.*

A. First, check within the Add/Change a Printer screen and ensure that the Accepts Top of Page command is set to NO for your printer. Go into the Label Report format, enter open-apple/O (to go to the printer options) and change the paper length to your mailing-label size (usually one inch). This same screen shows how many lines per page will print. Escape back to your report format and verify that the number of lines specified at the bottom matches the lines per page from the printer-options screen. For step-by-step instructions on mailing labels, see pages 130-133 of your AppleWorks 2.0 manual.

FILE-SAVING WOES

Q. *When trying to save a file, I get a message saying Cannot write to disk or Put program disk in drive 1. How can I avoid this problem?*

A. First, make sure the disk onto which you want to save the file is not write-

protected. You should see a small square open notch in one corner of 5¼-inch disks, and 3.5-inch disks should have a small plastic sliding square, which should be closed, in one corner. Second, ensure that the disk has enough free space to accommodate your file and that the maximum number of files within a root directory (51) has not been exceeded. If you have too many files, move some to another diskette and/or create a new subdirectory. If the program asks you to insert the program disk into drive 1 and it is already there, make certain that your data disk name is *not* /APPLEWORKS, which is what the working copy of the Startup/Program disk is called.

LOST CELLS

Q. *While copying rows with formulas into another section of my spreadsheets, I get the message Some cells lost in . . . Why?*

A. AppleWorks versions 1.1 through 1.3 allocate 2K of memory per row for formulas and formatting information. If the block of information you're copying is too large, you'll get this message. To avoid the problem, try copying a smaller block of information (fewer rows). If you are copying only a single row and still get the message, you'll either have to reorganize your spreadsheet into a format that has longer columns or upgrade to AppleWorks 2.0. AppleWorks 2.0 allocates 10K of memory per row for formulas and formatting information. +

Claris Corporation, publisher of AppleWorks, answers readers' questions. Write to Help File, A+, 950 Tower Lane, 18th Floor, Foster City, CA 94404. Because of limited space, we aren't able to publish responses to all inquiries we receive.



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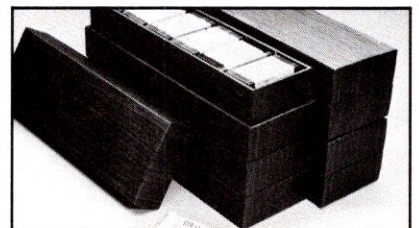
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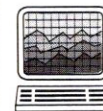


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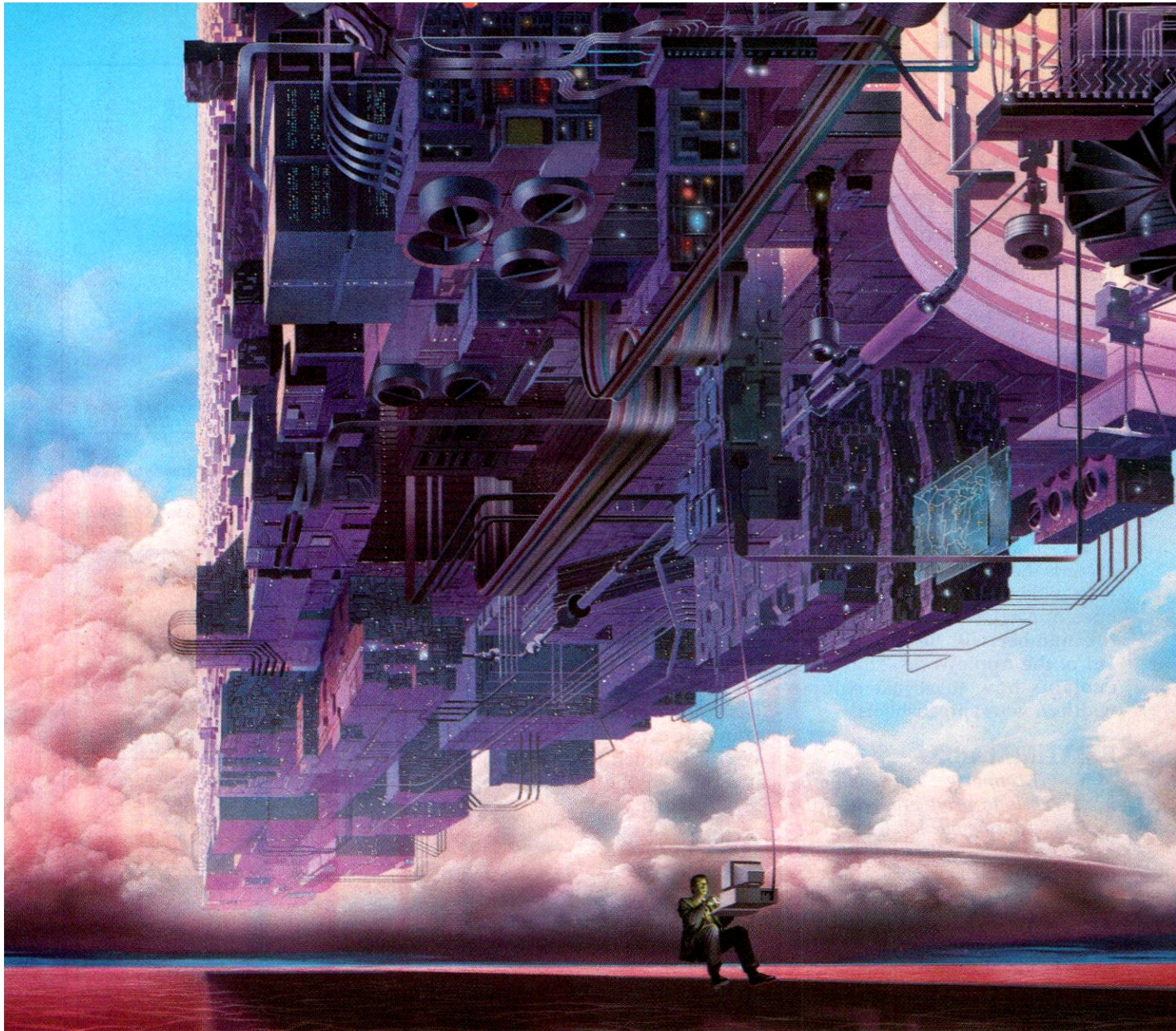
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TELECOMMUNICATIONS

Musical files and information await you on information services.

BY MICHAEL FISCHER

If you are interested in MIDI music or, indeed, any music, one useful instrument you may have overlooked is your modem. Your modem is the passport to a rich variety of musical information.

The nationwide on-line services offer information and files for Apple II users who are interested in music. The Apple II special-interest groups on CompuServe (MAUG), GENie (the Apple II Roundtable), and The Source (Applesig) all offer programs as well as song files for various Apple II music-playing programs (such as Music Construction Set and The Music Studio). Much of the recent activity has been in music for the Apple IIGs.

Music is, of course, merely a subset of a larger Sound category. Both CompuServe and GENie have extensive files in the area of sound generally, including ways of changing the startup sound and beep on the Apple IIGs to emulate, for example, Pee Wee Herman or 2001's HAL computer.

One of the most unusual programs that features sound as well as music is Background Music, an NDA (new desk accessory) program available on GENie's Apple II Roundtable. This program, by Guy T. Rice, the new leader of the Apple 2 Programmers' and Developers' Roundtable on GENie, allows you to play a digitized sound or music file at the same time you're run-

ning another ProDOS 16 application on your Apple IIGs. The music or sound file must fit into memory together with your program, however, limiting the size of the sound file you can play with Background Music. Don't throw away your stereo system yet.

An unanswered question about the song files on many services and BBSs concerns copyrights. Copy-

not infringement of the copyright.

The copyright question applies only to songs not yet in the public domain. The range of available song files is quite broad, extending from many currently popular rock songs through classical music. You can also find holiday music, national anthems for many countries, and some college fight songs.

CompuServe has the broadest range of other musical interest areas, which include

- Express Music, a distributor from which you can order "every compact disc, LP and tape in print."
- The General Music Forum, for all musical interests. The data libraries contain Apple II files as well as some for other computers.
- The MCS MIDI Forum, with message boards and six downloadable data libraries. Most of the computer-specific files in the library are for the IBM PC.
- Music Alley OnLine, an on-line music store that sells keyboards, synthesizers, and other musical equipment at a discount of 15-30%.
- RCA Music Service, an on-line record, cassette, compact disc, and videotape club.
- Rocknet, a special forum dedicated to all the happenings in the rock-music community.

Other services

You can find other music information on GENie as well as in the MIDI/WorldMusic Roundtable. The library has no Apple II-specific files, although the message board

MODEMS, MUSIC, AND YOUR APPLE II



right lawyers disagree about whether these files infringe the copyright of the actual song. Some lawyers claim the songs are subject to compulsory licensing and, in the absence of paid fees, constitute an infringement of the copyright. Others claim the songs are an obvious parody of the original product and thus are fair use of the song,

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has much information about MIDI and music on computers, including the Apple II.

On the BIX network, a message topic in the Apple IIGS area deals with graphics and sound. You can find music information in that area merely by using the Find command with the word *music*. In addition, BIX devotes an entire conference to music. The information there is quite technical, as is typical of much of the information on BIX.

Delphi's Apple II Group has little information about Apple II music. Available on Delphi, though, is Music City, a special-interest forum that covers the entire field of music, and Delphi Music Reviews, which has reviews of more than 200 rock and popular-music recordings.

On The Source, you can visit the Musicsig, "designed to serve all the musical interests of our Source community." Most of the computer-specific library files are for the IBM PC, though.

If you're looking for a MIDI-spe-

Your modem is the passport to a rich variety of musical information.

cific bulletin board, check out the MIDI-Net group of FidoNet Bulletin Boards. The FidoNet system is a group of bulletin boards, all running FidoNet software, that informally share information and electronic mail. MIDI-Net is the creation of four bulletin-board operators in Oklahoma City, Montreal, Dallas, and Denver.

One active member of the MIDI-Net group is the American MIDI Users Group (AMUG) bulletin board in Dallas, run by MIDI-Net cofounder Ray Reach. You can reach this board at (214) 276-8902 and use PC Pursuit in doing so. (See my telecommunications column in the August 1987 issue of A+ for details on PC Pursuit.)

MIDI-NET MEMBER BOARDS

Unless otherwise noted, boards operate 24 hours per day, at 300, 1200, and 2400 bps. An asterisk before a board name indicates that you can reach the board through PC Pursuit.

* ENIAC MIDI BBS	(212) 751-2347	New York (no 2400 bps)
* PROMIDI BBS	(214) 248-8530	Texas (M-F 7 P.M.-6 A.M.; weekends 24 hours; no 2400 bps)
* Dallas/American MIDI Users Group BBS	(214) 250-2811	Texas
* Musicians Net BBS	(214) 306-1857	Texas (no 300 bps)
* Musicians Den	(303) 321-6857	Colorado (M-F 7 P.M.-9 A.M.; weekends 24 hours; no 2400 bps)
* Fiddlers FIDO	(303) 674-1859	Colorado
RAM-SOFT FIDO	(305) 226-3310	Florida
CompuSci OPUS	(305) 758-4821	Florida (no 2400 bps)
Walksoft II	(313) 435-7818	Michigan
Walksoft I	(313) 435-9905	Michigan (M-F 7 P.M.-8 A.M.; weekends 24 hours)
* Alex' FIDO	(314) 771-9099	Missouri (no 2400 bps)
MidiWest MIDI BBS	(405) 733-3102	Oklahoma
MIDICOM	(514) 744-7354	Quebec, Canada (no 2400 bps)
* Corwin's Keep	(602) 894-1470	Arizona
MIDLINe BBS	(613) 966-6823	Ontario, Canada (no 2400 bps)
* San Diego MIDI-NET	(619) 452-0097	California (no 2400 bps)
* Choice Stop	(703) 620-6836	Virginia (M-F 6 P.M.-8 A.M.; weekends 24 hours)
* Family Computer Center	(703) 644-8445	Virginia (no 2400 bps)
Nebula 2	(916) 351-6193	California (no 2400 bps)
River City OPUS	(916) 362-6522	California
The Byte Boutique	(916) 483-8032	California (no 2400 bps)
Dynasoft FIDO	(916) 753-8788	California (no 2400 bps)
Now and Zen OPUS	(916) 962-1952	California
MIDI MEDIA	11-33-56-79-06-09	Bordeaux, France (no 2400 bps)

CIRCLE 124 ON READER SERVICE CARD

The message and file databases on AMUG are large, but some of the areas are not available unless you register as a member of the American MIDI Users Group and pay an annual membership fee of \$20 for regular membership or \$75 for professional membership.

The AMUG BBS has an Apple II SIG (Special Interest Group) in addition to one on the Ensoniq sound chip of the IIGS. Other topics include sequencing; scoring; sampling; specific instruments such as drum machines and keyboards from Casio, Yamaha, and other companies; and other music-oriented BBS systems.

The central host system of MIDI-Net is the MidWest MIDI BBS in Oklahoma City—(405) 733-3102. The focus of that board, though, is on non-Apple computers. The sysop, John Fordenbach, believes that Amiga, Atari, and IBM—not Apple—are dominant in the low-end MIDI market.

A table on the previous page lists names and phone numbers of all

An unanswered question about the song files on many BBSs concerns copyrights.

the MIDI-Net BBS members, with an indication of which boards you can reach through PC Pursuit.

The field of music is rich and varied, as are the offerings of the telecommunications community in

the music area. So, when you're considering a musical instrument, don't forget your modem.

AppleFest Panels

One additional note: I will be leading two telecommunications panels in Boston during AppleFest (May 20-22 at the Hynes Convention Center). One will be for beginning and intermediate telecommunicators and the other for intermediate and advanced users. I hope to see you there or at the A+ booth. Stop by and say hello. +

FURTHER INFORMATION

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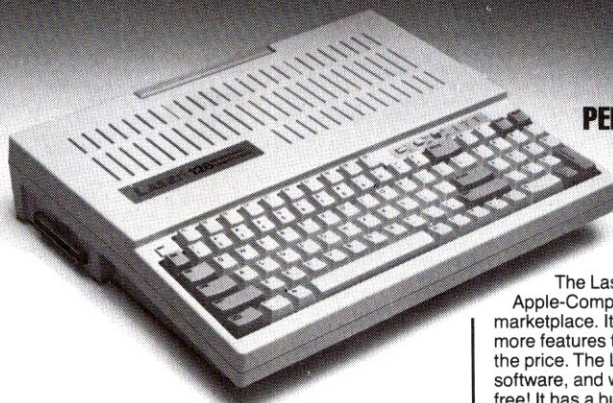
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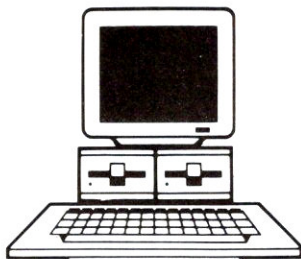
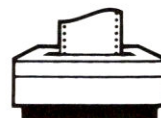
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LEARNING CURVE

Connecting your Apple II to a CD player

BY DAVID D. THORNBURG

Our lives are full of music, and personal computers continue to evolve in directions that enhance our access to music of all types.

The Apple II has never had a reputation as a stand-alone music machine. The primitive commands in the original Apple II let you create only simple sounds. These sounds now pale in comparison with the quality of those from even the cheapest keyboard synthesizer at your local department store. Even the Ensoniq synthesizer chip that is built into the Apple IIGS has its own limitations, although it is a tremendous step forward for Apple.

The opportunities to integrate high-quality music with educational programs are so great that I will spend this month's column laying out this topic in some detail. Instead of looking at ways to make music with the Apple II or connect the computer to an external music synthesizer, we will explore something completely different: connecting your Apple II to your CD player.

The market for compact-disc (CD) players has become one of the fastest-growing segments of the audio industry in the last year or so. The sound quality of the discs is phenomenal, and the players' prices continue to drop as this medium gains popularity.

Last year I decided to connect a CD player to my Apple II so I could write programs that synchronized

music with computer graphics. As I looked at various CD players, I couldn't find any with a built-in RS-232 interface. A player with such an interface would be easy to control through the computer's serial port.

I finally found an inexpensive CD player with infrared remote control for only \$150. One way to control a CD player from a comput-

yourself, it will only cost you about \$5 for a few parts. You will need to be handy with a soldering iron, and you must be willing to risk the destruction of your remote control. If you still want to proceed but don't want to do the work yourself, share this article with someone who can do the job for you. By the way, you might want to see if you can purchase an additional remote

control so that you have one for manual control and one for the computer.

The basis of computer operation of the remote control is really simple. The remote control connects to a circuit that "listens" for a tone that goes to the speaker or headphone jack of your Apple II. When this circuit detects a beep, it effectively presses the Pause/Play button on the CD to start or stop the music. You generate the beep by pressing Control-G or by including the following line in a BASIC program:

```
PRINT CHR$(7)
```

Each time this command is issued, the CD goes from Pause to Play or back again.

Now for the gory

part of the procedure.

Step 1

Carefully open the plastic housing on your remote control, which may require removing a screw or two and then prying the case open with a screwdriver. It's a lot like opening an oyster—hard at first, and then it just snaps open.

Once the case is open, you see a

A HOMEBREW MUSIC CONNECTION



er is to rewire the remote control so its signals come from the computer instead of the player's own push buttons. I figured it would be less risky to rewire the remote control than to work on the CD player itself. Even if I botched the job, the CD player would still work!

I'm happy to report that the job isn't that tricky. If you want to do it

rubber sheet containing the push buttons for the switches and a circuit board that is probably covered with a green transparent film except for the areas around the switches. Most remote-control units have switches that operate by pressing a piece of conductive plastic against an exposed grid. You won't be using this part of the switch, so just set the rubber sheet aside.

Locate the switch that corresponds to the Pause/Play button. Using a small knife, remove a bit of

the green coating over the conductors on either side of this switch. You need to do so in order to solder wires to these traces later on. Be very careful when removing the plastic film to avoid cutting through the copper foil underneath. Expose about a quarter inch of copper on each side of the switch if you can.

Step 2

Using a small piece of perforated circuit board (available from the place where you buy the electrical components), assemble the circuit

in figure 1, using the following parts:

D1—any small-signal diode, 1N34 or equivalent

C1—0.05-microfarad capacitor

Q1—any small-signal NPN transistor, 2N2222 or equivalent

You can purchase these parts, along with a small box and anything else you might need for this project, at any electronic-parts store such as Radio Shack. If you decide not to put the remote control back into its original case, you may need to buy a battery holder at the parts store and connect it to the remote control as well. Also, if you are connecting this circuit to an Apple IIc, you will want to get a 1/8-inch phone plug and cable for connecting the circuit to your computer through the headphone jack.

If you have another Apple II model, you may want to connect this circuit across the speaker wires of your computer, using small electrical clips, which you can also get from a parts store.

Once you've assembled the circuit, connect the collector and emitter leads of the transistor with small wires to the exposed traces

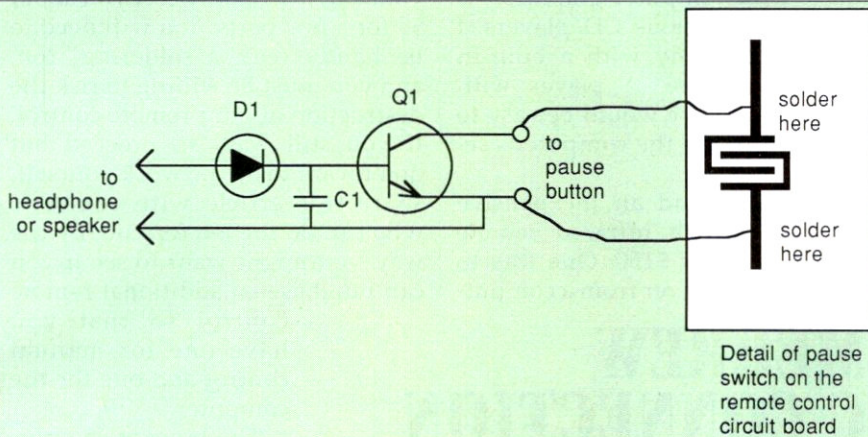


Figure 1: Schematic of the interface between the Apple II speaker connections and the CD infrared remote control

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Æ Update . . .

PC Transporter now includes powerful AppleWorks enhancement software. Not only does PC Transporter use an Apple IIGS, IIfx or II+’s existing peripherals for IBM emulation but it also acts as an Apple memory expansion card in Apple mode. The new AppleWorks enhancement software will expand AppleWorks 2.0 internal limits; it vastly increases the desktop, auto-loads all of AppleWorks in RAM, increases the maximum database records from 7250 to 22,600, increases word processor lines from 2250 to 22,600, expands the clipboard size from 255 to 2,042 lines, displays and stamps files with a ProDOS clock and automatically segments files onto multiple floppies.

RamKeeper is now shipping and includes the AE-Cache and AppleWorks enhancement software. This powerful software enhances the operation of both AppleWorks and access to the Apple 3.5 Drive. RamKeeper will allow instant access to favorite programs stored in RAM upon boot-up as well as the ability to have two Apple IIGS memory cards plugged in simultaneously. The RamKeeper comes complete with battery and enhancement software for only \$179.00.

AE is announcing a new IIGS stereo digitizer/MIDI card called Audio Animator. Audio Animator is a digitizer that takes advantage of the IIGS Ensoniq sound chip as well as full support for a MIDI device such as MIDI keyboard. Powerful graphic sampling software is included that takes full advantage of the color and mouse support in the Apple IIGS. The MIDI support is totally Passport compatible and includes a MIDI input/output box.

