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The #1 Apple II Magazine

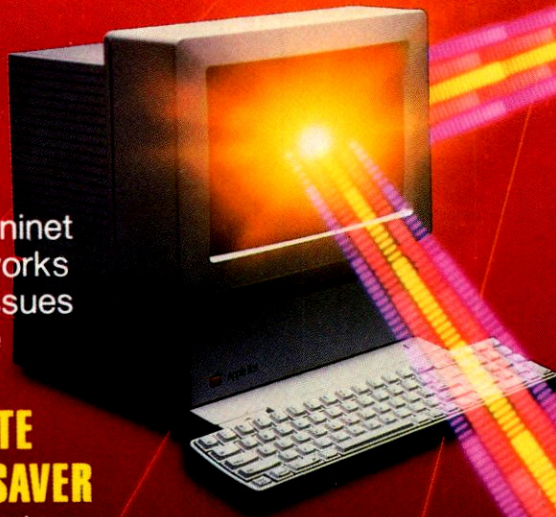


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DMG.

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.

- 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"

- Single, 1½ and double spacing.
- Search and replace text.
- Text and decimal tabs.
- Headers and footers, auto page numbering, date stamping.
- Create page breaks.
- Keyboard shortcuts.
- Set initial page number.

3. geoSpell™

- Find and correct misspelled words in any geoWrite document.
- Misspelled words are displayed in context in the document window.
- Displays words in dictionary closest to misspelled word and prompts user for action.
- Over 38,000 word geoDictionary.
- Create personal dictionaries for specialized vocabularies.

- 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 geoEx and geoFile.

6. geoPaint™

- Create charts, diagrams or full page images up to 8½" 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.

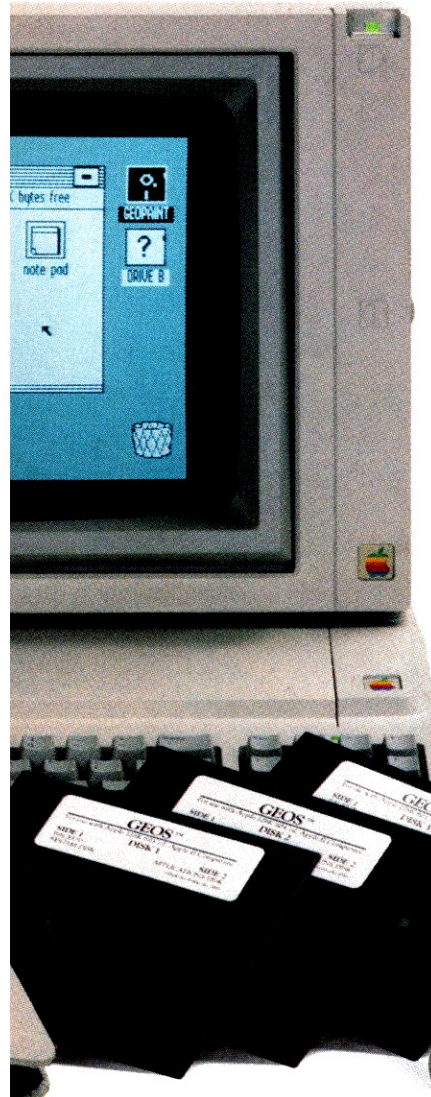
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GEOS \$129.95

(California residents add 7% sales tax.)

\$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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ftworks**

are working with Berkeley.

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

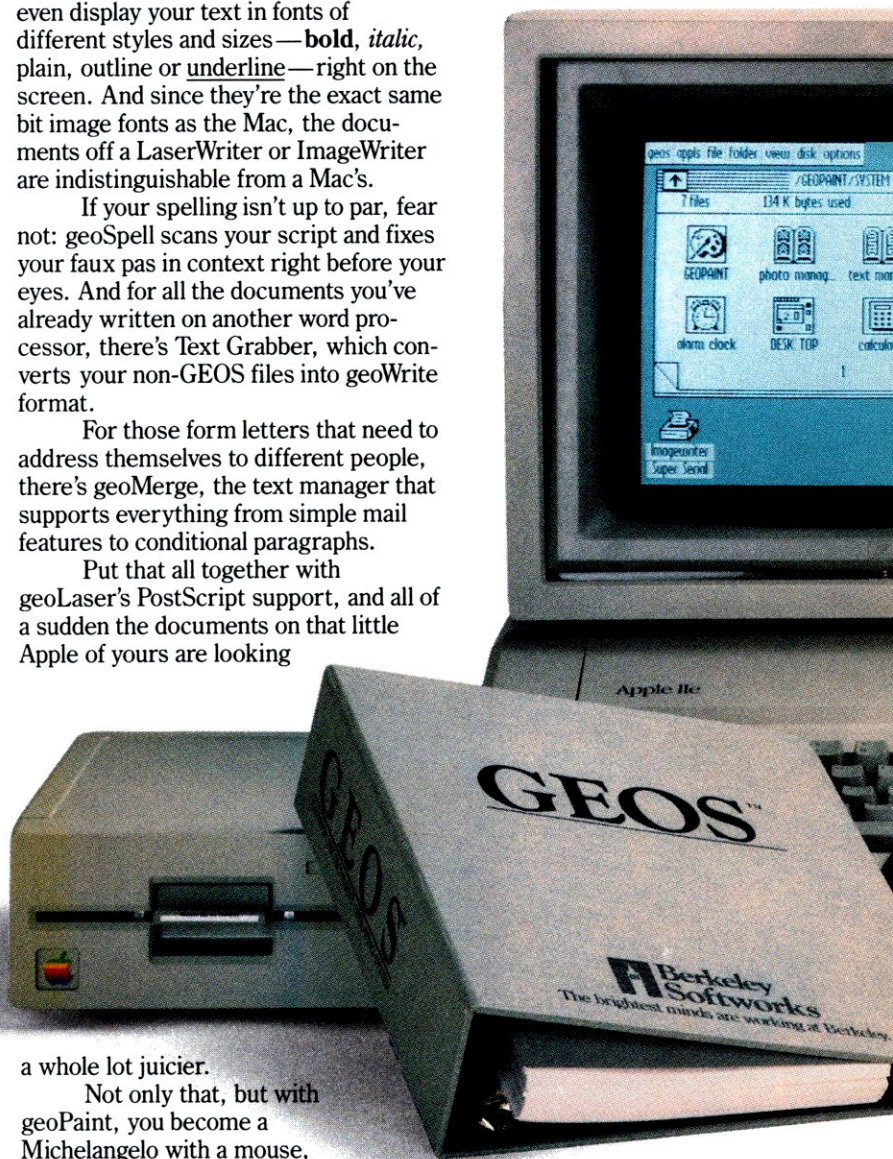
a whole lot juicier.

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.

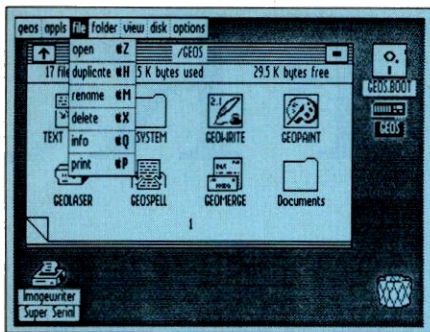
Polish up your Apple with GEOS.

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

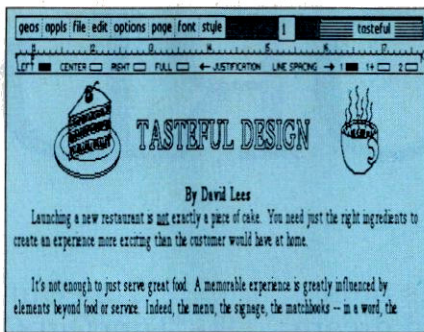


The brightest minds

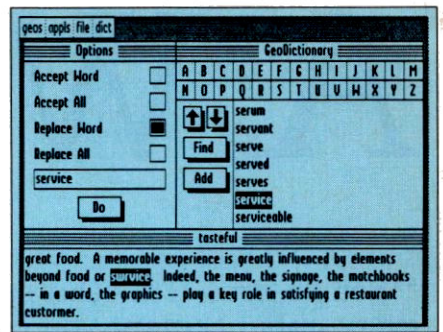
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FAMOUS FOR
ITS MOUSE,
ICONS, GRAPHIC
APPLICATIONS
AND DESKTOP
PUBLISHING.**



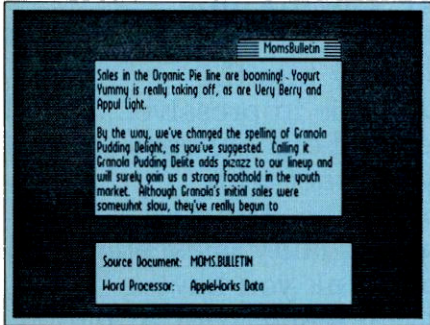
1. Icon and menu file managing.



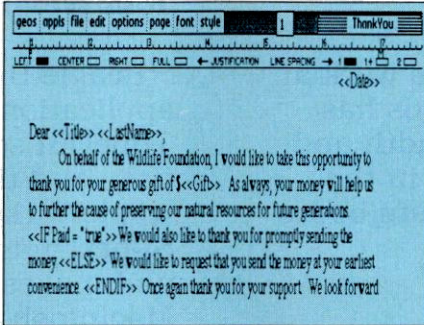
2. WYSIWYG ("What you see is what you get") word processing.



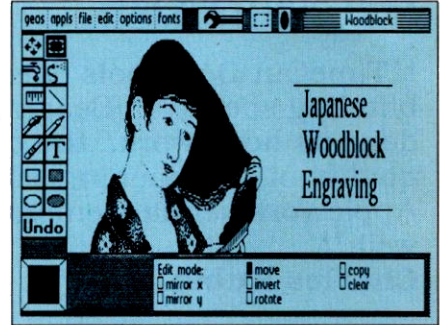
3. Contextual spell checking.



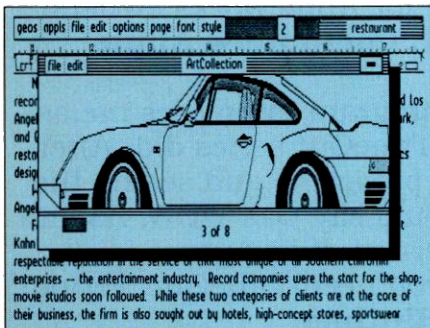
4. Text conversion and importing.



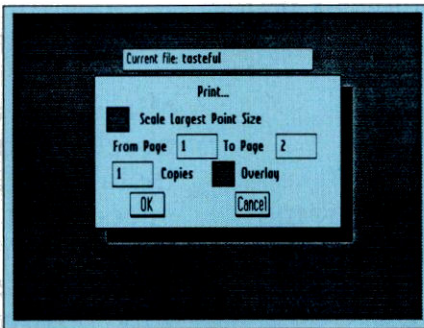
5. Sophisticated mail merging.



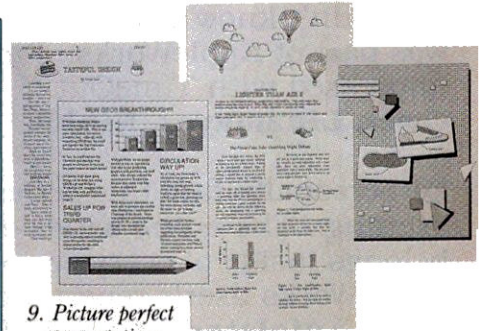
6. Hi res graphics editing.



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.”

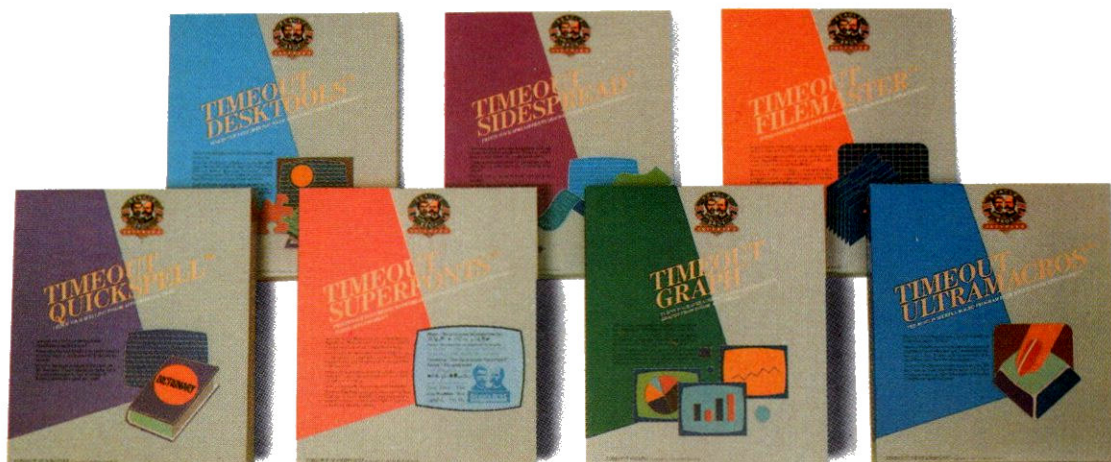
Gregg Keizer, Compute!’s Apple

“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**



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Howard M. Adkins, Tucson, AZ

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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.”

Francis E. Old III, Baltimore, MD

“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.”

Mark D. Widome, Hershey, PA

The **TimeOut series** is a revolutionary family of products that dramatically increase the power of AppleWorks (version 2.0 and later).

TimeOut QuickSpell (\$69.95) gives you perfectly spelled documents every time. Fast!

TimeOut SuperFonts (\$69.95) makes your documents stand out with dozens of Macintosh fonts in a wide variety of styles and sizes.

TimeOut Graph (\$89.95) extends the spreadsheet’s “what if” capability by producing great looking charts in seconds.

TimeOut UltraMacros (\$59.95) performs tasks at lightning speed by memorizing and repeating any sequence of keystrokes and commands. Includes a powerful programming language too.

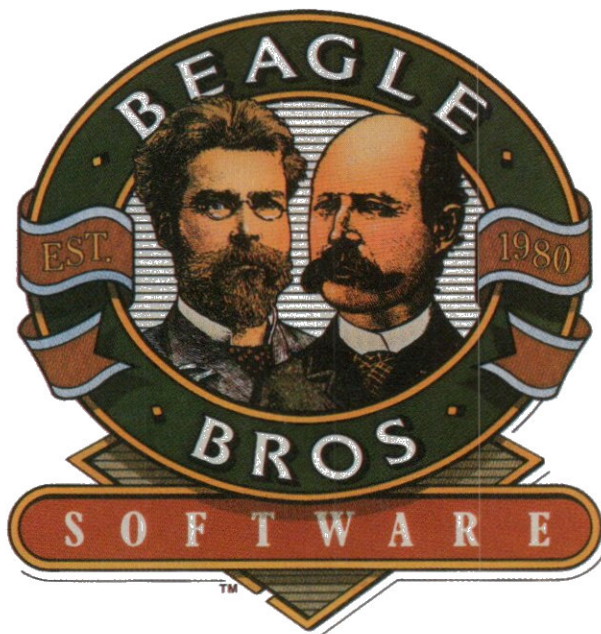
TimeOut DeskTools (\$49.95) includes a calculator, calendar, case converter, clipboard converter, clock, dialer, envelope addresser, file encrypter, notepad, page preview, puzzle and word count.

TimeOut SideSpread (\$49.95) prints your spreadsheets sideways in a variety of fonts, sizes and print qualities.

TimeOut FileMaster (\$49.95) gives you total control over all your disk and file handling needs.

Works with what you’ve got. TimeOut is compatible with Applied Engineering and Checkmate desktop expanders.

Never leave AppleWorks again. All of the TimeOut applications are fully integrated with AppleWorks and can be instantly accessed at any time from inside AppleWorks.



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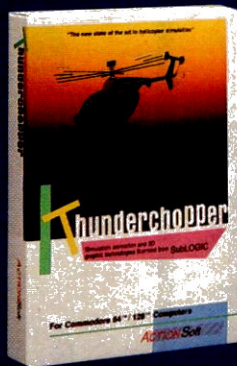
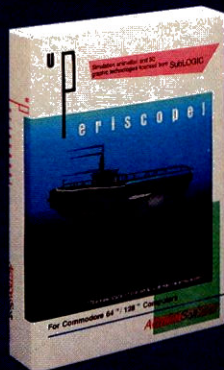
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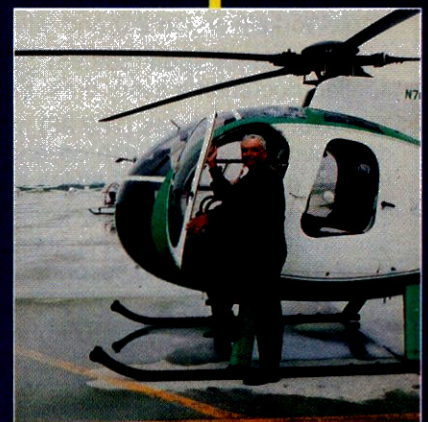
Colonel John B. Rosenow, USAF (Ret.)
President, ActionSoft Corp.



Rescue Mission - scan for flares



Escort troops through enemy territory - search and destroy enemy targets



Colonel Jack provided the strategy and tactics for ThunderChopper

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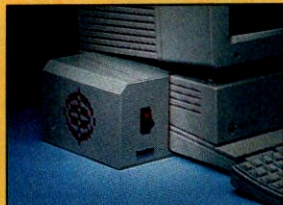


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IIC, Mac

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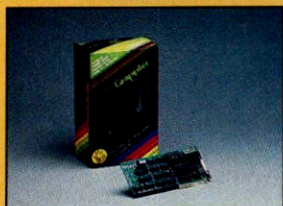


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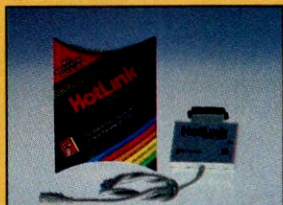


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IIC

HotLink™

IIC Printer Interface

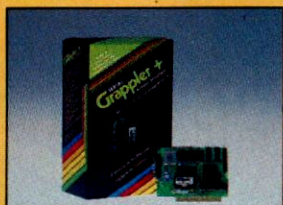
This is by far the most economical way to connect a printer to your Apple IIC. The HotLink and a parallel printer can save you up to \$200 over the Apple ImageWriter II printer. **\$69**



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CIRCLE 108 ON READER SERVICE CARD

▶▶▶▶▶ THE APPLE II NETWORK

COVER STORY

26 APPLE BRINGS NETWORKING TO THE APPLE II

BY GARY B. LITTLE
Apple has finally introduced AppleTalk for the Apple II. Here's what it consists of, how it works, and why you might need it.

35 THE CORVUS NETWORKING ALTERNATIVE

BY TOM VIER
A comparison of AppleTalk and Corvus' Omninet

43 OTHER NETWORKS: ELAN, VNET, DNET, AND CLASSROOM NETWORK

BY ROD WILLIAMS
A quick rundown of other networking options for the Apple II, and a comparison chart "Networks at a Glance"

53 SOFTWARE ISSUES: PRICING, LICENSING, AND UPDATES

BY LISA RALEIGH
Besides the entanglements of setting up hardware, networks also introduce a host of software issues.

73 APPLETALK CABLING SCHEMES

BY DON LANCASTER
Five alternatives for enterprising networkers

EDUCATION

59 THE LEARNING CURVE

BY DAVID D. THORNBURG
The good news and the bad news about networks in the classroom

65 TEACHERS' TOOLBOX

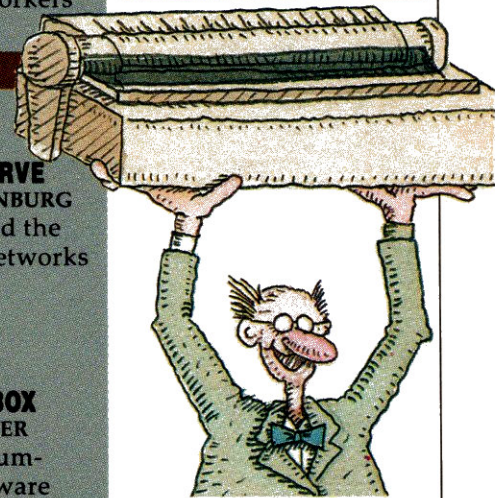
BY JENNIFER BRAWER
A look at curriculum-management software

APPLEWORKS REPORT

97 EDUCATIONAL RESOURCES MAKE THE GRADE

BY DAVID CHESEBROUGH
In this second of a three-part series on the universe of AppleWorks products, we focus on education.

HARDWARE



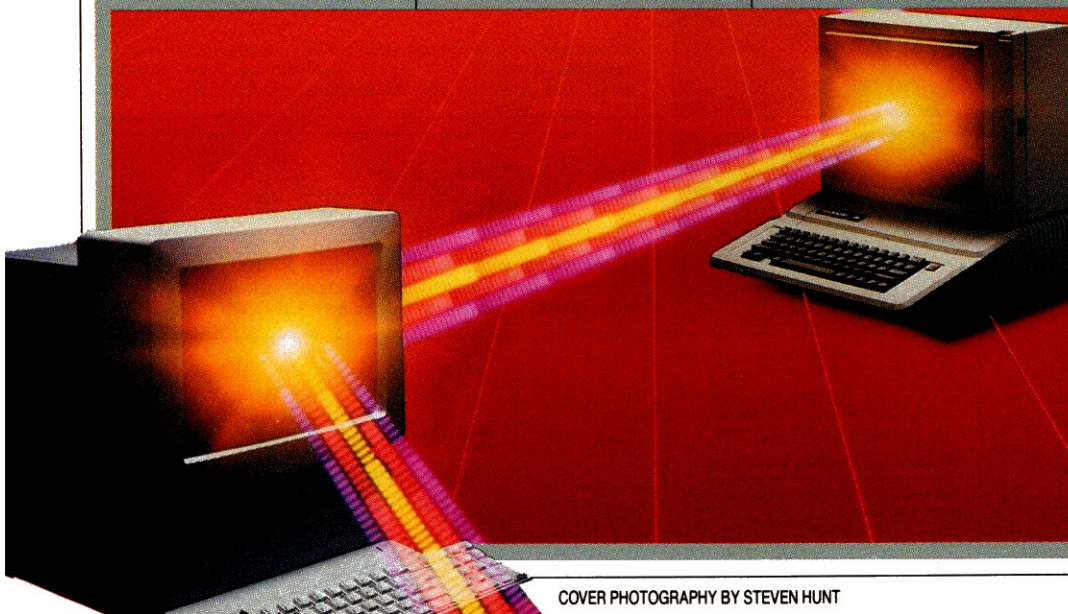
108 PREVENTATIVE PRINTER MAINTENANCE

BY SCOTT BRAINARD
Eighteen prescriptions for a healthy ImageWriter

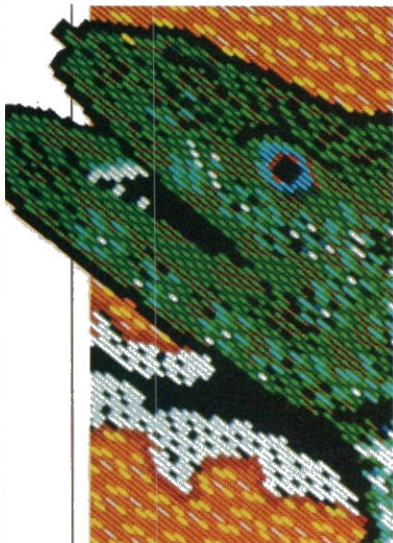
GRAPHICS

111 SPEAKING OF GRAPHICS

BY ROBERTA SCHWARTZ AND MICHAEL CALLERY
The Graphics Studio marches to its own drummer when it comes to its user interface.



T E N T S



116

GRAPHICS GALLERY

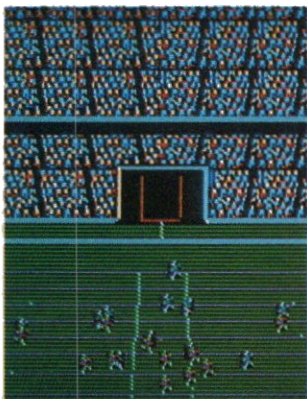
Scenes from the sea from Japan, Bermuda, and the U.S.

RECREATION

119

GAMEPORT

BY BOB LINDSTROM
A preview of eight coming attractions—watch for them soon at a store near you. Plus a IIcs Bard's Tale update.



126

ENTERTAINMENT

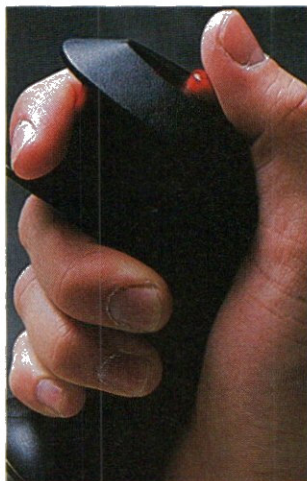
Following "GamePort" are reviews of Wings of Fury by Brøderbund, Legacy of the Ancients by Electronic Arts, and Ticket to London by Blue Lion.

PRODUCTS

80

PRODUCT SPOTLIGHT

BY PETER TUCKER
The most interesting products of the month for the Apple II



134

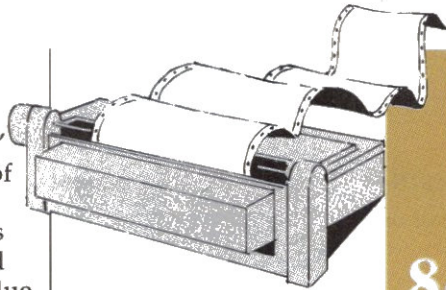
PRODUCT ROUNDUP

BY SHANON CULLEN
Products you want to know about—for the entire Apple II family

139

PRODUCT ALL-STARS

The A+ directory of the best Apple II products available



TO THE RESCUE

141

TIPS AND TECHNIQUES

Useful Apple II tips from our readers

152

RESCUE SQUAD

BY GARY B. LITTLE
A printer-activity-check subroutine and how to get your clock to say it's 1988

DEPARTMENTS

9

EDITOR'S PAGE

15

LETTERS

21

NEWSPLUS

BY LISA RALEIGH AND ALANE BOWLING
News and views of the personal-computer industry

142

MARKETPLACE

149

INDEX TO ADVERTISERS

IIcs

UPDATE

84

TWO PASCALS FOR THE IIcs

BY MICHAEL FISCHER
High-level languages are appearing for the IIcs, including Pascal compilers from TML and Orca. Here's how these two Pascals compare.

```
: integer  
: integer  
: real;
```

```
packed  
= integer  
number =  
code, pr
```

91

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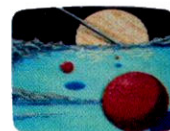
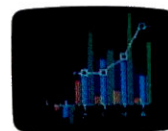
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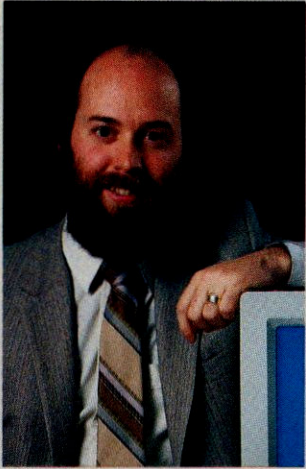
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APPLE II NETWORKS

Apple's announcement last March of AppleTalk products for the Apple II family makes *network* the hot buzzword for 1988. Simply put, a network is a group of computers and peripherals connected together in such a way that every workstation can communicate with any other on the network. With a network in place, users can share such high-ticket items as laser printers and high-capacity hard-disk drives. They

can also exchange disk files with other computers on the network, even if those computers are of different types. Therefore, networks tend to increase a group's efficiency and, of course, its productivity.

Networks are useful for all small work groups, whether they are made up of students in a classroom or colleagues in a business. But there is a price to pay, and I'm not just talking about the cost of the hardware and software. Networks are notoriously difficult to set up and maintain, although I will agree that AppleTalk is simpler than most. In fact, most require a network administrator, an individual responsible for assigning user names and passwords, configuring the network, and troubleshooting when things go wrong. And when things do go wrong, tracking down the source is frequently difficult, given that the network puzzle has so many pieces. Nevertheless, the benefits of a network usually outweigh the liabilities.

Curiously, networks also cause problems for software developers. First, developers must tackle the issue of how to write a program that works properly when more than one network user tries

to run it at the same time. Then they have to worry about how to price the program to get a decent return on their investment. They just can't sell a program for a conventional price if every student in a classroom is permitted to run it over the network, for example.

The purpose of this issue of *A+* is to raise your network IQ. We introduce you to the major Apple II networks (AppleTalk, Omninet, VNET, ELAN, Classroom Network, and DNET) and explain how they work, how much they cost, what their best features are, and what features they're missing. We'll also explain the jargon peculiar to

I expect the number of Apple II networks to grow dramatically in the coming year.

networks, elaborate on software-licensing issues, and let you know what kind of network-compatible software we can expect to see from publishers in the near future.

I expect the number of installed Apple II networks to grow dramatically in the coming year. *A+* will be closely monitoring developments in network hardware and software. Expect to read follow-up stories in future issues.

CD-ROM, Where Are You?

Apple also announced a CD-ROM drive for the Apple II and Macintosh, the AppleCD SC, in March. It uses optical technology to read (but not write to) compact discs containing up to 550 megabytes of data; that data can represent text, sound, or video information. The future for CD-ROM technology seems bright, but I won't get too excited about it until I see more than the two or three CD titles now available for the Apple II.

So I'm on the prowl for Apple II CD developers—when I've got products in my hand, you'll be sure to hear about them here in the pages of *A+*. First

EDITOR'S PAGE

CARMEN STRIKES AGAIN!



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54CMA

EDITOR'S PAGE

stop: the Microsoft CD-ROM Conference in Seattle.

AppleFest

The AppleFest show in San Francisco last September was exciting. It brought together under one roof (for the first time in a long, long time) most of the major Apple II hardware and software publishers and included many excellent panel discussions and seminars.

Good news for those who couldn't make it to the Bay Area: Another AppleFest is just around the corner, this time in Boston, May 20-22. *A+* will be an exhibitor once again, and all our staff editors will be there. I'm also arranging for columnists Mike Fischer, Roberta Schwartz, Michael Callery, and Bob Lindstrom to appear. We'll be leading seminars, checking out hot new products, and generally making ourselves visible. We look forward to meeting as many of our readers as possible.

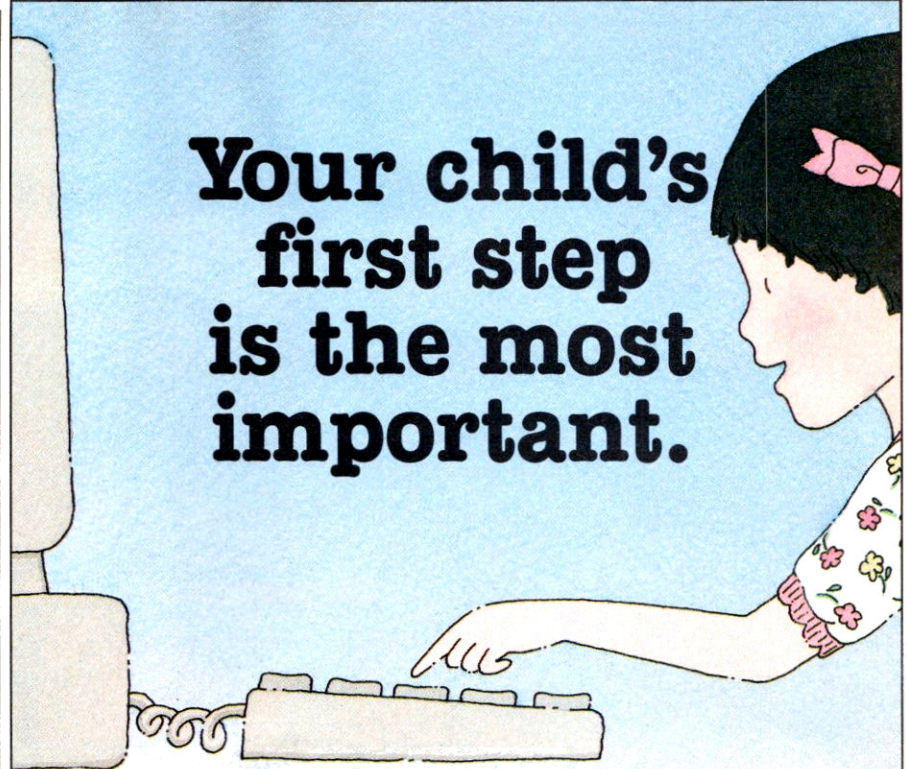
Exit Stage Left

With this issue, *A+* enters a new editorial era. Fred Davis, who was named *A+*'s first technical editor more than four years ago and who eventually moved up the ladder to become editor-in-chief (in other words, the king of the castle), has left us to become editor-in-chief of our sister publication *MacUser*. Under his direction, *A+* won the Computer Press Association's prestigious "Best Computer Magazine" award last year.

Fred's perceptive, yet often controversial, opinions on Apple II issues will certainly be missed. (His atrocious puns will not!) Of course, he's moved only a few doors down the hall, so, as *A+*'s new editor, I'll still have the benefit of hearing those opinions regularly. So Fred is still with us in spirit, and that's good news for all of us. Congratulations, Fred, and all the best in the crazy world of the Macintosh. +

GARY LITTLE/EDITOR

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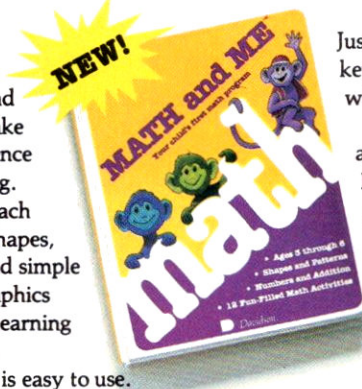


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CAT DOCTOR PLUSES

Dear A+: In the "All-Stars" coverage of disk utilities in the December 1987 issue of A+, I find that Gary Little did not give Glen Bredon's ProSel utilities enough credit compared to the other programs. Although I realize that the article was not trying to compare the different programs, I feel that some of the features that made ProSel first on the list were ignored in the article.

First, Bredon's Cat Doctor can be completely mouse-driven—the description made no reference to this feature, which alone makes the program ten times better than Copy II Plus for those of us with mice.

The second missed feature is that Cat Doctor allows users to sort files in a directory, using the open-apple and arrow keys. The latest version of Copy II Plus that I have lets you sort only alphabetically, not into any order as Cat Doctor does. Anyone trying to make a system file first in a directory listing, using Copy II Plus, has a lot of work to do, since you can only alphabetize the catalog. Cat Doctor allows you to move the file easily with the open-apple/arrow-key combination and can sort alphabetically by date (of either creation or modification), by file type, or alphabetically by file type.

Even though Cat Doctor can use a mouse, users without that luxury will find the program just as easy to use, since you also have the option of pressing a single character key to access a function. In other words, to copy files, you either use the mouse to select Copy, use the arrow keys to move the highlighted bar to the function, or simply press C to get that function to execute.

I realize this letter sounds more like a review than anything else, but I just wanted to point out some things that were ignored.

JOHN M. WARGO
AKRON, OH

Thanks for the testimonial. We tried to keep the All-Star write-ups as brief as possible because we had so many products to include in the issue.—Editors

DB MASTER LEARNING

Dear A+: Thank you for highlighting DB Master version 5 as one of your All-Stars in the December A+ and the new "Product All-Stars" listings. There are, however, a few comments I would like to make.

First, DB Master is not nearly as difficult to learn and use as Mr. High stated. Although he did mention that he was reviewing a prerelease version of the program, he failed to point out that he was

LETTERS TO THE EDITOR

also using a prerelease instruction manual, which had no tutorials. As page 1 of that manual states, "This is a pre-release version of both the program and the User's Guide . . . The final version of the User's Guide will include additional sections, such as step-by-step tutorials and appendixes."

As with any program, having the tutorials is going to make the learning process much easier. To use High's analogy, imagine trying to learn how to fly an airplane using only the blueprints and the service manual!

I assume High's review also led to your statement in the "Product All-Stars" listing that DB Master is "not suitable for merely routine tasks." I couldn't disagree more, and I suspect that most of our users feel the same way.

BARNEY STONE, PRESIDENT
STONE EDGE
TECHNOLOGIES, INC.
MAPLE GLEN, PA

Although the version we reviewed was indeed "prerelease," it was nonetheless the version that Stone Edge was selling. The company has a unique policy of marketing prerelease software and then updating its users

when the final version arrives. Since we reviewed what was commercially available, we stand by our review. We agree, however, that the tutorials now make DB Master easier to use than before.—Editors

Ile-TO-IIGs UPGRADE

Dear A+: I am writing to complain about Apple's Ile-to-IIGs upgrade kit. I feel that it is extremely poor and misrepresented. First, it is overpriced. Apple says it has a suggested retail price of \$499, which is deceiving. Yes, it does cost only \$499 for the IIGs motherboard and base pan, but that price does not include installation charges (which are left up to individual dealers), a mouse, and a numeric keypad. The mouse you must buy for an additional \$100 be-

LETTERS

cause almost all IIGs software is mouse-driven. Although the numeric keypad is not essential, it is included with a new GS and makes numeric entry smoother. These additions bring the price of an upgrade kit up to at least \$599 plus installation charges.

Second, Apple tells us that the upgrade kit will make your IIE a fully functional IIGs when, in fact, it does not. At the same time Apple released the upgrade kit, it also released an internal cooling fan, which you cannot use with an upgraded IIE because it is too large to fit into the IIE's case. Also, some IIGs RAM cards that use a piggy-back card cannot be used in an upgraded IIE. The IIGs has been out only a year and a half, and if there are already cards that don't work

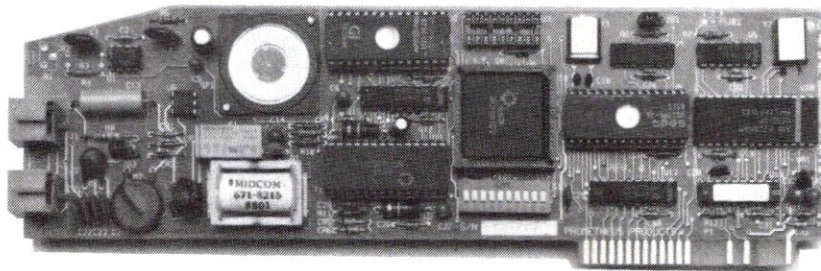
with the upgraded IIE, I am sure there will be more to come.

I am not criticizing Apple for trying to give IIE owners a chance to upgrade, but what's the point, if it isn't totally compatible and is more expensive than buying a new IIGs and selling your old system? Since the upgrade kit should be released within a few months, I think other IIE owners should be informed of these factors.

FRANK LAWERENCE
PITTSBURGH, PA

The upgrade kit has, in fact, been available for more than a year. Our understanding is that Apple hasn't sold very many of them, for just the reasons you describe. Please see our February 1987 cover story for a fuller description of the economics of upgrading vs. buying a new IIGs. We favored the latter option.—Editors

The Wait Is Over! 2400 Baud For Your Apple II Is Finally Here



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PACKET-RADIO SPECIFICS

Dear A+: Regarding the packet-radio article in the November 1987 issue of A+, I would like to know if any software is specifically designed to handle the communications requirements for packet-radio communications using an Apple IIE. Your article was a short general-interest story on the subject but lacked product references. I have done some research and found several programs designed for packet radio and Macintosh or IBM computers but no Apple IIE computers. I'd appreciate any help on this matter.

ROBERT J. FRANTZEN
LAS VEGAS, NV

Author Gabe Wiener responds: Most packeteers use ordinary terminal software. A packet-radio TNC (Terminal Node Controller) connects to a computer in the same way that a serial modem does. Therefore, any terminal package capable of sending to a serial port is fine for packet radio. Unlike modems, all TNCs currently on the market do not use the same set of commands, and, as a result, little specialty software is developed exclusively for packet radio. Depending on the brand of TNC you are planning to use, some software may be available from the manufacturer. You might also be able to find some public-domain software for your TNC. The Ham Radio Forum on CompuServe (G HAMNET) will probably have such programs in its data libraries.

CIRCLE 229 ON READER SERVICE CARD

Why MultiScribe GS 3.0 is the Best Word Processor for Your Apple IIGS.

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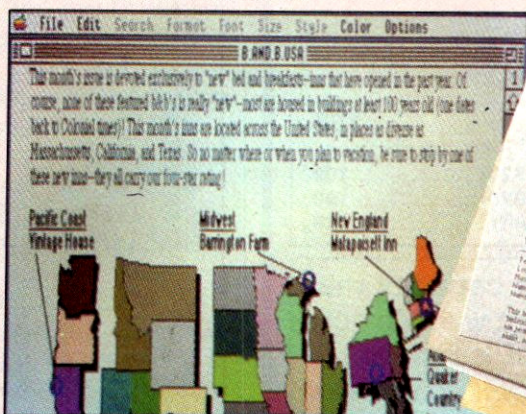
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*inCider, November, 1987, **A+, December, 1987, †Nibble, October, 1987
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CIRCLE 105 ON READER SERVICE CARD

LETTERS

MODEM MGR SHOULD BE A STAR

Dear A+: I thoroughly enjoyed reading the December 1987 issue of A+, with its special All-Stars coverage. I believe the Apple community should be made aware of the finest software products that are available.

There was one program that should have made the telecommunications list in my opinion: Modem MGR by James H. Okubo. I am strictly a user and not a telecommunications-program expert; I would, however, like to inform you and your readers of the support I have received after purchasing this program.

At first, Modem MGR did not work with my Rixon modem. When I informed the author of this problem, he immediately called Case Communication and programmed the necessary information to resolve this compatibility problem. I considered this alone to be a first-class support effort.

Approximately four months later, I began a subscription to a commodity data-retrieval service. This service provided a special software package for downloading prices. Unfortunately, I ran into the same compatibility problem with my Rixon modem. I called the data-retrieval company for assistance, but no one there was able to resolve the problem.

As a last resort, I wrote to James Okubo for help. Within a week, I received the data-retrieval program back from Okubo, and it was now totally compatible with my modem. I got all this support free with the purchase of the original Modem MGR program.

I have never received this type of support from the so-called national software companies. You didn't include Modem MGR in your top 96, but if you'd had a special category for authors or companies that provided the best support, James H. Okubo would have to have been on top of that list.

