inCider
A+
Apple II / Macintosh
AN IDG COMMUNICATIONS PUBLICATION
January 1991

NEW! Platinum Paint
Worth Its Weight in Gold
Editors' Choice, p. 112

SCANNERS

LightningScan vs. Quickie

PLUS:

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How to Buy A Hard Drive

Sneak Peek

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Inside Story

64K Video RAM
Controlled by our own Video Display Generator (VDG) array, this feature off-loads video work from the 128K system RAM, providing both analog and digital (IBM®-type RGB) outputs.

Very Large Scale Integration
We manufacture our own custom gate arrays to improve performance and make our products compact, reliable, and affordable.

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Universal Disk Controller
Our unique UDC array allows the use of both 3 1/2" and 5 1/4" drives. The 128EX/2™ even supports the IIGS®-compatible "Daisy Chain" drives.

Having all this performance usually means compromising one thing. Price. But like a good book, this story has a surprise ending. With a one year warranty, the Laser 128EX™ and 128EX/2 cost about half of what you'd pay for a stripped Apple IIe.

Want more inside information? Find out the reason why *inCider* said "Look at today's Laser if you want to see tomorrow's Apple." Call (708) 540-8911 for a free catalog and the name of a Laser dealer near you.

Laser Computer, Inc., 800 N. Church Street, Lake Zurich, IL 60047. In Canada, call (800) 387-9672. For information on our Dealer, VAR, and Education programs, call us at (708) 540-5000. Laser 128EX and 128EX/2 are trademarks of Laser Computer, Inc. Apple IIe and IIGS are registered trademarks of Apple Computer, Inc.

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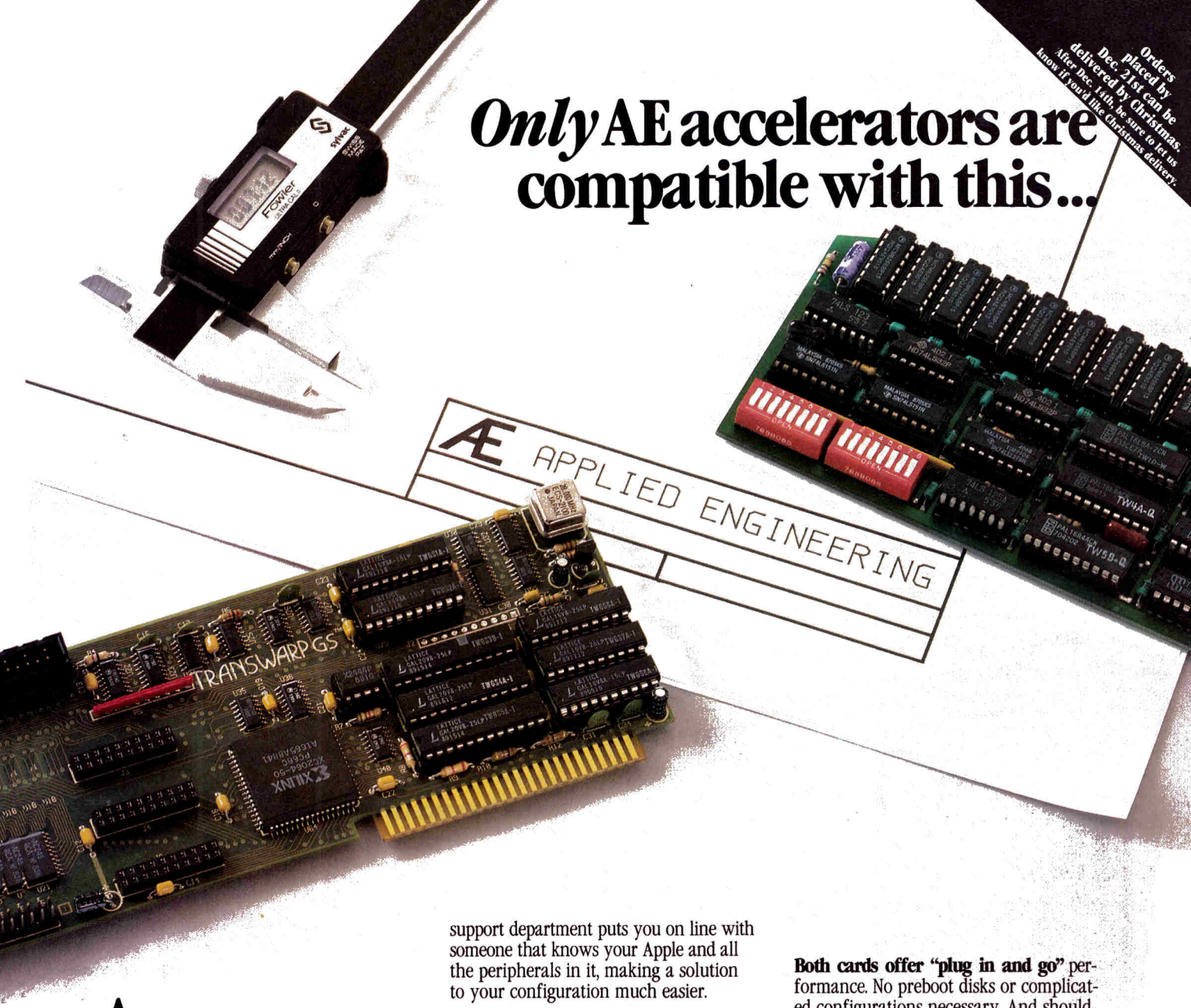