RAM chip prices have been soaring rapidly due to a worldwide RAM chip shortage. Prices for 1 Meg chips should remain stable through 1988 while 256K chip prices will rise steadily. Industry sources indicate that there will be no relief this year from the current situation.

DataLink’s IIGS/IIfx communication software now supports VT-52 emulation. In addition to the powerful IIGS/IIfx software included with DataLink, Apple II+ specific software is now included that allows II+ owners to easily connect to popular services. The 300/1200 baud DataLink modem is still the same low price - \$219.00. Previous owners that wish to upgrade to the latest software can upgrade for a nominal \$10.00 charge.

The A+ Magazine Reader’s Choice Award has been awarded to RamWorks III and Serial Pro. For the memory card category, RamWorks III was the A+ reader’s favorite. The serial/clock card, Serial Pro, won the multifunction card category.

on the Pause/Play switch on the remote-control unit. Before making these connections, apply power to the remote control and measure the voltage across the Pause/Play switch with a voltmeter. Connect the collector of the transistor to the positive side of the switch and the emitter to the negative side.

Next, connect a cable from the headphone jack or speaker connector of your computer to the input side of the circuit you just built.

You may want to cut a hole in the remote-control housing to make room for the wires you've soldered to the Pause/Play switch. Alternatively, feed the wires out through the opening for the Pause/Play push button in the housing. You might then be able to reassemble the remote-control unit. If you wish, you can place the remote-control circuit board and your own circuit in a separate box. Be sure to drill a hole in the end of the box so your CD player can detect the infrared light beam.

With everything connected, put a disc into your player, turn the player on, and press the Pause button. Next, turn on your computer. If you are using an Apple IIc, turn the volume control as high as it will go. Then press Control-G and see if the CD player starts to play. If it does, press Control-G again to see if it stops. If everything is working smoothly, you are home free!

If nothing happens, use this checklist:

1. Be sure that nothing between the remote control and the CD player is obstructing the light beam.
2. Reverse the leads across the loudspeaker or headphone jack and try again.
3. Be sure the remote control has fresh batteries and is working properly. One way to test it is to use a piece of bare wire to short across the emitter and collector of the transistor, which should cause the CD player to play or pause. If the shorting wire works but the computer control does not, you may need to reverse the connections on the remote-control circuit board.

This circuit is quite simple and should work on most remote controls with no difficulty at all.

The whole reason I went to all this trouble was to synchronize music from my CD with a graphics

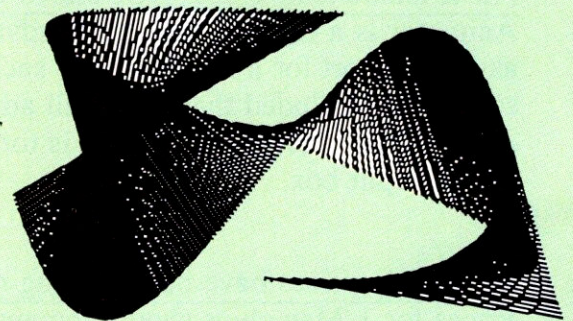
```

0 REM GNOS5 - ANIMATION FOR SATIE'S
1 REM 5TH GNOSSIENNE AS PLAYED BY
2 REM R. PONTINEN BIS-CD-317
3 REM TRACK 24
4 REM PROGRAM BY DAVID THORNBURG, INNOVISION
5 REM PO BOX 1317, LOS ALTOS, CA 94023
10 A = 0:B = 0:C = 6
70 PRINT CHR$(7)
80 HOME : HGR
90 FOR I = 1 TO 2600: NEXT I
100 FOR J = 1 TO 7
110 HCOLOR= C
120 FOR I = 0 TO 255
130 X1 = I
140 Y1 = 80 * (1 + SIN ((I / 40) + A))
150 X2 = 120 * (1 + COS ((I / 40) + B))
160 Y2 = I / 2
170 H PLOT X1,Y1 TO X2,Y2
180 NEXT I
190 A = 6 * RND (1)
200 B = 6 * RND (1)
205 C1 = C
210 C = 1 + INT (7 * RND (1))
215 IF C = C1 THEN 210
220 IF C = 4 THEN C = 7
230 FOR I = 1 TO 3200: NEXT I
240 IF J < 7 THEN HGR
250 NEXT J
260 PRINT CHR$(7)
270 GET A$
280 HGR
290 END

```

Figure 2: The GNOS5 BASIC program (above), which synchronizes music and graphics

Figure 3: Typical picture (right) created with the program GNOS5



program I was writing.

The connection between the musical and visual arts is compelling, and the use of computers to bridge this gap is well within the reach of students at almost any age. I have a personal fascination with the music of Eric Satie and the artwork of Alexander Calder, so one of my first projects was to blend the two.

The Applesoft BASIC program in figure 2 creates Calder-like animations on the screen, synchronized with a recording of R. Pontinen playing Satie's "Fifth Gnosienne." His compact disc (BIS-CD-317) is available in the classical-music section of most record stores. (You can get the program in figure 2, along with several others, at no cost by sending a 5¼-inch, blank, formatted, ProDOS disk and a self-addressed, stamped mailer to me in care of A+.)

To use this program, place the disc in the player, select track 24, and press the Pause button on the player. Now run the program. When the program gets to line 70, it sends a signal to start the music, after which the animation starts. Once the animation finishes, line 270 sends another signal to put the player on Pause again, and the program stops.

Figure 3 shows a typical graphic I created with this program.

This project may seem complicated, especially if you haven't built an electronic circuit before. Once you have your CD player under the control of your Apple II, however, you will find hundreds of applications for this powerful combination. If you are using computers in a classroom, the exploration of this combination is a wonderful class project. +

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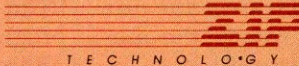
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Desegregation funds made possible a state-of-the-art music curriculum

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Can you imagine an elective music course so popular that it is considered a major subject area? Or what about interdisciplinary courses that encourage students in nonmusic classes such as social studies and physics to study their particular subject in terms of music history or, as in the case of physics, the nature of sound?

You don't have to imagine these things at San Jose High Academy. This school has an unusually comprehensive music curriculum that uses MIDI-equipped computers and peripherals to teach music fundamentals, keyboard techniques, notation, composition, voice, theory, and history. And these are just the basics—students also have opportunities to explore improvisation, jazz, rock, classical, opera, and percussion performance. Students who are thinking about professional music careers can prepare for advanced college-placement exams as well as learn about the latest music-related technology and arranging, composing, editing, sequencing, recording, and sound-sampling techniques.

So goes the story of a project that started three years ago at San Jose High Academy in San Jose, California, before MIDI was very familiar to anyone besides professional musicians and sound engineers. The

success of this music program is due primarily to the early vision of the music program's founder, Dr. William Erlendson. He saw the po-

An exemplary high-school electronic-music lab uses Apple IIe computers as MIDI workstations.

tential for MIDI-equipped computers and synthesizers to broaden instructional possibilities in music courses.

What It Takes

At the core of San Jose High Academy's music program is specialized, computer-based technology that lets students experience a broad range of musical forms not readily available in traditional school music programs. Students in music courses have at their disposal 30 MIDI workstations, each consisting of an Apple IIe with two 5¼-inch disk drives, a color monitor, a Passport MIDI interface card, a Casio C-Z 1 synthesizer (an electronic keyboard), and earphones.

These workstations are linked to the teacher's system, which consists of a IIe with dual disk drives

and color monitor, a compact-disc player, a graphic equalizer, a dual cassette player, a videodisc player, stereo speakers, and two Roland 24-station teaching modules (lab-management devices that allow the teacher to communicate with the students' synthesizers). The workstations and teaching module are also connected to each other via a Corvus Omninet network.

And that's not all: An electronic recording studio, an electronic percussion studio, two desktop-publishing centers, a practice room, and a rehearsal room for vocal and instrumental groups (with two real pianos!) top off the ensemble.

How the Apples Do

The Apple IIe computers provide an excellent medium for instructional delivery and a hands-on introduction to electronic-music technique. And in the San Jose High Academy music department, most students spend the majority of their time working with the IIe computers, running music-fundamentals software, composing, or exploring sounds. Serious students who plan for academic or professional music careers also have access to the next level of computer technology—for advanced editing, sampling, scoring, sequencing, mixing, desktop publishing, and multimedia presentations, faculty and students exploit the power of several Macintoshes, an IBM XT, and laser printers.

Besides plenty of hardware in the lab, the music department also has a large software collection. Most of the programs on hand are for use with the Apple IIe MIDI workstations. The software collection contains programs for popular to Baroque music performance; music printing and notation; sequencing and recording; and music theory, history, and fundamentals.

As great as it sounds to have all this electronic equipment and a comparable software library, some inherent problems plague the pro-

Music Director Dr. Hal Peterson oversees the San Jose High Academy electronic music lab.



gram. According to the current music-program director, Dr. Hal Peterson, music software in its present state is a real nightmare to use in a large electronic-lab setting.

The problems relate to the various system requirements that pop up on individual programs. For example, some software can run only with one company's MIDI interface—a big problem if you've equipped your lab with another brand. Another major contributor to software headaches is the Corvus Omninet network. Nothing is wrong with the network—it's the music software. Most music software written for the IIe is not network-aware and so is not suitable for the Academy's network.

Curriculum: Beyond Band

In addition to more traditional high-school music offerings, such as band or a jazz ensemble, San Jose High Academy offers an electronic-music course sequence that introduces students to a variety of musical forms through computers and synthesizers. Students also receive practical and didactic instruction in keyboard techniques, music dictation, music notation, and se-

*You need money—
lots of it—and
significant experience
with electronic
music to put
together a project
like this one.*

quencing. Advanced students can set up individual study contracts with instructors as they explore music theory, history, and literature. An important component of the advanced courses is the design and production of multimedia classroom presentations that incorporate computers, videotapes, compact discs, and laserdiscs.

The interdisciplinary projects are available within a course entitled Projects for Music across the Curriculum. In this course, students in nonmusic classes relate their subject area to music via semester-long, independently designed projects. Students select their project ideas from a variety of

performance, music-history, keyboard-skills, and composition project options.

Experience and Funding

When I discussed the San Jose High Academy music program with director Peterson, two prerequisites became clear: You need money—lots of it—and significant experience with electronic music to put together a project like this one. According to Peterson, setting up a MIDI-based music lab may be too complicated for music professionals without some electronic-music experience. If you could see the lab and the amount of equipment it contains, you could grasp the significance of this requirement, especially in the area of troubleshooting. In the absence of an overseer with appropriate understanding and experience, equipment failure or malfunction can silence an entire class for extended periods.

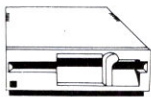
As with most educational projects, the major obstacle to a great program is money. The lab I'm describing here has a dollar value of approximately \$100,000 for the workstations and teaching-module equipment alone—an awesome

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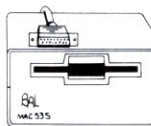
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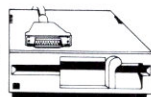
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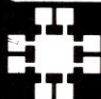


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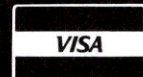
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sum for one elective course program that doesn't include the cost of the humans to teach and administer it. I was interested in how San Jose High Academy had funded its program and was not disappointed by the story.

It all started when the San Jose Unified School district got lucky and was sued by the state of California. The district was ordered to desegregate and set up two magnet schools. The desegregation plan designated San Jose High Academy as the high-technology magnet school, so the incorporation of computers into the music curriculum became legitimate. The lab owes its existence, in part, to the provision of surplus state funds to facilitate desegregation.

The desegregation monies clearly opened the doors for the creation of an innovative music program. Even more impressive is the effort of the program's directors to establish a corporate-outreach strategy that led to additional personnel, equipment, and financial grants from Apple Computer, IBM, Casio, the Packard Foundation, the California Arts Council, San Jose Unified School District, and the California State Office of Education.

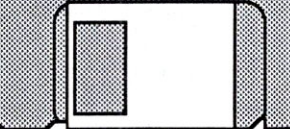
The Music Education MIDI Project did not remain isolated for long at one site. Erlendson's vision now extends throughout the entire district. Equipment, teachers, and dollars from grants also go to comparable music programs for elementary and middle schools.

One more vital component of the district's fine-arts program is its relationship with the music department at the local university, San Jose State University. The SJSU music department is currently working with the San Jose Unified School District to evaluate and field-test K-12 MIDI-compatible software as well as develop a K-12 teacher-training program.

The Music Education MIDI Project is an exemplary music-curriculum model. For more information, contact Dr. William Erlendson, Fine Arts Coordinator, San Jose Unified School District, 1605 Park Avenue, San Jose, CA 95126. For information on the San Jose High Academy music department, contact Dr. Hal Peterson, San Jose High Academy, 275 North 24th Street, San Jose, CA 95116. +

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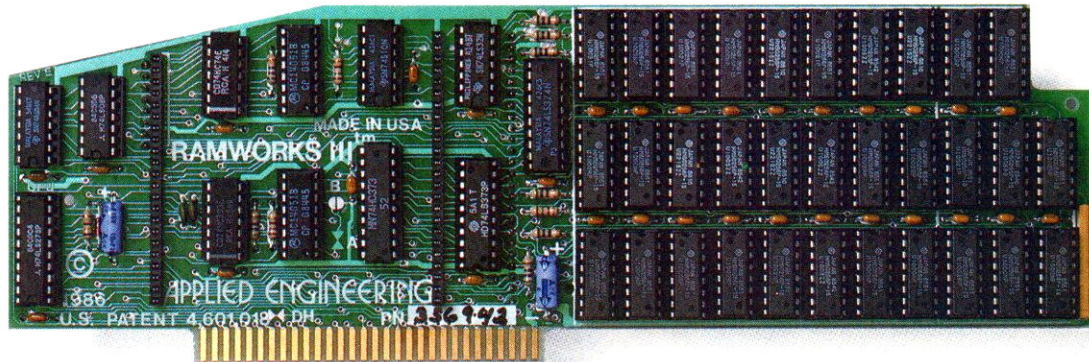
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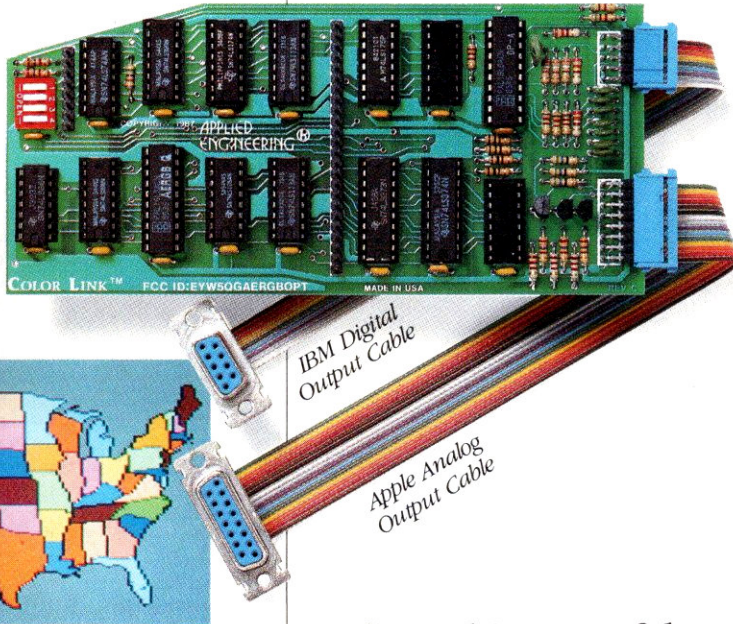
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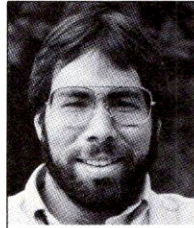
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SPEAKING OF GRAPHICS

A refresher on the fundamentals of Apple II graphics

BY ROBERTA SCHWARTZ AND MICHAEL CALLERY

Along with your submissions for "Graphics Gallery," most of you have taken the time to include some biographical data. We really appreciate that, because it tells us who our audience is. You've said: "This is my first attempt at computer art." "I've been painting for years, and I just got an Apple IIGS." "I'd appreciate any advice you could give me about how to improve my technique." Most of you are trying to get your computer graphics to look like paintings, and you're frustrated because you can't get the pictures realistic enough.

We're taking our cue from you: It's time to review the basics. Let's take a look at some of the factors that influence the appearance and creation of computer art.

The world, and most traditional art, is *analog*. In a black-and-white representation, it goes from black to white with countless grays in between. This analog world has lots of room for subtlety. Artists draw continuous lines with pencil, charcoal, or paint. The lines flow. By varying the pressure as they draw lines, artists can make them go from thick to thin, from light to dark.

Computer graphics, because of the characteristics of computers themselves, are *digital*—black and white without any grays in between. The "on/off" nature of computers is the most dramatic

way that they differ from most traditional art media.

Pixels

Computer graphics are composed of dots, and a dot can either be on (you see it) or off (you don't see it). Each dot is called a *pixel*, for "picture element." Pixels are indivisible; you cannot have half a pixel. A line, drawn on the computer, is actually a row of pixels; it may

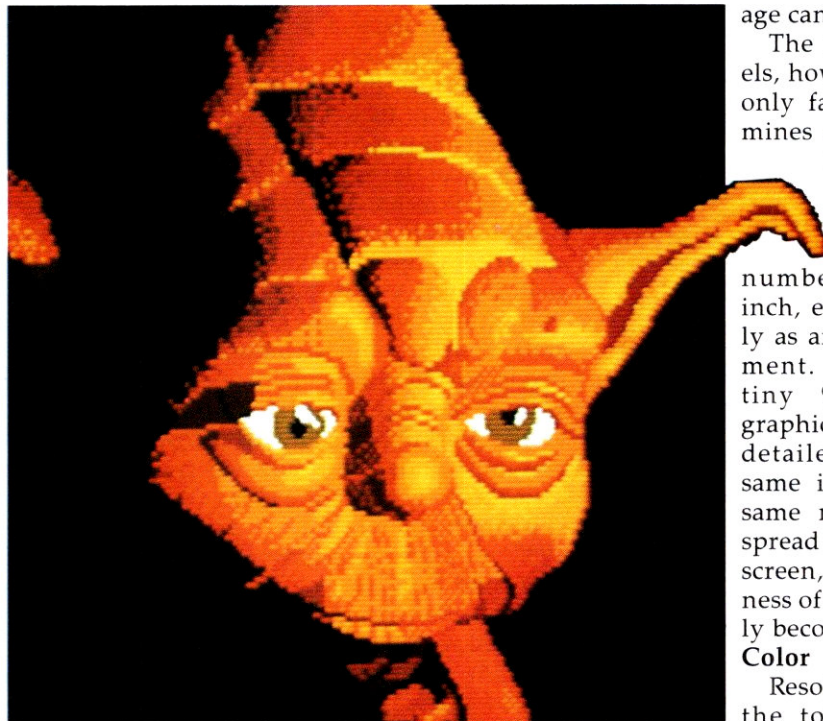
Resolution is the number of pixels in a computer graphic, most commonly specified as the number of horizontal pixels by the number of vertical pixels. The Apple II series of computers offers a variety of resolutions, ranging from 40×48 (standard lo-res) to 640×200 (640-mode super-hi-res). The more pixels you are able to use in your graphic—the higher the resolution—the less jagged the diagonal lines will be and the less grainy (and consequently the more detailed) your image can be.

The number of pixels, however, is not the only factor that determines an image's resolution. With the arrival of the Mac, pixel density, the number of dots per inch, emerged suddenly as an important element. On the Mac's tiny 9-inch screen, graphics can look very detailed, but put the same image, with the same number of dots spread across a 19-inch screen, and the coarseness of the image readily becomes apparent.

Color

Resolution, whether the total number of dots or the pixel density, does not, in and of itself, determine how realistic (nongrainy or photograph-like) an image can look. Another significant factor is the number of colors a pixel can be. A good example is Peter Steiner's "Yoda" (above), a super-hi-res image that appeared in the February 1988 "Graphics Gallery." The picture

BACK TO THE BASICS OF APPLE GRAPHICS



look continuous, but it isn't. That's why computer graphics tend to look grainy. Pointillistic painting is somewhat analogous to computer graphics, but it's less restricting; a pointillist can put a dot anywhere. Needlepoint offers a better analogy; needlepoint artists are restricted to placing stitches only where the canvas allows.

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its limitations are,
and then defy
them. In graphics,
craftsmanship is the
name of the game.*

looks so realistic not only because of the 320-pixel resolution but also because, with 16 colors available, Peter could use many shades of orange. The same image in the super-hi-res 640 mode would be less impressive, even though super-hi-res 640 has twice as many pixels as the 320 mode, because the 640 mode offers only four pure colors. Subtle shading is impossible in the higher-resolution mode.

Meeting the Challenge

The combination of ultra-high resolution and an unlimited color palette is the answer if you want to create photographic-quality computer graphics, but where does that leave those of us who work within the limits of the Apple II?

Our goal is to accomplish the most with what we have. If you want to create professional-quality computer graphics, you must work at it. Even if you're not especially "talented," you can master the craft. Your graphic is composed of pixels, so you must sometimes deal with those pixels individually. If you're working in standard hi-res, you must understand how the color sets affect each other. (See "Speaking of Graphics," August 1987, for a full description of color sets and how to avoid conflict among them.) Many images we've received would have been markedly better if errant pixels hadn't appeared along the edges or if they hadn't had erratic patches of the wrong color because the artist hadn't accounted for incompatible color sets.