BRUCE W. THOMPSON
 SCHAUMBURG, IL

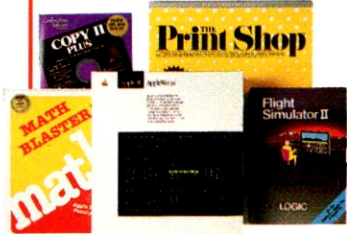
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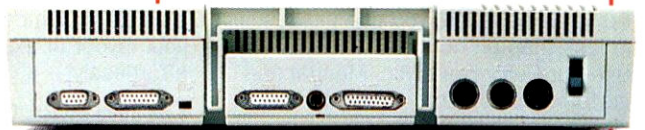


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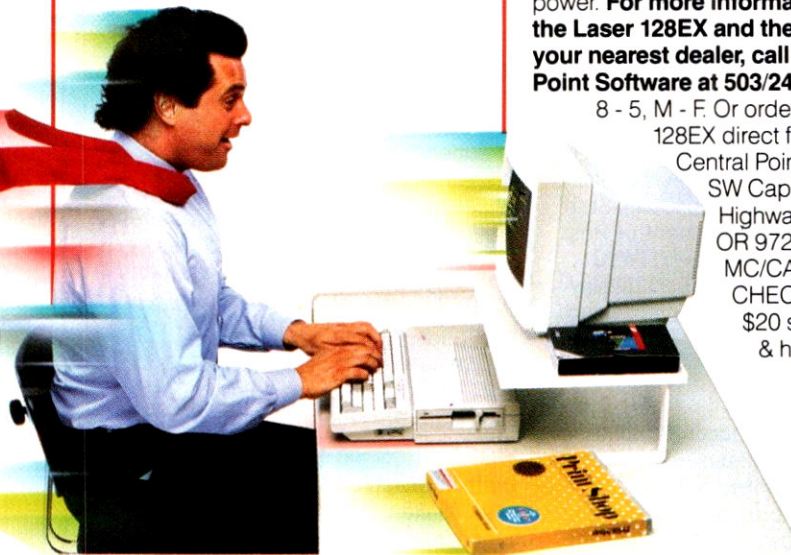
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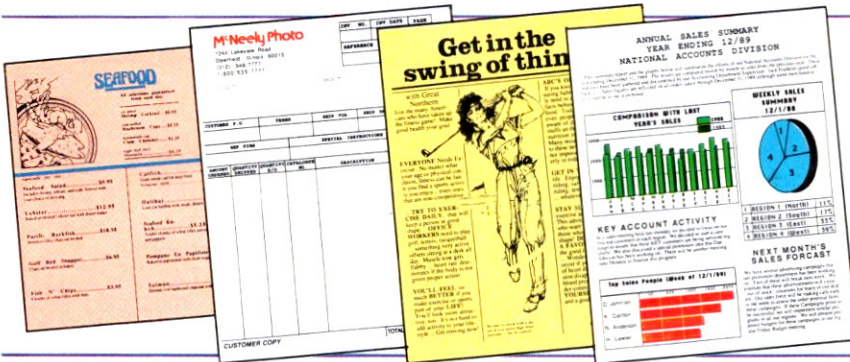
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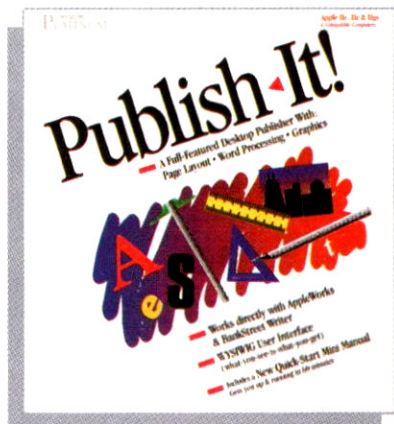
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BY LISA RALEIGH AND ALANE BOWLING

NEWS PLUS

Apple tours with MTV, NAUG offers free AppleWorks advice, mail-order companies aim for better image, and other industry updates

APPLE AND EMPTY-V

Apple Computer, Inc., has become a mall rat, hanging out with the heroes of mall-ratdom, the folks from MTV. But don't look for Apple representatives to be acting like rude dudes in acid-washed jeans and buzz-cuts. Instead, conventionally attired Apple

folks are participating in a nationwide mall tour called MTV's Museum of UnNatural History, featuring interactive displays of music, fashion, and technology. For its part, Apple will be showing how you can use the Apple IIGs and the Mac with Apple's new MIDI box to create righteous tunes, as well as how Apples can be used for truly unnatural stuff—such as

productivity and education. The tour will hit 27 cities by mid-September. Catch it soon at a mall near you.

APPLEWORKS HELP LINES

Now that Claris Corporation has opened a telephone-support line, there's a ready source of assistance for AppleWorks users. That number, in case you missed it in our April issue, is (415) 962-0371. But perhaps you're unwilling to make that long-distance call to connect with Claris in California. If so, the National AppleWorks User Group has an alternative. As a service to its membership, NAUG identifies members from all over the country (and Canada and Mexico as well) who are willing to offer free AppleWorks help over the phone to other members. NAUG asks the volunteer helpers to identify the areas in which they're most expert (e.g., educational applications, add-on applications, and the like) and publishes a chart in its newsletter showing who's able to help with what and how to get in touch with them. For further information, contact NAUG, P.O. Box 87453, Canton, MI 48187; (313) 397-1594. The annual membership fee is \$24.



New!

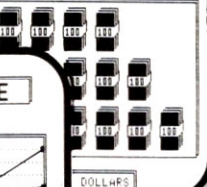
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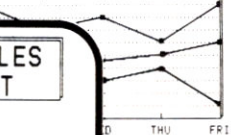
1983



HIGH-LOW-CLOSE

DOLLARS

210
209
208



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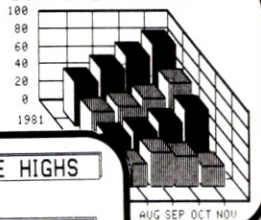
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107



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80000
60000
40000
20000

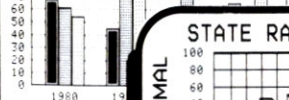


■ HONDA

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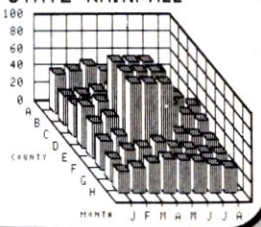
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NEWSPLUS



YOU ARE THERE

As Buckaroo Bonzai says, "Wherever you go, there you are." And if you happen to take along an InfoCom game and a camera, you might receive fame (but not fortune) in InfoCom's newsletter, *The Status Line* (formerly *The New York Times*.) Here's the offer: The next time you visit a famous landmark, take a picture of yourself holding an InfoCom game and send it off to InfoCom. The company will then publish the best photos.

Actually, there might be fortune involved for one lucky traveler. The first person to send a self-and-game portrait from the Great Wall of China will receive a complete catalog of InfoCom games. Entries go to: Landmark Photo, InfoCom, Inc., 125 Cambridge Park Drive, Cambridge, MA 02140.

MAIL-ORDER ETHICS

If you've heard horror stories about buying computer products via mail order, you're not alone. Buying direct from the manufacturer or through a mail-order house can mean great prices, but it can also create headaches.

Aware that consumers are concerned about the performance of direct-marketing organizations, a group of such companies has formed the Micro Marketing Council. The purpose of the council is to improve the image of direct marketers by providing ethical guidelines, professional development, and consumer education. Members promise to state their sales policies in their ads and to charge customers' credit cards only once they've shipped the product.

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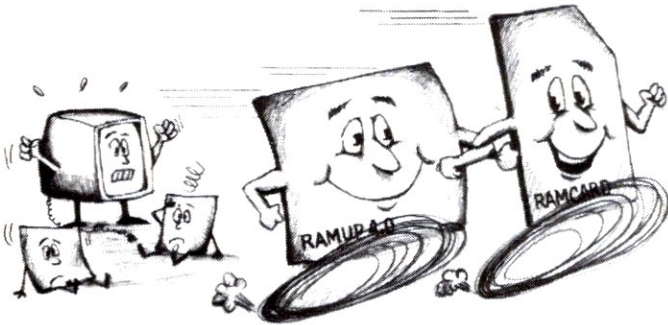
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NEWSPLUS

nies forming the council are at least two that are active in the Apple II market: JDR Micro-devices and Jameco Electronics. For a list of other direct marketers, contact John Irvine, John Irvine & Associates, 200 North Tustin Avenue, #100, Santa Ana, CA 92705; (714) 953-9449.

SOFTWARE FOR LIFE

Plenty of IIGs owners are disgruntled. They've found that if they want to move up to software designed especially for the GS's features, they must pay the full price for GS versions, even if they already own the IIE/IIC release. If they've been a loyal customer and made the investment in an 8-bit version, why shouldn't they get a break on the 16-bit release? The answer depends on which software company you talk to.

Electronic Arts has instituted a software-exchange program called Software for Life that lets you turn in the manual cover of your 8-bit EA program and then get the 16-bit version for half the retail price. EA isn't restricting you to any brand of computer, so you don't necessarily have to be going from the 8-bit IIE/IIC to the 16-bit GS. You can also get the same bennies moving up from another 8-bitter such as the Commodore 64 or the Atari 800.

CLUB MECC

MECC (Minnesota Educational Computing Corporation) has introduced the MECC Home Software Club, which gives members discounts on MECC's line of educational software. The major advantage to joining this club, though, is that it gives home buyers easy access to MECC's highly touted software, which is primarily sold directly to schools. To join the club, you pay \$75 and get four MECC titles (worth \$120) and a 10% discount on future purchases. Just as in a book or record club, this club offers a featured title every other month, which you can choose to receive or not. For further details, contact the MECC Home Software Club at 3490 Lexington Avenue North, St. Paul, MN 55126; (800) 228-3504.

ALL THE NEWS THAT'S FIT TO PUBLISH

Desktop publishing on the Apple II now has its own newsletter, the *Desktop Publishing Newsletter*. Yearly subscriptions cost \$20 for this 16-page bimonthly, which will offer hardware and software reviews and tips and techniques. It's published by Sage Productions, 5677 Oberlin Drive, San Diego, CA 92121; (619) 455-7513.

NEWS PLUS

UPDATE

■ Last year it was Kroy Color. This year it's Kroy Color Plus, the new color-transfer system from Kroy, Inc., that adds color to documents produced on laser printers including the Apple LaserWriter and H-P LaserJet. The Kroy Color Plus enables laser-printer users to add color to text or graphics. You place a laser-printed page between color-transfer sheets and pass them through the color processor. The color bonds to the toner image in less than 30 seconds. More than 50 colors of transfer film are available, including 14 metallic foils. The Kroy color-transfer film costs about \$60 per carton. The Color Plus processor itself is priced at \$875. For more information or to order, contact Kroy at (800) 328-1306 or (602) 948-2222.

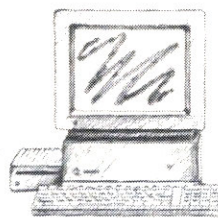
■ There was more going on in Canada last winter than the Olympic Games. In January, Logo Computer Systems, Inc. (LCSI), of Montreal made available a ProDOS version of its word-processing and graphics product LogoWriter. The LogoWriter ProDOS version requires 128K of RAM and lets you convert ProDOS text or graphics files, including Apple II files, into LogoWriter pages that

ProDOS word-processing and telecommunications software can access. This new version also works with the Corvus, Nestar, and VELAN Classroom networks. LogoWriter's ProDOS version is available through LCSI's site-licensing program. The price of the Apple ProDOS extension for current licensees is \$35. For newcomers, the one-time site-license fee is \$450. For more information or to order, contact LCSI at (800) 321-LOGO.

■ Micromatics, Inc., maker of Math Teacher's Tool Kit, which we reviewed in our March issue, has informed *A+* that it inadvertently supplied the reviewer with its bulk-purchase—instead of single-sale—prices. The firm did honor the bulk-purchase prices (for 25 sets or more) for single sales through April 1. The correct single-sale prices are \$40 per disk and \$100 for a set of three.

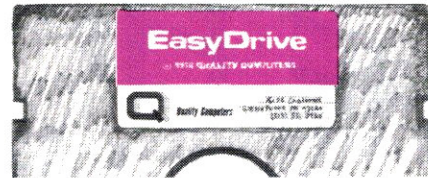
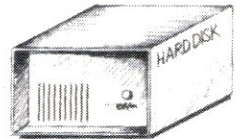
■ In preparing the printer-compatibility chart for printer-interface cards in the March *A+*, we did not have access to Applied Engineering's new manual for the Serial Pro. As that manual clearly indicates, the Serial Pro works with the Apple ImageWriter, Epson, NEC 8023, Anadex, IDS, Okidata 84 and Mannesmann-Tally printers. +

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*What it is, how it works,
and why you might need it*

THE APPLE II NETWORK

Just over three years ago, in January 1985, Apple Computer, Inc. introduced the world to the AppleTalk Personal Network, later renamed the AppleTalk Network System. At that time, AppleTalk was simply the means by which several Macintoshes, wired together like links in a chain, could share an expensive LaserWriter printer. AppleTalk became even more useful in January 1987, when Apple released a program called AppleShare, which allowed Macintoshes to share files on a hard-disk drive connected to a specially configured Mac called a file server. Apple now sells products that permit MS-DOS computers to work with AppleTalk-compatible printers and file servers as well.

Last March, Apple finally revealed that it would start selling a suite of hardware and software products this summer that would allow an enhanced 128K Apple IIe and a 512K IIGS to be part of an AppleTalk network. Apple has no way to network the IIc and II Plus, nor is it working on one.

The AppleTalk network is the most significant new "peripheral" Apple has released for the Apple II family in some time. In a nutshell, networking can do away with the costly duplication of peripherals in the classroom and in small-business work groups and will lead to the development of software that can help make networked groups become very productive. This article will focus on the AppleTalk

network—what it is, how to set it up, and how to decide if you're ready to take the plunge. You'll also find many other articles in this issue discussing networking issues and other network brands.

Setting Up an AppleTalk Net

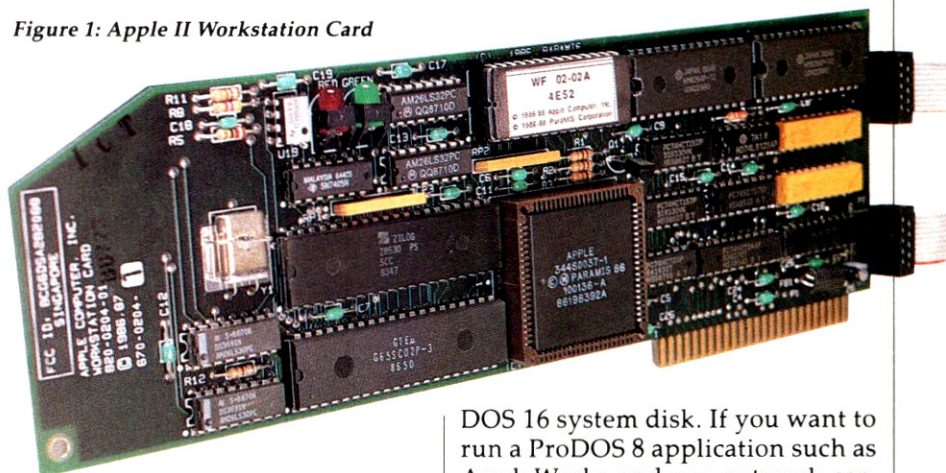
AppleTalk is nothing more than a set of communications protocols, or rules, that devices on a network must utilize to send and receive packets of data through the net-

work instead of Printer Port. The result is that serial port 1 becomes the AppleTalk port.

The Apple IIe has no built-in AppleTalk port, so you need to add one by plugging in a new Apple II Workstation Card (see figure 1). You should plug the card into slot 7 if you want to be able to boot automatically from the network when you turn on the IIe. An adapter box connects to the card and provides a serial port for a directly connected printer and an AppleTalk port that behaves much like the one on the Apple IIGS.

(The ROM on the Apple II Workstation Card contains all the software that defines the AppleTalk communications protocols; the AppleTalk ROM in the Apple IIGS does not. To load the missing AppleTalk routines into a IIGS, you must boot a new version of the Pro-

Figure 1: Apple II Workstation Card



work medium. The most common AppleTalk medium is Apple's LocalTalk cable, although you can use other types of media as well (see "Buzzwords" on page 32 for definitions of AppleTalk terms).

Each device you want to connect to an AppleTalk network must have an AppleTalk port. Macintoshes, LaserWriters, and the Apple IIGS all have built-in AppleTalk ports. To activate the AppleTalk port on a GS, you use the Slots command on the Control Panel to change the slot 7 option to Built-in AppleTalk instead of Your Card. Then you change the slot 1 option to Your

DOS 16 system disk. If you want to run a ProDOS 8 application such as AppleWorks and use network services as well, you must first boot ProDOS 16 and then select the application from the ProDOS 16 Finder or Launcher.)

You can also buy AppleTalk-port interface cards for ImageWriter II printers and MS-DOS computers.

For each device you want to connect to the network, you need a LocalTalk Connector Kit. The kit includes a LocalTalk connection box with a short drop cable for connecting to the device's AppleTalk port (see figure 2). It also comes with a two-meter LocalTalk cable for joining the connection box to the next box in the chain of network de-

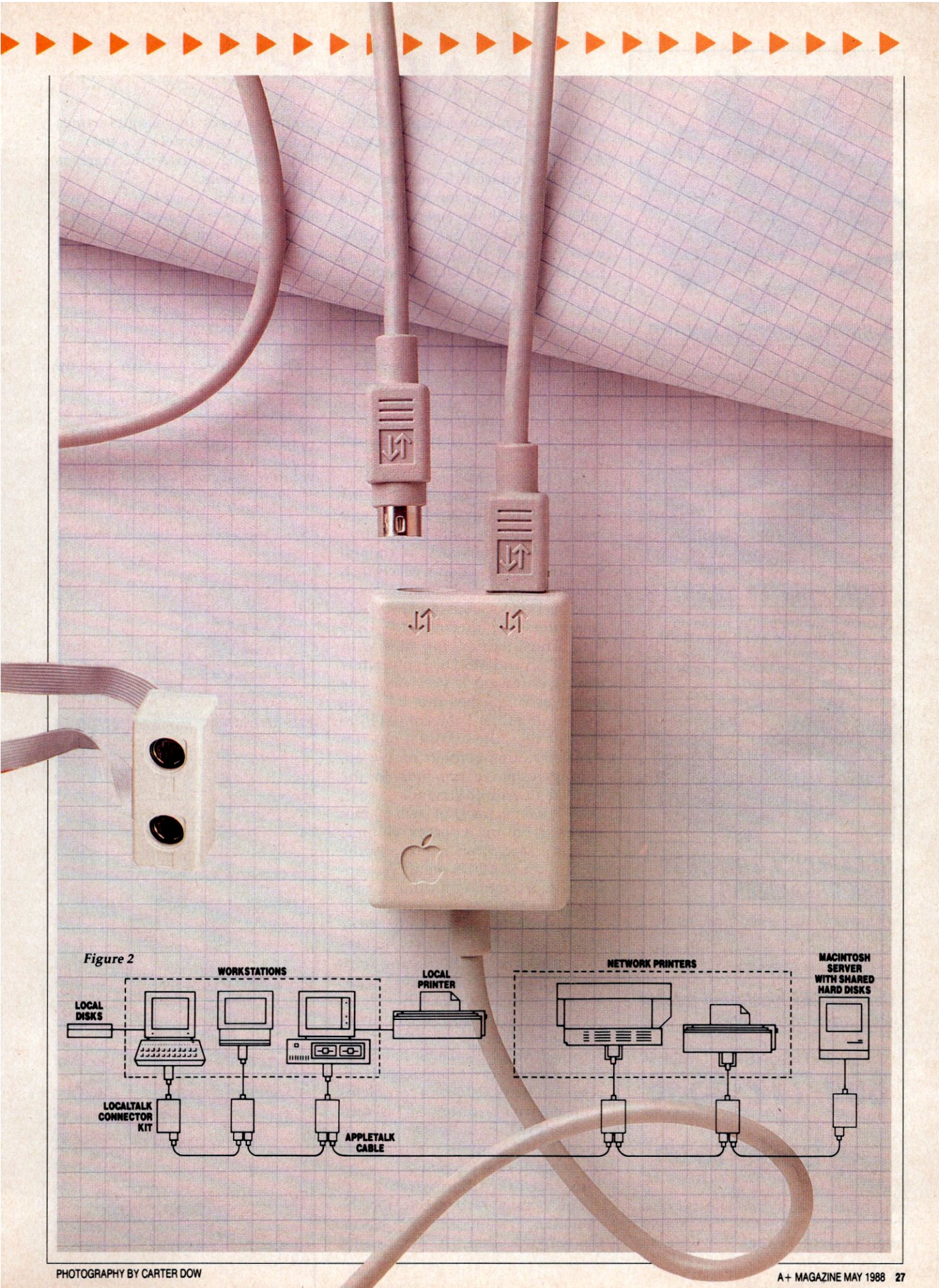
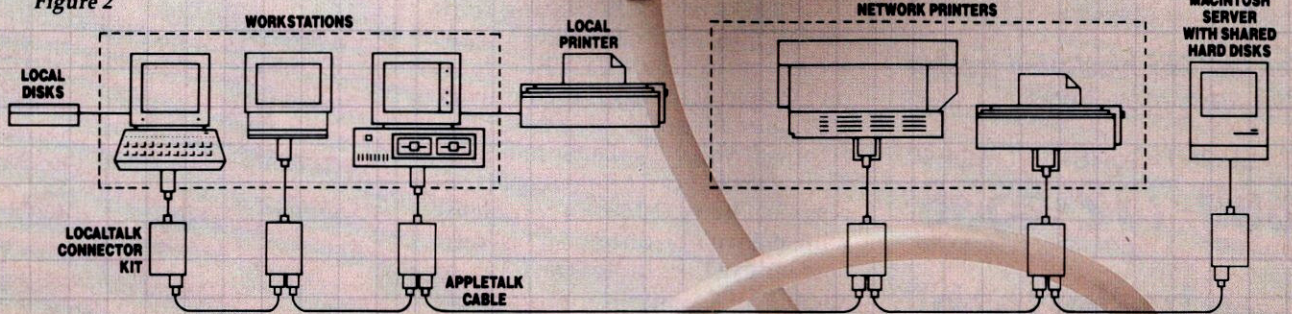


Figure 2



▶▶▶▶▶ NETWORK ▶▶▶▶▶



\$-SAVING RIBBON INKERS

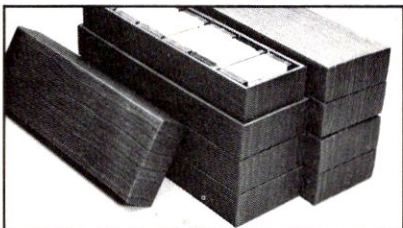
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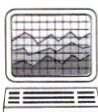


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vices. You can connect up to 32 devices in this way to form a single AppleTalk network.

The AppleShare File Server

Apple's file-server software is called AppleShare (see figure 3). The new version, 2.0, now works with Apple II ProDOS as well as the Mac and MS-DOS operating systems. Keep in mind, however, that AppleShare runs only on a Macintosh, so an all-Apple-II AppleTalk network is not possible if you need access to a file server—you will need a Macintosh to run the server. (You may, however, have an all-Apple II network if you simply want to share network printers.)

AppleShare manages the disk volumes that are connected to the Mac (usually large hard disks) and makes them available to all computers on the network. Although files are stored in the Macintosh format, Apple II computers see them as ProDOS files, and MS-DOS computers see them as MS-DOS files. Thus, exchanging files with Macintosh and MS-DOS computers over the network is very easy. The server accomplishes this by using the Apple Filing Protocol (AFP) to manage files; the workstations run translators that convert native operating-system commands to the equivalent AFP commands.

AFP keeps track of two names for each file on a server volume. One is a Macintosh name, and the other is an MS-DOS name. An Apple II workstation running a conventional ProDOS application can use files on the server only if the Macintosh name is also a valid ProDOS name. (ProDOS naming rules are far more restrictive than Macintosh naming rules.) Therefore, non-Apple-II users on the network must give files and folders (subdirectories) valid ProDOS names if they want to give Apple II users access to them. Naming problems will eventually disappear as software developers learn how to adapt ProDOS applications to handle Macintosh-style names.

The Network Administrator

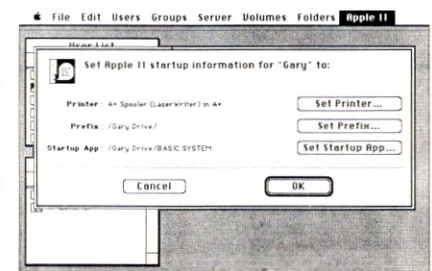
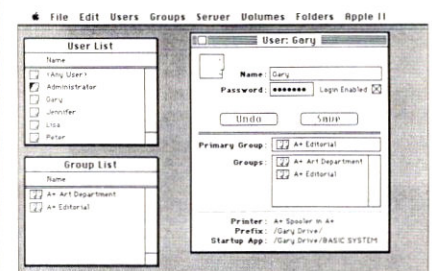
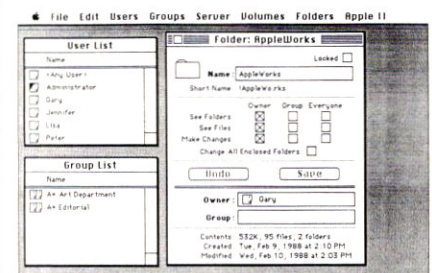
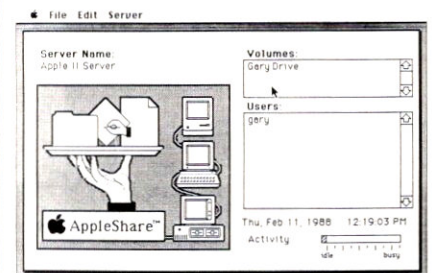
The person responsible for the smooth operation of the file server, the network administrator, defines

groups of users and assigns names and passwords to network users so they can log onto AppleShare as registered users.

You don't have to log on with a name and a password, but you'll want to so you can control how other users may access the folders and files you've put onto the server. If you log on as a guest (i.e., without specifying a user name and password), you cannot restrict access at all.

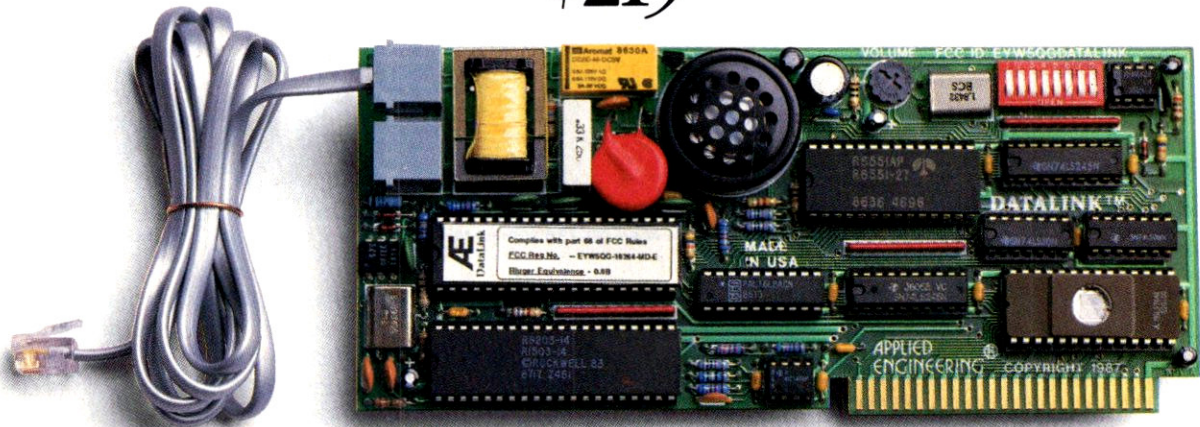
The administrator also sets up

Figure 3: The AppleShare software on the Macintosh server presents you with a status screen showing network activity. AppleShare software also lets network administrators change access attributes, create user and group lists, and assign a startup application, prefix, and printer for each Apple II network user.



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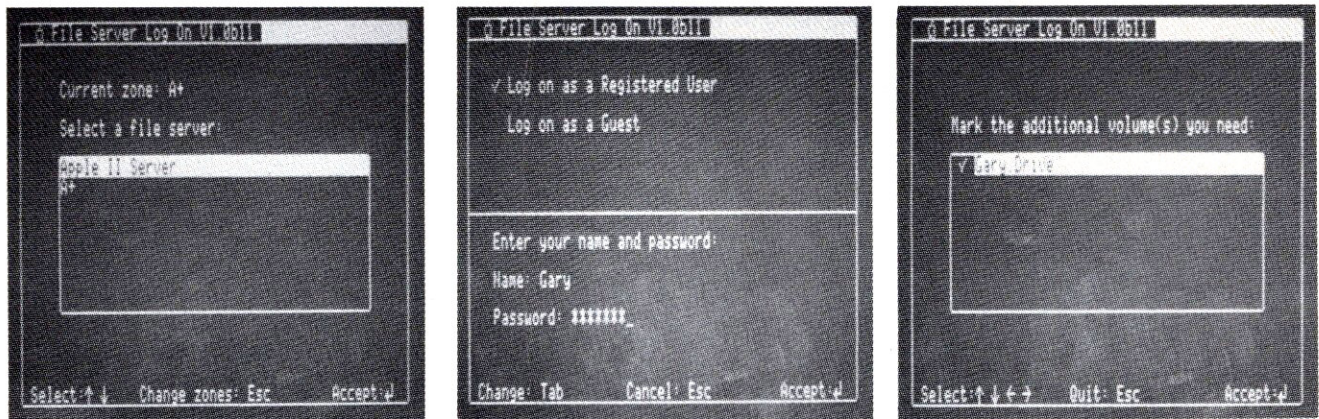


Figure 4: Logging onto AppleShare. The Logon program first asks for the server you want, then your name and password, and finally the server volumes you want to use.

which program will run when an Apple II user tries to boot from the network instead of from a local drive. Booting from the network is possible if you've previously put the necessary ProDOS system files onto the server. Any 128K enhanced Apple IIe can auto-boot from the network; if you have a GS, you need at least 768K of memory.

Accessing the Server

Before you can use an AppleShare disk volume from your Apple II workstation, you must run the Logon program on the ProDOS system disk. When Logon starts up, it scans the network for AFP file servers and displays a list of them on the screen. You then select the server you want to use, enter your user name and password (or specify guest access), and then select the server volumes you want to work with. (See figure 4.)

Thereafter, you can use the selected server volumes just as if they were on a disk directly connected to your II. You can create folders,

transfer programs and files to the server and back again, and so on.

Controlling Access to Folders

Although a file server is ideal for sharing files, you may want to prevent other users from seeing your files or changing them. AppleShare maintains three access-control attributes for each folder on the server, and the owner of the folder can adjust them to specify just who has the right to perform the following types of operations (see figure 5):

See Folders. Permits users to see the names of any folders within the current one.

See Files. Permits users to see the names of files inside the folder, read files, and copy files.

Make Changes. Permits users to move, change, and delete files inside the folder and add new files.

You can set these attributes for each of three user categories:

Owner. The person who created the folder or who was assigned ownership of the folder.

Group. Any group (set of users) the system administrator has previously set up.

Everyone. Any user with access to the server.

When a user first creates a folder, it is private. In other words, only the owner has the See Folders, See Files, and Make Changes privileges. You can use the ProDOS system program called Access to change the access attributes for Owner, Group, and Everyone.

Accessing Network Printers

More than one printer can be present on an AppleTalk network—you may have a LaserWriter for high-quality work and an ImageWriter II for draft work, for example. Thus, you must choose which printer you want to use before starting a print job, whether your file is on a IIe, IIGS, Macintosh, or IBM PC.

If you're printing from a IIe application program (which may be running on a GS in the Emulation mode), you choose a network

Figure 5: Changing access privileges. The Access program lets you adjust See Folders, See Files, and Make Changes attributes.

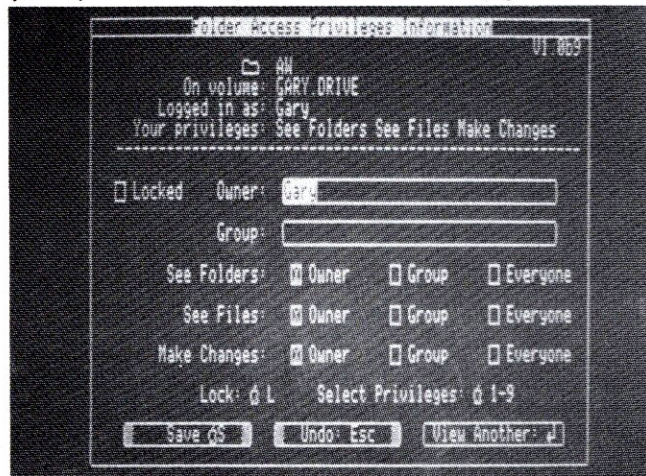
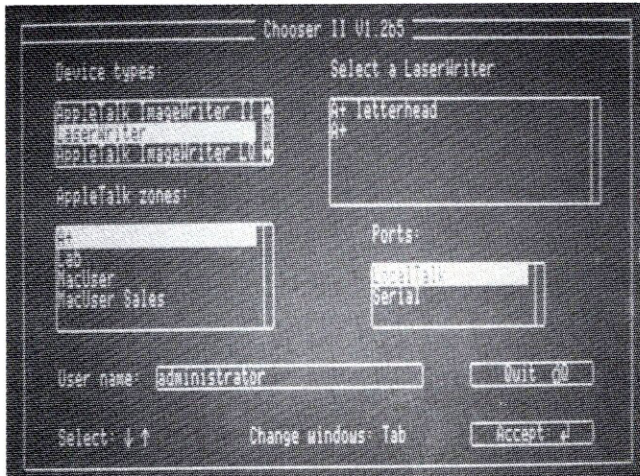
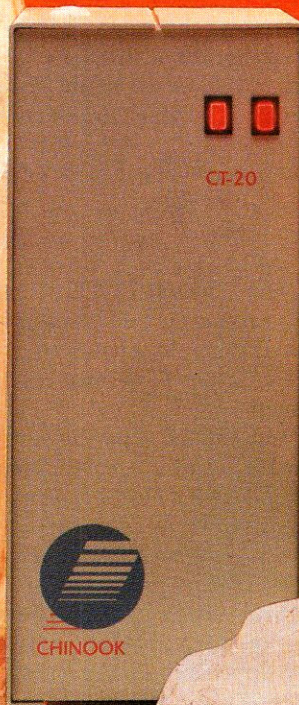


Figure 6: Choosing a printer. The Chooser.II program lets you select the network printer you want to use.



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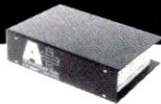
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printer by running a utility program called Chooser.II (see figure 6). If you choose a LaserWriter, Chooser.II sends ImageWriter emulation software to it so that it will behave just like an ImageWriter. To print over the network, just specify slot 7 as the printer slot in your application program.

Third-party IIGS software that follows the standard desktop interface should have a Choose Printer option in the File menu, which you can use to choose a network printer. If you choose a LaserWriter, your program will call on the GS Print Manager to send PostScript commands to the LaserWriter over

the network. PostScript is the page-description language the LaserWriter uses to draw text and graphic images on a page.

The AppleShare Print Server software manages printing requests from workstations, saves printing jobs to disk if the printer is busy, and prints deferred jobs as soon as the printer is free. The net effect is that workstations aren't tied up while they're trying to print, even if someone else is using the printer.

When considering whether to set up an AppleTalk network for your group of Apple II computers, consider first the main benefits:

BUZZWORDS

ACCESS PRIVILEGES.

Permission assigned to individual users or groups of users to view or make changes to certain folders on a server.

APPLESHARE. The file server software sold by Apple Computer.

APPLETALK. The set of protocols and conventions comprising Apple's local-area network.

CHOOSE. A program for selecting which printer you want to use on an AppleTalk network.

AFP. AppleTalk Filing Protocol. A standard file-handling scheme used by an AppleShare file server. Workstations have translators to convert commands from the native operating-system format to AFP format. AFP lets you connect ProDOS, MS-DOS, and Macintosh workstations to the network.

DISK SERVER. A computer that partitions a hard disk into several discrete volumes and lets network users access only their own volumes. Users can't open files on volumes assigned to other users.

FILE SERVER. A computer on a network that manages access to files on a hard disk. Users can access other users' files, given the proper access privileges.

GROUP. A collection of registered users to which the network administrator assigns a name.

GUEST. A user who logs onto an AppleShare file server without specifying a user name. Everyone has access to files and folders

guests create on the server.

LOCALTALK. An AppleTalk cabling scheme from Apple involving shielded, twisted-pair cables.

NETWORK. A system of interconnected computers and peripherals.

NETWORK ADMINISTRATOR. The person responsible for the operation of a network. The administrator sets up user and group lists and assigns passwords.

NODE. Any device connected to a network, such as a workstation or printer.

PASSWORD. A secret combination of characters that is sometimes required to log onto a file server.

REGISTERED USER. A user who logs onto an AppleShare file server by specifying a valid user name and password.

SPOOLER. A program that manages printers on a network. It accepts print requests from workstations and forwards them to the printer when the printer is ready, thus freeing up the workstation to do other tasks even if the printer is in use.

VOLUME. Usually a single disk device. A disk server can create multiple logical volumes on a single drive, however.

WORKSTATION. A networked computer that can run application programs and also take advantage of network services. —Gary Little

NETWORK

work-group efficiency and the ability to share expensive peripherals such as Apple's new CD-ROM drive or the LaserWriter printer. In other words, no more trotting disks down the hall to coworkers; no more waiting in line to work with a computer connected to a printer; and, for teachers, no more wasting time while you distribute program disks at the beginning of every class and collect them at the end.

You can also take advantage of useful software specifically designed for a network setting—electronic mail and multiuser database programs, for example. Apple will soon sell a teacher/student network-management program called Aristotle, which teachers can use to specify which programs on a file server the members of a particular class are permitted to use.

The network should also reduce your disk-drive budget—since Apple IIs can boot directly from the file server, you won't have to buy as many drives for your workstations, or any at all for that matter.

Although AppleShare is very slick, it is clearly not for everyone. Keep in mind that it works only with ProDOS-based software. If you are using some DOS 3.3-, Pascal-, or CP/M-based software, you won't be able to take full advantage of the network. Even some ProDOS programs may not work perfectly, but, in most cases, only minor changes will be necessary to make them "network aware."

And then there's the matter of price. First, each IIe requires a \$249 workstation card and perhaps a \$70 enhancement kit if you haven't yet enhanced your IIe. (Advice to everyone: Stop buying the IIe. The GS has always been more economical, and its built-in AppleTalk port makes it even more so if you're considering an AppleTalk network.) You also need a \$75 LocalTalk Connector Kit for each computer, perhaps some extra LocalTalk cable (\$75 for a ten-meter extension), and—the real kicker—a Mac with at least a 20-mega-byte hard-disk drive (\$3578 for a Mac Plus), AppleShare File Server software (\$799), and AppleShare Print Server software (\$299). We expect educational discounts will be available for all these products.

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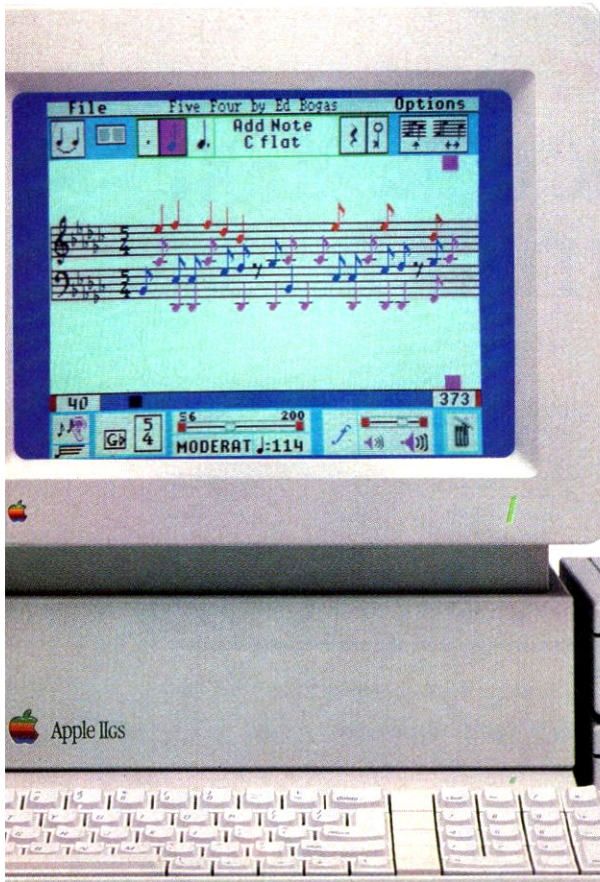
The new *Music Studio version 2.0* is the only IIgs music software with *real time MIDI input* plus *more than 15 new features*, including new digitized instruments and a "Jukebox" that automatically plays any selection of songs. The *Music Studio 2.0* combines power with ease-of-use for musicians at all levels. Compose and edit music, add lyrics, print sheet music, adjust MIDI parameters, edit instrument sounds, and more!

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Great Wave's *KidsTime™ II*

Created for children aged three to ten, *KidsTime II* has two educational programs emphasizing creativity, exploration and skill development.



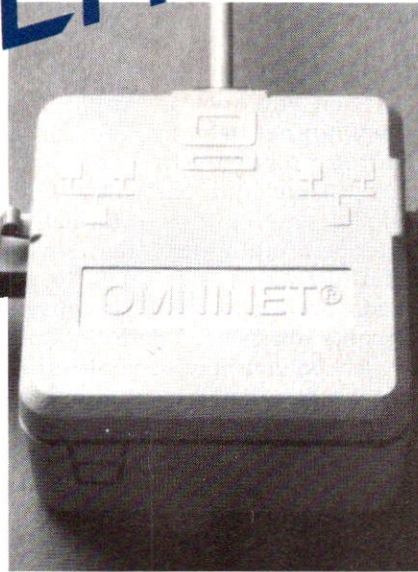
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Software: *The Music Studio 2.0* by Activision.

*Comparing Omninnet
with AppleTalk*

THE CORVUS ALTERNATIVE



Apple's entry into the Apple II network market is getting a lot of attention, but does Apple provide the best method for networking Apple II computers? Maybe, maybe not. In this article, we're going to take a good look at an old-timer in this market, Control Data/Corvus, and see how its network compares with Apple's.

Corvus is the pioneer that brought hard-disk drives to the Apple II world in 1979. In 1980 Corvus introduced its Constellation I network software. It used Corvus' disk multiplexer, a device that lets eight computers share a single hard disk. The following year, Corvus announced Omninnet, a conventional network with a transmission rate of 1 Mbps (megabit per second). In 1984, Corvus came out with a network-management-software system called Constellation II, which greatly increased the capabilities of Omninnet. For the first time, for example, you could use the ProDOS operating system. Constellation III, introduced last summer, features a convenient pull-down-menu interface and extensive on-line help.

Earlier this year, Control Data Corporation teamed up with Corvus to market the Omninnet. Con-

trol Data/Corvus estimates that there are more than 12,000 Apple II Omninnet networks worldwide, which tie together more than 120,000 computers.

Omninet can handle Apple II, Macintosh, and MS-DOS computers together on the same network. It also allows for simultaneous use of the ProDOS, DOS 3.3, Pascal, CP/M, Macintosh, and MS-DOS operating systems, although moving files from one system to another is not that convenient. Each Omninnet network can accommodate up to 63 computers and as many as 10 drives, with a total of one gigabyte of disk storage. Contrast this capacity with that of Apple's network, which can handle up to 32 devices and the ProDOS, Macintosh, and MS-DOS operating systems only.

Speed: That's the Ticket

Connecting multiple computers is a means for sharing expensive peripheral equipment, using a cen-

tral supply of application software, exchanging files and data, and sending electronic messages. A primary concern for any network user is that speed not be compromised. Ideally, network printers and hard-disk drives respond just as quickly as locally connected devices. Omninnet shines in this area.

Omninet is significantly faster than a LocalTalk implementation of AppleTalk. Why? For one thing, its 1-Mbps raw data-transmission rate, the speed at which data moves through the network wires, is about four times the AppleTalk rate. The effective AppleTalk rate is even slower because Apple's network software takes quite a while to create a network data packet before actually sending it. Refer to "AppleTalk Cabling Schemes" in this issue for author Don Lancaster's comments on the effective transfer rate through an AppleTalk network.

Dollar for Dollar

Besides speed, expense is a consideration. The biggest-ticket item for AppleShare is the Macintosh you need to run the AppleShare File Server software. A Macintosh Plus with an Apple 20-megabyte SCSI hard-disk drive has a suggested retail price of \$3578. Since it is



The Corvus 21-megabyte OmniDrive disk server

dedicated to acting as the file server, you cannot use the Mac as a network workstation. The AppleShare File Server software is an additional \$799, and the AppleShare Print Server software is \$299. Each of the computers needs a \$75 LocalTalk Connector Kit, and any IIe computers also require the \$249 Apple II Workstation Card. So the total for a sample network connecting five Apple IIe computers comes to \$6371, a price that does not include the cost of the extra LocalTalk cable you will probably need.

Here's how a Corvus system adds up, in comparison. A Corvus 21-megabyte OmniDrive disk server (a stand-alone unit) has a suggested retail price of \$2795. To this figure add \$695 for the Constellation III network-management and diagnostic software (it includes operating systems, utilities, and printer-server software). The print server is a stand-alone IIe (\$829) with an Omninet Network Interface Card (\$249) and up to six standard printer-interface cards. Each Apple II workstation needs a \$249 Omninet Network Interface Card, a \$45 cable with a network box for each computer, and a \$65 print-spooler card. Thus, our sample network connecting five Apple IIe workstations comes to \$6453 for Omninet, or about the same as the cost of an AppleTalk network. Extra cable is relatively inexpensive (\$149 for 500 feet), however.

AppleTalk is less expensive if you're networking IIGS computers—they don't need the Apple II Workstation Card for AppleTalk, but they still need the Network Interface Card for Omninet.