A blank sheet of engineering paper. For some time now, we've done all of our design work using CAD (computer aided design), but the blank sheet of paper shown above represents future AE peripherals and accessories for the Apple II line.

Because accelerator cards push technology close to the limit, designing new peripheral cards to be fully compatible with a given accelerator requires a special insight. That's why whenever one of our engineering teams designs an Apple II peripheral, they have to take into account the way in which TransWarp™ and TransWarp GS™ will interact with that particular peripheral device.

Both TransWarp and TransWarp GS were designed with future upgrades in mind (note the 40-pin high speed Bus connector on TransWarp GS). That's why Apple owners who expand and enhance their computers with Applied Engineering products have far fewer compatibility and performance problems than those who try to "mix and match". But should you ever have a question, one call to our technical support department puts you on line with someone that knows your Apple and all the peripherals in it, making a solution to your configuration much easier.

You've probably already read the great reviews the TransWarps have received; *"I wasn't able to find a single piece of software incompatible with it, nor could I attribute any system problems to the card's presence."* - A+ (IIGS)

"TransWarp is great. I have replaced all my other accelerators with it!" - Steve Wozniak, co-founder of Apple (IIe).

"Wait til you see it perform. Folders and icons open from the finder like lightning; text wraps instantly around graphics in your favorite desktop publishing program; documents scroll at a reasonable rate in any graphics-based word processor. TransWarp makes the GS as good as the Mac, because it's fast and it's still in color." - Incider (IIGS)

"Your engineering department should take a bow. As a developer and consultant, I work with the Mac II and Mac SE as well as the IIGS. I have conducted some recent tests which indicate that the "little" IIGS outperforms the Mac SE." - George Dombrowski, Jr. (IIGS)

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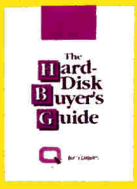

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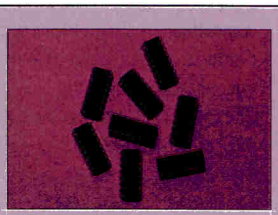

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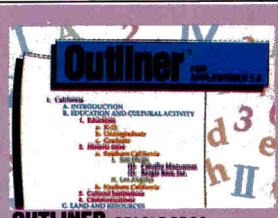

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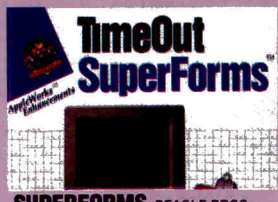

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44 Scanners Head to Head
Is a picture really worth a thousand words? More and more Apple II owners are finding out — the easy way. Thanks to Vitesse's Quickie and Thunderware's LightningScan — two lightweight, hand-held scanners with high resolution and a slew of graphics options — illustrating newsletters, brochures, reports, and ads has never been so simple.

