inCider A+

Apple II / Macintosh

AN IDG COMMUNICATIONS PUBLICATION
March 1992

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PRESS ROOM, P. 48

Did Somebody Say DEAL?

Used Apples at Bargain Prices

WHERE'S THE MONEY GONE?

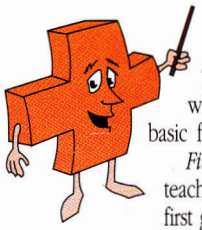
A Look at Personal Finance Programs

REVIEWS

- MacGlobe
- DeskWriter C
- Stack Enhancers
- Glider 4.0

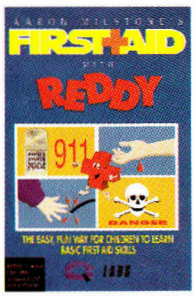
New for the Apple II from QUALITY COMPUTERS

Does your child know how to react in an emergency?



As a parent or teacher you try to equip your child to handle whatever life throws at them. There's so much out there that can hurt them. That's why children, even young children, should know basic first-aid.

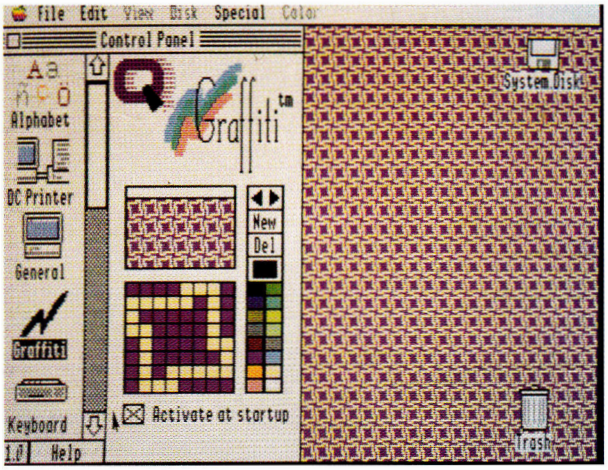
First-Aid with Reddy is the only computer program that teaches basic first-aid techniques to children as young as first grade. Your child will be captivated by the colorful animation and cheery sound as Reddy demonstrates proper techniques of treating burns, poison, shock, broken bones, bites, bleeding, and more.



The lessons are simple, and easy enough for a child to practice and use with confidence. Your child will learn how to determine treatment, how to keep a victim calm, how and where to get help, how to dial 9-1-1, as well as treatments for specific injuries.

Give your children the tools to act in an emergency — with confidence. Get *First-Aid with Reddy*.

First-Aid with Reddy.....$29.95



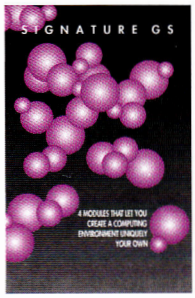
Make your IIGS anything you want it to be

Is your IIGS just plain vanilla? Now you can make it a custom ride — with *Signature GS*, Q Lab's set of C-Devs that will soup up your Apple IIGS. *Signature GS* lets you create a computing environment that is uniquely your own. With *Signature GS* you get:

PHANTASM — A utility that prolongs screen life — and looks good doing it. When your screen has been still too long, it can become damaged. Phantasm prevents damage by automatically giving your screen something to do. A variety of fun, attractive screen activities are available, plus you can tell Phantasm when to come on.

GRAFFITI — There's nothing wrong with the IIGS desktop — except it's boring. Graffiti gives you a variety of colorful desktop patterns to choose from — or you can create your own.

SONICS — The "S" in IIGS stands for sound. Sonics lets you customize your IIGS sounds, and assign special sounds for specific functions. And these aren't just beeps — they're fun and entertaining. Add sounds to Insert/Eject Disk, Dialog Boxes, etc.



BOOTMASTER — Changing the configuration of all your IIGS's drivers, and system elements can be a pain. But BOOTMASTER makes it easy by putting the controls for all your IIGS's drivers, CDAs and NDAs on one master control panel. You turn them on and off at will — and change your selections easily.

Signature GS.....$29.95

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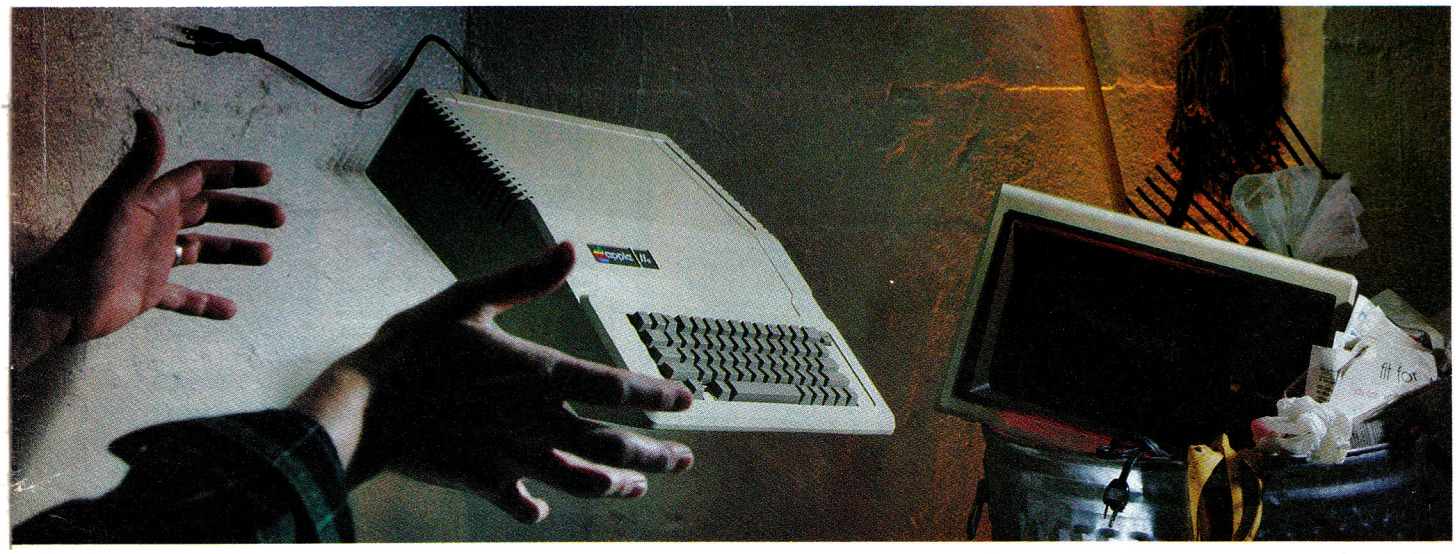

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SYSTEM REQUIREMENTS: *SOFTDISK*–APPLE II+, IIc, IIc+, IIe (enhanced), IIGS and Laser 128 computers 64K required, 128K recommended. *SOFTDISK G-S*—Apple IIGS computer 1.0 meg and one 3.5" drive required, 1.25 meg and two 3.5" drives recommended.

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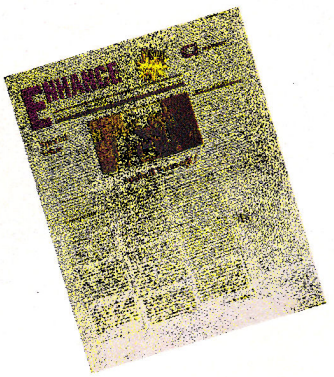

Enhance is Quality Computers' bi-monthly informative-technical-entertaining newsletter. *Enhance* gives you the kind of information you need to make your Apple the effective work/educational tool it was designed to be, like product reviews and comparisons, new product announcements, news, and two special sections, Enhancing Education — focusing on key educational topics like grants, fund raising and hypermedia applications; and Club Corner — designed to spark interest in User Groups across the country.

Enhance also includes our catalog — full of all the hardware and software you need for your Apple II. Quality Computers catalog includes detailed product descriptions and MONEY-SAVING COUPONS.

Quality Computers has been publishing *Enhance* for over 4 years. It's free to all QC customers, or you can call for your free subscription today!

"After reading through this issue of Enhance, I am ready to invest in upgrading my Apple IIGS and add some programs rather than go to the MS-DOS computers. You have restored my faith!"

Robert C. Donald
Hall Park, OK

"You publication is every bit as informative as the other

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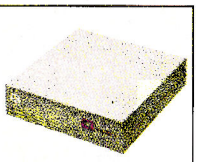

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The Q Drive is the best SCSI hard drive available. Automatically formats itself for IIe or IIGS, and comes with 15 MEG of free software.

40 w/o SCSI card .. 389.95
See page 4

NEW!

Quality Computers does it again. Tired of the low quality of many RAM cards, we built our own. The Q-RAM card uses SIMM modules to boost your IIGS's memory. The Q-RAM card comes with a 30-day, no-hassle trial period, and a 5-year warranty.

Q-RAM GS CARD

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NEW!

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This new guide touches on a broad range of items that can perk up your Apple II including hard drives.

Apple II Enhancement Guide 6.00

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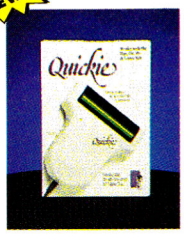
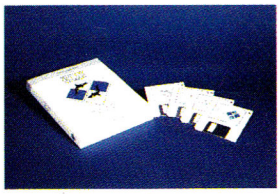


VITESSE
The new Quickie 3.0 includes exciting upgrades to both ProDOS 8 and GS/OS versions. The new ProDOS 8 version supports line art and photo scanning with dithering, and more. The GS/OS version offers new features in the tool palette including lasso, eraser, pencil and fatbits. There is also a "merge scan" command.

Quickie 3.0 ..... 199.95
Quickie/InWords Combo 268.95

VITESSE
Salvation Supreme *is the complete hard drive utility for the Apple IIGS. It includes: Bakkup, for high-speed backup and restore; Exorciser, to detect and cure viruses; Wings, a comprehensive hard drive management system; Renaissance, for fast, thorough optimization; and Deliverance, to recover lost files and find bad blocks.*

Salvation Supreme 99.95



BYTEWORKS
ORCA/M 2.0 *supports all of the new features of Apple operating systems, including longer path names, resources, and networks. It is faster, and has loads of new features to make programming easier. You also get GSBug to help you debug machine language programs, and Apple's Rez compiler and Derez decompiler to create and modify resources.*

NEW! **Orca/M 79.95**

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Hypermedia is a creative environment where even non-programmers can bring graphics, sound and text together, in an interactive and interconnected way.

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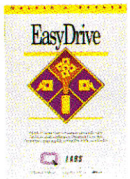

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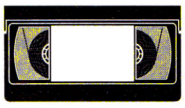

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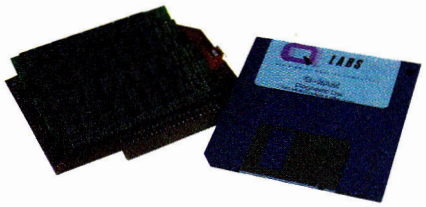
The Q-RAM GS



When we could no longer find reliable, affordable hard drives, we made our own—the Q Drive. The Q Drive made Apples faster and easier to use. In fact, it was such a success that we had to wonder why we'd waited so long. Now we've done it again.

Introducing the Q-RAM GS memory card.

The Q-RAM GS is an economical way to add up to 4 MEG of memory to your Apple IIgs. It's fully compatible with all Apple IIgs hardware and software—including the IIgs RAM Disk and DMA peripherals like the Apple II High Speed SCSI Card. And it's so small that it fits in your shirt pocket.

When you install the Q-RAM GS life becomes just a little easier. Programs load completely into memory at startup, eliminating disk swapping. Out-of-memory error messages disappear. You'll have memory to spare—memory to load desk accessories, or to set up a convenient RAM disk.

Installation is simple. You can expand a Q-RAM GS by snapping in standard SIMMs—we even include the necessary diagnostic software for your peace of mind. And since the Q-RAM GS uses SIMMs, your memory investment won't go to waste.

Of course, since you're dealing with Quality Computers, you get an unconditional 30-day money-back guarantee and a five-year warranty. And the price is the best news of all—a 2 MEG Q-RAM GS costs about the same or even less than other IIgs memory cards in a 1 MEG configuration!

CAPACITY	PRICE
1 MEG	99.95
2 MEG	149.95
4 MEG	249.95

30-day money-back guarantee • 5-year warranty

The Q DRIVE

Thousands of drives later, experts still are praising the Q Drive for its performance and value. *inCider/A+* gave it a four-and-a-half-star rating. Our customers are using words like "amazing" and "fantastic" to describe the way the Q Drive has changed their computing.

The Q Drive features a fast, reliable Conner mechanism using the latest technology, including auto-parking heads, a voice-coil actuator, and a track buffer. And since the Q Drive uses the industry-standard SCSI interface, you get complete compatibility with your current computer system—and your next, whether it's an Apple II, Macintosh, or IBM.

The Q Drive's plain-English manual covers more than installation and setup. It even tells you how to manage your mass storage effectively. From GS/OS and ProDOS to backups and maintenance, it's all there, including a glossary of hard drive jargon. And no hard drive is easier to set up and use—install a card, connect two cables, and turn on the power. The Q Drive automatically configures itself to match your computer, and the latest system software is already installed.

And remember, you're dealing with Quality Computers, the hard drive leader. The Q Drive comes with a 30-day money-back guarantee and a one-year limited warranty. If you run into a snag, our technical support staff is available for the cost of a phone call. A great drive and great support, at a great price—that's the Q Drive. Find out why it's the best Apple hard drive value—test drive one today!

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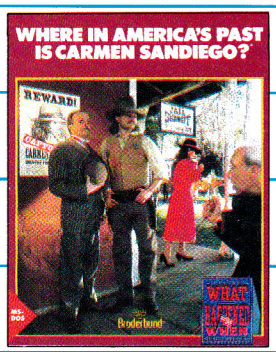

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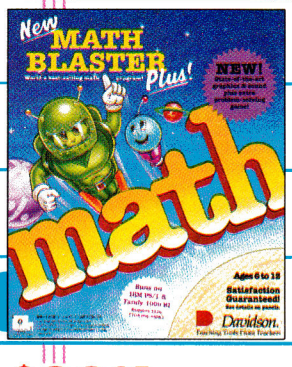

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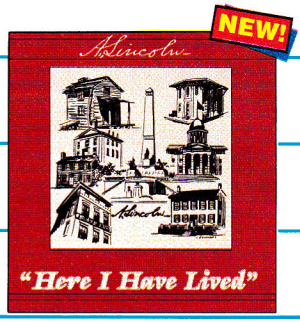

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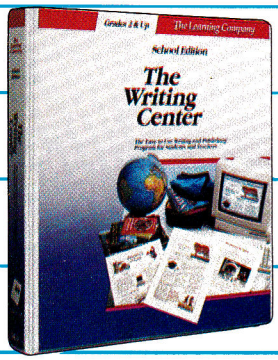

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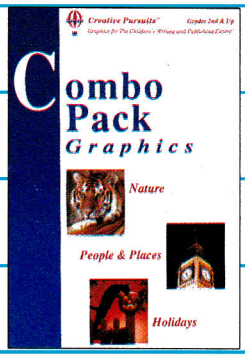

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inCider A+ Apple II / Macintosh

MARCH

1992 Vol. 10 No. 3

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Looking for a bargain? Used Apple II and Mac equipment offers big savings. Whether you're a parent looking for a machine for your kids, a teacher who needs to prepare lessons at home, or a small-business owner launching a new venture, secondhand Apples offer high quality and superb reliability at rock-bottom prices. Check out our lists of sources and tips for buyers and sellers, and get in on the hottest trend in the computer business today.

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Recording and reporting — the two vital ingredients in smart money management — are what your computer does best. So keep your household or small business in the black: Invest in a finance package for your Apple II or Mac and let a number-crunching expert get your accounts in shape. Computerize your records and you'll organize, categorize, and visualize your monetary condition faster and more effectively. Electronic checkbooks, home-office accounting, sweat-free tax preparation — your II or Mac can do it all.

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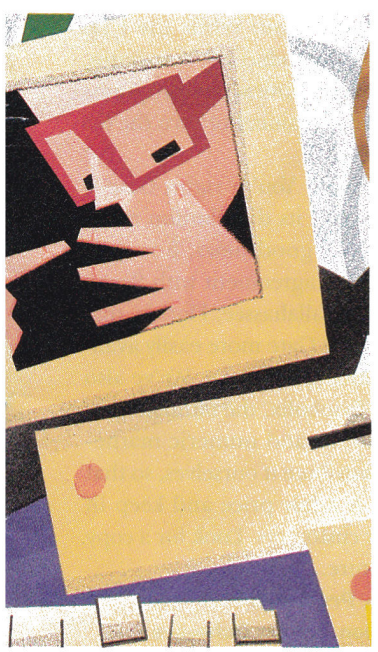

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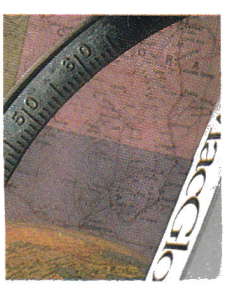

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LETTERS

MR. MUSE, IN THE STUDY, WITH THE CANDLESTICK

I APPRECIATE THAT NO ONE welcomes the messenger carrying bad news, and if your editorial in the December 1991 issue ("Rasputin and the II," *inCider*'s View, p. 8) had fallen into that category, I would have understood and wouldn't have written this letter. Unfortunately, your editorial not only perpetuates unsubstantiated rumors, but is nearly tantamount to crying "Fire!" in a crowded theatre.

For some months now, the industry has been rife with rumors of the discontinuation of the Apple II line. Some third-party developers are understandably miffed at Apple for its attitude toward the II. Some people have a "political" reason for attempting to make Apple terminate the II line. They may be Mac aficionados, or possibly even individuals within Apple itself, who want to see the II line end for their own petty reasons. As for the dealer network, they re in it solely for the money, and most of them find they can't make a reasonable profit selling Apple IIs.

From these sources, the only substantiated message I've gleaned is that Apple Computer will continue to make Apple IIs as long as people will buy them. I saw no hint of this in your editorial. On the contrary, you led your readers to believe that you had inside information the Apple was about to announce the "end of the line." If you have a truly reliable and authoritative source of information within Apple Computer who led you to your belief, you have a duty to inform your readers of that fact. Otherwise, you have a duty to refrain from making statements that could cause irreparable loss to owners of Apple II computers by provoking an accelerated shrinkage of the Apple II owner pool and a concurrent lessening of demand for Apple II computers, which in turn could cause Apple Computer to terminate production of the II line.

Don't get me wrong — I wish the best for your magazine. I enjoy it as a source of important news and features. The advertisements are also especially useful. I mean what I say as constructive criticism, and I hope you'll take it in that vein.

John J. Czyzewski
386 Maple Avenue East
Suite 107
Vienna, VA 22180

IT WAS WITH DISGUST AND ALARM that I read Dan Muse's December 1991 editorial, in which he states, "We expect that Apple will praise but bury the Apple II shortly." Unless Mr. Muse is privy to some special inside information, we II owners would appreciate it if the largest-selling magazine that covers our platform wouldn't hasten that death with premature predictions. One sentence like that can scare off anyone even considering developing for the II.

Frank Tracy Wells
3542 Carfax Avenue
Long Beach, CA 90808

We regret that so many readers missed the point of December's inCider's *View, which was to highlight the healthy state of product development for the II. This proliferation is more astounding when you consider that Apple has shown little or no interest in the line. Our sources (whom we can't identify) confirm that Apple has no plans to revive the II and, in fact, recently quashed a plan to produce a souped-up, priced-down GS. To say that sales of new Apple IIs are unlikely is merely stating the obvious, but that doesn't detract from the millions of IIs used productively every day in schools, homes, and small businesses. — eds.*

MISTAKEN IDENTITY

WE WERE PLEASED TO READ that Gate was your December 1991 Editors' Choice ("Once Upon a Time," p. 88). However, you wrote that Gate is an FTA (Free Tools Association) product. Bright Software is a completely independent group of Swiss programmers. Our goals are different: While the FTA mainly creates "nonproductivity" programs, we concentrate on interactive programs that either are entertaining or turn the GS into a useful tool.

One more detail: You're right, Gate is too expensive, and its distribution is too difficult. There's good news, however. We've come to an agreement with Seven Hills Software of Tallahassee, Florida, that we hope will make Gate more easily available while reducing the price. We've also just finished GSymbolix, the ultimate program for symbolic and numeric mathematics. We'll distribute it ourselves, so that we can sell it at a fair price and keep in touch with our customers. Look for a copy in the near future.

Henrik Gudat, President
Apple II Division, Bright Software
Pantelweg 2, CH-4153 Reinach
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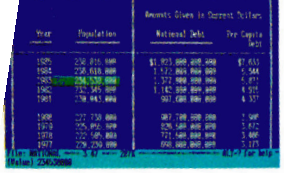

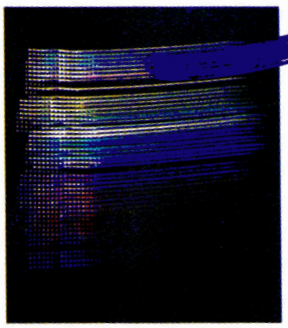

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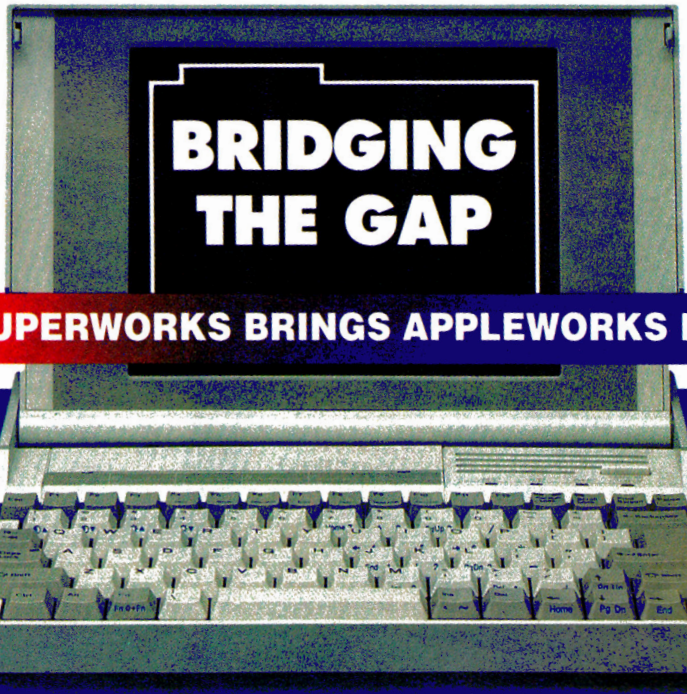
★★★★ inCider Magazine, November 1991

Miami Herald/Craig Crossman 8/12/91

"Known as SUPERWORKS, this Appleworks clone does almost everything Appleworks does and more. If you know how to use Appleworks, you can use SUPERWORKS without picking up a manual. SUPERWORKS brings the functionality of Appleworks to the MS-DOS world while leaving behind many of its limitations."



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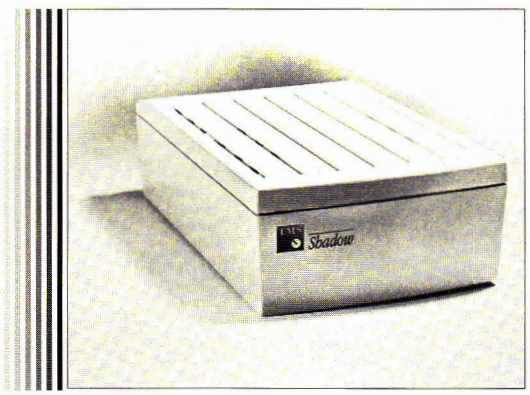

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Full Two Year Warranty

PRO TAPE BACKUP SYSTEMS

Pro T60, $439, includes 1 tape
Pro T155, $499, includes 1 tape
Extra tapes $15.95 & $24.95
Full One Year Warranty

PRO REMOVABLE HARD DRIVES

Pro R45, $479 20ms, incls. 1 cart.
Pro R90, $699 20ms, incl. 1 cart.
Extra carts $67.95 & $119.95
Full One Year Warranty

PRO SERIES FEATURES

International Auto-Switch Power Supply
2 AC Jacks
VCA Mechanism
Selectable Pushbutton SCSI ID Switch
2 SCSI Ports
Shielded Power Supply
All Manuals
Shareware: 25 Mbs, Macintosh • 29+ Mbs, GS
"Whisper Quiet" Fan
All Necessary Hardware

30 DAY MONEY BACK— PERFORMANCE GUARANTEE

TMS Peripherals' 30 Day Money Back & Performance Guarantee: *"If you experience a problem with your drive, TMS will ship you a new drive & pick up the suspect drive—at our expense!"*

TMS 2 YEAR FULL WARRANTY

TMS Peripherals' Full 2 Year Warranty - Toll-Free Tech Support Line: *"If a problem persists after thorough troubleshooting by our courteous, expert technical staff—ship us the suspect drive & we'll send you a replacement unit within 48 hours."*

C.V. Technologies

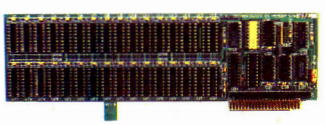
"We make hard drives Ram*FAST*"

RamFAST SCSI V2.01

This is the SCSI card that is upgradable to 1 Mb of cache. It is also the SCSI card that is 5 to 8 times faster than the Apple SCSI card under ProDOS 8 and twice as fast under GS/OS. It has an automatic lookahead for unbeaten performance. It has built-in tape backup software that runs in the background. It has a mouse-driven configuration program. It has password protection, of course. By the way, it's also TOTALLY System 6.0 compatible. It's made by C.V. Technologies..