Using Omninet

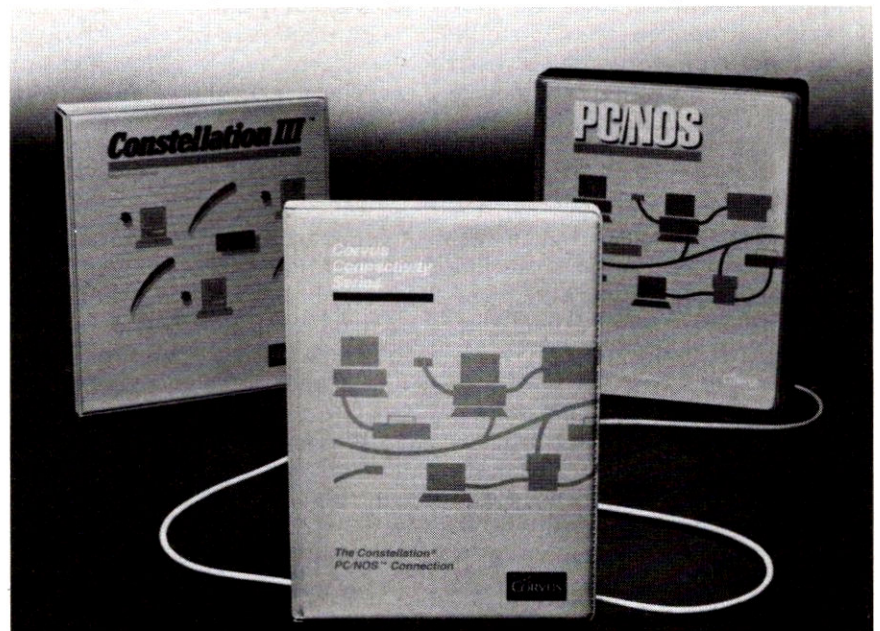
When you boot an Apple II on the Omninet network, the Corvus startup program asks you to enter your name and password. Once you've entered this information, the operating system the network administrator has assigned to you loads, and up to ten disk volumes become available. These volumes, which behave like separate disks, can be designated as read-only or read/write. You can get access to additional volumes during a session by removing and adding any of a maximum of 24 volumes. With ProDOS, the Corvus volumes, after the first two, appear as ProDOS volumes with "phantom" slot and drive assignments, and you can use them just like locally connected drives.

At this point, you should begin

to see some of the design differences between the Omninet server and Apple's AppleShare server. On an AppleShare server, all users see the hard disk as the same big volume and can store files and create folders anywhere on the volume (subject to access restrictions). With Omninet, users gain access to specific private portions of the hard disk, which appear to be discrete disk volumes. That's why the Omninet server is called a disk server and AppleShare a file server.

Omninet has several problems, some minor, some not so minor. Updating the Omninet operating system or driver software is difficult unless you're content to wait for new updates to the Constellation disks from Control Data/Corvus. The operating system and driver software are stored in Pascal files, regardless of the operating system, meaning that their replacement or correction requires conversion to the Pascal format. You cannot just place a new version of the PRODOS file in the ProDOS boot volume.

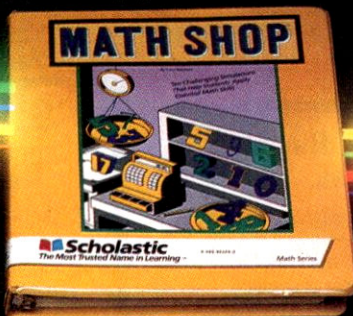
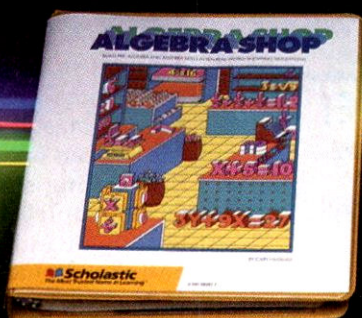
Also, exchanging disk files with other users on the server is awkward, because files sit in their users' separate volumes, unless the administrator happens to allow two users access to the same volume. To exchange a file, you first have to send it to a special transfer area on the server; to complete the transfer, the recipient has to re-



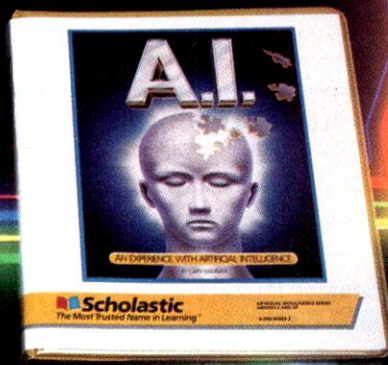
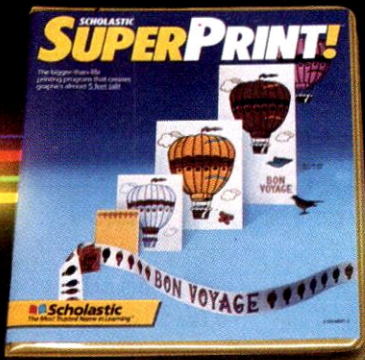
Constellation and PC/NOS are the network management programs for Omninet.

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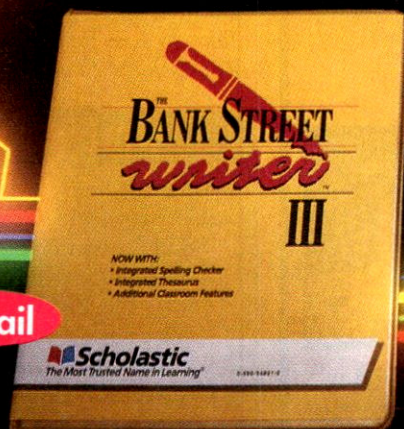
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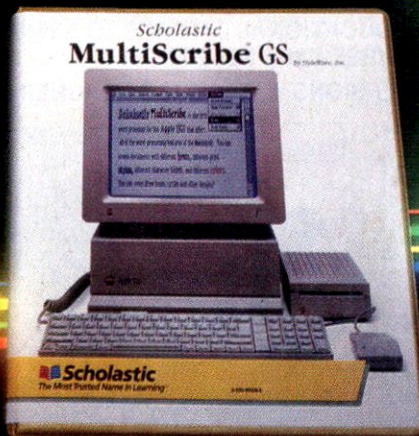
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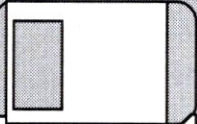
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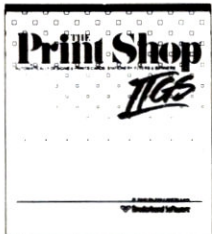


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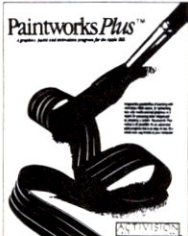
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trieve it from the transfer area.

Perhaps the most serious problem with the Omninet network at present is that you cannot use it with an Apple IIGS running in the Fast mode. This limitation makes running super-hi-res desktop applications painfully slow. Corvus is aware of this problem and is working on a solution.

Decisions, Decisions

You may prefer Omninet over AppleTalk because it's faster with Apple IIe's, and it does not require a Macintosh (meaning you won't have to master another computer). Also, it can handle all major Apple II operating systems, not just ProDOS. AppleTalk/AppleShare, on the other hand, is better for file and peripheral sharing and can be less expensive, particularly if you have a lot of IIGS computers.

Corvus technical support has a reputation for high-quality service. Apple's support is as yet untested, but we can surmise that Apple's dealers will support this product as well as they support the rest of the Apple line.

Even though the momentum of the Apple label could propel AppleTalk and AppleShare into the forefront, the performance and reliability of Omninet make it a worthy competitor. +

Tom Vier has been the Washington Apple Pi user group's Corvus expert for more than five years. He also works with a much larger network as a senior transmission engineer for the American Broadcasting Company in Washington, D.C. If you have a pre-OmniDrive Corvus system, contact Tom c/o A+ for information on a new ROM that lets you run ProDOS.

VITAL STATISTICS

Omninet

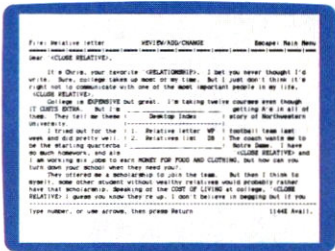
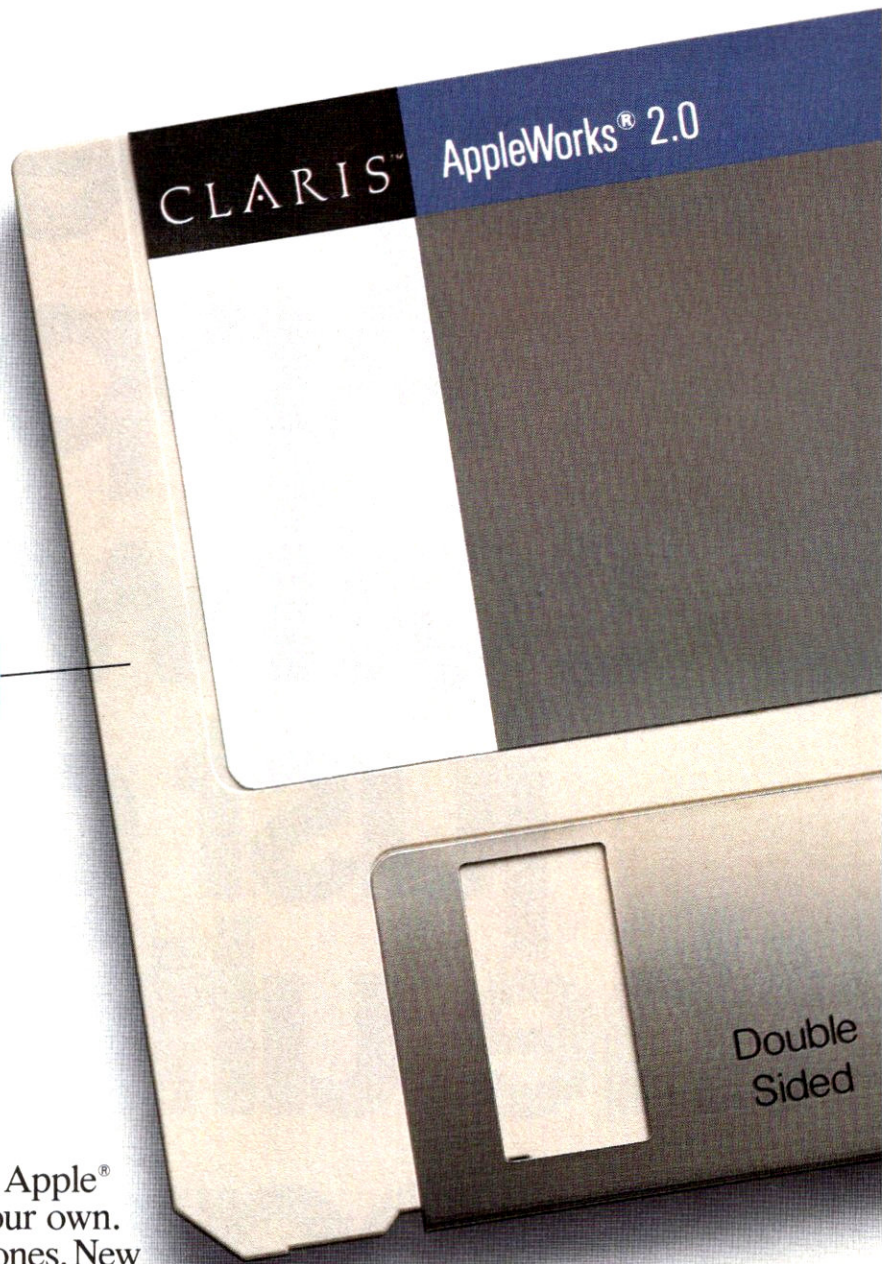
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List Price: Omninet Omni-Drive, \$2795 (21 megabytes); Omninet Network Interface Card, \$249; Omninet Network Box, \$45; Omninet Print Spooler Card, \$65; Constellation III software, \$695

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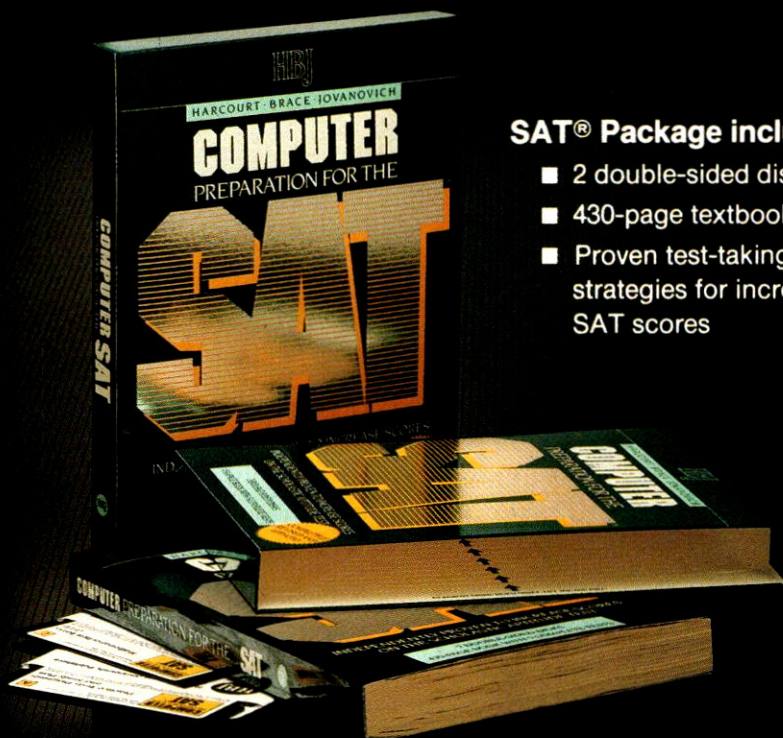
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*A quick
rundown of
other Apple II
alternatives*

OTHER NETWORKS

Besides Apple and Corvus, three other companies are significant players in the Apple II network market. Here's a look at what they have to offer and what their strengths and weaknesses are. You'll see that LanTech offers a file server, whereas Velan and Major Educational Resources offer disk servers. The difference between the two types of servers is that a file server allows users to share all files on the server hard disk (which is what AppleShare does), whereas a disk server allows users to have private areas on a shared disk—the users can't share files directly.

LanTech's ELAN

LanTech specializes in Apple II networks for schools. Its current installed base is approximately 300 networks, which average 20-25 workstations each.

LanTech offers file/print/boot servers and workstation cards, which together form ELAN (Educational Local Area Network). The server is an Apple IIe running LanTech's proprietary operating system, AROS; it connects to workstations with interface cards called Satellite Boards. Workstations that run ProDOS require an additional EXpander Board. The network can

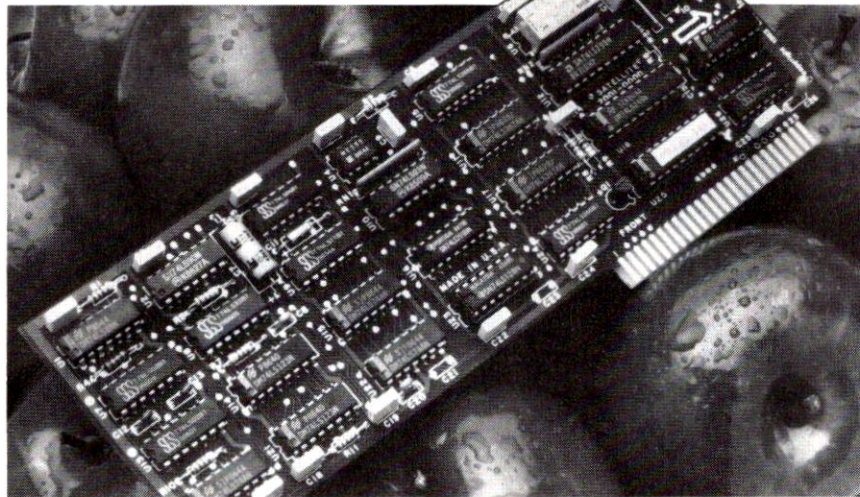
have as many as 128 workstations and can be up to 1000 feet long.

To create a LanTech ELAN server, you first need a 128K Apple IIe with a 5¼-inch disk drive and monitor (\$1326). For it you need a LanTech Satellite Board (\$189) and cable assembly (\$17), the LanTech AROS Operating System (\$400), a 20-megabyte LanTech hard-disk drive (\$1295), a hard-disk interface (\$100), and a Super Serial Card for each of up to four printers (\$139 each). The total server cost, including the IIe itself and four serial cards, is \$3883.

Each workstation requires a Sat-



Photo of a typical ELAN environment



The LanTech Satellite Board

elite Board (\$189), a ten-foot cable assembly (\$17), and an EXpander Board for ProDOS (\$120), which totals \$326.

Thus, the cost for a five-workstation network comes to \$5513, not including the cost of the Apple IIe workstations. To see how this price compares to the cost for a similar AppleTalk or Omninet network, see the chart "Networks at a

Glance" on page 50. Like Apple and Corvus, LanTech offers educational discounts.

The file-server software features automatic file locking for both DOS 3.3 and ProDOS 8. (File locking prevents conflicts when more than one person tries to use a file at the same time.) The network cannot handle Pascal and CP/M. It can accommodate up to six disk drives

with volumes as large as 32 megabytes and uses a disk-caching scheme to improve the speed of disk access over the network.

Other than a menu-setup utility program, no classroom-management or automatic-lesson-collection software is provided by LanTech, but the company is working with software publishers that provide such software.

ELAN's print service provides spooling (print-job queuing) for up to four printers, which you get by adding printer-interface cards to the IIe server. You can spool as many as eight documents. It works with dot-matrix printers such as the ImageWriter but not with the LaserWriter.

ELAN works with the Apple II Plus and the IIe (enhanced or not) but not with the IIc or the IIGS running ProDOS 16 applications.

ELAN is perhaps the most similar network to AppleShare/AppleTalk, in that it offers file, print, and boot service. One of LanTech's strengths is that it allows schools to use Apple IIe equipment they may

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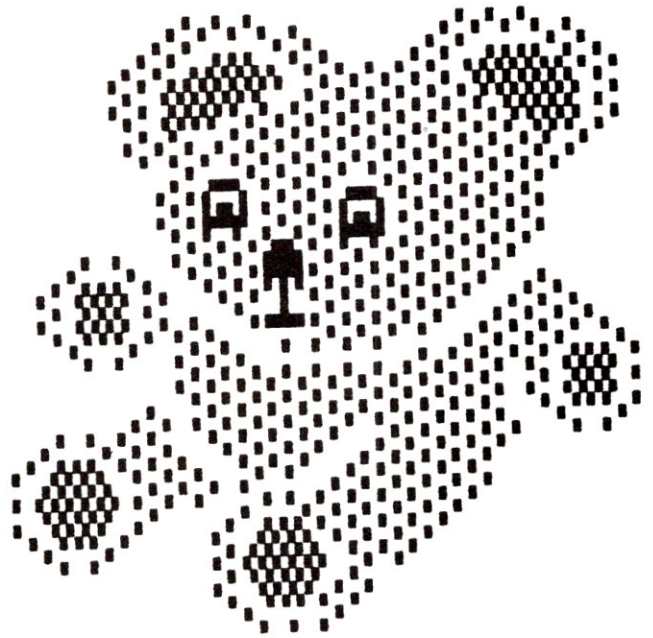
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Print Magic offer is available for Apple IIe/c/gs and IBM and compatibles. Allow 4-6 weeks for delivery. When ordering, specify computer type and send your check or money order plus the front cover of your *Print Shop* manual to: Epyx, Inc., 2995 Woodside Road, Dept. 004, Suite 400-383, Woodside, CA 94062.



PRINT MAGIC

BY Epyx

*product comparisons for Apple IIe/c/gs, IBM and compatibles
**excludes *Print Shop* Apple IIgs

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CIRCLE 147 ON READER SERVICE CARD

already have, which helps reduce the already relatively low cost, and it works with DOS 3.3 and ProDOS 8. (AppleShare works with ProDOS 8 and 16.) The network transfer rate is also faster than AppleTalk.

Some weaknesses are its expensive cabling and connectors and the requirement of a second \$120 card in each workstation to run ProDOS. Although the file service is impressive for a product priced so low, the security and system-management capabilities are simplistic. Print service is reasonable with four printers but needs more flexibility and expansion possibilities beyond spooling eight jobs. Technical support is limited to the central factory location and not available locally.

Velan VNET

Velan was founded in 1985 to develop classroom networking systems. Headquartered in California, it operates four regional sales offices. Velan now has more than 100 networks installed nationwide.

The company offers a combina-

tion disk/print/boot server based on an unusual animal for the typical K-12 classroom—an IBM PC/AT (or compatible).

The first thing you can say about Velan's network technology is that it is different. First, each workstation connects directly to a central server rather than to the next device in a chain of devices, in a so-called star configuration. Second, the network interface is simply a standard serial port. The network can include as many as 64 workstations, and the cabling can be up to 1000 feet long.

Velan sells its servers as upgrade packages for existing PC/AT computers but most often delivers them in complete bundles with an IBM PC/AT or compatible, a hard-disk drive, serial cards with 16 ports, server software, classroom-management software, and menu-driven student software. A 16-port, 20-megabyte server bundle costs \$5745.

Each Apple II or IBM PC work-

station requires a serial-interface card (\$85) and a cable assembly (about \$30). Thus, a five-workstation setup comes to \$6320. Educational discounts are available.

A special \$20 ROM is available for the Apple Super Serial Card that makes it usable as a VNET interface. Computers with built-in serial ports, such as the IIC and Macintosh, can be connected without interface cards, but you need special disks containing drivers.

Velan's file service is basically disk service with some file-locking capabilities. Disk service means that although files from different operating systems can coexist on the server's disk, they cannot be shared. Each user has access to a certain area of the disk and that area only.

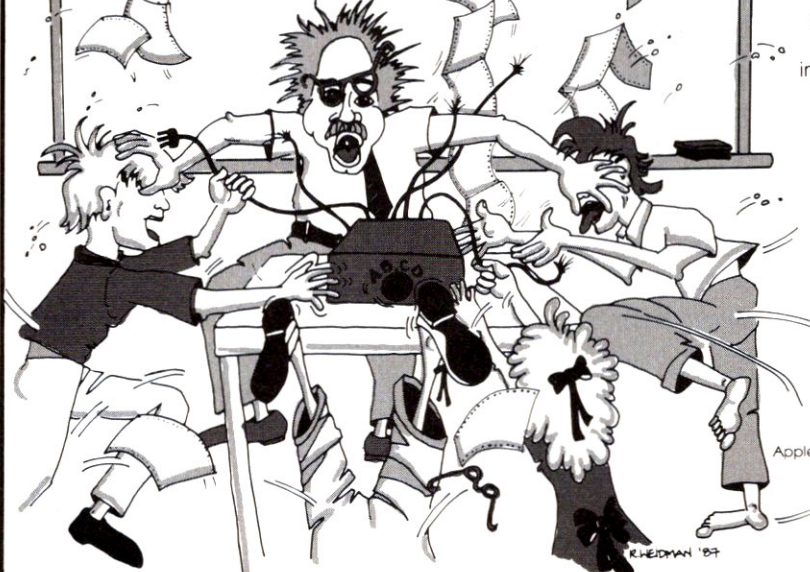
Where this odd star really shines in comparison to most other classroom networks is in classroom-management software. Integrated with the system-management software and included with every system is a set of flexible utilities specifically for the classroom:

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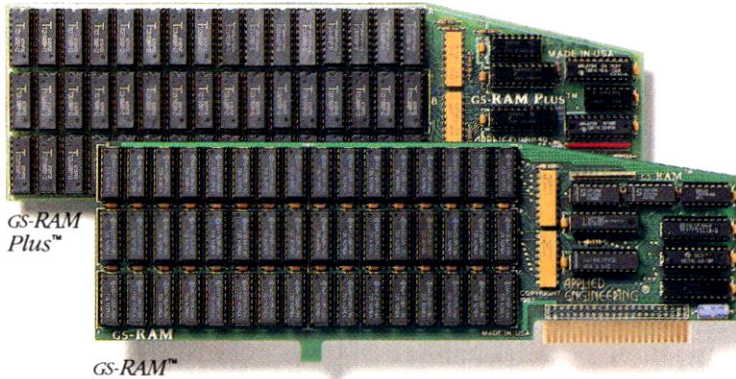
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NETWORK

The VSETUP utility allocates network resources such as hard-disk space and printers on a class-by-class basis.

VCLASS allows teachers to set up program-access menus for each class and even each student within each class. Students select programs from the menu without ever seeing a native operating system, pathname, or even program name.

COLLECT and DISTRIBUTE are utilities that let teachers collect homework or other documents to be combined, displayed, printed, or distributed to other students.

VCOMM is an electronic-mail and electronic-bulletin-board system that enables students and teachers to communicate with each other individually or in groups within a class or an entire school.

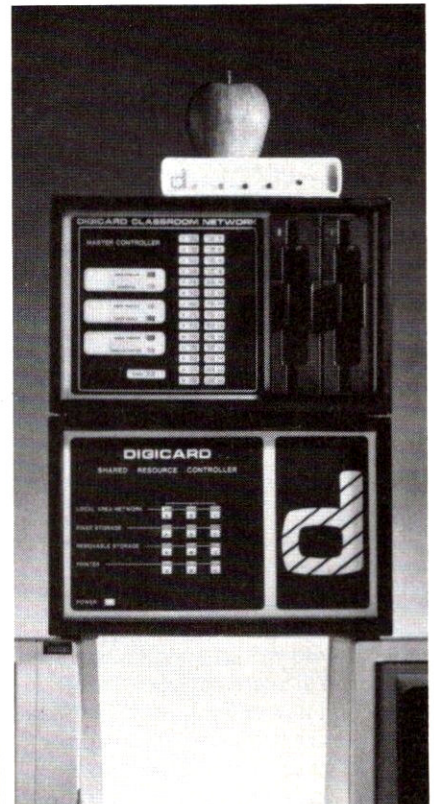
Velan's print service provides spooling for up to 8 printers on the 16-port system. It works with ImageWriter or other dot-matrix printers but not with the LaserWriter.

A VNET workstation can be an Apple II Plus, IIe (enhanced or

not), or even an Apple IIc via its built-in serial port. Macintosh and MS-DOS computers also work with this network, through their built-in serial ports. Apple IIe computers may be diskless workstations and boot either DOS 3.3 or ProDOS 8. IIGS computers cannot currently run ProDOS 16 programs on VNET, but will "soon" be able to.

VNET's main strengths are its classroom-management software, accommodation of workstations using different operating systems, and the ability to attach lots of printers. Also, network performance appears to remain relatively constant even as the number of workstations increases.

One of the weaknesses of this system is that it is based on an IBM PC/AT, which is unfamiliar and perhaps unattractive to many K-12 teachers. Also, cabling for the star configuration is less convenient and more expensive than that of other setups. The added cost of the cables offsets much of the lower



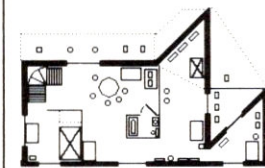
The DigiCard Master Controller (for the Classroom Network) and the Shared Resource Controller (for DNET)

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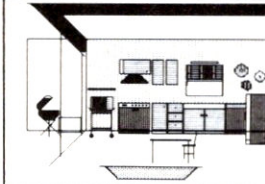
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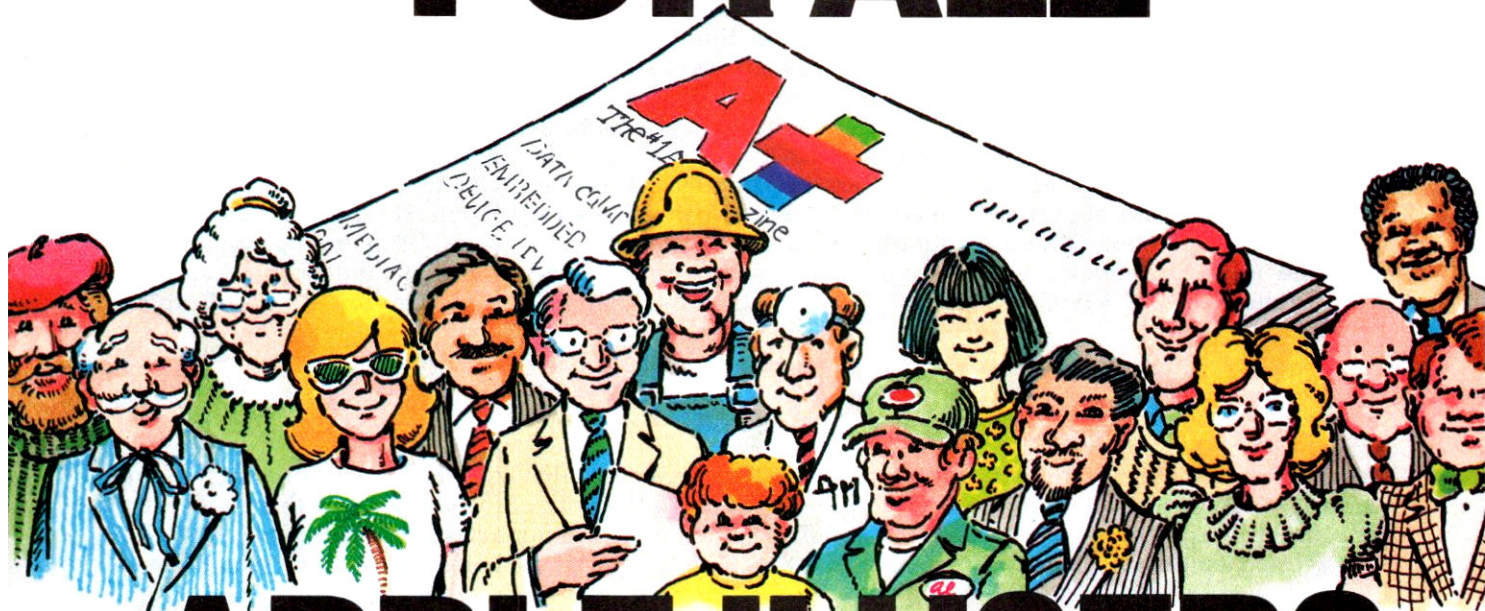
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NETWORK

cost of the network interface. Also, you can have only one hard-disk drive per server. The transfer rate is among the lowest of all the classroom networks, but it is difficult to compare, since each workstation has a dedicated cable through which to communicate.

Classroom Network and DNET

Major Educational Resources Corporation has approximately 400 network installations in the United States and offers a combination disk/print/boot server called a Digicard Master Controller (\$2495) for use with its Apple II-only Classroom Network. It can connect up to 28 Apple II computers, which can be about ten feet apart from each other. It also has a Shared Resource Controller (SRC), which gives you a hard-disk drive and allows the sharing of three printers. SRCs are available with hard disks with three capacities: 20 (\$2995), 43

(\$4995), and 70 megabytes (\$6995). An SRC allows you to set up DNET, a network for Apple II, Macintosh, and MS-DOS computers.

The technologies of DNET and the Classroom Network differ markedly from each other. The Classroom Network consists of interconnected external Network Interface Units that enable each workstation's disk controller to access the two floppy disks of the Master Controller. This network is the only one in this overview in which users share access to floppy, rather than hard, disks.

DNET is a more traditional multiple-access network that uses internal network-interface cards. The medium is twisted-pair cable with familiar modular phone-jack connectors. The network can be up to 4000 feet long. A DNET can in-

clude up to 32 nodes and provides access to the SRC hard disk.

Each workstation requires either a \$195 Network Interface Unit (for the Classroom Network) or a \$195 DNET interface card. Thus, a five-workstation configuration, not including the price of the workstations themselves, comes to \$3470 for a Classroom Network (two shared floppy-disk drives) or \$3970 for a DNET (a shared 20-megabyte hard-disk drive). Educational organizations typically receive a discount.

The Shared Resource Controller provides a rudimentary disk-serving capability. It can accommodate the widest variety of operating systems, including DOS 3.3, ProDOS 8 and 16, UCSD Pascal, CP/M for the Apple II, and the Macintosh and MS-DOS operating systems. It provides no file-locking capabilities, however. You can attach up to six

NETWORKS AT A GLANCE

This chart shows which computers and operating systems are compatible with the networks covered in this issue of *A+*. Also, we've provided a cost comparison, showing the price of each network with a 20-megabyte hard-disk drive, print-spooling capabilities, and five Apple IIe workstations connected to it. Costs are based on suggested list prices, but actual prices can be lower, with the educational discounts each vendor offers.

	APPLESHARE	OMNINET	ELAN	VNET	CLASSROOM NETWORK	DNET
CPUs						
Apple II Plus		■	■	■	■	■
Apple IIc				■		
Apple IIe	(1)	■	■	■	■	■
Apple IIgs	■	(2)	■	■	■	■
Macintosh	■	■		■		■
IBM-compatible	■	■		■		■
OPERATING SYSTEMS						
ProDOS 8	■	■	■	■	■	■
ProDOS 16	■	■				■
DOS 3.3		■	■	■	■	■
Pascal		■			■	■
CP/M		■			■	■
COST OF A NETWORK						
WITH 5 WORKSTATIONS	\$6371 (3)	\$6453	\$5513	\$6320	\$3470 (4)	\$3970

1. Enhanced IIe only

2. Only at Normal (not Fast) speed

3. In an all-IIgs configuration, the price would be \$995 less because no network cards are required.

4. Floppy-based system

disk drives to the SRC.

Other than a menu-setup utility, no classroom-management or automatic-lesson-collection software comes with the system, but software from two other companies, Ideal Learning and SkillsBank, works with this network.

DNET's print service, with its built-in printer interfaces, provides spooling for up to three printers. The number of spooled documents is limited only by available disk space. The network works with ImageWriter and similar dot-matrix printers only.

The following computers can be workstations on this network: Apple II Plus, IIe (enhanced or not), and IIGS. MS-DOS computers can connect via a DNET interface card, and you can attach Macintoshes through their serial port. This product is, in some ways, the least sophisticated, but it runs the most operating systems and can include the most types of workstations. The floppy-based Classroom Network's "burst load" feature for simultaneous program loading by workstations is very fast.

Weaknesses include the lack of file locking. This system offers no backup capability and is the least sophisticated in terms of system management. +

Rod Williams is a computer consultant who specializes in networks. He lives in Irvine, California.

FURTHER INFORMATION

LanTech
4501 North 22nd Street
Suite 220
Phoenix, AZ 85016
(602) 955-7746

CIRCLE READER SERVICE NO. 380

Velan, Inc.
849 Independence Avenue
Mountain View, CA 94043
(415) 960-3388

CIRCLE READER SERVICE NO. 381

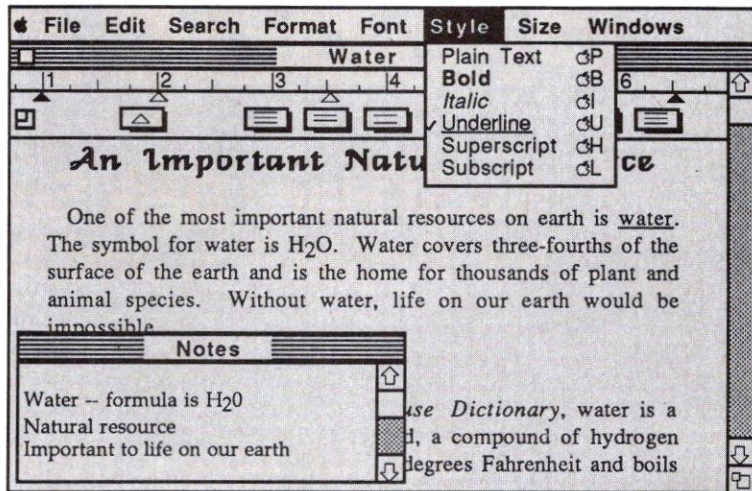
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System Requirements:

// Write runs on the Apple IIe/c (128K) and Apple IIgs. Requires only one disk drive. All functions can be used with the keyboard or with a mouse.

// Write developed by UNICOM Software Development Group. Apple is a registered trademark of Apple Computer, Inc. Macintosh and Apple IIgs are trademarks of Apple Computer, Inc.

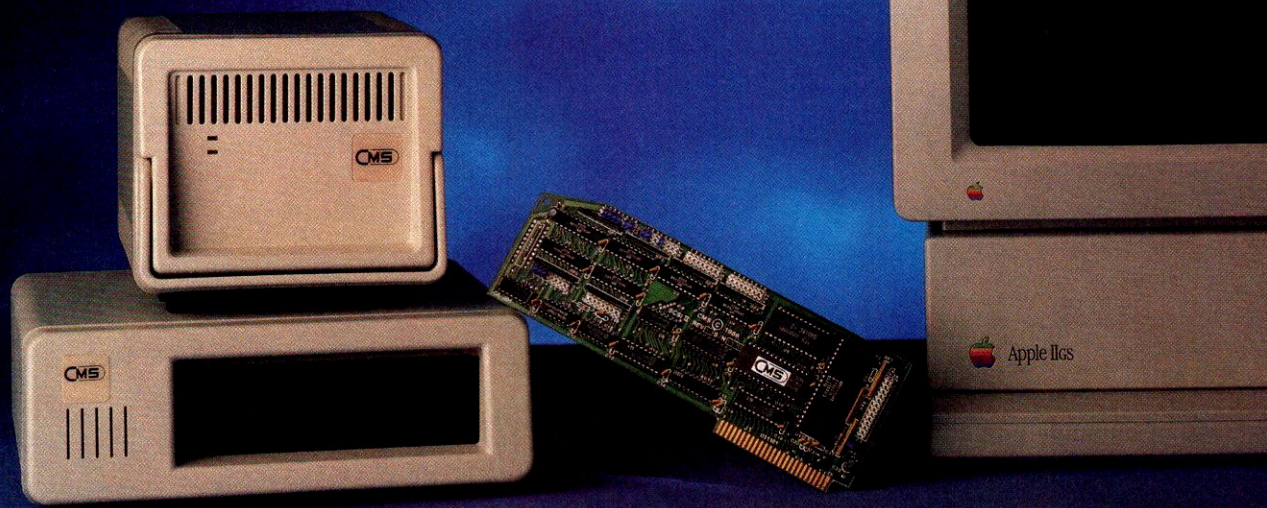
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SOFTWARE ISSUES

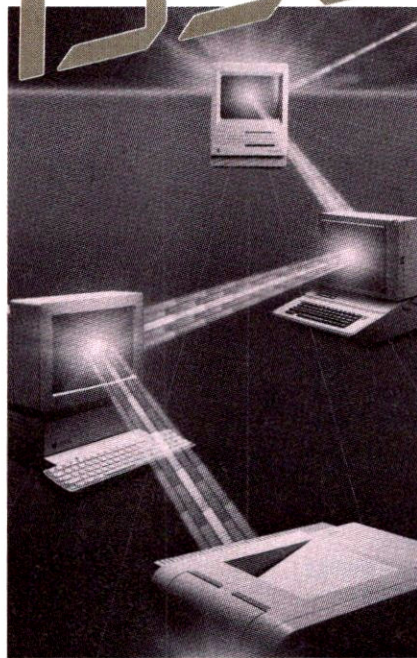
Setting up a network can involve complex tasks, not the least of which is sorting through the software issues. To get the most out of your network, you might need to buy specialized network software, which is costlier than single-user software and comes with a different sort of license. Perhaps the biggest software issue, though, is upgrading. If you already have, say, five copies of AppleWorks in your computer lab, do you then fork over the full price for the network version, or do you get some kind of price break since you're an existing customer? The answer may not be readily apparent—it depends on the individual software vendor.

Why New Software?

Application software presents challenges on a network because single-user versions may not work properly in a network setting. Many single-user programs are copy-protected, so you won't have much luck getting them installed on the network's hard disk. Even unprotected programs can cause difficulties, because it's one thing to be able to install software on the network and another to get it to cooperate when several people are trying to use it at once. Network applications typically have intelligence that prevents users from working on the same files at the same time. (In classrooms, life can be further complicated by the need for curriculum-management software. See "Teachers' Toolbox" in this issue for details.)

Paying the Price

One reason network software costs more is because it's more so-



phisticated and harder for publishers to support than single-user versions. How much more does it cost? Typically, a network application package runs three to five times the price of a single-user version. (Of the 11 companies we interviewed for this article, the extremes were Temporal Acuity, which is charging 2½ times the single-user price for its network software, and Claris, charging 6½ times the single-user price of AppleWorks.)

The main reason, though, that vendors charge more for network versions is that more than one person uses the software. Publishers easily justify a 400% cost markup, assuming that you'll have as many as 10 or 15 or 20 users sharing the same program. (In fact, none of the companies we surveyed for this ar-

ticle place any limit on the number of users you can have—see below.)

Licensing of network software is generally pretty straightforward. We interviewed the 11 companies that Apple Computer told us were developing products for the AppleTalk network, and most of them said they would simply sell network versions separately from the single-user versions. The network license allows purchasers to install the software on a single file server and lets an unlimited number of workstations access that software, as long as those workstations are connected to that file server, not gaining access through a bridge from another network.

A couple of companies, though, have a different approach to licensing. MECC, for instance, likes to deal with school districts rather than individual buyers and offers its customers "memberships" that entitle a district to make as many copies of a product as necessary, with the price based on the district's enrollment. Logo Computer Systems, Inc., prefers to work with individual schools and offers a site license for its LogoWriter for the AppleTalk network. In this case, the \$450 license agreement covers all the file servers in the school.

Upgrade Paths

The least-defined issue pertaining to networking software is upgrading. Most of the companies told us that they would offer some kind of upgrade path but didn't have the details ironed out by the time we went to press. Here are the ways that different companies say they'll handle it:

SOFTWARE FOR APPLE TALK

Here's the list of companies developing software for the AppleTalk network that Apple Computer, Inc., gave us at the beginning of February 1988. It includes specific titles that they are modifying for use with AppleTalk. Undoubtedly, many more companies have commenced AppleTalk development since then, but this list should give you an idea of the breadth of products that will soon be available in network versions.