55 On the Other Hand: Five Affordable Mac Scanners
The case is small, but it packs a lot of power — boost your graphics creativity with a portable scanner and give your desktop publications that professional touch.

61 Hard-Disk Drives Made Easy: Shopping for a System
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INCIDER'S VIEW

DON'T BELIEVE EVERYTHING. . .

By DAN MUSE * EDITOR IN CHIEF

There's even greater truth to the adage "Don't believe much of anything you read on line."

EVERY ONCE IN A WHILE I WORRY about the computer-magazine industry. With on-line services and interactive this and that, I wonder if the day will come when there's no room left for the good old hold-it-in-your-hand, read-it-on-the-subway, take-it-to-the-bathroom magazine.

The print media in general are at some risk. CD-ROMs are "friendlier" and maybe even more helpful than volumes of encyclopedias, which go sadly unopened by most students. Optical databases let students, reporters, lawyers, and others search for information faster and more effectively than they could by poring over reams of data. Keyword searches let a student, for example, find the name of the first woman to enter a given profession by searching with the words *woman, first*. Getting the same information the traditional way would take hours or days of plodding through piles of books.

If CD-ROM is a threat to the heavyweight encyclopedias we grew up with, what technology threatens computer magazines? I used to think the answer was on-line services. They're becoming easier to use; the public in general is more technically savvy; and the immediacy lets reviews and articles appear shortly after a product hits the streets. Magazines such as *inCider/A+* have a three- to four-month lead time. Also, with hundreds of members, on-line services get a range of opinions to weigh. But although that can be a great benefit, it's also becoming a clear danger. Recent trips through the on-line community have made one thing clear. If there's truth to the adage "Don't believe everything you read," then there's greater truth to the adage "Don't believe much of anything you read on line." It's too easy for anyone with a modem to write things that have little or no basis in reality.

What made the dubious nature of on-line reporting stand out to us was a recent exchange between an electronic crusader and an Apple II engineer. On one of the major on-line services, a man we'll call John relayed his recollection of comments made by the Apple engineer. I won't repeat John's impressions; however, they prompted the Apple engineer to say, "I don't recall, in my years of talking to Apple II developers and customers, any statements I've ever made that have been more stretched and misrepresented than what John attributed to [me]."

We've also read dozens of questionable reports recently — rumors that Steve Wozniak was going back to Apple to take over the II line; trumped-up descriptions of new Apple computers; bogus internal memos from Apple; and more.

Erroneous reporting may not be unique to the on-line community; it's more endemic to it, though. Typing a newsletter, printing it, and mailing it take considerably more effort than logging on to America Online or GEnie and typing away. Also, someone who takes pride in or expects revenue from a publication has a vested interest in relaying accurate information.

Newspapers and magazines apply a series of checks and balances to ensure a much better chance of accuracy. Most journalists are cynical enough to doubt just about everything they hear or read. So if someone calls us and says Apple is going to announce a IIGS that runs Mac software, we check it out with a variety of sources in addition to Apple. The rule of thumb with most computer publications is three confirmed on-the-record sources before a story sees print.

You'll find mistakes from time to time in some publications. With other magazines years may pass before factual or typographical errors creep in. Around here we like the philosophy of Chicago's City News Bureau, which *The New York Times* describes as a boot camp for journalists: "If your mother says she loves you, check it out."