256K Rev. D V2.01 $179.95,
1 Mb Rev. D V2.01 $239.95,
Reconditioned 256K Rev. C $99.95

LIFETIME WARRANTY



GS Memory Board

The memory board that is upgradable to 4 Mbs and fully DMA compatible up to 8 Mbs utilizing its piggyback connector is now the most affordable IIGS memory board available today! It's made by a company known for its support of the Apple II market. It's made by C.V. Technologies.

0 Mb $49
1 Mb $89
2 Mb $133
3 Mb $177
4 Mb $221

LIFETIME WARRANTY

Memory

256K chips (set of 8)	$18
1 Mb chips (set of 8)	$50
1 Mb SIMMs	$39
2 Mb SIMMs	$95
4 Mb SIMMs	$141

LIFETIME WARRANTY

PLEASE CALL TODAY ABOUT OUR NATIONAL PRICE MATCHING POLICY!

Circle 56 on Reader Service Card.

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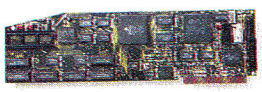
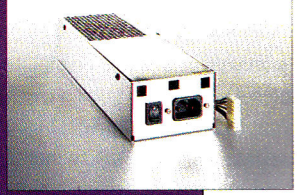
Vulcan Gold Upgrade	$45.95
3.5" 800K	$195.95
3.5" 1.6 Mb	$235.95
5.25" Drive IIe Compatible	$138.95
Power Supply IIe	$78.95
TransWarp 32K Upgrade	$79.95
DL Express w/ V.42	$275.95
DL Express w/ V.42 & S-Fax	$343.95

RamWorks III
256K $129.95 • 512K $149.95 • 1Mb $189.95

P.C. Transporter $248.95

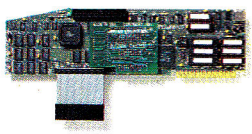


GS Power Supply $84.95



Conserver $74.95

TransWarp GS $299.95



WestCode SOFTWARE

POINTLESS $49.95
Improves output with most printers — including ImageWriter™ and DeskWriter™. Pointless' INIT/CDEV generates characters at any point size, providing laser-sharp text, transparently from the GS/OS System Folder. Includes a variety of TrueType Fonts. *System 6.0—O.K.*

INWORDS $78.95
Discover the power & ease of InWords™ today. InWords provides a revolutionary new way to enter text into your Apple II, at up to 500 WPM. Requires 512K & Quickie or compatible scanner.

InSync

ProTERM 3.0 $78.95

QUICKIE SCANNER $195.95
The only hand-held, grey-scale scanner for all "slot equipped" Apple IIs & Laser 128. ***Editor's Choice, inCider, June '90***

HARMONIE $31.95
Printer driver software for excellent GS/OS text & graphics.

SALVATION SUPREME $95.95
ALL 5 Salvation IIgs Utilities

Bakkup, Renaissance	28.95
Exorciser	27.95
Wings	45.95

Roger Wagner Publishing

HyperStudio 3.0	$99
Clip Art Vol. 1 or Vol. 2, Clip Sounds or Desktop Screen Saver	$19.95
Graphic Exchange or Macromate	$28.95
SoftSwitch	$33.95

BEAGLE BROS SOFTWARE

PLATINUM PAINT	$58.95
BeagleWrite GS	$58.95
GS Desk Accessories	$34.95
T.O. SideSpread	$32.95
T.O. Graph	$51.95
T.O. SuperFonts or T.O. SuperForms	$41.95
T.O. UltraMacros	$38.95

Broderbund®

The New Print Shop	$28.95
McGee at the Fun Fair Macintosh Version	$23.95 $26.95
Katie's Farm or McGee Macintosh Version	$23.95 $26.95
Where in (the) World, USA, Europe or Time is Carmen Sandiego? IIGS or Mac	$28.95
The Playroom, Apple II Macintosh Version	$23.95 $28.95

The Byte Works Inc.®

ORCA/C or Pascal Compiler	$78.95
ORCA/M 2.0 Assembler	$59.95
Design Master	$48.95
ORCA/Disassembler	$28.95
Talking Tools	$38.95
Learn to Program Bundle	$118.95

IIGS Products From Seven Hills Software

SHOEBOX™ Requires 1.5 Mbs & hard disk.	$39.95
FORMULATE™	$32.95
GRAPHIC WRITER III™	$88.95
SUPERCONVERT™	$27.95
FONT FACTORY GS™	$27.95
FXPRESS Requires hard drive.	$25.95

TECHNOLOGY

ZipGSX

Compatible with ALL GS hardware and software.

9 MHz/32K Cache memory, DMA Compatible
Now only $248.95

7 MHz/8K Cache memory, DMA Compatible
Now only $148.95

Full One Year Warranty on ZIPGSX.

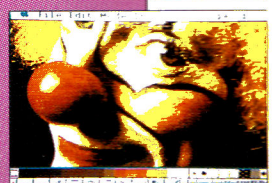
8 Mhz Zip Chip for your IIe / IIc. Available now! ONLY $144.95

DreamWorld Software

New!!!

DreamGrafix™

DreamGrafix is the ONLY full-featured 16, 256 & 3200 color paint program for the Apple IIGS that allows users to create & edit the highest quality pictures available. Supportive of all known Super Hires graphics formats. Displays PaintWorks animations. Comes with complete tool set. Compatible with all system accelerators, CDAs. NDAs, inits & system drivers. $69.75



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APPLE II ALLIANCE

If you believe that Apple Computer ought "to increase the awareness of the public about the existence of the Apple II computer through national and international advertising," but have just about given up hope, you might be ready to sign the mission statement of The Alliance International — sometimes called "The Apple II Alliance" (but not officially, because Apple II is a trademark).

Founded by John R. Majka, Robert Bowen, and Richard Schultz in 1991 and incorporated in Kentucky, The Alliance International was first proposed on the telecommunications service America Online, where Majka though there was too much "Apple bashing" going on and not enough constructive action. "We will officially treat Apple as a partner," he says now. The Alliance basically hopes to take over certain aspects of the Apple II business, such as marketing and software evangelism, that Apple no longer performs.

To that end The Alliance International will target software developers and try to convince them that it makes financial sense to write software for the Apple II. As John Majka, who has had some experience in development with Raptor Software, puts it, "A lot of current Mac software could be easily ported to the IIgs." A later task for The Alliance International will be to offer Apple II users and owners support in their efforts to buy Apple IIs and related hardware and software, as well as repair services and technical advice.

The Alliance International isn't a non-profit organization: It's currently selling shares in what its founders believe could be a lucrative, as well as philanthropic, venture. But you don't have to be a major investor; Majka is also looking for 150 members before April 1, 1992. For $20 a year, you'll receive a quarterly newsletter and other services, as you help support the Apple II. For a detailed look, call or write The Alliance International, P.O. Box 20756, Louisville, KY 40250, (502) 491-6828. **— P.S.**

APPLE EXPO RETURNS

Apple Expo East returns on April 4 and 5 this year to the Park Plaza Castle in Boston, site of the original AppleFest in 1980. Twelve years of progress since that first show will be on display — including software and hardware for the Apple II, the IIGS, and the Macintosh. Teachers, students, and parents will learn how to use the latest educational goodies.

Apple Expo Central, which was held last summer in conjunction with the A2-Central "KansasFest" for Apple II software developers, was a great success. The Boston event, also sponsored by the Apple II and Macintosh special-interest groups of the Boston Computer Society, promises to be even bigger. According to Andi Ehrens at Event Specialists, the show organizers decided to include all Apple computers, including the Macintosh, "because the [Apple Expo Central] exhibitors asked for it."

But Apple Expo East will be the largest Apple II event on the East Coast this year, and certainly the best place to buy if your local dealer no longer stocks Apple II hardware and software. Even mail-order dealers will be there, offering you the chance to "try before you buy" at catalogue prices. And Mac owners will have the chance to see personal and educational products in a less-frantic environment than MacWorld Expo, as well as products that highlight Apple II and Macintosh connectivity.

Ehrens expects that with the help of the Boston Computer Society and interest in the Macintosh, Apple Expo East will attract 6000 curious computer users. At press time, it had already attracted a number of national exhibitors, including Apple Computer, Quality Computers, and Roger Wagner Publishing of San Diego, publishers of HyperStudio for the IIGS. Roger Wagner himself will speak at Apple Expo East, and demonstrate how easy it is to create multimedia on the GS.

If you sign up before March 20, the two-day show, including exhibits and conferences, costs only $10. After March 20, the price will be $15. Contact Event Specialists, 17 Lilac Drive, Sharon, MA 02067, (617) 784-4531, for details.

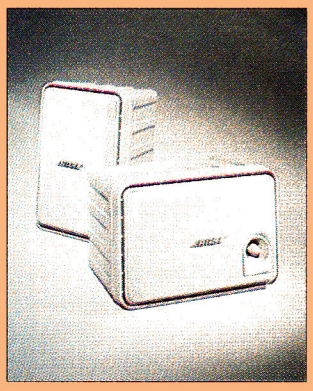
inCider/A+ plans to attend Apple Expo. We'll be handing out complimentary copies of the magazine and fielding questions — as well as complaints — from readers in the northeastern United States. Teachers, how are you and your colleagues using Apple IIs and Macintoshes together? Stop by and tell us. **— P.S.**

Barney Stone of Stone Edge Technologies, who left the Apple II market reluctantly in 1991 after years of devoted support, still has many copies of the powerful database manager DB Master for sale. Call Stone Edge at (215) 641-1825 for details. — P.S.

In the January 1992 inCider/A+, we printed the wrong price for the hypertext-creation program Links (formerly called Nexus). The price for the Apple IIGS version is $69.95; Links for the Macintosh costs $189, from LinksWare, 812 19th Street, Pacific Grove, CA 93950, (408) 372-4155. — P.S.

"Apple II" indicates an 8-bit product compatible with IIes, IIcs, IIc Pluses, and IIGSes unless noted otherwise.

NEW HARDWARE



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STEREO IN SMALL

The new edition of the **Bose RoomMate Computer Monitor** unleashes the potential sound power of your Mac or Apple IIGS.

MIDI musicians, multimedia mavens, and even gamers will appreciate the range and depth of stereo sound these RoomMate speakers set free. (You'll need a Mac with stereo output, such as the SE/30 or Mac II, or a stereo card for your GS.)

The differences between the new RoomMate and the old are subtle but many. Immediately obvious is the external built-in volume control, which frees you from the computer's Control Panel.

The RoomMate includes adapters for stereo and mono mini-plugs, like those most computers and portable stereos have — but it starts with standard RCA phono jacks, which you can use with a videodisc player or videocassette player as well. It's no bigger than the earlier-model RoomMate — 6 by 6 by 9 inches — and comes in Apple platinum.

Inside, the RoomMate's as good a powered bookshelf speaker as you can buy, incorporating the advanced technology for which Bose is famous.

The new RoomMate is magnetically shielded, too, so it can't erase a floppy disk placed on it or create distorted rainbows on a nearby video monitor.

The Bose RoomMate Computer Monitor sells for $399 a pair in audio, appliance, and computer stores. For details, contact the Bose Corporation, The Mountain, Framingham, MA 01701-9168, (508) 879-7330, or circle number 351 on the Reader Service card.

▲ ■

READ THE FINE PRINT

Thunderware believes that optical character recognition (OCR) is an integral part of scanning. To that end, Thunderware now bundles OCR software — the popular **Read-It!** program from Olduvai Software — with its full-size Mac scanners, the **LightningScan 400** and **LightningScan Compact**, as well its grey-

scale personal scanner, the **LightningScan Pro 256**.

Thunderware also recently lowered the price of its already inexpensive **LightningScan GS/LC**, from $169 to $99. Apple IIGS owners can now purchase a hand-held scanner, interface card, scanning application, and desk accessory for less than $100.

LightningScan GS/LC doesn't include an OCR program, but does work well with **InWords** from WestCode Software (11835 Carmel Mountain Road, Suite 1304, San Diego, CA 92128, 619-679-9200).

For more information, contact Thunderware, 21 Orinda Way, Orinda, CA 94563-2565, (510) 254-6581, or circle number 352 on the Reader Service card.

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MAGIC WAND

The **Magic Wand Keyboard**, designed for people with little or no hand or arm movement, is now available for any computer that uses the Apple Desktop Bus (ADB), including most Macintosh models and the Apple IIGS.

Developed under a grant from the New York State Science and Technology Foundation, the device provides full keyboard capability at the slightest touch of a wand.

What's more, it can emulate a mouse by simply touching a key. No strength or dexterity is required; there are no buttons to push or switches to activate.

The special keyboard installs by plugging into the ADB port on the Macintosh or Apple IIGS, and includes, in addition to the standard Apple keys, dedicated mouse keys and some programmable keys as well for smoother operation.

The Magic Wand Keyboard is priced at $1425. For more information, contact In Touch Systems, 11 Westview Road, Spring Valley, NY 10977, (914) 354-7431, or circle number 353 on the Reader Service card.

NEW SOFTWARE

■

BETTER EXCHANGES

Apple IIGS owners face a bewildering array of formats when they want to use graphics with painting, drawing, and publishing programs.

There's hi-res, lo-res, super-hi-res 320, and super-hi-res 640 — and those are just the official Apple modes. Smart GS owners boot up The Graphics Exchange, from Roger Wagner Publishing, to convert pictures to usable formats.

Now the **Graphics Exchange Library Disk #1** adds the ability to work with Springboard Publisher Works of Art, Print Shop and Print Shop GS borders, Superprint graphics, graphics interchange format (GIF) Mac files, picture-exchange (PCK) MS-DOS files, and 3200 color from Dream Graphics.

Disk #1 requires The Graphics Exchange version 4.2 or later. It's the first in a projected series of extensions that will be offered as graphics formats continue to evolve.

Disk #1 sells for $29.95, from Roger Wagner Publishing, 1050 Pioneer Way, Suite P, El Cajon, CA 92020, (619) 442-0522. Circle number 354 on the Reader Service card for more information.

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WHAT'S THE DIF?

Do you know the difference between a cougar and a mountain lion? Between a puma and a cougar? **What's the Difference? The Classification Toolkits**, from Tom Snyder Productions, is an illustrated interactive database that turns your Mac into a new kind of tool for studying the animal kingdom.

Unlike a traditional textbook, What's the Difference? makes

NEW-PRODUCT FOCUS

▲ MAC ◆ APPLE II ■ APPLE IIgs

students design and create their own interactive classification keys. Making and using keys is a good way to develop the thinking skills required in any kind of classification.

What's the Difference? gives students compelling immediate visual feedback, as they watch on screen each step of their classifications according to animals' similarities and differences. A database of information about the organisms studied, including drawings, is available at all times, as well.

Dr. Esther Inbal, a biologist and classroom teacher, and Oded Susskind, an instructional designer at Boston University's Center for Science and Math Education, created the program.

What's the Difference? runs on HyperCard. Each toolkit includes program disks and a teacher's guide for $79.95 ($239.95 for a ten-disk lab pack). A set containing both toolkits (Vertebrates and Invertebrates) is $139.95 ($399.95 for a lab pack).

For more information, contact Tom Snyder Productions, 90 Sherman Street, Cambridge, MA 02140, (800) 342-0236, or circle number 355 on the Reader Service card.

TWO NEW GEMS

JEM Software has updated two of its most popular AppleWorks additions: **TotalControl** and **DoubleData**.

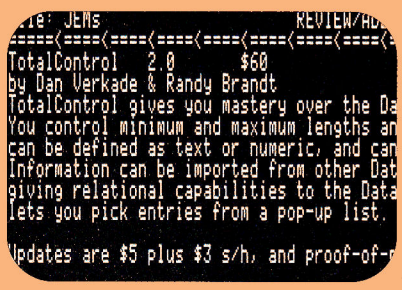
TotalControl was the ultimate database enhancement for AppleWorks 3.0 — it turned your AppleWorks database manager into a powerful tool, letting you set limits on what you could put into a database: text or numbers only, minimum or maximum values, telephone numbers or zip codes, for example. It even linked information from other spreadsheets, databases, or word-processor files.

Now Total Control 2.0 is even better. It lets you import database and spreadsheet files from disk, allowing access to unlimited files of unlimited size. You can turn on "automatic recalculation" in database categories, just as you would in a spreadsheet. You can display the calculated results with decimals lined up for easy reading. A new @TimeToNum function allows calculation of elapsed time — especially handy for billing.

Dan Verkade, who wrote Total Control 2.0 with Randy Brandt, has completely rewritten DoubleData 2.0. It's still the only AppleWorks 3.0 add-on to provide 60 categories in a single database record.

But DoubleData 2.0 now provides smooth integration into AppleWorks — no longer will you need to use any additional AppleWorks commands to access DoubleData "pages." Also, mail merge, the clipboard, and all reports can use all 60 categories. In single-record layout, the screen now scrolls to reveal all extra categories.

TotalControl 2.0 sells for $60; the upgrade from earlier versions is only $5. DoubleData 2.0 costs $9; the upgrade is



$10. For more information, contact JEM Software, 7578 Lamar Court, Arvada, CO 80003, (303) 442-4856, or circle number 356 on the Reader Service card.

NEW RESOURCES

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LOGO FOUNDATION

Seymour Papert, originator of the computer learning environment known as Logo, has now formed the **Logo Foundation**, a nonprofit organization dedicated to the support of Logo-using educators around the world.

The Logo Foundation has been Papert's dream for many years, and was realized with initial financial support from Logo Computer Systems in Montreal and Logo Japan of Tokyo. Michael Tempel, former director of educational services at Logo Systems, is president of the foundation.

"Logo is one of the most widely used and enduring educational computer environments," says Tempel. "It is designed to support active, user-centered education. Yet there are many teachers who, while sharing Logo's vision of education, do not use Logo." In fact, Tempel notes, the very teachers who might agree with the Logo philosophy "may see computers as irrelevant or even alien to their way of thinking and working." The foundation's goal is to reach these reluctant educators.

The foundation's activities will include publication of informational brochures, research summaries, workshop materials, and curriculum units, incorporating materials that emerge from the foundation's direct work in schools. The Logo Foundation will establish a library in New York, and will also publish a newsletter.

Educators can contact Tempel at the Logo Foundation, 250 West 57th Street, Suite 2603, New York, NY 10107, (212) 765-4918, or circle number 357 on the Reader Service card for more information.

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NAUG PD CATALOG

The National AppleWorks Users Group has released the 1992 edition of its **Public Domain Library Catalog**. The new volume lists more than 200 disks filled with templates, utilities, and fonts for AppleWorks and AppleWorks GS.

NAUG represents the country's biggest group of AppleWorks users, and the catalog is the largest collection of AppleWorks-compatible software enhancements in the public domain available from a single source. Most disks will interest educators, but the six pages devoted to educational software offer special value.

The catalog costs $5, which includes postage and $2 toward your first purchase, from NAUG, Box 87435, Canton, MI 48187, (313) 454-1115. Circle number 358 on the Reader Service card for more information.

There's also a Vitesse software product called ***Salvation-Exorciser*** *(13909 Amar Road, Suite 2A, P.O. Box 929, La Puente, CA 91747-0929, 818-813-1270, $54.95).*

If possible, run at least two virus checkers in case the first program misses one of those bugs. Even that's not "cast in concrete" safe. When a virus hit my system as part of a network, a crew spent many hours cleaning up the mess, yet still missed one computer. It soon infected the other systems, and we had to start over again.

APPLESOFT TOOLS

I OWN AN APPLE IIGS; I HAVE A wealth of DOS 3.3 software and want to update my graphics library. I'd like to upgrade my old favorites, Animatrix and Hi-Res Character Generator, to ProDOS. Can I convert these members of the Applesoft Tool Kit to ProDOS, or are ProDOS versions available? Are there any alternatives out there?

Philip C. Van Decar
Royal Oak, MI

The Applesoft Tool Kit was converted to ProDOS and comes with the book **BASIC Programming with ProDOS**, *published by Addison-Wesley's Trade Computer Books Division (1 Jacob Way, Reading, MA 01867, 617-944-3700, $29.95). The disk contains Applesoft command extensions only for renumbering, show, and so on, and doesn't include hi-res character-generator software.*

If you're looking for a shape-table editor, try ***Shape Mechanic*** *from Beagle Bros (6215 Ferris Square, Suite 100, San Diego, CA 92121, 619-452-5500) — an oldie-but-goodie. Because you have an Apple IIGS, you might also consider* ***Beagle Graphics****, a paint program that lets you work in super hi-res. Both products are available free on Beagle Bros' bulletin board; call the company for details.*

SEVERAL READERS SERVED TOURS OF DUTY IN THE APPLE CLINIC OPERATING ROOM THIS MONTH. SPECIAL THANKS TO GUEST PHYSICIANS JOHN COPPLE, GUY FORSYTHE, JOHN GRAHAM, GEORGE GRIFFIN, GARY JACOBSEN, CHUCK NEWBY, WALT ROSHON, AND DEREK YOUNG. APPLE CLINIC IS A FORUM FOR ANSWERING YOUR QUESTIONS ABOUT APPLE II AND MACINTOSH HARDWARE AND SOFTWARE. ADDRESS YOUR CORRESPONDENCE TO APPLE CLINIC, *INCIDER/A+*, 80 ELM STREET, PETERBOROUGH, NH 03458.

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UNIV & SCHOOL P.O.'S WELCOME!

APPLE IIGS UPGRADES

4 MEGabyte IIGS RAM board.
Fully DMA Compatible .....w/1 MEG $99
Expands ROM 01 & ROM 3 IIgs ...w/2 MEG $149
Fall Special .....**w/4 MEG $229**
AEGS-RAM+ 6 MEG RAM board .w/1 MEG $189
256K RAM SET (8pc) Lifetime Wty $18
256K RAM 3 Set Special (24pc) $49
1 MEG RAM Set (8pc) 5 Yr Wty $55
IIGS Serial/Parallel Converter $59
IIGS replacement Power Supply..... $75
SoundSystem 2 New 2-Way Amplified Speaker Pair. Put the S in your IIGS $89

IIGS 105 MEG PRO-DRIVE

The fastest Quantum HardDrive (10ms). Complete w/Apple Hi-Speed SCSI Card. BONUS 25 Megabytes of the Best IIGS Public-Domain & Shareware Programs.
PLUG AND PLAY READY!..... $599

IIe/IIc MEGABYTE RAM

Licensed by Applied Engineering. A 100% replacement for Extended 80 card. Expands Appleworks desktop to 998K and allows instant switching between modules.
Above **w/256K** $89
Above **w/512K** .....**$109**.....**w/1 Meg** $149
Super Expander C Expands IIc to 1152K, Appleworks desktop to 1052K, & allows instant module switching **w/256K** $99
Above **w/512K** .....**$119**.....**w/1 Meg** $159

QUIET COOLING FANS

SuperFan II for II+/IIe. Kensington Style w/surge protect & twin rear AC outlets..... $27
Super Cooler GS for your IIgs. No audio line interference. Internal Mount..... $24

PRO-KEYPAD for IIe/IIc

Numberic data entry made simple. Includes mathematic, decimal & RETURN keys.
PRO KEYPAD for U.S. & European IIe..... $34
PRO KEYPAD for U.S. & European IIc..... $39

APPLE II Plus OWNERS

Run Appleworks on your II+ or Franklin Ace!
NEW Plusworks III will configure any version of Appleworks to run on your computer. One time configure package. Not a pre-boot.
A.W. 1.0-2.1 req. 64K, 80 columns, shift key mod.
A.W. 3.0 req. 128K, 80 columns, shift key mod.
Plusworks III w/complete docs $39
16K RAM BD. Expands II+ from 48K to 64K.. $34
128K RAM BD. Legend/Titan Compatible... $64
DOS/ProDOS Emulator for above 128K BD.. $24
80 Column II+ Board Videx compatible..... $48
Shift Key Modification $7
Lower Case Adapter. Rev. 7 & up $12

FALL SPECIALS

PBC EXTENDED 80 COLUMN CARD for Apple IIe. Expands IIe to 128K (Appleworks desktop to 56K). Super sharp 80 column display, soft switch select 40/80 columns, & Double Hi-res graphics, all built-in! $35
PBC 256K/80 COLUMN BORD IIe. All above features, plus expands your Appleworks 3.0 desktop to 137K .....**INTRO** $79
Super Serial Board 100% replacement for Apple Super Serial Card, this versatile RS232 board can be used for all modems **and serial printers. For II+/IIe/IIgs**..... $48
SSB to Imagewriter I cable 10' $11
SSB to Imagewriter II cable 10' $11
SSB to Modem (Standard RS232) 10' $11

MORE SUPER SPECIALS!