CLARIS CORPORATION 440 Clyde Avenue Mt. View, CA 94043 (415) 960-2688	APPLEWORKS	Integrated word processing, database management, and spreadsheet
HARBOR SOFTWARE 403 Great Road, #8 Acton, MA 01720 (617) 263-1870	MOUSEFILER	Utilities
LOGO COMPUTER SYSTEMS, INC. 1000 Roche Blvd. 9th Floor Vaudreuil, Quebec Canada J7V 6B3 (514) 455-5636	LOGOWRITER	Integrated word processing, graphics, and programming
MECC <i>Approximately 100 of MECC's 300 educational titles</i> 3490 Lexington Avenue North St. Paul, MN 55126 (612) 481-3560		
MILLIKEN 1100 Research Road P.O. Box 21579 St. Louis, MO 63132 (314) 991-4220	THE FIRST "R"	Reading
PINPOINT PUBLISHING 5865 Doyle Street, #112 Emeryville, CA 94608 (415) 654-3050	PROFILER LET'S TALK POINT-TO-POINT DOCUMENT CHECKER	Database management Electronic mail and bulletin board Telecommunications Word-processing enhancement
SCHOLASTIC 730 Broadway New York, NY 10003 (212) 505-3000	BANK ST. WRITER III WITH ELECTRONIC MAIL AI ALGEBRA SHOP MATH SHOP TALKING TEXT WRITER MULTISCRIBE GS SUPERPRINT <i>Scholastic has announced that it intends to also make the rest of its product line compatible with AppleTalk.</i>	Word processing Logic Math Math Word processing Word processing Banner and sign making
STONE EDGE TECHNOLOGIES P.O. Box 200 Maple Glen, PA 19002 (215) 641-1825	DB MASTER VERSION 5 DB MASTER PROFESSIONAL	Database management Database management
SUNBURST COMMUNICATIONS Washington Avenue Pleasantville, NY 10570 (914) 769-5030	ANT FARM BOUNCE! GEOMETRIC PRESUPPOSER 39 GEOMETRIC PRESUPPOSER: CIRCLES GEOMETRIC PRESUPPOSER: QUADRILATERALS GEOMETRIC PRESUPPOSER: TRIANGLES MUPPET WORD BOOK MUPPETS ON STAGE MUPPETVILLE SUPER FACTORY	Problem solving Problem solving Math Math Math Math Reading Prereading Basic skills Problem solving and math
TEMPORAL ACUITY <i>20 music-education titles</i> 300—120th Avenue NE, Bldg. 1 Bellevue, WA 98005 (206) 462-1007		
TML SYSTEMS 8837-B Goodbys Executive Drive Jacksonville, FL 32217 (904) 636-8592	TML PASCAL TML BASIC	Programming language Programming language

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

FOR THE IIc			FOR THE IIgs			FOR THE IIc		
	RamWorks III®	Apple's™ Card		gsRAM™ gsRAM Plus™	Apple's™ Card		Z-RAM Ultra™	Apple's™ Card
Maximum Desktop	3017K	1012K	Maximum Desktop	8000K	1012K	Compatible with All IIc's	YES	NO
Maximum Number of Records in Database	22,600	6350	Maximum Number of Records in Database	22,600	6350	Maximum Desktop	727K	1012K
Maximum Number of Lines in Word Processor	22,600	7250	Maximum Number of Lines in Word Processor	22,600	7250	Maximum Number of Records in Database	22,600	6350
Maximum Clipboard Lines	2042	255	Maximum Clipboard Lines	2042	255	Maximum Number of Lines in Word Processor	22,600	7250
Autoloads All of AppleWorks	YES	NO	Autoloads All of AppleWorks	YES	NO	Autoloads All of AppleWorks	YES	NO
Multiple Disk Save	YES	NO	Multiple Disk Save	YES	NO	Multiple Disk Save	YES	NO
Built-in Printer Buffer	YES	NO	Built-in Printer Buffer	YES	NO	Built-in Printer Buffer	YES	NO
Compatible with All Versions of AppleWorks	YES	NO	Displays Time & Date on AppleWorks Screen	YES	NO	Compatible with All Versions of AppleWorks	YES	NO
Displays Time & Date on AppleWorks Screen	YES	NO	Time and Date Macros	YES	NO	Displays Time & Date on AppleWorks Screen	YES	NO
RGB Option	YES	NO	3.5 Disk Cache	YES	NO	16 Bit Co-Processor Port	YES	NO
16 Bit Co-Processor Port	YES	NO	Built-in Hi-Res Diagnostics	YES	NO	Built-in Hi-Res Diagnostics	YES	NO
Built-in Hi-Res Diagnostics	YES	NO	Memory Expansion Port	YES	NO	Built-in ProDOS, DOS 3.3 Clock	YES 1	NO
Memory Expansion Port	YES	NO	ROM Expansion Port	YES	NO	Built-in CP/M Capability	YES 2	NO
80 Columns Built-in	YES	NO	Number of RAM Banks	6	4	Maximum Total Functions	5	1
Maximum Total Functions	6	1	Maximum Memory on Main Card	1.5 or 6 MEG	1 MEG	Software Standard	YES	YES
Software Standard	YES	YES	Software Standard	YES	YES	Made in	USA	Singapore
Made in	USA	Singapore	Made in	USA	Singapore	Warranty	5 years	90 days
Warranty	5 years	90 days	Warranty	5 years	90 days			

Apple makes good peripherals for their computers. Perhaps that's why they sell more monitors, printers, disk drives and other accessories for their computers than anyone else. Well, almost anyone else. You see, Applied Engineering is the only company to outsell Apple in the peripheral business. In fact, according to several independent studies we outsell them 2 to 1. Why? Are Apple's memory cards not up to par? No, actually they're just as good as their other peripherals, it's just that ours are a generation ahead. And we outperform all other memory cards in a similar way.

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

NETWORK

•Sunburst says it will let customers of single-user versions trade up to the network release by paying an additional price of two times the single-user cost (all of Sunburst's networked products will cost three times the price of the individual version). Harbor Software will probably offer a similar plan, allowing customers to trade in single-user versions of MouseFiler and pay the difference between the

single-user price (\$69.95) and the network price (\$199.95). Stone Edge Technology says it's also considering the same type of arrangement, pricing the upgrade close to the difference between the price of the single-user and network versions of DB Master, Version 5. And Temporal Acuity says it's likely to take the same approach with its

music-education titles.

•MECC offers its membership customers the opportunity to simply buy the network "loader" at an additional cost, rather than swap for a whole new version. The expense, again, depends on the size of the school district.

•Scholastic Software says it "will offer an upgrade" but didn't have any details at press time. TML Systems and Claris Corporation say essentially the same thing, although Claris adds that it will have "a special policy for users who have multiple copies."

•Pinpoint says it will probably offer some kind of temporary promotion to move customers of its single-user products up to network versions.

•Logo Computer Systems, Inc., gives buyers of its single-user software a nine-month period during which they can upgrade to the network version for a discount. After that, they must pay the full price.

•A representative from Milliken says the company "hasn't really decided that issue." With Milliken it's not such a critical matter, though, because the program the company is releasing for the network (The First "R") is a new product even in the single-user version, so no huge installed base of users is concerned about upgrading.

The Bottom Line

As you can see, upgrading is the great gray area in software networking. Particularly confusing will be situations in which a user has lab packs or just multiple, single-user copies of a program and wants to swap them for a network version.

By the time this issue of *A+* appears, companies that are new to networks will have a better idea of what their policies will be, so we recommend that you check with them and press the issue. (Claris, for instance, suggests you call its upgrade number—[800] 544-8554—for details.) If the companies haven't decided, they'll need to do so soon to keep their customers satisfied. Your best bet is to ask a lot of questions before taking the network plunge. +

Lisa Raleigh is the executive editor of A+ magazine.

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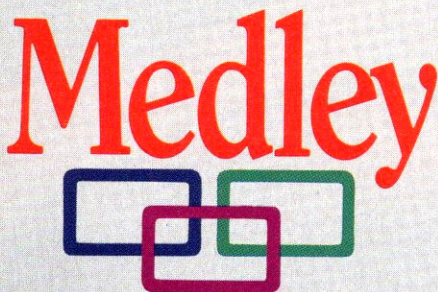
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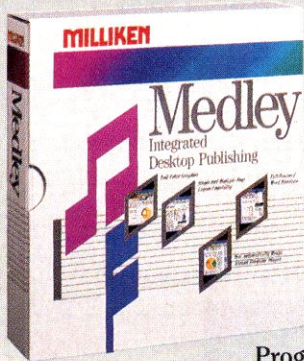
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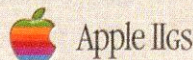
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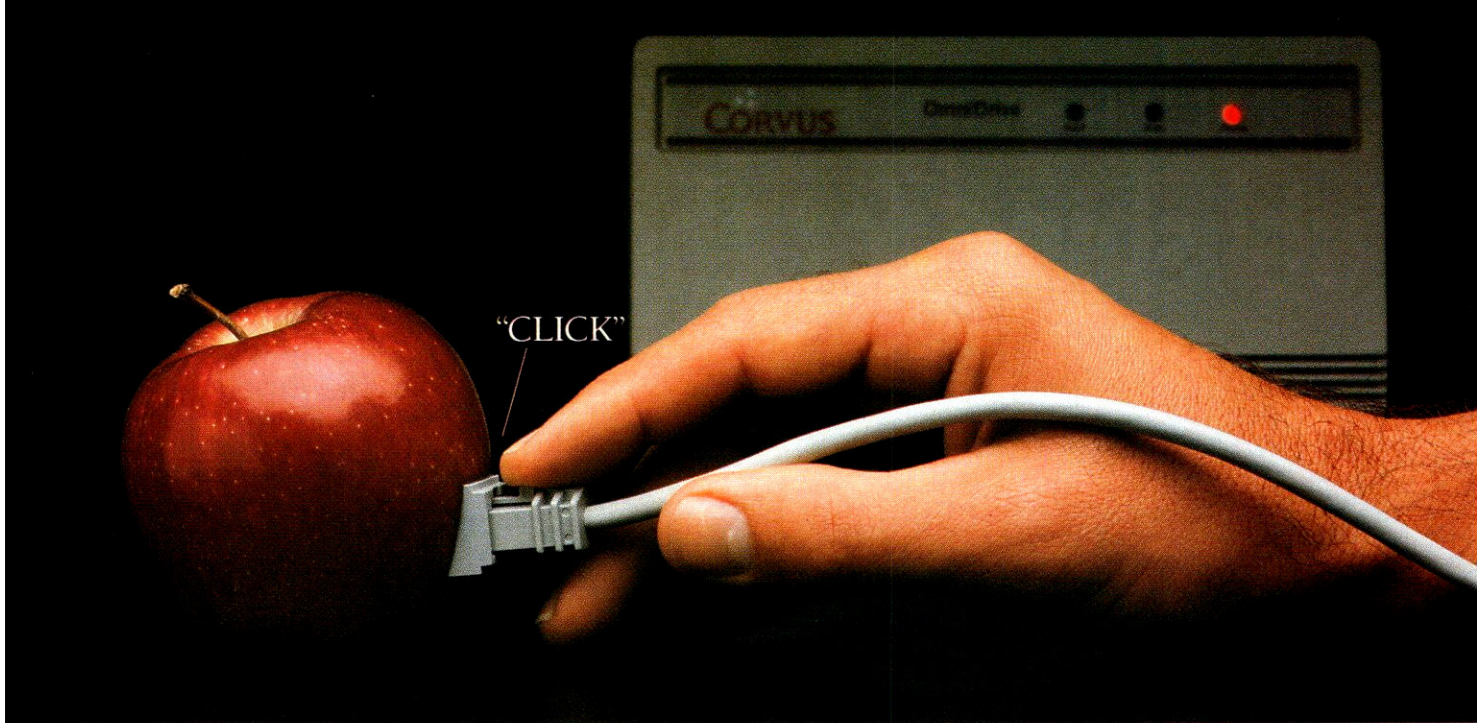
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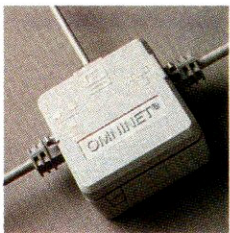
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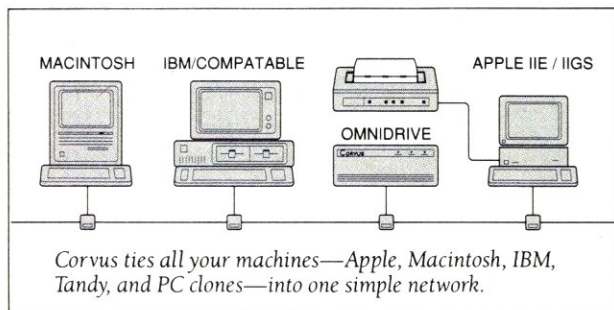
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monplace, software developers will feel free to create larger programs, since they will no longer be constrained by disk size.

ICON's writing program is undergoing an extension that will increase its size to several hundred megabytes. The program will be distributed on CD-ROM disks, each of which can hold 550 megabytes of information.

Educational file servers will probably be enhanced to provide program libraries and reference material on CD-ROM and will use traditional hard-disk technology to record class-generated files and records. To see the impact that such a setup could have, consider that each CD-ROM's 550 megabytes equals about 250,000 typewritten pages of text. Audio CD players are available for a few hundred dollars that can handle six compact discs at a time, so similar players are likely to evolve for CD-ROM. If so, each player could hold the equivalent of 1,500,000 pages of information, any word of which could be accessed within a few seconds. Now imagine that these disks contained the great works—Plato, Aristotle,

Disk failures on a network are generally catastrophic.

Lao Tzu, Shakespeare, the Bible, and so forth. A writer looking for a certain quote could find it quickly and could also browse through the surrounding material to see the context in which the quoted passage appeared. Reference material of this sort could be located in a central file server, where anyone who needed to see it could access it.

The Bad News

The first piece of bad news (as any owner of a hard-disk drive already knows) is that no matter how much disk space you buy, it isn't enough. Parkinson's Law ("Expenditure rises to meet income") applies to disk storage as well as to anything else in life. I have a 20-megabyte drive on my computer that holds only "essential" stuff. Within a month of buying the drive, I had filled 13 megabytes of space, and I now am lucky if I have more than 2 megabytes free. If I went to a 40-megabyte drive, I'd

probably fill the disk in a month.

Disk failures on a network are generally catastrophic. Since the restoration of a 20-megabyte hard disk takes about an hour (assuming you remembered to make a backup), a crash of the file server can essentially shut a school's computers down for the day.

A related issue: Who is going to maintain and control the network? Most schools haven't the resources to fund education properly, let alone fund equipment maintenance. You can't expect teachers to add "network czar" to their title without getting some release time to make sure everything is going properly. To get a glimpse of what can happen, talk to people who maintain an electronic bulletin board in their "spare time." It's not a pretty job!

The Complex News

Educators and administrators who think that a network will allow them to serve all their computers for the price of a single piece of software are in for a rude awakening. Software is usually sold like books—one copy per reader.

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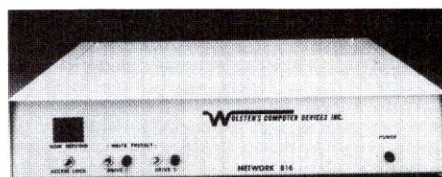
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*Most schools haven't
the resources to fund
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schools that buy one copy of a program and then make copies for distribution to many teachers. If the physical act of making a copy causes pangs of conscience in educators, this cue is absent once a program is installed on a fileserver. In principle, anyone connected to the fileserver has access to any program saved there. The opportunities for abuse are tremendous.

On the other hand, it is unfair for a vendor to base the price of its software on the total number of computers in a network if only a few of those computers use the program at any one time.

One solution to this dilemma is for software developers to establish a pricing policy that keeps track of multiple loadings. A program can be priced to run on any number of computers, from one on up to the network limit. For example, suppose a program comes with a five-unit license. If all five copies of the program are in use and more users want the program, they will get a busy signal until someone else's copy is released. Multiple loadings are fairly easy to monitor, and a policy of this sort may work in the best interests of educators and developers alike. (For other approaches to multiple-use licensing, see "Teachers' Toolbox" and "Software Issues: Prices, Licensing, and Updates" elsewhere in this issue.)

My fear is that, unless we find some equitable way to meet the legitimate needs of schools and software developers, commercial software support for educational networks will be modest at best.

We should take the time now, while educational networks are still in their infancy, to resolve this issue in a way that will increase the power and capability of the computers in our classrooms.

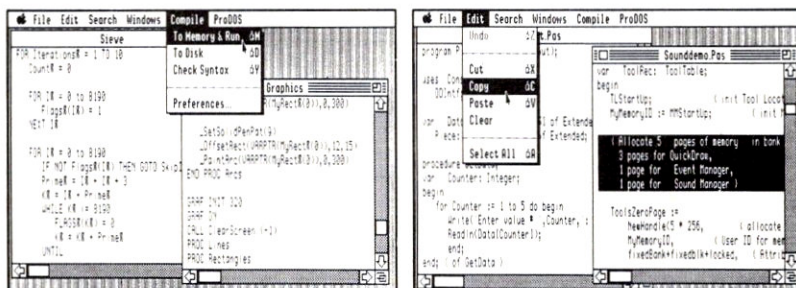
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The **A+** SECOND ANNUAL

'HOW I USE THE

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All entries must be 500 words or less in length, type-written, and double-spaced. And make sure your entry includes your name, address, telephone number, and the name of the category you are entering.

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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

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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.



AppleWorks Is Great!

But...

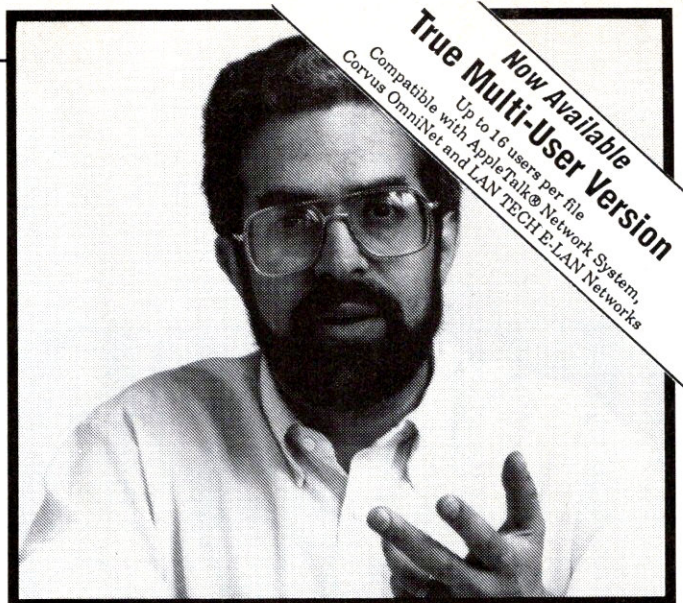
Let's face it. AppleWorks is a great program, but as a data base manager it leaves a lot to the imagination. Like, imagine more than 30 categories per record. (Lots more!) And using up to 30 screens in the single record display. Or scrolling left and right to see more fields in a multi-record display. And entering up to 250 characters per category.

ACE REPORTER

Imagine printing reports in almost any form: multiple-across mailing labels, columnar reports, mail-merge letters. Even complex forms like school or medical records or invoices. Reports that include free-form text, and printstyles like bold, large and underline, and every easy-to-use formatting option you're ever likely to need.

FORMULAS FOR SUCCESS

Imagine calculated categories—lots of them. Not just in reports, but within the records themselves, too. Using multiple levels of parentheses, and date math and string comparisons and other functions. Imagine reports with calculations based on subtotals and totals. Reports that can even group records by week, month, calendar quarter or year.



Barney Stone

Designer, DB Master

Now Available
True Multi-User Version
Up to 16 users per file
Compatible with AppleTalk® Network System,
Corvus OmniNet and LAN TECH E-LAN Networks

RELATIONAL? SENSATIONAL!

And if that's not enough, imagine a *relational* data base manager. One that does automatic look-ups and posting. Imagine an invoice file that looks up customer names and addresses in a customer file, then descriptions and prices in an inventory file, then posts quantities shipped and back-ordered back to the inventory file, and finally posts the amount due to the appropriate record in the customer file. Imagine doing this easily, without any programming.

RECOMBINANT DBM

Is your AppleWorks data split into several files? Imagine combining them into one convenient file. Do the AppleWorks files have different categories, so each record in one file has a corresponding record in the other file? And they really should have been a single record, but there were too many categories? Imagine combining them properly, so the information that belongs together is in one record.

DREAM ON!

Imagine that all of this, and much, much more, is available **right now**, in DB Master Version Five and DB Master Version Five *Professional*.

Sometimes wishes do come true!

DB Master vs. AppleWorks

Features and Maximum Capacities	AppleWorks	DB Master Version Five	DB Master Version Five Professional
■ RELATIONAL IMPORT (look-up) and EXPORT (posting) RULES	No	No	YES!
■ fields (categories) per record	30	200	200
■ max. record length (bytes)	1,024	2,000	2,000
■ screens per record	1	30	30
■ characters per field (category)	76	250	250
■ RAM or disk based?	RAM	Disk (1)	Disk (1)
■ passwords for file security	No	No	Yes
■ required fields	No	No	Yes
■ field validation rules	No	No	Yes
■ criteria per search or select	3	20-50	20-50
■ computed values within records	None	99 (2)	99 (2)
■ computed values per report	3	50 (2)	50 (2)
■ date calculations	No	Yes	Yes
■ field types	3	13 (3)	13 (3)
■ automatic date and time fields	No	Yes	Yes
■ current mon/day/year searches	No	Yes	Yes
■ report formats per file	8	255	255
■ multiple-across mailing labels	No	Yes	Yes
■ forms-style reports	No	Yes	Yes
■ report lines per record	15	255	255
■ calculations based on subtotals	No	Yes	Yes
■ free-form text in reports	No	Yes	Yes
■ print fields and/or free-form text in various printstyles	No	Yes (4)	Yes (4)
■ print simple bar graphs	No	Yes	Yes
■ multiple levels of header and footer lines for reports	No	Yes	Yes
■ include fields in header and footer lines	No	Yes	Yes
■ multiple levels of group subtotals in reports	No	Yes	Yes
■ add and/or delete fields without losing report formats	No	Yes	Yes
■ works with RAM disks	Yes	Yes	Yes
■ copy protected?	No	No	No

(1) up to 50 disks per file, 5 1/4", 3 1/2" or mixed; up to 10 megabytes per file on hard disk
 (2) use . * / > < < > AND, OR, NOT, SQR, ABS, SGN, INT, MIN, MAX, up to 7 levels of parenthesis; text comparisons, days-between dates, calculated dates, special "Current Date" function, etc.
 (3) text, 3 numeric types, \$/cents, yes/no, date, add date, edit date, add time, edit time, user-defined, label
 (4) underlined, bold, compressed, large, italics and user-defined print styles; depend on printer's capabilities

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A+ TEACHERS' TOOLBOX

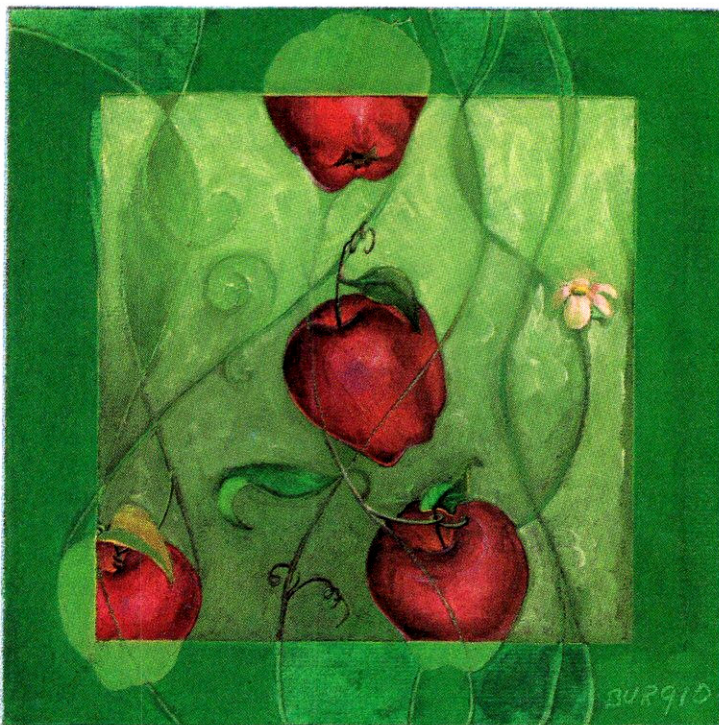
Are you considering a network for your class or school? This issue of *A+* is packed with information about the network options from which you can choose. Whether you go with AppleTalk, Corvus, or one of the "other guys," you will have to become familiar with the hardware, the network system software, and the management and installation of curriculum software on the file server.

Today, a lot of networkable software exists to meet most curricular-area needs as well as the productivity needs of teachers and administrators. The system software that comes with the network fileserver is a disk-management program that creates the medium for using software in the network. It lets registered users share programs, data files, hard-disk space, and printers—while they maintain private directories or volumes of their own. Just how the registered users access and use network files is often up to the person handling the network-management software, usually a teacher or network administrator.

When you are making decisions regarding the purchase or installation of a network, take the time to look at *curriculum-management* software. This kind of software is much different than the system-management software. In general, curriculum-management software is built around preexisting educa-

Classroom essential: curriculum-management software

BY JENNIFER BRAWER



tional software programs and actually manages the delivery of lessons according to a sequence of learning objectives. This type of software also tracks student performance and performs record-keeping functions that are not available on networks running curriculum software solely within the system-management-software parameters.

You can't add just any networkable program to a curriculum-management system yourself. The addition of programs to the system is handled by the developer of the

curriculum-management system. In most cases, you actually mail in your hard-disk drive for upgrades of the courseware. You can, however, install software programs on your network hard disk that do not work with the curriculum manager. You can install them yourself, and they work perfectly but independently of the managed software.

The three types of users in a curriculum-management system are system managers, teachers, and students. Each group of users has a different area of access to the software. System managers and teachers have access to the curriculum-management options, but students do not. The management system organizes courseware into meaningful assignments; coordinates teachers, their classes, and corresponding assignments; enrolls students in classes and tracks their progress; and, finally, organizes and prints detailed reports and summaries.

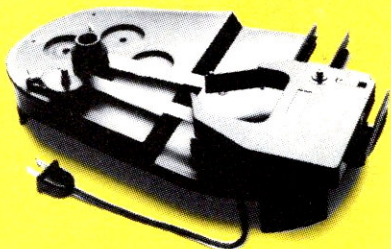
One-Stop Network Shopping

Those of you already familiar with networks may recognize the company names Computer Network Specialists (CNS) and Ideal Learning, Inc. Their software is fairly prevalent on installed Corvus networks. CNS and Ideal Learning provide a one-stop-shopping approach to LAN (local-area network) purchases for schools, in that they offer network hardware; system and curriculum-manage-

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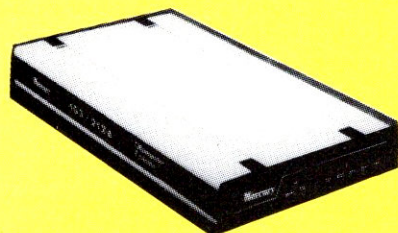
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The cost of a network depends on its size and on the amount of courseware you buy.

ment software; curriculum software; teacher training; and follow-up customer support for hardware, system, and curriculum software.

For those of you who are wondering what is available for Apple Computer's new network, both of these companies are working on AppleTalk products.

ClassWorks

CNS markets a curriculum-management package called ClassWorks (formerly Master Curriculum Manager), a computer-aided-instruction (CAI) software-management tool for Apple II networks. Currently, ClassWorks operates under DOS 3.3, which makes it practical for educational settings, since most Apple II educational software is DOS 3.3-based. ClassWorks manages curriculum packages from more than 20 different educational publishers, including Hartley, Milliken, Random House, DLM Teaching Resources, and Educational Activities. These K-12 software packages contain lessons that target specific math, reading, and language-arts skills. Speech output is available with the reading programs that contain a phonics component, but you'll need extra hardware, a Super-Talker from CNS.

ClassWorks is a flexible program with easy-to-follow documentation. Teachers and system managers can set and change default settings for individual students or for everyone using the system. For example, you can alter the sequence of lessons or adjust students' progress through the lessons according to your own mastery or review criteria. You can even set the system to a Pretest/Posttest mode that lets you perform diagnostics and evaluation.

Two important ClassWorks features are the student-information and student-assignment matrices, which are for tracking and customizing student assignments. As soon as students enroll in a class, they get their own student matrix with default assignment settings that

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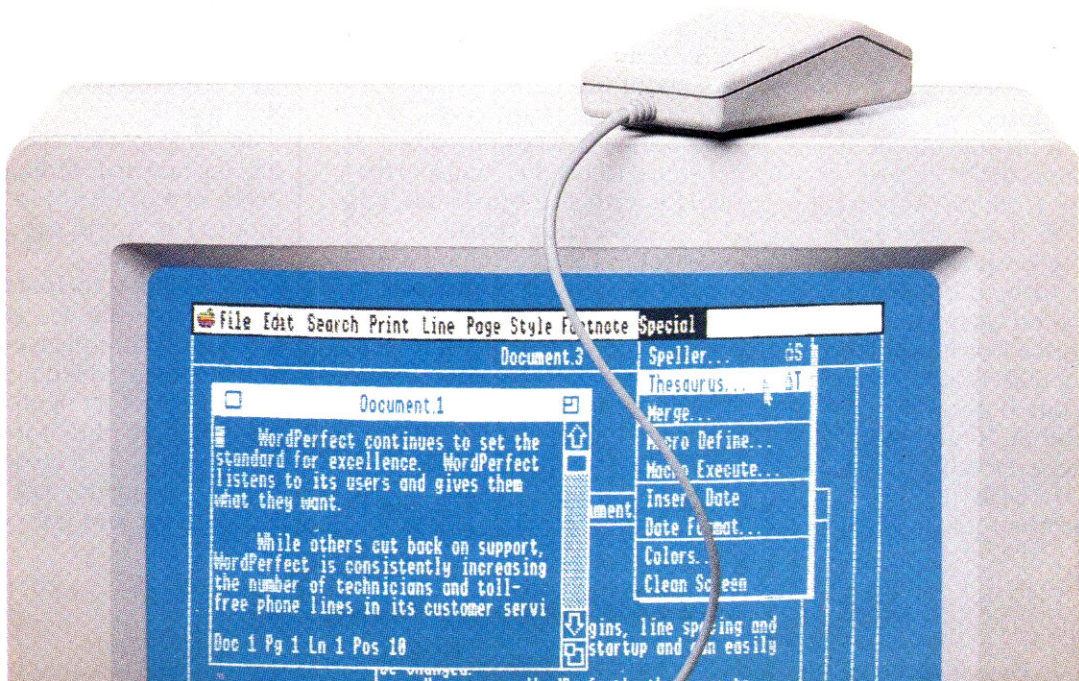
perform scores of other functions like mail merge, macros, on-screen formatting, super/subscript, automatic page numbering, and more.

WordPerfect Flexibility.

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

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

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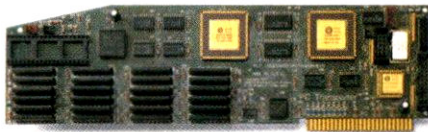
Now your Apple II can run over 10,000 programs you could never use before. Like Lotus[®] 1-2-3[®], MultiMate[®], dBASE III PLUS[®], Even Flight Simulator[®].

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

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

Less expensive than an IBM clone.

Sure, a stripped-down IBM



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

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

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

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

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

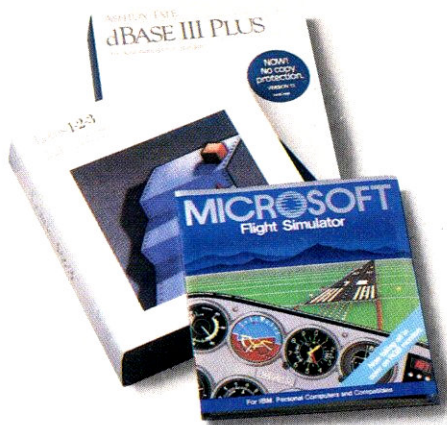
Plenty of power.

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

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

Easy to install.

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



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

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

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

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

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

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

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



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

You can even use our 360K PC compatible drive for ProDOS

Make your Apple speak IBM.

PC Transporter memory choices.

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

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

IIGs Installation Kit 49.00

IIE/II Plus Installation Kit 39.00

PC Transporter Accessories

5.25" IBM Format 360K Drive Systems

Single-Drive System 269.00

Dual-Drive System 399.00

Half-Height Drive 135.00
(add to Single-Drive system to make Dual-Drive)

IBM-Style Keyboard 139.00
(required for Apple II Plus. Requires IBM Keyboard Cable.)

IBM Keyboard Cable 34.00

Sony RGB Monitor 499.00

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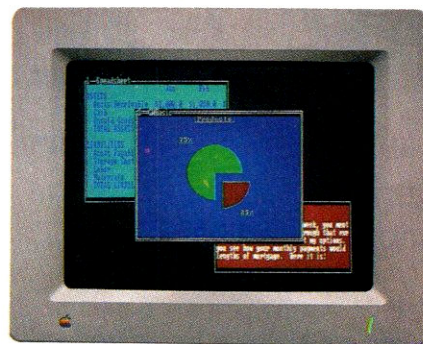
ColorSwitch 44.00
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Heavy Duty Power Supply 69.00
(IIE and II Plus only)



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

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

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

Created by Apple's original designers.

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

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

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

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

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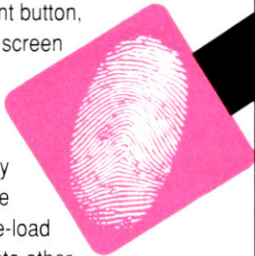
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Press the Fingerprint button, instantly freeze the screen and enter the GSi desktop without exiting from the application. Instantly dump screens to the printer, to disk, or re-load captured screens into other applications. Press the escape key and return to the application where you left off.



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Desk accessories in the GSi desktop include a typewriter (to type labels and add text to captured screens); a calendar with past, present and future dates; and a calculator.

The Fingerprint® GSi multifunction card plugs directly into slot 3 (or any other open slot) and is ready to use immediately. The GSi manages the two GS serial ports and an auxiliary Fingerprint serial or parallel card. The GSi will not interfere with the operation of any software or operating systems. Fingerprint models are available for the Apple IIe, IIc, and II+.

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the teacher can modify. As students progress through a lesson sequence, the system tracks their performance and progress results on their matrix. The matrices also contain information for the reports ClassWorks can generate: Assignment Results, Class Roster, Class Status, Class Summaries, Mastered Objectives, and Objective Range (the range of mastered assignment objectives).

Integrated Classroom Learning System

The Integrated Classroom Learning System from Ideal Learning, Inc., has management capabilities similar to those of ClassWorks. It organizes CAI software into lesson plans based on individual teacher objectives; offers curricular sequences for language, reading,

One teacher and a single network can serve many students, who share peripherals such as disk drives.

math (including calculus), science, and foreign language (currently Spanish and German); and generates a variety of reports.

In addition to CAI programs in the listed curricular areas, Ideal Learning offers a special product called Writer's Network. Writer's Network is a complete, interactive, multiyear writing curriculum designed to teach writing according to the latest research. An "error profile" that automatically accompanies each student essay decreases the work load of teachers who use Writer's Network. The profile includes information on the ratio of "to be" verbs, a "vague word" index, sentence lengths, and word frequencies. The program also logs teacher comments and grades.

Ideal Learning differs from CNS in that the former develops its own educational software. The Integrated Classroom Learning System manages Ideal Learning's own software as well as other products from third-party developers. Ideal Learning also provides a unique service option with its software. If you buy its curriculum-management software and courseware, the

company will provide a custom correlation of objectives to your school or district curriculum. Two other valuable features of Ideal Learning's CAI courseware are a diagnostic test-scoring and reporting system and an authoring system that allows teachers to add supplementary lessons.

Worth the Cost

A network requires a major expenditure, whose total depends on the size of your network and the amount of courseware you buy. Where you save money is in the increased efficiency of instructional delivery and reduced costs for peripherals. One teacher and a single network can serve many students, who share peripherals such as disk drives and printers. The sophistication of the report functions and the absence of disk management also free teachers from many purely administrative responsibilities. +

VITAL STATISTICS

ClassWorks

Computer Networking Specialists, Inc. (CNS)
Rt. 1, Box 286-C
Walla Walla, WA 99362
(800) 372-3277
In WA (509) 529-3070

List Price: contact company for prices of custom installations

Requires: Apple IIe or IIGS with 128K RAM as "master computer"; Apple II Plus, IIe, or IIGS computers with 48K RAM as student "workstations"; printer; network system.

CIRCLE READER SERVICE NO. 358

Integrated Classroom Learning System

Ideal Learning, Inc.
5005 Royal Lane, Suite 130
Irving, TX 75038
(214) 929-4201
or
327 South Marschall Road
Suite 200
Shakopee, MN 55379
(612) 445-2690

List Price: contact company for prices of custom installations

Requires: Apple II Plus, IIe, or IIGS with 128K RAM and one disk drive as "teacher station"; Apple II Plus, IIe, or IIGS with 64K RAM as "student station"; network system.

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CIRCLE 160 ON READER SERVICE CARD



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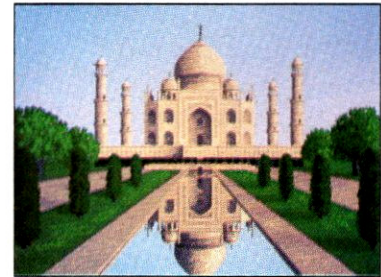
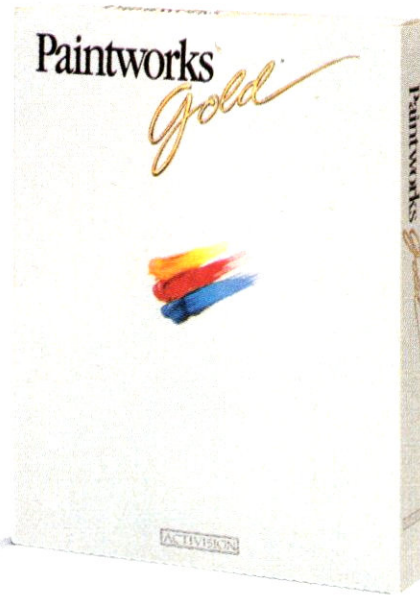
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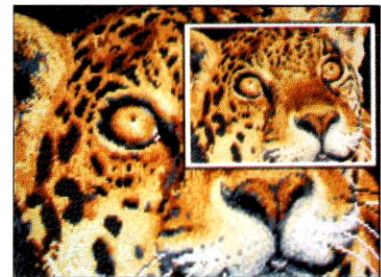
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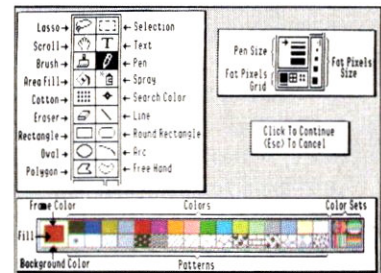
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*Five alternatives
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APPLETALK CABLING SCHEMES

The AppleTalk Network System works with a variety of cabling schemes. The most common one uses the LocalTalk cable and connectors Apple sells (see figure 1). In this article, I look at what's inside a LocalTalk connector and suggest alternative, money-saving cabling schemes you might want to use in your Apple II AppleTalk network. I'll also share my ideas on whether you should bypass AppleTalk altogether if all you need to do is communicate with a LaserWriter.

One of the ruder surprises that greets AppleTalk network users is that the LocalTalk cables for hooking up your Apple II to a LaserWriter may cost as much as \$150. Yet this \$150 may be an unneeded expense for many people most of the time. In fact, you can connect a LaserWriter to AppleTalk by using nothing but three pieces of doorbell wire—at near-zero cost!

Two Myths Shattered

Here's a look at what's in Apple's magic cables and connectors, followed by five conventional and not-so-conventional alternatives to the stock LocalTalk cables and connectors. (A LocalTalk connector is a connection box with a short built-in cable that plugs into the computer.) But first I want to shatter two networking myths.

Myth #1 says that you must use the AppleTalk network to use a LaserWriter. This myth is totally, absolutely, and positively untrue. You can easily and rapidly communicate with a LaserWriter from any old serial port on any old personal



Figure 1: A LocalTalk connector, showing the connection box and drop cable. The drop cable connects to the IIe or IIgs.

computer at speeds up to 57,500 baud.

Myth #2 says that AppleTalk is faster than plain old 9600-baud serial communications. This myth falls by the wayside, though, assuming that you are using the current AppleTalk firmware with typical applications.

In theory, the AppleTalk baud rate is way up there at 230 kilobaud if you're using LocalTalk cable. Thus, you would somehow expect at least a 24:1 speed advantage over a 9600-baud serial connection. In

the real world, however, the AppleTalk firmware's handshaking and software overhead can sometimes gobble up this 24:1 speed advantage and then some. Thus, what really matters is the overall "click to clunk" time, not just the baud rate.

To prove this point, I took Meowrrrr, a feline I'd designed with the LaserWriter's PostScript page-description language, and printed him through LocalTalk and then through some serial ports. The results were surprising, to say the least (see figure 2).

On a LaserWriter Plus with version 47 of PostScript, the repeat copies of Meowrrrr took 90

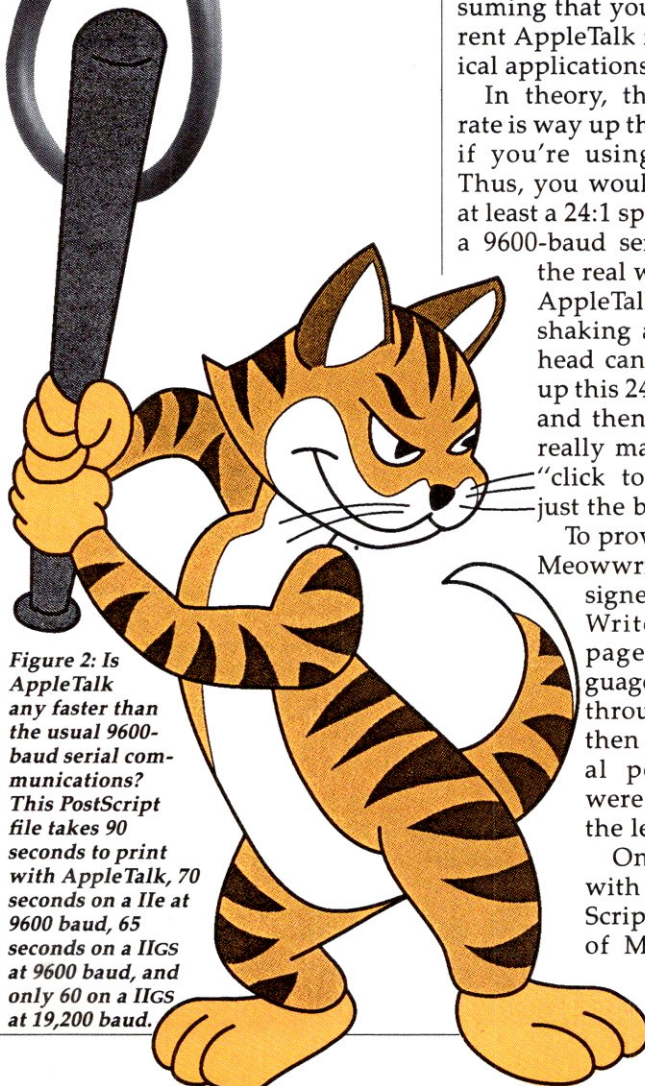


Figure 2: Is AppleTalk any faster than the usual 9600-baud serial communications? This PostScript file takes 90 seconds to print with AppleTalk, 70 seconds on a IIe at 9600 baud, 65 seconds on a IIgs at 9600 baud, and only 60 on a IIgs at 19,200 baud.

NETWORK

seconds to print under AppleTalk with LocalTalk cable. Compare this result with the times I got when I used a standard serial-interface cable: 70 seconds on a IIe at 9600 baud, 65 seconds on a IIGS at 9600 baud, and 60 seconds on a IIGS running at 19,200 baud.

If you go to very large files, particularly ones that involve PostScript halftones or bit maps, then AppleTalk starts to show a modest

speed advantage over 9600 baud.

Since today's AppleTalk often has no speed advantage whatsoever over standard serial communications, I certainly expect Apple to clean up its act sometime in the future and give us some faster networking code.

Today, though, far and away the fastest method for driving a Laser-

Writer is to use a IIGS at 57,500 baud, going out the game-paddle port by way of "bare metal" hand-crafted machine-language code. I leave creating such a setup as an exercise for Apple II hardware hackers everywhere!

I don't mean to say you should never use AppleTalk. AppleTalk is well suited for networking over longer distances, where several different hosts and peripherals must share each other. You also need it to use an AppleShare file server. The usefulness of a LaserWriter diminishes dramatically if you cannot reach out and touch it from your workstation, though, and standard A-B serial switch boxes and serial communications can often be an inexpensive alternative to true networking.

So, your first and by far cheapest alternative to LocalTalk cables is simply to avoid using the AppleTalk network in the first place.

Inside That Lump

Perhaps you really do need long-distance communication, with several hosts using a common printer and sharing a file server. In such a situation, AppleTalk is for you. Your goal now should be to minimize your cabling costs.

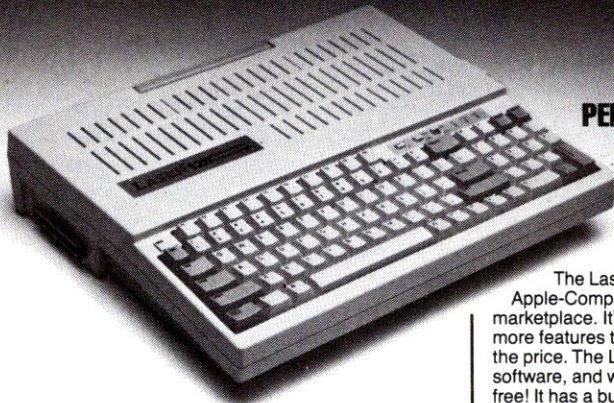
By now, you've probably seen that ominous-looking lump in the stock LocalTalk connectors. What is in that lump? What makes it so special?

Figure 3 bares all. Inside the lump is a 50-cent transformer, a couple of resistors and capacitors, and some connectors and switches. And that's it.

The transformer is there for safety and noise isolation. It also creates a "balanced" high-frequency signaling system that is immune to external noise. In order to avoid any cable reflections, the transformer switches in a 100-ohm resistor if only a single output cable is in use.

Your second method of reducing AppleTalk cable costs is to build up clones of the figure-3 circuit on your own. Chances are you can use a Hong Kong audio-interstage transformer instead of that fancy toroidal job in the figure. If you do get into any serious home-brew cabling, be sure to check out the good folks at Redmond Cable. They

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NETWORK

stock the mini circular 8 and DB9 plugs you'll need, besides also offering a wide variety of stock and custom interface solutions.

Alternatively, you can save a little money by buying compatible cables and connectors from third-party sources such as AESP, Inc., or Monster Cable Products, Inc.