Computers may be fast, but creating art isn't. Take your time. Finish each graphic by magnifying the screen and touching up those pixels. This time-consuming effort may make the difference between a

good result and a great one. Get comfortable with your computer. Understand what its limitations are, and then defy them.

More often than not, our professional work involves using standard hi-res. We're working with 280-pixel resolution and a restrictive palette of blue, orange, violet, green, black, and white—with all the inherent color incompatibilities. Still, our clients expect us to create images that look "real": "Put a parrot on the ship's deck and surround him with fifty gold-colored Spanish doubloons." "Change the expression on the cow's face and make the flowers around her neck larger and brighter." "The man walking across the green grass must wear a blue uniform." Despite the limitations, we do it!

Craftsmanship is the name of the game.

A Final Thought

Consider this question: Should photographic quality be the computer artist's goal? Why should you try to make your computer graphics look like paintings? If you want a painting, then why not paint? If you want the mountains to look "real," why don't you use a camera and photograph them?

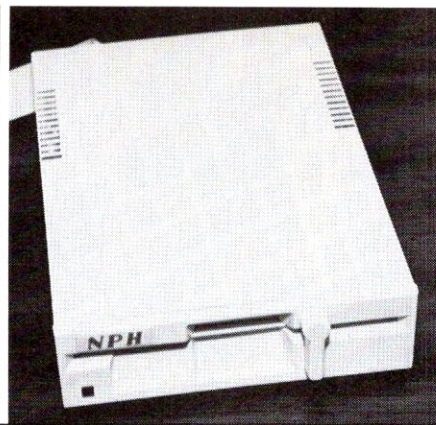
Think about the medium you're using. Your graphics are generated on a screen. Pixels, color, and light come together in computer graphics. Perhaps these graphics should have a distinctive style all their own.

Why not let the medium dictate the style? Be creative. Explore and experiment. Then share your results with us.

Upgrades and Updates

We're delighted that Baudville has removed copy protection from 816/Paint. Upgrade to the current version to receive an unprotected disk. It's always good to know that if your program dies an untimely death, there's a backup in the wings. Thanks, Baudville.

We recently received a welcome letter from Brooke Boering, author of Fire Organ and the graphics-programming language Ceemac. Boering informed us that Ceemac is now available from Kinko's Academic Courseware Exchange for \$13. If you're interested in Apple graphics and don't have Fire Organ or Ceemac, you don't know what you're missing! Get them. +



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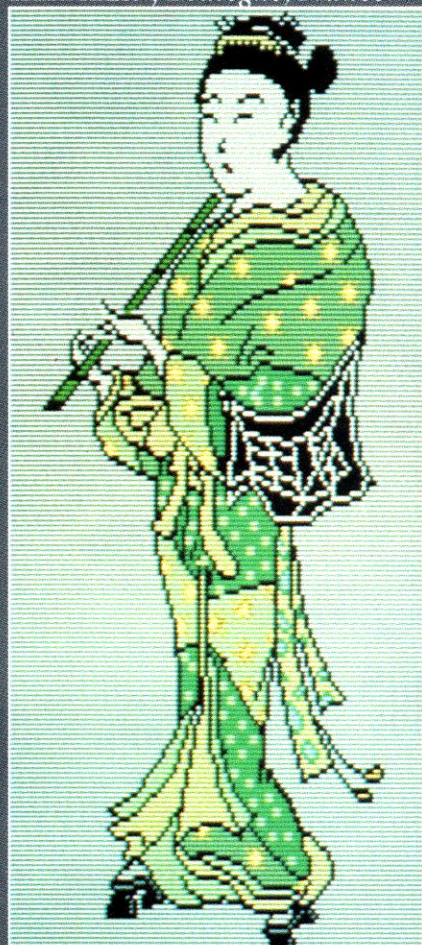
SPEAKING OF GRAPHICS GALLERY

*A gallery inspired
by femininity*

LADYLIKE

The feminine face and form serve as inspiration for this month's "Gallery" artists. From the impressionistic "Girl" to portraits and highly stylized renditions, this international gallery of artists have used their Apple II computers' graphic abilities to dazzling effect. All of our artists, save one, used Dazzle Draw for their creations. The exception is "Niponeserie," which is a Paintworks Plus creation.

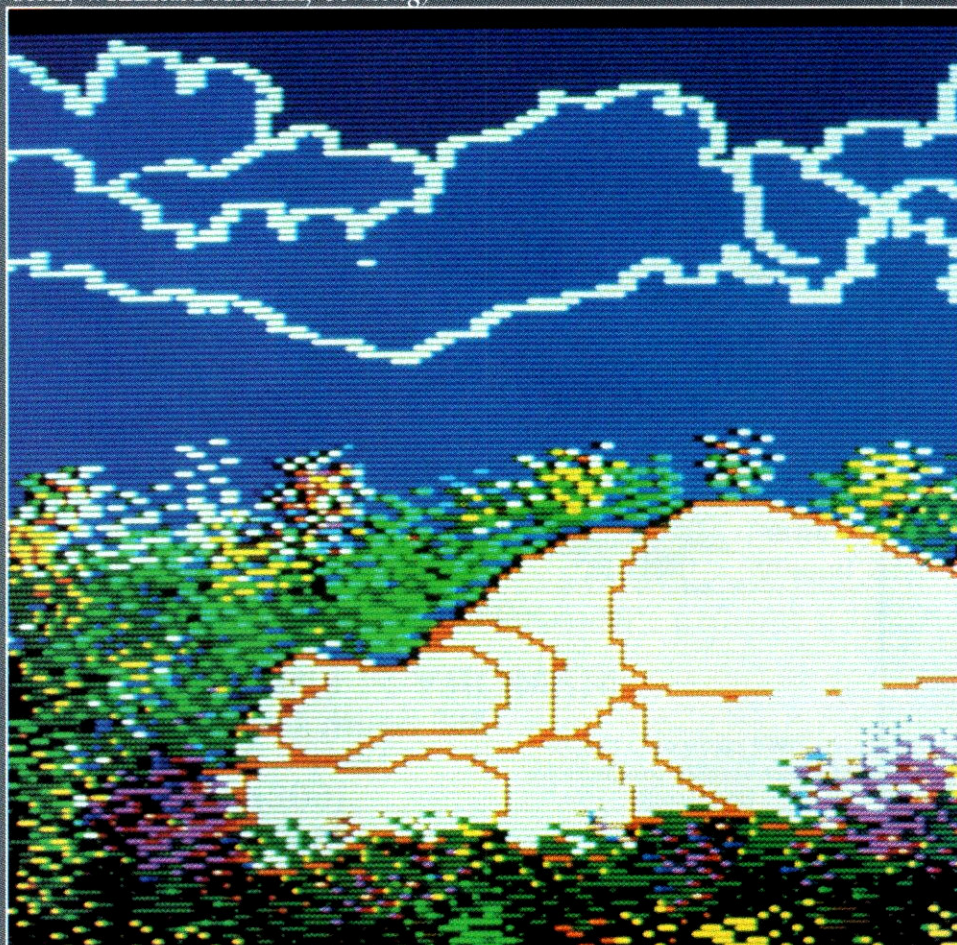
**NIPONESERIE, FRANÇOIS
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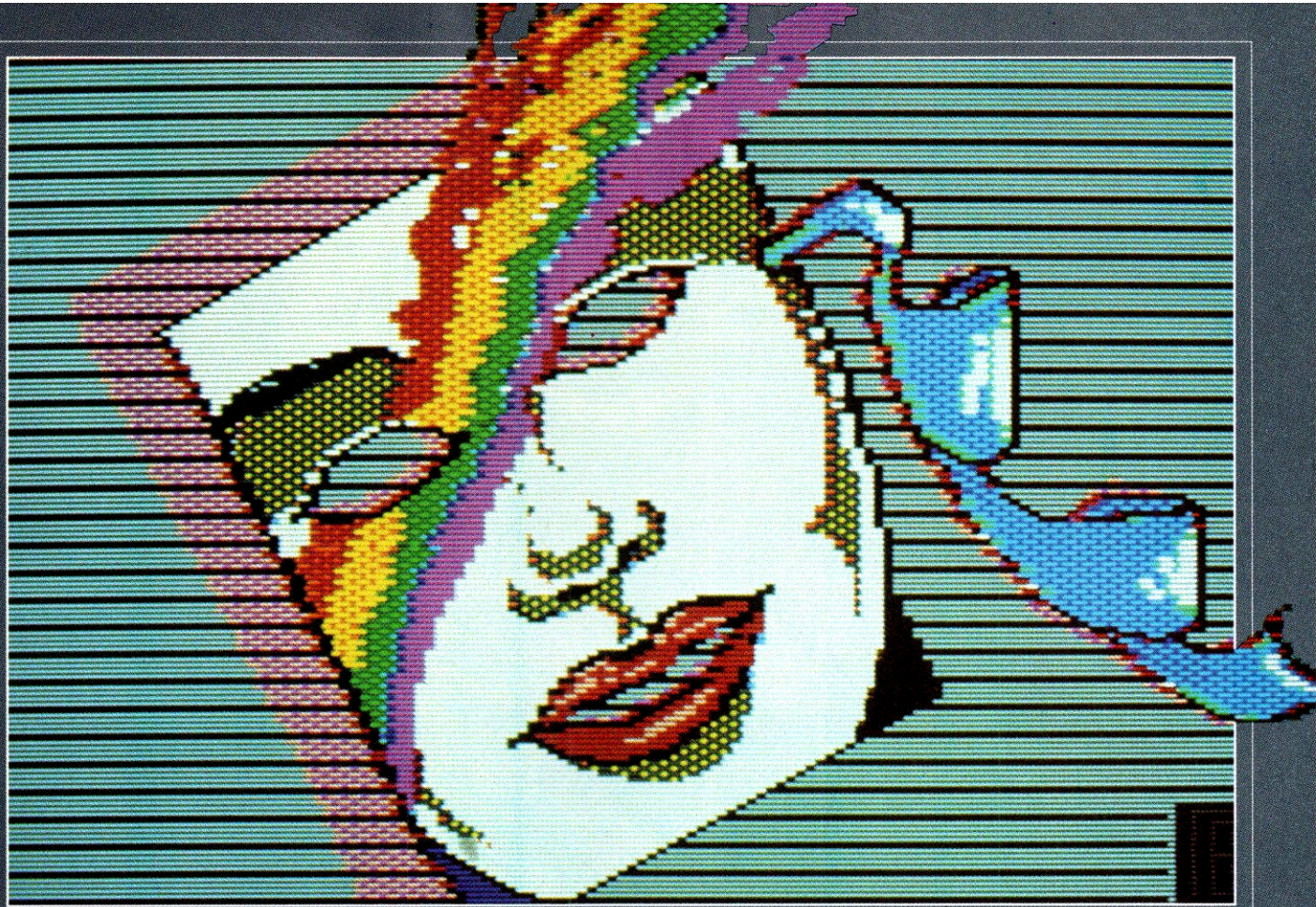


JUNE, RON ST. PIERRE, Kobe, Japan



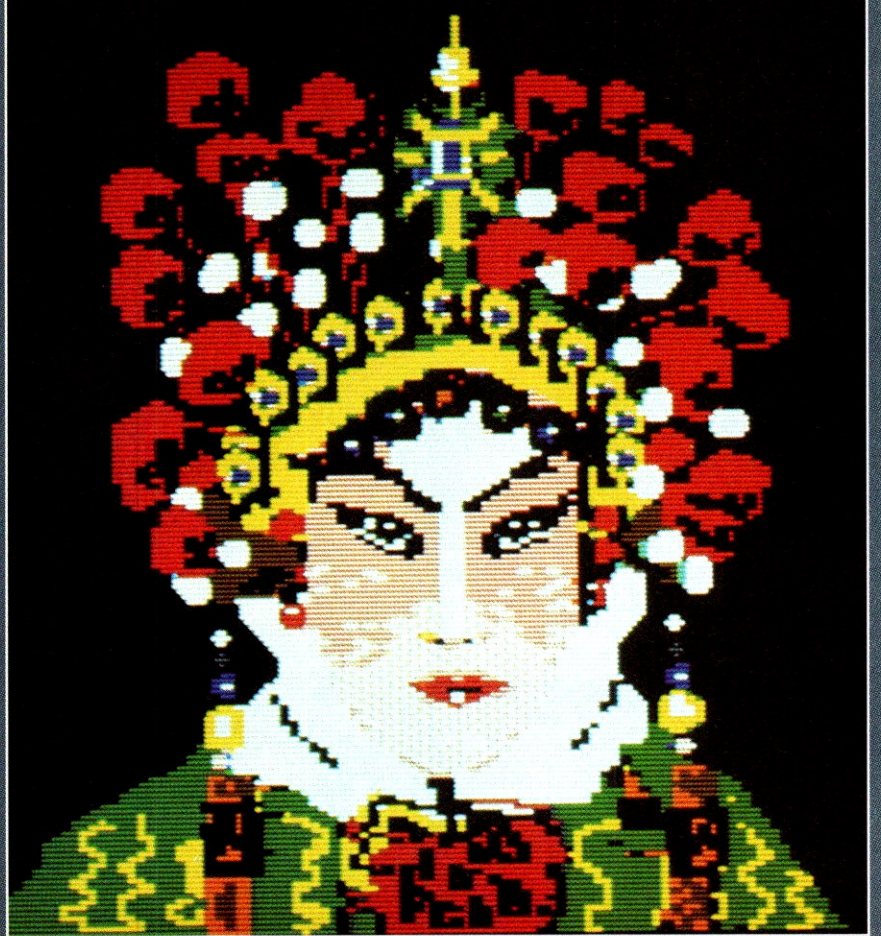
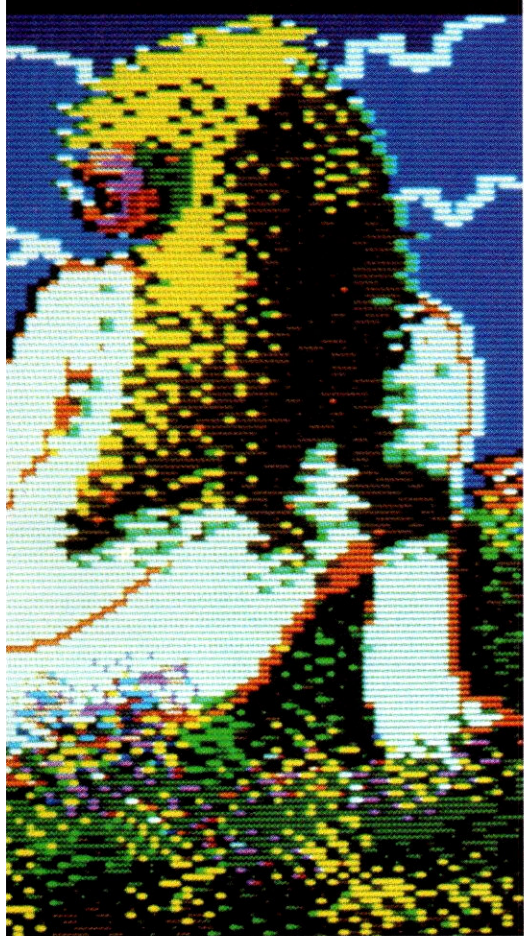
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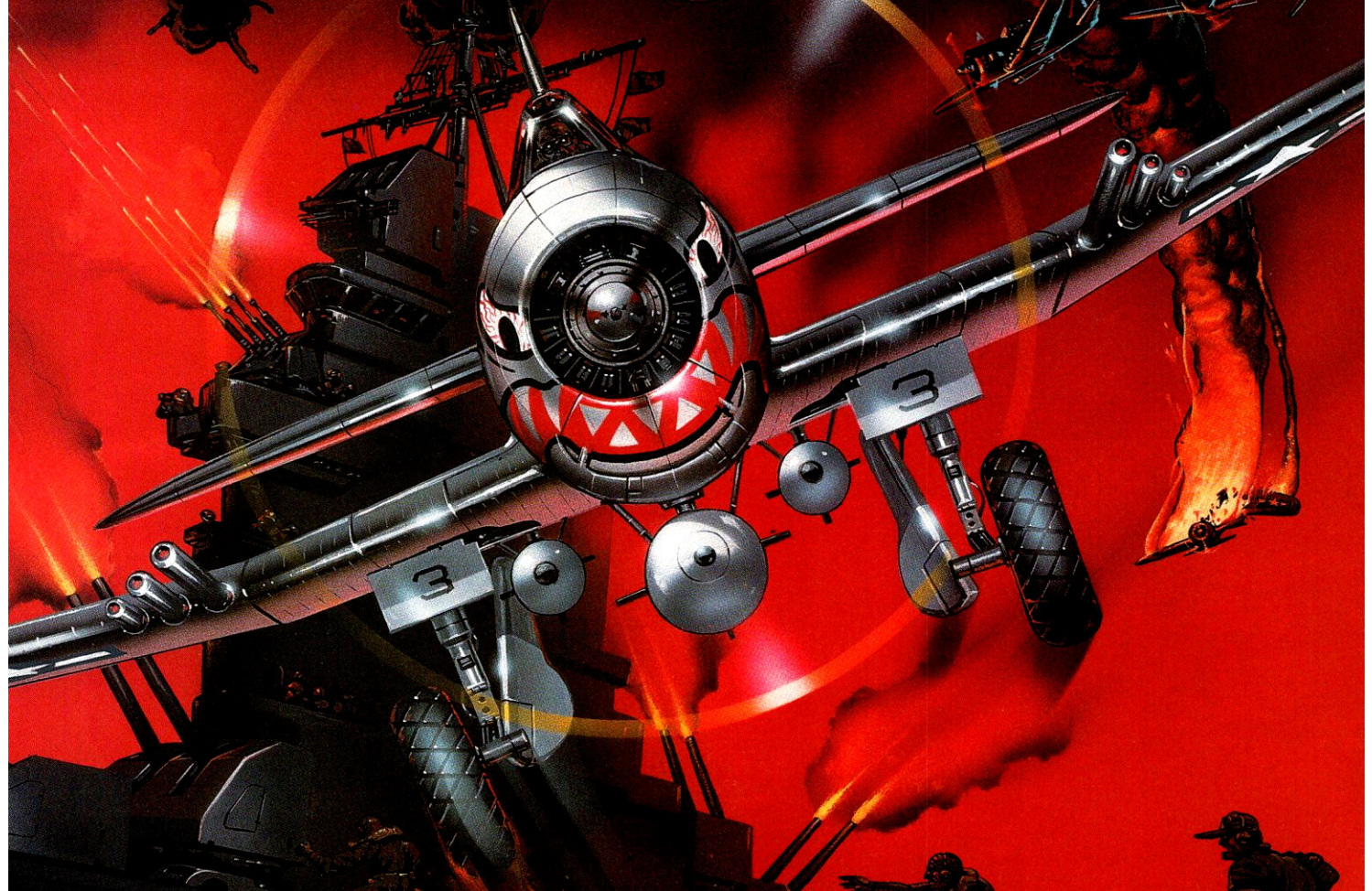
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ENTERTAINMENT GAMEPORT

BY BOB LINDSTROM

*The anatomy of
vaporware—
a pair of firsthand
accounts—
and looking
through a new
Portal*

VAPOR-GAME BLUES

Vaporware—it's the smog, fog, and tear gas of the computer industry.

But if you think *your* eyes are smarting from the haze of undelivered products, squint at the programmers and publishers who are responsible. When they miss a deadline, they lose money and industry respect and send their customer-support-line operators to tearful early retirement.

"Vaporware isn't a question of deception," says Ultima creator Richard "Lord British" Garriott, whose Ultima V came in eight months behind schedule last

March. "The thing that's unpredictable is research and development. Ultimas are written from scratch every time. It's a constant trade-off between what's a nifty idea and what can be achieved on schedule."

"We don't like vaporware any more than the customers do," says Sir-Tech Software vice-president Rob Sirotek. Sir-Tech holds one of the vaporware records. The company announced Wizardry IV in 1983. Four years later, it finally released the product, in December 1987.

Back in 1983, Sir-Tech really believed Wizardry IV was only a few months away. "The original design was going to be a two-disk, two-sided product," Sirotek recalls, "but consumers wanted something more in-depth, more challenging." Eventually, Wizardry IV grew to six disk sides. With additional size came additional programming, testing, and debugging. As the game grew larger and more complex, new programming problems surfaced to create more delays.

"We did not succumb to the pressure consumers were putting on us until we were sure that the game measured up to the quality that people wanted," Sirotek says. "The Wizardry series is

too important for that. Of course, I don't know how to explain that to an angry consumer on the telephone."

And angry they were. Operators of Sir-Tech's hot lines occasionally were brought to tears by frustrated callers.

And then came the development system.

To make Wizardry scenarios more portable among different brands of computers, programmer Robert Woodhead created a universal development system that radically sped up conversions. That caused a delay of an additional two and a half years.

"I wouldn't have minded being a busboy in a resort hotel down in Acapulco during that time," Sirotek jokes.

After additional delays, including two to three months of play-testing the game, the final delay occurred in the marketing and advertising arrangements.

"When I was trying to plan for product release in 1981 (during the early days of Wizardry I), it was pretty easy," Sirotek explains. "Distributors were ecstatic about receiving a new product, and we sent it to them. Now, distributors require 90 days forewarning. You have to tell the dealers and notify users' groups.