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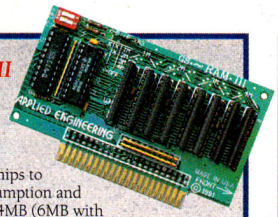

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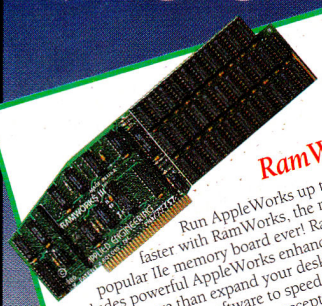

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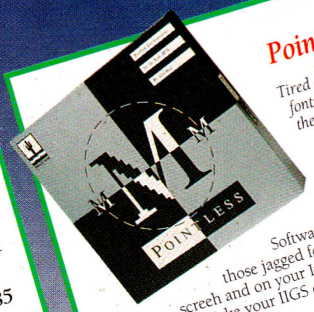

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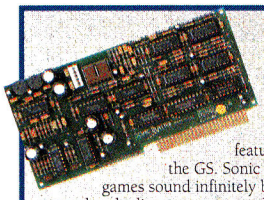

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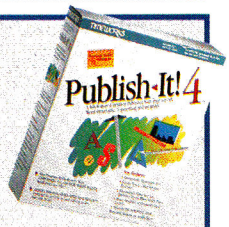

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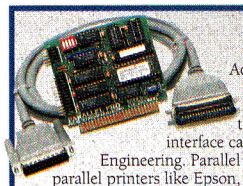

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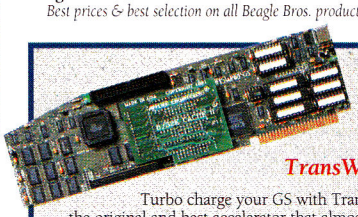

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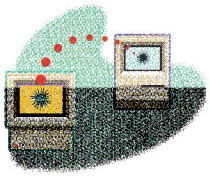

BRIDGING THE GAP

HOMEWARD BOUND

Dial up your school or office network and commute from the comfort of home.

By GREGG KEIZER

HOME IS WHERE THE HEARTH IS, and often where you pound computer keys, too. There's not nearly enough time to get everything done at the office or in the classroom during the day, so you take work home. Bridging the gap between the home office and your day job is getting easier all the time, what with fax machines popping up in dens, on-line services available at all hours of the night, and sneaker-net between Apple II and Macintosh computers, thanks to things like Apple File Exchange and XTND translators.

There's another way to connect your on-the-clock and off-hours worlds: remote computing. Essentially, remote computing makes it seem as if your home (or remote) computer is physically linked to the computers at work (usually referred to as *hosts*), and to the networks, printers, and other peripherals there. Rather than depending on cables to connect the computers, though, remote computing relies on phone lines, modems, and specialty software.

Apple's new **AppleTalk Remote Access** (ARA), though not the first such package for the Mac, is noteworthy for easy setup, simple operation and management, and a thorough approach to the problem of long-range bridges. For on-the-go Mac PowerBook users, ARA is a necessity. (It's included with every PowerBook notebook computer. See "Portable Classroom," February 1992, p. 22.) But ARA also works wonders for anyone who uses a Mac regularly at home, especially teachers and students who work with classroom networks.

Let's say your school sports an AppleTalk network, with Macs and Apple IIs communicating through an AppleShare-driven file server or through Macs using System 7.0's file-sharing capabilities. When you're in the class or computer lab, your students can send reports and assignments from their Apple IIe and IIGS computers to the file server's hard-disk drive, or to any of the shared folders you've set up on Macs connected to the network. You can return their work the same way, as well as call on any network printer — most likely a shared laser or ink-jet model — to pump out hardcopy.

But all those resources are out of your reach when you head home. Wouldn't it be nice if you could use the school's laser or color ink-jet printer from your home Mac? Wouldn't it be great if you could catch up on your grading spreadsheet from home, without having to remember to tote a floppy disk back and forth? And if you're out sick, wouldn't it be terrific if you could zip instructions and class notes to the substitute, just by dumping a file to the administrative assistant's computer?

ARA makes all these things possible by adding a distant Mac to the school's network. Business understands and appreciates the applications of remote-computing technology — isn't it time education caught up?

THANKS, MR. BELL

Remote computing's lifeblood is the copper-and-fiber-optic phone lines that stretch across country. Data can course through those lines — though at a much slower speed — just as it can travel down LocalTalk cabling in the office or school. You'll need at least two 2400-baud modems, one for each end of the connection. Practical Peripherals' **2400SA**, for instance, is an affordable modem you can plug into Macs, Apple IIs, or IBM PCs. Faster modems, like the lightning-quick 9600-bps devices most manufacturers now sell, make remote computing even slicker, but their prices are more than most of us can bear ($450 and up).

Speed's important because remote-computing programs like ARA move impressive amounts of information between computers, especially on the Mac, where the graphics-based user interface is so important. The faster the transmission speed between computers, the less lag time between command and action.

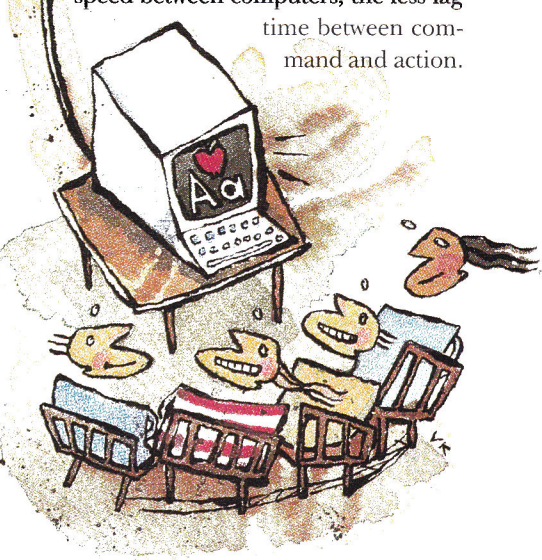

Illustration • Vala Kondo

One thing working in your favor is that on the host end you can get by with just a single modem. One gateway is all that's necessary to get into an entire network.

CALLING REMOTE CONTROL

ARA requires **System 7.0**, the newest version of the Mac's operating system. That means both machines in the connection — host and remote — must run System 7.0; and because of System 7.0's own demands, those Macs must have at least 2 megabytes of memory. (Unfortunately, there's no Apple II application similar to ARA, so only Macs can connect from long distance.)

After running the ARA *Installer* on both computers, a five-minute chore, you're ready to prepare for remote control. Pick a Mac at school (or the office) as the gateway. Ideally, it should be part of an AppleTalk network, because that gives you potential access to additional systems and peripherals, but you can operate with just one host computer if you want. And if possible, select a powerful, memory-equipped Mac. ARA works in the background, taking calls from remote computers without disrupting the work being done on the host computer, but such calls and the ensuing commands do affect the computer's performance. Remember, only the gateway computer — the one running ARA in host mode — needs to use System 7.0. Other computers on the network can run earlier versions of the Mac's operating system. Apple IIs on the network are unaffected by ARA.

Launch ARA by double-clicking on its icon. Pull down the *Setup* menu and select *Remote Access Setup*. A dialog box pops up (**Figure 1**). Choose the gateway computer's modem type from the list, identify the port it's using, and click on the *Answer calls* box. You can also specify how long a caller can stay connected to the host, so that you can, for instance, ensure that no one user hogs the gateway. The host will disconnect a caller automatically after the time you enter has expired, though the caller will receive several countdown warnings before cutoff occurs.

Normally, you'll want to check the *Allow access to entire network* button so that callers can get to other computers and printers on the net. In some cases, though, you may want to restrict callers to just this computer. If so, check the second button. The gateway is now ready to receive calls.

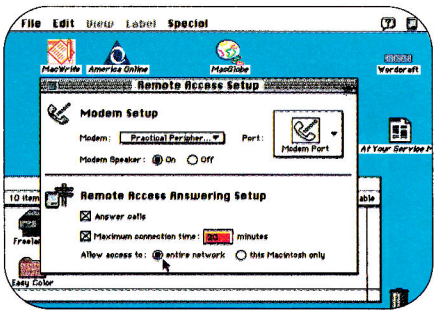

Figure 1. Setting up host computer's modem to receive calls with AppleTalk Remote Access.

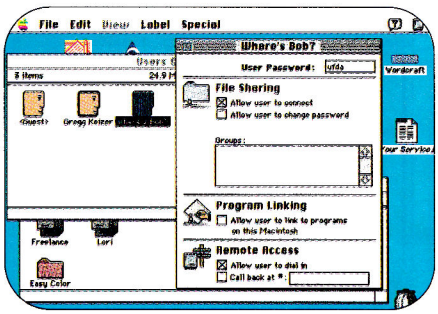

Figure 2. Establishing list of designated callers with corresponding passwords.

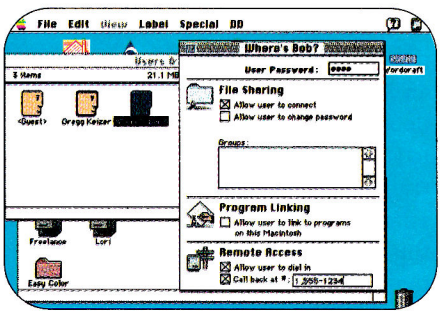

Figure 3. Listing call-back phone numbers. After receiving call, host hangs up and dials predetermined number to establish connection with remote computer.

Before the host lets anyone on, though, it has to know who's calling. To prevent unauthorized access, ARA demands that potential callers be named *before* they call. (It's this requirement that most distinguishes ARA from a BBS.) To identify a caller, you work in the *Users & Groups* area within the *Control Panel*, just as you do when you set up file sharing under System 7.0. From the *Setup* menu, pick *Users & Groups*, then double-click on the *Guest* icon. Click on the *Allow guests to dial in* box at the bottom; now anyone can call in.

But you probably don't want just anyone dialing in and connecting. Pull down the *File* menu and select *New User*. Rename the icon — say to *Where's Bob?* — and then set up a password and check the *Allow user to dial in* box (**Figure 2**). If you want to give remote-computing rights to someone who already has file-sharing privileges, just check the box. When *Where's Bob?* calls in, he has to enter the password before the system allows access. That's another security feature that protects the host computer from unwanted callers.

A last-ditch defense against illegal users lets you set up the host so that it hangs up the phone shortly after a caller connects, then calls a predetermined number back to re-establish the link. Not only does that reverse any phone charges, but it also makes sure that unauthorized callers can't get in, even if they somehow uncover a real user's password, unless they happen to be calling from the real user's phone number, which is unlikely. Check the *Call back at #* box and type in the phone number, remembering to include a *1* if it's a long-distance call (**Figure 3**). You probably won't want to set this feature for a school's host, because long-distance bills could easily mount up.

Continue to create user icons until there's one for every person who will call the host and operate it remotely.

CALLING IN

Once you've set up the host, you can prepare your remote Mac for dialing in. The procedure is even simpler from this side of the connection.

Double-click on the *Remote Access* icon and a dialog box appears, waiting for you to fill in the blanks. Check the *Registered User* box, type in your name and password (it has to match exactly the password the host lists in your *Users & Groups* icon), and then enter the phone number of the host machine (**Figure 4**). That's it.

Check the *Save my password* box if you want your password included in the connection document; the system will then give the password automatically to the host. That may sound convenient, but remember that anyone who gets a copy of the connection document can then dial the host. That's unlikely if you're calling from home, so go ahead and check it.

You can also have the host remind you of the connection every few minutes. Check that box and type in a number between 1

and 9999. It's easy to forget that you're using the phone — and perhaps racking up impressive charges — when you remote-compute with ARA. This feature jogs your memory every so often.

Make sure the modem is on and connected to the correct port, then click on the *Connect* button. In a few moments, ARA dials the phone, makes the connection, and verifies your password. You're at work, but you're at home. Maybe you can be in two places at once.

Still, it's not as if your home-bound Mac suddenly turned into the host at work, like some silicon version of *Invasion of the Body Snatchers*. No, your household Macintosh remains the same. But it *has* been fooled. AppleTalk Remote Access makes it think that it's physically connected to the host machine with LocalTalk cabling. In other words, your home machine can do anything that a similarly equipped Mac at school, hooked up to the network, can do.

If there's a printer on the school's network, you can run it from home. Simply select the *Chooser* from the *Apple* menu, pick the appropriate model, and print from within any application (**Figure 5**). Rather than sending data through a printer port to your home's ImageWriter II or StyleWriter, ARA sends it down the phone lines to the host computer, and from there, along the AppleTalk network. Printing this way is slow, of course, because the phone lines can't move data as quickly as AppleTalk, but it beats waiting in line in the morning for a spot at the printer.

And you can open any shared folder on any Mac on the network, assuming that the Mac is turned on and that you have access privileges for those shared folders. Want a file at school, but you're tucked away at home? Head for the *Chooser* again, but this time double-click on a shared folder so

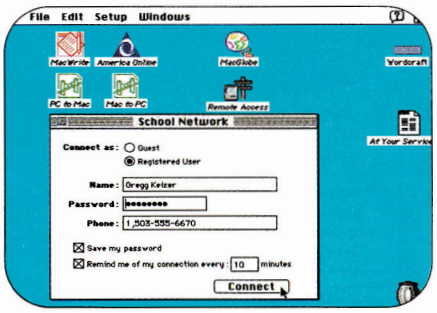

Figure 4. Setting up remote computer with user's ARA password and host modem's phone number.

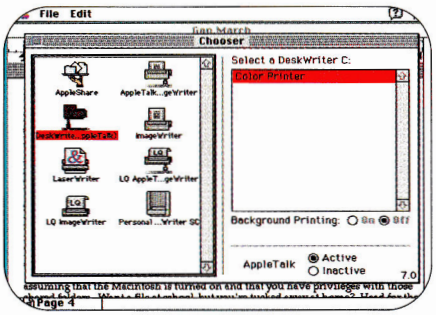

Figure 5. Accessing a network printer from remote computer over phone lines with ARA.

that it appears on your Mac's desktop as an AppleShare-volume icon. Open it by double-clicking, then drag the desired file to your hard disk's icon. The file begins to transfer, across phone wires, from the school machine to your machine. Again, this copy procedure takes much longer than copying a file across an AppleTalk network. The transfer rate is akin to the time it takes to download a similarly sized file from an on-line service.

It's not so farfetched, this computing by remote control. A teacher can often purchase a Mac for the home at a very attractive price through the school district or a state educational agency. Once equipped with Macs at home and at work, educators can take advantage of the same productivity boosts that have been driving businesses to personal computers.

In a mixed Apple II/Macintosh school, for instance, AppleTalk is often used to connect the different computers, sometimes with a central file server running AppleShare. With a home Mac and AppleTalk Remote Access installed on both that machine and one of the school's computers, you can shift work to the time most convenient for you. Connect to the network via ARA, and you can access students' AppleWorks files stored on the file server, transfer them to your home computer, open them with software such as MacWrite II or ClarisWorks, make your changes, and then copy the finished work back to the file server over the phone lines.

Because you can secure the network with several defensive layers, a school can even open up limited parts to students who wanted to access it from home (though the price of AppleTalk Remote Access — $199 for a three-user pack — makes a bulletin board much more feasible). If the school's library catalogues its holdings with a database program like FileMaker Pro, for instance, kids with Macs at home can connect with ARA and search for references for their term papers. Or the school can loan an ARA-equipped Macintosh to kids with long-term illnesses or recuperating from accidents so that they can communicate with teachers, and retrieve and submit assignments to keep up.

ARA can't do everything, though. It's no substitute for a home Macintosh well stocked with its own software, for example. Don't expect to launch applications remotely — the wait is interminable. And a compression utility such as **DiskDoubler** or **StuffIt** — which squeezes files as much as 50 percent — trims the time you'll spend connected to the network. If you remote-compute regularly, look into one.

AppleTalk Remote Access may not bridge the gap between Apple II and Macintosh, at least not directly, but it can bridge a gap just as large — the one between hearth and homeroom. ❑

WRITE TO CONTRIBUTING EDITOR GREGG KEIZER AT 4420 HILYARD STREET, EUGENE, OR 97405. ENCLOSE A SELF-ADDRESSED, STAMPED ENVELOPE IF YOU'D LIKE A PERSONAL REPLY.

PRODUCT INFORMATION

AppleTalk Remote Access, $199
System 7.0 Personal Upgrade Kit, $99
Apple Computer Inc.
20525 Mariani Ave.
Cupertino, CA 95014
(408) 996-1010

DiskDoubler
Salient Software
124 University Ave.
Suite 300
Palo Alto, CA 94301
(415) 321-5375
$79.95

StuffIt
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165 Westridge Drive
Watsonville, CA 95076
(408) 761-6200
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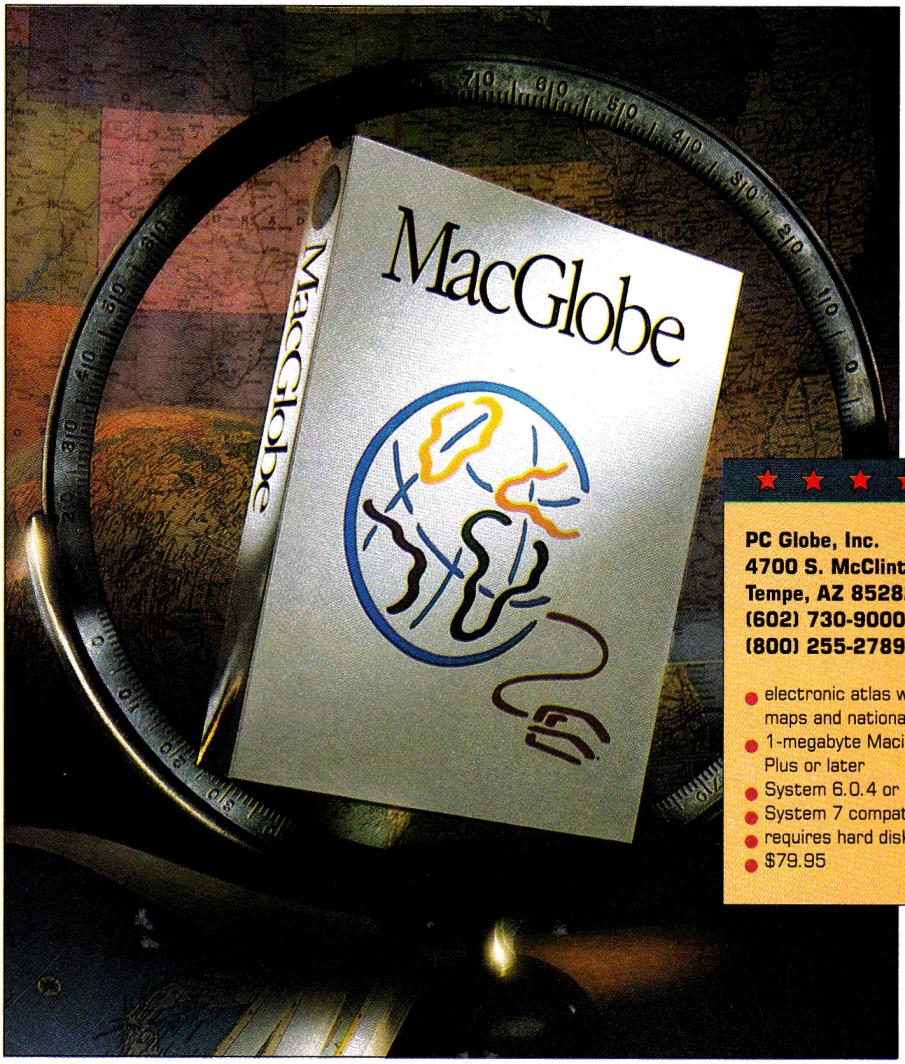

★ ★ ★ ★ ★

PC Globe, Inc.
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Tempe, AZ 85282
(602) 730-9000
(800) 255-2789

- electronic atlas with maps and national data
- 1-megabyte Macintosh Plus or later
- System 6.0.4 or later
- System 7 compatible
- requires hard disk
- $79.95

MacGlobe calculates automatically the distance (in miles or kilometers) between any two cities on a world map. The program not only computes distance, it displays city coordinates measured from one of four preselected horizontal centers on the map. Viewers specify *From* and *To* city locations by scrolling through long lists of possibilities or typing in the first few letters of a city's name.

There are four types of country maps. Each one displays an outline of the country (with or without rivers). Select the *Base* map to see a picture of the country's flag, play the national anthem, or obtain information on population figures and land area (in square miles or square kilometers). Choose the *Cities* map to see the location of the capital city and major urban areas. An *Elevation* map presents a topographical view, with population and area figures. A *Features* map shows the locations of rivers, mountains, tourist attractions, and major sites. Double-clicking on any country map calls up all reports available for that nation.

While MacGlobe features comprehensive data for each nation, country maps don't include an inset showing a nation's location in relation to its neighbors. You can direct MacGlobe to "paint" the individual country on a world map, but, if the territory is small, painting won't make it any easier to locate.

Stacking up one country against another is as easy as calling up MacGlobe's comparison maps. The program presents statistical information on 13 data topics, including demographics, economy, health, education, and manufac-

Photography • Larry Dunn

turing. It assigns colors or patterns to differentiate among data ranges and plots them so that you can get the whole picture at a glance, such as how much of their GNP countries spend on defense.

Comparison maps exist for geographic regions like Central America, Southeast Asia, North America, the Middle East, and so on, but unfortunately not for political, economic, and cultural regions such as the Organization of American States (OAS), the Organization of Petroleum Exporting Countries (OPEC), the Warsaw Pact, the North Atlantic Treaty Organization (NATO), or the Caribbean Community (CARICOM). Nor can you create custom maps by selecting individual countries. Ironically, this shortcoming is noticeable only because MacGlobe offers so many ways to group nations (politically, economically, and culturally) in nearly all its other display options.

MacGlobe takes the drudgery out of geographic research by providing a world of information your fingers can access in a jiffy. Yet the current version of the software has a few glitches. For example, there's no reference to Antarctica, the Antarctic Circle, or the Antarctic Ocean. Even more significant is the fact that MacGlobe's interface is clumsier than necessary. The current version lacks a *Find* command. To call up a national map or report, you must scroll through pop-up lists accessed via the *Change* command in the *Edit* menu.

MacGlobe lacks a zoom command. This makes it difficult to obtain an enlarged view of selected countries from the world map. You can zoom in on a particular country by double-clicking on it, but this action only calls up a map of the individual country. To see an enlarged view of a country in context, you have to go through the *Change* command in the *Edit* menu and select the country's geographic region — a convoluted process at best.

Omissions and awkward interface aside, MacGlobe presents geography in an electronic format even youngsters will enjoy. It offers easy-to-digest facts and figures, plus a host of colorful maps at an affordable price. So spend a few dollars and take a leisurely trip around the world. If you behave, maybe next year PC Globe will take you someplace else.

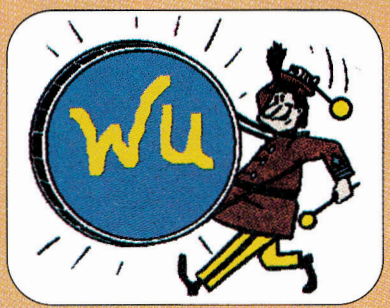
Carol S. Holzberg, Ph.D.
Shutesbury, MA

★ ★ ★ ★ ★

DESKWRITER C

Hewlett-Packard
19310 Pruneridge Avenue
Cupertino, CA 95014
(800) 752-0900

- color ink-jet printer for Macintosh
- $1095



Color doesn't do you much good if it's trapped inside your computer. Those vibrant shades on your Macintosh screen may dazzle every onlooker, but unless you have the means to push them onto a piece of paper, they're only so much window dressing.