On-line services offer Apple users enormous benefits: dozens of public-domain and shareware programs, conferences with industry leaders, and technical information. And sometimes a little gossip is fun, too. Just remember that what you read may be a wild rumor or just someone's opinion stated as fact. ❑

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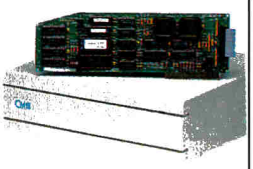

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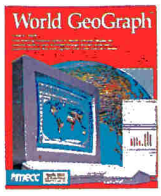

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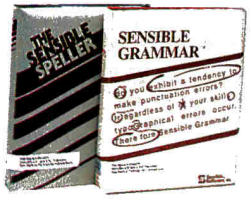

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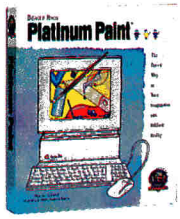

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Quality Responds

In the November 1990 issue, you published a letter from Wayne Pribble ("Caveats," Letters to the Editor, p. 10), who had ordered RepairWorks from Quality Computers and was disappointed that the product wouldn't work with his unenhanced Apple IIe. While Mr. Pribble is correct that RepairWorks requires an enhanced IIe, IIc, IIc Plus, Laser 128, or IIGS, we're concerned that he says he wasn't offered a refund.

Quality Computers has worked hard over the last six years to earn its reputation as one of the most reliable mail-order firms. Many potential customers could be swayed by Mr. Pribble's remarks, so we'd like to clarify our policy.

Quality Computers offers a satisfaction guarantee on RepairWorks along with all other Q-Labs products. Our policy is stated on the back of every sales order. Had Mr. Pribble asked whether he could return the prouct, he would have been told he would receive a full refund.

We realize that we are in part responsible for Mr. Pribble's confusion. Most companies don't let customers return any software for refund. In fact, some companies don't allow return of any product. In the past, we've stated our return policy on the back of the sales order, as noted above. As of November 1, however, we've included a description of our policy in the form of a gold-star service program. We feel we have the best service policy, and we want to brag about it.

We offer full refunds on all Q-Labs products, send air service to pick up a defective item, and "advance swap" merchandise from our stock. We also offer a technical newsletter and provide in-house technical support. Our policy is exceptional as well as expensive — so expensive that we can't afford to recommend products that are prone to problems. Therefore, we constantly test and evaluate the products we sell. These actions have made Quality Computers one of the most respected companies in the industry. Maybe we just need to make it a little more obvious.

Joseph P. Gleason, President
Quality Computers
20200 East Nine Mile Road
St. Clair Shores, MI 48080

The Times, They Are A-Changin'

When I read the September Letters to the Editor, Dr. Howard McCollister's comments caught my eye. (See "Biting the Dust," p. 12.) In 1988 I bought my first computer — an Apple IIGS. I've had a lot of fun learning to use it, and have accumulated quite a bit of software.

There's no arguing the fact that the computer industry is passing the Apple II by, but I don't think we have any right to complain. All technology becomes obsolete sooner or later — we simply must choose between switching to the new racehorse, or sticking with the old nag.

There's nothing wrong with wanting the latest equipment. In fact, manufacturers depend on this desire. Remember the eight-track tape? Now even cassette tapes are being replaced by compact discs. What about the old LP record? Well, I guess they'll be worth something on the antiques market. The people who invested heavily in record collections have two choices: They can either keep playing their old records or upgrade to a CD player. That's the price of progress.

Please don't feel guilty about not "keeping the faith." I think I speak for many Apple II users when I say, "Congratulations" and "Enjoy your Mac." But I'll just keep plugging along with "Old Nellie."

Say, I gotta run. I need to put another stack of Dylan records on the changer.

Ed Giecek
Box 174
Granite Falls, WA 98252

We're with you, Ed — crank up that Dylan. We also agree that while the Apple II is plenty of computer for most of us, some folks want the latest technology, or simply need the increased power and different software options of the Macintosh. There's no reason Apple II-turned-Mac users need to feel guilty, just as there's no reason Apple II users should feel as if they're using obsolete technology. inCider *will continue to serve the loyal base of Apple II users; however, we'll also focus on bridging the gap between the Apple II and the Mac.* — *eds.*

. . . But the Song Remains the Same

I'm another loyal Apple IIc owner. Although I was pleased to see Mr. Sculley's comments in your October issue (p. 8), I realized that Apple's rhetoric hasn't changed. It seems to me that Apple Computer's attention remains directed toward the Macintosh.