GAMEPORT

"There's a 90-day lead time for booking advertising," Sirotek points out. If the product falls behind schedule after the ads have been purchased, the ads still appear. "The unpredictability of finishing a product creates nightmares within the advertising and marketing areas," he says. "It must be terribly frustrating to the consumer not to see an advertised product on the shelves. It is for me, too. But we have to answer to the consumers for vaporware," concludes Sirotek.

Vaporware was also clouding the air at Origin Systems last year. Although scheduled for summer 1987 delivery, Ultima V didn't finally leap from the offices of Origin Systems to the delivery trucks at Brøderbund Software until Leap Year Day, February 29, 1988.

In a telephone interview a few days later, Garriott confesses that the event was "extremely anticlimactic. Nearly everyone on the staff had been working 10-12-hour days since April '87 because we all thought we were on the home-stretch. Even four months ago, I had close friends bringing me champagne to celebrate finishing the game."

In June 1987, Garriott and his team were convinced they would meet an end-of-month deadline. "We even had our in-house artist making a daily poster that counted

It's a trade-off between what is a nifty idea and what can be done on schedule.

down—29, 28, 27 days. He counted all the way down to 1," he says.

As late June arrived, Ultima V was still incomplete and bigger than ever. "When you get close to the deadline and realize you're not going to make it, you begin to loosen up your constraints, reevaluate the product, and add features," notes Garriott.

"Someone says, 'Hey, let's give monsters artificial intelligence.' You plan time lines around the successful operation of the AI. But after three to six weeks, there's a reasonable likelihood you'll find out that the AI you planned won't work."

The new deadline for the latest new features became the Christmas season. The team missed Christmas.

By then, Ultima V had become, according to Garriott, "the largest entertainment-software product ever written: eight disk sides. [Sierra On-Line's] Time Zone used more disk sides, but it was mostly pictures."

Play-testing a product of that scope proved to be a daunting task. "Play-testing is an amazingly unpredictable activity,"

GAMEPORT

says Garriott. "We figured Ultima V would come through play-test quickly because we had been doing so much play-testing internally along the way."

Play-testing, however, only uncovered more problems, suggested more possibilities, and led to more delays, more late-night programming sessions, and more practical jokes and Rubaser wars.

"Rubasers (rubber lasers) shoot lengths of surgical tubing at incredible speeds," Garriott explains in a devilish tone of voice. "If it strikes you on bare skin, it can raise a welt. It was common to have Rubaser wars break out in the halls as an evening wore on.

"The office is also full of practical jokers. One guy works very late and can often be found asleep at his desk. One night we found him asleep while he was on the phone to his girlfriend. We buried him alive in his office—took all the cushions from the couch, built layers around him, took chairs and crammed his office full while he was still asleep. Abusing each other is a common occurrence at this office."

Eventually, the leap-year deadline arrived, and Ultima V was shoved out the door to an expectant world. In the aftermath of the Ultima V experience, Origin Systems has put a high priority on finding ways to avoid the vaporware problem.

"We just had a board meeting about the problem of predicting the release of a product," says Garriott. "The company is not trying to mislead the public. The company was also misled. The company plans its finances around the release of a product. Our customers should at least have faith that the company is just as unhappy about vaporware as they are."

PORTAL IN PRINT

Remember books?

In the olden days before video games and interactive fiction, I hear, people used books as a common form of entertainment and information. Books were much like magazines, but they were thicker, had fewer pictures, were free of advertisements, and couldn't be folded into your pocket.

As inconvenient as they might sound, books were actually popular in their day and even inspired such computer games as Infocom's *Sherlock: The Riddle of the Crown Jewels*, Sierra On-Line's *The Black Cauldron*, and Pong, which few people realize was adapted from the book *Fiscal Recovery and the Reagan Years*.

But *Portal* (\$18.95, St. Martin's Press) is the first book I know of that was created from a computer entertainment.

COMPUTER DIRECT

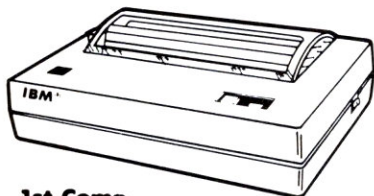
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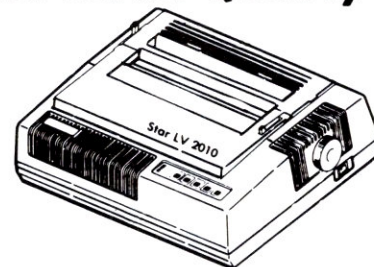
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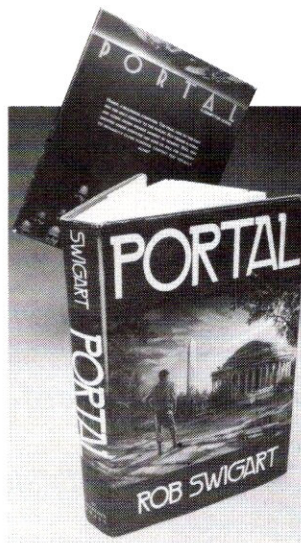
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GAMEPORT



Author Rob Swigart sent a sudden bolt of innovation into the computer-game community over a year ago when Activision released Portal as the first computer novel.

In the 22nd century, an astronaut returns home to discover a deserted Earth. Although there are no signs of destruction or catastrophe, mankind seems to have been peeled off the surface of the planet. In search of an explanation, players/readers of Portal use their computer to scan a futuristic database and sort out a story of benevolent dictators and devastating mind power.

In moving Portal to book form, Swigart has added a framework and a few enhancements that logically adapt the computer novel to a more conventional medium. In black and white, Portal is no less fascinating and touching.

If you're looking for a nice change of pace, entertainmentwise, try a book, whether it's Swigart's Portal or, perhaps,

the biography of one of Apple's cofounders, *The Journey to the Automatic Teller is the Reward*.

Books actually have a lot in their favor. They're as portable as a laptop computer. They last indefinitely without batteries. And they have a crisp, sharp monochrome display that you can read for hours without eye-strain.

HINTS FROM THE CRADLE

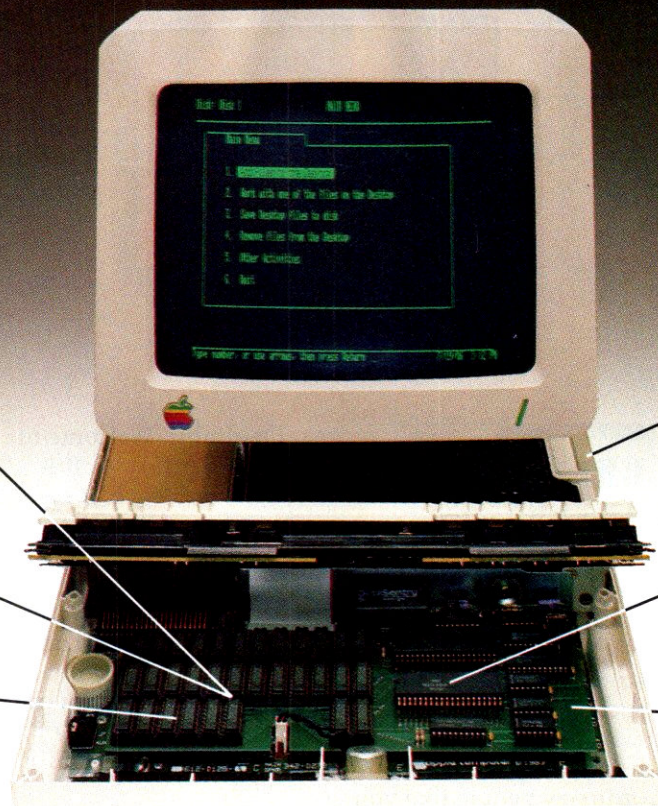
The cradle of civilization, that is.

This month's handy game tip comes to us all the way from Athens, Greece, home of "GamePort" reader Victor Aravatinos.

In Brøderbund's Captain Goodnight and the Islands of Fear, Aravatinos has "found out that when you arrive at Doom Island, after getting off the plane, you can press Delete four times. You will be surprised to see that you have already finished the game, avoiding the thermo berserkers and the nightstalker robots."

You, too, can send tips and spoilers to "GamePort" at our new address: GamePort, A + Magazine, 950 Tower Lane, 18th Floor, Foster City, CA 94404.

Because of the volume of mail, I cannot respond personally to your requests for hints, clues, and authorized credit-card numbers. Sorry. +



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ENTERTAIN

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BRINK OF AN ABYSS

Welcome to a world more dangerous than any you've been to before, a world where you learn to scoff at petty annoyances such as dungeons and evil spells. There are no heroes in this world, only ordinary people like you and me, caught up in events beyond our control. In this world, a small miscalculation can send hundreds to the brink of an abyss.

Welcome to the world of the stock market.

Or almost. Welcome to Millionaire II from Britannica Software. It's a simulation, folks, not the real thing—it just feels like it. It's exciting; frustrating; scary; and, yes, sometimes boring. The difference is that when you're tired of it, you can pull the plug instead of having someone pull it on you.

As a simulation, of course, it has a lot less complexity than the real thing: only 91 weeks of play, five levels of experience, and 15 companies. The companies are real ones, though—Ford, DEC, Boeing, and others—and they have real problems. One company faces investigation, another lays off 600 workers, and a third faces a strike by thousands. A

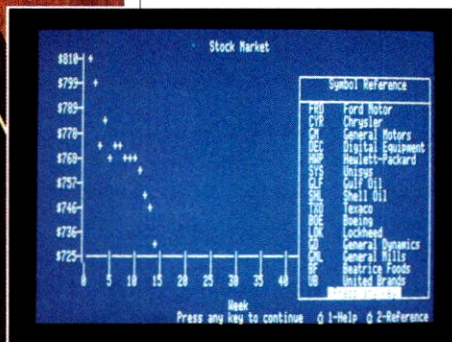
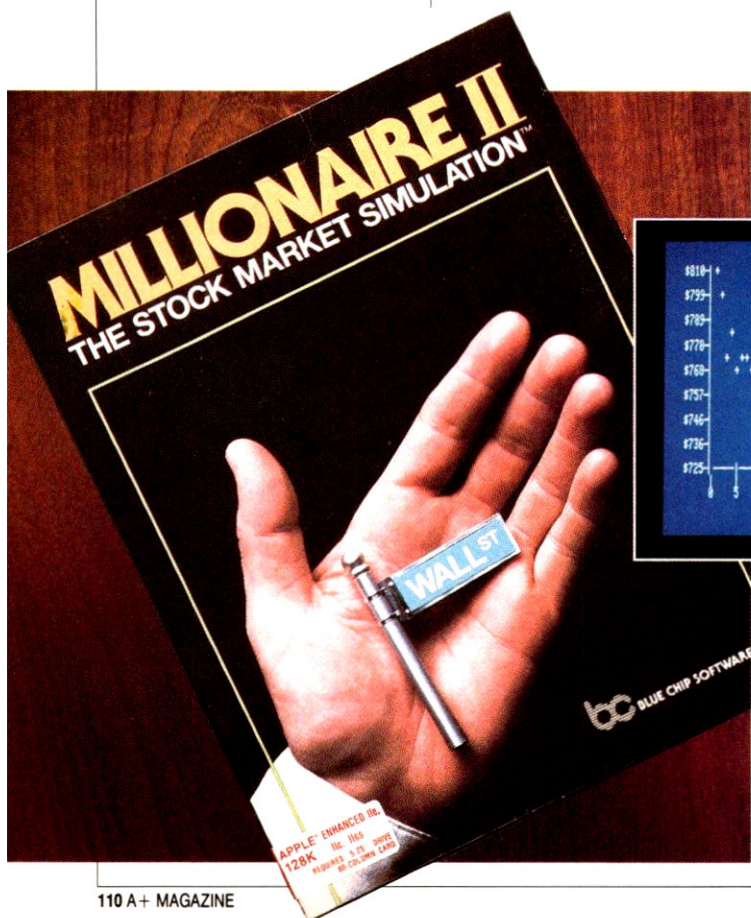
gin, trading options, and selling short). The game has three levels in between. As you make more money, your level and the strategies you can use move up.

The game is clearly structured, with simple menus and windows. To execute a command, you highlight it and press Return, or you can type the first letter of the command. At any point, you can check your portfolio or review the stock prices, graphs, and news items.

For all its strengths, Millionaire II suffers from two glaring weaknesses. One is that it's slow. A IIc takes a full minute to save a game and even longer to restart one. Many operations are sluggish: 15 seconds to paint the Sell screen, another 15 to scroll to the bottom—and every Sell transaction starts from scratch.

The other fault depends on your reason for playing. Millionaire II is a good simulation but a bad training tool. If you don't already know how to make smart investment decisions, you won't learn it here. No magic formulas and no hand-holding—just like in real life. If that's what you're after, fine. Otherwise, you're in for considerable frustration.

Sour grapes? Probably. I did better at this game when I let my money sit



shuttle explosion rocks one of the aerospace companies to its core.

The goal is to make a million dollars fast—an open invitation to market speculation. You can choose to start as a novice (buying and selling) or broker (buying on mar-

MENT REVIEWS

and collect interest. But at least I've experienced the other side; I felt the pull of the market. And although I still can't read the financial news and spot the important trends, I have a sharper sense of how much skill goes into the effort.

Tad Davis

MILLIONAIRE II

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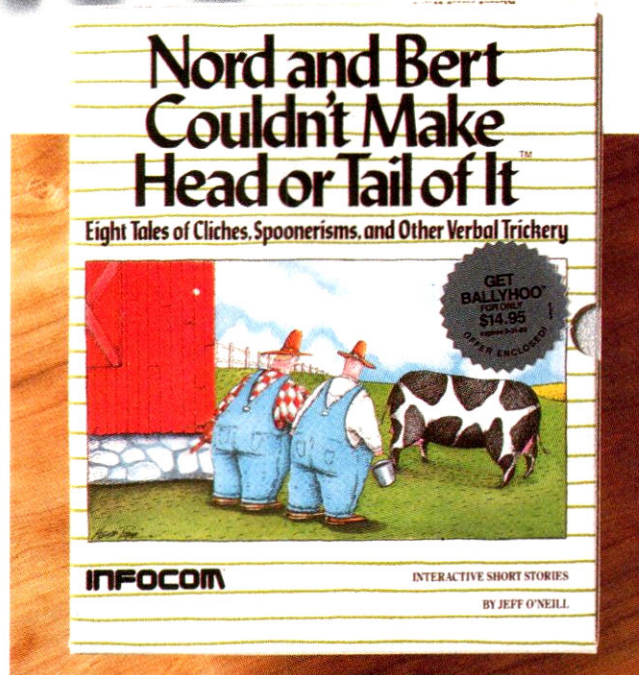
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CIRCLE READER SERVICE NO. 410

PUN AND GAMES WITH NORD AND BERT

I have always loved the English language, not so much for its variety and expressiveness but for the humor inherent in its conventions and inconsistencies. And I have always been particularly fond of writers who make the contradictions of grammar and syntax funny.

So I'm downright tickled that Infocom has released a new interactive text game improbably titled Nord and Bert Couldn't Make Head or Tail of It, which revels (wallows?) in the idiosyncratic peculiarities of



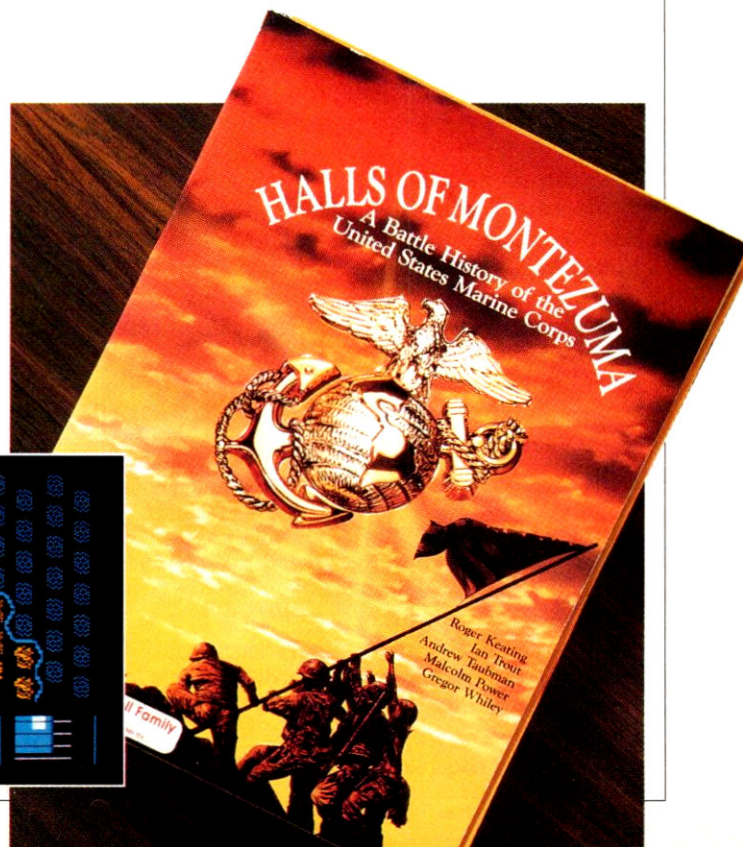
our mother tongue. Written by Jeff O'Neill, the author of Ballyhoo (a common garden-variety text-adventure game from Infocom), Nord and Bert is different from any other previous computer game. Although object manipulation, the standard element of interactive-fiction/adventure games, is part of Nord and Bert, the game's puzzles mostly involve some sort of wordplay: using, abusing, twisting, and untwisting the English language.

Nord and Bert is actu-

ally the collective title for eight miniscenarios that all take place in and around the town of Punter. This once-peaceful

town is now in a terrible way because of problems with "verbal abuse" and is waiting for you to fix things. The first seven stories can be played independently, in any order. After successfully completing each story, you receive a password, and you need all seven passwords to gain entrance to the eighth story. That's the one in which you are finally able to restore order to the chaos.

The scenarios are: The Shopping Bizarre—A trip to a grocery store in which you have to use homonyms (*steak* for *stake*, etc.) to transform the various items you



REVIEWS REVIEWS

find in the aisles.

Play Jacks—In the house that Jack built, you find items beginning with *jack* (*jackrabbit*, *jackhammer*, etc.).

Buy the Farm—A rural setting in which, upon encountering a tailless ass, you have to pin the tail on the donkey as well as make new use out of many old saws (clichés). **Shake a Tower**—This one involves the use of "spoonerisms" (phrases with transposed first letters). "Shake a tower" becomes "take a shower." **Eat Your Words**—In a restaurant, you have to "turn the tables" on a defiantly pesky waitress while you try to literalize figurative expressions. **Act the Part**—You find yourself in a 50s television sitcom and have to improvise gags to win the audience's approval. **The Manor of Speaking**—A house whose rooms all have unique personalities. **Meet the Mayor**—Even after completing the previous stories, you still have to "toot your own horn" to get the mayor's assistance in putting an end to the nonsense.

Now, unless you're astoundingly well read and have a memory as large as the New York Public Library, you're not likely to have on the tip of your tongue all of the clichés and expressions you have to use. For example, the game describes a wall of swords on the side of a barn. If I had been more familiar with the Bible, I would have known that I had to "turn the swords

into plowshares." Since I was stumped, however, I was able to use a new, unique feature of Infocom's games: on-line hints, a virtual necessity in this game.

Rather than having to purchase a separate hint booklet, as with other Infocom games, all you have to do in Nord and Bert is type HINT and a list of buzzwords appears on the screen. You pick the word that relates to the problem at hand, and you get as much nudging as you need to see you through.

Is Nord and Bert for everybody? Most certainly not. But then, neither Zork nor The Hitchhiker's Guide to the Galaxy (two previous Infocom bestsellers) appeals to *everyone's* taste. I especially recommend Nord and Bert to nongamers who have a sense of whimsy—or to those who are daunted at the prospect of interactive-fiction games. Nord and Bert might be the one to get you hooked. In a world that is hungry for some literary humor, Nord and Bert is an entertaining and distinctive step in the right direction.

Donald Oliver

NORD AND BERT COULDN'T MAKE HEAD OR TAIL OF IT

Infocom, Inc.
125 Cambridge Park Drive
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(617) 492-6000

LIST PRICE: \$39.95

REQUIRES: Apple IIe, IIc, or IIgs; 128K RAM; one 5¼-inch disk drive. Copy-protected.

CIRCLE READER SERVICE NO. 411

BATTLING MARINES

Halls of Montezuma: A Battle History of the United States Marine Corps, from Strategic Studies Group (SSG) is the best computer version of board war gaming that has appeared so far. Its quality is not surprising, since the team of Roger Keating and Ian Trout has been perfecting the basic design for several years, through two previous games, *Battlefront* and *Battles in Normandy*. The present package is completely compatible with scenarios created for the two previous games.

The game offers seven battles from the history of the U.S. Marine Corps: Mexico City—1847, Belleau Wood—1918, Iwo Jima—1945, Okinawa—1945, Pusan Perimeter—1950, Inchon—1950, and Hue—1968.

For most of their history, the U.S. Marines

have been elite troops. The game, which is based on painstaking historical research, accurately reflects the great advantages in combat power and endurance elite troops enjoy, as well as the heavier casualties they suffer.

The game system puts you in the position of a two- or three-star general commanding up to three divisions. Each division comprises regiments, and each regiment contains several battalions, which are the basic fighting units. Battalions may be infantry, artillery, armor, or a specialized type. Using an intricate system of nested menus, you assign missions and resources to your units.