Fortunately, color printers keep edging toward the affordable. The ImageWriter II, for instance, a classic printer that uses ancient nine-pin technology, works limited color magic in homes and schools on Apple IIs and Macs. It's a good start at putting more than black on white.

But Hewlett-Packard, the giant among today's printer makers, has a better solution — the DeskWriter C. Based on the popular and affordable DeskJet series, this Macintosh color ink-jet printer won't win any speed trials, but it will do something no other reasonably priced printer can dream of — produce artwork that shows sunsets in shades of deep red and kids' drawings in smooth chromatic glory.

Connecting and setting up the 8-by-17-by-15-inch DeskWriter C to your Mac is a snap. Just plug the printer's power cord into a wall outlet, jack the printer into an AppleTalk network or directly to the computer's printer or modem port, drop the print cartridge into the printhead, install a printer driver in your *System* folder, and, in most cases, you're set. System 7 users don't have to hassle with installing the bit-mapped and screen fonts included, but can use built-in TrueType fonts instead. If you're still working with a pre-System 7 machine, though, you'll spend a few minutes copying font files with the Font/DA Mover utility. All told, it won't take you more than 15 minutes to unbox and ready the DeskWriter C.

The controls are simple. Easy-to-reach buttons take the printer on and off line and let you change printer cartridges. The rest of the DeskWriter's operation is just as convenient. The 100-sheet paper tray, for instance, is at the front, tucked under the output path. Printing envelopes, normally a frustrating chore, is especially easy.

Ink-jet printers are often touted as the poor man's laser printer. Although that's less a consideration today as personal laser printers continue to drop in price, it's still true that DeskWriter output is difficult to distinguish from that of a PostScript printer.

When you're using one of the DeskWriter C's four built-in outline fonts — Times, Helvetica, Courier, and Symbol — or System 7's TrueType, the results are sharp characters whose edges show no signs of the jaggies. And because you can scale fonts up to 250 points in size with no drop in clarity, the DeskWriter C makes an excellent word-processing or desktop-publishing printer.

But the DeskWriter C can't compete with a laser printer in any speed trials. Select *Normal* printing in black, for example, and the printer puts out paper at the rate of two pages per minute. That's half the speed of QuickDraw- or PostScript-based personal laser printers from companies such as GCC, QMS, and Okidata. Background printing (printing continues while you work on something else) is currently possible only on Macs running pre-System 7 software. HP has promised an upgrade to the DeskWriter C driver to make background printing possible on System 7-equipped machines.

And the DeskWriter C doesn't work as quietly as a laser printer. Though not as noisy as a dot-matrix machine, the back-and-forth of the DeskWriter's printhead is still loud enough to be bothersome in a quiet home office.

You're not buying the DeskWriter C for its black-and-white output, though. It's color that makes this ink-jet printer attractive, and those colors are enticing. Using the color cartridge's cyan, magenta, and yellow inks, the DeskWriter C can

Continued on page 54

DEALS, DEALS,

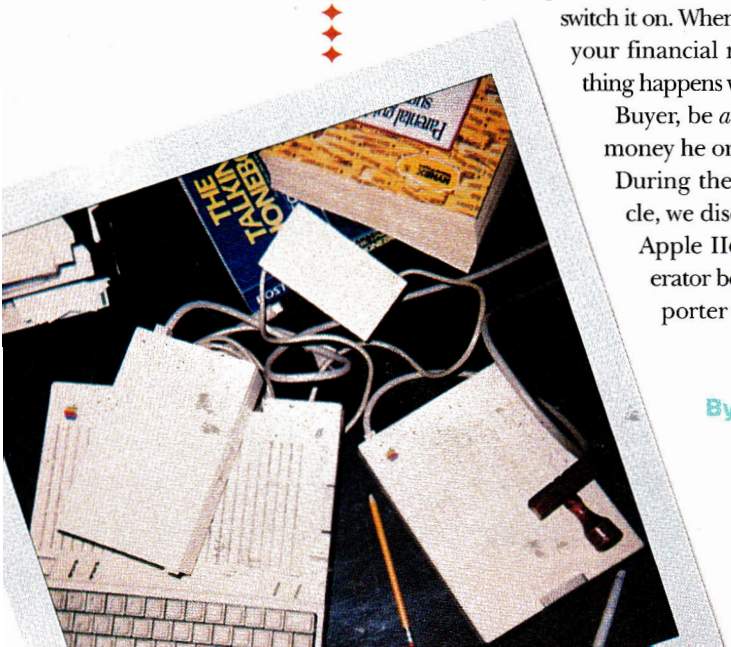
Looking for a bargain? Used Apple II and Macintosh equipment offers big savings. Check out our lists of sources and tips for buyers and sellers.

BELIEVE IT OR NOT, used Apple IIs and Macs are *hot* commodities. No, your local fence has nothing to do with it. We're talking about all the legitimate, too-good-to-pass-up deals we stumbled upon recently when we crisscrossed the United States by telephone to interview computer dealers, consignment stores, and other resellers of Apple systems. From Maine to Wisconsin to Alaska, from California to Texas to Florida, the folks we talked to sang the same refrain: "We can't get enough of them!"

Dr. Alexander Randall 5th and Steven J. Bennett, co-authors of ***Alex Randall's Used Computer Handbook***, wouldn't be surprised at our discovery. They write, "Great technology is never obsolete because obsolescence is in the eyes of the user." In their myriad configurations, Apple IIs and older-model Macs continue to represent "appropriate technology" for a host of users — neophytes and veterans alike. For now at least, some of the smart money is still on Apple IIs and older-model Macs — albeit used ones.

TRADE SECRETS

To borrow a euphemism from the used-car industry, why are "pre-owned" Apples such a good deal? Like an automobile, an Apple II or Mac (or any computer, for that matter) depreciates the instant you switch it on. When you drive a car off the dealer's lot, your financial net worth takes a hit. The same thing happens when you open a computer carton. Buyer, be *aware*. A seller rarely recoups the money he or she invests in a "power" system. During the course of researching this article, we discovered an ad for a full-featured Apple IIGS with extra memory, an accelerator board, a hard-disk drive, PC Transporter (a plug-in card that lets you run



By CYNTHIA E. FIELD, Ph.D.

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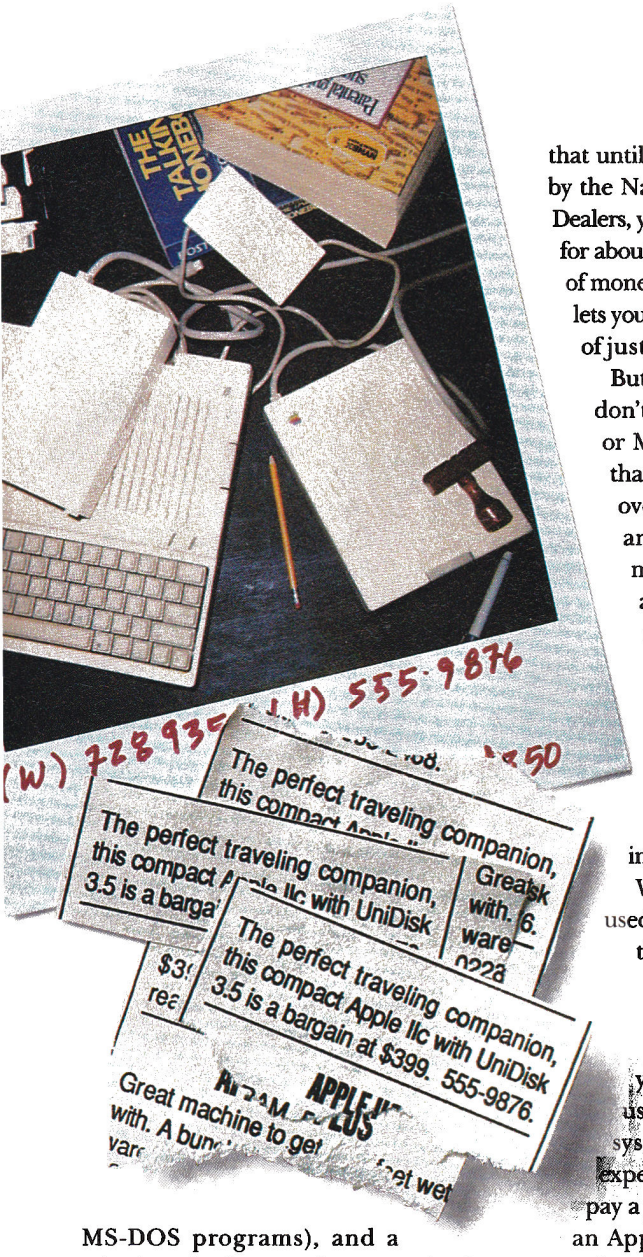


MS-DOS programs), and a selection of software — $8000 worth of equipment. The whole kit-and-kaboodle was on the market for $2000 "or b.o." (or best offer). What an opportunity!

The same level of saving applies to more basic systems, as well. According to Apple dealer Bob Rivera of **MicroComputer Systems** in Tampa, Florida, a new 128K Apple IIe system retails for about $1350 — but he'll gladly sell you a pre-owned Apple IIe for about a thousand dollars less. **Maya Computer Company**'s Jahan Salehi says that a used 128K Macintosh goes for $149 ("It's good for parts"), but you can purchase a functional, second-hand Macintosh 512Ke for $349. A refurbished 1-megabyte Mac SE with 20-megabyte hard drive sells for just $995 — "a better value than a new Classic," Salehi observes.

Then again, according to the ***Computer Blue Book Price List***, a marketing survey that until recently was compiled annually by the National Association of Computer Dealers, you can pick up a used Mac Classic for about $600 — or, for the same amount of money, a pre-owned Apple IIGS, which lets you enjoy thousands of colors instead of just black-and-white.

But unlike automobiles, computers don't wear out. The typical Apple II or Mac system has few components that fail under continual use. Moreover, parts that are subject to wear and tear — primarily disk-drive mechanisms and printheads — are relatively inexpensive to realign, repair, or replace. To Apple's credit, virtually everyone we interviewed for this article praised the company's systems as reliable, low-maintenance machines, more often than not requiring only a dusting and cleaning before resale.

When you purchase (or sell) a used Apple II or Mac, about the only thing you have to do to make sure the computer's in good working order is to round up your usual software. If you're buying your first Apple, ask a II- or Mac-using friend to help you test any system you're considering. Some experts claim it's a waste of money to pay a professional technician to check an Apple II or Mac because you can perform the evaluation yourself. Decision making is easy: If something doesn't work right, don't buy it. Here are a few tips:

1. For starters, scrutinize the computer's components for evidence of physical abuse. Twinkie crumbs and coffee stains on the keyboard — or dings on the disk-drive door — aren't good recommendations. Like a prime-condition automobile, a well-maintained computer is clean under the hood. Responsible sellers vacuum the motherboard (the main circuit board) carefully and dust off the keyboard with compressed air. You can purchase small cans of compressed air from photography-supply shops as well as from computer dealers and software stores. A spritz of low-tech window cleaner on a soft cloth is all it takes to remove most fingerprints and smudges from the monitor's case and screen. A Q-tip lightly dabbed in rubbing alcohol will clean key caps. Special-purpose cleaning kits for disk drives and mice are available for just a few dollars.

2. Boot a program such as AppleWorks 3.0 and format a data disk. Configure the printer. Create a short word-processing file; a paragraph or two should suffice. Embed a handful of printer options such as boldface and underlining. Save the file on the data disk, remove the file from the Desktop, then reload the file. If you encounter read or write errors, the data disk drive may be defective.

3. Print your document. Uneven type can mean printhead pins have drifted out of alignment. If you're purchasing a used ImageWriter II printer (commonly available for half the retail price), be sure to print a full-color painting or Print Shop banner. Remember, you need to use a four-color ribbon to make sure these features are working properly. In addition, many printers have built-in self-tests; check the owner's manual for instructions.

4. For additional assurance, test an assortment of programs, including your favorite desktop-publishing program, educational software, and games. If you're buying a used GS, it's a good idea to run a music program. Products such as Music Construction Set and Instant Music can help you determine whether or not the GS' Ensoniq sound chip is "in tune." There's no more attractive way for a seller to show off his or her GS system — it's like baking bread accidentally on purpose when the real estate agent shows your house.

5. Make sure the mouse and joystick function properly if they're included in the sale. Sluggish mice may simply require cleaning. Joysticks usually have self-centering adjustments; consult the user's guide for details on running a test and interpreting results.

6. Be sure you get all pertinent hardware and software manuals. Even more important, insist on seeing a copy of an original sales slip or some other documentary evidence that the computer's "legit."

CLASSIFIED INFORMATION

So where do you start looking for this bargain system? Perhaps the only thing that's easier than putting a prospective system through its paces is striking a good deal on a used Apple II or Mac in the first place.

Individual sellers are one common source. Newspapers, shopper's guides, and other local publications are popular forums for advertising used computer equipment. You'll also find an assortment of "for sale" ads in computer publications, including ***Computer Shopper***, ***Enhance***, and ***The Processor***.

Paul Robbins of Coastal Computer Center, an Apple dealership in Portland, Maine, suggests contacting nearby user groups to find out whether any members are selling their Apple IIs or Macs. Robbins adds that Down East modem jockeys hang around ACORN, a local BBS (bulletin-board system) where used computers are sometimes offered for sale.

Purchasing a pre-owned Apple II or Mac from a private owner can be a two-edged sword, though. Often you'll pay a higher price than you would for a similar system you'd buy through a broker or from a reseller. Sounds weird, but individuals develop emotional attachments to their Apple IIs and Macs: We tend to overvalue them. If you're a seller, appreciate the many hours' enjoyment and productivity your computer has provided — but be realistic about its street value. (Do you feel you've already gotten your money's worth? Then consider donating that II or Mac to one of the charitable organizations described in the accompanying sidebar, "Share the Wealth.")

Buying directly from the seller usually means forgoing a warranty, but a private owner will often sweeten the deal with "extras" such as memory boards, software, or printer ribbons. Some sellers will even hook up the computer for you and give you a starter lesson if you need one. A few sellers may even be willing to provide telephone technical support from time to time. Their Apple experience can prove invaluable.

An alternative to scouring the classifieds is purchasing a used Apple II or Mac from a reseller such as **Shreve Systems**, **Pre-Owned Electronics**, or **Sun Remarketing**. These companies buy second-hand Apple II and Mac computers or take them in trade from their customers. After evaluation and cleaning, the systems are resold at a reasonable profit. A 90-day warranty is standard.

As an example, Ken Anderson, Shreve Systems' purchasing manager, told us his company buys basic Apple IIes (128K, green monochrome monitor, one 5.25-inch disk drive) for $200. After cleaning them and running diagnostic tests, Shreve sells them for $400 apiece.

At press time, Sun Remarketing's Roger Smith told us his company had bid successfully on a large lot of factory-serviced Apple IIs, including 450 IIes, 1600 IIcs, and 850 GSes. Smith's company — which offers a 30-day money-back guarantee and a 90-day warranty on parts and labor — was planning to sell the IIes at $195 each, the IIcs at $229, and the GSes at $299. These giveaway prices don't include the cost of monitors or external disk drives, but Sun Remarketing sells those at reasonable cost. Smith quoted **$69 for**

SHARE THE WEALTH

During the course of researching this article, we heard stories about opportunistic resellers who offer only a paltry $75 for a used Apple IIe system or $125 for a GS, and not much more than that for an older-model Mac. These same profiteers can make hundreds of dollars when they turn around and resell your computer. If you have a system you'd like to sell and you don't think you're getting a fair price, call Ken Heinze, founder of **A.P.P.L.E.S.**, the Apple Products and Program Library Exchange for Students, in Milwaukee, Wisconsin.

The goal of Heinze's group — a subsidiary of Scholastic Computer Systems, Inc. — is to put computers into the hands of students, teachers, schools, churches, and other nonprofit organizations in Wisconsin. A.P.P.L.E.S. gratefully accepts donations of used Apple equipment, but also buys pre-owned computers if a reasonable price can be negotiated. At press time, the organization was paying anywhere from $200 to $900 for a pre-owned GS system, for example. According to Heinze, the organization will pay a proportion of fair market value in cash and provide a certificate of donation for the remaining amount, if you prefer.

When you itemize deductions on your federal income-tax return, according to Providence, Rhode Island, District IRS Public Affairs Officer Pat Rusk, you can claim the value of such charitable donations as a noncash contribution on line 15 of Schedule A. If the value of the donation exceeds $500, you'll also need to fill out and attach **Form 8283** (donations exceeding $5000 require a professional appraisal). For additional information, read **Publication 526** ("Charitable Contributions") and **Publication 561** ("Determining the Value of Donated Property"). You can obtain these booklets, as well as Form 8283, by calling the IRS' toll-free number: 1-800-829-3676.

One thing's for certain: There's no dearth of good homes for your pre-owned Apple II or Mac. Just ask Yvette Marrin, Ph.D., president and cofounder of the **National Cristina Foundation**. Active in five countries and 35 states, the nonprofit group works with some 500 organizations — including the United Cerebral Palsy Association, the Texas Rehabilitation Commission, and the Maryland State Department of Education — to provide technology to the disabled.

"There are 43 million people with disabilities and many more with special needs," says Dr. Marrin. Even old equipment doesn't goes to waste. The group has placed some 2500 Apple II Pluses in Maryland alone. The National Cristina Foundation uses the **Orion Computer Blue Book** to assess fair market value, which it documents on a handsome diploma-like certificate.

If you'd like to be part of an endeavor that's seeding computer equipment in schools in Russia and Eastern Europe, contact the **East-West Education Development Foundation**. Established by Patrick J. McGovern, founder and chairman of International Data Group (parent company of inCider/A+), the East-West Education Development Foundation needs both hardware and software — and cash (for packaging and transporting equipment abroad). All donations are tax deductible.

Closer to home, consider donating your Apple II to a local school, church, or charitable organization. You can get a tax deduction and enhance your community at the same time.

— **C.F.**

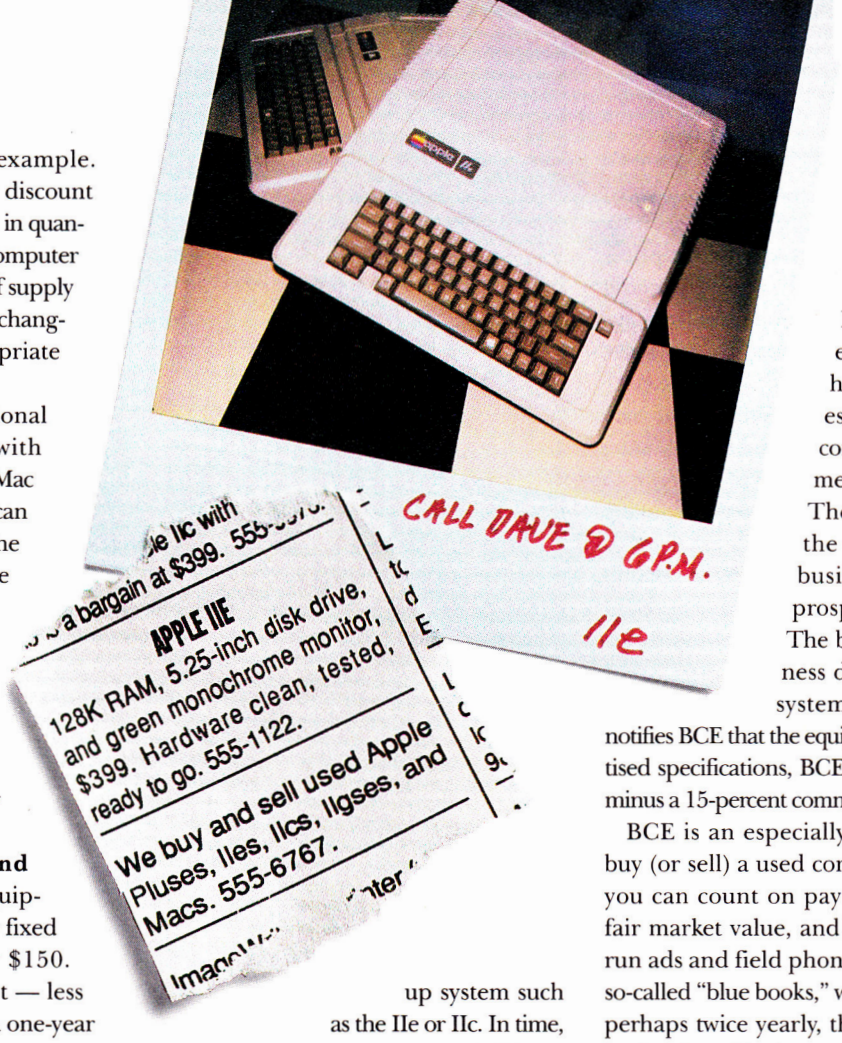
a 5.25-inch Disk II drive, for example. Additionally, schools qualify for discount pricing if they purchase computers in quantity. (Note that because the used-computer market is subject to the vagaries of supply and demand, however, prices are changing all the time. Call the appropriate companies for current prices.)

Some companies offer additional services. For instance, along with marketing complete Apple II and Mac systems, Pre-Owned Electronics can repair your system. In addition, the company's Advance Exchange service means you can swap a defective piece of equipment for a prerepaired item. For example, you can purchase a used UniDisk 3.5 drive outright for $259 — or you can turn in your broken drive and pay only $160 for a refurbished one.

Arminius Publications and Products also repairs Apple equipment. Last summer the company fixed our groaning UniDisk 3.5 for $150. Turnaround was remarkably fast — less than a week — and we received a one-year warranty on the repair. Arminius is also interested in buying any "dead" Apple IIs or Macs you might have.

Apple dealers can service your II or Mac, too. (Call Apple Computer at 1-800-538-9696 to locate a dealer near you.) Perhaps not surprisingly, however, most of the Apple dealers we contacted for this article don't sell used computers. (We chose dealers at random from the 1990 edition of the ***The Apple II Guide***, a publication of Apple Computer.) Bob Rivera, the Florida Apple dealer mentioned above, is one of the few who do. At press time, he was purchasing pre-owned Apple IIe systems for about $250 and reselling them for $350. Small potatoes, right? Not so, says Rivera, who explains that competitive pricing of new computers often generates a profit of only $50 on a new Mac Classic.

"Besides," says Rivera, "we get a lot of people who want to get into computing inexpensively. Eventually they want bigger and better units." Rivera sells them "seed" or "puppy dog" Apple II Plus systems for $99. After the customer develops some computing know-how and confidence, he or she can return the unit to the store and receive 50-percent credit toward a move-up system such as the IIe or IIc. In time, a GS system for which Rivera might have paid $650 or $700 sells for twice that amount as "revolving units" are recycled to new generations of customers.



The **Computer Trading Post** in Saugus, Massachusetts, represents a second kind of used-computer storefront: consignment shops. President Bill Titelbaum says that, among other price-conscious shoppers, representatives of parochial schools and parent/teacher organizations (PTOs) are frequent visitors to his store. "We have a list of customers ready and waiting," he notes.

When a computer's sold, the purchaser has three days to test the equipment, at which time the store releases payment to the seller. The Computer Trading Post retains a 20- to 25-percent sales commission. A few weeks before this past Christmas, a typical price for a complete Apple IIGS system with RGB monitor and two drives (one 5.25-inch and one 3.5-inch) was $900 to $1000.

THE BIG BOARD

Clearinghouses are another option for the buyer and seller of used computer equipment. Among the most widely known listing services is the **Boston Computer Exchange** (BCE). For a small administrative fee, the seller can list his or her Apple II or Mac. Brokers match buyers and sellers and hold payment in escrow until a sale's completed; all agreements are in writing. The seller must ship the unit within three business days to the prospective purchaser. The buyer has two business days to inspect the system; when the buyer notifies BCE that the equipment meets advertised specifications, BCE releases the funds, minus a 15-percent commission, to the seller.

BCE is an especially attractive way to buy (or sell) a used computer. It's timely, you can count on paying (or receiving) fair market value, and you don't have to run ads and field phone calls. And unlike so-called "blue books," which are published perhaps twice yearly, the *BoCoEx Index* is updated weekly. At press time, the "closing prices" on basic Apple IIc and IIgs systems, for instance, were $250 and $700, respectively. A souped-up GS system with two drives and an ImageWriter II printer was listed for $1100, however.

BCE's innovative *Fax Yourself Information* (FYI) system lets you obtain, among other things, a current *BoCoEx Index*, a listing form, nine-year BoCoEx price comparisons, and product-database information. All you need is a touch-tone telephone and a fax machine. Call the FYI number (617-542-2345) and enter the appropriate three-digit extension (300 for the current *BoCoEx Index*). When prompted, enter your fax number. Within minutes the information's on its way. A cover sheet includes a full "Menu of Selections," which lists BCE telephone numbers and FYI extensions.