Sculley states that "during 1990 and 1991, Apple will introduce several new entry-level Macintosh computers," but he neither identifies nor refers to any new Apple IIs. He also says that he "can reassure our Apple customers that we value the Apple II product family as an asset, which we will continue to nourish. Beyond that, I am not at liberty to disclose specific ➪

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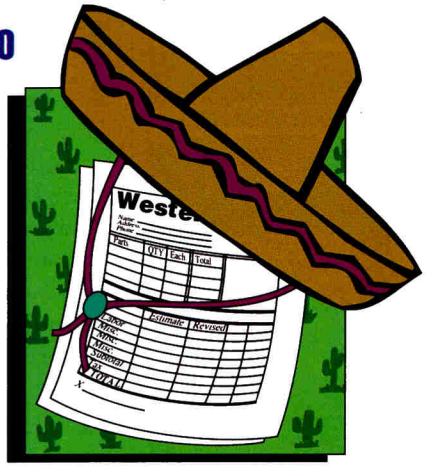

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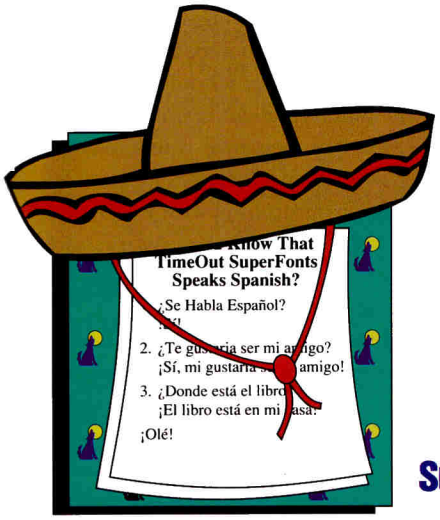

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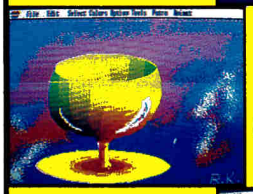

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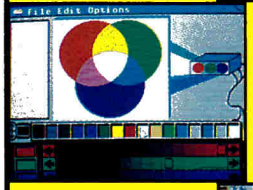

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LETTERS TO THE EDITOR

product plans." He spoke of new Macintosh products, so why can't he tell us more about the Apple II line? Could it be that there are no new Apple II products in the offing? Surely Mr. Sculley can give loyal Apple II users more than this! Although Macs are some of the best machines available today, for my level of usage, experience, background, and budget, the Apple II is my computer of choice.

Gary Lauterback
P.O. Box 81
Bradley, CA 93426-0081

PHANTOMVISION

I'M AN EDUCATOR WHO TEACHES a computer class with the Apple IIe. After reading August's Speaking of Graphics column ("Animated Antics 3," p. 76) I called Broderbund Software to order Fantavision. Guess what? Broderbund's representative told me that "the IIe version is no longer produced, and has been out of stock for several months." I hope someone knows where I can locate an unsold copy. Someone somewhere should be saying oops.

Don P. Johnson
111 S. Wilson #20
Wenatchee, WA 98801

Oops. Production schedules require us to complete work on issues several months in advance. So, when we were working on the August issue (in April), Broderbund was still making Fantavision. We now know that the Fantavision line for both the IIe and IIGS has been discontinued. We apologize for any inconvenience. — eds.

ZIP FROM ZIP

I'M SHOCKED THAT YOU'D devote space in the September What's New section (p. 22) to any product released by Zip Technology, without warning your readers that you were ready to refuse advertising space to this company [because of its reputation for unreliable product shipment in the past]. My problems with Zip Technology began more than a year ago, and when I wrote to inform you of the company's practices. Rita Rivard, your marketing assistant, told me that for quite some time the company's ads weren't allowed in the magazine. How can you give your trusting readers Zip's address and phone number? You should inform your readers of the risk they take in sending money to this company. I've found its business practices disreputable and its promises unreliable.