Typical missions are attack, defend, and rest. Attacking units move toward their objective; units defending an objective deploy to protect it. With one exception—headquarters units, which must be carefully positioned to stay in con-

Iwo Jima

(TIME)
6th MAR 1945

(HANDICAP)
even

JAPAN Iwo Jima Garrison Gen. Kuribayashi		UNITED STATES V Marine Amphib. Maj. Gen. Schmidt	
KIA	Points	Points	KIA
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101	606	942	314
	1614	3750	
	2700	4728	
		MECH NON MECH OBJECTIVES TOTALS	

Maj. Gen. Schmidt wins by (2028) points

Hit (RET) to return to main menu

HALLS OF MONTEZUMA'S VICTORY SCREEN

When the Bard's scared sober, trust a thief

... like me.



hen the Bard's Tale began, we lived a charmed life. Good ale. Good song. Good company.

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Back then, being a thief was dull. Pick this lock. Disarm that trap. When things got hot, they'd tell me "Into the shadows, wimp." I should've lifted their gold and split long ago. But it's too late now.

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REVIEWS

One of the great lessons of modern combat is that the defender enjoys the advantage.

tact with their men—the players do not move units directly. The game system does the moving automatically.

The results of combat depend on the terrain, the strength of the opposing units, supply, fatigue, air support, and many other factors. One

of the great lessons of modern combat is that the defender enjoys the advantage (all other things being equal), so the attacker needs to concentrate his resources against one or two targets to make much progress.

The computer can play either side; in fact, it can even play both sides if you want to sit back and watch. The computer opponent is a tough and canny adversary, programmed to snatch every possible victory point.

Each hexagonal cell on the map represents one kilometer of terrain. A game turn represents

REVIEWS

about six hours of real time, and a battle can last up to 25 days. Most activities are severely restricted during night game turns—you risk exhausting your troops if you don't let them sleep.

Halls of Montezuma, like its predecessors, provides an elaborate kit of design utilities for simulating virtually any division-level modern battle. Simulation requires hours of research, terrain analysis, and quantitative evaluation of the combatants, but many people who play these games delight in the design almost as much as in the play-

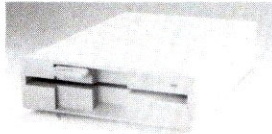
ing. Complete data for new battles is also published in *Run 5*, a quarterly journal from SSG. A new graphic utility in the design menus, *Warpaint*, lets you create your own icons for terrain and combat units.

A useful screen-dump feature allows you to print out any status report, map, or menu, but it does not work with the Apple IIc or with serial printers such as the ImageWriter.

Halls of Montezuma will appeal most to experienced players. To fully appreciate the game, you need some familiarity

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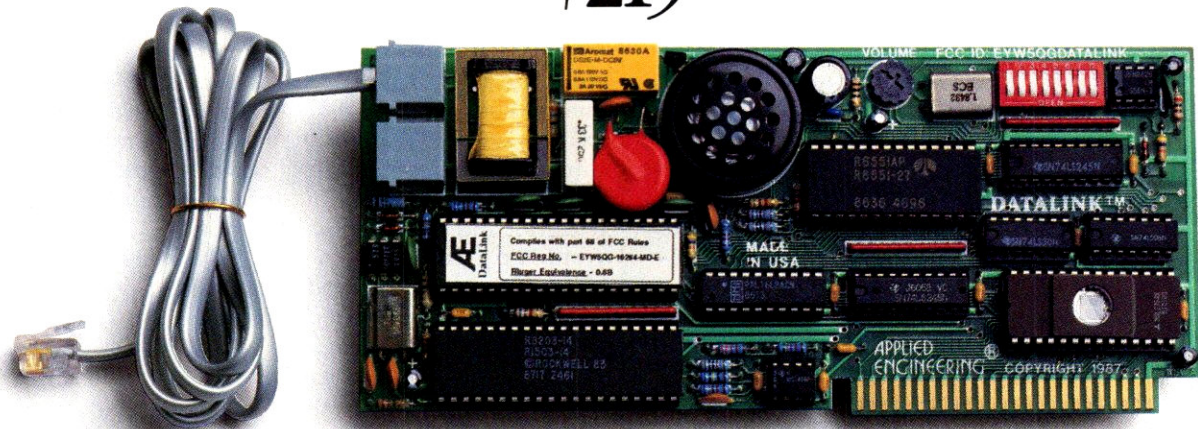
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REVIEWS REVIEWS

Any further evolution in Apple II war gaming is going to require more than 64K of computer power

with military history. The game package includes two quick-reference cards and a 104-page manual, with background information on each battle. You also get a big, colorful plastic-laminated map of all seven battlefields.

The master disk is copy-protected but provides a utility for creating one backup. The scenario disk (on the reverse side) is not copy-protected. You can save a game in progress to a custom-formatted blank disk.

With this game, Strategic Studies Group has just about reached the limits of what can be done on a 64K Apple II. Any further evolution in Apple II war gaming is going to require more computer power. If Keating and Trout could be coaxed into taking a plunge into 128K, we might hope for a zoom

feature (variable, user-controlled map scales) and maybe even maps that looked like real terrain, rather than a mosaic of hexagonal tiles. Ease of learning and ease of play would be greatly improved by a mouse-based user interface with pull-down menus. I'd also like to see graphic unit-status displays, so you wouldn't have to assimilate quite so many numbers, and maybe even a little pop-up notepad, so you wouldn't have to record key information on scraps of paper.

As long as the top designers of computer war

games continue to imitate the style and conventions of board war gaming, we are not going to realize the full potential of the computer for this hobby.

Now, if we could just get these guys to write for the IIGs . . .

Michael Markowitz

HALLS OF MONTEZUMA

Strategic Studies Group
1747 Orleans Court
Walnut Creek, CA 94598
(415) 932-3019

LIST PRICE: \$40

REQUIRES: Apple II Plus, IIe, IIc, or IIgs; 64K RAM; one 5 1/4-inch disk drives. Copy-protected.

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Enthusiasts!

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 best warranty (all your money back if you're not satisfied), and it takes up the least shelf space.

II cue #54

The original version of Apple's *Backup II* program for backing up ProDOS hard disks calls an "illegal entry point" inside ProDOS and works only with versions of ProDOS 8 prior to 1.2. Apple has a newer version of *Backup II*, 1.1.1, that works with current versions of ProDOS.

For more, including a patch that will make older versions of *Backup II* work with newer versions of ProDOS, see the April 1988 **Open-Apple**, page 4.19.



From our fan mail:

Despite its small size, **Open-Apple** is the best Apple information source I've ever found. Creating a forum for the global Apple II user community is a noble purpose.

Jerry Kindall, Grove City, Ohio

Let me add my appreciation to the chorus of Apple II users who have come to depend on **Open-Apple** for the most accurate, realistic, and down-to-earth information available.

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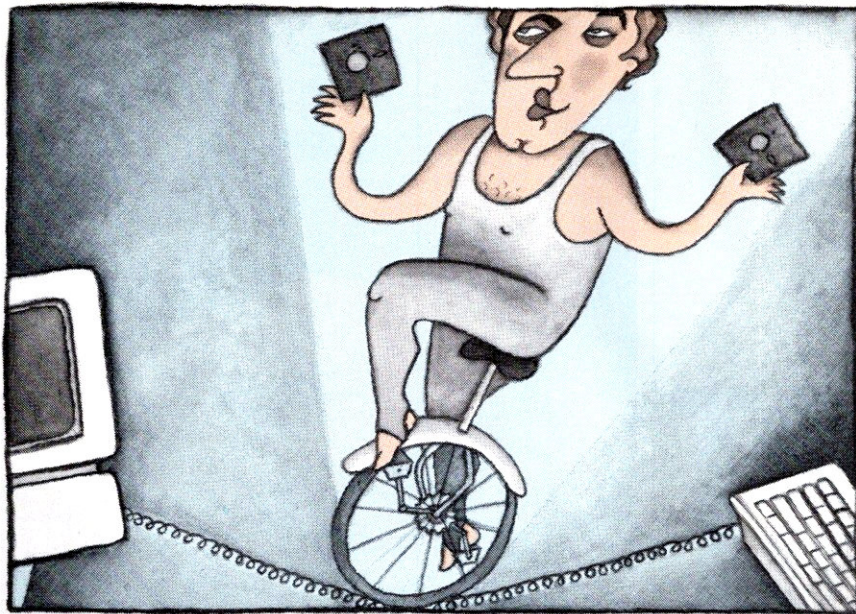
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CURING THE GS 2S

When you boot some older Apple II programs on a GS, you sometimes see a screen full of 2s instead of the expected text display. This phenomenon occurs when a program uses page 2 of the text screen instead of page 1, because the GS does not transfer the data in page 2 to the true video-memory area (as it does for page 1).

You can eliminate this problem by going to the Desk Accessories menu (with Control/open-apple/Escape) and setting the Alternate Display mode to On. In this situation, the GS transfers the video data every 1/60 second, so you will see what the program intends you to see.

DANIEL FREEDMAN
KINGSTON, PA

SPEEDING WITH THE IIGs

Here are some time-saving tips for GS users. If you write programs, you will end up doing a lot of editing and will find that it seems to take forever for the cursor to get to the beginning or end of a long program line. On the GS, this problem is easy to fix. All you have to do is enter the Control Panel, choose Options, and change the Fast Space/Delete Keys option to Yes and Dual Speed Keys option to Fast. Then, when you're editing programs, use the left- and right-arrow keys, space bar, and delete keys as you normally would, but press Control at the same time. Now watch that cursor fly at mach speeds!

By turning on another option, Keyboard Buffering, you can ensure that the GS will keep up with your typing, even when it's accessing the disk.

JOSEPH J. HARAMIC III
MERRILLVILLE, IN

Please send your Apple II tips to A+, 950 Tower Lane, 18th Floor, Foster City, CA 94404; ATTN: Tips and Techniques. We pay \$25 for each tip we publish, so be sure to include your name, address, and Social Security number.

TIPS AND TECHNIQUES

CONTROLLING THE COLOR FUZZIES

If you're using an Apple Color-Monitor and Styleware's Multi-Scribe word-processing program with an Apple IIe or IIc, you may find it hard to read the text you're typing, since the letters are all blurred. Here's a solution to the problem: Open the front panel at the bottom of your ColorMonitor and press the button on the far right. You now have a black-and-white display, and the text is no longer blurry. This display is better for your eyes than that of AppleWorks and other popular word-processing programs, because your eyes are accustomed to the black-on-white display of text and don't have to keep adjusting to white-on-black (the kind of display most other word-processing programs use).

MATT SNYDER
CLINTON, PA

COPY II PLUS ON THE IIc

As of version 8.1, Copy II Plus from Central Point Software can handle extra memory, 3.5-inch drives, and 3.5-inch bit copying—but not very well if you have a IIc.

One procedure that does work is 3.5-inch disk-to-disk copying, but it requires 14 or 15 disk swaps if you have only one 3.5-inch drive. Bit copying does not work with the UniDisk 3.5 Drive (the only 3.5-inch drive you can use with a IIc). Last, but not least, the Copy II Plus memory manager does not recognize the extra memory on a Z-RAM card, because it does not recognize slot 3.

The solution? Use Applied Engineering's Slotchanger program, which comes with the Z-RAM. With Slotchanger, you change the slot and drive assignment for the Z-RAM RAMdisk. If you pick slot 7, drive 1, the Copy II Plus memory manager will recognize the memo-

BY SHANON CULLEN

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

PRODUCT ROUNDUP

GESLER FRENCH PROGRAMS

Gessler Educational Software has begun shipping several programs that sup-

plement French language skills for students 8-17.

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Les Secrets de Gertrude focuses on following directions in French. Students use grammar, vocabulary, and idioms and solve puzzles by recognizing similarities and differences. The advanced version of this program is Les Puzzles de Gertrude.

La Parade des Marionnettes includes seven games that focus on using descriptive adjectives in French. L'Hotel des Marionnettes is a more advanced version in which students learn how to use trial-and-error logic to develop correct solutions.

L'Odyssee du Robot is an adventure game through which students learn French vocabulary and develop problem-solving skills.

Les Jeux du Bourdon includes six games that introduce the concepts of number lines and number pairs. Le Complot du Bourdon is the advanced version, which includes five games.

La Boite à Puces is a program that encourages creativity and develops logical-thinking and problem-solving skills.

List Price: \$49.95 each; lab pack of ten for the price of four; site licenses available.

Requires: Apple II Plus, IIe, IIc, or IIcs; 64K RAM; one 5¼- or 3.5-inch disk drive; color monitor recommended. DOS 3.3; copy-protected. Gessler Educational Software

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MAD SCIENTIST SOFTWARE

Mad Scientist Software has released five medical programs for the Apple II. The software author is Bruce Argyle, MD, an emergency physician. Cardiac Arrest, the top of Mad Scientist's product line, is a cardiac-resuscitation simulator for physicians, nurses, and paramedics. It is also for nonmedical computer owners who want to use it as an



Mad Scientist Software medical programs

interactive adventure game. You interact with the simulator by typing medical orders in plain English. You can ask for lab tests, procedures, and drugs while monitoring vital signs and the effects of therapy on the on-screen EKG. The other programs are ACLS Protocols, EKG Teaching, Cardio-Quiz, and Blood Gases.

List Price: Cardiac Arrest, \$69; ACLS Protocols, \$29; EKG Teaching, \$29; Cardio-Quiz, \$19; all four, \$109; Blood Gases, \$24
Require: Apple II Plus, IIe, IIc, or IIGs; 64K RAM; one 5¼-inch disk drive. DOS 3.3; not copy-protected.
 Mad Scientist Software
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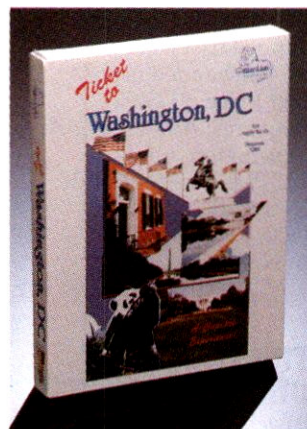
discover the identity of a famous American from the past or present. Seven detailed 3-D maps and on-screen information help you in your search to identify famous Americans. Realistic details and real-time simulations are part of the more than 14 different mysteries.

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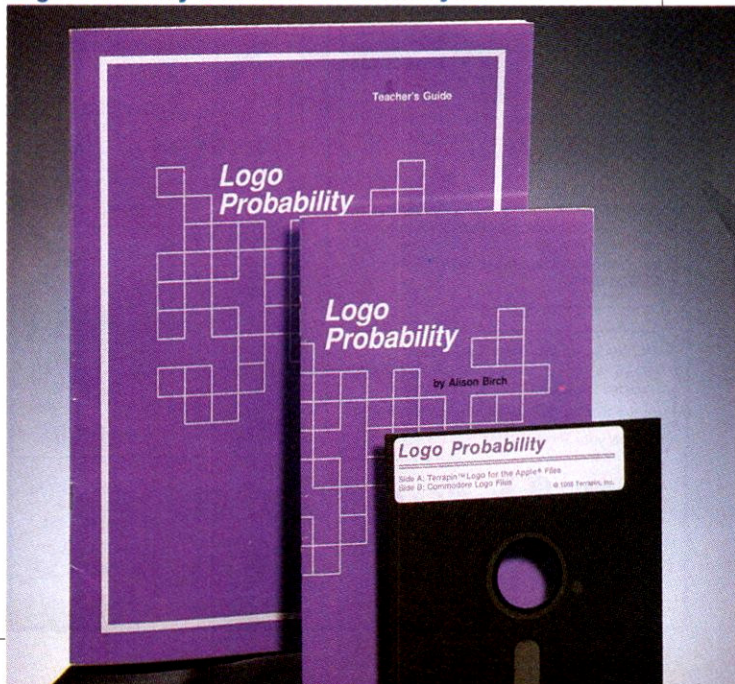
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List Price: Single Pack (includes 1 student booklet), \$23.95; Probability Pack (includes 8 student booklets), \$34.95; Probability Class Pack (includes 25 student booklets), \$59.95. Each includes a teachers' guide and probability disk.

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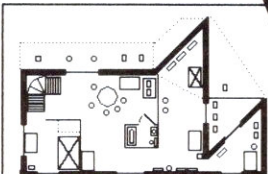
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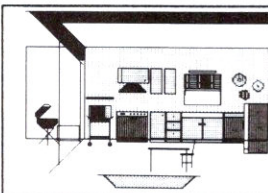
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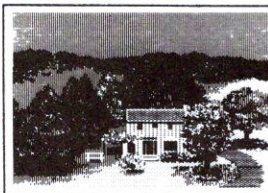
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HARDWARE

TURBO MOUSE

Turbo Mouse is a stationary mouse that fits at the end of your keyboard. The mouse ball is on top and has an automatic acceleration feature that moves the cursor further when you move the ball faster. The mouse has two buttons, one for right-handed users and the other for left-handed users.

List Price: \$129.95

Requires: Apple IIe or IIc.
Kensington

251 Park Avenue South
New York, NY 10010
(800) 535-4242

In NY (212) 475-5200

CIRCLE READER SERVICE NO. 507

**THE POWER
DIRECTOR III**

Power Director III is a surge-suppression and power-control device that fits between the monitor and the CPU of a personal computer. It incorporates integrated circuitry for high-speed transient-voltage surge suppression, filtering of electro-magnetic and radio-frequency interference (EMI-RFI), and over-current protection. The circuitry includes a separate surge-suppression circuit for the protection of mo-

dem and other data-communications devices.

Power Director III has a panel of push-button switches that allow you to power up system peripherals individually or all at once.

It features a storage pocket for 3.5-inch disks and a disk stand. A shielded pocket can also house additional space-saving system-expansion products including the Print Saver Printer Buffer and several data-transfer switches.

List Price: \$149.95

Computer Accessories Corporation
6610 Nancy Ridge Drive
San Diego, CA 92121
(619) 457-5500

CIRCLE READER SERVICE NO. 508

SOFTWARE

MUSICSHAPES

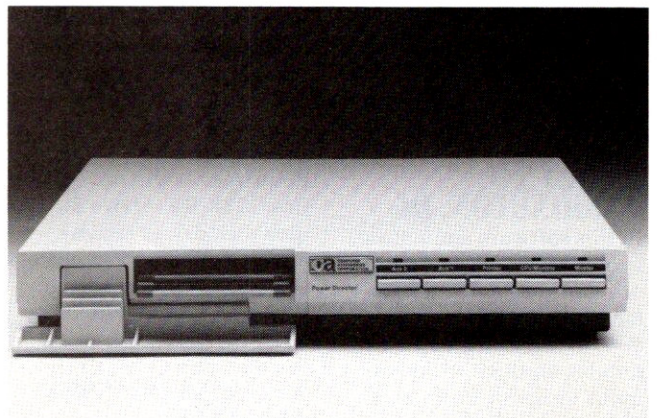
MusicShapes is a program for exploring music and sound through composition. You experiment with pitch, rhythm, timbre, form, and variation by moving graphics that represent musical patterns. The program provides synthesized sounds such as organ, flute, cow-bell, and steel drum.

List Price: \$175; version 1.0, \$139.95

Requires: Apple IIGs, 512K RAM, one 3.5-inch disk drive, speakers recommended, MIDI interface optional. ProDOS 16; not copy-protected.

Music Systems for Learning
311 East 38th Street, #20C
New York, NY 10016
(212) 661-6096

CIRCLE READER SERVICE NO. 509



Power Director III, a surge-suppression and power-control device from Computer Accessories Corporation

*A quick guide
to products we
prefer*

PRODUCT ALL-STARS

The products listed in "Product All-Stars" are those that *A+* contributors have favorably reviewed or those that *A+* editors deem to be exceptional, although we may not have formally evaluated them. When *A+* has reviewed a product, however, the issue date (e.g., 12/87) appears at the end of the product description. When the issue date is followed by a "PS," it means the product appeared in "Product Spotlight" and not in a feature-length review.