SMART SHOPPING

Reasons for purchasing a pre-owned Apple II or Mac are probably as varied as Apple users themselves. A second (or even a third) computer at home means that parents can once and for all put an end to kids' bickering about whose turn it is

to use the machine. And if you're a teacher, you haven't lived until you enjoy the convenience of preparing lessons and recording grades at home on your own system.

Professionals, including physicians and accountants who cut their teeth on VisiCalc (a once-popular spreadsheet program, now discontinued), are adding used Apple IIs to their offices, according to at least one dealer with whom we spoke. And what better way to launch a new business than with a pre-owned Mac with Microsoft Works, or an Apple II with AppleWorks 3.0 and a few TimeOut modules?

Secondhand Apple computers are a windfall for schools, too. According to the resellers we interviewed, PTOs know they can stretch the proceeds of fundraisers a lot further when they purchase used equipment. One reseller, for example, estimates that a school can buy ten used Apple IIs for the price of five new ones — even after factoring in Apple's educational discount.

Whatever your motivation for purchasing a used Apple II or Mac, you become a member of a strong user community. Contacting like-minded folks in your home town or state is as easy as dialing 1-800-538-9696 x500, Apple's **User Group Connection**. On a larger scale, you can learn more by joining organizations such as the **National AppleWorks Users Group** or the **Boston Computer Society**, or by accessing commercial information systems such as **CompuServe** and **America Online**, for instance, which offer *PC Catalog* (1-800-544-1296), a classified-ad service that lets you shop for used Apple equipment on line.

Whether the Apple you purchase on the secondary market is your first computer or an add-on, you join the ranks of millions of Apple enthusiasts who have seen thousands of Apple II, IIGS, and Mac programs appear on the scene in the past 15 years. Hundreds of new Macintosh products for home, school, and small business are produced every year by large and small companies alike, and many publishers, including Seven Hills Software, Sunburst Communications, and MECC, continue to develop new Apple II programs. (See "The Year in Review," December 1991, p. 42, for descriptions of dozens of software products released in 1991.)

What about tomorrow? Referring to a federal law that requires U.S. manufacturers to provide replacement parts and repair service for a product for at least seven years, Robert Barnes, an Apple II evangelist at Apple Computer, points out that the company stocks "rows and rows of bins" with II and Mac parts — even "the little rubber feet that go on the bottom" of your machine. With that kind of support, IIs and discontinued Macs may set yet another record: as the longest-running "obsolete" computers in the history of the world.

Suffice it to say that if you'd like to "steal" your next computer, consider purchasing a pre-owned Apple II or Mac. Wall Street it's not. But the brisk secondary market provides ample trading opportunities for buyers and sellers alike. If the savviest shoppers are so bullish on Apples, why would you want anything else? ❑

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PRODUCT INFORMATION

Alex Randall's Used Computer Handbook
Microsoft Press
1 Microsoft Way
Redmond, WA
98052-6399
(800) 677-7377
$14.95

America Online
8619 Westwood
Center Drive
Vienna, VA 22182
(800) 827-6364
$5.95/month
$8/hr. prime time
$4/hr. nonprime time

A.P.P.L.E.S.
9600 West Flagg
Milwaukee, WI 53225
(414) 466-8806

The Apple II Guide
Apple Computer, Inc.
20525 Mariani Avenue
Cupertino, CA 95014
(408) 996-1010
$19.95
distributed through resellers

Arminius Publications and Products
8519 Orchard Avenue
Merchantville, NJ 08109
(609) 662-3420

Boston Computer Exchange
Box 1177
Boston, MA 02103
(800) 262-6399 U.S.
(800) 437-2470 Canada
(617) 542-4414
(617) 542-2345
Fax Yourself Information

Boston Computer Society
1 Kendall Square
Cambridge, MA 02139
(617) 252-0600
$39/year individuals
$28/year students/seniors
$72/two years
$105/three years

CompuServe Information Service
P.O. Box 20212
Columbus, OH 43220
(800) 848-8199
$39.95 signup
21¢/min. 1200/2400 baud
10¢/min. 300 baud
38¢/min. 9600 baud

Computer Blue Book Price List
National Association
of Computer Dealers
15400 Knoll Trail
Suite 500
Dallas, TX 75248
(800) 866-3241
discontinued

Computer Shopper
Ziff-Davis Publishing
1 Park Avenue
New York, NY 10016
(800) 274-6384
$2.95/issue
$29.97/year

Computer Trading Post
216 Broadway
Saugus, MA 01906
(617) 231-2574

East-West Education Development Foundation
1 Exeter Plaza
15th Floor
Boston, MA 02116
(617) 542-1234
(617) 542-3333 fax

Enhance
Quality Computers
20200 East Nine Mile Road
Box 665
St. Clair Shores,
MI 48080
(800) 443-6697
(313) 774-7200
(313) 774-2698 fax
free Apple II
newsletter/catalogue

Maya Computer Company
Bridge Street Marketplace
Box 680
Waitsfield, VT 05673
(800) 541-2318
(802) 496-6982
(802) 496-8110 fax
MAYA ONE America Online
75226,3632 CompuServe

MicroComputer Systems
3616 West Cypress
Tampa, FL 33607
(800) 622-4636
(813) 875-0406

National AppleWorks Users Group
Box 87453
Canton, MI 48187
(313) 454-1115
(313) 454-1965 fax

National Cristina Foundation
42 Hillcrest Drive
Pelham Manor, NY 10803
(800) 274-7846
(914) 738-7494

National Used Hardware and Software Club
P.O. Box 1343
Round Rock, TX 78680
(800) 777-6632
$15/year

Orion Computer Blue Book
Orion Research Corp.
1315 Main Avenue
Suite 230
Durango, CO 81301
(303) 247-8855
$129

Pre-Owned Electronics
205 Burlington Road
Bedford, MA 01730
(800) 274-5343
(617) 275-4600
(617) 275-4848 fax

The Processor
P.O. Box 85518
Lincoln, NE 68501
(800) 247-4880
$19/year

Shreve Systems
3804 Karen Lane
Bossier City, LA 71112
(800) 227-3971
(318) 742-2700
(318) 742-2799 fax

Sun Remarketing
P.O. Box 4059
Logan, UT 84321
(800) 821-3221 orders
(801) 755-3311 fax

Illustration • Roger Boehm

THE SILICON CPA

Keep your household or small business in the black — invest in a finance package for your Apple II or Mac and let a number-crunching expert get your accounts in shape.

By GREGG KEIZER
CONTRIBUTING EDITOR

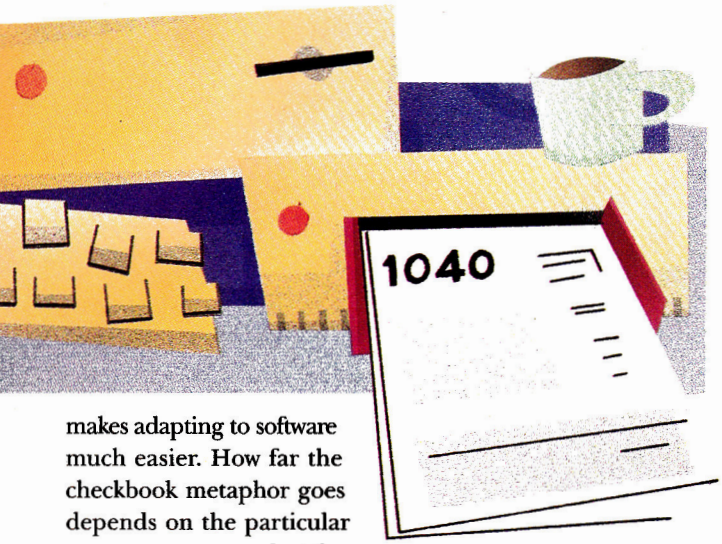
THE FUTURE'S NOT QUITE WHAT THEY PROMISED. Thirty years ago, when the Peace Corp was hardly more than a gleam in JFK's eye, when American cars still had huge fins, the future looked just grand. We'd soon be dialing up with a videophone, flitting across town in a gyrocopter, and charging every purchase with a magnetic card and a thumbprint. Prosperity would find its way into every home. Money? There'd be enough for everyone.

Today, your telephone is still blind, your car still creeps along the ground, and your wallet still carries more greenbacks than credit cards. And you still worry about how to manage your money, especially in times as tough as these.

But at least you can get some financial help. Add a personal-finance package to your Macintosh or Apple II library, and you can shift some of your fiscal responsibilities to a number-crunching fiend, an aide with enough memory to make an elephant envious. Computerize your finances and you'll organize, categorize, and visualize your monetary condition faster and more effectively. Electronic checkbooks, home-office accounting, sweat-free tax preparation: Those are the promises of home-finance software — promises you can keep.

THE CHECK'S IN THE COMPUTER

Most of us manage our money through our checkbooks. If we know how much we spend and on what, it's only because we can look it up in the checkbook register or see it on a check stub. That's why so many silicon CPAs put an electronic checkbook on screen. Working with the familiar



makes adapting to software much easier. How far the checkbook metaphor goes depends on the particular package, of course, but they all share some common traits.

Check-writing programs such as Intuit's **Quicken** for the II and the Mac, ACTAsoft's **Alpha Check Plus** for the II, and Survivor's **MacMoney** and **Alpha Check Back to Basics** for the Macintosh, display a facsimile of a blank check on screen, with the standard date, payee, and amount lines ready for data you can enter yourself or have the program fill in automatically. Type in *$120.00* as the amount, for instance, and the computer inserts *One Hundred Twenty and 00/100* into the next line. Unlike the checkbook you stick in your back pocket, these computerized versions can churn out checks routinely for those repetitive mortgage, car, and credit-card payments.

Not only do these programs assemble checks, they write them, too, either as they're created or later, in a batch. Though they require special forms, personal-finance software prints your checks on everything from the lowly ImageWriter II to the more professional-looking Apple LaserWriter or Hewlett-Packard DeskWriter printer. In some cases, finance packages place the payee's address right on the checks, making them a snap to mail if you invest in window envelopes.

And because everything's stored in its records, a personal-finance program can

GOING ELECTRONIC

Swapping a shoebox of receipts for a box of floppy disks? Your choices in electronic money managers range from simple check writers to feature-packed financial planners. The following snapshots point you toward just a few of the available personal-finance packages for the Macintosh and the Apple II.

Alpha Check Plus. Acting as an extension to AppleWorks 3.0, Alpha Check Plus for the Apple II writes and prints checks, handles double-entry accounting (useful for a small business), and generates custom reports. Its biggest draw is its AppleWorks-style operation. If your Apple II is irreplaceable because you can't do without AppleWorks, Alpha Check Plus is your best pick. Add-ons are available to help you calculate and print payroll checks, and produce sophisticated reports for your home or small business. **ACTAsoft, 19700 Wells Drive, Woodland Hills, CA 91364, (818) 996-6731, (818) 786-9760, $68, requires AppleWorks 3.0.**

Alpha Check Back to Basics. Running on HyperCard, Alpha Check Back to Basics for the Mac writes and prints checks, plus deposit, debit, credit-card, and income-posting slips. The software updates and prints ledger, check-register, income, expense, and reconciliation reports on request, and offers cutom report design, as well. Voice comments make Back to Basics unique among check-writing programs. **ACTAsoft, 19700 Wells Drive, Woodland Hills, CA 91364, (818) 996-6731, (818) 786-9760, $59.95, requires HyperCard 2.0 or later.**

AtOnce! Four integrated modules — general ledger, accounts receivable, accounts payable, and payroll — are at the heart of this small-business package for the Mac. On-line help, automatic data entry, and inventory functions are also included. **Peachtree Software, 1505 Pavilion Place, Norcross, GA 30093, (404) 564-5700, $249.**

BusinessWorks. Four linked modules — general ledger, accounts payable, accounts receivable, and inventory control — make up the main BusinessWorks package for the II. A Payroll module is extra. When you pay a bill with this one, the software not only prints the check, but also debits the appropriate account in the general ledger automatically. **Manzanita Software Systems, 2130 Professional Drive, Suite 230, Roseville, CA 95661, (800) 447-5700, (916) 781-3880, $195/module, $495/4-module package, $195 Payroll option.**

CheckFree. Convenience costs — keep that in mind as you consider CheckFree for the Macintosh. This electronic bill-paying program — whether used alone or in conjunction with other home-finance software — zips payments directly to some companies' accounts, or churns out laser-printed checks or drafts, then sends them through more-traditional channels. In any case, you circumvent the U.S. Mail. And there's the rub. CheckFree's $9.95 monthly fee (for 20 payments; it's $3.50 for each group of ten additional payments) means that each bill costs 16 cents more than the price of a stamp. But if you often get stung with late charges, or simply want to keep your money until the last moment, CheckFree may pay for itself. **CheckFree, 720 Greencrest Drive, Westerville, OH 43081, (614) 898-6000.**

College Cost Explorer. With College Cost Explorer, you'll have a better chance of meeting the price tag of your chosen school: This package calculates the amount of money you must save today to meet the expected cost tomorrow. Scan through the database of colleges and highlight the schools you're interested in. See how they stack up financially: The program shows the cost of attending for residents and nonresidents, and breaks down that figure into tuition and fees, books and supplies, transportation, and personal expenses. A financial-aid profile lists the types of grants and scholarships available at each institution, as well. A financial-options section details arrangements such as installment plans and credit-card and deferred payments, and helps you decide whether to pay from your current

reconcile your account quickly. For many people, this feature is enough reason to move money to the computer. Rather than the 15 to 30 minutes it takes to balance your books manually, a finance package can do it in less than a third the time.

BUDGETARY CONSIDERATIONS

Few of us create, much less stick to, a budget. Finance software can't stretch your dollars — not alone, anyway — but it does make it easier to produce a budget, review it, and when conditions change, modify it.

Budgeting is essentially a matter of keeping accurate records and generating intelligible reports. The computer is good at both. Most personal-finance packages let you list expense and income categories, and peg a monthly limit for each. By assigning those categories to the checks you write, you track your expenses. You follow income the same way.

But a budget's only as good as your diligence. Personal-finance software helps here, too, for it can instantly show whether you're meeting or exceeding your budget, where you're over or under, and by how much.

Changing a computerized budget in a program such as MECA's **Managing Your Money** (in either the II or the Mac version) is usually just a matter of a few mouse clicks or key presses. Not only does it let you keep your budget up to date, it lets you play interesting *what if?* games, too. Can you afford a new car or that remodeling job on the home office? What will an impending raise do for your lifestyle? Budget your bucks on the computer, not in your head, and you can explore the possibilities and make more informed decisions.

SETTLING ACCOUNTS

Account maintenance is another must for savvy financial management. You probably keep a checking account, a savings account, and several credit- or charge-card accounts. Extras — certificates of deposit, money-market accounts, retirement accounts — may be part of your portfolio, too. Following the ups and downs of each, tracking interest earned, and tracing maturation dates is a bewildering chore unless you rely on a personal-finance program.

income, borrow in full, borrow and save, or save in full. Graphs of college data and a what-if capability for testing monthly allotments are included. **College Board Publications, Box 886, New York, NY 10101, (212) 713-8142, $89.95.**

MacInTax. MacInTax includes a complete selection of federal income-tax forms and schedules for return preparation and produces IRS-approved printouts. The program also accepts data directly from the Mac version of Quicken. A guide to tax basics is included. **ChipSoft, P.O. Box 85709, San Diego, CA 92186-5709, (619) 453-8722, $99.95, $49.95 update.**

MacMoney. MacMoney may look and work like an electronic checkbook, but it includes extras — such as charting and several financial-planning tools — that take it a step up from the simpler program Quicken. Pair MacMoney with **Invoicit**, a $99 add-on from Survivor Software, and you have a workable home-office accounting system. It beats rigging Quicken for accounts receivable and writing invoices by hand or with a word processor. **Survivor Software, 11222 La Cienega Boulevard, Suite 450, Inglewood, CA 90304, (213) 338-0155, $119.95.**

Managing Your Money. On both the Macintosh and the Apple II, the venerable Managing Your Money wins kudos for thoroughness. It's all here, from check-writing and investment planning to cash-flow forecasting and recurring transactions. It isn't a full-fledged tax-preparation program, but it does offer an blizzard of tax advice — both within the program itself and in the documentation. Calculating your net worth, never an easy task, is simple with Managing Your Money. If Quicken is for the novice, Managing Your Money is for the financially astute. Version 4.0 for the Macintosh is much easier to use than previous versions, but unprepared users may find its power overwhelming at first. **MECA Software, 55 Walls Drive, Fairfield, CT 06430, (800) 288-6322, $149.95 Apple II, $199.98 Mac.**

Quicken. Perhaps the simplest check-writing package around, the Mac version of Quicken recently went through an overhaul that added features and made it a better business tool. (The Apple II version, 1.0, hasn't been updated in years, and can't compete with the Mac version.) Easy check writing and printing, quick transaction classification, numerous reports, and links to CheckFree make Quicken the pick for anyone trying electronic money management for the first time. You can use Quicken as a small-business tool, but it's a stretch. There's no invoicing or investment tracking, and few safeguards against changing accounts or deleting transactions. Several business-specific reports have been added, however. **Intuit, 66 Willow Place, P.O. Box 3014, Menlo Park, CA 94026, (415) 322-0573, (800) 624-8742, $69.95.**

Small Business Accounting Series. This integrated package produces invoices, charges customers in accounts receivable (including printing monthly statements and past-due notices), and deducts anything sold from an inventory-tracking module. A billing-rate option (the labor you charge per hour for services your company provides) is especially useful if you sell both products and services and are tracking inventory. Posting reports and sales reports are easy to generate. **Dilloware, 213 Congress Avenue, Suite 200, Austin, TX 78701, (800) 880-0887, (512) 629-7400, $179.**

1040Works (128K)/1040Works-X (256K). This popular AppleWorks-spreadsheet tax template has been available for the II since 1986 and is updated annually. It generates printouts of nonsignature forms in IRS-acceptable format. It accepts data from the II version of Quicken and includes an organizer template to help you track tax-deductible items throughout the year. **National AppleWorks Users Group, Box 87453, Canton, MI 48187, (313) 454-1115, $29.95 members/$32.95 nonmembers plus $3.50 shipping, $22.95 plus $3.50 annual update.**

FURTHER READING

"Investment Software That Pays Off"
January 1988, p. 42

"The Apple II in Business: Your Silent Partner"
April 1988, p. 60

"Business As Usual"
January 1989, p. 40

"Tax Time: It's Closing In"
March 1989, p. 50

"Checking Out Seven Home-Budget Programs"
January 1990, p. 48

"April 15 — No Problem"
March 1990, p. 50

"Small Business Accounting Series"
Reviews, May 1990, p. 27

"Taking Care of Business"
October 1990, p. 44

"College Cost Explorer"
Reviews, March 1991, p. 21

"A New Approach to Personal Finance"
March 1991, p. 66

"Free Enterprise"
November 1991, p. 62

Software such as the Macintosh version of **Quicken** or **Managing Your Money** for the II collects your fiscal information and stores it in one place for a complete portrait of your financial condition. In fact, calculating your net worth — your cash, investments, and possessions — is difficult without a personal-finance program.

MEET THE IRS

April 15 — tax time. Gathering those wide-flung numbers and filling out federal income-tax forms stress even the stoutest of hearts. If personal-finance programs do nothing more than help here, they earn their keep.

By nature, personal-finance software forces you to organize. You set up accounts, characterize expenses, and monitor income. At tax time, then, you already have most of the necessary figures at your fingertips. In addition, a slew of tax-preparation programs, including ChipSoft's **MacInTax** for the Mac and NAUG's **1040Works** for the II, can help you complete your return.

Software such as MacInTax goes so far as to put the actual forms on screen, and prints duplicates you file with the IRS. You simply plug numbers into the blank fields and the program calculates your refund or payment. The best of the genre even offer a limited amount of tax advice (though it's certainly no substitute for a trained tax preparer or CPA). More-limited tax assistance is offered by simple spreadsheet templates, including those for AppleWorks, that handle the addition and subtraction. (See "The Tax Man Cometh," AppleWorks in Action, February 1992, p. 46, for one example.)

You're ignoring much of your computer's potential power, though, if all you do is fill out tax returns with a prep package. The most efficient way to computerize your money management is to track expenses, income, and deductions with a personal-finance program during the year, then use that data to fill out the forms. The best personal-finance software eases the transition by linking with a tax-preparation package, letting you export information from one program to another without retyping. Quicken for the Mac, for instance, connects with MacInTax this way.

BUSINESS BONANZA

Making money from home is tough enough without worrying about the books, too. Good personal-finance software is flexible enough to handle much of a home-based business's accounting chores.

Business-accounting needs differ from the strictly personal. Even assuming that you don't cut payroll checks, you at least need a way to track money coming in and money going out. Terms like *accounts receivable* and *accounts payable* may sound mysterious, but all they represent are ways to categorize income and expenses, and crank out reminders when bills are overdue and payments are late.

Although it's not hard to define a business' expense and income categories — finance software excels at that kind of pigeonholing — it's nearly impossible to get a personal program to generate invoices, or even more importantly, the repeat invoices you'll want to send when a payment's past due. Accounts payable — the money you owe others — is somewhat easier to jury-rig in software packages such as **Quicken**. By entering post-dated checks to the electronic register, you can pay each bill just before its due date.

If your small business employs others, you'll want to look for a personal-finance program that offers a paycheck-writing add-on, or maybe even move to a more-expensive accounting package that includes a payroll module, such as Manzanita's **BusinessWorks** for the II or Peachtree's **AtOnce!** for the Mac. Dilloware's **Small Business Accounting** for the II includes invoicing, accounts receivable, sales tracking, and inventory in one integrated package.

GOOD NEWS, BAD NEWS

If you work with a sharp accountant, he or she will be glad to analyze your cash flow, business profit and loss, and other such fiscal details. A finance package, though, can usually do the same thing — without demanding more money. Your Mac or Apple II lives to report. Plug in data, and with the right software, the machine can tell you almost everything you need to know about your financial condition.

Most finance programs come equipped with several standardized reports that show your budget, list every transaction in a given account, and summarize your tax-deductible expenses. Other reports can illustrate your business's balance sheet or outline income and expenditures by vendor or even by project. You can review the figures on screen, or on paper after the program's printed them. Software packages such as Survivor's **MacMoney** generate charts that, though less than exact, show your tax bite or red ink graphically.

A personal-finance program is really only as useful as its reports. What good is all this information if you can't make sense of it? That's why many packages let you change existing reports, or build new ones from scratch. If you're self-employed, for instance, and pay estimated taxes quarterly, changes in the tax laws may require you to take a pay-as-you-go approach next year; you'll want a report that shows income and expenses per quarter. No problem, if your personal-finance program lets you customize reports.

ODDS AND ENDS

The basics won't be enough for some folks. But investment and stock-portfolio management is within the reach of many packages, as are exotic details such as capital gains, investment income, and portfolio performance. Tracking individual stocks and mutual funds is much like following specific accounts: Enter transactions, in this case stock or fund purchases and sales, then let the software issue

reports, calculate dividends, and the like.

Other programs help you puzzle out the bizarre world of economics with integrated financial calculators that whip out a loan-payment schedule faster than most bankers. Still others help you plan for your children's higher education (College Board's **College Cost Explorer** for the II is one such program) or your golden years of retirement with ready-to-use sections that step you through the kinds of questions a financial planner might ask.

And with additional software — a program such as **CheckFree** for the Mac, from the company of the same name — and a modem, you can even save stamps and trees by paying bills electronically. Using your own checking account and an online-like service, you issue checks and drafts over the phone lines, paying bills directly into some companies' accounts. It lets you make payments at the very last minute, keeping your money yours (and earning interest) as long as possible.

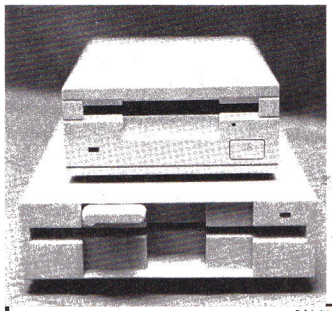
DUMB BUT DEDICATED

Just putting a disk in a drive doesn't make your Mac or Apple II a smart financial planner; the software's advice — if it offers any — is usually fuzzy with generalities. But although personal-finance programs may be dumb, they *are* dedicated. These informational vaults can hold all the financial data you have, and will unfailingly tell you where your money is, where it's going, and why it's left your pocket.

The right software can save you money, too, especially at tax time. If you can account for all your allowable deductions, you can trim your tax bill to the fullest extent of the law — and be able to back it up when questions come up.