Using Twisted Pair

In the long run, the only economically acceptable cable I recommend for local-area networks is the extra twisted-pair lines the telephone company installed when it hooked up your telephone.

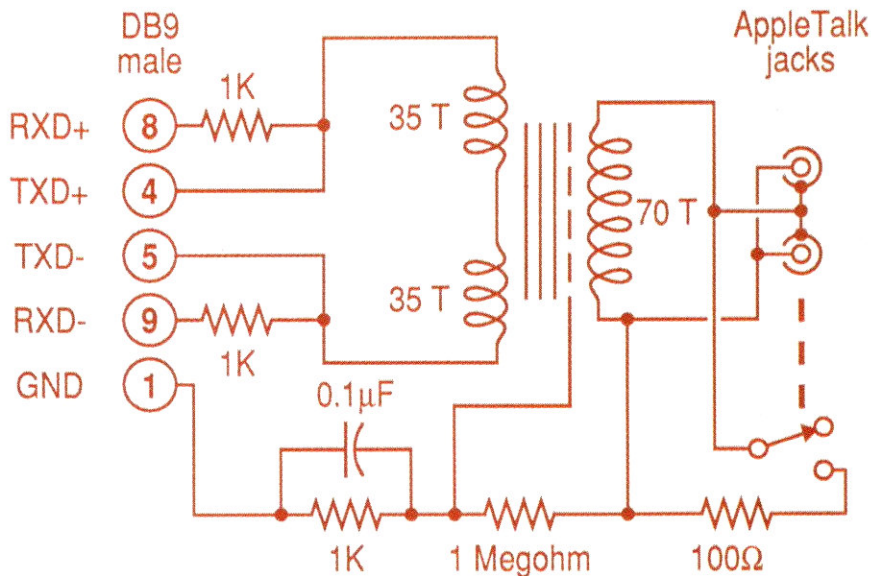
Fortunately, AppleTalk works quite nicely over unused telephone lines, making all of those expensive LocalTalk cables unnecessary in many situations. So, the third approach to AppleTalk cabling involves substituting your extra phone lines or using ordinary twisted-pair wire. This scheme is the one the *A+* editorial staff uses, by the way.

An interesting series of products from the Farallon Computing peo-

ple lets you substitute ordinary telephone lines for the fancy LocalTalk cables. Besides lower-cost con-

nectors that terminate in ordinary telephone plugs, they also have repeaters that allow you to go well beyond the 3000-foot limit of LocalTalk cables.

Figure 3: Schematic for the stock LocalTalk drop cable. The balanced transformer provides both isolation and noise immunity.



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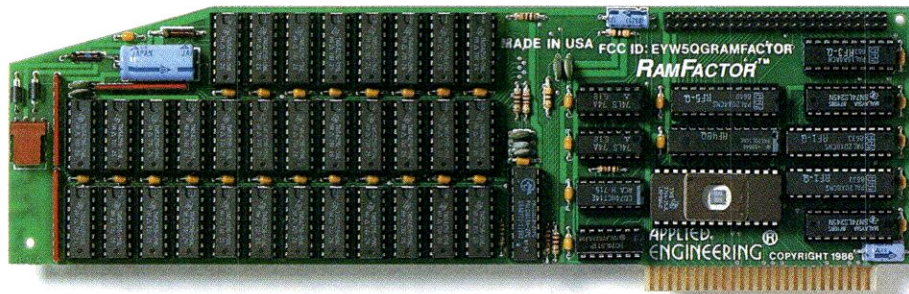
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NETWORK

Using a Null Modem

You may simply want to use AppleTalk to connect one printer to a close-in host. If the distance is very short and everything is plugged into the same grounded outlet strip, you can substitute a standard null-modem cable for the LocalTalk connectors.

This fourth cable solution appears in figure 4, which shows schematics for three null-modem

cables. One of these cables goes from a DB9 to a DB9 connector, one goes mini circular 8 to mini circular 8, and the final one is a DB9-to-mini-circular-8 adapter combined with a null-modem cable.

These cables are available from a variety of sources. Besides Redmond Cable, you might check out the Micro Computer Cable Compa-

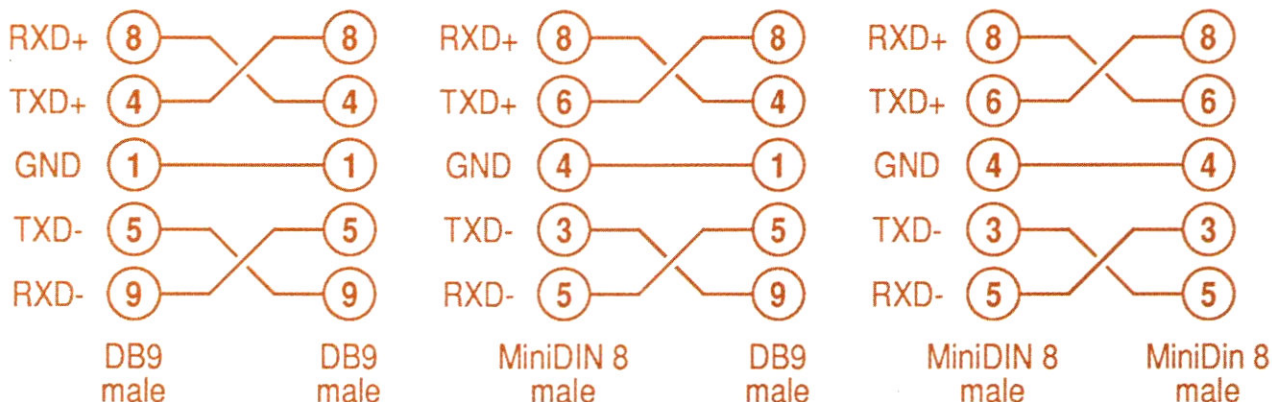
ny. Null-modem cables can cost as little as \$5.50 in single quantities.

Once more, though: Do not use a null-modem cable as a LocalTalk substitute unless (1) only one computer and a single peripheral are in use and (2) both are always plugged into the same grounded outlet.

Cheater Cords

Figure 5 shows my final solution to the AppleTalk cable problem: an

Figure 4: You can use a null-modem cable if there are only two users on the line and if both are plugged into the same grounded AC outlet strip. This figure shows three variations.



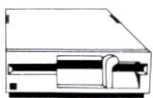
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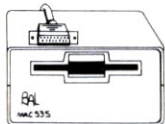
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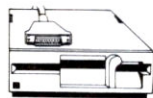
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CIRCLE 167 ON READER SERVICE CARD

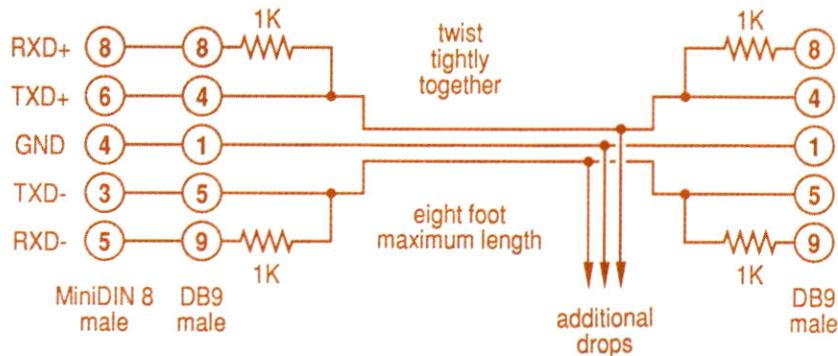


Figure 5: You can build this LocalTalk "cheater cord" at almost no cost. It lets you connect two, three, or more stations to the network. But all stations absolutely MUST be plugged into the same grounded AC outlet, and operation beyond a few feet is not recommended.

el-cheapo home-brew doorbell-wire substitute I use that fakes the cable and connectors for two, three, or more AppleTalk talkers and listeners. This "cheater cord" automatically adapts DB9 to mini circular 8 or vice versa.

As with a null modem, this method offers no safety isolation, so every talker and listener on the net must always be plugged into the same grounded outlet strip. I definitely would not try going

more than a few feet with such a setup, but it's certainly cheap and does work well when your local-area network is truly local. +

Microcomputer pioneer Don Lancaster is the author of 25 books and countless magazine articles. He maintains a no-charge Apple IIGS, PostScript, and laser-printing voice help line at (602) 428-4073. He welcomes calls from A+ readers, 8-5 weekdays, Mountain Standard Time.

FURTHER INFORMATION

AESP, Inc.
1680 N.E. 205th Terrace
North Miami Beach, FL 33179
(305) 653-0898

Farallon Computing
1442A Walnut Street #64
Berkeley, CA 94709
(415) 849-2331

Micro Computer Cable Company
16018 Huron River Drive
Romulus, MI 48174
(313) 941-6500

Monster Cable Products, Inc.
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(415) 777-1355

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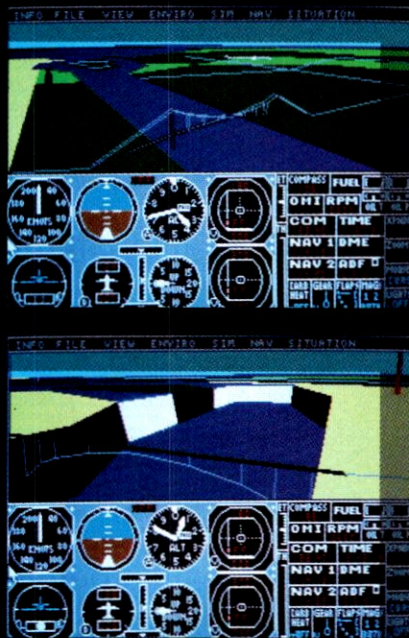
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CIRCLE 110 ON READER SERVICE CARD

PICK OF THE CROP
BY PETER TUCKER

This month brings you early-learning, macro-assembling, database-managing, desktop-publishing, and flight-simulating software.

PRODUCT SPOTLIGHT

DESKTOP PUBLISHING

From Timeworks comes Publish It!, an extensive desktop-publishing program that allows you to edit, design, lay out, and print attractive-looking documents.

The software's built-in layout tools allow you to

position and resize elements on the screen, seeing exactly what the finished document will look like. Publish It! includes sample formats for newsletters, business reports, brochures, and forms.

You enter text into documents directly with the built-in word-processing program, or you import it

from an AppleWorks or other ASCII text file. The program contains a graphic tool box for drawing lines, circles, or rules, as well as obtaining fill patterns. You can also import graphics from Dazzle Draw, The Print Shop, or other double-hi-res drawing packages.

Printouts are evidence of a high-density print format (72 x 120 dots per inch) that provides a clean, attractive ImageWriter original. The Publish It! Laser Pack, allowing LaserWriter printouts, is scheduled for release later this year.

Publish It! comes with six attractive typefaces, each available in a variety of point sizes. You'll also find

32 files of ready-made artwork, covering animals, people, signs, and symbols. **Publish It!**

List Price: \$99.95

Requires: Apple IIe, IIc, or IIGs; 128K RAM; mouse or joystick. 5¼-inch or 3.5-inch disk drive.

Timeworks
444 Lake Cook Drive
Deerfield, IL 60015
(312) 948-9200

CIRCLE READER SERVICE NO. 410

MAKE A LIST AND CHECK IT TWICE

Activision announces List Plus, a new database manager for the Apple IIGs.

With List Plus, you can maintain, organize, or report information—from simple address books to complex customer lists and sales records.

It gives you up to five different ways to display information, allowing you to switch immediately from one to another.

The program can read AppleWorks-compatible data and ASCII files automatically, with the record and file size limited only by available memory. Up to four different windows can be open at a time, which means you can work on multiple lists.

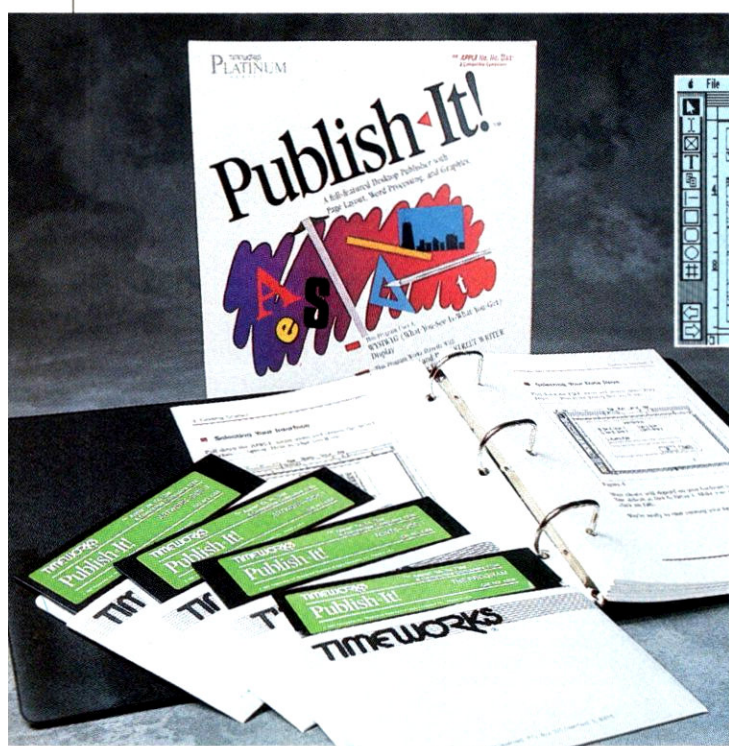
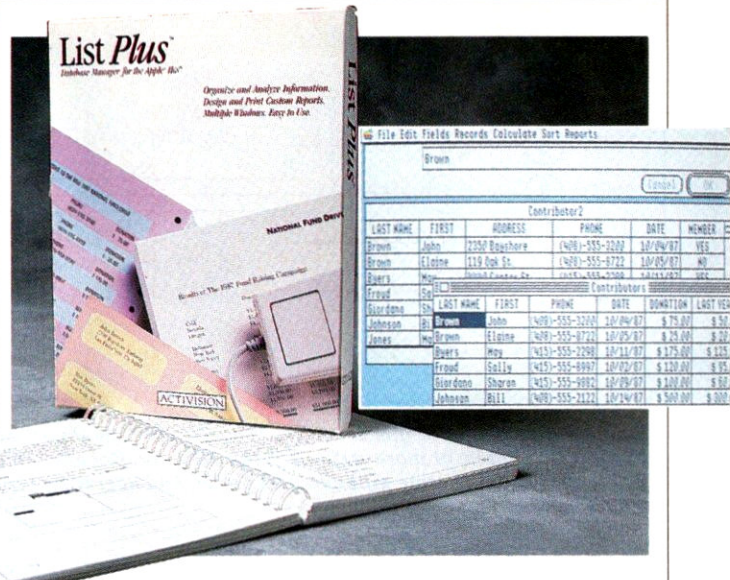
The List Plus package also comes with eight pre-designed templates ready for data entry, including an address list, class roster, customer and sales information, and home inventory. List Plus reports can print on an ImageWriter or LaserWriter.

List Plus
List Price: \$99.95

Requires: Apple IIGs; 768K RAM with 2.0 ROM installed, one 3.5-inch disk drive. ProDOS 16; not copy-protected.

Activision, Inc.
P.O. Box 7287
Mountain View, CA 94039
(415) 960-0410

CIRCLE READER SERVICE NO. 411

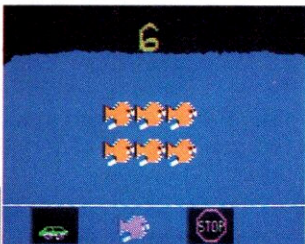
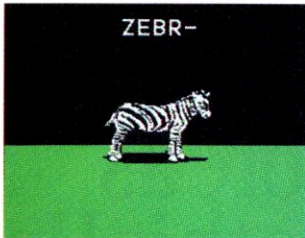


STEPPING STONES

Parents of children from 2 to 7 will appreciate Stepping Stones from Compu-Teach. Two separate packages, each with three colorful programs, provide a strong introduction to letters, words, and numbers.

Level I provides your preschooler with three complete learning programs. ABsCenes teaches the alphabet at three different skill levels, ArithMATIC: Counting introduces numbers and basic math concepts, and Word Pieces offers simple three-letter words and word sounds.

For children ages 5-7, Stepping Stones continues with Level II: fundamentals of words, math, and sentences. Like Level I, the package contains three different programs. Pictionary is an early-reading game,



ArithMATIC Addition demonstrates addition as an extension of counting, and Sentence Wizard builds sentences associated with animated illustrations.

Stepping Stones Levels I and II

List Price: \$39.95 each
Requires: Apple II Plus, IIe, IIc, or IIgs; 64K RAM; one 5¼-inch disk drive.
 Compu-Teach Corporation
 78 Olive Street
 New Haven, CT 06511
 (800) 448-3224

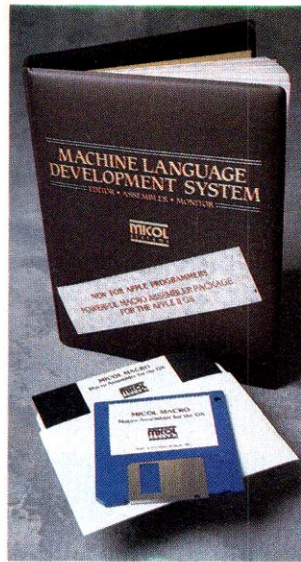
CIRCLE READER SERVICE NO. 412

THE RIGHT TO ASSEMBLY

Designed for programmers working in assembly language, Micol Macro offers an integrated text editor, monitor/shell, and self-relocating macro-assembler package.

You create programs with the full-screen editor and then assemble them with the macro assembler. Communication with the system is via the monitor/shell.

Files the assembler creates are special Micol load files that accept multiple ORG statements. You can create relocatable programs that load at the lowest available area of memory or at the exact location you specify. In addition, you can create SYS files for loading by ProDOS.



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Micol Macro comes on both 3.5- and 5¼-inch disks, complete with extensive documentation and sample programs.

Micol Macro

List Price: \$49.95
Requires: Apple IIgs, 512K RAM, one 3.5-inch or 5¼-inch disk drive.
 Micol Systems
 9 Lynch Road
 Toronto, Ontario
 Canada M2J 2V6
 (416) 495-6864

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FLYING WITH FLIGHTSTICK

Whether you're out for a relaxing cruise in your Cessna or engaged in deathly combat in your F-15, FlightStick from CH Products gives you the look, feel, and action of the real thing.

FlightStick features a realistic, comfortable pistol grip, with convincingly smooth action. The strategic placement of the trigger and fire buttons gives you immediate tactile and audio feedback. You can also use the FlightStick with graphic applications, should the creative mood strike.

Other features include a five-foot cable, dual-axis trim controls, and linear potentiometers rated at four million life cycles (whatever that means!).

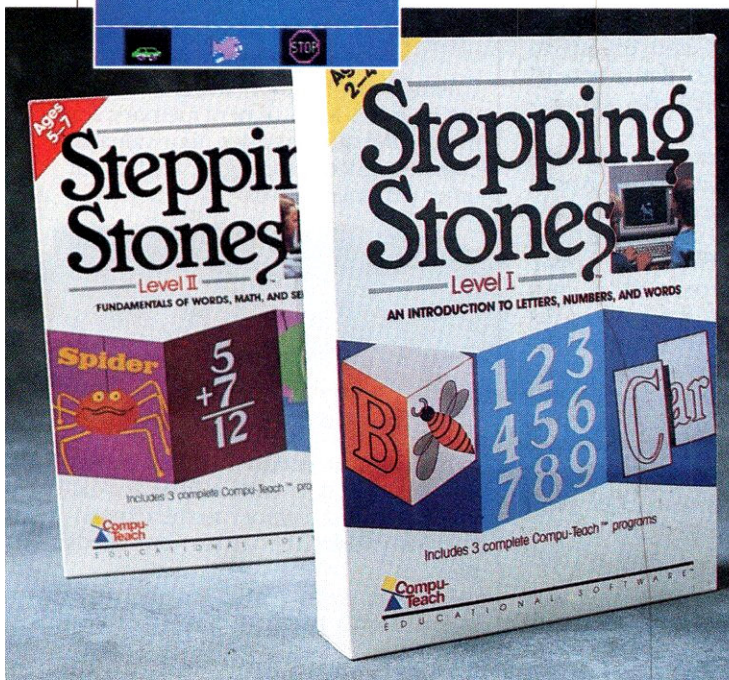
FlightStick

List Price: \$74.95

CH Products
 1225 Stone Drive
 San Marco, CA 92069
 (619) 744-8546

CIRCLE READER SERVICE NO. 414

FOR MORE PRODUCT INFORMATION, SEE "ROUNDUP," PAGE 134.





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No other expansion board, not even

Apple's, gets so much out of AppleWorks.

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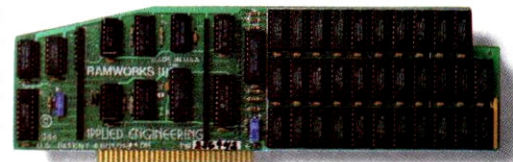
Autosegments large files.

RamWorks automatically segments large files so they can be saved on two

or more disks. When you need to work with the file, you simply load it in the same sequence you saved it.

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

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



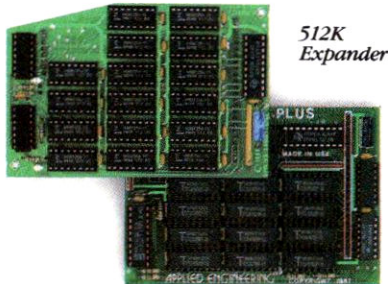
RamWorks III expansion board

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

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

more memory than most people ever use. (1 MEG is about 500 pages of text.)

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



2 MEG plus Expander

Recover your investment in the wrong card.

Most of it anyway.

If you bought some one else's RAM card — one that's not recognized by your programs — RamWorks III can help recoup your loss. Pull the memory chips off your old card and plug them into RamWorks III.

Truly compatible.

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

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

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



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

Steve Wozniak, the creator of Apple Computer.

Easy to install and use.

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

RamWorks III comes with every-

thing you need to get up and running. The easy-to-understand manual shows you how to get the most from your new memory. The two accompanying 5¼" disks include a graphics utility program, AppleWorks enhancement program, ProDOS and DOS 3.3 RamDrive™ and other useful utility software.

Superior color graphics, more readable text.

The ColorLink™ RGB option gives brilliant, sharp graphics and text.

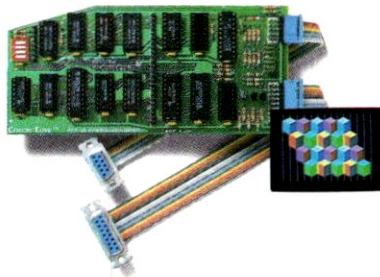
It meets all Apple standards for RGB output control. So it's compatible with more off-the-shelf software.

You can use Apple or IBM RGB monitors. ColorLink provides Apple standard analog and IBM standard digital RGB outputs (cables included).

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

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

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



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

Optional 16 bit power.

You can explore powerful programming possibilities with Applied's optional 65C816 card. It's capable of linearly addressing more than 1 MEG.

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

The RamWorks basic® alternative.

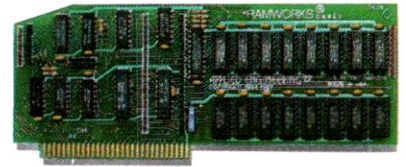
Need power but not all the capabilities of RamWorks III? Look at RamWorks basic. It has the same performance features as RamWorks III, it's attractively priced and it's available with up to 512K memory.

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Pinpoint with RAM Enhancement Software	\$ 79
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type

```
name = string[20];
```

```
House = record
```

```
  bedrooms: integer;
```

```
  baths: integer;
```

```
  den, kitchen, dining_room: b
```

```
  price: real;
```

```
end;
```

```
matrix = packed array [1..10, 1
```

```
  address = integer;
```

```
phone_number = record
```

```
  area_code, prefix: 0..999;
```

```
  number: 0..9999;
```

```
end;
```

TWO PASCALS

When the Apple IIGS first came out, you had to be an assembly-language jockey to write programs for it. Fortunately for those of us who want to program that machine in a higher-level language, several other programming options are now available, including two excellent versions of Pascal.

Pascal, a highly structured language designed to promote good programming habits, sees frequent use as an instructional language in an academic environment.

The two versions of Pascal for the Apple IIGS—Orca Pascal and TML Pascal—are both *compilers*. A compiler takes the program you have written in Pascal, known as *source code*, and converts it to the only real code the Apple IIGS understands, *machine language*. This

FOR THE IIGS

SOFTWARE BY MICHAEL FISCHER

*The Orca Pascal and
TML Pascal compilers*

conversion takes place as part of the programming process and results in a long development process but a fast-running program.

(By contrast, Applesoft BASIC and GS BASIC are both *interpreted* languages. The translation of the source code for these languages, which takes place when the program runs, results in a noticeably slower-running program.)

Editing Environment

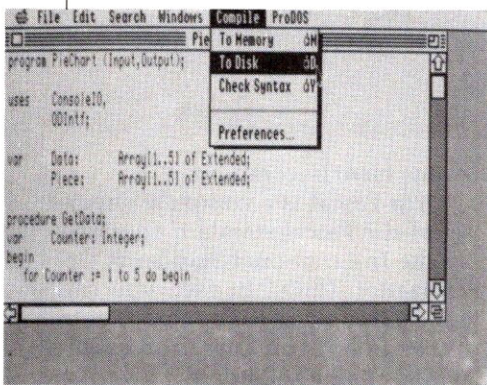
TML Pascal comes in two versions. One runs under the shell of the Apple Programmer's Workshop (APW) and uses the editor and linker that come with that system. You must buy APW (available for \$100 from the Apple Programmers' and Developers' Association) or the Orca/M GS system to run this version of TML Pascal. Orca/M

is a programming environment that is almost the same as APW.

The other version of TML Pascal (known as TML Integrated) doesn't require APW and comes with a built-in editor; it functions as a full-fledged Apple IIGS desktop-style application. You use the mouse to make selections from the menu and enter the program text into one of several windows that can be open on the desktop. The compiler and linker are built into this system and are invoked when you select them from a menu. This version of TML Pascal is nearly, but not quite, the same as the APW version. One difference is that the APW version lets you link other files such as assembly-language code segments to your programs.

Orca Pascal, as of this writing (January 1988), comes in a version that runs either under APW, Orca/MGS, or by itself in an environment that is much like APW. Orca has also announced a desktop version, much like the TML integrated version. I was able to review a beta-test version of this latter program while writing this article. You should carefully check any statements I make here about features of the desktop Orca Pascal against the actual released version of the program.

The APW shell, under which Orca Pascal and the APW version of TML Pascal run, is a powerful development environment. It is also complex. If you are an experienced programmer who needs substantial power, you should consid-



TML Pascal compiles to memory or disk.

er the APW versions of Orca or TML Pascal. Otherwise you should consider the integrated or desktop versions. I will not be reviewing the operating environments for the APW versions of the programs because they are the same.

MENU FUNCTIONS IN BOTH ORCA PASCAL AND TML PASCAL

File actions

- New
- Open
- Close
- Save
- Save As
- Revert
- Delete
- Quit

Edit actions

- Undo
- Cut
- Copy
- Paste
- Clear
- Select All

Window actions

- Tile
- Stack

Find actions

- Find
- Replace
- Goto

Other actions:

- Compile to memory
- Compile to disk
- Check for errors

Significant Differences

The table above lists the system commands common to the desktop versions of both programs; despite these similarities, the two systems have significant differences.

TML Pascal allows you to compile a new desk accessory (NDA) and test it without placing it in the desk-accessory folder and rebooting the system. This capability saves you much time when you're developing and testing an NDA. TML Pascal also allows you to rename a file, launch another program without returning to the Finder, and get information such as the source-file size and the amount of free memory in your IIGS. These features are absent in Orca Pascal.

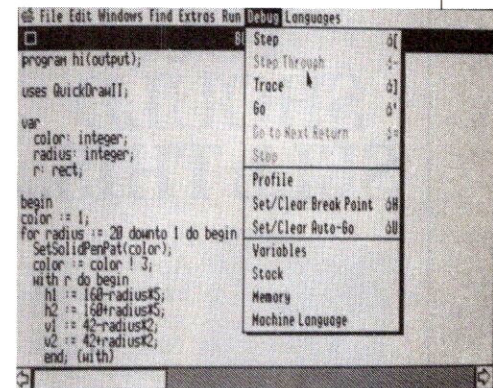
Orca Pascal has its own unique features, too. It comes with a set of debugging commands that permit you to track down errors in your programs. You can step through the code; use break points; and examine variables, the stack, and

memory. If you have a fairly large or complex program, this feature will prove invaluable. (A debugger is also available for use with APW.)

Orca Pascal also has commands for formatting your source code: shifting blocks of code left or right on the screen, changing from the Overstrike to the Insert mode, and setting tabs by means of a ruler.

Orca Pascal allows you to select between an ImageWriter and a character-oriented printer. If you select a character-oriented printer, you must also specify the line length and number of lines per page. By contrast, TML Pascal is designed to send its output only to an ImageWriter printer. It has no Page Setup command, and, when you choose the Print command, printing starts immediately.

The two different approaches to the printing function represent different philosophies about who is likely to use the desktop system. Orca can accommodate almost all



Orca Pascal comes with a set of debugging commands.

users, at the price of requiring some additional actions of everyone. TML, on the other hand, accommodates the more typical users of the system without needing much, if any, extra action.

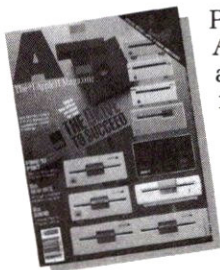
These two approaches also appear in the type of material that each desktop system handles. The Orca desktop system is supposed to be fully compatible with any APW language and source-code file. You can edit source code and compile, link, and run the programs—all from the desktop system. The Orca desktop system functions as a replacement for the APW editor and shell. (Technically, though, the desktop environment is called from the shell, and when you quit from the system, you return to the APW shell.)

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PASCAL COMMANDS IN BOTH ORCA PASCAL AND TML PASCAL

Directives

External
Forward
Tool

Statements

Case [otherwise]
Code segment
Data segment
For ... to/downto ... do
Goto
If ... then ... [else]
Repeat ... until
Uses
While ... do
With ... do

File procedures/functions

Close
EOF
Eoln
Page
Read
Readln
Reset
Rewrite
Seek
Write
Writeln

**Memory allocation
procedures/functions**

Dispose
New

**Ordinal
procedures/functions**

Chr
Odd
Ord
Pred
Succ

Conversion

procedures/functions

Ord4
Pointer
Round
Trunc

Math

procedures/functions

Abs
Arctan
Cos
Exp
Ln
Sin
Sqrt

String

procedures/functions

Concat
Copy
Delete
Insert
Length
Pos

**Bitwise manipulation
procedures/functions**

And
Not
Or
Shift left
Shift right
Xor

Miscellaneous

procedures/functions

Halt
Tool error number

The TML system is designed for one purpose, developing programs for the Apple IIGS in Pascal. The Pascal compiler is built into the system, and it automatically handles the linking of files when you select the Compile command.

Command Differences

The two programs, though, differ in more than just their design. Both programs have most of the commands you would expect in a Pascal compiler, but each also has certain commands that the other lacks. The table above lists all of the Pascal commands that the two pro-

grams have in common.

Orca Pascal is a complete superset of the Pascal standard specified by the International Standards Organization (ISO). In fact, you can issue a command to the compiler to flag as an error any use of an extension to the ISO standard.

If you are writing programs that are to be completely portable from one operating environment to another, you may find this ISO-compatibility feature significant. Of course, adherence to the ISO standard prevents you from using any of the IIGS tools, including the desk-

top system of windows and menus.

The first figure on the next page lists the commands that are available only in Orca Pascal, and the second figure lists the commands that are available only in TML Pascal. These lists are subject to much change, since the two programs are undergoing substantial revision and are each likely to incorporate the more useful features of the other.

The missing commands (marked in the tables with an asterisk) are not, for the most part, that significant. Indeed, you can create most of them by simply writing your own procedure or function. When you need certain other commands (marked in the tables with an @), you can create them by using Apple IIGS toolbox calls, either individually or in conjunction with other Pascal commands.

Compiler Differences

The two compilers each take Pascal source code and turn it into object code. The object code is then linked into applications or desk accessories by the linker. In the TML desktop system, the linking occurs automatically. With the Orca desktop system, you can specify that the linking occur without further intervention if you issue the proper compiler directives and set the desktop system appropriately.

The version of TML Pascal for APW (version 1.5) whose release is expected by the time this article is printed will have the ability to generate 65816 assembly-language source code as well as object code. Thus, if you are proficient in 65816 assembly language, you will be able to fine-tune some of the code the compiler generates.

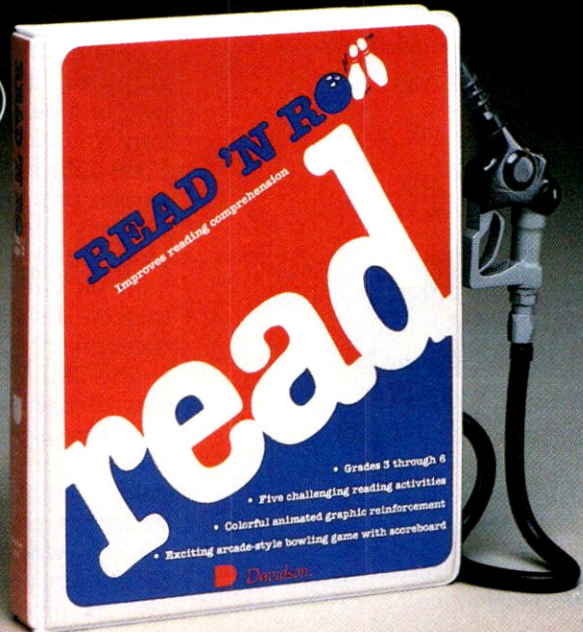
The Orca compiler is an optimizing compiler; that is, it creates object code that functions in the most efficient manner. Optimization, though, takes time. Fortunately, you can tell the Orca compiler to postpone optimization during the development phase, waiting until you have the program working the way you want before you perform the optimization.

Other Features

The Orca Pascal disk comes with a samples disk that contains a working desktop program, an Othello game, several graphics programs, some text programs, and desk accessories. The samples disk

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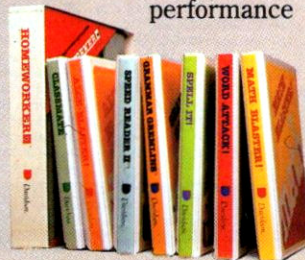


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COMMANDS EXCLUSIVE TO ORCA PASCAL

File commands

- * Get
- @ Open
- * Put

Conversion commands

- * Integer to string
- * Real to string
- * String to double precision real
- * String to integer
- * String to long integer
- * String to single precision real

Math operations

- * Arccos
- * Arcsin
- * Arctan2
- * Exponent
- @ Random
- @ RandomDouble
- @ RandomInteger
- @ RandomLongInt
- Seed
- * Sqr
- * Tan

Desktop environment and operating system commands

- Commandline
- @ EndDesk
- @ EndGraph
- ShellID
- @ StartDesk
- @ StartGraph
- SystemError

Fortunately, these programs are all very good.

also contains the source code for the Pascal run-time library and for the toolbox interface files, as well as macros for use in the passing of parameters to assembly-language subroutines.

The TML program comes with several sample files on disk that demonstrate the various aspects of programming the IIGS, including graphics, desktop environment, text, and desk accessories. In addition, you can buy the TML Source Code Library, which contains examples of using nearly all the IIGS tool sets. TML Systems is currently considering packaging much of the Source Code Library material in a tutorial disk that will come with the main program.

The TML Speech Toolkit enables you to use synthesized sound in your Pascal program. The disk contains three new tool sets (male voice, female voice, and text-to-phonetics parser), an interface file for use when calling the speech tools from your program, and several example programs showing the use of the speech tools. The speech tools produce sounds synthesized and is thus significantly lower in quality than digitized speech. It also takes up significantly less memory space and is more versatile than digitized speech. The

COMMANDS EXCLUSIVE TO TML PASCAL

Directives

Inline

File commands

- @ Erase
- FilePos
- @ IOResult
- @ Rename

Math commands

- * Dec
- * Inc

Bitwise commands

- * Rotate left
- * Rotate right

Other commands

- * Cardinality
- Cycle
- * Exit
- * FillChar
- * HiWord
- * Leave
- * LoWord
- * MoveLeft
- * MoveRight
- * Scan for matching character
- * Scan for non-matching character
- Sizeof
- @ Tool error occurred

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speech tool sets were developed by First Byte, Inc., of Long Beach, California, developer of the Smooth-Talker program for the IIGs. If you intend to distribute software using the speech tool sets, you must get a license from First Byte.

Determining which of these four Pascal compilers is the best one and deciding which one to buy is not an easy matter. There is no clear-cut choice unless you need a compiler that is fully ISO-compatible, in which case you need one of the the Orca Pascal compilers.

If you will be programming in a combination of assembly language and Pascal, you should consider either of the Orca Pascals or the APW version of TML Pascal. The desktop version of TML Pascal cannot handle that combination. On the other hand, if you are relatively new to programming and do not wish to contend with extra complexity and power, you should consider the desktop version of TML Pascal, the simplest to use of the four programs. The desktop version of Orca is a bit more complex, and the APW versions of both programs are the most sophisticated.

VITAL STATISTICS

Apple IIGs Debugger

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The Byte Works, Inc.
4700 Irving Blvd., NW, Ste. 207
Albuquerque, NM 87114
(505) 898-8183

List Price: APW, \$125; desktop version, \$150; Orca/M Gs, \$69.95

CIRCLE READER SERVICE NO. 362

TML Pascal for APW (requires APW or Orca/M Gs), TML Source Code Library, TML Speech Toolkit

TML Systems
8837-B Goodby's Executive Drive
Jacksonville, FL 32217
(904) 636-8592

List Price: \$125; integrated version, \$125; TML Source Code Library, \$49; TML Speech Toolkit, \$69

CIRCLE READER SERVICE NO. 363

Cost is another consideration. The least expensive products that work by themselves are the desktop version of TML Pascal (\$125) and the APW version of Orca Pascal (\$125). As stand-alone products, each of these Pascals gives you a development environment and a Pascal compiler. It costs extra to get an assembler (\$100) for working with assembly language with Orca Pascal; you can't work in assembly language with the desktop TML Pascal. The cost of a combined assembly-language and Pascal environment is the same with either of the APW versions of the two products. The desktop version of Orca Pascal costs the most (\$150).

Fortunately the programs are all very good. In this case, you are unlikely to make a bad choice. You should carefully consider your needs and compare them against the features of each of the compilers. Then base your choice on a balance of which features of which program you need most. +

Michael Fischer's most recent book is Apple IIGs Technical Reference, from Osborne/McGraw-Hill.

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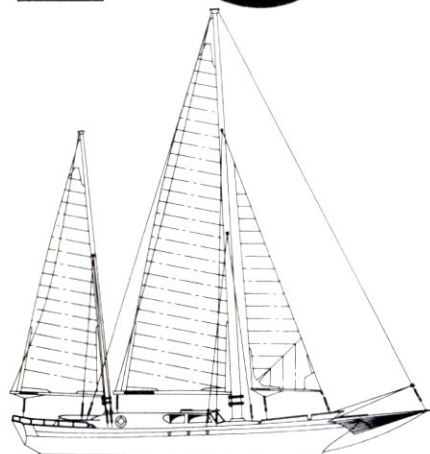
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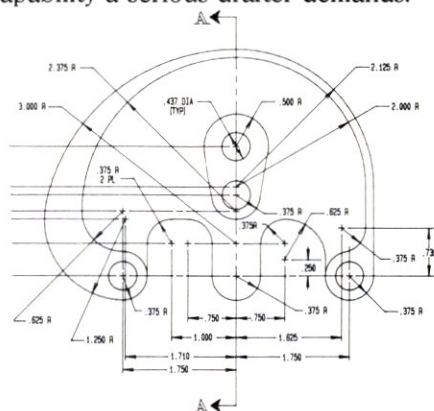
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The Memory Saver

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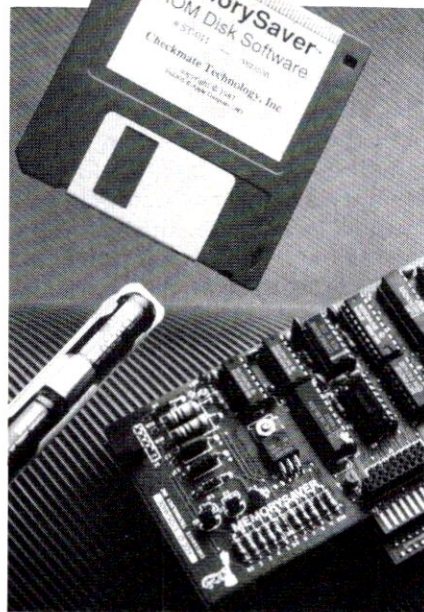
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You can attach your existing memory card, plus another one from a different manufacturer, to the MemorySaver board (see figure 1 for a list of compatible RAM cards) and partition all or a portion of the RAM as a battery-backed-up RAM disk called /ROM. Once you've installed the /ROM volume, the information on it remains in place when the power is off.

All-in-One Package

The MemorySaver system comprises a MemorySaver board, wall transformer, battery holder for six rechargeable batteries, power connector, configuration software, program selector, and manual. Installation is simple and straightforward. Plug your memory card(s) into the MemorySaver, one on the front and the other on the back, and plug the MemorySaver into



Checkmate's MemorySaver system

the memory-expansion slot. (For certain cards, you may need the MemorySaver slot-extender option for an additional \$39.95.) Put the battery holder under the power supply, install the insulating paper between the case and the memory card, hook up the power connections, and you are finished. A word of caution: *Do not* forget to install the piece of insulating paper between the side of the GS case and

your memory card. If you don't install it, severe damage to your GS could result.

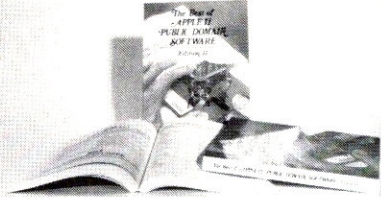
/ROM Size

To set up your ROM disk, run the MemorySaver program that comes with the system. You can make the /ROM volume any size, up to the maximum GS memory limit of eight megabytes or the amount of RAM available on your memory card(s). To determine the amount of memory to dedicate for the /ROM volume, you need to decide what files you want to have available at startup. If you use a program selector such as MouseFiler or ProSel, you will want ProDOS and your selector program. If you want to use the Finder, you will need the files in figure 2. This configuration requires a 421K ROM disk, which leaves 859K for program execution on a machine with a one-megabyte memory card. This amount of free memory is more than adequate for all the current ProDOS 8 and ProDOS 16 system programs.

Once you've selected the size of /ROM, you select Install at the menu prompt. Your ROM disk will be ready to use as soon as you re-

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The MemorySaver board can best be thought of as an independently powered expansion bus for the memory-expansion slot on the Apple IIgs.

boot. After you have restarted your GS, you can load the files you want into /ROM, use the Control Panel to set the startup slot to ROM Disk, and turn your machine off and on again to boot from /ROM. Once you've installed the ROM disk and loaded the files you want, the ROM disk operates like any other disk drive on your system, only faster. If you configure it as your boot drive, some interesting things happen. The system maps /ROM into slot 5, drive 1, and shoves any other 3.5-inch drives down the line (see figure 3).

Memory Management

All the IIGS memory is allocated by the Memory Manager tool set. The MemorySaver software partitions the available RAM on the expansion card(s) by telling the Memory Manager which banks of memory are in use, thus preventing the overwriting of information on the ROM disk. With two memory-expansion cards installed, the MemorySaver divides the memory on each card into two four-megabyte segments. It then determines

the actual amount of memory installed on each card, maps that amount into the lower half of each four-megabyte bank, and informs the Memory Manager that the balance is in use, even though it is not there.