SOFTWARE

ACCOUNTING

Back to Basics

This professional three-module accounting system handles receivables, payables, and general ledger for small to medium-sized businesses. Its greatest virtues are ease of use and a predefined chart of accounts (users also can create their own). (12/87) **List Price:** \$195. **Requires:** Apple IIe, IIc, or IIGS; 64K RAM. *Peachtree Software, 4355 Shackleford Road, Norcross, GA 30093; (800) 247-3224*

BusinessWorks

This complete accounting package includes receivables, payables, general ledger, inventory, and payroll modules that you can use alone or as an integrated system. Priced like other fully functional accounting programs but much easier to use. Exports AppleWorks spreadsheet or database files. (12/87) **List Price:** System Manager module, \$95; accounting modules, \$195 each; BusinessWorks Bundle (all modules except Payroll), \$495. **Requires:** Apple IIe, IIc, or IIGS; 128K RAM; at least one 3.5-inch disk or a hard-disk drive. *Manzanita Software Systems, 1*

Sierra Gate Plaza, Suite 200-A, Roseville, CA 95678; (916) 781-3880

BPI Entry Series

Separate modules for general ledger, payables, receivables, payroll, and inventory comprise this longtime Apple accounting favorite. Does not maintain a historical monthly ledger record, so it can't produce an annual budget. No on-line help is available, and the manual is more utilitarian than instructional, but widespread popularity should ensure that local support is available. (12/87) **List Price:** \$295 per module. **Requires:** Apple IIe, IIc, or IIGS; 128K RAM. *Computer Associates International, 2195 Fortune Drive, San Jose, CA 95131; (408) 432-1727*

Q-Mar General Ledger Template

This AppleWorks template provides a less-expensive general-ledger option for AppleWorks owners. (12/87) **List Price:** \$89.95. **Requires:** Apple IIe, IIc, or IIGS; 128K RAM; AppleWorks. *The Q-Mar Group, 5677 Oberlin Drive, San Diego, CA 92121; (619) 455-7513*

DATABASE PROGRAMS

DB Master

Larger, more capable, and with better report generation than AppleWorks, DB Master has abilities that soar above those of the AppleWorks database module. This program's bulky power can be difficult to get off the ground, however, and it is not suitable for merely routine tasks. (12/87) **List Price:** standard, \$179, professional, \$295. **Requires:** Apple IIe, IIc, or IIGS; 128K RAM. *Stone Edge Technologies, P.O. Box 200, Maple Glen, PA 19002; (215) 641-1825*

ProFILER 3.0

Combining some of the best attributes of AppleWorks and DB Master, ProFILER 3.0 provides 65,000-record capacity with an exceptionally good mouse- or keyboard-driven user interface. Simplicity of use comes at the expense of some features, though. (12/87) **List Price:** \$129. **Requires:** Apple IIe (enhanced), IIc, or IIGS; 128K RAM. *Pinpoint Publishing, 5865 Doyle Street, #112, Emeryville, CA 94608; (800) 633-2252; in CA (415) 654-3050*

Notes•n•Files

Satisfies the common database need of keeping track of names and addresses. Not a full-fledged database, but effective. Simple, even fun, to use, with desktop interface and clever icons. (1/88) **List Price:** \$129.95. **Requires:** Apple IIGS, 512K RAM. *DataPak Software, 14011 Ventura Blvd., #507 Sherman Oaks, CA 91423; (818) 905-2201*

UTILITIES

ProSel

A startlingly comprehensive collection of more than a dozen disk utilities from disk-file manager to sector editor, file finder, and Mr. Fixit directory repairman. A bargain available only by mail. (12/87) **List Price:** \$40. **Requires:** Apple II Plus, IIe, IIc, or IIGS; 64K RAM. *Glen Bredon, 521 State Road, Princeton, NJ 08540*

Copy II Plus

Yes, Copy II Plus does duplicate copy-protected software, but it also includes a library of disk utilities. Works with both DOS 3.3 and ProDOS disks, allows file copying between the two, and takes care of necessary conversions. Also copies smaller disk to image file on larger disk. (12/87) **List Price:** \$39.95. **Requires:** Apple II Plus, IIe, IIc, or IIGS; 64K RAM. *Central Point Software, 9700 SW Capitol Highway, Suite 100, Portland, OR 97219; (503) 244-5782*

Diversi-series

The Diversi-series consists of three programs: **Diversi-Copy** uses all available RAM to make the fastest disk copy east (or west) of Silicon Valley. (12/87) **List Price:** \$30. **Requires:** Apple II Plus, IIe, IIc, or IIGS; 64K RAM. **Diversi-Cache** is a disk-caching program for the IIGS that speeds 3.5-inch disk operations by copying disk data blocks to RAM. (12/87) **List Price:** \$35. **Requires:** Apple IIGS, 512K RAM. **Diversi-Key** is a flexible keyboard-macro program for the Apple IIGS with built-in macros for AppleWorks. (4/88) **List Price:** \$45. **Requires:** Apple IIGS, 512K RAM. *Diversified Software Research, Inc., 34880 Bunker Hill, Farmington, MI 48018-2728; (313) 553-9460*

TimeOut Series

This collection of desk accessories installs inside your AppleWorks program and makes several utility programs available at any time. It works

only with AppleWorks Version 2.0 or later and not with other ProDOS programs. The TimeOut environment is open-ended, so you can add the TimeOut spelling program, graph program, font editor, macro program, spreadsheet-printing utility, and file-management program to its menu. (4/88) **List Price:** \$69.95. **Requires:** Apple II Plus, IIe, IIc, or IIGS; 128K RAM. *Beagle Bros, 6215 Ferris Square, Suite 100, San Diego, CA 92121; (619) 296-6400*

Pinpoint Desk Accessories

Pinpoint Desk Accessories installs inside AppleWorks and puts eight programs at your fingertips: an appointment calendar, a calculator, a basic telecommunications program, a telephone dialer, a graphic-merging utility that lets you put graphics inside AppleWorks word-processing documents, a notepad, an envelope-address printer, and a typewriter feature that lets you print as you type. (4/88) **List Price:** \$89. **Requires:** Apple II Plus, IIe, IIc, or IIGS; 128K RAM. *Pinpoint Publishing, 5865 Doyle Street, Suite 112, Emeryville, CA 94608; (415) 654-3050*

MouseFiler

Mac-like mouse-driven menus and windows make MouseFiler the disk-file-management favorite of double-clickers everywhere. Efficient to use and skillfully executed. (12/87) **List Price:** \$69.95. **Requires:** Apple IIe (enhanced), IIc, or IIGS; 128K RAM. *Harbor Software, Inc., 403 Great Road, Suite #8, Acton, MA 01720; (617) 263-1870*

EDUCATION

DATABASE PROGRAMS

BookBrain 4-6

BookBrain is an interactive, reading-incentive database of children's book titles. It is also a simulation of a library card catalog. The disk stores more than 2100 book titles, 765 of which are annotated, selected from several library and reading-resource guides for children in grades 4-6. (4/88) **List Price:** \$195. **Requires:** Apple IIe, IIc, or IIGS; 64K RAM. *Oryx Press, 2214 North Central at Encanto, Suite 103, Phoenix, AZ 85004; (602) 254-6156*

GeoWorld

GeoWorld is an example of what the next wave of educational database products should strive for. This product is fun and visually exciting, teaches the basics of information management, and provides opportunities for engaging in sophisticated cognitive tasks. GeoWorld combines a natural-resource database with a geological-exploration simulation and works with AppleWorks. The simulation can be played as a game or be treated as a research exercise by single students, teams, or entire classes. (4/88) **List Price:** \$79.95; lab pack, \$240. **Requires:** Apple IIe, IIc, or IIGS; 64K RAM. *Tom Snyder Productions, Inc., 123 Mount Auburn Street, Cambridge, MA 02138; (800) 342-0236*

EARLY LEARNING

Touch 'N Write

With a touch screen and fingers, young students practice Palmer Manuscript Penmanship along with letter-recognition and reading skills. (12/87) **Grade Level:** K-3. **List Price:** single-user, \$75; ten-disk lab pack, \$225. **Requires:** Apple II series, 64K RAM, Touch Window, color monitor. *Sunburst Communications, 39 Washington Avenue, Pleasantville, NY 10570; (800) 431-1934 or (914) 769-5030*

PRODUCT ALL-STARS

ENRICHMENT/ GENERAL ENTERTAINMENT

Car Builder

In this program, you can design, build, and test custom cars that you create. The design capabilities cover the chassis, engine, and body. **Grade Level:** 8 and up. **List Price:** \$39.95. **Requires:** Apple II Plus, IIe, IIc, or IIGS; 48K RAM. *Optimum Resource, Station Place, Norfolk, CT 06058; (203) 542-5553*

French Micro Scrabble

Scrabble in French that allows four players to compete at different skill levels. Program contains a 20,000-word spelling checker. **Grade Level:** 9th and up. **List Price:** \$39.95. **Requires:** Apple II Plus, IIe, IIc, or IIGS; 64K RAM. *Gessler Educational Software, 900 Broadway, New York, NY 10003; (212) 673-3113*

Crosscountry USA

A simulated big-rig driving experience that teaches geography, map reading, and money management. The goal is to deliver vital commodities to major U.S. cities with out getting caught for speeding. **Grade Level:** 5 and up. **List Price:** \$39.95. **Requires:** Apple II Plus, IIe, IIc, or IIGS; 64K RAM. *Didatech Software, Ltd., 3812 William Street, Burnaby, BC, Canada V5C 3H9; (604) 299-4435*

LANGUAGE ARTS

Writer's Helper

An amazing program that guides students through creative and organizational phases of writing and then gathers student-provided information into a rough outline. Also offers techniques for evaluating document readability. (12/87) **Grade Level:** 7-12. **List Price:** \$120. **Requires:** Apple IIe (enhanced), IIc, or IIGS; 64K RAM. *Conduit, The University of Iowa, Oakdale Campus, Iowa City, IA 52242; (319) 335-4100*

Grammar Examiner

This simulation of a journalism career rewards good grammar, spelling, punctuation, and proofreading skills with financial and professional success. The game is challenging, the competition ruthless, and the pay lousy. Just like real life. (12/87) **Grade Level:** 10 and above. **List Price:** \$44.95. **Requires:** Apple II Plus, IIe, IIc, or IIGS; 48K RAM. *DesignWare, 185 Berry Street, San Francisco, CA 94107; (415) 546-1866*

Writer Rabbit

Children learn basic sentence and paragraph structure while playing a six-game sequence. The program allows children to write and print silly stories of their own creation. **Grade Level:** 2-4. **List Price:** \$49.95. **Requires:** Apple II Plus, IIe, IIc, or IIGS; 64K RAM. *The Learning Company, 6439 Kaiser Drive, Fremont, CA 94555; (800) 852-2255*

Wordmaze

Players look for secret words hidden in a maze of scrambled letters. **Grade Level:** 3 and up. **List Price:** \$49.95. **Requires:** Apple II Plus, IIe, or IIc; 48K RAM. *Mindscape, Inc., 3444 Dundee Road, Northbrook, IL 60062; (312) 480-7667*

MATHEMATICS

Number Munchers

Little creatures wander a grid while gobbling meals of arithmetical operations, equalities, inequalities, prime numbers, and factors. (12/87) **Grade Level:** 3 and above. **List Price:** \$54-inch disk, \$49; 3.5-inch disk, \$55. **Requires:** Apple II series; 64K RAM. *MECC, 3490 Lexington Avenue North, St. Paul, MN 55126; (612) 481-3500*

Math Blaster Plus

New graphics and pull-down menus give this basic math classic a classy new look. Test maker, retake option, student record keeping, report capabilities, and problem-solving activities make it a valuable teaching tool. (12/87) **Grade Level:** 1-6. **List Price:** single-user, \$49.95; five-disk lab pack, \$129.95. **Requires:** Apple IIe (enhanced), IIc, or IIGS; 128K RAM. *Davidson & Associates, Inc., 3135 Kashiwa Street, Torrance, CA 90505; (213) 534-4070*

Green Globes and Graphing Equations

With an amazing instructional range, from beginning algebra to math analysis, this program teaches the relationship between equations and graphs. (12/87) **Grade Level:** 9-12. **List Price:** single-user, \$65; ten-disk lab pack, \$195. **Requires:** Apple II series, 64K RAM. *Sunburst Communications, 39 Washington Avenue, Pleasantville, NY 10570; (800) 431-1934 or (914) 769-5030*

Quations

Players build math skills as they create equations on a Scrabble-like screen. Up to three can play. **Grade Level:** 4 and up. **List Price:** \$49.95. **Requires:** Apple II Plus, IIe, IIc, or IIGS; 48K RAM. *Scholastic Software, 730 Broadway, New York, NY 10003; (212) 505-3020*

Fay: That Math Woman

Fay helps children visualize math concepts by putting their answers on a number line. **Grade Level:** K-3. **List Price:** \$29.95. **Requires:** Apple II Plus, IIe, IIc, or IIGS; 48K RAM. *Didatech Software, Ltd., 3812 William Street, Burnaby, BC Canada V5C 3H9; (604) 299-4435*

PROBLEM SOLVING

Think Quick

A fun and challenging way for younger students to improve problem-solving and decision-making skills. Run from cute slime worms while dealing with intellectual opportunities hidden in the game. (12/87) **Grade Level:** 2-9. **List Price:** \$49.95. **Requires:** Apple II series; 64K RAM. *The Learning Company, 6493 Kaiser Drive, Fremont, CA 94555; (800) 852-2255*

The Enchanted Forest

Defy the wicked witch and identify the logical connection between geometrically shaped ponds in order to save woodland friends. The program teaches mathematical concepts of negation, conjunction, and disjunction. (12/87) **Grade Level:** 4-12. **List Price:** single-user, \$65; ten-disk lab pack, \$195. **Requires:** Apple II series; 64K RAM. *Sunburst Communications, Inc., 39 Washington Avenue, Pleasantville, NY 10570; (800) 431-1934 or (914) 769-5030*

AI: An Experience with Artificial Intelligence

Students design games and then teach the computer how to beat human opponents. This program explores principles of artificial intelligence central to the study of cognitive science and advanced computer programming. (12/87) **Grade Level:** 6-12. **List Price:** single-user for IIe or IIc, \$87.45; five-disk lab pack for IIe or IIc, \$137.45; single-user IIGS, \$87.45. **Requires:** Apple IIe or IIc with 128K RAM; IIGS with 256K RAM. *Scholastic, Inc., 730 Broadway, New York, NY 10003; (212) 505-3000*

PRODUCTIVITY

Bank Street Writer III

Easy-to-use word-processing program includes 80-, 40-, and large-type 20-column screen displays. Also incorporates thesaurus, spell-checker, search mode, user-definable keys, and pull-down menus. Teachers can use frozen-word option to create prompts that students can't delete. (12/87) **Grade Level:** 2-12. **List Price:** single-user, \$99.95; five-disk lab pack, \$162.45; Corvus Omninet network version, \$499.64. **Requires:** Apple IIe, IIc, or IIGS; 128K RAM. *Scholastic, Inc., 730 Broadway, New York, NY 10003; (212) 505-3000*

Crossword Magic

Crossword Magic constructs custom crossword puzzles, complete with clues for any subject area in any language using Roman symbols. A library of puzzle disks covers specific curricular areas. **List Price:** \$49.95; Crossword Magic, puzzle disks, \$14.95 each or \$59.95 for a set. **Requires:** Any Apple II computer, 48K RAM, one disk drive, printer recommended. Puzzle disks require Crossword Magic. *Mindscape, Inc., 3444 Dundee Road, Northbrook, IL 60062; (312) 480-7667*

Homeworker

Integrated productivity program especially for students includes word processing, outliner, calendar, flash-card maker, calculator, and grade keeper. (12/87) **Grade Level:** 10 and above. **List Price:** single-user, \$89.95; ten-disk lab pack, \$249.95. **Requires:** Apple IIe (enhanced) or IIc, 128K RAM. *Davidson & Associates, Inc., 3135 Kashiwa Street, Torrance, CA 90505; (213) 534-4070*

The Print Shop and The Print Shop IIGS

Design and print stationery, book-report covers, calendars, banners, newsletters, and award certificates. The classroom productivity tool. Print Shop IIGS is even more fun than the original. (12/87) **Grade Level:** K-12. **List Price:** The Print Shop single-user, \$49.95; school edition, \$59.95. **Requires:** Apple II Plus, IIe, or IIc; 64K RAM. The Print Shop IIGS, \$59.95. **Requires:** Apple IIGS, 256K RAM. *Brøderbund, 17 Paul Drive, San Rafael, CA 94903; (415) 492-3500*

SCIENCE

Operation: Frog

Amphibian dissection without the sharp edges or the mess. Three modules: dissection and two levels of reconstruction. Organs must be removed or replaced in logical order, and students can examine body parts with a "magnifying glass." (12/87) **Grade Level:** 4-10. **List Price:** single-user, \$74.95; five-disk lab pack, \$112.45. **Requires:** Apple II Plus, IIe, IIc, or IIGS; 64K RAM. *Scholastic, Inc., 730 Broadway, New York, NY 10003; (212) 505-3000*

Information Laboratory Software—Life Science

A life-science database that covers abiogenesis to zygote. Information organized by subject area, then by relationships among life-science topics. (12/87) **Grade Level:** 6-9. **List Price:** \$80. **Requires:** Apple IIGS, 512K RAM. *Addison-Wesley Publishing Company, 2725 Sand Hill Road, Menlo Park, CA 94025; (415) 854-0300*

Science Toolkit

A Master Module interface box turns your computer into a science laboratory with "probeware" sensors to measure light, speed, temperature, and centrifugal force. Companion lab add-ons study earthquakes, speed and motion, and the body. (12/87) **Grade Level:** 4-12. **List Price:** single-user Master Module, \$69.95; school edition, \$89.95; companion modules, \$39.95 each. **Requires:** Apple II series; 64K RAM. *Brøderbund, 17 Paul Drive, San Rafael, CA 94903; (415) 492-3500*

The Halley Project:

A Mission in our Solar System

A simulated mission through our solar system is guided by mastery of astronomy concepts. Data collection, analysis, synthesis, and hypothesis testing are encouraged by this program. **Grade Level:** 5-12. **List Price:** \$44.95. **Requires:** Apple II Plus, IIe, IIc, or IIGS; 64K RAM. *Mindscape, Inc., 3444 Dundee Road, Northbrook, IL 60062; (312) 480-7667*

SOCIAL STUDIES

Oregon Trail

Simulates experiences of westbound pioneers, circa 1840-1848. Surviving the hazards of nature, ill-health, and random fate requires analytical skills. (12/87) **Grade Level:** 5-12. **List Price:** \$54-inch disk, \$55; 3.5-inch disk, \$59. **Requires:** Apple II Plus, IIe, IIc, or IIGS; 64K RAM. *MECC, 3490 Lexington Avenue North, St. Paul, MN 55126; (612) 481-3500*

Where in the World Is Carmen Sandiego?

Capture an international criminal by culling facts from the *World Almanac* and *Book of Facts*. A graphically vivid way to learn world geography. (12/87) **Grade Level:** 4-9. **List Price:** single-user, \$39.95; school edition, \$49.95; lab pack, \$99.95. **Requires:** Apple II series, 64K RAM. *Brøderbund, 17 Paul Drive, San Rafael, CA 94903; (415) 492-3500*

ENTERTAINMENT

The Bard's Tale I & II

Hack and slash never looked so good. Detailed, scrolling, point-of-view dungeons make Bard's Tale the glamour boy among role-playing games. The stunning graphics and sound of the IIGS version place it in a class by itself. (12/87) **List Price:** \$44.95. **Requires:** Apple II Plus, IIe, or IIc with 64K RAM or Apple IIGS with 512K RAM. *Electronic Arts, 1820 Gateway Drive, San Mateo, CA 94404; (415) 571-7171*

Chessmaster 2000

Computerized chess the way it ought to be. Graphically attractive and strategically devastating, Chessmaster 2000 plays an excellent game of chess. (12/87) **List Price:** \$39.95. **Requires:** Apple II Plus, IIe, IIc, or IIGS; 64K RAM. *Software Toolworks, Distributed by Electronic Arts, 1820 Gateway Drive, San Mateo, CA 94404; (415) 571-7171*

Choplifter!

In addition to making the two-button joystick standard equipment for Apple-game players, Choplifter! brought humanity to the arcade game. Pilot a helicopter behind enemy lines and rescue wildly waving prisoners. They may be stick figures, but they'll steal your heart. Packaged with the pinball game David's Midnight Magic. (12/87) **List Price:** \$14.95. **Requires:** Apple II Plus, IIe, IIc, or IIGS; 64K RAM. *Brøderbund, 17 Paul Drive, San Rafael, CA 94903; (415) 492-3500*

Conflict in Vietnam

This war-game simulation raises and answers some questions about the unfortunate realities of U.S. military involvement in SE Asia. A well-written manual provides historical background and insight. (12/87) **List Price:** \$39.95. **Requires:** Apple II Plus, IIe, IIc, or IIGS; 64K RAM. *MicroProse, 120 Lakefront Drive, Hunt Valley, MD 21030; (301) 771-1151*

Flight Simulator II

Faster and flashier than the original, Flight Simulator II enables Apple II owners to soar like a mechanical bird while keeping all office-chair wheels firmly on the ground. Includes a WWI air-combat mode for action fans. (12/87) **List Price:** \$49.95. **Requires:** Apple II Plus, IIe, or IIc; 64K RAM. *subLogic Corporation, 713 Edgebrook Drive, Champaign, IL 61820; (800) 637-4983 or (217) 359-8482*

Halls of Montezuma

This ambitious and far-ranging war game re-creates the entire history of the U.S. Marine Corps, from the 1848 capture of Mexico City to the 1968 battle of Hue in Vietnam. Includes prefab scenarios and 55G's utilities for building your own. (6/88) **List Price:** \$40. **Requires:** any Apple II, 64K RAM. *Strategic Studies Group, distributed by Electronic Arts, 1820 Gateway Drive, San Mateo, CA 94404; (415) 571-7171*

King's Quest I & II

Control an animated Little Man as he wanders through a fairy-tale kingdom in a variety of daring quests. A breakthrough in real-time, animated graphic adventures. (12/87) **List Price:** \$49.95 (upgrade from IIe or IIc version to IIGS, \$10). **Requires:** Apple IIe or IIc with 128K RAM or Apple IIGS with 512K RAM. *Sierra On-Line, Inc., P.O. Box 485, Coarsegold, CA 93614; (209) 683-6858*

Loderunner

Run through a convoluted array of ladders and levels, stealing gold and eluding your pursuers. Loderunner offers more levels than you can imagine and a build-it-yourself construction set as well. Addictive, puzzle-solving game play. (12/87) **List Price:** \$34.95. **Requires:** Apple II Plus, IIe, IIc, or IIGS; 48K RAM. *Brøderbund, 17 Paul Drive, San Rafael, CA 94903; (415) 492-3500*

Lords of Conquest

Inspired by the board game Risk, this program gives down-home dictators the power, the prestige, and the perseverance to conquer up to 19 different worlds. (12/87) **List Price:** \$39.95. **Requires:** Apple II Plus, IIe, IIc, or IIGS; 64K RAM. *Electronic Arts, 1820 Gateway Drive, San Mateo, CA 94404; (415) 571-7171*

Pinball Construction Set

One of the classics. All the electronic tools and parts you'll need to build your own on-screen pinball machines. The granddaddy of construction sets and still the best. (12/87) **List Price:** \$14.95. **Requires:** Apple II Plus, IIe, IIc, or IIGS; 48K RAM. *Electronic Arts, 1820 Gateway Drive, San Mateo, CA 94404; (415) 571-7171*

Pirates!