Recording and reporting, the two vital ingredients in money management, are what your computer does best. The rest — the decisions, the choices between spending and saving, the options open to you and your money — are left in your hands, capable or not. And that's as it should be. Who wants a *computer* spending your money? ❑

CONTRIBUTING EDITOR GREGG KEIZER IS THE AUTHOR OF BRIDGING THE GAP, *INCIDER/A+*'S MONTHLY COLUMN ON APPLE II/MAC CONNECTIVITY. WRITE TO HIM AT 4420 HILYARD STREET, EUGENE, OR 97405. ENCLOSE AN SASE IF YOU'D LIKE A PERSONAL REPLY.



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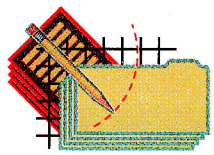

APPLEWORKS IN ACTION

TAKING STOCK 1

Invest a little time organizing your portfolio, and you'll reap some significant dividends.

By RUTH K. WITKIN

WANT YOUR STOCKS TO "LIVE LONG and prosper"? Well, all it takes is a trio of Trekkie traits: Spock's technical appraisal of trends and events, Scottie's sensible approach to problems and pitfalls, and Kirk's steady hand at the helm. So okay, a bit of luck can't hurt, either.

This month's spreadsheet (see **Figure 1**) lets you go where you may have never gone before — a place where you can record what you do with which stock, when, and at what price. Formulas use this information to produce a variety of calculations, including gain or loss per share, dollar change, percentage change, and totals and averages of the original and current values of your portfolio. It's all eminently logical.

Load AppleWorks and create a new spreadsheet file named **PORTFOLIO**. Refer to **Figure 2** as you follow the setup instructions.

CREATING LONG LINES

With so many long lines, it makes sense to create one, then use the clipboard to create others of the same type. It can take multiple passes to create just one line on a spreadsheet this wide. A neat technique — reducing the width of columns A through V — eliminates the fuss and bother. Here's how: Press Open apple-L (OA-L). Now type **C** (for *Columns*) and press OA-Right Arrow three times, then Left Arrow twice, and hit Return. Type **C** (for *Column width*), press OA-Left Arrow six times (to reduce these columns to three characters each), and hit Return again.

Now that these columns are all on one screen, it's a simple matter to enter lines: In cell A2, type quotation marks and hold down the equal-sign key long enough to fill through V2, then press Return. Now copy this row to the clipboard: Press OA-C, choose *To clipboard*, confirm *Rows*, and hit Return. The row is now on the clipboard. Insert this row at other places in the spreadsheet: Place the cursor on A4, press OA-C, and choose *From clipboard*. Copy the line to A19 and A27 the same way. (At this point, the latter two row numbers won't correspond to the **Figures**.)

					PORTFOLIO ANALYSIS						
LATEST REVISION DATE: Mar 1 92											
***** B U Y S *****				[----- ORIGINAL -----]		[---------- CURRENT ----------					
Company or Fund	Symbol	Exch	Shares	Price per Share	Total Cost	Price per Share	Gain/Loss per Share	Total Value	Dollar Change	Percent Change	Dividend per Share
MERLIN FUND	MER	AMEX	1,000	$11.75	$11,750.00 ❶	$18.50	$6.75 ❷	$18,500.00 ❸	$6,750.00 ❹	57.45% ❺	$.25
HENLEY MFG	HEN	OTC	2,000	$3.50	$7,000.00	$6.37	$2.87	$12,740.00	$5,740.00	82.00%	$0.00
ALASKA MINING	ALM	OTC	1,000	$3.75	$3,750.00	$6.25	$2.50	$6,250.00	$2,500.00	66.67%	$1.10
KEEL SOFTWARE DESIGN	KES	NYSE	500	$20.00	$10,000.00	$24.50	$4.50	$12,250.00	$2,250.00	22.50%	$0.00
ABRACADABRA INC	ABR	NYSE	200	$23.83	$4,766.00	$21.00	($2.83)	$4,200.00	($566.00)	-11.88%	$.05
GENERAL CORP	GCO	NYSE	1,000	$47.87	$47,870.00	$49.75	$1.88	$49,750.00	$1,880.00	3.93%	$0.00
EERO METALS	EEM	OTC	500	$13.75	$6,875.00	$15.00	$1.25	$7,500.00	$625.00	9.09%	$0.00
COMPUTERS UNLIMITED	COU	AMEX	200	$22.00	$4,400.00	$21.62	($.38)	$4,324.00	($76.00)	-1.73%	$0.00
TOTALS			6,400 ❼	$146.45	$96,411.00	$162.99	$16.54	$115,514.00	$19,103.00	228.03%	$1.40
AVERAGES			800 ❽	$18.31	$12,051.38	$20.37	$2.07	$14,439.25	$2,387.88	28.50%	$.18
***** S E L L S *****				[----- ORIGINAL -----]		[---------- AT SALE ----------					
Company or Fund	Symbol	Exch	Shares	Price per Share	Total Cost	Price per Share	Gain/Loss per Share	Total Value	Dollar Change	Percent Change	Dividend per Share
ATLANTIC POWER	APOW	NYSE	1,000	$34.33	$34,330.00	$42.00	$7.67	$42,000.00	$7,670.00	22.34%	$2.00
STAG FIBER OPTICS	SFO	OTC	750	$4.25	$3,187.50	$6.25	$2.00	$4,687.50	$1,500.00	47.06%	$.55
TOTALS			1,750 ❾	$38.58	$37,517.50	$48.25	$9.67	$46,687.50	$9,170.00	69.40%	$2.55
AVERAGES			875 ❿	$19.29	$18,758.75	$24.12	$4.84	$23,343.75	$4,585.00	34.70%	$1.27

Figure 1. Completed portfolio spreadsheet with sample entries. Highlighted areas are formula locations.

Next, use a minus sign to create the single line in row 8, columns A through V. (You're on your own on this one — but you can do it.) Copy the line to the clipboard and from the clipboard to rows 17, 24, and 27. All lines should now be in the row numbers shown in the **Figures**.

Now give the columns the width they need. To get started, make column A 22 characters wide: With the cursor in column 1, press OA-L. Type **C** and press Return. Type **C** again, press OA-Right Arrow 19 times, and hit Return again.

In the same way, widen the following columns (remember, each is already three characters wide): B to seven characters; C to four characters; D to eight characters; E, G, H, K, N, O, Q, R, and T to ten characters; F and I to 13 characters; J and V to 12 characters; and L and M to nine characters. Columns P, S, and U remain at three characters. Press OA-S to store your work on disk.

ENTERING LABELS AND NUMBERS

Now enter all labels and numbers shown in **Figure 2**. (If you're an experienced user, you can use this shortcut: Enter the labels in rows 5, 6, and 7 and copy them as a block to rows 21, 22, and 23, then edit them to match **Figure 2**. Copy after you edit in the trailing spaces described below under the heading "Creating Formats.")

Where you see two words that look joined in **Figure 2**, such as *Exch* in C7 and *Shares* in D7, peek at **Figure 1** to see that they're indeed separate labels that go into separate cells. Type quotation marks before the labels in N6, O6, N22, and O22, so that AppleWorks doesn't confuse the labels that start with numbers for values. Columns P, S, and U have no entries. They serve only as buffers between the columns to the left and to the right.

Here's how to enter the fancy labels you see in rows 5 and 21:

- In A5, type quotation marks, five asterisks, space, **B U Y S**, space, and five asterisks.
- Do the same in A21, but type **S E L L S** instead of *B U Y S*.
- In E5, type quotation marks, open bracket, five hyphens, space, **ORIGINAL**, space, five hyphens, and close bracket.
- Do the same in E21, or copy (OA-C) E5 through F5 into E21 through F21.
- Display columns G through M. In G5, type quotation marks, open bracket, 31 hyphens, space, **CURRENT**, space, and 23 hyphens.
- Display columns M through U. In M5, type quotation marks, nine hyphens, close bracket, space, open bracket, and 30 hyphens.
- Display columns O through W. In R5, type quotation marks, space, **HISTORY**, space, 28 hyphens, and close bracket. The final result, which spreads from column G through V, should agree with **Figure 2**.
- Do the same starting in G21, or copy G5 through V5 into G21 through V21, then overtype the label in column J. To overtype, place the cursor in J5, press OA-U, and press OA-E to toggle to the overtype cursor. Replace *CURRENT* with **AT SALE** in the edit line at the bottom of the screen, and press Return. Press OA-E to toggle back to the insert cursor.

Now type the numbers just as you see them in **Figure 2**. The formatting you do in the next step will produce the dollar signs, decimal places, percentage signs, and commas.

CREATING FORMATS

Set a standard value of *Dollars* with *two* decimal places: Press OA-V and hit Return (to confirm *Value* format). Type **D2** and hit Return again. All number cells now show their contents in dollars, except those showing number signs (#####), which indicate that the cell's contents are too wide to display completely. Instead of giving misleading results, AppleWorks alerts you with number signs.

Reformat column D (*Shares*) for *Commas* with *no* decimal places: Place the cursor on D9 and press OA-L. Type **B** (for *Block*), move the cursor to D29, and hit Return twice (the second time to confirm *Value* format). Type **C** and hit Return again. Now that you've changed the format in column D, the number signs disappear.

Next, format the individual cells K9 (*Percent Change*) and M9 (*Percent Yield*) for *Percent* with *two* decimal places. When you copy the formulas you'll enter into those cells, you'll copy the format, too.

Finally, right-align the labels: Place the cursor on D6 and press OA-L. Type **B** and move the cursor down to D7, then right to V6, and press Return. Type **L** (for *Label* format), then **R** (for *Right justify*).

Use the same technique to right-align D22 through V23. When you're finished, D22 will still show *(Layout-C0)* at the bottom of the screen. That's fine. Now right-align A18 through A19 and A28 through A29. Again, press OA-S to store the spreadsheet on disk.

To produce a more pleasing alignment between column headings and numbers, edit in trailing spaces to shift headings a

```
========M========N=====  ====O======P=====Q=========R======S=====T======U======V======

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

=======================================================================================
    ----------] [---------------------- HISTORY ------------------------------]
    Percent    52-Week    52-Week      Buy        Buy          Dividend      Certificate
     Yield       Low        High        Date    Commission       Date         Location
 ------------------------------------------------------------------------------------
      1.35% (6) $9.75      $18.50     Jun 21 85    $23.00     Nov 23 89     Safe deposit
      0.00%     $3.50      $6.37      Jan 7 87     $20.00                   Broker
     17.60%     $3.00      $6.25      Mar 25 87    $90.00     Feb 10 90     Broker
      0.00%     $17.25     $24.50     Jan 10 88     $7.00                   Broker
       .24%     $19.75     $30.00     Jun 26 89    $47.00     Jan 30 90     Broker
      0.00%     $45.00     $53.50     Jun 21 91    $47.00                   Safe deposit
      0.00%     $12.00     $21.00     Dec 23 91    $13.00                   Safe deposit
      0.00%     $21.62     $31.75     Feb 9 92     $13.00                   Broker
 ------------------------------------------------------------------------------------
     19.19%   $131.87    $191.87                  $260.00
      2.40%    $16.48     $23.98                  $32.50
 ====================================================================================
    ---------] [---------------------- HISTORY ------------------------------]
    Percent    52-Week    52-Week      Buy        Buy          Sale          Sale
     Yield       Low        High        Date    Commission       Date         Commission
 ------------------------------------------------------------------------------------
      4.76%    $30.00     $42.00     Oct 17 89    $62.00     Dec 5 91        $190.00
      8.80%     $3.00      $6.25     Aug 23 89    $90.00     Feb 15 92        $22.50
 ------------------------------------------------------------------------------------
     13.56%    $33.00     $48.25                  $152.00                     $212.50
      6.78%    $16.50     $24.12                  $76.00                      $106.25
 ====================================================================================
```

tad left. Here's how: Place the cursor on F6 and press OA-U to put *Total* on the edit line. Press Right Arrow five times, press the spacebar twice to add two spaces after the word, and hit Return. Now insert trailing spaces after the following headings:

- four spaces after Q6, R6, R22, Q22
- three spaces after I6, F7, I7, Q7, T7, I22, T22, V22, F23, I23, Q23, T23
- two spaces after J6, E7, G7, J7, K7, N7, O7, V7, F22, J22, E23, G23, J23, K23, N23, O23
- one space after K6, T6, M7, K22, M23

Now everything you've entered so far should look like **Figure 1**.

ADDING FORMULAS

The formulas are shown in the highlighted areas in **Figure 1**. To enter a formula, place the cursor on the specified cell, create the formula, and press Return:

FORMULA 1: Total Cost. Formula 1 multiplies the original price per share (E9) by the number of shares (D9) to produce the total cost of the stock in F9.

Cell location: F9

Formula: +E9*D9

Protect this formula: Leave the cursor on F9 and press OA-L. Hit Return to confirm *Entry*. Type **PN** (for *Protection Nothing*).

Now copy Formula 1 (and its protection) from F9 to F10 through F16: With the cursor on F9, press OA-C. Hit Return twice to confirm *Within worksheet* and *Source*. Move the cursor to F10, type a period, move the cursor to F16, and hit Return again. AppleWorks asks which cell references are *No change* (absolute) and which are *Relative*. Both cell references are relative, so press OA-R.

Next, copy Formula 1 to F25 and F26: With the cursor on F9, press OA-C. Hit Return twice and move the cursor to F25, type a period, move the cursor to F26, and hit Return again. Press OA-R.

FORMULA 2: Gain/Loss per Share. Formula 2 subtracts the original price per share (E9) from the current price (G9) to produce the gain or loss per share in H9.

Cell location: H9

Formula: +G9–E9

You'll protect and copy Formula 2 as part of a group after you enter Formula 5.

FORMULA 3: Total Value. Formula 3 multiplies the current price per share (G9) by the number of shares (D9) to produce the current value in I9.

Cell location: I9

Formula: +G9*D9

You'll protect and copy Formula 3 after you enter Formula 5.

FORMULA 4: Dollar Change. Formula 4 subtracts the total cost (F9) from the total value (I9) to produce the dollar change in cell J9.

Cell location: J9

Formula: +I9–F9

You'll protect and copy Formula 4 after you enter Formula 5.

FORMULA 5: Percent Change. Formula 5 divides the change in dollar value (J9) by the total cost (F9) to produce the percentage of change in K9.

Cell location: K9

Formula: +J9/F9

Protect Formulas 2 through 5: Place the cursor on H9 and press OA-L. Type **B** and move to K9. Press Return and type **PN**.

Now copy protected Formulas 2 through 5 down their respective columns: With the cursor on H9, press OA-C and hit Return. Move the cursor to K9 and hit Return again. Move the cursor to H10, type a period, move the cursor to H16, and hit Return again. All cell references are relative, so press OA-R.

Copy Formulas 2 through 5 to the *SELLS* section: With the cursor on H9, press OA-C and hit Return. Move the cursor to K9 and hit Return again. Now move the cursor to H25, type a period, move the cursor to H26, and hit Return again. Press OA-R.

FORMULA 6: Percent Yield. Formula 6 divides the dividend per share (L9) by the price per share (G9) to produce the percentage of yield in M9.

```
==============A==============B====C=====D========E===========F==========G===== ====H===========I===========J==========K========
  1|                                                  PORTFOLIO ANALYSIS
  2|=========================================================================== ===============================================
  3|LATEST REVISION DATE: Mar 1 92
  4|=========================================================================== ===============================================
  5|***** B U Y S *****                      [----- ORIGINAL -----] [--------- ---------------------- CURRENT ---------------
  6|                                          Price per Total        Price per  Gain/Loss Total        Dollar      Percent
  7|Company or Fund       Symbol ExchShares  Share     Cost         Share      per Share Value        Change      Change
  8|-------------------------------------------------------------------------- ---------------------------------------------
  9|MERLIN FUND           MER    AMEX    1000     11.75                  18.5
 10|HENLEY MFG            HEN    OTC     2000       3.5                  6.37
 11|ALASKA MINING         ALM    OTC     1000      3.75                  6.25
 12|KEEL SOFTWARE DESIGN  KES    NYSE     500        20                  24.5
 13|ABRACADABRA INC       ABR    NYSE     200     23.83                    21
 14|GENERAL CORP          GCO    NYSE    1000     47.87                 49.75
 15|EERO METALS           EEM    OTC      500     13.75                    15
 16|COMPUTERS UNLIMITED   COU    AMEX     200        22                 21.62
 17|-------------------------------------------------------------------------- ---------------------------------------------
 18|TOTALS
 19|AVERAGES
 20|=========================================================================== ===============================================
 21|***** S E L L S *****                    [----- ORIGINAL -----] [--------- ---------------------- AT SALE ----------------
 22|                                          Price per Total        Price per  Gain/Loss Total        Dollar      Percent
 23|Company or Fund       Symbol ExchShares  Share     Cost         Share      per Share Value        Change      Change
 24|-------------------------------------------------------------------------- ---------------------------------------------
 25|ATLANTIC POWER        APOW   NYSE    1000     34.33                    42
 26|STAG FIBER OPTICS     SFO    OTC      750      4.25                  6.25
 27|-------------------------------------------------------------------------- ---------------------------------------------
 28|TOTALS
 29|AVERAGES
 30|=========================================================================== ===============================================
```

Figure 2. Labels and numbers for portfolio spreadsheet.

Cell location: M9

Formula: +L9/G9

Protect Formula 6 as you did the other formulas, then copy it from M9 to M10 through M16 (both cells are relative) and then to M25 through M26.

FORMULA 7: Total Buys. Formula 7 adds the number of shares bought (D16 through D9) and enters the result in D18. The formula includes the lines in D17 and D8. Thus, if you insert rows anywhere between D17 and D8, AppleWorks will adjust the SUM formula to include the new entries.

Cell location: D18

Formula: @SUM(D17.D8)

FORMULA 8: Average Buys. Formula 8 averages the number of shares bought (D16 through D9) and enters the average number bought in D19. This formula includes the lines in D17 and D8 for the same reason Formula 7 does.

Cell location: D19

Formula: @AVG(D17.D8)

Protect Formulas 7 and 8 as you did the others. Now copy the formulas from D18 and D19 to E18 through O18: Place the cursor on D18, press OA-C, and hit Return. Move the cursor to D19 and hit Return again. Move to E18, type a period, and move to O18 and hit Return. Press OA-R to tell AppleWorks all cell references are *relative*. Now copy both formulas the same way to R18 and R19.

Copying from D18 and D19 gives the other cells *Commas* format. Use OA-L and *Value* format to reformat E18 through J19, L18 through L19, and N18 through R19 for *Standard* (*dollars* with *two* decimal places), then reformat K18 through K19 and M18 through M19 for *Percent* with *two* decimal places. Save the spreadsheet again.

NEXT MONTH

In the second installment of this two-part project, you'll enter the last two formulas and print the spreadsheet. Even better, you'll discover ways to make working with the portfolio spreadsheet smoother and easier. You'll keep titles fixed in place while making new entries, find out how to sort stocks alphabetically and numerically, and practice inserting a new stock and moving a sold stock. See you then. ❑

CONTRIBUTING EDITOR RUTH K. WITKIN IS THE CREATOR OF THE *SUCCESS WITH APPLEWORKS* TEMPLATE SERIES (A+ PUBLISHING, IDG COMMUNICATIONS/PETERBOROUGH) AND *RUTH WITKIN'S BEST NEW APPLEWORKS TEMPLATES* (QUALITY COMPUTERS). SHE'S THE AUTHOR OF *THE BEST BOOK OF APPLEWORKS* AND *PERSONAL MONEY MANAGEMENT WITH APPLEWORKS*. WRITE TO HER AT 5 PATRICIA STREET, PLAINVIEW, NY 11803. ENCLOSE A STAMPED, SELF-ADDRESSED ENVELOPE IF YOU'D LIKE A REPLY.

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-----------------------------------------------------------------------------------------
      .25            9.75       18.5     Jun 21 85        23     Nov 23 89    Safe deposit
        0            3.5        6.37     Jan 7 87         20                  Broker
      1.1            3          6.25     Mar 25 87        90     Feb 10 90    Broker
        0            17.25      24.5     Jan 10 88         7                  Broker
      .05            19.75      30       Jun 26 89        47     Jan 30 90    Broker
        0            45         53.5     Jun 21 91        47                  Safe deposit
        0            12         21       Dec 23 91        13                  Safe deposit
        0            21.62      31.75    Feb 9 92         13                  Broker
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------------------] [-------------------------- HISTORY ----------------------------]
 DividendPercent  52-Week    52-Week      Buy        Buy          Sale         Sale
per ShareYield    Low         High        Date       Commission   Date         Commission
-----------------------------------------------------------------------------------------
        2            30         42       Oct 17 89        62     Dec 5 91          190
      .55            3          6.25     Aug 23 89        90     Feb 15 92        22.5
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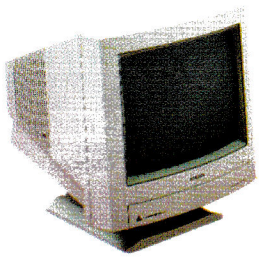

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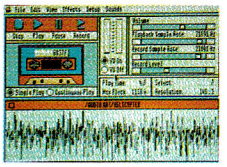

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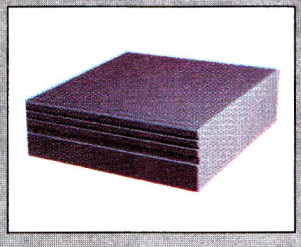

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WORTH ITS WEIGHT

Enter the third dimension — observing tones of surface light and shadow will make your pictures "pop."

By ROGER GOODE

SUPER-REALISTIC COMPUTER-generated art seems to be just about everywhere you look these days: Just check out what's happening on your TV screen during commercials or your favorite sports broadcast. And if you've seen any recent block-buster action-adventure flicks, you've no doubt gotten an eyeful of the best computer-assisted performances that Arnie, Bruce, or Roger (Rabbit) could hope to give.

It's true that a lot of what you're seeing is produced on specialized high-end systems, using programs that can create 3D, complete with ray tracing, surface mapping, and animation to boot. The memory required to generate just one frame would fill your hard drive several times over. But achieving a strong sense of dimension and realism in your artwork is still within reach of most Apple II and Mac owners, if you're willing to invest a little time and effort learning the basics. No matter what machine, software, or medium you use — even if it's professional-level equipment — a grasp of basic techniques is still essential if you're going to create good art.

SOLID AS A ROCK

In the last installment of this column ("Made in the Shade," December 1991, p. 66), I discussed the use of light and shadow and the importance of using light to define an object's shape. It's just as important to understand how light and shadow can give a sense of real weight and solidity to an object — and how the improper use of shading can make an object seem insubstantial or even translucent.

In **Figure 1**, you can clearly see a basic principle of light at work. The stack of blocks on the right has a much stronger feel of weight and substance than the one on the left. If you look carefully, you'll see that in the right-hand stack *white in the shadow is darker than black in the light*. That may seem a little odd at first, but understanding this simple truth can make all the difference in giving a picture a sense of reality. Variables such as reflected light or a second light source shining into the shadow side of an object will affect your rendering, but knowing the basic conditions — single light source, no reflected light — will help you use any variables to enhance the illusion of reality.

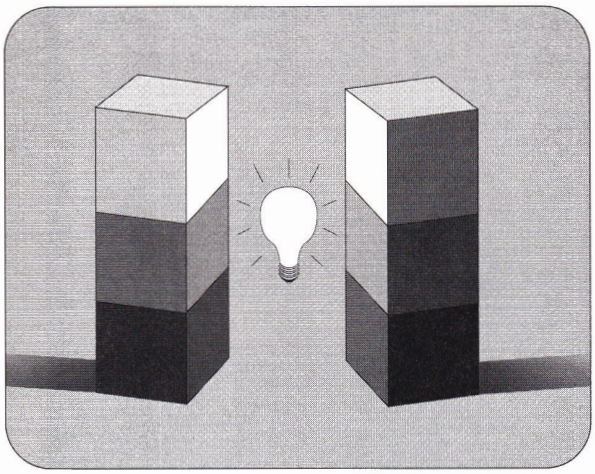

Figure 1. The blocks on the right appear to have more weight and solidity than the blocks on the left.

You'll see a good example of the violation of this rule in the way many beginners render clouds. Even though clouds aren't solid objects, a large cumulus cloud still does a pretty good job of blocking light. But because clouds are big, fluffy, *white* objects, most beginners quake at the idea of making the corresponding shadows too dark. If we know an object is white, our minds rebel at making it black. But if you put a white object into a pitch-black room, it doesn't look white any more.

That's not to say you should make all shadows as dark as possible — but if you train yourself to observe relative values of light and shadow, you'll begin to note a difference in the weights of objects in your pictures and a stronger sense of reality.