The manual gives a good explanation of how a ROM disk works and what precautions you should take during installation. Its photos and diagrams help with installation. The manual also contains a

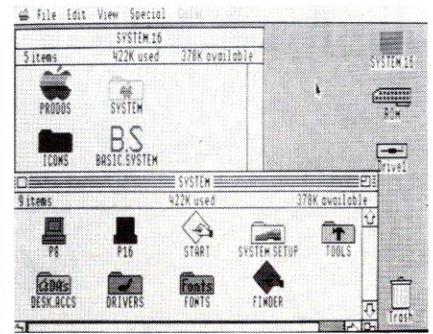


Figure 2: Screen shot showing what files to load from the system disk onto the ROM-disk volume so you can use the Finder as your program selector

troubleshooting section and a section on Checkmate's seven-year warranty and service policy. The appendix covers Squirt, a program selector that comes in the package. /ROM Problems

I had two problems when I was using /ROM as my startup device: remembering which slot my 3.5-inch drive was in and figuring out a way for my seven-year-old daughter to boot her games. I solved the first by using pathnames and the second by using the

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ALS Add-RAM gs.....	■ ■
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Applied Engineering gs-RAM Plus.....	■
Applied Ingenuity gs Juice.....	■ ■	■.....
AST RamStackPlus.....	■ ■
Checkmate Technology MultiRam gs.....	■	■.....
MDIdeas OctoRam.....	■ ■
Orange Micro RamPak4gs.....	■ ■
On Three ON-BOARD.....	■ ■
Parallax MegaRAM.....	■ ■
■ Yes		
■ ■ MemorySaver slot extender required.		
■ □ MemorySaver slot extender not required for Rev. A, B cards; required for Rev. C, D cards.		

Figure 1: A list of RAM cards that are compatible with the MemorySaver

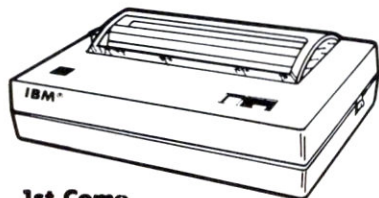
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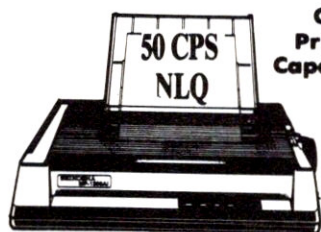
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CIRCLE 312 ON READER SERVICE CARD

STARTUP SLOT = 5

Drive	Location
1st Apple 3.5 Drive	S5, D1
/RAM5	S5, D2
2nd Apple 3.5 Drive	S2, D1
1st UniDisk 3.5	S2, D2
1st UniDisk 5.25	S6, D1
2nd UniDisk 5.25.....	S6, D2

(RAM disk active)

STARTUP SLOT = ROM DISK

Drive	Location
/ROM.....	S5, D1
1st Apple 3.5 Drive	S5, D2
2nd Apple 3.5 Drive	S2, D1
1st UniDisk 3.5	S2, D2
1st UniDisk 5.25	S6, D1
2nd UniDisk 5.25.....	S6, D2

(RAM disk inactive)

Figure 3: List of the slot and drive assignments when you're using a 3.5-inch drive in slot 5 as your startup drive or the ROM disk as your startup drive

```

2 HOME
5 VTAB 12
10 INPUT "TYPE THE DRIVE NUMBER YOUR DISK IS IN ";A
20 IF A = 1 THEN PRINT CHR$(4) "PR#6" : REM BOOTS FIRST 5.25-INCH DISK
30 IF A = 2 THEN PRINT CHR$(4) "--PRODOS,S5,D2" :
   REM BOOTS FIRST 3.5-INCH DISK
40 IF A = 3 THEN PRINT : GOTO 10 : REM ASKS AGAIN
50 IF A = 4 THEN PRINT : GOTO 10 : REM ASKS AGAIN
60 IF A = 5 THEN PRINT CHR$(4) "-GO.16" : REM BOOTS FINDER ON ROM DISK
70 IF A = 6 THEN PRINT : GOTO 10 : REM ASKS AGAIN
80 IF A = 7 THEN PRINT : GOTO 10 : REM ASKS AGAIN
90 IF A = 8 THEN PRINT : GOTO 10 : REM ASKS AGAIN
100 IF A = 9 THEN PRINT : GOTO 10 : REM ASKS AGAIN
110 IF A = 0 THEN PRINT : GOTO 10 : REM ASKS AGAIN
  
```

Figure 4: A BASIC program for MemorySaver users that allows you to bypass the Finder and boot games without resetting the startup slot

BASIC program in figure 4. This program allows her to boot her games without going into the Control Panel to reset the startup slot and also lets me bypass the Finder. The memory overhead for ProDOS 8, Basic System, and the BASIC program called Startup is 27K. I gave the system-disk application named ProDOS a new name, GO.16, so it would not conflict with ProDOS 8. Hopefully Apple will allow direct booting of slot-6 drives in a future release of the Finder.

I called Checkmate's toll-free number, got right through to a technician, and asked him several questions. The technician's answers were clear and to the point. I told him that my battery cable had come loose from the mounting plate. He said that the company had corrected that problem and that he would send a replacement. Five days later, I received it and sent the old one back.

Should You Buy One?

The MemorySaver is ideal for those who don't like wasting time while booting the GS. The alternative is to set up a big RAM disk and never

turn off your GS; in such a situation, however, you would lose everything in the event of a power failure and would be restricted to using one memory-expansion card only. The adaptability of the MemorySaver makes it a more attractive alternative. +

Laerie Easterly is a certified Apple developer, free-lance writer, and president of the Apple Portland Program Library Exchange users' group in Portland, Oregon.

VITAL STATISTICS

MEMORYSAVER

The MemorySaver board is an independently powered memory-expansion bus with battery backup. It fits into the memory-expansion slot, holds two memory boards, and can handle up to eight megabytes of RAM. It comes with software that allows the creation of a high-speed ROM disk from a portion of the RAM.

CPU: Apple IIgs

DISK DRIVES: one 3.5-inch

OPERATING SYSTEM: ProDOS

LIST PRICE: \$149.95; slot-extender board, \$39.95

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CIRCLE READER SERVICE NO. 355

The Memory Saver Tips

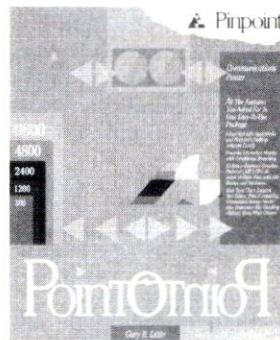
The following suggestions should help you use your MemorySaver board to its fullest advantage.

1. Use only rechargeable batteries.
2. Do not forget to install the insulating paper between the side of the IIGS case and the back of your memory card.
3. Use only "CAS before RAS" memory chips on your memory cards. The MemorySaver package includes a list of acceptable chips.
4. Checkmate does not recommend the use of a RAM disk while a ROM disk is active. You can have conflicts between the memory dedicated to the ROM disk and the memory for the RAM disk. I have run into such a problem only when copying large amounts of data to the RAM disk. Small amounts, 5 to 10K, seem to work all right. The worst experiences I've had while copying large files were getting an I/O Error message and having files not copy onto the ROM disk.
5. When you're using two memory boards, dedicate all the memory on one board to serving as the ROM disk and leave the memory on the other card available for program use.
6. Be sure that you plug the wall transformer into a nonswitched wall outlet to prevent the loss of the ROM disk.
7. If you have a card in slot 7, be sure to get the MemorySaver Extender to prevent the memory card attached to the front side of the MemorySaver board from touching the card in slot 7.
8. You cannot use memory boards that use different-size chips. For example, if the back card uses 256K chips, the front card must also use 256K chips, rather than one-mega-byte chips.
9. Fonts and desk accessories can take up a lot of disk space.
10. To increase the speed of launching applications from the Finder, turn off the Save Finder Information Onto Disk option on the Preferences menu.

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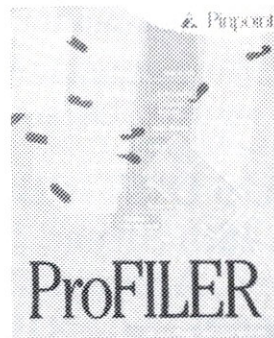
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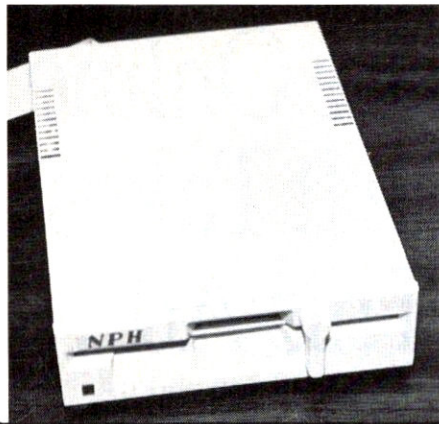
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In this second of a three-part series on the AppleWorks universe of products, we focus on education.

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BY DAVID E. CHESEBROUGH

APPLEWORKS EDUCATIONAL RESOURCES MAKE THE GRADE

AppleWorks isn't just for homes and small businesses. It also is one of the best choices for schools in achieving computer literacy and classroom integration and serving as a teaching/administrative tool. In fact, the number of support products for educational applications of AppleWorks has recently exploded.

You, as a teacher, librarian, or administrator can surround yourself with a host of useful resources designed to help you get more mileage out of AppleWorks.

RESOURCE BOOKS

Books about AppleWorks for educators range from introductory to advanced and cover educators' as well as students' needs.

AppleWorks for Educators: A Beginner's Workbook

This manual by Linda Rathje is useful for conducting AppleWorks in-service workshops. Rathje has taken lessons she's developed over the years and combined them with relevant reprints from *The Computing Teacher*. The materials come with a data disk and, although they

are not comprehensive, offer a good start for teachers. (\$18; shipping, \$2.50; billing, \$2.50)

AppleWorks for School Librarians

This introductory manual by May Lien Ho is best suited for novice librarians who can learn basic skills while seeing how AppleWorks can apply to library operations. The template disk offers many simple examples of relevant AppleWorks applications. (\$29.95)

AppleWorks for Teachers

This well-organized and -conceived book/disk combination by Patti D. Nogales and Carol H. McAllister leads educators through AppleWorks by having them accomplish typical tasks: writing letters and memos, creating seating charts and student databases, and analyzing grades. Nogales and McAllister have produced one of the best educationally focused AppleWorks books, although it lacks coverage of integration and mail-merge functions. (\$16.95 [includes disk])

Computing Tools: AppleWorks

This package is designed for

teaching AppleWorks in grades 9 and above, as well as training teachers in introductory skills. (\$55)

STUDENT TEXTBOOKS

AppleWorks in Your Classroom: A Student Introduction

I developed the activities in this book while establishing a model program for integrating AppleWorks into a school curriculum. The lessons are self-paced, interactive, and built around student application examples on the copyable resource disk. (\$6.95; ten books with Resource Disk, \$99.95)

ClassWorks: AppleWorks for the Classroom

ClassWorks is a comprehensive set of instructional materials designed to introduce AppleWorks to students or teachers. In addition to explicit text-based lessons on the three AppleWorks programs, the package includes a data disk, command reference sheets, quizzes and answer keys, and overhead-transparency masters. The purchase price includes a site license for one school building. (\$39.95)

Developing and Using Office Applications with AppleWorks, Versions 1.0-2.0

This comprehensive text by M. S. Varnon teaches business applications as students work through activities to learn skills applicable to the various AppleWorks components, including mail-merge. Each unit concludes with a challenge that uses the skills learned in the unit activities. An instructors' manual, transparency masters, and resource disk are free with the purchase of 20 texts. (\$18.50)

Hands-On AppleWorks

This three-text series, each one devoted to one of the AppleWorks modules, is by Arthur Luehrmann and Herbert Peckham. Each soft-cover student workbook offers a general introductory section, lessons for the specific application, and lessons to reinforce and expand learning. A teacher pack (guide, reproducible masters, copyable data disk, and student set) is free when you purchase 20 texts. You can also purchase a wall chart

of AppleWorks commands. (\$9.25 each; three-text set, \$18.95; wall chart, \$14.95)

Understanding and Using AppleWorks

This textbook by Frank Short offers three sections—"Getting Started, Mastering, and Advanced Applications"—for each AppleWorks module, plus guidance on integration. Many of the applications are relevant to school or student use. If you purchase 20 books, you also get an instructors' manual, transparency masters, and a copyable resource disk for free. (\$16.50)

Using AppleWorks in the Classroom

This 350-page sourcebook by Joan Postman and Jennebeth Bogard is for teachers who want to present AppleWorks in a step-by-step fashion to a whole class. It offers detailed lessons, student worksheets, overhead-transparency masters, and an activity disk, covering all the AppleWorks components in an introductory fashion. (\$85.60; school price, \$60)

TEMPLATES

Templates are AppleWorks files that set up the program for a specific application, such as recording grades. Many education-related templates are available.

Customized Gradebooks

With information you provide to template publisher Jim Crawford about your particular grading system and number of students and classes, Crawford customizes the grading templates he has devised to suit your needs. Instructions and spreadsheet protection make this product especially useful for novice AppleWorks users. (\$21.95)

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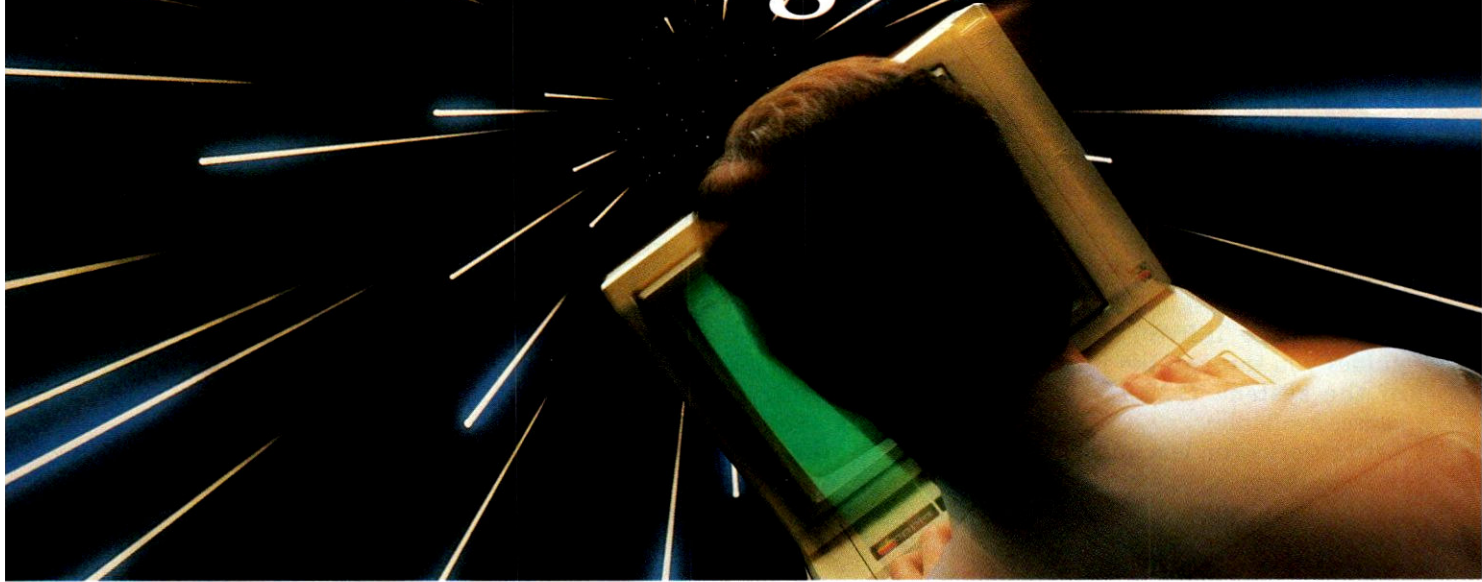
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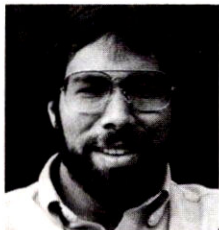


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*Steve Wozniak, the creator
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LetterWorks for Teachers

Techniform has created a number of useful form letters, such as letters to publishers, parents, government agencies, and educational companies, in addition to resumé forms. (\$39.95; shipping and handling, \$2)

Principals' Pal and Teachers Aide series

This set includes four disks for

education: Band Aide, Teachers with Class, Guys in Vocation, and The Meal Planner. Each disk has a collection of files with simple directions and is best suited for novice users who can use ideas for AppleWorks applications. (\$22.50 each; set of four, \$80)

School Zipfiles

The spreadsheet templates on this disk are the best-designed I have ever seen. The main files contain extensive grading spreadsheets, a spreadsheet for adding trigonometric functions to AppleWorks, and a self-scoring test. You receive extensive on-disk documentation. (\$24.95)

SchoolWorks

SchoolWorks comprises templates with documentation and prepared database-report formats on three double-sided disks—SchoolWorks: Teacher, SchoolWorks: Office, and SchoolWorks: Athletic Director. The spreadsheet files offer useful features and examples. (one disk, \$55; two, \$99; three, \$125)

Special Education Student Information Database

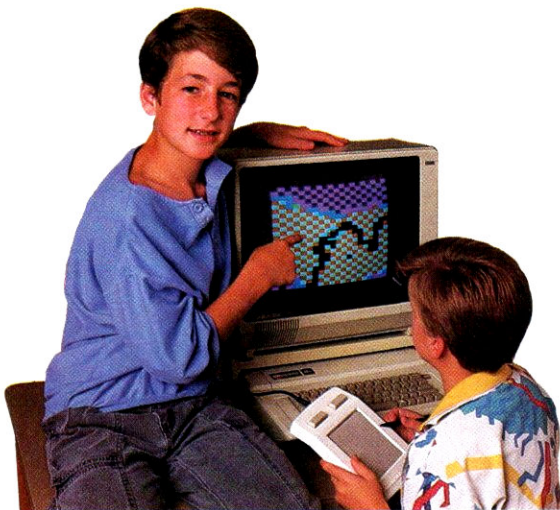
This product comes with just a single database template, but the 15-page loose-leaf manual guides beginners in maintaining a special-education database. (\$10)

SportsWorks

This series of 14 template disks is for the record keeping that comes with athletic coaching or administrative positions. The disks include Athletic Director, Club/League Organizer, Baseball, Football, Soccer, Softball, Swimming & Diving, Track & Field, Volleyball, Tennis, and Wrestling. (\$35 each)

Teachers Tools

The main offerings of this disk are the grading templates. The key one requires at least 256K of RAM, but it offers you the largest collection of features I have ever seen in a grade template. Other files include macros for SuperMacroWorks, AutoWorks, or Key Player to automate use of the grade template, as well as a few correspondence and database files. (\$29.95)



KoalaPad+. The low-cost drawing pad for the Apple II family of computers. Suggested Retail Price \$139.50. Ask for it at a computer store near you.

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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.

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CIRCLE 103 ON READER SERVICE CARD



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Write On!

Write On! is an extensive AppleWorks template library that uses word-processing functions to develop writing skills in grades K-12. The template disks are organized into five separate collections: Primary (\$1174), Upper Elementary (\$781), Intermediate (\$781), Secondary (\$560), and Special Education/ESL (\$560). You can also buy disk titles individually for \$59 (multiple-site licenses are available).

RESOURCE-FILE COLLECTIONS

These database and spreadsheet files come ready-made, filled with information on specific subjects. Teachers and students use this data to meet curricular objectives.

CareerWorks

CareerWorks is a unique offering that features extensive database files with information on 227 occupations for use in selecting potential careers. You can use these materials with individual students

or through school guidance counselors. (\$49.95 per disk; set of six, \$149; site license available)

Climate and Weather

Scholastic's strength has always been in the teacher-support materials, as is the case here. Each module offers experiments, teacher notes, activities, and AppleWorks instructional materials to help students use database and spreadsheet files to explore concepts. (\$59.95)

Computer Activities for the Classroom - Dinosaur Packet

I prefer classroom-developed and -tested materials such as this, which has been used with fourth-, fifth-, and sixth-graders studying dinosaurs. The written activities and data disk of word-processing, database, and spreadsheet files promote critical-thinking skills. (\$25)

Databases in the Classroom: AppleWorks Sampler

This collection of databases and support material are a good way to begin integrating AppleWorks into your classroom. Although the files (covering science, social studies,

and humanities) are not extensive, the teacher notes and student activities make the package useful. (\$45)

FactWorks
FactWorks is a four-volume series of resource files. The files are more like almanac listings than providers of the in-depth "encyclopedia power" that their maker advertises. Topics include science, grammar, sports, geography, and history. (\$32.95 per volume)

HelpWorks

This 340-page resource is the most comprehensive tutorial/teaching aid I've seen, with 120+ sample files and templates. The three-ring binder contains sections on all three AppleWorks components, in addition to disk management, spreadsheet design, and integration within AppleWorks. I'm most impressed with the question-and-answer databases and "learning files," which illustrate spreadsheet functions. (\$49.95)

Mindscape's Educational Division Software Catalog-on-a-Disk
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Disk contains information about its educational-software titles.

NewsWorks I/II/III

The NewsWorks series from the Newsweek Education Division offers a collection of AppleWorks database files (three per series), including a teachers' guide with lesson plans and student activity sheets. (NewsWorks I and II, \$29.95 each if your class subscribes to Newsweek Social Studies or Economic Programs; NewsWorks III, free with a class subscription)

Spreadsheets for Mathematics & Science: AppleWorks Sampler

This sampler of 22 spreadsheet files provides much-needed examples of how to use AppleWorks spreadsheets effectively with students. Teacher notes and student activities explain how to use the files, which are divided into grade 6-9 and 9-12 applications. (\$55)

The Constitution Then and Now

Students use AppleWorks files, as well as outside resources, to play roles in each of the two units in this package: The Constitutional Con-

vention and Bill of Rights. The teachers' guide, activities, instructional modules, and database and word-processing files promote inquiry, higher-order thinking, and group participation. (\$59.95)

The Power of Nation States

The teachers who developed these materials have assembled the most comprehensive collection of lessons and resource materials yet compiled on a topic. All materials, including activities, are files on the three disks, allowing you to alter lessons as you choose. Every high-school or college instructor of Global Studies or World Geography should take note of these materials. (\$95 site license)

VIDEOTAPES

One way to learn AppleWorks is by watching a videotaped lesson.

AppleWorks Video: The First Step

To me, this video offers the most sensible approach to integrating videotapes with AppleWorks instruction. The 35-minute VHS-for-

mat tutorial provides an overview of AppleWorks, through several presentations, including a simulated "real life" sequence of tasks for a PTA leader. Showing this video early on during an in-service course would help you present an overall view of AppleWorks. (\$39.99; shipping, \$3)

How to Use AppleWorks Video

This 90-minute training video covers the AppleWorks word-processing, spreadsheet, and database modules. It also includes instruction on commands, integration, and mail-merge (version 2.0 only). VHS and Beta formats are available. (\$39.95)

Videoware

Each of the five videotapes in this series covers a separate aspect of AppleWorks: Overview, Word Processing, Databases, Spreadsheets, and Troubleshooting. The written materials offer overhead transparencies and a script for an instructor. (complete package of five videotapes, \$199.95; individual prices are available)

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FEATURE REPORT

APPLEWORKS-COMPATIBLE SOFTWARE

These programs provide increased educational capabilities.

AppleWorks Companion

This disk patches AppleWorks (version 2.0) so that you can use it with RC Systems' Slot-Buster II card (\$149.95) and Speech Synthesizer (\$39.95) to give visually impaired users audio feedback of the screen display. RC Systems suggests the addition of its SCAT (Screen Articulation) disk (\$19.95) for blind users. (\$39.95)

GeoWorld

GeoWorld is a database/simulation that brings concepts in world geology, resource distribution, and rock formation alive. (See "Teachers' Toolbox" in the April 1988 issue for a full description.)

SurveyWorks

SurveyWorks automates the analysis of surveys. The survey is printed directly on the scan sheet, and you can transfer the results directly to AppleWorks files or to any ASCII files. The product requires a Super Serial Card and SCAN-TRON Scanner. (\$195)

TestWorks

TestWorks assists you in scoring and grading tests through the use of a scanning machine. The documentation guides you through the easy process of transferring the results to any AppleWorks grading spreadsheet. The program includes sample AppleWorks grading and resource files and requires a Super Serial Card and SCAN-TRON Scanner. (\$49.95)

TestWriter

The TestWriter program automates the creation of a variety of test types: multiple choice, essay, true/false, fill in the blanks, and matching. The program produces answer keys and multiple versions of the same test. You can write the tests to ASCII files for loading into AppleWorks. (\$39.95)

ThinkWorks

ThinkWorks is a slow but useful program that functions as a stand-alone outline processor. You can easily save the outlines produced with the program as AppleWorks word-processing files. The educational version provides lessons and ideas. (\$99.95, and \$10 per disk)

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RESOURCE GROUPS AND REFERENCES

Besides considering the resources I've already listed, you can get in touch with several organizations that serve as clearinghouses of AppleWorks information.

Teacher Idea & Information Exchange (TI&IE)

TI&IE offers its members a disk subscription that provides the most cost-effective means to obtain AppleWorks resource files, templates, and tips. The educationally focused disks come out about once

Several organizations serve as clearinghouses of AppleWorks information.

a month, with back issues available (six-disk subscription, \$29.95; sampler disk and catalog, \$9.95)

The Apple Library Users Group

The Apple Library Users Group (ALUG) is a group of more than 10,000 librarians and individuals interested in using Apple computers to manage information. Its fine quarterly newsletter is free to all members. ALUG also sponsors the Apple Library Template Exchange, which includes many AppleWorks templates. Write to ALUG for the free template catalog.

The Works Newsletter

The Works offers tips, advice, classroom ideas, and timely articles for teachers and administrators. You also receive reviews and announcements of products as well as updates and highlights of TI&IE and The AppleWorks User Group (TAWUG), two educationally oriented AppleWorks public-domain groups. TAWUG will be covered next month in the third part of this series. (\$19.95 per year [Sept-May])

AppleWorks Accessories

This extensive free catalog of AppleWorks-related products for schools and general use offers the best single source for finding resources for AppleWorks. Prices generally fall in the retail range.

AppleFest AppleWorks Workshops

If you are headed to Boston for

the spring AppleFest (May 19-21), sign up for one or more of the eight-hour workshops for educators, beginners, or advanced users (May 19-21). Each day-long workshop with an AppleWorks expert involves hands-on time and demonstrations. You receive handouts, including public-domain templates, resource guides, how-to articles, and discount offers on

AppleWorks aids. (day-long workshop [lunch included], \$95 each)

David Chesebrough is editor of The Works newsletter, focusing on educational applications of AppleWorks, and has developed an award-winning school computer program based on AppleWorks use. He is responsible for computer education at the Buhl Science Center in Pennsylvania.

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The Apple Library Users Group
Monica Ertel, manager
Apple Computer, Library &
Information Services 8C
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HelpWorks
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(806) 796-8495

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Fayetteville, AR 72702
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Humanities Software
P.O. Box 1064
Hood River, OR 97031
(509) 493-1395

*AppleWorks for Educators—
A Beginner's Workbook*
ICCE, University of Oregon
1787 Agate Street
Eugene, OR 97403
(503) 686-4414

FactWorks
ImagiMedia Software
16640 Roscoe Place
Sepulveda, CA 91343
(818) 891-3707

*AppleWorks in Your Classroom:
A Student Introduction*
J. Weston Walch, Publisher
321 Valley Street, Box 658
Portland, ME 04104-0658
(800) 341-6094

*ClassWorks: AppleWorks for the
Classroom*
International Council for
Computers in Education
University of Oregon
1787 Agate Street
Eugene, OR 97403
(503) 686-4414

AppleWorks Accessories for
School, Office & Home;
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K-12 MicroMedia
6 Arrow Road
Ramsey, NJ 07446
(800) 922-0401

GradeWorks
Katama Software
RFD 304
Edgartown, MA 02539
(617) 627-5145 (4-8 EST)

Databases in the Classroom: Apple-
Works Sampler; Spreadsheets for
Mathematics & Science: Apple-
Works Sampler; Computing Tools:
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AppleWorks Video: The First Step
PCR Video, Inc.
45 Pond Street
Norwell, MA 02061
(617) 871-5398

How to Use AppleWorks Video
Computer Network
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Teachers Tools
Sage Productions, Inc.
Box 11215
San Diego, CA 92111
(619) 286-8165

Climate and Weather, The
Constitution Then and Now
Scholastic Software
2931 East McCarty Street
P.O. Box 7502
Jefferson City, MO 65102
(800) 325-6149

CareerWorks
Sextant Software
1223 Walnut Street
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The Math Learning Center
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Salem, OR 97302
(503) 229-3041

Teacher Idea & Information
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18 prescriptions for a healthy ImageWriter

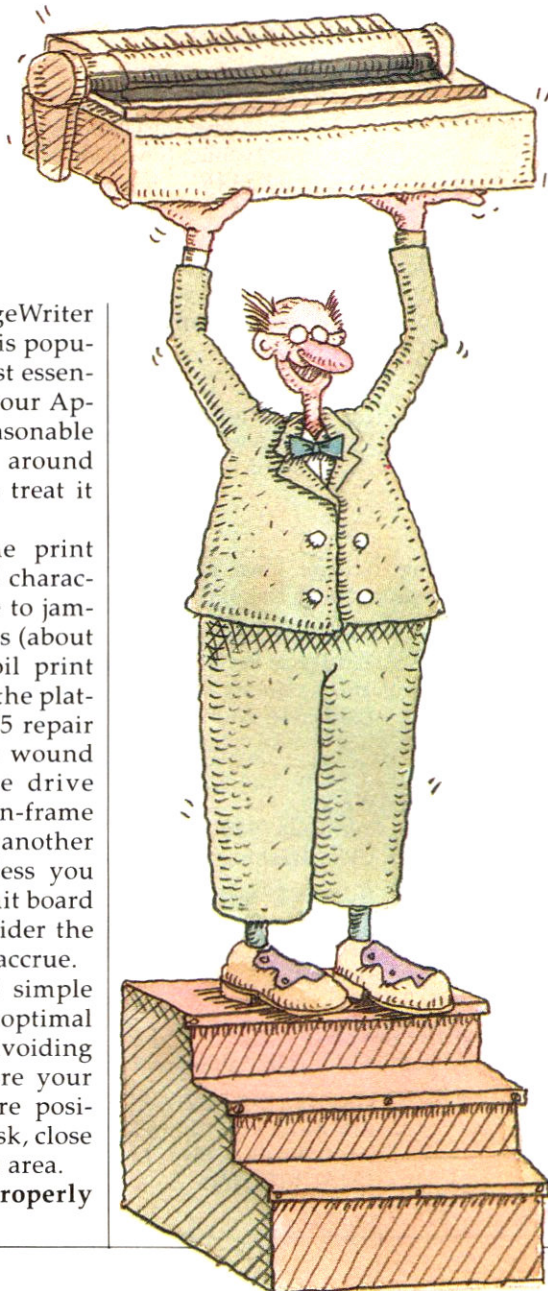
Preventive Printer Maintenance

What is your ImageWriter worth to you? This popular printer will last essentially the life of your Apple, provided you take reasonable care of it. Since it costs around \$500, you can ill afford to treat it badly.

An ink buildup on the print head can produce smeared characters, and it may contribute to jamming of the print-head pins (about a \$100 repair job). The foil print shield can tear and scratch the platen, which can require a \$75 repair job. Also, a ribbon that is wound too tightly can cause the drive mechanisms in the ribbon-frame assembly to break, adding another \$20 replacement bill. Unless you can replace a platen or circuit board yourself, you have to consider the labor charges that quickly accrue.

This article presents 18 simple ways to assure you will get optimal use of your printer while avoiding repairs. But first, make sure your ImageWriter and Apple are positioned on a firm table or desk, close to a wall socket, in a secure area.

1. All cables should be properly hooked up.



The ImageWriter requires its own power source, and it should be plugged into a three-hole grounded outlet. To avoid shocks and possible damage to the circuitry, leave the printer and the computer off while hooking them up, and use tightening screws to secure the connection firmly in place.

2. Plug your printer into a surge protector.

Even though the ImageWriter does not have all of the sensitive chips of the Apple, electrical fluctuations can still damage the circuits. The cables use a metal wrap-around shield to reduce the effects of radio-frequency interference, but on days of thunderstorm activity or power disturbances, don't give your printer the \$500 test. Although most protectors cannot overcome a major power surge, they help moderate the minor fluxes, so they are worth having.

3. Ban food and drinks in the work area.

You've heard it a million times before, but the number 1 taboo for the Apple office is setting your coffee and morning Danish beside your keyboard or printer. If by the

slightest chance a few drops of coffee or crumbs of jelly doughnut fell inside, they could cause a short circuit (along with some rather high repair bills).

4. Keep the work area dusted and the printer covered.

No matter how neat a work area may be, dust always seems to accumulate. Dust particles are everywhere, but covering the printer (and computer) during long periods of disuse reduces the exposure of your equipment. Dust the work area about once a week.



Dust covers vary widely in materials and price, from tailor-made leather with gold trim to an ordinary bed sheet.

5. Watch the paper flow.

When using track-fed paper, avoid letting the output pile on top of the printer. To avoid jamming, don't cram a large quantity of paper under the printer intake. Printer stands work nicely, or try keeping the box of paper on the floor and allowing the printed output to flow off the table into a stack.

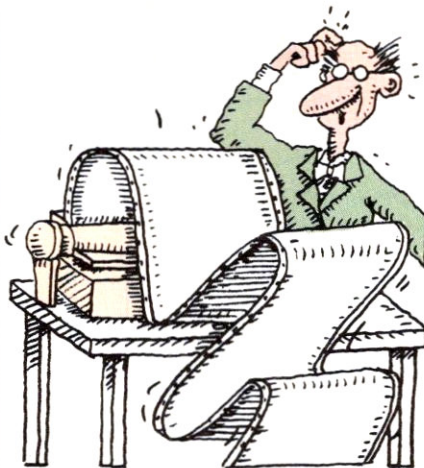
6. Use paper of the proper weight.

Avoid using paper that is less than 16 pounds (unless you add a couple sheets), because the impact of the print-head pins can damage the platen. Using paper a little heavier than 24 pounds presents no problem, as long as you adjust the thickness gauge accordingly.

7. Use a good ribbon.

As the ribbon wears, further impact by the print head may cause the fibers of the cloth to unravel and jam the head. Using a re-inked ribbon is fine, but the greater the usage, the greater the chances of its becoming frayed.

8. Properly align the paper, envelopes, and labels.



The ImageWriter can handle a wide variety of materials, but if you don't correctly position them in the paper feed, they can get jammed. For multiple forms, envelopes, and labels, adjust the thickness gauge to assure enough space for the print head to move back and forth properly.

You can usually force out self-stick labels that get caught, by feeding in several sheets of paper (turn the platen knob by hand).

9. Run the printer self-test, and don't change the DIP switches.

The self-test shows the printer output, which should be crystal clear and readable. If not, check the ribbon for wear and proper alignment before contacting your Apple dealer.

The DIP switches come preset, so unless you have a particular need, don't change them (or first consult your dealer).

10. Place a foam pad under the printer.

If you place a 1/2-inch foam pad under the printer, it becomes much quieter and experiences less vibration of its semifragile inside.

11. Periodically dust the inside of the printer.

With all of its moving parts, a printer is more susceptible to dust damage than a computer is. Use a slightly moistened soft rag with water or alcohol to remove the bits of paper and dust that accumulate inside, at least once a month. A can of compressed air (available at most camera shops for about \$5) also works nicely.

The carrier rod should also remain free of dust, and a drop or two of a light high-quality oil helps keep the rod lubricated.

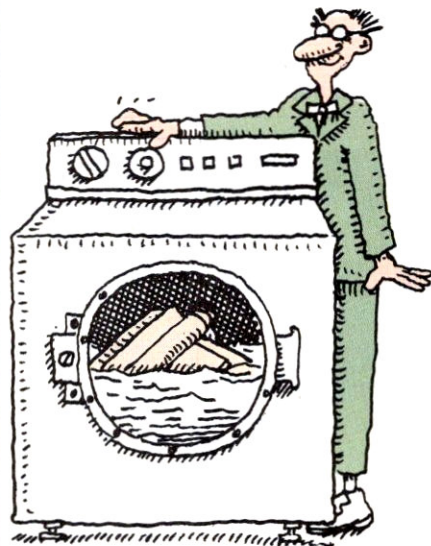
12. Regularly clean the outside.

Damp-rag the outside of the printer to remove dust as often as once a week. Clean any stains on the printer by using a mild liquid dish soap—never use cleansers or solvents.

13. Clean the print head.

Periodically, you should clean the print head to remove ink build-ups, which also reduces the chances of jamming. Cleaning ribbons are available that remove ink residue; they're especially handy when you're swapping color ribbons, to prevent darker ink from getting onto the cloth of lighter-colored ribbons.

You can remove the print head by carefully bending back the pointed white tab and pulling up. Be patient—it's a snug fit. Once you've removed it, use alcohol on a cloth and lightly rub it over the pins until the red square appears. Take great care when replacing the print head, so as not to bend the metal tabs.



Aside from using a cleaning ribbon or removing the print head, using a little alcohol on a thin rag can also remove remnant ink. Just dampen the edge of the cloth and pass it back and forth in front of the print head.

14. Clean the paper guide and print shield.

Ink can also accumulate on the paper guide, which can cause smudge marks. Just unscrew the guide, take an alcohol-dampened cotton swab, and lightly brush the inside. If you remove the print head first, you can completely free the plastic guide.

The foil print shield may lose its stick and can get caught on the paper, resulting in a severely scratched platen. If it starts to come loose, remove it.

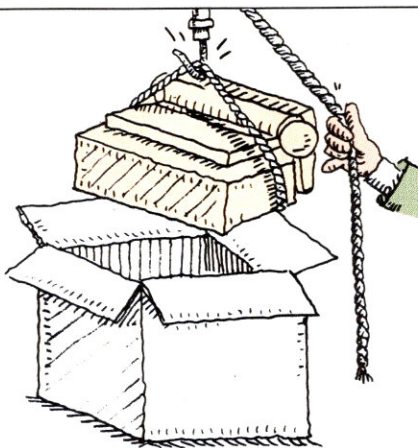
15. Keep the platen clean.

You can clean the platen with a cloth dampened with alcohol, which helps remove any ink stains and dirt. Don't print directly on the platen, or you'll get an uneven print surface.

16. Inspect and clean the ribbon-frame assembly.

Regularly inspect and clean the ribbon-frame assembly, which holds the cartridge in place—bits of paper and dust gather there also. When you turn on the printer, watch the centering of the ribbon, since the assembly can get out of alignment. Just notify your dealer if it needs adjusting.

The drive mechanisms on the frame assembly can break if you are using a tightly wound ribbon (often caused by too much cloth inside the cartridge). Simply pull some out, cut off the excess cloth, and rejoin the ends with a couple drops of super glue (or just throw away that cartridge).



17. Pack the printer when moving it.

If you're moving your printer beyond the confines of your home or office, then carefully pack it in the original box and place the styrofoam pads around it. Also insert the carrier-rod tubes to prevent the print head from moving during transport. If neither the original box nor the carrier-rod tubes are available, place socks or soft cloth inside to prevent the print head from moving and wrap the printer with a blanket before placing it in-

side a sturdy box. Also place the printer inside a plastic bag (such as a trash bag) and tape the box (especially for long journeys).

18. Consider buying Apple Care.

If your printer and computer are a key part of your livelihood, or if you would rather not risk the expenses of possible repairs, then get a service contract from your Apple dealer. Apple Care for the ImageWriter—an insurance policy against any wear, defects, or problems that may arise—costs about \$5 a month.

Don't Forget the TLC

The ImageWriter is too expensive to let simple disregard ruin it. It was designed to last for years without lubrication or servicing, and it can provide an almost endless supply of high-quality output from your Apple. +

Scott Brainard is a freelance writer and graduate student at Humboldt State University in California, where he uses his ImageWriter extensively. As a editor in quality control at a software firm, he learned firsthand how simple maintenance can stave off costly repairs.

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CIRCLE 169 ON READER SERVICE CARD

SPEAKING OF GRAPHICS

The Graphics Studio and its eccentric user interface

BY MICHAEL CALLERY AND ROBERTA SCHWARTZ

Sometimes a program's release follows such a blast of prerelease gossip, "beta leaks," and hullabaloo that you can't help but know it's there. DeluxePaint II for the IIGS was such a program. And then sometimes a program appears out of nowhere—Accolade's *The Graphics Studio*, another paint program for the Apple IIGS, is an example.

Since most Apple IIGS owners already have a paint program—Paintworks Plus, 816/Paint, or DeluxePaint II—they would have to have a pretty good reason to switch to *The Graphics Studio*.

We can think of a couple of good reasons for switching to a new program: It's either so easy to use that it puts the competition to shame, or it's got so many features that you can't do without it.

Of the competition in the GS paint category, DeluxePaint II dominates on the feature count, and Paintworks Plus wins on the ease-of-use count. So what about this new kid on the block? Let's start with ease of use.

The part of a coupteur program that you work with is called the user interface. Does it have a command-line prompt, or do you select commands from a menu? Does the whole screen scroll or only part of it? Which keys do you press to accomplish a function? These issues, and many others, are user-interface questions.

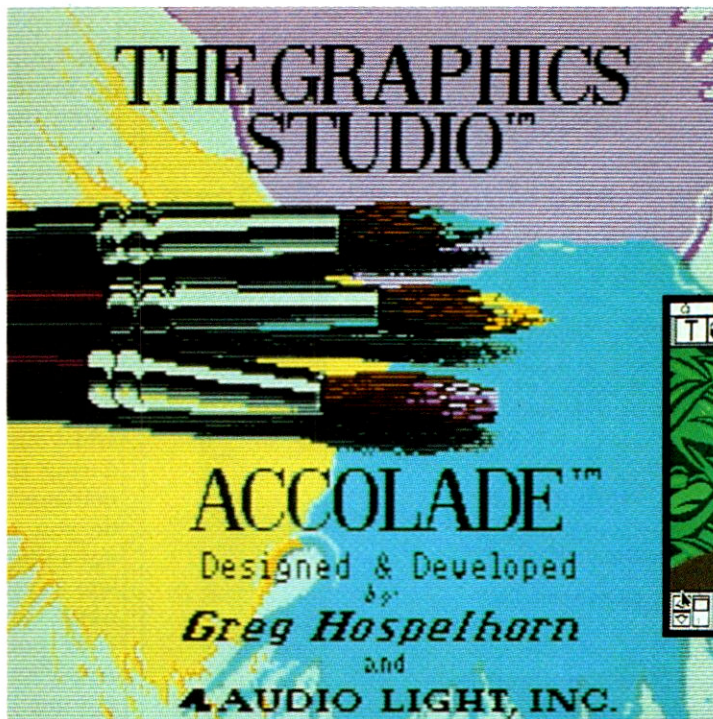
The real controversy over the

user interface started with the Macintosh. The early Apple software for the Mac (the Finder, MacPaint, MacWrite, MacDraw, and so on) set the standard: mouse, windows, pull-down menus, icons, and so on. An important factor in rating Mac software is now whether or not it "follows the interface," because a consistent interface is so important to Mac users.

a desktop interface on the Apple IIGS. Programs such as MultiScribe, Paintworks Plus, and Draw Plus—and, indeed, most of the newer productivity software—have embraced this interface. The desktop interface has proven easy to use, and standardizing it has a distinct advantage: Once you've learned how to use one piece of software, learning to use another one is much easier.

Besides the "look and feel" Apple itself has fostered, there's another kind of standard interface: The popularity of a certain product in the market can make that product's features a de facto standard. In this case, the program that many others have imitated is MacPaint, which has inspired the

PROGRAM MARCHES TO OWN DRUMMER



The Graphics Studio opening screen (left) and menu bars (above)

The success of the Macintosh led Apple to create a Human Interface Group to codify and refine the components of the "desktop interface," and the increased power of the Apple IIGS led to adoption of the desktop interface as the standard for graphics programs on the Apple II. Programmers finally got the system software to easily create

icons, patterns, and general screen layout of both Macintosh and GS paint products.

Therefore, we come to an Apple IIGS paint program with a certain set of expectations. We expect tool palettes with icons for brushes as well as line and polygon tools, a marquee (or edit box), a lasso, a spray can, a paint bucket (for fills),

a hand (for scrolling), a magnifying glass (for zoom editing), and a text tool. We expect a color/pattern palette. We expect a standard menu bar at the top of the screen. We know the menu and the tool and color palettes will obscure part of our drawing so that we have to scroll to paint on the full page.

Of the IIGS paint programs on the market, Paintworks Plus wins the interface test hands down. If you know the interface, it takes ten minutes at best to become comfort-

Of the IIGS paint programs, Paintworks Plus wins the interface test hands down.

able with Paintworks Plus. 816/Paint and DeluxePaint II add their own twists to the interface.