Plunder for profit or use your nefarious band of cutthroats to curry political favor. Pirates! combines military, financial, and political strategy with real-time action simulations of sword fighting, ship-to-ship combat, and land battles. (4/88) **List Price:** \$39.95. **Requires:** Apple II Plus, IIe, IIc, or IIGS; 64K RAM. *MicroProse, 120 Lakefront Drive, Hunt Valley, MD 21030; (301) 771-1151*

Rebel Charge at Chickamauga

One of the most evenly contested battles of the American Civil War becomes an intensely grand tactical war game. Introductory and advanced versions make it appealing to players of varying abilities. (12/87) **List Price:** \$49.95. **Requires:** Apple II Plus, IIe, IIc, or IIGS; 64K RAM. *Strategic Simulations, Inc., 1046 North Rengstorff Avenue, Mountain View, CA 94043; (415) 964-1353*

The Seven Cities of Gold

Whether you see it as a graphics adventure or as a simulation of cultural invasion, The Seven Cities of Gold is a brilliant combination of fantasy and education. It simulates the explorations, and sometimes the slaughters, of 16th-century Spanish conquistadors. (12/87) **List Price:** \$14.95. **Requires:** Apple II Plus, IIe, IIc, or IIGS; 64K RAM. *Electronic Arts, 1820 Gateway Drive, San Mateo, CA 94404; (415) 571-7171*

Shanghai

The ivory tiles of the Mah Jongg board game are piled into a computerized classic. Whether you play it as solitaire or in the head-to-head competitive mode, matching and removing the brightly colored tiles is an endlessly hypnotic experience. (12/87) **List Price:** \$44.95. **Requires:** Apple IIGS, 512K RAM. *Activation, P.O. Box 7287, Mountain View, CA 94039; (800) 227-9759; in CA (415) 940-6044*

Thexder

Race through high-tech caverns as an armored robot or transform into a fighter jet and soar through monster-infested halls. With stereo music, rapid-fire animation, and more monsters than you can shake a stick at, Thexder is the first arcade game to show what the IIGS can do. **List Price:** \$34.95. **Requires:** Apple IIGS, 512K RAM. *Sierra On-Line, Inc., P.O. Box 485, Coarsegold, CA 93614; (209) 683-6858*

Ultima I, III, IV, and V

Epic in scope and fascinating in detail, this long-running series of fantasy/role-playing adventures continues to set new standards in Apple sword-and-sorcery swashbuckling. The fifth and latest installment is the largest Apple game of all time. (12/87) **List Price:** Ultima I and III, \$39.95 each; Ultima IV and V, \$59.95 each. **Requires:** Apple II Plus, IIe, IIc, or IIGS; 64K RAM. *Origin Systems, distributed by Brøderbund, 17 Paul Drive, San Rafael, CA 94903; (415) 492-3500*

Wilderness

With scrolling 360-degree graphics and life-threatening dangers, Wilderness teaches you that it's not nice to challenge Mother Nature. (12/87) **List Price:** \$29.95. **Requires:** Apple II Plus, IIe, IIc, or IIGS; 64K RAM. *Electric Transit, distributed by Spectrum Holobyte, 2061 Challenger Drive, Alameda, CA 94501; (415) 522-3584*

The Wizard and the Princess

The first color graphic adventure. Though technically surpassed, The Wizard and the Princess still charms with quaint pictures and challenging puzzles. (12/87) **List Price:** \$7.99. **Requires:** Apple II Plus, IIe, IIc or IIGS; 64K RAM. *ShareData, 7400 West Detroit Street, Suite 170, Chandler, AZ 85226; (602) 961-7519*

Wizardry I-IV

The four Wizardry scenarios are renowned as the thinking man's role-playing game. With unique wit and devilish mapping challenges (particularly in the expert-level scenario of IV), Wizardry captures the illusion of life as does no other role-playing game. (12/87) **List Price:** Wizardry I, \$49.95; Wizardry II, \$34.95; Wizardry III, \$39.95; Wizardry IV, \$49.95. **Requires:** Apple II Plus, IIe, IIc, or IIGS; 48K RAM. *Sir-Tech Software, P.O. Box 245, Ogdensburg, NY 13669; (315) 393-6633*

The Zork Trilogy

Vividly written and inventively plotted, the three Zorks represent a watershed accomplishment in text adventuring. (12/87) **List Price:** \$69.95. **Requires:** Apple II Plus, IIe, IIc, or IIGS; 48K RAM. *Infocom, 125 Cambridge Park Road, Cambridge, MA 02140; (617) 492-6000; (800) 262-6868 (mail-order department)*

GRAPHICS

Blazing Paddles

The best standard-hi-res paint program, Blazing Paddles lets you see the entire graphic as you work. It works with a variety of input devices from mouse to light pen and has a full range of cut, paste, zoom, and color-mixing functions. (12/87) **List Price:** \$34.95. **Requires:** Apple II Plus, IIe, IIc, or IIGS; 64K RAM. *Baudville, 1001 Medical Park Drive SE, Grand Rapids, MI 49506; (616) 957-3036*

Dazzle Draw

This double-hi-res paint program was one of the first to emulate the Macintosh interface. All the necessary art tools are here, although it would be better if it displayed the full screen. Menu bar and tool windows obstruct the view. (12/87) **List Price:** \$49.95. **Requires:** Apple IIe, IIc, or IIGS; 128K RAM. *Brøderbund, 17 Paul Drive, San Rafael, CA 94903; (415) 492-3500*

DeluxePaint II

The best super-hi-res paint program, with every possible feature you could wish for and a few you may not have thought possible on an Apple II. It belongs in every IIGS software library. (12/87) **List Price:** \$99.95. **Requires:** Apple IIGS; 768K RAM. *Electronic Arts, 1820 Gateway Drive, San Mateo, CA 94404; (415) 571-7171*

Take 1

Tools and keystroke commands bring animated life to hi-res graphics. The program animates graphics or text, allows integration of sound effects, and compresses hi-res backgrounds to economize on disk space. Take 1 Programmers' Toolkit helps convert animations into viewer-responsive interactive presentations. (12/87) **List Price:** Take 1, \$59.95; Take 1 Programmers' Toolkit, \$60. **Requires:** Apple II Plus, IIe, IIc, or IIGS; 64K RAM. *Baudville, 1001 Medical Park Drive SE, Grand Rapids, MI 49506; (616) 957-3036*

PRODUCT ALL-STARS

Animate

This superb double-hi-res program provides tools and utilities for creating frame animation on the Apple II. Draw the frames and plot the object's path across the screen, and Animate does the rest. Animate has a pull-down-menu interface similar to that of Dazzle Draw and offers graphics compatibility with that program. (12/87) **List Price:** \$59.95. **Requires:** Apple IIe, IIc, or IIGS; 128K RAM. *Brøderbund, 17 Paul Drive, San Rafael, CA 94903; (415) 492-3500*

The Graphics Magician

This most enduring of all the Apple II graphics programs includes both a game-style animation module and paint-oriented sequential-picture module in standard- and double-hi-res modes. Four years old but still in use by professional developers. (12/87) **List Price:** \$39.95. **Requires:** Apple II Plus, IIe, IIc, or IIGS; 48K RAM. *Polarware, 1055 Paramount Parkway, Suite A, Batavia, IL 60510; (312) 232-1984*

Fontrix

Fontrix was the first Apple II program to mix text and graphics on a full-page printout. It's suitable for creating newsletters, fliers, and other printed material. Works with an astonishing array of printers and additional FontPaks font disks. (12/87) **List Price:** \$75. **Requires:** Apple II Plus, IIe, IIc, or IIGS; 48K RAM. *Data Transforms, 616 Washington Street, Denver, CO 80203; (303) 832-1501*

The Graphics Department

Although it's showing its age, this program remains the most comprehensive hi-res business-graphics program available. A complete set of drawing tools and 40 different fonts aid in the creation of slide shows and other presentations. (12/87) **List Price:** \$124.95. **Requires:** Apple IIe, IIc, or IIGS; 64K RAM. *Sensible Software, Inc., 335 East Big Beaver, Suite 207, Troy, MI 48484; (313) 528-1950*

Draw Plus

Draw Plus is a two-dimensional drawing program that can display up to eight drawing windows at a time. Its text commands are cramped into a dialog box, and it has a crude set of default fill patterns, but its rulers have a wide range of customizing options, and its icon library offers a handy place to store frequently used objects. (1/88) **List Price:** \$89.95. **Requires:** Apple IIGS, 512K RAM. *Activation, Inc., P.O. Box 7287, Mountain View, CA 94039; (415) 960-0518*

TopDraw

This color drawing program contains more object-editing and -moving commands than you might expect for such a moderate price. It is limited to working within a single drawing window and has a weak Undo command but provides a rich set of colored pattern fills and a simple palette-editing option. **List Price:** \$89.95. **Requires:** Apple IIGS, 512K RAM. *StyleWare, Inc., 5250 Gulton, Suite 2E, Houston, TX 77081; (800) 233-4086; in TX (713) 668-0743*

PRODUCT ALL-STARS

Timeout Graph

This Timeout desk accessory for AppleWorks lets you create seven basic types of business graphs from AppleWorks spreadsheet data. **List Price:** \$89.95. **Requires:** Apple IIe, IIc, or IIGS; 128K RAM. *Beagle Bros, Inc., 6215 Ferris Square, Suite 100, San Diego, CA 92121; (619) 296-6400*

Graphic Edge

A stand-alone graphing program that creates eight different chart types from AppleWorks spreadsheet data. **List Price:** \$89. **Requires:** Apple IIe (enhanced), IIc, or IIGS; 128K RAM. *Pinpoint Publishing, Inc., 5865 Doyle Street, #112, Emeryville, CA 94608; (415) 654-3050*

INTEGRATED

AppleWorks 2.0

AppleWorks has plenty of features that users want. The people's choice, hardworking and affordable. It gives you spreadsheet, database, and word-processing capabilities in one tidy package. (12/87) **List Price:** \$249. **Requires:** Apple IIe, IIc, or IIGS; 128K RAM. *Claris Corporation, 440 Clyde Avenue, Mountain View, CA 94043; (415) 960-1500*

Foundation

Although difficult to learn, Foundation, an integrated program with a relational database, is worth it. Appropriate for almost any data-processing application. Some file-compatibility with AppleWorks. (12/87) **List Price:** \$300. **Requires:** Apple IIe, IIc, or IIGS; 128K RAM. *Foundation Corporation, 506 West Armitage, Chicago, IL 60614; (312) 880-5761*

MUSIC

The Music Studio

A comprehensive IIGS music-composition program with pull-down menus and mouse-driven note entry. Color-coded notation indicates which of 15 instrumental timbres are in use. (12/87) **List Price:** \$79.95. **Requires:** Apple IIGS, 512K RAM. *Activision, P.O. Box 7287, Mountain View, CA 94039; (800) 227-9759; in CA (415) 940-6044*

Instant Music

Unabashed musical amusement for nonmusicians, Instant Music lets you move your mouse to play along with a variety of digitized sound tracks. Uses nonstandard musical notation of colored bars instead of notes and staves. Results can be weird, campy, and a lot of fun. (12/87) **List Price:** \$49.95. **Requires:** Apple IIGS, 512K RAM. *Electronic Arts, 1820 Gateway Drive, San Mateo, CA 94404; (415) 571-7171*

KidsTime II

This music-education program uses a grand staff and simulated keyboard to assist youthful composers. In KidsNote option, you choose note duration and click on the on-screen piano key for pitch, and the note is entered on the staff. Not as musically sophisticated as other IIGS programs, but accessible for younger musi-

cians. For ages 3-10. (12/87) **List Price:** \$39.95. **Requires:** Apple IIGS; 512K RAM. *Great Wave Software, 5353 Scotts Valley Drive, Scotts Valley, CA 95066; (408) 438-1990*

Music Construction Set (for IIGS)

The digitized sonics of the IIGS add new interest to this venerable Apple composition program. Not as graphically imaginative as some of the competition, but simplicity and innovation make it the most foolproof of note-dragging programs. (12/87) **List Price:** \$49.95. **Requires:** Apple IIGS; 256K RAM. *Electronic Arts, 1820 Gateway Drive, San Mateo, CA 94404; (415) 571-7171*

The Music Class

Children are taught such music fundamentals as rhythm, ear-training, note-reading, and music symbols in this five-part, ten-disk package. Clever animated characters keep the subject lively. (2/88) **List Price:** \$195. **Requires:** Apple II Plus, IIe, IIc, or IIGS; 64K RAM. *Coda Music Software, A Wenger Company, 1401 East 79th Street, Bloomington, MN 55420; (800) 843-1337*

MIDI Music Tutor

This drill-and-practice package of music fundamentals incorporates a Record Keeper that enables teachers to maintain student performance records and modify lessons. Works with MIDI instruments. (12/87) **List Price:** \$229.95. **Requires:** Apple II Plus, IIe, IIc, or IIGS; 64K RAM. *Passport Designs, Inc., 625 Miramontes Street, #103, Half Moon Bay, CA 94019; (415) 726-0280*

Guitar Wizard

Four basic areas of study comprise this guitar-tutorial program. Locates chords in different positions; displays fingerings, intervals, and notes for various scales; teaches basics of fret-board harmony and open tunings; and suggests scales appropriate for improvisation. Astonishingly complete. (12/87) **List Price:** \$29.95. **Requires:** Apple II Plus, IIe, IIc, or IIGS; 64K RAM. *Baudville, 1001 Medical Park Drive SE, Grand Rapids, MI 49506; (616) 957-3036*

Foundations of Music: A

Computer-Assisted Introduction
A beautifully written textbook, with accompanying computer disk, on scales, intervals, and other music fundamentals. (12/87) **List Price:** \$31.25. **Requires:** Apple II Plus, IIe, IIc, or IIGS; 48K RAM. *Wadsworth Publishing Company, 10 Davis Drive, Belmont, CA 94002; (415) 595-2350*

PERSONAL FINANCE

Quicken

One of the easiest checkbook-balancing programs. Quicken has data-entry screens that look like a checkbook and checkbook register. It follows the AppleWorks file-folder interface and can export data to AppleWorks. (12/87) **List Price:** \$49. **Requires:** Apple IIe, IIc, or IIGS; 128K RAM. *Intuit, 540 University Avenue, Palo Alto, CA 94301; (800) 624-8742; in CA (800) 468-8481*

On Balance

This checkbook-balancing program accepts keyboard or mouse input and reports information in statistical or bar-graph form. On Balance automatically fills in the account category based on the initial letters you type. (12/87) **List Price:** \$99.95. **Requires:** Apple IIe (enhanced), IIc, or IIGS; 128K RAM. *Brøderbund, 17 Paul Drive, San Rafael, CA 94903; (415) 492-3500*

Dollars & Sense

With some of the hardheaded attitudes of a human CPA, Dollars & Sense lacks the flexibility of the competition, but it has more features. Doesn't export data directly to AppleWorks but can write DIF-format files (which can be imported into AppleWorks). (12/87) **List Price:** \$119.95. **Requires:** Apple IIe (enhanced), IIc, or IIGS; 128K RAM. *Monogram, 367 Van Ness Way, Torrance, CA 90501; (213) 533-5120*

TELECOMMUNICATIONS

CommWorks

One of the earliest communications programs to work with the IIGS. CommWorks resembles Point-to-Point but lacks review buffer and Binary II protocol support. Includes VT-100 terminal emulation. (12/87) **List Price:** \$95. **Requires:** Apple IIe, IIc, or IIGS; 128K RAM. *PBI Software, 1163 Triton Drive, Foster City, CA 94404; (415) 349-8765*

MouseTalk

Easy to use and mouse-driven, MouseTalk boasts a review buffer, full-screen text editor, on-line help, and VT-52 emulator. Good remote-control mode. Uses AE Xmodem extension but not Binary II. (12/87) **List Price:** \$99.95. **Requires:** Apple IIe (enhanced), IIc, or IIGS; 128K RAM. *United Software Industries, Inc., 8399 Topanga Canyon Blvd., Canoga Park, CA 91304; (800) 332-7244 or (818) 887-5800*

Point-to-Point

With an AppleWorks-like file-card display and transmission-protocol support that includes Binary II, Point-to-Point is a very popular favorite. A new full-screen editor makes it even easier to use. (12/87) **List Price:** \$129. **Requires:** Apple IIe, IIc, or IIGS; 128K RAM. *Pinpoint Publishing, 5865 Doyle Street, #112, Emeryville, CA 94608; (415) 654-3050*

ProTERM

Works with a wide variety of modems but has only limited expansion-RAM support. AutoLearn feature creates log-on sequences automatically. (12/87) **List Price:** \$95. **Requires:** Apple IIe, IIc, or IIGS; 64K RAM. *Checkmate Technology, Inc., 509 South Rockford Drive, Tempe, AZ 85281-3021; (800) 325-7347*

Talk Is Cheap

This shareware includes Xmodem and Binary II protocols, along with an extensive macro-command language for automation of on-line functions. Turbo Xmodem downloading (to a RAMdisk) can speed data reception by 100%. Available from bulletin boards and data services. (12/87) **List Price:** \$30 shareware. **Requires:** Apple IIe, IIc, or IIGS; 128K RAM. *Don Elton, Carolina System Software, 3207 Berkeley Forest Drive, Columbia, SC 29209-4111; written inquiries only*

WORD PROCESSING

WordPerfect for the Apple IIe and IIc, Version 1.1, and WordPerfect for the IIGS, Version 2.0

Remarkably full-featured, both WordPerfects offer many advanced abilities. The cost of their sophistication is a marked lack of speed. (12/87 and 4/88) **List Price:** WordPerfect 1.1 and WordPerfect GS, \$179 each. **Requires:** WordPerfect 1.1—Apple IIe or IIc; 128K RAM. WordPerfect GS—Apple IIGS, 256K RAM. *WordPerfect Corporation, 288 West Center Street, Orem, UT 84057; (801) 227-4000*

MultiScribe GS 3.0

The first IIGS word-processing program to attain real stature. The mouse-driven design takes after and sometimes exceeds MacWrite. Variable fonts and the ability to cut and paste graphics make MultiScribe GS a delight. (12/87) **List Price:** \$99.95. **Requires:** Apple IIGS; 512K RAM. *StyleWare, Inc., 5250 Gullfong, Suite 2E, Houston, TX 77081; (800) 233-4088 or (713) 668-0743*

Sensible Writer

A Mac-like word-processing program that is compatible with AppleWorks, Sensible Writer offers features such as mail merge, Undo, Lock Document, and Append Document. (12/87) **List Price:** \$99.95. **Requires:** Apple IIe (enhanced), IIc, or IIGS; 128K RAM. *Sensible Software, Inc., 335 East Big Beaver, Suite 207, Troy, MI 48011; (313) 528-1950*

MouseWrite

Mac-like design lacks full WYSIWYG capability but includes AppleWorks and DOS 3.3 file compatibility, 61,000-word spelling checker, telecommunications module, macros, and expandable desktop accessories. (12/87) **List Price:** \$149.95. **Requires:** Apple IIe, IIc, or IIGS; 128K RAM. *Roger Wagner Publishing, Inc., 1050 Pioneer Way, Suite P, El Cajon, CA 92020; (619) 442-0522*

Bank Street Writer Plus

This newly updated word-processing program is ideal for home use. (12/87) **List Price:** \$79.95. **Requires:** Apple IIe, IIc, or IIGS; 128K RAM. *Brøderbund Software, 17 Paul Drive, San Rafael, CA 94903; (415) 492-3500*

HomeWord Plus

With easy-to-understand icons to get you going, HomeWord is an attractive program for home users. (12/87) **List Price:** \$69.95. **Requires:** Apple IIe, IIc, or IIGS; 128K RAM. *Sierra On-Line, Inc., P.O. Box 485, Coarsegold, CA 93614; (209) 683-6858*

HARDWARE

ACCELERATORS

TransWarp

This venerable accelerator runs your IIe or II Plus software up to 3.6 times normal speed. It speeds up both main and auxiliary memory on the IIe, so it's ideal for AppleWorks number crunching. (8/86) **List Price:** \$219. **Requires:** Apple II Plus or IIe. *Applied Engineering, P.O. Box 798, Carrollton, TX 75006; (214) 241-6060*

AUDIO/SOUND/SPEECH

Supersonic

A stereo-output card that connects to the GS Ensoniq chip. Output can be directed to a hi-fi stereo, headphones, or speakers. (7/87) **List Price:** \$59.95. **Requires:** Apple IIGS. *MDIdeas, 1163 Triton Drive, Foster City, CA 94404; (800) 843-5722; in CA (800) 573-2746*

Supersonic Digitizer

This card plugs into the Supersonic card. You can use it to digitize incoming sound so that it may be played back through the Supersonic. (7/87) **List Price:** \$59.95. **Requires:** Apple IIGS. *MDIdeas, 1163 Triton Drive, Foster City, CA 94404; (800) 843-5722; in CA (800) 573-2746*

Phasor

A stereo music, sound, and speech synthesizer with 12 sound channels and 4 white-noise generators. Comes with software for composing songs and generating speech. **List Price:** \$179. **Requires:** Apple II Plus, IIe, or IIGS. *Applied Engineering, P.O. Box 798, Carrollton, TX 75006; (214) 241-6060*

Echo IIb

A speech synthesizer that can translate ASCII text to understandable speech. Includes software that makes the chore of adding speech to your own Applesoft programs very easy. (2/84) **List Price:** \$129.95. **Requires:** Apple II Plus, IIe, or IIGS. *Applied Engineering, P.O. Box 798, Carrollton, TX 75006; (214) 241-6060*

CLOCKS

TimeMaster H.O.