SCRATCHING THE SURFACE

Understanding how the surfaces of different materials look will also go a long way toward making your work more realistic. Rendering glass and metal may seem intimidating, but if you pay attention to a few basic principles, it should be no different from rendering anything else. The main thing here is *learn to observe*.

For now, let's work in monochrome (black-and-white); this exercise is primarily a study in values rather than color. Whether you work in color or in black-and-white, however, the trick to making the picture look real is to get the value relationships correct. As you look at the objects you're trying to render, ignore at first what colors you're seeing and focus instead on how light or dark they are in relation to the objects around them.

Just as in our discussion of the blocks in **Figure 1**, look to see whether an object (or pattern of tone on an object) is lighter or darker than the tone next to it, and the other tones around it. It may help to squint when looking at value relationships: Squinting obscures all the confusing details and reduces what you look at to larger, simpler tonal areas.

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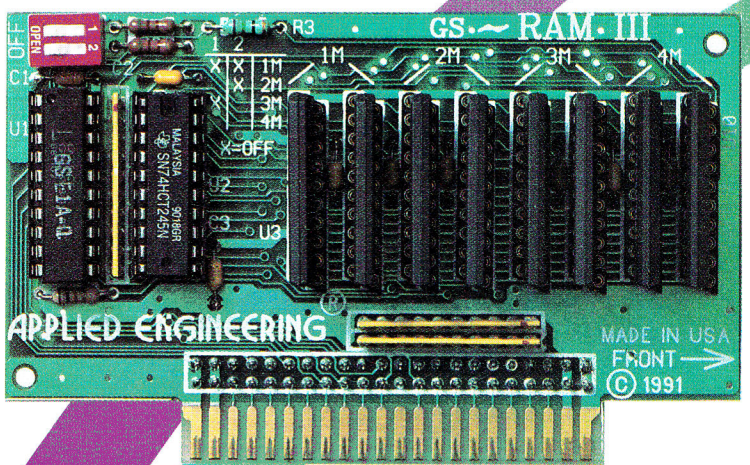

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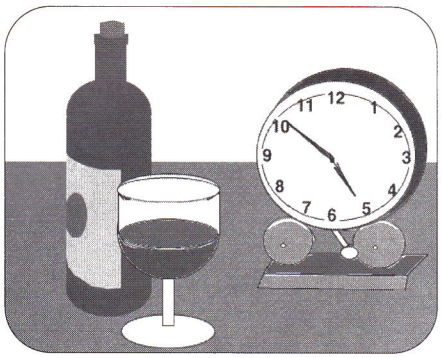

Figure 2. In step 1, the artist arranges basic geometric shapes and fills them in with flat tones.

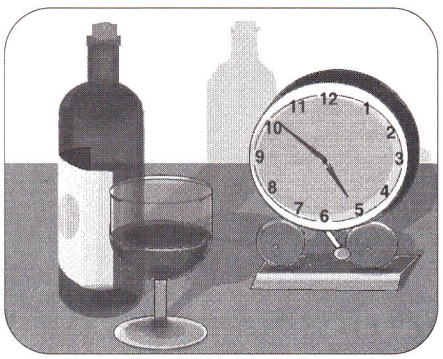

Figure 3. In step 2, the artist creates simple shadow patterns by overlaying darker tones, then adds cast shadows.

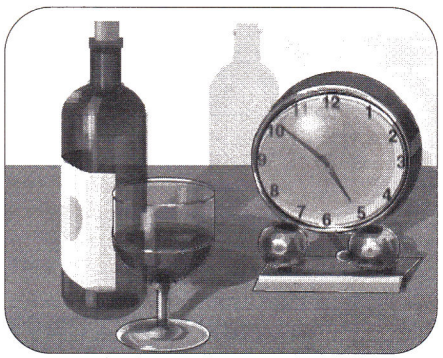

Figure 4. In step 3, the artist works on detail, with special attention to shapes reflected and distorted in metal.

Using the same basic charcoal-like technique we discussed in "Made in the Shade" (December 1991, p. 66), you can render any surface to whatever degree of finish you like. You'll set up your palette with a range of greys (see also "Palette Primer," October 1991, p. 56), then use your system's *transparency* tool (also called *blend control*, or *shade* or *charcoal mode*) to raise or lower the values in your picture by drawing different shapes over each other. The nice thing about this method is that you can build up a picture layer by layer until you achieve the look you want.

In **Figures 2**, **3**, and **4**, I've created a still life with glass and metal objects, and broken it down into three steps, or layers of rendering. Start by setting up a still life with a light on it right next to your computer. Then in step 1 (**Figure 2**), begin by blocking out the basic composition of the picture — what you want to paint and how you want objects arranged. Use your paint program's various shape tools (circles, ellipses, rectangles, straight lines).

When you're satisfied with the arrangement, fill each shape with a flat value of grey that approximates the overall tone of each object. (Don't worry about too many details yet — in this example, trying to see through the wine glass in the foreground or covering up any lines used in drawing the shapes.) To "ground" the objects, I simply drew a straight line across the picture area to define the back edge of the table, then filled the bottom portion of the screen with a middle-value grey.

In step 2 (**Figure 3**), use your system's transparency technique and start defining shadow patterns, establishing a strong sense of light coming from the left side of the picture. In our example, for instance, the bottle's label grows lighter as it turns toward lamplight, so I drew progressively lighter transparent rectangles as I moved left. Using mostly the rectangle and ellipse tools, I added layers of lighter and darker tones to give everything more of a sense of form as I moved around the picture. I shaded the face of the clock a couple of times to lay down a background for the highlights that will later define the glass lens over it. Don't forget to add cast shadows, extending behind each object, away from the light, and, in our example, up the wall behind the table.

I drew the shadow cast by the bottle in a transparent layer right over the wine glass to establish the glass as a clear object. Drawing the bottle itself right through the wine glass in a series of darker rectangles gives some sense of the wine glass' refracting, or bending, the light as it passes through. I used the same method to suggest the transparency of the bottle: drew a dark shape over it to line up with the back of the table and then added a still darker shape to represent the label as it wraps around the back of the bottle.

Observing the way light bends as it passes through glass is one of the keys to making a convincing illusion. Watch the shapes created in glass as you look through thicker and thinner areas, and then try to simplify them. Don't try to see too much detail; draw the simplest shapes possible at first and then add a little bit of detail at a time on top of the initial shape.

FINISHING TOUCHES

Now let's focus on the patterns on metal surfaces — here, the reflections in the bells beneath the clock and the chrome trim around the face (**Figure 4**). Remember that by simplifying shapes and tones, you can nonetheless give a good impression of what you see, and lay a strong foundation for building more detail later.

After I worked up the metal surfaces to an acceptable degree, I moved around the rest of the picture and added a few more broad tone strokes here and there, adjusting other areas accordingly. As a last step, place highlights and dark accents to make your picture "pop" a little, and clean up any drawing lines and artifacts left over from your original layout.

Note in **Figure 4**, for example, the layers of light reflecting from the clock face, and even partially obscuring the number 11 in the brightest spot, suggesting the clock face's glass cover. Note the variations in tone within the shadows cast by the bottle and the wine glass, as well as highlights on those objects' surfaces, suggesting a glinting effect. The cork is here more defined as a cylinder, thanks to blending several shades of grey. Note slight variations in the table surface, and background shading further defining the wall.

Remember that the rules and approaches discussed here apply whether you choose to work in color or in monochrome. If you're careful not to let the color you see overwhelm you and to focus instead on value relationships first, your work will take a large step from the two dimensions of the computer screen and the printed page into the third dimension of realism. ❑

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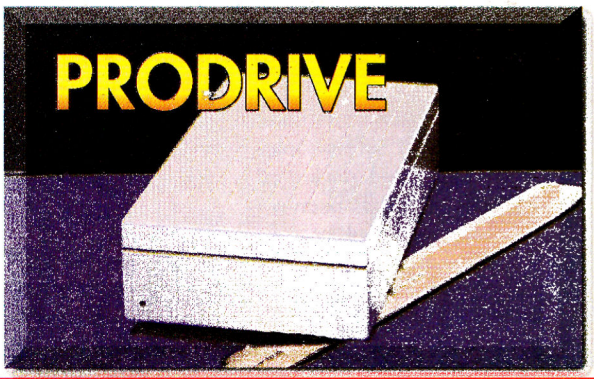

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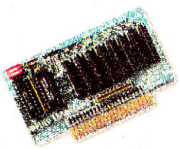

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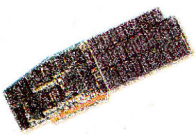

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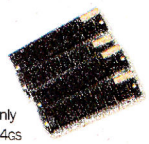

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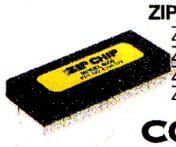

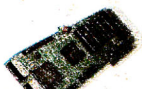

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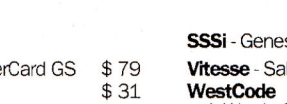

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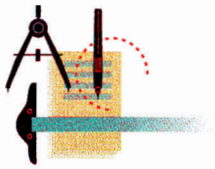

PRESS ROOM

JUST YOUR TYPE

Try on an assortment of sizes and styles — dress up your page designs with attractive, low-cost fonts.

By CYNTHIA E. FIELD, Ph.D.

IF THE VOLUME OF MAIL WE RECEIVE on the subject is any indication, the "care and feeding" of fonts seems to cause needless frustration for many Apple II enthusiasts. To help cut through the confusion, this month's Press Room provides a short course in so-called "GS" fonts. Although most Apple IIGS programs — including **AppleWorks GS** and **GraphicWriter III** — support GS fonts, most 8-bit Apple II-family products don't. Some notable exceptions, however, include **Publish It! 4** and **AppleWorks 3.0** enhanced with the Beagle Bros utility **TimeOut SuperFonts**.

When you use one or more of these programs (and who doesn't?), you can boost your desktop-publishing (DTP) creativity easily and inexpensively thanks to hundreds of GS fonts available on line, through user groups, or from public-domain libraries managed by companies such as the **Big Red Computer Club** (BRCC), the **National AppleWorks Users Group** (NAUG), and the **Public Domain Exchange** (PDE). Often for no more than a few dollars you can acquire a 5.25- or 3.5-inch disk stuffed with an assortment of typefaces in various sizes.

Take a look at the attractive fonts displayed in **Figure 1** — a collage created with Publish It! 4, an ImageWriter II printer, and conventional cut-and-paste methods. GS fonts run the gamut from bookwormish typefaces such as Palatino to highly ornamented ones like Aberdeen. Among public-domain offerings you'll find fanciful fonts such as San Quentin, Dots, and Candy, and also symbol fonts such as Electronic, Music, and Zapf Dingbats. Despite wide variations in appearance, GS fonts share a common trait: All are file type $C8 (or FON).

The numeral you'll often see following a font's name refers to size. *Geneva.10*, for example, is the Geneva typeface in 10-point size. Because a point is equal to one 72nd of an inch, you can easily see why fonts in 10- or 12-point size are popular for columns of text in newsletters and brochures — although you may want to select 14-point text in deference to older or visually impaired readers.

Figure 1. Sampling of public-domain GS fonts.

Intermediate type sizes such as18- and 24-point can make subheadings in fliers and other promotional pieces stand out. Because large (36- and 72-point) fonts are big attention getters, save them for announcements, headlines, and letterhead titles. A few GS font disks boast sizes as large as 96-point — great for posters.

Diminutive text ranging from 6- to 9-point size is usually reserved for that proverbial fine print your mother warned you about. Keep in mind that small text is often unreadable when printed on a dot-matrix printer unless you take pains to select a very plain *sans serif* font. (Characters in sans-serif fonts lack end strokes or "feet.")

Keep in mind that public-domain disks rarely include all sizes of a given font, particularly the large sizes required for best-quality printing by Apple IIGS programs. Here's a good alternative: Seven Hills sells a series of four GS **Font Disks** containing popular typefaces such as Bodoni and Garamond. Each disk provides two typeface families in all common sizes, from 9-point through 96-point. **Font Disk 3**, although available separately, is also included free with the company's **Independence** collection of drivers for Hewlett-Packard DeskJet, DeskWriter, and LaserJet printers.

GS FONT PREP

Before you can actually use a GS font, however, you have to "install" it. On an Apple IIGS running under the GS/OS operating system, you must store any ready-to-use fonts in the *Fonts* folder on your System disk. (The System disk is either that 3.5-inch floppy you use to start up your GS, or one of the partitions on your hard-disk drive.)

Either way, click on the appropriate drive icon and select *Open* from the *File* menu — or simply double-click on the icon to open its window the fast way. When

the System-disk window opens, it displays assorted files and folders. Find the folder named *System* and open it. Then find the *Fonts* folder and open it. You'll see a list of the fonts you already have — a series of files with names like *Geneva* and *Shaston*.

Now insert your new GS font disk into a drive. Double-click on the disk icon when it appears on the desktop. (If you're using a 5.25-inch font disk, double-click on the disk-drive icon first.) Some public-domain disks store fonts in a *Fonts* folder. If so, open it. Font files may be represented by small icons instead of large ones. To represent fonts in large-icon format, make sure the font window is the active one. (Its title bar displays horizontal stripes.) If it's not, click anywhere within its bounds. Pull down the *View* menu and select *By Icon*.

Sometimes font-file icons are scrunched together, making it difficult to read individual filenames. Straighten out the mess by pulling down the *Special* menu and selecting *Clean up*. Within a matter of seconds (longer if you have dozens of files to orient), your GS rearranges the icons in more orderly fashion. Use the window's scroll bars to see all the font files if they're not visible in one glance. Remember, too, you can enlarge a window by clicking on the zoom box in the upper right-hand corner of its frame.

From your public-domain (or commercial) GS font disk select the fonts you want to transfer to your GS/OS System disk's *Fonts* folder. Selecting a font is as easy as clicking on its icon. If a typeface is available in assorted sizes, select the whole "family" for best results. Authentic (16-bit) GS programs such as AppleWorks GS can "scale" a font to virtually any size, but quality is often sacrificed. Moreover, Publish It! 4 — still our favorite DTP program — and other 8-bit Apple II programs don't scale fonts at all. If you want to use 14-point Palatino in the drama club's next playbill, for instance, be sure to copy *Palatino.14* to the *Fonts* folder.

Save time and effort by copying multiple fonts simultaneously. Click on the first font icon, then, while holding down the shift key, click on subsequent files you want to transfer. When you drag the group of selected fonts to the *Fonts*-folder window, GS/OS copies them automatically. Cleanup (as described above) is usually required.

If your working GS/OS System is on a 3.5-inch disk, the space available for additional fonts is severely limited; you'll have to delete one or more existing fonts from the *Fonts* folder if you want to store new ones there. Deleting fonts (or anything else for that matter) is easy with GS/OS (a mixed blessing): Just drag the font file to the trash can.

Don't forget: Always use a backup of your System disk — not the original. In addition, be careful not to delete fonts that your programs may require. Check with their respective user's guides if you're not sure which are "system fonts."

Lucky for you if you use a hard disk drive: Your *Fonts* folder can be as extensive as the hard drive's storage size allows. Most of us don't require the kind of variety that professional designers demand, but it's nice to have dozens of fonts readily available — just in case. The 40 or so fonts we like to keep handy on our hard drive take up a meager 283K. Besides convenience, hard-disk drives offer speedier processing — a feature that's particularly noticeable when you preview or print Publish It! 4 documents.

Once installed in the *Fonts* folder on your System disk, GS fonts are readily available. All you have to do is start up your favorite GS program, pull down its *Font* menu, and select the typeface, size, and style you want to use. Publish It! fans, however — whether they use a GS, an Apple IIe, or a IIc — have to perform a few extra steps.

PUBLISH IT! PANACHE

Before you can use a new GS font with Publish It! 4, you must install the font's name in the program's *Select Font* directory. The process is easy, though somewhat tedious if you're installing a number of fonts. (Publish It! 3 also supports GS fonts, but doesn't support hierarchical file structures, which store fonts in a folder within a folder. For that reason, place any GS fonts you want to use with Publish It! 3 in the "top" directory of a given disk volume.)

While Publish It!'s *User Name Table* claims to accommodate two dozen fonts at a time, we've encountered situations in which we could list no more than about 18 fonts. So, although you may have scores of fonts on your hard drive, you won't be

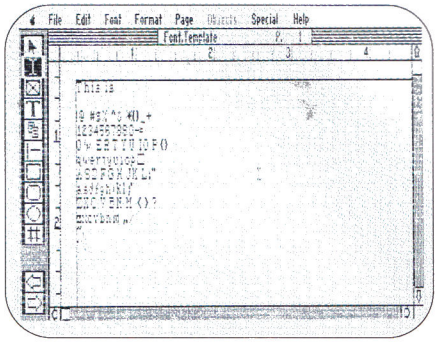

Figure 2. Screen dump showing initial Publish It! 4 font-test template.

able to use them all in a Publish It! 4 project. (Nor would you want to.) Suffice it to say that before installing new fonts in Publish It! 4, you often must "de-install" existing ones to make room in the *User Name Table*.

Start up Publish It!, pull down the *Apple* menu, and select *De-Install Font*. When the *Remove Font* directory appears, select a font you plan not to use in a given project. Click on the *Remove* button. To de-install additional undesired fonts, repeat the process as many times as necessary. Because we rarely use Madison, Ravinia, or Westwood fonts, for instance, we've de-installed them. That way we have room to install a half dozen or so new fonts. (Always use a backup copy of Publish It! before fooling around with fonts.)

To install a font in Publish It! 4, pull down the *Apple* menu, and select *Install Font*. Click on the *Drive* or *Disk* button until the desired font directory appears. Select the font you want to install and click on the *Open* button. Whenever we want to install a font that's stored in the *Fonts* folder on our hard drive, for instance, we first locate and double-click to open the *System* folder and then the *Fonts* folder.

Publish It!4 has a reputation for WYSIWYG

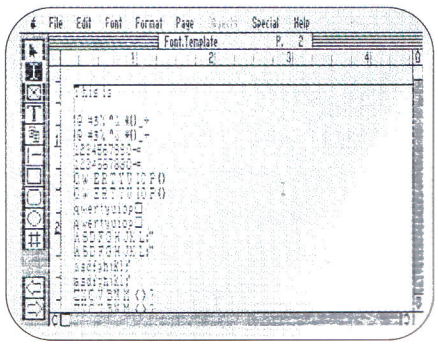

Figure 3. Screen dump showing font-test template in its final form.

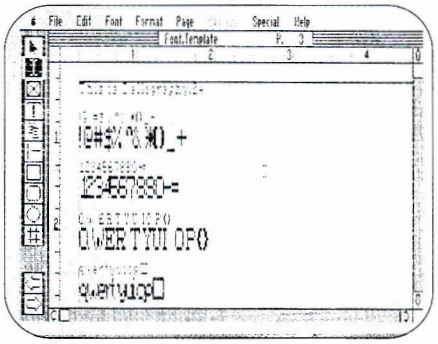

Figure 4. Screen dump showing screen appearance of 24-point Calligraphy font.

(what you see is what you get) display. For example, you can switch viewing modes (OA-1 through OA-4) to see exactly how a layout will appear on paper, and you can type object specifications to thousandths-of-an-inch precision (OA-M). But if you install and then select the *Calligraphy.24* font, say, any words you type appear as jagged text on screen — until you press

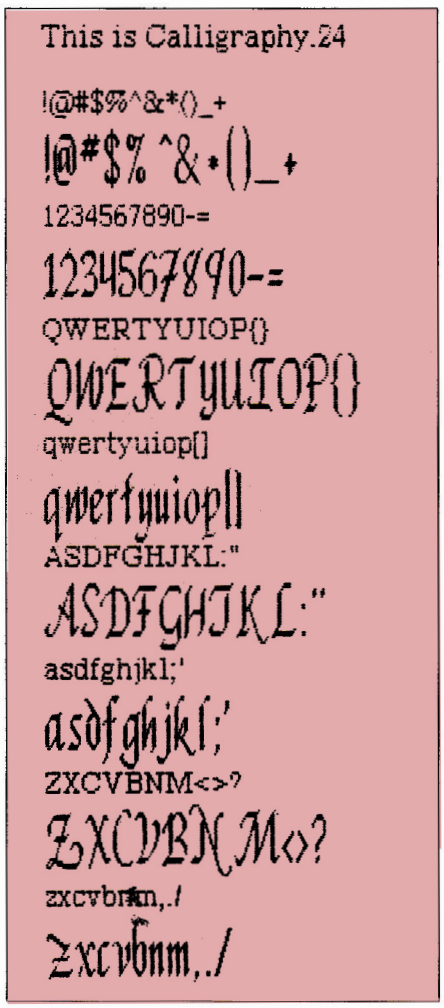

Figure 5. Printout of Calligraphy.24.

OA-K or pull down the *File* menu and select *Preview* to see the text's actual printed appearance. When you experiment with fonts, you tend to use *Preview* mode a lot.

ARMCHAIR DTP

Before we tackle a new project, we browse through our printed font library. Like most Apple II enthusiasts, we're lazy in a creative sort of way. Hence we developed this simple template that displays and prints samples of the fonts we add to our collection. After we print the samples, we arrange them in a three-ring "fonts" notebook.

To duplicate this template, start up Publish It! 4 or open a new file. Switch to *Size to Fit* mode (OA-4) and "rubber-band" a text frame (hold down the mouse button, drag, and release) that's approximately a full page in size. Insert the I-beam into the frame and type **This is**. Press the return key once. Beginning with the number row, press each keyboard character once. Type each row's shifted characters first. Press the return key. Then type the unshifted characters. When you finish, your template should look like **Figure 2**.

Now copy and paste each row of characters once so that the finished template looks like **Figure 3**. Save this file as **FONT.TEMPLATE** — or use any other name you like. From the fonts you've installed, *mentally* choose one you want to test — but don't select it from the *Font* menu yet. Instead, insert the I-beam at the end of *This is* and type the font's name and size with one of Publish It!'s system fonts: *Deerfield.12* or *Desplaines.12*. You could use the public-domain font you plan on testing to enter the name, but some fonts are made up of symbols and icons. A printout that reads "This is §ª¶¢∞°¤" won't be much use. Better to avoid gobbledygook; that's why we consistently use Desplaines or Deerfield.

Drag the I-beam to select the second (identical) line in each set of typed lines. When the line is properly highlighted, select the font you want to test (*Font* menu). The original typed text changes appearance, but sometimes only slightly and you may not be able to see the actual results until you press OA-K. When we tested the *Calligraphy.24* font mentioned earlier, we did see noticeable changes on screen (see **Figure 4**), but accurate results appeared only upon previewing or printing the revised template, as shown in **Figure 5**.

Authentic GS programs such as AppleWorks GS are inherently WYSIWYG, so you don't need to "preview" results by pressing a program command. Create a template similar to the one just described and select the font you want to test from the program's pull-down *Font* menu. Print the results and organize them in a folder or notebook.

SUPERCONVENIENT

Thanks to **John Sambataro**, you don't have to create from scratch the template we just described. His documents display dot-matrix printouts of the hundreds of fonts in NAUG's 43-disk collection of public-domain GS fonts.

Although Sambataro's printouts don't show every possible character, they provide a quick look at each font's appearance. Sambataro annotates each page with remarks about limitations such as "missing" characters. Theoretically, each font can be composed of as many as 256 characters, including alphabets, numerals, and symbols. Rarely do public-domain GS fonts come "complete," however. Worse, some fonts lack essential characters such as certain punctuation marks. You can use a font-editor program to make up for deficiencies by creating any missing characters.

In the meantime, GS users who pass on Sambataro's offer have another option. If you want to create a permanent hardcopy of standard and "extended" character sets, look to Seven Hills' **SuperConvert**. (Extended character sets can include accented foreign-language characters and legal symbols such as copyright and trademark. On the GS you generate these characters by pressing the option key in combination with another key or keys. Publish It! 4 doesn't seem to support extended character sets, though.) This indispensable GS program converts a wide variety of graphics formats (including certain Macintosh files) to super hi-res. Perhaps just as important, included as a bonus under the *Extras* menu is a feature that lets you print "key charts" for fonts installed in your System. Each chart displays all characters included in a given font. Moreover, the chart displays the key

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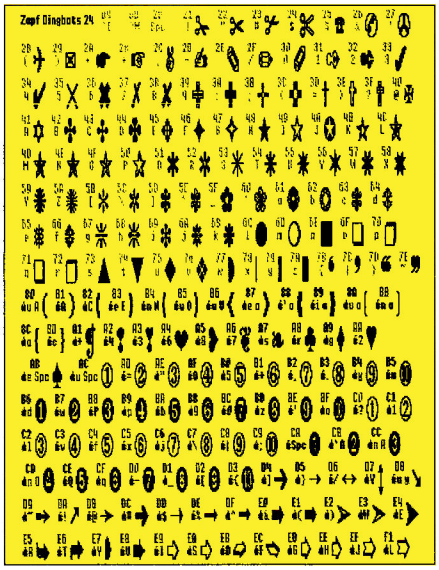

Figure 6. SuperConvert key chart for 24-point Zapf dingbats.

or combination you type to print a selected character. **Figure 6** shows a SuperConvert chart for public-domain *Zapf Dingbats.24*.