The question is whether the user interface should become a criterion for judging software. More defini-

tively stated: Should a program be subject to criticism because it doesn't follow the Apple desktop interface? What if some programmers feel they can do it better?

Interface

The Graphics Studio deviates from the desktop-interface guidelines in several ways, although on cursory examination it looks as though it adheres to them. There is a menu bar at the top of the screen, but it disappears when you are not near the top of the screen. When you are painting or selecting from the tool options, it shows the current tool or function. (You can turn this feature off so that the normal menus show all the time.)

When you access a pull-down menu and click on your selection, the menu does not go away; it stays there. Accolade claims that a "stay-down" menu lets you make multiple selections from the same menu without having to pull it down more than once. We agree, but the Apple guidelines say that multiple choices such as these should be available in dialog boxes, not menus.

On the subject of dialog boxes, The Graphics Studio's dialog boxes are clearly hand-honed. Instead of using the standard file-dialog box boxes for Save and Load, the programmers obviously did their own thing rather than depend on Apple's tools. We really don't care how they created their dialog boxes, but the boxes should act the same as those created with the GS tool sets. They don't. When you are typing a filename, you cannot use the arrow keys to edit the name, and your pointer disappears, rendering the mouse useless. We can manage without editing, but how do you cancel the operation without a pointer? Answer: Use the Delete key to erase all that you may have typed; then press Return. Your pointer will reappear. Isn't Apple's way easier? Just move the pointer to the Cancel button and press the mouse button.

Instead of placing all the tools on the screen as other programs do, The Graphics Studio uses "pop-up" menus. When you select the rectangle tool, for example, and hold down the mouse button, a new menu unfolds with six more options, such as filled rectangle and rounded rectangle. Ideally, this

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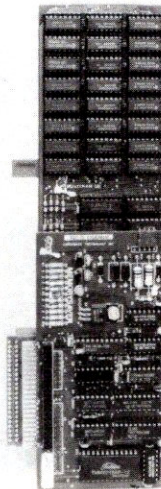
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approach should make the screen display less confusing, but we found it disorienting because we couldn't see all the tools and options. Furthermore, unlike the pull-down menus at the top of the screen, the pop-up menus for the tools don't remain on the screen—they disappear when you select a function. This disappearing act makes sense, since you can select only one tool at a time, but it does do a bit of damage to one of the prime rules of the Apple desktop interface: consistency.

Here's another bothersome quirk in this program: The copy/edit functions in most paint programs require you to select the edit box and then choose Copy, Flip, Horizontal, Cut, and so on. Apple's interface guidelines require a noun before a verb: First you select an area, and then you decide what to do with it. In The Graphics Studio, you must decide what to do before you select an area, and each edit function requires a different tool.

The final blow of the Accolade interface is that it does not allow access to any desk accessories, classic or new. The apple menu at the far left of the menu bar contains only About . . . , and Control/open-apple/Esc is locked out. OK, guys—we just got this great scrapbook from StyleWare, and we can't use it in The Graphics Studio. Score a minus 10 for the interface.

Tools and Functions

The Graphics Studio features a good collection of tools and functions, somewhere between Deluxe-Paint II's dazzling array and the basic set of Paintworks Plus. The program lacks 3-D effects, a lasso, gradient fills, and antialiasing (smoothing). The implementation of the existing tools is as eccentric as the interface.

In The Graphics Studio, your working icon is always a large, outlined cross hair (rather than a pencil, paint bucket, or spray can). The cross hair lets you position your tool, but it disappears as you're working. Thus, as you are painting, you don't see anything but the paint stroke, which makes it hard to pinpoint your location on the screen. All the competing IIGS paint programs use an inverse brush to let you see where your brush is while you are painting.

The Graphics Studio's Zoom

*Our enthusiasm for
The Graphics Studio's
Zoom mode is mitigated
by a paucity of tools.*

mode, though, approaches greatness. The top half of your screen shows the actual-size image, and the bottom half shows the enlarged area. Instead of scrolling the zoomed area with the hand or

scroll bars, you look at a rectangle on the actual-size image that shows the zoomed-in area; to scroll you move the rectangle. Our enthusiasm for the Zoom mode is mitigated by a paucity of tools, however. Only a pencil and fill are available in the Zoom mode. You find the Zoom mode under the freehand-tool icon—yet another example of a user interface designed by the Mad Hatter.

Color, or palette, editing is unique. The top half of the screen



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shows your image, so you can see the effects of palette edits immediately. If you're not sure which color you used for a particular area, all you have to do is move the cursor up to your image and click on the color you want, and it will appear in the Edit box. In addition to the now traditional RGB slider controls, The Graphics Studio offers a color-editing box. Here, one value (red, green, or blue) is constant. The editing box contains a small square. As you move the square, the other two values change. For example, if you make red constant, moving the small square in the color-editing box changes the green and blue values. Just keep moving the square around, and you'll get 256 different colors from which to choose.

The Graphics Studio offers color cycling along the lines of 816/Paint; that is, it cycles through different palettes rather than within a single palette as does DeluxePaint II. The implementation of the color-cycling edit box is confusing. In 816/Paint you can see all the available palettes, but in The Graphics Studio you can see only one palette

at a time. You must use a scroll bar to move through the different palettes and use buttons to add palettes to and subtract them from the cycle.

Preferred Patterns

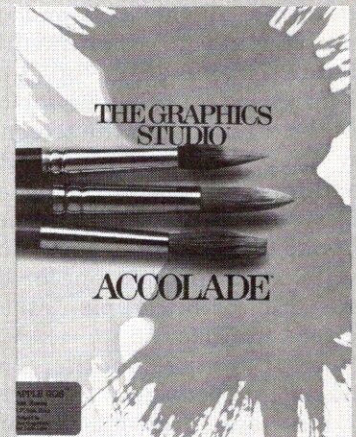
The Graphics Studio's pattern editing is more to our liking. You can make any area of the screen a pattern. A pattern editor allows you to fine-tune the pattern, create an entirely new one, swap a pattern (only 6 patterns are available in the pattern palette, but the program keeps tabs on 18 of them), or load one from a picture or a pattern file. You can also save your patterns to a file.

We could go on; every tool has its idiosyncrasies. All in all, we give the tool selection an 8 out of 10, but the implementation of these tools drops the score considerably, and such tools in an eccentric environment make a program hard to use. Hold off on this one until Accolade cleans up its act.

On the Horizon

We're looking forward to AppleFest in Boston. Look us up at the A+ booth if you're there. Until next month—if not sooner. +

VITAL STATISTICS



THE GRAPHICS STUDIO

An eccentric paint program whose unusual tool implementation and deviations from the standard desktop interface make it more difficult to use than it should be

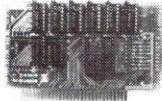
- CPU:** Apple IIgs
- RAM:** 768K
- DISK DRIVES:** one 3.5-inch
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AMON. \$99.95

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APC1. \$6.95 \$7.95

IIe to ImageWriter II or serial cable — 6 feet long.

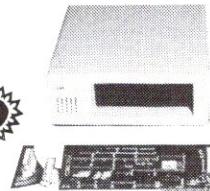
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AAM Adapts standard Apple drives for use with IIc. . . \$4.95

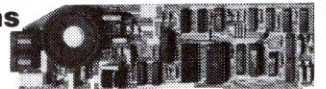
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ADD2C Disk Drive (for IIc). \$109.95

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SPEAKING OF GRAPHICS GALLERY

*Six ocean images
from artists with
Apple II computers*

SCENES FROM THE SEA

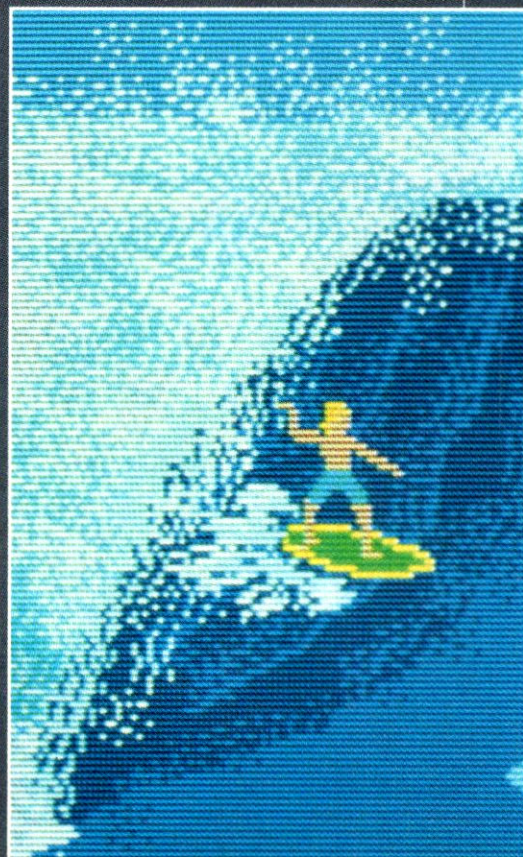
All of this month's artists drew their inspiration from the sea, bringing us colorful images from under, over, and on the waves. "Wave Birds," "Moray Eel," "Sea Garden," and "Shell" are Dazzle Draw creations; "Perfection" was done with Paintworks; and Dick Davies used a Koala Pad with Micro Illustrator for "Shells."

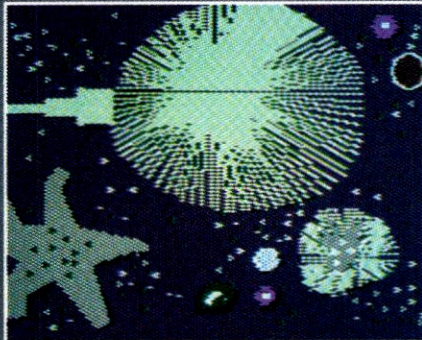
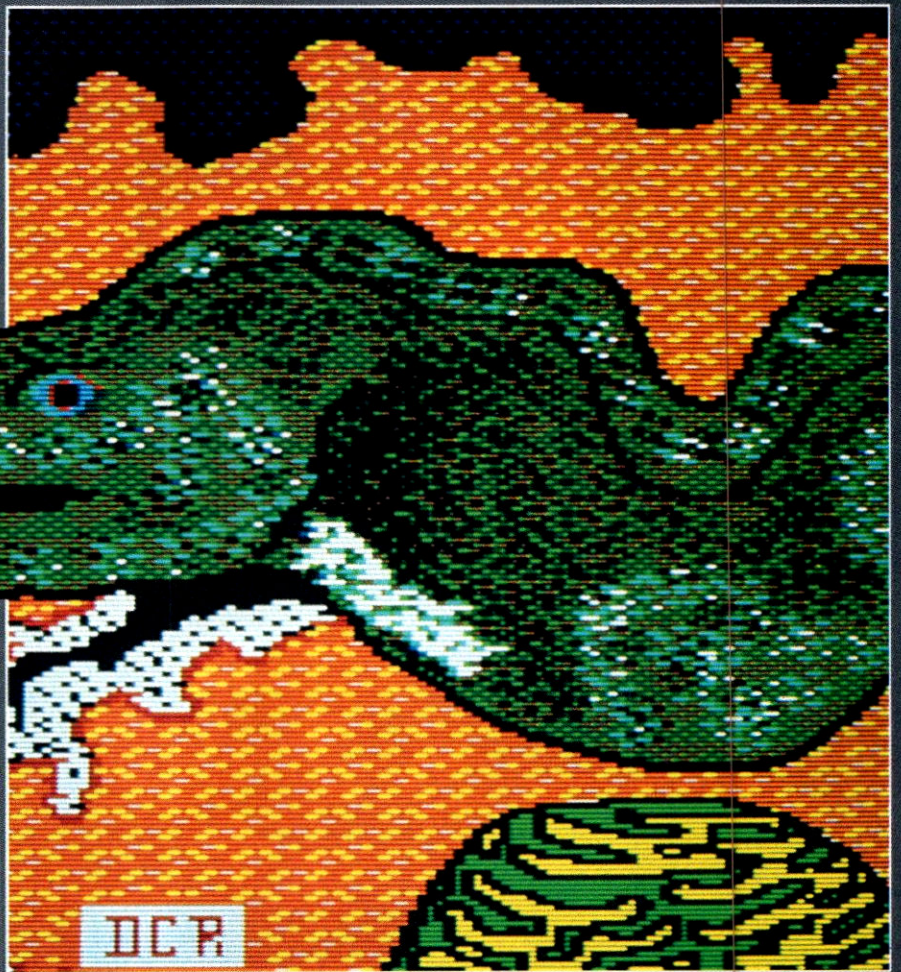
SHELL, GLENN RIDENOUR, Cincinnati, OH



PERFECTION, VINCENT
BATISTONI, Address Unknown

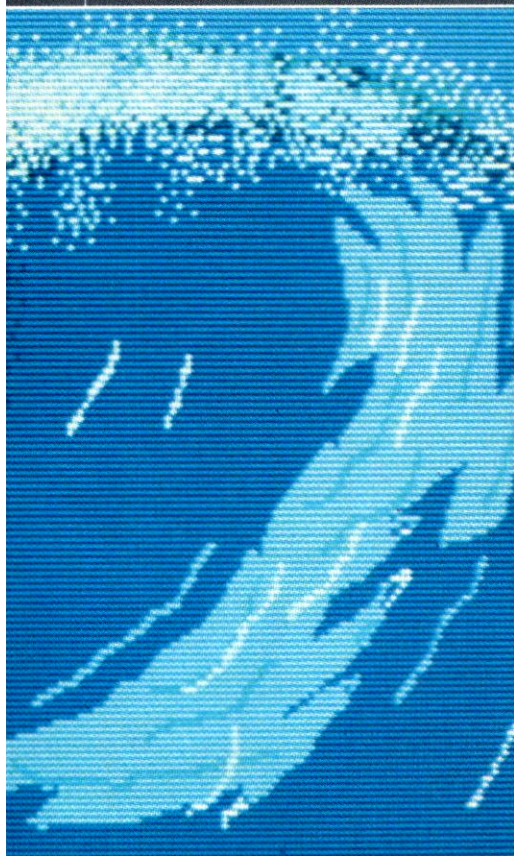
WAVE BIRDS, RON ST. PIERRE, Kobe, Japan





SHELLS, **DICK DAVIES**,
Mountain View, CA

MORAY EEL (above), SEA GARDEN (below), **DAVID RHIND**, *Bermuda*



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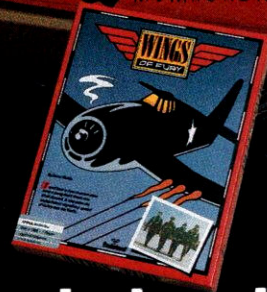


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ENTERTAINMENT GAMEPORT

BY BOB LINDSTROM

A preview of eight coming attractions, and a Illes Bard's Tale update

COMING (COMPUTER) ATTRACTIONS

Exploding on the screen in a blaze of glittering pixels, these are the games that demand to be brought before the American public in the first half of 1988: the stories and puzzles that will entertain a nation—arriving soon on your Apple video terminal.

Monster Mash

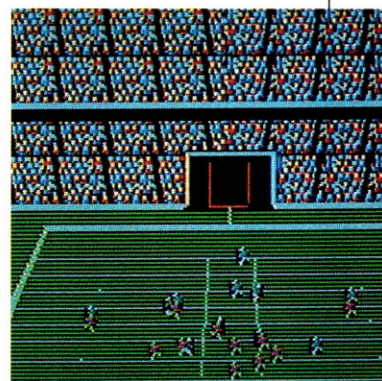
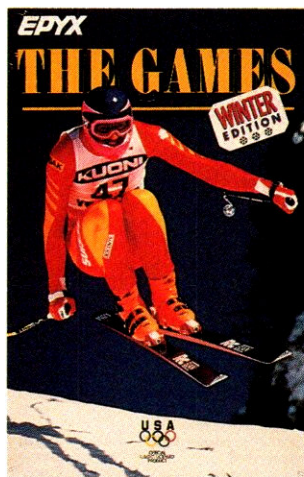
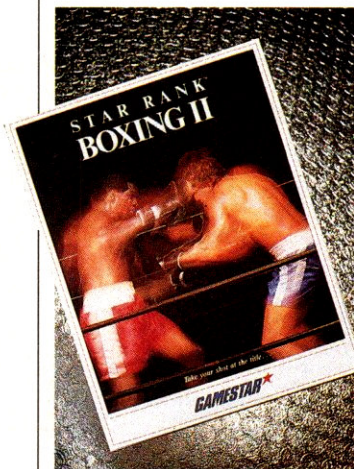
More deadly than Jaws, more frightening than another "GamePort" literary parody—

joysticks across the nation quiver when monsters go on the Rampage! Leaping from the arcades to your home, three giant fiends—ape, lizard, and wolfman—level as many as 157 cities under your insidious control. Rampage is an Activision production appearing now on Apple IIe/c/Gs computers throughout America (\$34.95).

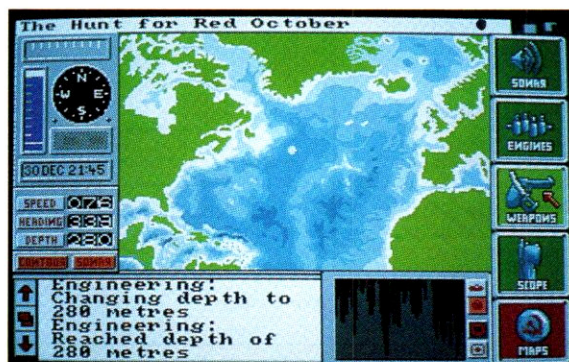
Put Your Gloves On

He could'a been a contender. Or is he just another punch-drunk pa-

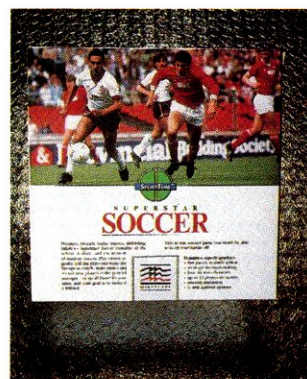
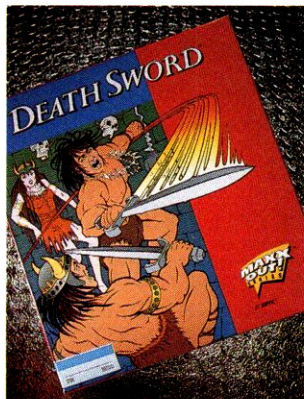
looka from the wrong side of town? The answer lies in your glove in Gamestar's Star Rank Boxing II (\$34.95). He slugs it out against the computer-controlled fighters. He pummels other human opponents. He trains and coaches and fights exhibition matches in his quest for The Title. Just when you thought it was safe to go back into the ring, Star Rank Boxing II—the sequel—hits the mat, boasting better sound, animation, and more fluid player control than the original. Now playing on an Apple near you.



John Madden Football



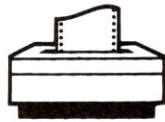
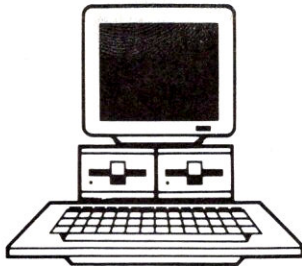
The Hunt for Red October



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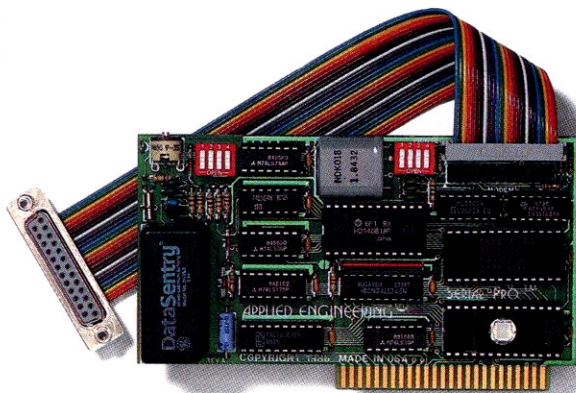
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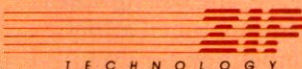
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GAMEPORT

His scheme is to surrender his sub to the Yanks without raising the suspicions of his 113-man crew. Can he do it? Can you?

defector. Commander of a state-of-the-art Russian submarine. His scheme is to surrender his sub to the Yanks without raising the suspicions of his 113-man crew. Can he do it? Can he evade detection? Can he learn to control screen after screen of sophisticated submarine equipment? Can you? The answer comes later this year when DataSoft brings The Hunt for Red October to Apple II computers (\$39.95).

There they are, preview fans, just a few of the entertainments that will be lighting up the Apple screen in the weeks and months ahead.

MORE SAD SONGS FROM THE BARD

Adventurer Matthew D. Krantz of Massillon, Ohio, is a woeful participant in one of the greatest adventures of them all, surviving the Apple IIGs.

Krantz discovered, along with many other

"GamePort" combaters, that the Apple IIGs version of The Bard's Tale doesn't work properly.

Well, that's almost true.

The Bard's Tale for the IIGs did work properly once upon a time. But it seems that not so long ago in the temple of Sculley, a hardware wizard from the land of Woz re-designed the ROM (read-only memory) chips in his magical IIGs sound and graphics box.

Worshippers of the IIGs from far and wide took their own boxes to local Apple gurus to upgrade them to the new ROMs.

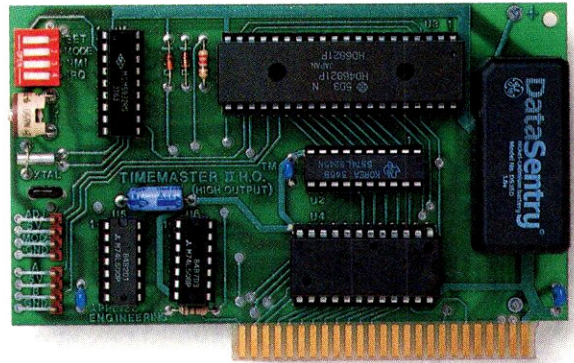
Unfortunately, the improved ROMs drained much of the enchantment from the originally published version of The Bard's Tale.

Before Bard adventurers around the uncivilized world began casting Shock-Sphere spells in the direction of San Mateo, California, Electronic Arts assembled its own team of wizards to re-write The Bard's Tale to benefit from the new ROMs.

The good news for Matthew and all other IIGs bard beaters is that now they can get the updated version of The Bard's Tale for the IIGs by sending their original disk, along with a note explaining the problem, to:

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- Time in hours, minutes, seconds and milliseconds; date with year, month, day of week and leap year
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- Digital I/O port for advanced applications
- Allows AppleWorks to time and date stamp all data automatically
- Displays time and date on AppleWorks screens and files
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ENTERTAIN

A view from a Hellcat's cockpit, a mapmakers' paradise, and Anglophilic trivia await you in this month's games.

HELLCATS OF THE PACIFIC

The Grumman Hellcat was one of the great fighter planes of the War in the Pacific. Between 1942 and 1945, 12,272 of these sturdy aircraft were built for the U.S. Navy, the Marines, and the British Royal Navy. Armed with six 50-caliber machine guns and as much as a ton of bombs, it was equally effective against enemy aircraft and ground targets.

Wings of Fury by Steve Waldo, an action/arcade game, recreates the challenge and excitement of piloting a Hellcat. It is no flight simulator—the joystick controls are quite

simple, the gauges and indicators are nothing like those of the real aircraft, and your airspace is a scrolling two-dimensional screen, with a small window that shows the view from your cockpit. The fast, colorful animation and special effects are up to the very high standards that Apple II gamers have come to expect from Broderbund. Some of the tactics and elements of mission planning are realistic, but the designer has taken a few liberties with history. You can select bombs, rockets, or torpedoes before you take off. The Hellcat, however, never carried torpedoes; that was a job for slow, steady, and specialized bombers.

A good arcade game is quick to learn, visually intense, and full of new challenges as you improve your skill. Wings of Fury gets high marks on all three counts. In the first ten games I played, my score climbed from a pathetic 150 points to a respectable 925. You earn points for knocking out enemy targets. The game

has seven levels of difficulty, but until you get the knack of making carrier landings, you should stay at the beginners' rank ("midshipman"). As in real life, a carrier landing in Wings of Fury is one of the most difficult piloting skills. A little too high and you overshoot the deck. A little too low and you crash into the ship. Crash landings are superbly animated—your plane skids across the deck, spins around, belches smoke, and then bursts into flames.

Air-to-air tactics are extremely challenging. The enemy planes are fast, maneuverable, and quite "intelligent." I haven't been able to line up a good shot against one yet, but I'm still trying, which is some indication of the staying power of this game.

You have three aircraft to complete a mission. The game is over when all three have crashed or been shot down. If you can manage a safe landing on your carrier, you can have your plane rearmed and refueled for another flight. You receive an additional plane every time you earn a promotion in rank.

The game handles the effects of altitude cleverly. At low altitude, you have a detailed view of a small area that scrolls past very swiftly. At high altitude, the view changes to a wide-angle field that moves more



MENTAL REVIEWS



slowly. At low altitude, your bombing and strafing are more accurate, but you are also more vulnerable to anti-aircraft fire.

Although the sound effects are nothing special, the graphics deserve a color monitor. Your carrier rocks gently on the waves, its flag streaming in the wind. Your landing-signal officer waves a pair of little flags. When your tail hook hits the arresting wire, you see the wire reeling out, and when you taxi onto the deck elevator, you see your plane descend into the hangar deck. When you hit an enemy gun position, little animated figures run out, and you can get extra points for strafing them.

The game takes up both sides of a 5¼-inch disk. A self-running demonstration on side A gives prospective players a good idea of the action. A 16-page users' guide provides minimal in-

structions. A few more notes on tactics and a little more historical background would improve the documentation.

Nevertheless, *Wings of Fury* is an engaging entertainment for anyone interested in World War II aerial combat, and a remarkable example of what can be done with 128K on an Apple II.

Mike Markowitz

WINGS OF FURY

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REVIEWS

wilderness pests. Rafts and climbing gear cost plenty.

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Why bother? Because the Compendium must be destroyed. You had it once, but some bandits stole it ("it was bound to happen," the game assures you). The Compendium contains the combined magic of many evil wizards, and only the "four jewels" can thwart it.

Your quest begins in the Galactic Museum. Return there often for gold, weapons, clues, and transportation to faraway places. If the curator is pleased with your progress, he'll raise you a level—but he's not easy to please.

The animation is remarkable, especially in the museum and the dungeon. The mazes are three-dimensional; passageways actually move closer or further away as you take each (resounding) footstep. Dungeon monsters loom and attack from all sides, sometimes in layers. Zap one of the monsters with a "kill flash" or try to rob one of the museum exhibits, and you'll be treated to extra fireworks.

In the wilderness, towns, and castle, the graphics become two-dimensional, but move-

ment, with arrow keys and multiple-choice commands, is still fast and realistic. When you get tired of bashing monsters, you can play one of the "action games": blackjack, flip-flop, or point-and-shoot practice at one of the training schools.

Legacy of the Ancients isn't a tricky game, just a hard one. It requires careful notes and patient strategy. The designers, Chuck and John Dougherty, have combined their specialties (psychology and computer science) to produce a map-makers' paradise.

The copy-protected game comes on two double-sided 5¼-inch disks (you need a blank disk to save character information). Joysticks are optional, but a color monitor helps, especially in the wilderness (where, in monochrome, it's hard to tell mountains from swamp).

The game is part maze, part fantasy, and part pinball. You may be frustrated when your third attempt to storm the castle falls flat, but the changes in visual style and pace are wonderful compensation.

Tad Davis

LEGACY OF THE ANCIENTS

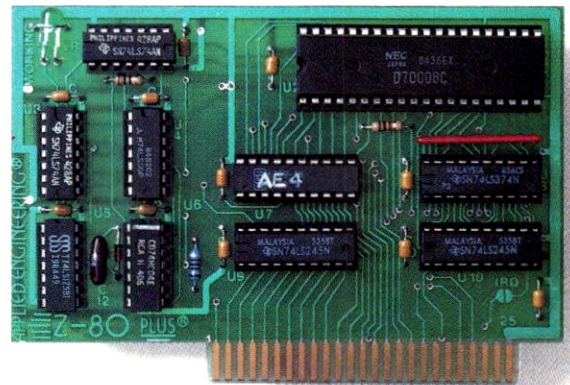
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REVIEWS

RULE, BRITANNIA!

Congratulations! You are the fortunate recipient of a ten-day, all-inclusive trip to London. What sights you'll see, what adventures you'll have! But your luck being what it is, you did not receive your return ticket before you left. "Don't worry!" you were told back in the U.S. "Don't worry!" says the English travel agent who meets you in Victoria Station after you take the train from the airport to the British capital. Rather than giving you your bloody ticket immediately, however, the agent decides to play a game: If over the next few days you can discover the identity of a famous British person, then and only then will the agent hand over your return ticket.

Instead of summoning a bobby or contacting the American embassy, you go along with the plan. After all, this isn't real life—it's the premise of a fun but flawed travel-simulation/trivia-game-with-graphics called Ticket to London.

Now this famous person you're supposed to identify can be a man or a woman, real or fictional—from the present or from the past. You have to solve the puzzle by gathering clues as you explore downtown London.

Here's one set of clues from a game I played—let's see how you do with them. First clue: "She

was born in Switzerland in 1760."

Do you know yet? Hang in there. I'll give you another clue in just a moment.

Upon your leaving Victoria Station, the game displays a map of London's West End, highlighting 20 places of interest. Your first task is to find your hotel among four possibilities. You'll probably waste some time picking a wrong hotel or two—you don't get any help in figuring out which one has your reservation. ("Why?" I asked myself. Even in a game with a premise as absurd as this one, there's no reason for this needless hassle.)

Second clue: "She learned the trade from her uncle."

Among the places of interest on the map are many sites you've probably heard about: Buckingham Palace (where the Queen stays when she's in town), Covent Garden (where the opening scene of *My Fair Lady* takes place), and the British Museum.

You will also become familiar with some landmarks you may not already know of, such as Fortnum & Mason (a high-class store), Portobello Road (an open-air market), and the Tate Gallery (an art museum). You also must visit banks and money-changing locations where you can exchange your American greenbacks for British pounds, at the prevailing exchange rate of course—

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REVIEWS

it fluctuates daily.

Now here's your third clue: "She gave flower-modelling lessons to the sister of Louis XVI." Any ideas yet? I'm sure you've already ruled out both Margaret Thatcher and Princess Di.

As you travel about town, some of the people you encounter will quiz you on British trivia, four questions per encounter, in multiple-choice format. If you don't know the answer, you can attempt to pick the correct response by guessing, but if you don't get it after two tries, the questioner moves along to the next query without telling you which of the answers was right. I fault this part of the game the most. The game's rich database is designed to give you new information every time you play, but its presentation prevents you from learning much that you don't already know, despite the claim on the game's packaging.

Fourth clue: "She came to England in 1802."

Ticket to London is essentially a trivia game, and as with other trivia games, the more knowledge you possess before playing, the more successful you'll be. For example, one of the clues tells you to buy a ticket for "Henry Purcell's opera." Since Covent Garden is on the map and because the documentation tells you that Covent Garden is the place to see opera or ballet, you head in that direction. But once you get there, if you

don't know that the name of Henry Purcell's opera is *Dido and Aeneas*, you won't get another identity clue.

Which brings us to the fifth and, for the time being, final clue (the game can give you up to ten): "She modelled heads of people during the Reign of Terror."

Aha! That one made it simple, right? Who else could it be but "Madame Tussaud," who made death masks of Louis XVI and Marie Antoinette immediately after they were beheaded and whose wax museum is one of London's most popular tourist attractions.

So if this sort of Anglophilic guessing game appeals to you, you might have fun with Ticket to London, but as much as I liked parts of it, I just don't think that its potential has been completely realized.

A personal note: Although the game makes no claim for its usefulness in such a situation, I played it many times just before my first trip to London to familiarize myself with the layout of the city and to get myself in a British frame of mind.

Donald Oliver

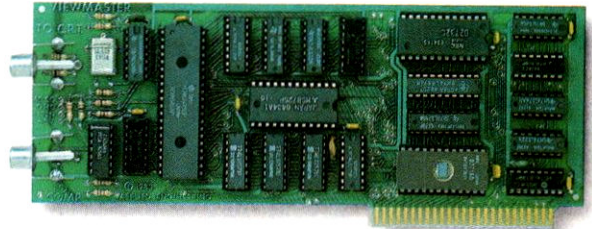
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Tot Fuel Eliminator or Shanghai	21.	Indoor Sports, Uridium, or Xevious	21.
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Broderbund 2400 A.D.	27.	The Tower Of Myrallan (IIgs) or Alien Mind	34.
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Bulseye Ticket to London, Paris, Spain, or Washington D.C.	28.	Space Quest or Space Quest II (IIgs)	34.
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Tag Team Wrestling or Commando	24.	Kings Quest I, II, or III (APII or IIgs Ver.)	34.
DianaSoft Goonies	15.	Leisure Suit Larry (APII or IIgs Ver.)	27.
Electronic Arts Bards Tale	32.	Thexder (IIgs)	24.
Bards Tale (IIgs), Instant Music (IIgs), or Music Construction Set (IIgs) (each)	39.	The Black Cauldron	27.
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Adventure Construction Set, Lords of Conquest, Make Your Own Murder Party, or Realm of Impossibility (each)	12.	Star Trek (The Promethean Prophecy)	27.
EPYX California Games (IIe or IIgs Ver.), Dive Bomber, Championship Wrestling, Destroyer (IIe or IIgs Ver.), Omnicron Conspiracy, Sub Battle Simulator (IIe or IIgs Ver.), Summer Games II, Street Sports: Baseball, Street Sports: Basketball, Winter Games (IIe or IIgs Ver.), Home Video Producer, Sporting News Baseball, Stickler Maker, Street Sport Soccer, The Games: Winter Edition, or World Games (IIe or IIgs Ver.) (each)	26.	Sir-Tech Wizardry	32.
Rad Warrior	18.	Knight of Diamonds	32.
The Movie Monster Game	15.	Legacy of Lyllygarn	27.
World's Greatest Baseball or Football Game	15.	Return of Werdna	39.
Firebird Elite	17.	Deep Space-Operation Copernicus	27.
Guild of Thieves	27.	Software Simulations	
Hayden Software Sargon III	15.	Pure Stat College Basketball (IIe, IIc, IIgs)	28.
Infocom		Baseball (IIe, IIc, IIgs)	28.
Border Zone, Bureaucracy, Hollywood Hyjinx,		Football (IIe, IIc, IIgs)	21.
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		Gato (IIgs)	25.
		Orbiter (IIgs), Wilderness or Dondra	31.
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		Colonial Conquest, Roadwar 2000, Realms of Darkness, Shard of Spring, The Eternal Dagger, or Wizard's Crown (each)	28.
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		Sublogic Flight Simulator II	36.
		Jet	30.
		Scenery Disks 1, 2, 3, 7, or II (ea)	16.

Utilities & Languages

Absoft		Roger Wagner SoftSwitch (IIgs)	39.
AC/Basic (16-bit BASIC Compiler for IIgs)	99.	Merlin 8/16 (IIe, IIc, IIgs)	79.
Apple Computer Apple II Instant Pascal	119.	The Byte Works ORCA/Pascal (IIgs)	89.
Apple Pascal V1.3	215.	ORCA/Pascal Desktop Debugger	99.
Beagle Brothers		ORCA/M 4.1	72.
Beagle Screens, Big U, MacroWorks, or Pro-Byter (each)	21.	ORCA/M GS	49.
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D-Code, Extra K, Power Print or Triple Dump (each)	25.	TML Pascal for the GS	35.
Borland Turbo Pascal 3.0 (Req. CP/M)	48.	TML Source Code Library for the GS	35.
Funk Software Sideways Prodos & Dos 3.3	47.	TML Speech Toolkit	49.
		TML Pascal APW	89.
		Zedcor ZBasic 4.0	42.

Accelerators/Ramcards/Z-80/80 Column Cards

Apple Computer		Z-RAM Ultra 2 or 3 (256K to 1MB)	Call
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Apple IIe Enhancement Kit	49.	GS-Ram Plus (1MB to 6MB)	Call
Applied Engineering		Phasor (IIe, IIc, and IIgs)	139.
RamKeeper	149.	TransWarp Accelerator (IIe and IIc)	169.
RamWorks Basic (256K or 512K)	Call	ViewMaster 80 (IIe)	129.
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PC Transporter (384K to 768K)	Call	Ramstack Plus IIgs (256K Exp. to 1MB)	105.
PC Transporter Installation Kit (IIe or IIgs)	Call	Checkmate Technology MemorySaver (IIgs)	119.
RamFactor (256K to 1MB)	Call	Orange Micro RamPak 4GS	
Z-RAM Ultra 1 (256K or 512K)	Call	(512K Exp. to 4MB w/Utilities)	229.

Printer Interface Cards

Apple Apple Super Serial Card	119.	SMT Envoy (Super Serial type Interface)	67.
Applied Engineering Buffer Pro 32K	85.	Printech II (Parallel Interface)	37.
Buffer Pro I28K or 256K	Call	Thirdware Finger Print GSI	69.
Serial Pro (IIe, IIc, IIgs)	119.	Finger Print Plus	
Parallel Pro (IIe, IIc, IIgs)	79.	(Specify Cables: Parallel, Serial or ImageWriter II-IIe & IIc)	89.
Orange Micro ProGrappler (Apple IIe or IIgs)	79.	FingerPrint IIe (Internal or External Ver.)	74.
Serial Grappler Plus	61.	Finger Print G+ (With Parallel Cable IIe, IIc, IIgs)	55.
Grappler C/Mac/GS	65.		
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Acolade Graphics Studio (IIGs)	42.	Print Shop Graphics Library Party Edition	24.
Activision Draw Plus (Not Protected IIGs)	59.	Show Off (IIGs)	42.
Paint/Write/Draw (Not Protected IIGs)	115.	Data Transforms Printrix I.I	46.
Clip Art Gallery (Req. PaintWorks Plus IIGs)	21.	Monster Font Pack	21.
GameMaker Maker Bundle	34.	Electronic Arts DeluxePaint II (IIGs)	37.
PaintWorks Gold	64.	DeluxePrint II (IIGs)	26.
Postcards (IIGs)	21.	Art Parts 1 or II, or Seasons & Holidays (IIGs)	41.
Postcards (Ile & Ile)	18.	EPYX Printmagic	17.
Greeting Card Maker	28.	Graphics Scrapbook Chapter #1, #2, or #3	21.
Bantam Software		Create-A-Calendar	21.
Wait Disney Card & Party Shop	27.	Intracorp Bumper Sticker Maker	34.
Wait Disney Comic Strip Maker	27.	Business Card Maker	36.
Baudville 816/Paint (Works On All Apples)	46.	The Video Wizard	42.
Award Maker Plus	24.	PBI Software Visualizer (IIGs)	59.
Take 1 Deluxe	36.	Visualizer IIe	55.
Animation Library or Zany Characters	18.	Scholastic SuperPrint (IIGs)	31.
Beagle Brothers Beagle Graphics	36.	Spinnaker T-Shirt Shop	34.
Minipix Disk #1, #2 or #3 (each)	19.	T-Shirt Shop Graphics	15.
Shape Mechanic	25.	Springboard Newsroom	35.
Berkeley Software GEOS	64.	Springboard Publisher (Ile, IIG, IIGs)	79.
Broderbund Toy Shop	34.	Certificate Maker	26.
Animat	45.	Certificate Maker Library #1	20.
Dazzle Draw	39.	Fonts For Springboard Publisher	26.
Drawing Table (IIGs)	62.	Newsroom Clip Art Collection Vol. 1 or 3	18.
Print Shop Enhanced or Fantavision	32.	Newsroom Clip Art Collection Vol. 2	25.
Print Shop (IIGs) or Fantavision (IIGs)	42.	Graphics Expander Vol. 1 or Laser Drivers	25.
Print Shop School Edition	48.	Style Sheets/Newletters	19.
Dazzle Draw School Edition	48.	Works of Art Education, Holidays	26.
Print Shop Companion	25.	or Assortment (each)	59.
Print Shop Graphics Library 1, II, III	16.	StyleWare, Inc. TopDraw (IIGs)	59.
or Holiday Ed.	16.	Unison World Printmaster Plus	31.
Print Shop Graphics Library Sampler Edition	24.	Art Gallery 1 or Art Gallery II	19.

Educational Software

Activision Mavis Beacon Typing	29.	Great Wave Kidstime II (IIGs)	24.
Term Paper Writer	34.	SpaceLace	21.
Barron's Computer SAT Revised Version	34.	Harcourt, Brace, Jovanovich Computer SAT	27.
Baudville Guitar Wizard	19.	Learning Company Reader Rabbit (IIGs)	41.
Ted Bear Discovers...Rainy Day Games	19.	Writer Rabbit (IIGs), Think Quick (IIGs)	34.
Britannica Algebra I, 2, 3, or 4	25.	or Rockys Boots (IIGs)	28.
Algebra 5 & 6	31.	Magic Spells (IIGs)	31.
Designasaurus (IIGs)	24.	Gertrude's Secrets (IIGs)	31.
Broderbund Geometry	68.	Think Quick or Writer Rabbit	30.
Science Tool Kit Master Module	51.	Reader Rabbit or Magic Spells	26.
Science Tool Kit Module I or II	27.	Gertrude's Puzzles or Secrets	31.
Type!	31.	Word Spinner	23.
Variable Feasts	35.	Math Rabbit	26.
Where in the World is Carmen Sandiego?	26.	Robot Odyssey I or Rocky's Boots	32.
Where in the USA is Carmen Sandiego?	29.	Mindscape Crossword Magic	34.
Where in Europe is Carmen Sandiego?	31.	Perfect Score SAT	48.
Compu-Tech Once Upon A Time	25.	PinPoint Micro Cookbook (Ile or IIG)	31.
Stepping Stones Level I	25.	Bon Appetit	37.
Stepping Stones Level II	25.	Simon & Schuster	27.
See the U.S.A.	36.	Speed Reading Tutor IV	34.
Davidson & Associates		Speed Reading Tutor IV (IIGs)	34.
Alge-Blaster, Classmate or Math Blaster Plus	30.	Typing Tutor IV (Ile, IIG, or IIGs)	34.
Grammar Gremlins or Read 'N' Roll	30.	Spinnaker Kindercomp Gold	26.
Homeworker	55.	Homework Helpers Writing or Math (Ile or IIGs Ver.)	32.
Speed Reader II	41.	Typing Made Easy	32.
Spell-It or Word Attack!	30.	Facemaker: Golden Edition	26.
Math & Me	25.	Kidwriter	27.
Designware Grammar Examiner	25.	Terrapin Enhanced Terrapin Logo V3.0	69.
Spellicopter or Math Maze	25.	Weekly Reader	
Body Transparent	25.	<i>Stickybear Series:</i> Sticky Bear ABC, Car	
States & Traits	25.	Builder, Basic, Drawing, Math I, Math II,	
First Byte/Electronic Arts		Math Word Problems, Numbers, Opposites,	
Mathtalk, Kidtalk, First Shapes, Speller		Parts of Speech, Printer, Reading, Reading	
Bee, or Smoothtalker (IIGs) (each)	36.	Comprehension, Shapes, Spellgrabber,	
Mathtalk Fractions or First		Typing, Townbuilder, Vocabulary	
Letters & Words (IIGs)	36.	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		Pro Modem 1200A (Single Card)	169.
Internal Modem II, Ile, IIGs)	169.	Pro Modem 300c	89.
Hayes Hayes Micromodem IIe (Internal)	149.	Communications Buffer (2K Exp. to 512K)	105.
Hayes Smartmodem 1200A (Internal)	265.	Supra Corporation	
Hayes 300 Baud Smartmodem		Supra Modem 2400 (Hayes Compatible)	149.
Ile w/Smartcom I	187.	U.S. Robotics U.S. Robotics Sportster 1200	119.
Hayes 1200 Baud Smartmodem	299.	U.S. Robotics Courier 1200	199.
Hayes 2400 Baud Smartmodem	449.	U.S. Robotics Courier 2400	349.
Practical Peripherals		U.S. Robotics Courier 2400E	379.
Practical Modem 1200 SA	129.	U.S. Robotics Courier HST 9600	689.