Reginald A. Bowes
7945 Oscar Green Road
Franklin, TN 37064

The Zip GS Accelerator card is of interest to many readers and developers. A mention in the What's New section doesn't imply endorsement of a product, nor does it imply any guarantees as to the product's availability. We advise our readers to make mail-order purchases with a credit card if possible, as this will offer you better protection. — eds.

AND A CHILD SHALL LEAD THEM

I'M 13 YEARS OLD AND I'M GOING to miss the Apple II. My school has just replaced about 18 IIes with Mac SEs and IIcxes. Although some people believe that school systems are making this switch to shift from teaching on computers to teaching about computers, I don't agree. The first classes in our school's computer program taught us about mainframes and micros as well as megabytes and kilobytes. In the more advanced classes we learned beginning programming with Logo, and word processing with AppleWorks and Bank Street Writer. Macs are powerful, but the II is the computer for me.

When I saw what Reid and Hume had to say about the II in certain recent installments of their syndicated newspaper column, I felt sick and angry. They said, "The educational software in most classrooms gives students the wrong lessons — that computers are boring, frustrating tools." How would they know? The only time I get bored or frustrated is when I'm in front of a C> prompt.

Also, Brian Whitt's comments in the April issue of Letters to the Editor made me angry. (See "Business Is Business," p. 12.) He said, "Children rarely sit in front of those educational games for

more than ten minutes." My brother and I have spent many hours playing educational games. Also, during my school's "free time," many children show up to use educational games and programs. (And they're not nerds.)

Dustin Holmes
RR#4
Osgoode, ON
Canada KOA 2WO

Corrections

The formula for a macro in October's Appleworks Programmers Association report (What's New, p. 25) was garbled. You can fix it by removing the letters "DB" wherever they appear.

In October we listed an incorrect toll-free telephone number for information about the Scholastic Software Club (p. 21). The correct number is (800) 872-8228. In addition, the toll-free number for Scholastic as listed in the November issue (p. 19) should be (800) 541-5513.

In November's Hints & Techniques listing ("Cookin' Up a Batch," p. 90), line 440 was omitted and should read 440 END. Thanks to H. Gilbert of McLean, Virginia, for bringing this to our attention.

November's Editors' Choice column ("Faster Than a Speeding . . . ," p. 96) shows an incorrect phone number for CV Technologies. It should read (513) 435-5743.

Also in the November issue, the ratings listed for Exploring Tidepools and Geographic Jigsaw (Reviews, pp. 78 and 80, respectively) were switched inadvertently. Exploring Tidepools should have a rating of 9; Geographic Jigsaw should receive a 6.

inCider welcomes readers' comments. We reserve the right to edit letters for clarity, style, and space. Please address your correspondence to Letters, *inCider*, 80 Elm Street, Peterborough, NH 03458.

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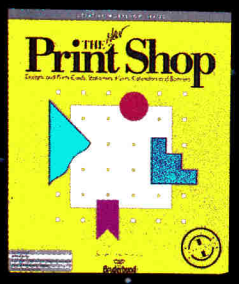

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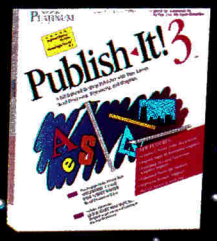

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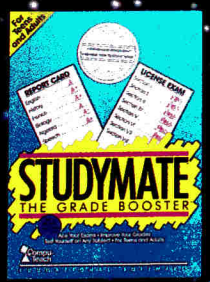

Your Cost
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Lab Pack (5) $79.95
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IBM $48.95
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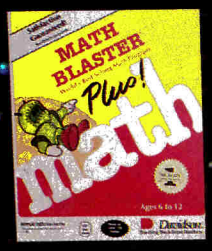
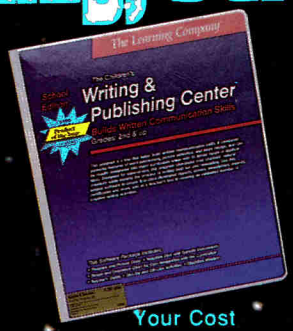
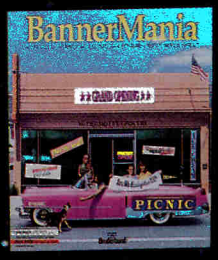