MAKE THE SWITCH

Speaking of format transfers, a number of other utilities in addition to SuperConvert can help you expand your list of font sources. Seven Hills' **Font Factory 2.0**, for instance, lets you convert native Macintosh fonts — as well as fonts from BeagleWrite, MultiScribe, Printrix, and all versions of The Print Shop — to $C8 (GS) format. A font disk with 100-plus files is included free with the program.

According to Earl Childers at Seven Hills Software, Apple Computer's recently announced GS/OS System 6.0 means you'll soon be able to insert a Macintosh disk into your Apple IIGS' 3.5-inch drive. No longer will you have to go on line to download Macintosh fonts — unless you want to, that is. You can turn, instead, to mail-order firms such as **EDUCORP**, which distributes public-domain, shareware, and commercial Macintosh fonts.

By the way, if you haven't upgraded to Publish It! 4 (or Publish It! 3) from Publish It! 2, you can still use GS fonts. Just convert them from $C8 to $F7 (IMG) format. All you need is an easy-to-use program like the one we acquired from California media specialist Bill Olson. Olson modified a utility written by fellow Californian Jim Mensch, and donated the new-and-improved version of **Font Type Fixer** to the public domain four years ago. Olson says that both Big Red and the Public Domain Exchange carry the program.

APPEARANCE COUNTS

As you can imagine, we've tested hundreds of public-domain fonts during the past several years. We're impressed with the majority of them. But sometimes you find a font that would be perfect for the project you have in mind — if only the quality hadn't deteriorated so much when the font was cloned from its bit-mapped Macintosh alter ego.

When that happens, take a cue from Minnesota reader Jon McCreight. He uses Beagle Bros' **GS Font Editor** to shrink, enlarge, or improve public-domain GS fonts. (If you have the fortitude — not to mention the cleverness — required, you can also use font-editing programs to create your own custom fonts from scratch.) In true Apple II spirit, McCreight says, "Tinkering with a font is a nice way to blow an afternoon. As you twiddle with a character, a box on the right side of the screen simultaneously shows how the character will look normally, plus how it'll look printed in five styles: underline, italic, outline, boldface, and shadow."

In addition, Seven Hills Software's **Font Factory GS**, mentioned above in regard to its conversion features, is also a popular editing program, letting you edit, resize, and smooth your GS fonts. (For more on public-domain and third-party font editors, see "Face to Face," March 1990, p. 61.)

REAPING THE REWARDS

Before you "sow" your next publishing project, spring into step with some new GS fonts. Whether you use Publish It!, AppleWorks GS, or another DTP program, a veritable profusion of public-domain and commercial GS fonts is just a few floppy disks away. Create a sample font template — or peruse John Sambataro's ready-to-go printouts. Either way, it's easy to put a new "face" on your '92 crop of Apple II desktop masterpieces. ❑

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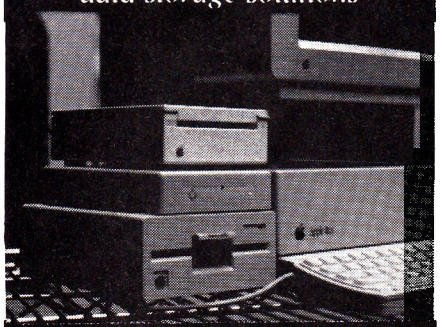

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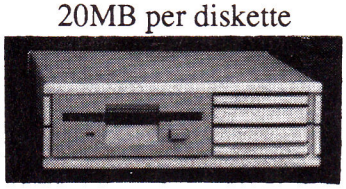

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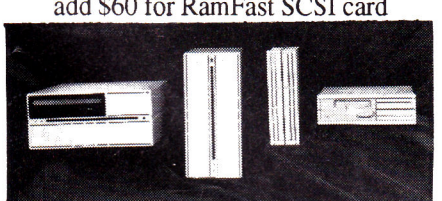

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REVIEWS

Continued from page 25

produce an astounding 16.7 million shades and tints. The results may not be as bright as the picture you see on the Mac screen — or even come close — but they're a great improvement over what you get from an ImageWriter II with a color ribbon.

Options within the *Page Setup* dialog box let you specify one of three color-blending techniques and set the color intensity. The higher the latter setting, the brighter the colors in the final product; the cost is faster ink consumption.

The DeskWriter C's print speed is even more lackadaisical in color than in black-and-white, though. You'll be lucky to see a page fall into the output tray every four minutes. And with the color cartridge installed, the machine prints black by combining its three colors; the result is washed-out text. You'll be switching cartridges often if you flip from text to artwork regularly.

But nothing beats bright color in the classroom and, to a lesser extent, in the home or corporate office. Charts, graphs, even proofs for brochures come out of the DeskWriter C in eye-popping colors, and make much more effective sales and presentation tools than monochrome competitors. With software such as Easy Color Paint, kids can create color masterpieces on their Macs. Connect the DeskWriter C to an AppleTalk network, and an entire class or lab can share the color printer and put computer artwork on paper for the first time. Don't expect to use the DeskWriter C as the sole network printer, however: It's too slow, it's too expensive to operate for simple text chores (about four cents per page for the ink alone), and cartridge swapping from black to color gets tiresome.

The DeskWriter C would be even more attractive if Apple IIGS owners could print to it as well. Unfortunately, that's not in the color cards — at least for now. Vitesse, manufacturer of the printer-driver package Harmonie, has promised that an upcoming upgrade will include DeskWriter C support.

Still, nothing comes close to the DeskWriter C when you're talking affordable color printing from the Macintosh. If you want to kick color out of the computer and onto paper, take a good, long look at HP's newest ink-jet printer.

Gregg Keizer
Eugene, OR

★ ★ ★ ½ ★

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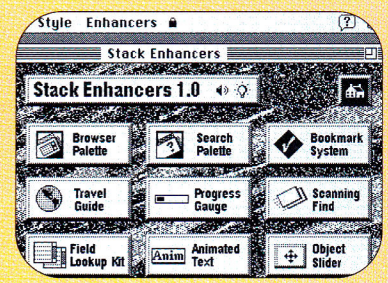

More than any other Macintosh software, HyperCard is a work in progress. The five-disk package is designed to be personalized and enhanced by users. HyperCard lets you add and edit information in data fields, modify on-screen graphics, link cards and stacks with buttons, change commands in the menu bar, or create your own stacks incorporating all these elements. When you use HyperCard, you're in charge.

Just about any child or adult can use HyperCard as an authoring tool with a little time and training. Of course, some of HyperCard's most powerful tools are reserved for users who learn HyperTalk, HyperCard's friendly programming language. But HyperTalk scripting is still programming, and many HyperCard users don't have the time or inclination to master the necessary skills. Stack Enhancers is an assortment of tools that lets nonprogrammers add sophisticated features to their stacks. Even experienced HyperTalk scripters are likely to find something of value in this diverse and appealing collection.

You can install all Stack Enhancers in other stacks at the click of a button. You install the two most important and useful tools — the *Browser Palette* and the *Search Palette* — directly into your home stack, adding new commands to the *Go* menu.

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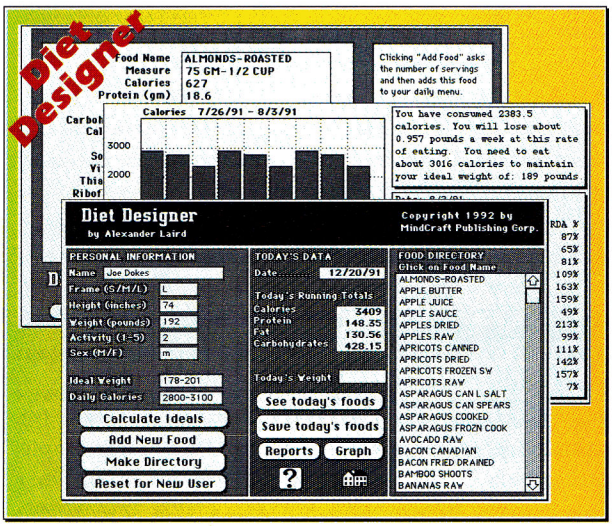

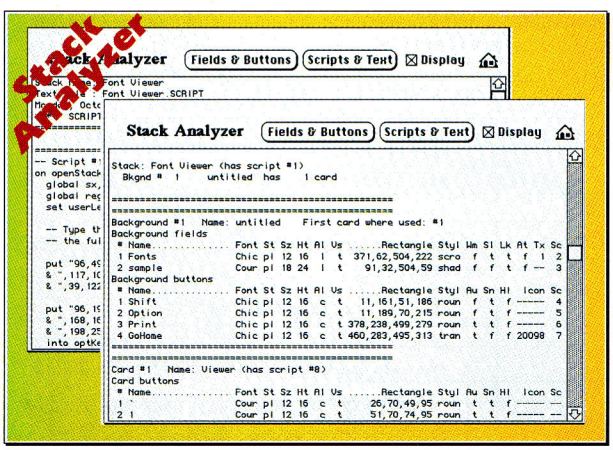

Every issue of HyperTalking is an adventure. Get exciting new HyperCard stacks with complete articles on disk that show how they work — and all for only $6.66 per issue. There's no risk – you can get a refund for all unmailed issues at any time. Here's a sample:

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Selecting either command (or typing it into the message box) reveals a floating palette that adds new features to the basic HyperCard environment.

The *Browser Palette* displays a scrolling list of every card in the current stack. Clicking on any name in the list takes you to the corresponding card. The *Browser Palette* provides an overview that makes it easy to fine-tune stack structure and uncover obsolete or unlinked cards. The problem with this kind of list is that it's useful as a navigation aid only if you've given cards meaningful names. Fortunately, the *Browser Palette* includes a *Rename* button that makes the card-naming process about as simple as it could be. It also includes a *Sort/Unsort* button for changing the list order, and a *Find* button for locating cards by name.

For those situations in which you need to locate cards based on content rather than name, Stack Enhancers includes a *Search Palette*. Unlike HyperCard's built-in *Find* command, the *Search Palette* displays a list of all cards with a matching character string in any searchable field; clicking on any name in the list transports you to that card.

The *Search Palette* is especially useful in stacks with marked cards. You can limit searches to marked cards or unmarked cards, and use a check box to mark any or all selected cards. If you leave the search field blank when *Search only marked cards* is selected, the *Search Palette* locates all marked cards. You can combine the program's searching and marking capabilities to locate cards containing two different character strings.

The remaining Enhancers are tools for installation in cards or backgrounds of specific stacks. Two resemble parts of the two universal enhancers. *Scanning Find* lets you perform complex searches without the *Search Palette*, and the *Progress Gauge* looks like the gauge at the bottom of the *Browser Palette*; both monitor your current relative location in the stack graphically.

Three enhancers add navigation and organizational features to stacks. The *Bookmark System* provides a more flexible arrangement for marking cards. The *Field Lookup Kit* is a sort of instant-reference-card setup intended to simplify the process of creating glossaries, indices, and on-line help. *Travel Guide* is a rotating-Earth button that evokes a stylized version of the standard *Recent* dialog box. All these tools can add functionality to a stack, but they may also add unnecessary complexity to the interface if you use them carelessly.

The simplest stack enhancer is one of my favorites: *Animated Text* makes it easy to install a field containing Times Square-style moving text, complete with custom message, font, style, and size.

The last two enhancers are tools for serious stack builders. *Object Slider* simplifies the process of grouping and moving objects; *Script Viewer* makes any object's script window just a click away.

These enhancements don't come free. Each has the potential to slow HyperCard down a little; a stack containing several enhancers can slow to a crawl. But most stack builders are willing to trade a little speed for functionality.

Stack Enhancers' documentation is clear, clean, and concise for the most part, and the on-line help is exemplary. Still, spelling errors in the manual and on screen suggest that the product was rushed.

Spelling errors aside, I was confused by the apparent contradiction between the manual's statement on distributing stacks with enhancers and the license agreement forbidding redistribution of the software. A call to the company clarified the policy: Noncommericial distribution of stacks containing enhancers (except for the *Browser Palette* and the *Search Palette*) is okay; commercial distribution requires an additional license. Still, I'd like to see that decision in writing before I upload an enhanced stack to CompuServe or America Online.

It's likely that future versions of HyperCard will incorporate some of the features of Stack Enhancers. Until then, anyone who's serious about multimedia should take advantage of this bargain-priced collection of HyperCard helpers.

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Corvallis, OR

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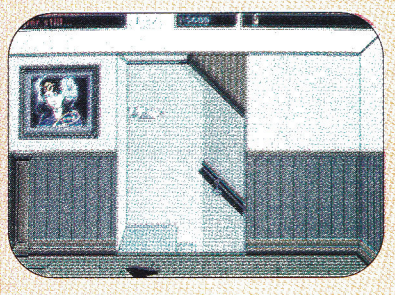

Hot air rises. That's about all you need to know to play Glider, one of the Mac's most unusual and charming games. Actually, you'll soar farther and stay in the air longer if you keep a few other facts in mind, too — things such as fire's bad for paper, paper shredders are even worse, and rubber bands are the best things since Orville and Wilbur hit Kitty Hawk.

Glider isn't your typical piece of electronic diversion. There are no explosions, no gruesome displays of dungeons, not even a political, ecologic, or military score to settle. What it is, is fun — nasty, addictive fun that can keep you in front of your computer for far too long.

Glider works from a deceptively simple, but ultimately goofy, premise: A paper glider soars through a huge house, riding air currents from floor heating vents and burning candles. Along the way, it must avoid all flat surfaces — floor, tables, or shelves. A single touch means instant dissolution.

This two-dimensional obstacle course isn't that simple, of course. There are spinning razors, balloons, darts, and other paper airplanes that cut you to the quick. Strategically placed vents suck the glider into the ceiling and deposit it in lands unknown. Fans blow currents across rooms, and tea kettles send the fragile craft up and away in a jet of steam.

You guide the glider's flight path, although that control is far from complete. From keyboard, mouse, or joystick, you send the glider forward or backward. That's it. The mouse works best, for it gives you some power over the plane's speed.

Most of your time and effort is spent getting the glider to the next rising air current, just as a sailplane pilot looks for lift on ridges. Lose the warm air that comes out of the floor vents and your plane is doomed. At least you can pause the game to plot a path, or save it so that if your glider turns into confetti, you won't tear your computer into the same small pieces.

Glider sports traditional game elements, too, such as scores that soar when you speed through rooms and additional glider lives when you touch folded paper. Grab a battery and your glider gets an afterburner boost; pick up rubber bands and you can launch them as missiles.

Other techniques are stranger. To turn off a fan blowing you back, for instance, or a shredder that keeps ripping up your glider, you need to fly by an off switch. Some rooms are pitch-black — you'll get nowhere until you turn on the lights by hitting another switch.

When you tire of the 60-some rooms that come with Glider, you can build your own paper-airplane maze with the *Room Editor*, a construction kit of objects, obstacles, and enemies. You'll have to work at it, but the payoff can be a house easy enough for the clumsiest glider flier or one tough enough to foil even the best.

Glider works under System 7, in either black-and-white or color. On a Mac LC, Glider looks (and sounds) outstanding. Its only fault, and it's not terminal, is the light documentation. At the least, the manual needs to describe explicitly the uses of battery power and rubber bands, and tell how to turn switches off and on.

Glider's a great game, not because of its often frustrating difficulty, but because of its nearly addictive draw. Although the two often go hand in hand, other factors play a part, too. You can play a game of Glider in minutes, so it's a perfect break from work. And no matter how convoluted the glider's flight becomes, you'll always believe you can do better, just a bit better, next time. Whether you can, well, that's up to you. And your hot air. ❑

Gregg Keizer
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Ruth Witkin is an author and software specialist in the Apple II field. Ms. Witkin writes *inCider/A+*'s AppleWorks in Action column and is the creator of the popular *Success with AppleWorks* template series. Her AppleWorks books include *The Best Book of AppleWorks* and *Personal Money Management*

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Continued from page 64

• **Multiple pathways.** Books are designed to be read from left to right, top to bottom. CD-ROM databases contain raw information from which you can construct your own knowledge pathways. As just one example, NASA has released a 12-disc set of unedited images from the Voyager excursion to the outer planets. It's priced at about $100. You can use these discs as image libraries in numerous ways — as clip art for incorporation into written reports, as the basis of detailed analyses of the surface textures of the planets, as backdrops for interactive-multimedia presentations, and so on.

WHAT'S THE CATCH?

The transition's not going to be easy, though. For one thing, CD-ROM drives have yet to become standard equipment on anything bearing an Apple label. Although Apple was the first company to put a CD-ROM drive into the marketplace, it has yet to realize that by not building a drive into every computer it ships, it's as out of date as bell-bottom pants and eight-track audio tape decks. Apple's recalcitrance is all the more surprising because many competing MS-DOS systems (Tandy, Magnavox, Clones-R-Us) include CD-ROM drives as they come out the door.

And Sony is now coming into the classroom, too, with CD-ROMs hidden in student book bags — the Data Discman is selling like hotcakes. If Sony can make money when the Data Discman (with three reference works) retails for about $450, then there's no legitimate reason for any personal computer not to have a CD-ROM drive.

But even if CD-ROM drives were free and every child had one, another force would impede their use in education. Textbook publishers are about the most conservative lot I've ever encountered — I half-expect to see visor-clad scriveners with quills poised over manuscripts whenever I visit these folks. And many publishers see themselves in the book, rather than the information, business. As long as that remains the case, we'll see still more textbooks, and school districts and states whose curriculum advisers suffer from paradigm paralysis will continue to adopt them.

How do we blast these folks into the 20th century while there's still some of it left? How do we get the paradigm shift to hit the fan? What do we say to teachers who are wondering what to do now that some of their kids have complete encyclopedias at their desks? My recommendation is that they stop teaching "facts" and move onto more meaningful turf.

Our children already live in the new paradigm — they're comfortable with electronic information retrieval. They spend hours glued to devices of all sorts. Unless we do something drastic to push the horse-drawn carriage of educational theory and classroom technology out of their 19th-century quagmire, our kids will scoot past us in their electronic tin lizzies, sailing happily into a future in which today's classrooms have simply become irrelevant to learning. I, for one, hope we never let that happen. ❑

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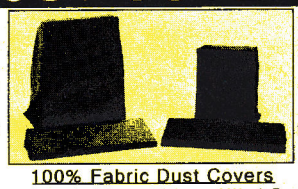

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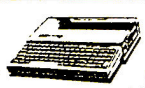

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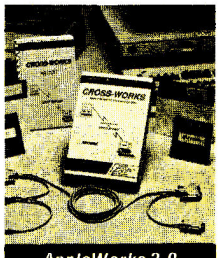

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BLAST FROM THE PAST

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The educational agenda in this country seems to be driven by two powerful forces — standardized tests and textbooks. Tests drive education because of the tremendous pressure schools feel to report good scores to the community. One negative consequence is the emphasis this approach places on rote knowledge — the antithesis of what industry says it wants students to focus on. But the fact that many tests reflect little of value in the curriculum seems less important than whether scores have gone up. As a result, many teachers teach to the test — and who can blame them?

By DAVID D. THORNBURG, Ph.D.

Another factor driving curriculum is the textbook — a compendium of piecemeal knowledge written by a committee and edited in such a way as to offend no one. I'm continually amazed at the capacity of textbooks to render exciting topics so empty of wonder and meaning that the only reason anyone would be caught dead looking at one is because a teacher requires it.

But, looking at educational change in the next century, we can safely predict the death of the textbook. Not the death of *books*: Literature will continue to be published in printed form. Technology can't replicate the aesthetic experience of reading a good book (at least not yet). But textbooks don't even try to engage the reader. My generation used them to hide the comic books we read in class. (At least the comics told a story.)

LONG LIVE CD-ROM

It's true that textbooks are repositories of information and sometimes serve as an impetus to explore a subject in more depth. But today's CD-ROMs (compact-disc read-only memory) can perform those functions more efficiently — and in the not-so-distant future we should soon see CD-ROMs displacing textbooks.

A single 12-centimeter CD-ROM can store about 275,000 pages of text. Some of this space can be traded off for other information — pictures, sounds, video clips, and so on. But no matter how you look at it, the capacity of CD-ROMs is phenomenal.

But are they a practical substitute for textbooks? Using 275,000 pages as a guide, how do books and CD-ROMs compare? In terms of manufacturing, a 275,000-page library costs about $500 to print. The manufacturing cost of a CD-ROM is only $1.50. A high-speed press would need about 15 hours to print 275,000 pages, while the same amount of data can be pressed into a CD-ROM in six seconds. Shipping a 275,000-page library means moving about 2750 pounds, compared to only four ounces for a CD-ROM in a plastic box. In terms of impact on the environment, a 275,000-page library would consume about 23 trees, while a CD-ROM uses only 16 grams of polycarbonate and a milligram or so of aluminum. In other words, from the standpoint of economy and ecology, the CD-ROM wins hands down, even if only a fraction of the disc space is used.

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- **Variety of content.** Books are well suited for textual and pictorial information, but CD-ROMs go them one better, with sound files, film clips, animation, and computer programs that model aspects of the subject being taught, in addition to the traditional words and pictures. Given our current interest in teaching in ways that honor individual learning styles, the textbook is an anachronism.

Continued on page 59

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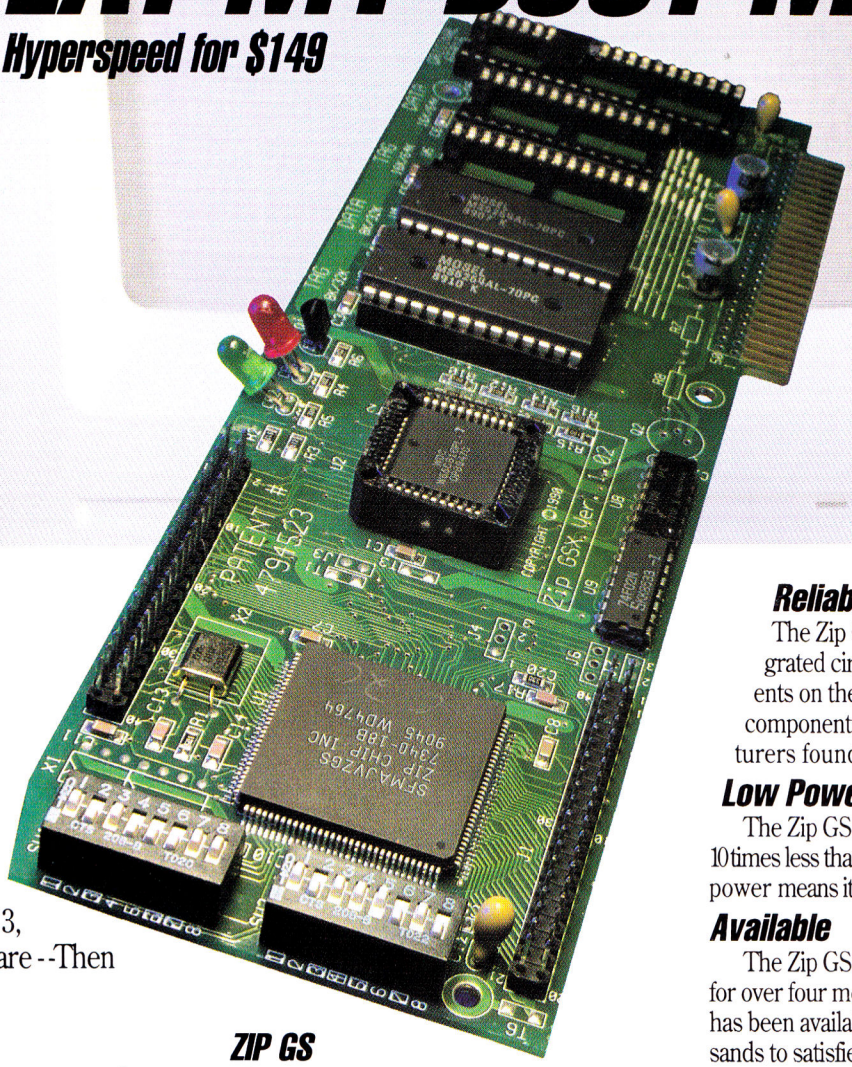

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