Disk Drives & Hard Disk SubSystems

American Micro Research (Micro Sci)		SD 40 (40MG Hard Drive)	879.
A5 D Half Height 5 1/4" Drive	149.	First Class Peripherals	
(IIGs Daisychain)	149.	Sider 20MB Hard Drive	549.
A2 Full Height (II+ & Ile)	139.	Sider 40MB Hard Drive	839.
A.5 Half Height (II+ & Ile)	139.	B-Sider 60MB Tape Backup	839.
A.5C Half Height (IIG)	52.	Blank Tape 5 Pack	65.
Micro Sci C2 Controller	52.	Revision D (Chip/Software for CP/M)	52.
Applied Engineering Transdrive 360K	215.	Hi-Tech Peripherals	
Transdrive Dual 360K	319.	Full Height 5 1/4" Drive for Apple IIe (Beige)	139.
Transdrive Half Height 360K	109.	Half Height 5 1/4" Drive for	
Central Point Software		Apple IIe or IIG (Beige)	139.
Universal Disk Controller	79.	Half Height 5 1/4" Drive for	
Central Point 800KB Drive	185.	Apple IIe or IIG (Platinum)	149.
Universal Disk Controller/800KB		Half Height 5 1/4" Drive Platinum for IIGs	169.
Drive Bundle	259.	Apple IIc Drive Adaptor	15.
CMS SD 20 (20MG Hard Drive)	579.	Mitac AD-3C Slimline IIc	129.

Accessories

Apple Computer Apple Mouse IIe	125.	System Saver (IIGs)	79.
Apple Mouse IIc	89.	Turbo Mouse (Reg. or ADB)	82.
Applied Engineering		Kraft Kraft Universal 3 Button	
TimeMaster H.O.	85.	Joystick (II+ Ile, IIG)	34.
Ine System Clock	55.	Koala Technologies	
IBM Style Keyboard	109.	Koala Pad Plus w/Graphics Exhibitor	84.
CH Products		MDideas	
Hayes Mach II Joystick (Beige or Platinum)	38.	Conserver (IIGs Switched Surge	
Hayes Mach III Joystick (Beige or Platinum)	29.	Suppressor w/Fan)	119.
Hayes Flight Stick	52.	SuperSonic (Stereo Card for IIGs)	52.
Curtis Curtis Emerald	36.	SuperSonic Digitizer (IIGs)	52.
Curtis Ruby	64.	Mouse Systems A+ Mouse (IIG)	69.
Curtis Ruby Plus	50.	A+ ADB Mouse (IIGs)	89.
Curtis Diamond Plus	40.	MousTrak	
DataDesk		MousePad 7"x9" Size	8.
DataDesk ADB-101	159.	MousePad 9"x11" Size	9.
Enhanced Keyboard (IIGs)		MousePad L/F (Low Friction)	9.
Kalmar		Orange Micro	
Teakwood Rolltop Disk Case (Holds 50)	18.	Juice Box (IIGs Switched Surge	
Kensington		Suppressor w/Fan)	69.
Mouse Pocket (Reg. or ADB)	8.	SMT	
Mouseway (Mousepad)	8.	No Slot Clock (II+ & Ile)	42.
Apple IIGs Dust Cover or		Street Electronics	
Imagewriter I or II Cover	10.	Echo IIb Speech Synthesizer (II+, Ile, IIGs)	109.
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Disk Drive Cleaning Kit (3.5" Drives Only)	20.	Ribbons Unlimited	
Apple Security System	34.	ImageWriter Ribbon-Black	4.50
Printer Muffler 80	38.	ImageWriter Ribbon-Color	5.
Printer Muffler 132	51.	ImageWriter II - 4 Color Ribbon	11.
Printer Muffler Stand 80 or 132	61.	ImageWriter Rainbow Pk. (6 Colors)	25.
A/B Box (IIGs)	23.	Thunderware	
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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)	20.
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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	Call	Microline 292P (240cps Dot Matrix 10")	539.
FX-86c	Call	Microline 293P (240cps Dot Matrix 15")	639.
FX-286c	Call	Panasonic	
EX-800 or EX-1000	Call	KXP-1080 I/M2 (144 cps) NLQ Mode	199.
LQ-800 or LQ-850	Call	KXP-1091 I/M2 (192 cps) NLQ Mode	209.
LQ-1050 or LQ-2500	Call	KXP-1092 I (240 cps) NLQ Mode	329.
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Microline 182P (120cps Dot Matrix 10")	249.	Seikosha SP 1000 (Imagewriter Compatible)	219.

Communication Software

Activision Telcomm Plus	64.	Pinpoint Point-To-Point	79.
Checkpoint Technology		United Software Industries	
ProTERM (IIGs, Ile, IIG)	79.	ASCII: Express Pro: Prodos or Dos 3.3	75.
Compuserve Compuserve Starter Kit	24.	ASCII: Express Mousetalk	59.

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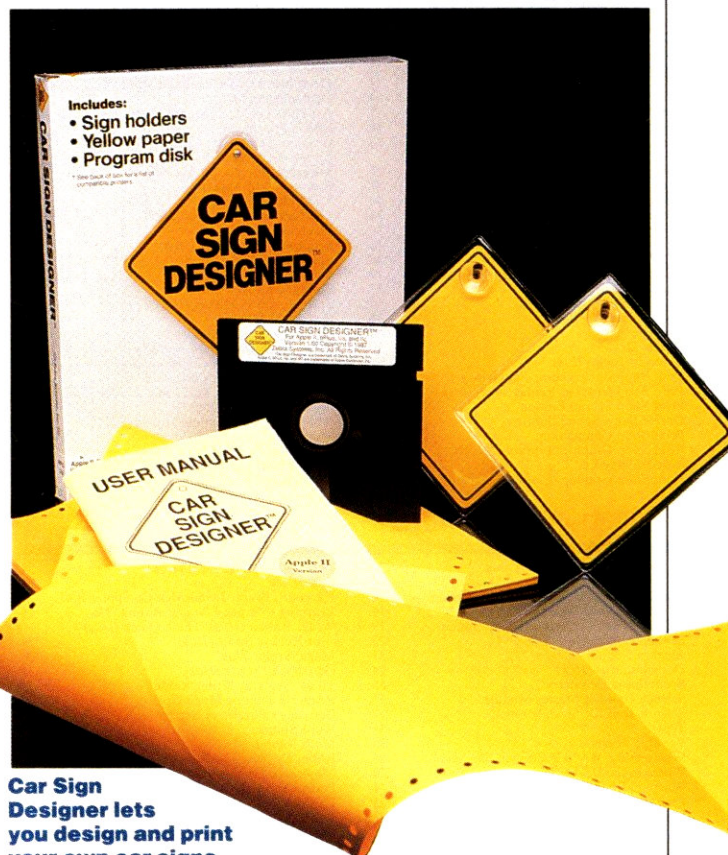
PRODUCT ROUNDUP

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Great Chefs is a software collection of recipes based on the PBS-television cook-

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The Great Chefs software contains hundreds of recipes.



Car Sign Designer lets you design and print your own car signs.

cross-indexed by virtually every item in every recipe. The meal-planning software that comes with each volume or set allows you to select dishes based on ingredients, cooking time, and method of cooking; to re-scale recipes for any size group; and to print out your selections. In addition to the recipes, the program includes cooking tips, anecdotes, and wine suggestions from the chefs. Volumes are divided alphabetically by chefs' last name (Volume 1: A-F, Volume 2: G-N, Volume 3: O-Z).

List Price: \$24.95 per volume; three-volume set, \$65
Requires: Apple IIe or IIc; 128K RAM; one 5¼-inch disk drive. DOS 3.3; not copy-protected.
Concept Development Associates, Inc.
45 Cordova Street
St. Augustine, FL 32084
(904) 825-0220

CIRCLE READER SERVICE NO. 501

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List Price: \$29.95
Requires: Apple II Plus, IIe, or IIc; 64K RAM; one 5¼-inch disk drive; printer. ProDOS; copy-protected.
Zebra Systems, Inc.
78-06 Jamaica Avenue
Woodhaven, NY 11421
(718) 296-2385

CIRCLE READER SERVICE NO. 502

MAVIS BEACON TEACHES TYPING

Mavis Beacon Teaches Typing is a typing tutorial that includes, as its practice lessons, quotes from history's greatest writings, riddles, rhymes, and jokes, in addition to hundreds of facts from *The Guinness Book of World Records*. The program features 2-D and 3-D graphics, "guide hands" that type with you and show proper technique, and help windows for each stage of every lesson. The program also includes an arcade-type Road Racer typing game and a musical "Tempo Typing" section with an on-screen metronome. More than 20 color graphs display your progress at any time.

Both word-processing and typewriter modes are available. The package includes a typing textbook as well as a program called Resume Writer.

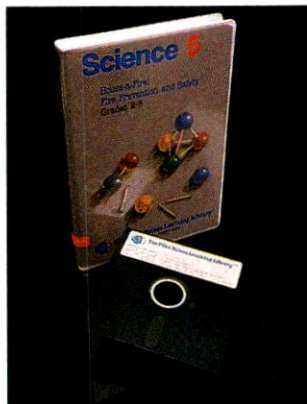
List Price: Apple II Plus, IIe, or IIc version, \$39.95; Apple IIgs version, \$44.95; backup, \$5; hard-drive-installable disk, \$10

Requires: Apple II Plus, IIe, or IIc; 64K RAM; two 5¼-

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House-a-Fire is a program designed to teach fire safety and fire prevention to students in grades 2-8. The program consists of a database of scientific/safety information and two simulations, *The Firefighter* and *Make It Safe*.

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House-a-Fire

appropriate substance to use to extinguish it, and dealing with utilities and weather.

In *Make It Safe*, students move into and furnish a new house and try to make it safe from fire. If they are unsuccessful, a fire breaks out, and they must decide to evacuate or try to fight the fire. If the students safely extinguish the fire, they may choose to search the house for all the other fire hazards.

List Price: \$49.95

Requires: Apple IIe, IIc, or IIgs; 64K RAM; one 5¼-inch disk drive. Copy-protected.

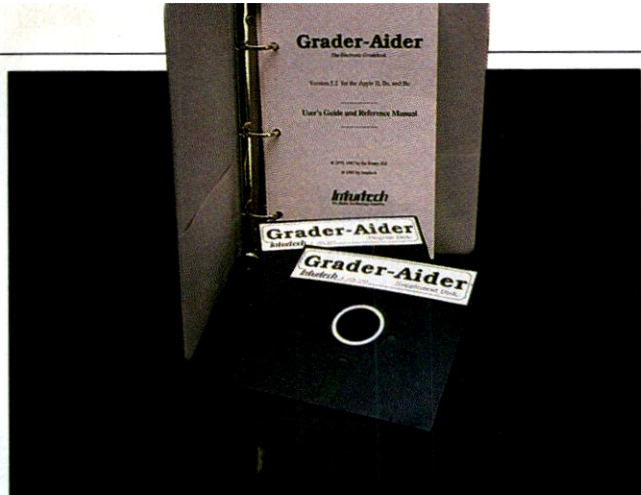
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GRADER-AIDER (VERSION 5.2)

Grader-Aider is a grading program designed for all teachers, from kindergarten through college. It can hold 120 assignments or 200 students per class, with up to 15 classes per disk. It offers three different grading sys-



Grader-Aider is designed for teachers of all grades.

tems—points, percentages, and weights.

The program can produce six kinds of reports: individual student progress, class score, final score, assignment score lists, missing-assignment lists, and failing notices. Teachers can tailor reports by using options such as ranking, statistics, assignment selection, and multiple-low-score dropping. You can add comments to any report and save reports as text files for use with most word-processing programs.

List Price: single-user version (not available to schools), \$45; unlimited schoolwide license, \$235; demonstration disk, \$6

Requires: Apple II Plus, IIe, IIc, or IIgs; 48K RAM; one 5¼-inch disk drive; printer recommended. DOS 3.3; not copy-protected.

Intuitech
69 South 400 East
Orem, UT 84058

Written inquiries only

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ICONIX

Iconix is a super-hi-res graphics and animation interface for Applesoft and the Apple IIgs. It includes 16 new commands for Applesoft that link your BASIC programs to the super-hi-res screen. Iconix lets you plot all 4096 colors in the 320 mode; edit, plot, float, or animate icons; and plot super-hi-res fonts in any color. You can increase the potential size of your Applesoft programs by 16K and create your own menus or screen environments with mouse control.

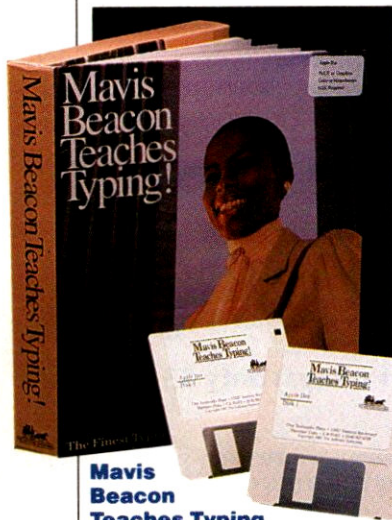
List Price: \$39.95

Requires: Apple IIgs; 512K RAM; one 3.5- or 5¼-inch disk drive. ProDOS; not copy-protected.

So What Software
10221 Slater Avenue
Suite 103

Fountain Valley, CA 92708
(714) 964-4298

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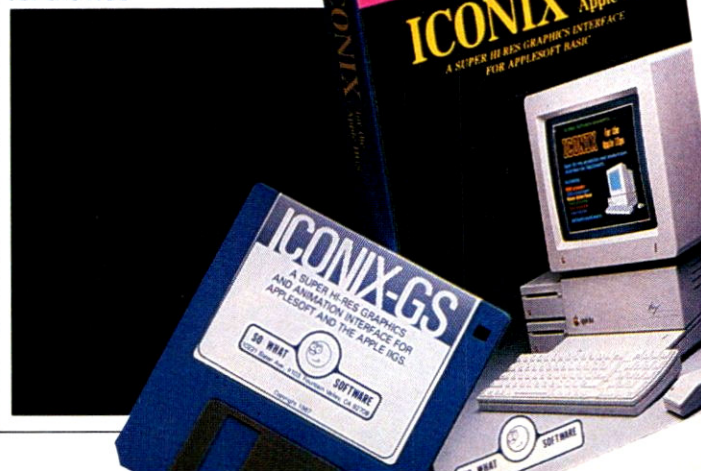
Mavis Beacon Teaches Typing

inch disk drives—or Apple IIgs, 512K RAM, one 3.5-inch disk drive. Copy-protected.

The Software Toolworks
One Toolworks Plaza
13557 Ventura Blvd.
Sherman Oaks, CA 91423
(818) 907-6789

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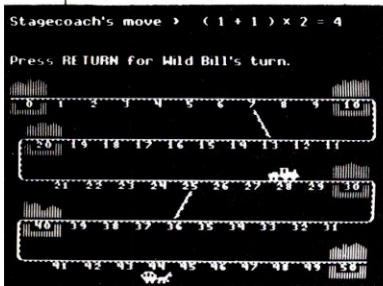


PRODUCT ROUNDUP

SOFTWARE

HOW THE WEST WAS ONE + THREE X FOUR

How the West Was One + Three X Four is a mathematics game for grades 4-12. It involves a race between a stagecoach and a locomotive, each "driven" by a student. Students decide on the length of their moves by forming three randomly generated numbers into equations, using addition, subtraction, multiplication, and division.



A mathematical game from Sunburst

List Price: \$65

Requires: Apple II Plus, IIe, IIc, or IIGs; 48K RAM; one 5¼-inch disk drive. Copy-protected.

Sunburst Communications, Inc.
39 Washington Avenue
Pleasantville, NY 10570
(800) 431-1934
In Canada (800) 247-6756
In NY (914) 769-5030

CIRCLE READER SERVICE NO. 507

TEENAGE STRESS PROFILE

The Teenage Stress Profile is a program that creates a comprehensive profile of the stressful aspects of a teenager's life.

The program provides individualized reports based on teenagers' response to several sets of questions. These reports identify physical and psychological

symptoms of stress that teenagers may be experiencing, evaluate their vulnerability to stress, outline specific problems that they are experiencing, and make suggestions on how to deal with these problems. You can print out the reports.

Each individual's profile is evaluated in terms of norms for the teenage and general population. The program can be used alone or under the direction of a counselor.

List Price: \$99; lab packs, \$287

Requires: Apple II Plus, IIe, IIc, or IIGs; 48K RAM; one 5¼-inch disk drive. Copy-protected.

HRM Software
175 Tompkins Avenue
Pleasantville, NY 10570
(800) 431-2050
(914) 769-6900

CIRCLE READER SERVICE NO. 508

PROFESSIONAL BASEBALL HANDICAPPING SYSTEM

The Professional Baseball Handicapping System for Baseball Enthusiasts allows you to handicap baseball games by using information from the daily newspaper sports section. The computer performs the statistical analysis to predict the winner, the point spread, and the total points in each game. You can print the data or have it displayed.

List Price: \$49.95
Requires: Apple II Plus, IIe, IIc, or IIGs; 48K RAM; one 5¼-inch disk drive. DOS 3.3; not copy-protected.

Software Exchange
P.O. Box 5382
West Bloomfield, MI 48033
(800) 527-9467 (orders only)
(313) 626-7208

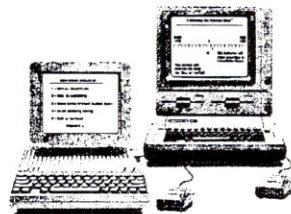
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Expert Opinions

Nibble magazine says, "This program should be in the library of every Apple user". Howard Sams Tech Manual, Apple Orchard, InCider Popular Computing, and the Apple II Review have all awarded Master Diagnostics with triple AAA ratings. *Consumers Guide chose Master Diagnostics as one of the best programs for 1985.* Used by Apple service centers world-wide.

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CIRCLE 329 ON READER SERVICE CARD

Clarity

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 #48

A IIGs *Finder* limitation that many people have run into is that it won't copy the contents of a 3.5 disk into /RAM5. The problem is that *Finder* automatically loads the contents of disks to be copied into IIGs RAM to make the copy procedure go faster. Once it has done this, however, there isn't enough room left in /RAM5 to hold the contents of the 3.5. For more, see the February 1988 **Open-Apple**, page 4.5.

From our fan mail:

"Lee Raesly directed questions and added his input to a panel of four Apple II stalwarts....A brief recounting of their answers may be of interest to many of you:

Q. What magazines are available?
A. *WAP Journal*, *A+*, *AppleWorks Journal*, *Byte*, *CALL Apple*, *InCider*, *Open-Apple*, *Nibble*. (After *WAP Journal* *Open-Apple* was the unanimous favorite.)"

Washington Apple PI Journal
Washington D.C., January, 1988, page 10

Open-Apple

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**PRODUCT
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cabulary of 40 nouns is the basis of six testing and training units: Vocabulary, Categorization, Word Identification by Function, Word Association, Concept-Same, and Concept-Different. Several levels are available, and instructors can control the format and difficulty.

List Price: \$185

Requires: Apple II Plus, IIe, IIc, or IIGs; 64K RAM; one 5¼-inch disk drive; Street Electronics Speech Synthesizer; joystick or Touch Window optional. Copy-protected.

Laureate Learning Systems, Inc.
110 East Spring Street
Winooski, VT 05404
(802) 655-4755

CIRCLE READER SERVICE NO. 510

school, and home. The wallets, available for either 3.5- or 5¼-inch disks, are velcro-sealed. The 3.5-inch size holds 6 diskettes, and the 5¼-inch size holds 15.

List Price: \$11.95-\$16.95
Computer Coverup, Inc.
2230 South Calumet
Chicago, IL 60616
(312) 326-3000
(800) 282-2541

CIRCLE READER SERVICE NO. 512

STATFREE WIPES

Statfree Wipes are disposable, nonresidual cleaning pads moistened with a cleaning agent that includes a static dissipator. The wipes come in a dispenser package containing 20 pads plus an adhesive strip for attaching the package to equipment or furniture.

List Price: \$4.70

Perfect Data Corporation
1825 Surveyor Avenue
Simi Valley, CA 93063
(805) 581-4000

CIRCLE READER SERVICE NO. 513

THE CURTIS CLIP

The Curtis Clip is a copyholder that attaches to the top of either side of a monitor and holds copy at the angle and eye level most comfortable for the user. The clip is beige, is constructed of durable plastic, and uses no metal parts. When not in use, it can be rotated out of the way against the side of the monitor.

List Price: \$6.95

Curtis Manufacturing Company, Inc.
305 Union Street
Peterborough, NH 03458
(603) 924-3821

CIRCLE READER SERVICE NO. 514

FLOPPICLENE

FloppiClene is a cleaning kit for maintaining floppy-disk drives. Available for 3.5- and 5¼-inch formats, the kit consists of disposable cleaning disks, solvent, and a reusable jacket. Refill kits are available.

List Price: \$39.95

Tech-Sa-Port
P.O. Box 5295
Pittsburgh, PA 15206-5295
Written inquiries only

CIRCLE READER SERVICE NO. 515

MISCELLANEOUS

STA-BLK

The STA-BLK reinking printer ribbon is now available in an ImageWriter/Prowriter model. The STA-BLK cartridge contains an ink reservoir and an automatic reinking mechanism that keeps the ribbon from fading. Each ribbon comes with a bottle of refill ink.

List Price: \$39.95

Requires: Apple ImageWriter I or II, or C. Itoh Prowriter or compatible.

Chronos Computers
4186 Sorrento Valley Blvd.
Suite H

San Diego, CA 92121
(619) 455-8200

CIRCLE READER SERVICE NO. 511

DISKETTE WALLETS

Computer Coverup, Inc., has introduced new antistatic nylon diskette wallets.

The wallets, available in five colors, are designed for the organization and safe transportation of disks back and forth from office,

PRODUCT ALL-STARS

Every three months, *A+* will publish summaries of its Product All-Stars—those hardware and software products that *A+* editors and contributors consider exceptional. Watch for this quarterly guide beginning in the June. Here's a list of products that will be covered in detail in the All-Stars guide.

SOFTWARE

ACCOUNTING

Back to Basics
BusinessWorks
BPI Entry Series
Q-Mar General Ledger
Template

DATABASE PROGRAMS

DB Master
ProFILER 3.0
Notes•n•Files

DISK UTILITIES

ProSel
Copy II Plus
Diversi-COPY
MouseFiler
Bag of Tricks 2
Universal File Conversion
Diversi-CACHE

EDUCATION

Touch 'N Write
Great States Race
Car Builder
French Micro Scrabble
Crosscountry USA
Writer's Helper
Show Time
Grammar Examiner
Word Attack
Writer Rabbit
Wordmaze
Number Munchers
Math Blaster Plus
Green Globes and Graphing
Equations
Alien Addition
Quations
Math Rabbit
Fay: That Math Woman
Think Quick
The Enchanted Forest
A.I.: An Experience with
Artificial Intelligence
Crossword Magic
Bank Street Writer III
Homeworker
The Print Shop
Operation: Frog
Information Laboratory
Software—Life Science
Science Toolkit
Dinosaur Dig
The Halley Project: A
Mission in our Solar
System
Oregon Trail
Where in the World Is
Carmen Sandiego?

ENTERTAINMENT

The Zork Trilogy
Suspended
The Wizard and the
Princess
King's Quest I & II
Ultima I, III, IV
Wizardry I-III
The Bard's Tale I & II
Shanghai
Hacker II
Chessmaster 2000
Lords of Conquest
Archon II
Europe Ablaze
Rebel Charge at
Chickamauga
Conflict in Vietnam
Wilderness
Flight Simulator II
The Seven Cities of Gold
Loderunner
Pinball Construction Set
Choplipter!

GRAPHICS

Blazing Paddles
Dazzle Draw
DeluxePaint II
Take 1
Animate
The Graphics Magician
Fontrix
Shape Mechanic and Font
Mechanic
The Graphics Department
Draw Plus
TopDraw
Timeout Graph
Graphic Edge

INTEGRATED

AppleWorks
Foundation

MUSIC

The Music Studio
Instant Music
KidsTime II
Music Construction Set
(for IIGs)
The Music Class
Note-Us
MIDI Music Tutor
Guitar Wizard
Stickybear Music
Peter and the Wolf Music
Foundations of Music: A
Computer-Assisted
Introduction

PERSONAL FINANCE

Quicken
On Balance
Dollars & Sense

TELECOMMUNICATIONS

CommWorks
MouseTalk
Point-to-Point
ProTERM
Talk Is Cheap

WORD PROCESSING

WordPerfect 1.1
Perfect Writer 2.0
MultiScribe gs 2.0
Sensible Writer
MouseWrite
Bank Street Writer Plus
HomeWord Plus

HARDWARE

ACCELERATORS

TransWarp

AUDIO/SOUND/SPEECH

Supersonic
Supersonic Digitizer
Phasor
Echo IIb

CLOCKS

TimeMaster H.O.
No-Slot Clock

DIGITIZERS

ThunderScan

DRIVES/CONTROLLERS

Universal Disk Controller
Chinon 800K Drive

HARD-DISK DRIVES

CMS SC20
Sider D2, D4

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RamWorks III
gs-RAM
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RamPak 4gs
Z-Ram Ultra 3
MultiRAM CX
MemorySaver
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CIRCLE 212 ON READER SERVICE CARD

TIPS AND TECHNIQUES

Readers share tips for the II

GS COLOR CONTROL

I've been experimenting with the GS color-control soft switches for many, many hours, and I think I've finally mastered them. You can really create some interesting effects with them. The program in figure 1, for example, uses them to scroll rainbow patterns in the background, foreground, or border areas of the screen. Have fun playing with it!

SCOTT CORLEY
GLENVIEW, IL

PRINT-SHOP-COMPANION GOODIES

Print Shop Companion users can take advantage of two interesting features the program's manual fails to mention. First, on the front side of the disk, at the main menu, type STEVEN and then press the Esc key. Thereafter, everything on the screen appears upside down! (In

case you're wondering, Steven is the middle name of programmer Roland Gustafsson.)

On the back side of the Print Shop Companion disk, type Control-6 when you see the message that the back side is not bootable. Doing so starts up a nifty maze game you can play even without a disk-operating system.

JEFFREY SHAPIRO
IRVINE, CA

SUPERPRINT! BONUS

While I was working with my SuperPrint! program, I discovered an interesting "Easter egg." With the Clip Art disk in drive 2 and the program disk in drive 1, while you are at the Clip Art menu, press Tab. Doing so takes you to the program disk, where you will find three additional clip-art files to use. One is the little dinosaur that moves across the screen at the opening credits, the second file contains the faces of the people involved in the production of SuperPrint!, and the third contains two views of the SuperPrint! pelican with a big SP emblazoned across its chest. Enjoy!

DANA MAFIT
EUGENE, OR

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.

```

1 REM Copyright <c> 1987 by Scott Corley
2 REM and Piranha Software
3 REM Scrolling is speed-dependant
4 REM Default scroll speed is for fast mode
6 REM 2nd to last data byte is default scroll speed
10 C=0:FOR B=768 TO 813: READ A:POKE B,A:C=C+A:NEXT
30 READ D: IF C < > D THEN PRINT : PRINT "DATA STATEMENT ERROR!":END
35 HOME : FOR X = 1 TO 23: PRINT "Copyright <c> 1987 Piranha
Software":NEXT
36 PRINT ">>>Switch to fast mode"
37 CALL 768
40 HOME
50 PRINT "1: FOREGROUND SCROLL"
51 PRINT "2: BACKGROUND SCROLL"
52 PRINT "3: BORDER SCROLL"
60 PRINT "4: CHANGE SCROLL RATE"
65 PRINT "5: QUIT"
70 PRINT : INPUT "WHICH <1-4:>";A$:A = VAL (A$): IF A < 1 OR A > 5 GOTO
40
80 ON A GOTO 110,120,130,140,150
110 POKE 771,16: POKE 773,34: POKE 779,240: GOTO 200
120 POKE 771,1: POKE 773,34: POKE 779,15: GOTO 200
130 POKE 771,1: POKE 773,52: POKE 779,15: GOTO 200
140 PRINT : INPUT "SCROLL RATE <1-255:>";A$:A = VAL (A$):IF A<1 OR
A>255 THEN 140
142 POKE 813,A: GOTO 200
150 PRINT : PRINT "TYPE 'CALL 768' TO SCROLL"
152 PRINT : PRINT "HIT SPACEBAR TO STOP"
154 PRINT : PRINT "SEE PROGRAM FOR POKES TO CHANGE SCROLL"
155 PRINT "TYPE (TEXT, BACKGROUND, BORDER)"
156 PRINT : PRINT "COPYRIGHT PIRANHA SOFTWARE 1987": END
200 PRINT : PRINT "PRESS SPACEBAR TO STOP SCROLLING": CALL 768:GOTO 40
500 DATA 169,0,105,16,141,34,192,32,33,3,201,240,176,3,76,2,3
510 DATA 173,0,192,201,160,174,16,192,240,5,176,3,76,0,3,96,162,0
520 DATA 232,236,45,3,176,3,76,35,3,96,128,4328

```

Figure 1: Scott Corley's rainbow scrolling program



MARKETPLACE

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MARKETPLACE CLASSIFICATIONS

HARDWARE 143-145

ADD-ON-BOARDS	143
COMMUNICATIONS	
COMPUTER SYSTEMS	143
DISK DRIVES	143
DISKETTES	143
GENERAL	
MONITORS	
NOISE REDUCTION	
PERIPHERALS	144
PLOTTERS	
POWER PROTECTION	
PRINTERS/PRINTER ACCESSORIES	144
STORAGE DEVICES	145
MEMORY EXPANSION	

SOFTWARE 145-148

ACCOUNTING	
AGRICULTURE	
ASTROLOGY	
BUSINESS	145
COMMUNICATIONS	
DATA MANAGEMENT	
DEVELOPMENT TOOLS	
EDUCATIONAL	145, 146
ENTERTAINMENT/HOBBIES	146
FINANCIAL	146
GENERAL	146
GRAPHICS	147
LEGAL	
MAILING LIST	

SOFTWARE *continued*

MAILING PROGRAMS	147
MANUFACTURING	
MEDICAL/HEALTH	
ONE-OF-A-KIND	147
PERSONAL	147
PROJECT MANAGEMENT	
PUBLIC DOMAIN	147
REAL ESTATE	
RELIGION	
SCIENTIFIC	
STATISTICS	147
TAXES	147
UTILITIES	147, 148
VIDEO TRAINING	
WORD PROCESSING	

MISCELLANEOUS 148

ACCESSORIES/SUPPLIES	148
APPLE III	
BUSINESS OPPORTUNITIES	
COMPATIBLES	
COMPUTER INSURANCE	148
COMPUTER LEASING/RENTAL	
COMPUTER SERVICES	
COMPUTER TRAINING	
DATA CONVERSION	148
PUBLICATIONS/CATALOGUES	
SECURITY	
USED EQUIPMENT	
USER GROUPS	148

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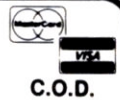
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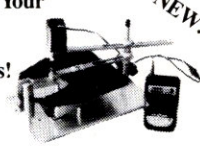
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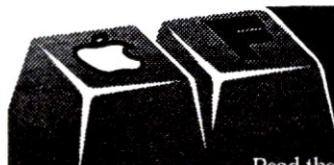
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A+ ADVERTISING INDEX

ALPHABETICAL

READER SERVICE NO. PAGE

A

- 227 Abracadata48
 296 Activision72
 273 Advantage Computing105
 * Applied Engineering..14,
29,47,55,68-69,77,
82-83,99,103,121,123,
125,129,131

B

- * Beagle Bros.....2-3
 326 Berkeley SoftworksCover2-4,1
 244 Bede Tech28
 113 Big Red Apple Club 138
 313 Bose Corporation34
 * Brøderbund Software10,118

C

- 235 CDA Computer Sales151
 300 CMS.....52
 212 Cambridge Marketing140
 107 Central Point Software19
 248 Central Point Software89
 127 Checkmate Technology112
 118 Chinook Technology .31
 322 Claris Corporation39,40-41
 105 Coit Valley Computers18
 192 Compu-Teach33
 136 Computer Cover 113
 265 Computer Direct93
 195 Computer Friends.....66
 312 Computers Plus.....94
 164 Control Data.....58

READER SERVICE NO. PAGE

D

- 340 Davidson & Associates11
 338 Davidson & Associates87
 169 Digital Vision, Inc... 110
 173 Direct Micro38
 310 Diversified Software Research 102

E

- 183 Educational Resources38
 171 Electronic Arts12-13
 103 Electronic Arts 101
 101 Electronic Arts 128
 147 EPYX45

F

- 180 Fast Find..... 130
 149 First Byte Software44

G

- * General Electric Information Services.71
 * Golem Computers... 120

H

- 175 Harcourt Brace & Jovanovich.....42

J

- 167 JDR Microdevices.....78
 308 Jameco Electronics.. 114

K

- 158 Kalglo Electronic.....48
 134 Kensington Microware Cover 6

READER SERVICE NO. PAGE

- 187 Kinson Products Corp.98
 176 Koala Technology 100

L

- 199 Land Tech.....56

M

- 138 Maxima Electronics 102
 152 Memory Plus.....96
 215 Micro Illusions. Cover 5
 250 Milliken Publishing..57

N

- 325 Nexo..... 130
 329 Nikrom..... 137

O

- * Open Apple..... 137
 108 Orange Micro.....5

P

- * Pinpoint Publishing..95
 * Preferred Computing115
 185 Programs Plus.. 132-133
 229 Prometheus Products 16
 190 Public Domain Exchange.....92

Q

- 204 Quality Computers...24
 209 Quality Computers...25

R

- 283 Random House Media51
 202 Ribbon Land76
 109 Roger Coats..... 104

READER SERVICE NO. PAGE

S

- 302 Scholastic Software....37
 200 Sequential Systems....46
 231 Silicon Express..... 124
 222 SoftDisk..... 8
 293 Softsync, Inc.....75
 255 Spectral Graphics Software22
 207 StatSoft 138
 267 Stone Edge Technology64
 155 Styleware17
 122 SubLOGIC 4
 110 SubLOGIC79

T

- 315 TML Systems, Inc61
 217 Teachers Support Software60
 160 Thirdware.....70
 116 Timeworks.....20

U

- 294 USA Micro.....74
 219 UPTIME23

V

- 259 Versacad90

W

- 197 Wolsten's Computer Devices, Inc.60
 120 WordPerfect Corp.....67

Z

- 126 Zimco International ..88
 102 Zip Technology..... 122

A+ ADVERTISING INDEX

BY PRODUCT

PAGE

HARDWARE

DISK DRIVES/STORAGE DEVICES

CMS.....	52
Chinook	31
Kinson Products.....	98
Maxima Electronics	102

INTERFACE CARDS

Applied Engineering	14,
.....	47,55,68-69,77,82-83,
.....	99,121,123,125,129,131
Checkmate Technology ..	112
Orange Micro.....	5
Quality Computers.....	24,25
Sequential Systems.....	46
Zip Technology.....	122

MODEMS

Applied Engineering	29
Prometheus Products.....	16

PRINTERS/PRINTER ACCESSORIES

Bede Tech	28
Maxima Electronics	102
Thirdware.....	70

MISCELLANEOUS

Bose Corporation	34
Central Point Software	19
Control Data.....	58
Digital Vision.....	110
Kalglo Electronics	48
Kensington Microware	Cover 6
Koala Technology	100
Land Tech.....	56

SOFTWARE

BUSINESS

Beagle Bros.....	2-3
Claris Corporation	39-41
Pinpoint Publishing.....	95
Public Domain Exchange..	92

CREATIVITY/PRODUCTIVITY

Abracadata.....	48
Activision	72
Milliken Publishing	57
Softsync, Inc.....	75

DATABASE MANAGEMENT

Stone Edge Technology.....	64
----------------------------	----

DEVELOPMENT SYSTEMS

TML Systems	61
-------------------	----

EDUCATIONAL

Brøderbund Software.....	10
Compu-Teach	33
Davidson & Associates	11,87
First Byte Software	44
Harcourt Brace & Jovanovich.....	42
Scholastic Software.....	37
Teachers Support Software	60

ENTERTAINMENT/STRATEGY

Brøderbund Software.....	118
Electronic Arts.....	101,128
EPYX.....	45
Micro Illusions.....	Cover 5

PAGE

GRAPHICS

Spectral Graphics Software	22
Versacad	90

ON-LINE SERVICES

General Electric Information Services.....	71
--	----

UTILITIES

Central Point Software	89
Fast Find.....	130

WORD PROCESSING SPELLING CHECKERS

Random House Media	51
Styleware	17
WordPerfect Corp.....	67

MISCELLANEOUS

Advantage Computing ..	105
Berkeley Softworks	Cover 2-4,1
Big Red Apple Club.....	138
Diversified Software Research	102
Electronic Arts.....	12-13
Nikrom.....	137
SoftDisk.....	8
Statsoft.....	138
Timeworks.....	20
UPTIME	23

PAGE

ACCESSORIES

DISKS

Direct Micro	38
--------------------	----

MISCELLANEOUS

Computer Cover	113
----------------------	-----

MAIL ORDER

CDA Computer Sales	151
Coit Valley Computers.....	18
Computer Direct	93
Computer Friends.....	66
Computers Plus.....	94
Educational Resources	38
Golem Computers.....	120
JDR Microdevices.....	78
Jameco Electronics	114
Memory Plus.....	96
Nexo.....	130
Preferred Computing.....	115
Programs Plus.....	132-133
Ribbon Land	76
Roger Coats.....	104
Silicon Express.....	124
USA Micro.....	74
Zimco International	88

MISCELLANEOUS

Applied Engineering	103
Cambridge Marketing	140
Open Apple.....	137
Wolsten's Computer Devices, Inc.	60

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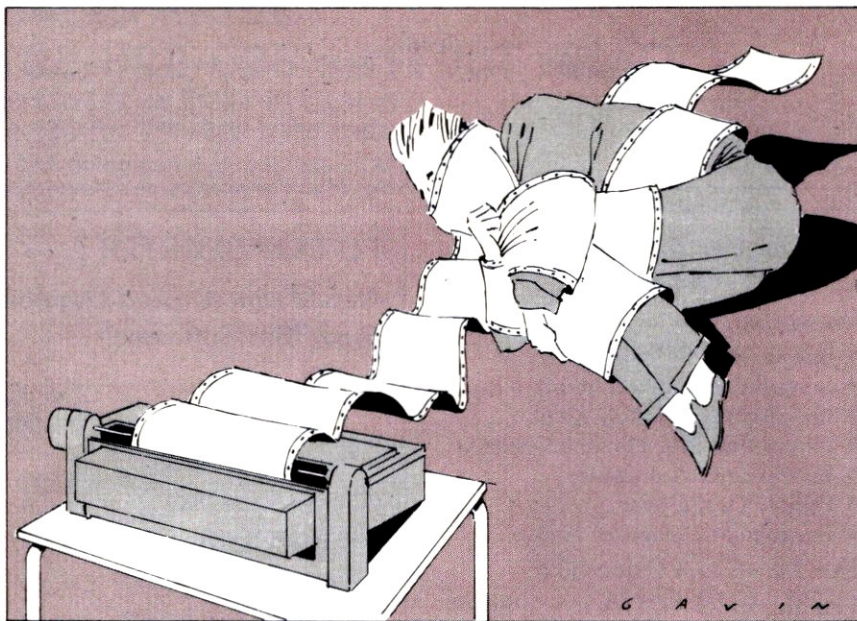
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them scratching their heads when the program freezes up.

DAVID L. VIDMAR
BRITT, MN

A. There is no simple PEEK you can perform to check the status of a printer. Since most printer-interface cards can now handle Apple's firmware protocol, however, you can solve your problem by calling a standard status subroutine. Doing so from Applesoft is a bit tricky, but you can do it by calling an assembly-language subroutine like the one in figure 1.

The low-order byte of the status subroutine is stored at location \$C110 in the peripheral-card ROM area (assuming a slot-1 printer). The high-order byte is always \$C1. To see if the printer is ready to accept output, call the subroutine by loading X with \$C1, Y with \$10, and A with 0. When the subroutine ends, the carry flag is clear if the printer is not ready. Before calling the status subroutine, initialize the printer by calling the standard firmware's initialization subroutine (see figure 1).

For more information on the standard firmware protocol, refer to Chapter 11 of my book *Inside the Apple IIe* (Prentice Hall Press, 1985).

RESCUE SQUAD

BY GARY B. LITTLE

PRINTER-ACTIVITY CHECK SUBROUTINE

Q. I'm writing an Applesoft program and would like to know if there is a

simple way to check whether the printer is active. If there is, I'll be able to display a message telling people to turn on the printer instead of having

```

1 *****
2 * To see if printer is busy before sending *
3 * it output, do a CALL 768 from Applesoft. *
4 * If PEEK(0) <> 0, the printer is busy. *
5 *****
6          ORG    $300
7
0300: A9 00  8          LDA    #0
0302: 85 00  9          STA    $00          ;Clear result
10
0304: AD 0D C1 11       LDA    $C10D        ;"Initialize"
offset
0307: 8D 0F 03 12       STA    PATCH1+1
13
030A: A2 C1  14          LDX    #$C1
030C: A0 10  15          LDY    #$10
030E: 20 00 C1 16       PATCH1 JSR    $C100        ;Initialize
17
0311: AD 10 C1 18       LDA    $C110        ;"Status" offset
0314: 8D 1E 03 19       STA    PATCH+1
20
0317: A2 C1  21          LDX    #$C1
0319: A0 10  22          LDY    #$10
031B: A9 00  23          LDA    #0          ;ready for output?
031D: 20 00 C1 24       PATCH JSR    $C100        ;Get status
25
0320: 90 01  26          BCC    BUSY        ;busy if carry
clear
0322: 60  27          RTS
0323: E6 00  28       BUSY INC    $00          ;Non-zero result if
busy
0325: 60  29          RTS

```

Figure 1: A subroutine for checking the status of a printer in slot 1

CLOCK CARD NEEDS ProDOS UPDATE

Q. I have an Apple IIe and a ProDOS-compatible clock card in slot 7. The clock worked flawlessly until January 1 of this year, when the year started coming up as 1982. Can you tell me what's going on?

LARRY WARNEMUENDE
MALI, WEST AFRICA

A. There's nothing wrong with your clock card. The clock driver in older versions of ProDOS is capable of properly handling dates for the years 1982 to 1987 only. The latest version of ProDOS, version 1.4, fixes this problem and gets you to 1988. Your solution, then, is to obtain the latest version of ProDOS from an Apple dealer and transfer it to all your boot disks. +

Gary Little is A+'s editor and author of *Exploring the Apple IIGs*. Please send your questions and problems to "Rescue Squad," A+, 950 Tower Lane, 18th Floor, Foster City, CA 94404.

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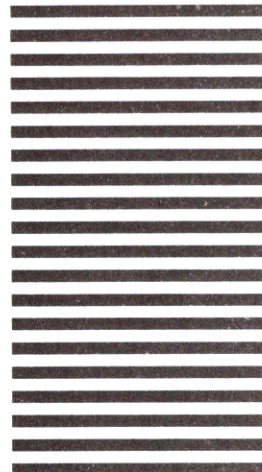
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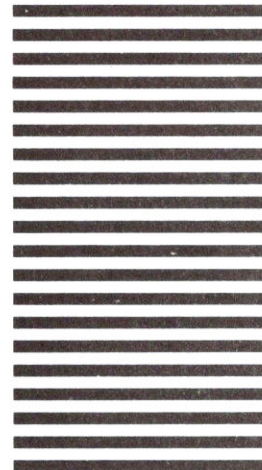
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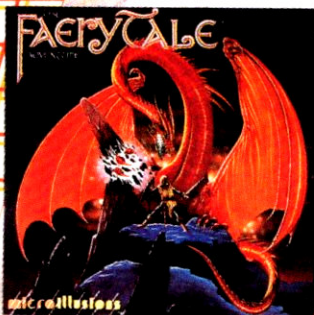
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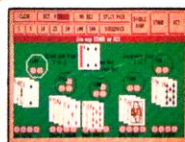
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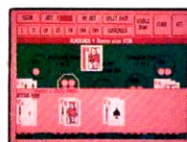


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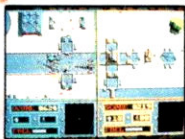
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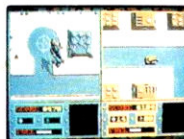
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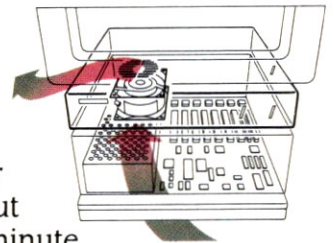
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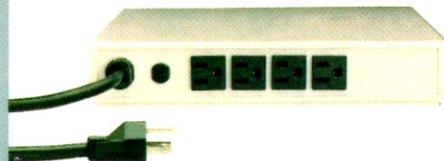


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