A versatile ProDOS-compatible clock that comes with plenty of software that shows how to use it with DOS 3.3, Pascal, and CP/M. Keeps track of the time and date to the millisecond and has a BSR port for X-10 home-control modules. (12/85) **List Price:** \$99. **Requires:** Apple II Plus, IIe, or IIGS. *Applied Engineering, P.O. Box 798, Carrollton, TX 75006; (214) 241-6060*

No-Slot Clock

This unique device installs underneath a ROM chip on the motherboard. It comes with software for patching ProDOS to recognize the chip. (7/87) **List Price:** \$59. **Requires:** Apple II Plus, IIe, or IIGS. *Systems Technology Manufacturing (SMT), 1145 Linda Vista Drive, San Marcos, CA 92049; (619) 744-3590*

COMPUTERS

Laser 128EX

A low-priced Apple II compatible packed with high-end features, including an accelerator board, RAM card, and Universal Disk Controller. (12/87) **List Price:** \$579. *Video Technology, 400 Anthony Trail, Northbrook, IL 60062; (312) 272-6760 or Central Point Software, 9700 SW Capitol Highway, Suite 100, Portland, OR 97219; (503) 244-5782*

DIGITIZERS

ComputerEyes Color Video Digitizing System

Upgraded for the Apple IIGS, this powerful digitizing system, with the aid of a color-video source, lets you capture real-world images in full color. (3/88) **List Price:** \$249.95. **Requires:** Apple IIGS, 512K RAM. *Digital Vision, Inc., 66 Eastern Avenue, Dedham, MA 02026; (617) 329-5400*

ThunderScan

A low-cost device that replaces the ribbon cartridge in a standard ImageWriter printer and transforms the printer into a high-quality scanner. **List Price:** \$249. **Requires:** Apple IIe, IIc, or IIGS; 64K RAM. *ThunderWare, Inc., 21 Orinda Way, Orinda, CA 94563; (415) 254-6581*

DRIVES/CONTROLLERS

Universal Disk Controller

This controller card can attach two 3.5-inch drives, two 5¼-inch drives, or one of each, to your system. (1/87) **List Price:** \$90. **Requires:** Apple II Plus, IIe, or IIGS. *Central Point Software, 9700 SW Capitol Highway, Portland, OR 97219; (503) 244-5782*

Chinon 800K Drive

A low-cost 3.5-inch drive that works with the Universal Disk Controller. You can also attach it directly to the disk port on a Macintosh. (1/87) **List Price:** \$199. **Requires:** Apple II Plus, IIe, or IIGS. *Central Point Software, 9700 SW Capitol Highway, Portland, OR 97219; (503) 244-5782*

HARD-DISK DRIVES

CMS SC20

A SCSI hard-disk drive with 20 megabytes of storage and an optional 40MB tape backup system. Can be shared by multiple Apple IIs and Macintoshes. (11/87) **List Price:** \$895. **Requires:** Apple II Plus, IIe, or IIGS. *CMS Enhancements, 1372 Valencia Avenue, Tustin, CA 92680; (714) 259-9555*

Sider D2, D4

The most popular hard-disk drive for the Apple II family, the Sider works with all major Apple II operating systems. A tape backup unit is optional. (11/87) **List Price:** 20MB unit, \$695; 40MB, \$995. **Requires:** Apple II Plus, IIe, or IIGS. *First Class Peripherals, 3579 Highway 50 East, Carson City, NV 89701; (800) 982-3232; in NV (702)883-4000*

MEMORY CARDS

RamFactor

Plugs into a standard expansion slot (1-7) and holds up to 1MB (in 256K increments). ProDOS automatically recognizes it as a RAMdisk. Comes with AppleWorks enhancement software and battery backup option. (8/86) **List Price:** \$239 for 256K. **Requires:** Apple II Plus, IIe, or IIGS. *Applied Engineering, P.O. Box 798, Carrollton, TX 75006; (214) 241-6060*

RamWorks III

Plugs into the auxiliary slot and holds up to 1MB (in 256K increments). You can add more memory with a piggyback card. Comes with AppleWorks-enhancement and RAMdisk software for all major operating systems. Works with ColorLink RGB video option. (8/86) **List Price:** \$179 for 64K. **Requires:** Apple IIe. *Applied Engineering, P.O. Box 798, Carrollton, TX 75006; (214) 241-6060*

GS-RAM

Holds up to 1.5MB (in 256K increments) and features ROM and RAM expansion ports. Includes AppleWorks-enhancement, disk-caching, and printer-buffering software. (5/87) **List Price:** \$169 for 256K. **Requires:** Apple IIGS. *Applied Engineering, P.O. Box 798, Carrollton, TX 75006; (214) 241-6060*

OctoRAM

Holds up to 2MB (using 256K SIMMs) or 8MB (using 1MB SIMMs). The SIMM RAM packages are the same as those on newer models of the Macintosh and are very easy to install. (5/87) **List Price:** \$149.95 for 256K. **Requires:** Apple IIGS. *MD-Ideas, 1163 Triton Drive, Foster City, CA 94404; (800) 843-5722; in CA (800) 573-2746*

RamPak 4GS

This card holds up to 4MB, in 256K increments. It uses 256 × 4 RAM chips and comes with disk-caching software. (5/87) **List Price:** \$189 (512K). **Requires:** Apple IIGS. *Orange Micro, 1400 North Lakeview Avenue, Anaheim, CA 92807; (800) 223-8029; in CA (714) 779-2772*

Z-Ram Ultra 3

Holds up to 1MB (in 256K increments) and has an on-board clock/calendar and a Z-80B microprocessor for CP/M applications. Comes with AppleWorks expansion and RAM-disk software. (8/86) **List Price:** \$329 for 256K. **Requires:** Apple IIc. *Applied Engineering, P.O. Box 798, Carrollton, TX 75006; (214) 241-6060*

MultiRAM CX

This card holds up to 512K (in 256K increments). It comes with AppleWorks expansion software. (8/86) **List Price:** \$179.95 for 256K. **Requires:** Apple IIc. *Checkmate Technology, 509 South Rockford Drive, Tempe, AZ 85281; (800) 325-7347; in AZ (602) 966-5802*

MemorySaver

This unique card plugs into the GS memory slot and acts as a receptacle for two GS memory cards (it works with most brands). Also has a remote-power and battery option for maintaining data on the memory cards even after you turn off the Apple or experience a power loss. **List Price:** \$149.95. **Requires:** Apple IIGS. *Checkmate Technology, 509 South Rockford Drive, Tempe, AZ 85281; (800) 325-7347; in AZ (602) 966-5802*

QCARD

This low-cost card holds up to 256K (in 64K increments). It comes with AppleWorks-expansion and RAM-disk software. You can piggyback additional memory onto it. (11/87 PS) **List Price:** \$129.95 for 256K. **Requires:** Apple IIe. *Checkmate Technology, 509 South Rockford Drive, Tempe, AZ 85281; (800) 325-7347; in AZ (602) 966-5802*

MultiRAM RGB

Holds up to 1MB (in 256K increments) and has Apple-compatible RGB video circuitry built in. Comes with AppleWorks-expansion software and DOS 3.3 and ProDOS RAMdisk software. You can piggyback additional memory to it. (8/86) **List Price:** \$189.95 for 64K. **Requires:** Apple IIe. *Checkmate Technology, 509 South Rockford Drive, Tempe, AZ 85281; (800) 325-7347; in AZ (602) 966-5802*

MODEMS

AppleMate

A low-cost, 1200-bps Hayes-compatible internal modem. (4/87) **List Price:** \$127. **Requires:** Apple II Plus, IIe, or IIGS. *Sunnyvale Communications Company, P.O. Box 3565, Sunnyvale, CA 94088; (800) 558-5741, in CA (800) 835-9009*

DataLink

A 1200-bps Hayes-compatible internal modem. Comes with communications software in ROM and on disk. **List Price:** \$219. **Requires:** Apple II Plus, IIe, or IIGS. *Applied Engineering, P.O. Box 798, Carrollton, TX 75006; (214) 241-6060*

PRODUCT ALL-STARS

MULTIFUNCTION CARDS

SlotBuster II

This card has a bevy of optional features: a parallel-printer port, serial-printer port, modem port, speech synthesizer, clock, and BSR controller, to name a few. None of these devices take up a phantom slot, as many other multifunction cards do. (9/87) **List Price:** \$149.95 with 8K buffer; additional options available from \$19.95 to \$57.95. **Requires:** Apple II Plus, IIe, or IIGS. *RC Systems, 121 West Winesap Road, Bothell, WA 98012; (206) 672-6909*

PARALLEL CARDS

ProGrappler

This is the latest revision of the granddaddy of parallel-interface cards. It works with a variety of printers, and its firmware facilitates the printing of screen images. (4/87 PS) **List Price:** \$119. **Requires:** Apple II Plus, IIe, or IIGS. *Orange Micro, 1400 North Lakeview Avenue, Anaheim, CA 92807; (800) 223-8029; in CA (714) 779-2772*

SERIAL/PARALLEL CARDS

Print-It!

This card comes with a small red button that you can attach to your keyboard. When you press the button, your program halts, and the current screen image prints immediately. The card works with more than 50 printers, both parallel and serial. **List Price:** \$199. **Requires:** Apple II Plus, IIe, or IIGS. *Texprint, 200 Reservoir Street, Needham Heights, MA 02194; (800) 255-1510; in MA (617)449-5808*

Fingerprint Plus

Fingerprint Plus has a special button that permits you to interrupt any program and print a copy of the screen display of that program. You can use this snapshot feature even with software that doesn't normally permit printing. (3/88) **List Price:** \$149. *Thirdware Computer Products, 4747 NW 72nd Avenue, Miami, FL 33166; (305) 592-7522*

SERIAL CARDS

Serial Grappler+

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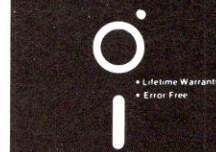
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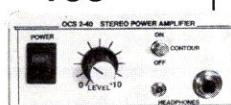
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play text on the screen.

If the card you want to use doesn't use the peripheral ROM space, you won't have any conflicts if you put it into slot 3. Such cards include the TransWarp accelerator from Applied Engineering and some older memory-expansion cards (the kind that provide multiple 16K banks).

Even if your card does use the peripheral ROM space, however, you can put it into slot 3 if the applications you use with it don't use the subroutines in its ROM. For example, most telecommunications programs for the IIe bypass the ROM and talk directly to the hardware switches for the device; as a result, you could put your modem-interface card into slot 3 if you wanted to, freeing up slot 2 (the usual slot for a modem card) for some other device.

PROGRAMMING THE IIgs

Q. Where can I learn to program the GS? Specifically, what books do I need to learn how to write desk accessories like the ones I see on GENie and MAUG?

MICHAEL BEYL
SAN ANSELMO, CA

A. The starting place for books on how to program the GS is the Apple IIGS Technical Library series from Addison-Wesley (6 Jacob Way, Reading, MA, 01867). The Library includes most of Apple's official GS technical-reference manuals. The ones I'd be sure to get are volumes I and II of the *Apple IIGS Toolbox Reference*. You should also consider non-Apple books, since they often contain more programming examples and better practical advice to programmers. One of the best of these is Mike Fischer's *Apple IIGS Technical Reference* (1987, Osborne/McGraw-Hill). If you want to learn assembly language, take a look at Roger Wagner's *Apple IIGS Machine Language for Beginners* (1987, Compute! Publications). **+**

Gary Little is A+'s editor and author of several books about Apple computers. Please send your questions and problems to "Rescue Squad," A+, 950 Tower Lane, 18th Floor, Foster City, CA 94404. Because of limited space, we aren't able to publish responses to all inquiries we receive.

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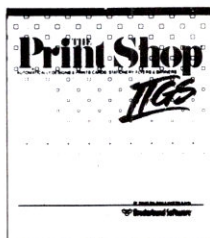
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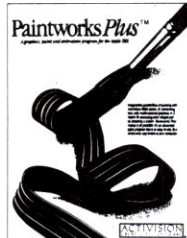
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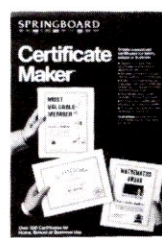
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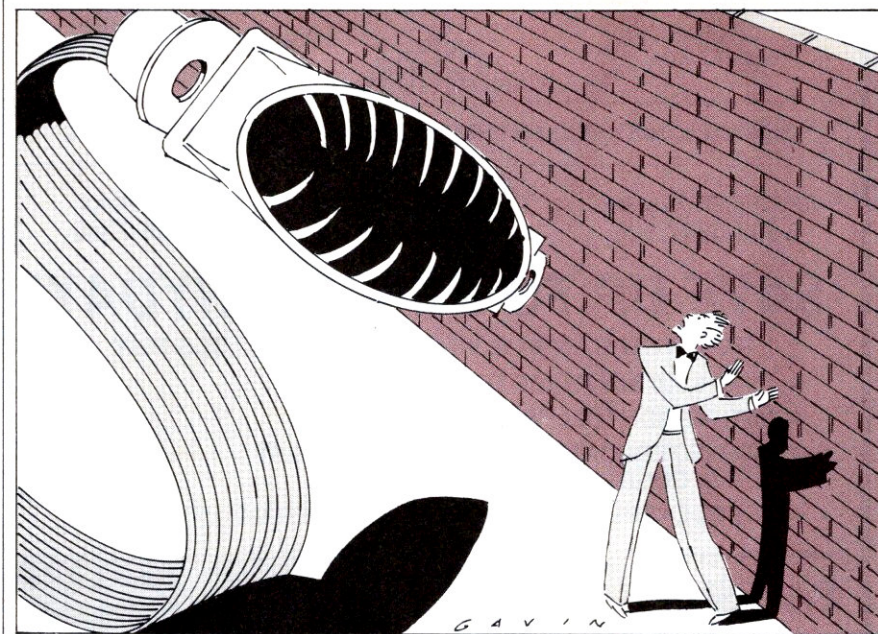
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RESCUE SQUAD

BY GARY B. LITTLE

SWITCHING IMAGEWRITER CHARACTER SETS

Q. I own a GS and often use the AppleWorks word-processing module to write documents in foreign languages. The ImageWriter II can produce several foreign-language character sets,

but enabling them (without setting switches) involves sending the ImageWriter a command that includes a null character (ASCII 0), and AppleWorks doesn't recognize a null character. How can I switch character sets on the ImageWriter? On a related point, is

```

1  REM GS/ImageWriter II Language Selector
2  REM by Gary Little
10  TEXT : HOME :CD = 8192
20  PRINT "The printer languages available are:": PRINT
30  FOR I = 1 TO 8: READ A$: PRINT I; ". "; A$: NEXT : PRINT
40  PRINT "Enter language # (1-8): "; : GET A$: PRINT A$
50  L = VAL: (A$): IF L < 1 OR L > 8 THEN HOME : END
60  L = L - 1
70  FOR I = 0 TO 27: READ X: POKE CD + I, X: NEXT
100 PRINT CHR$(4); "PR#1"
200 REM Select language:
300 PRINT CHR$(27); CHR$(68); CHR$(L); CHR$(0)
310 PRINT CHR$(27); CHR$(90); CHR$(7 - L); CHR$(0)
500 PRINT CHR$(4); "PR#3"
600 REM Change Control Panel:
610 FOR I = 0 TO 7: READ XL(I): NEXT
620 POKE CD + 5, XL(L): CALL CD
630 END
700 DATA American, Italian, Danish, British
710 DATA German, Swedish, French, Spanish
800 REM Write parameter to battery RAM
810 DATA 24, 251, 194, 48, 244, 0, 0, 244, 41, 0
820 DATA 162, 3, 11, 34, 0, 0, 225, 173, 252, 255
830 DATA 141, 26, 32, 56, 251, 76, 0, 0
900 REM Conversion table: ImageWriter --> GS
910 DATA 0, 5, 3, 1, 6, 7, 2, 4

```

Figure 1: A program for changing the ImageWriter character set

there a way to automatically switch the GS's screen-display language to the same language as that of the ImageWriter character set without having to use the Control Panel?

RAYMOND F. BENTSEN
SKOKIE, IL

A. You're right, AppleWorks does not accept a null character (Control-@) when you're entering a printer-command sequence, so you can't change the ImageWriter's default character set from within AppleWorks. Instead, you have to run a program like the one in figure 1 before booting your AppleWorks disk. This program lets you change the character set to any of the eight that the ImageWriter can produce.

The GS has eight text-display languages, one for each character set the ImageWriter produces. The default display language is USA, but you can change it by using the Options command on the GS Control Panel. To change it from inside a program instead, you must use a function called WriteBParam in the GS's Miscellaneous Tool Set. The program in figure 1 uses this technique to keep the GS display language in sync with the ImageWriter character set. When you run the program, don't be alarmed by the beep you hear when it ends; the program forces a system reset so that the new language selection becomes active right away.

SLOT-3 OPTIONS

Q. What cards, if any, can work in slot 3 of my IIe even though I have an Extended 80-Column text card in the auxiliary slot?

DOUGLAS FRAZIER
HYDE PARK, UT

A. The video-output subroutines for Apple's 80-column card occupy the peripheral ROM space normally reserved for a card in slot 3 (\$C300-\$C3FF). Thus, if you insert a card in slot 3 that has a controller program that also uses the peripheral ROM space, it won't work with programs that call the controller program to communicate with the card.

Some programs can switch out the 80-column subroutines in favor of the slot 3 ROM, but most programs don't do so because they need to use the subroutines to dis-

(Continued on page 135)

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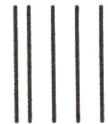
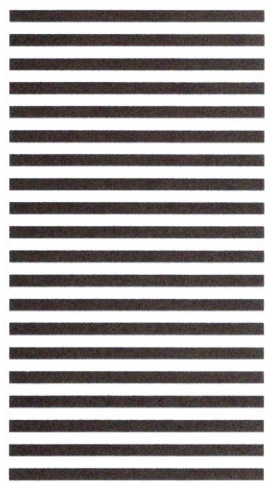
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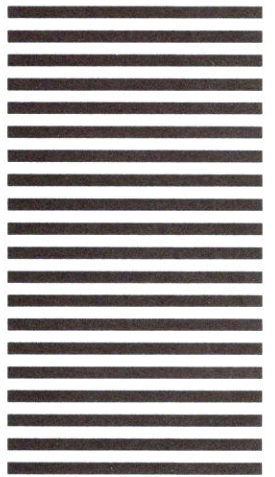
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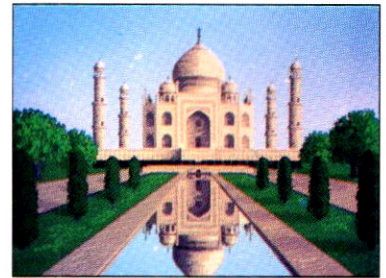
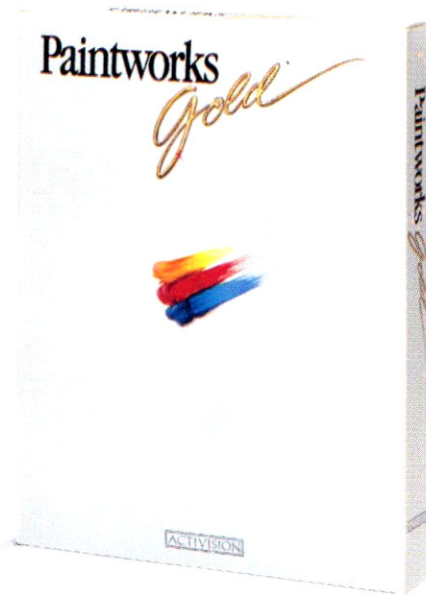
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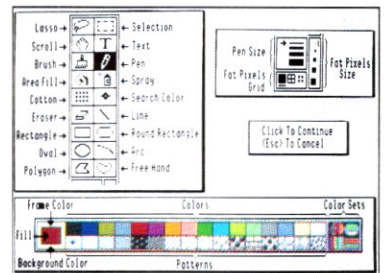
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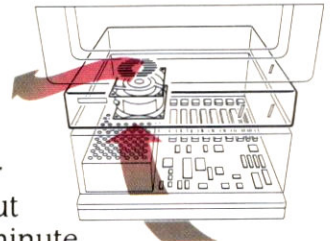
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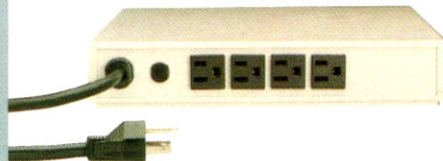


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