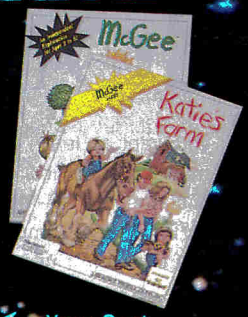
Your Cost
$27.95
School Version $41.95
Lab Pack (5) $119.95
APL/IIGS/IBM/MAC



Your Cost
$51.95
Lab Pack $97.95
Home Version $32.95
APL/IIGS



Your Cost
$21.95
APL/IBM/MAC



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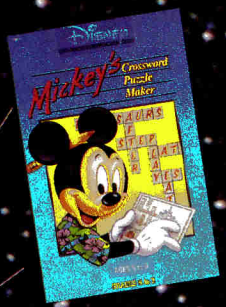

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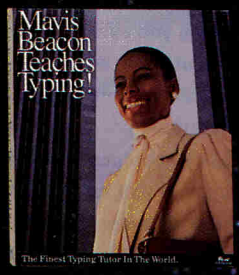

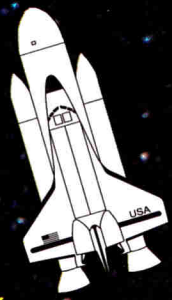

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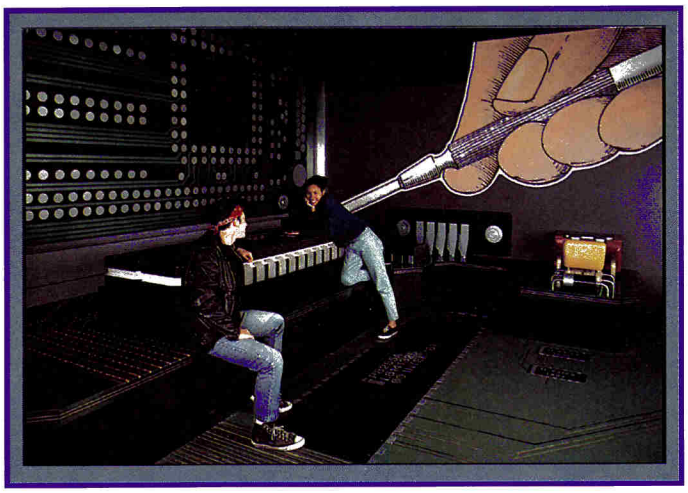
WHAT'S NEW

edited by Paul Statt

COMPUTER SCIENCE

If you want to learn what makes a computer tick, take a look at the new 25-minute video from Boston's Computer Museum. In the film a group of teenagers set out to discover the inner secrets of computing by visiting the museum's famous "walk-through computer," a giant model that's 50 times the size of a microcomputer.

The kids not only explore the major parts of the computer — the central processing unit (CPU), random-access memory (RAM), disk drive, and video display — they act out the operation of the machine. While some students take the role of various computer components, others act as the data bus, carrying information and messages among the other students. To explain the abstract idea of software, the video incorporates animated graphics from the Computer Museum's collection.



Exploring inner space: Students get into the act when they visit a walk-through computer in a new video produced by Boston's Computer Museum.

How Computers Work: A Walk Through the Walk-Through Computer is designed for use in middle-school classrooms, but you can use it to teach the basics of computing to all ages. The video costs $19.95 (plus $3 shipping); a companion packet of educational activities costs only $5 more. Contact the Computer Museum Store at Museum Wharf, 300 Congress Street, Boston, MA 02210, (617) 426-2800 extension 307.

— P.S.

GOLF TEACHER

GOLF TEACHER is the first commercially available HyperStudio product (see the related story at right), and it's an incredible bargain — 28 stacks of "everything you ever wanted to know about golf" on five 3.5-inch disks for only $27.95, plus $2 shipping.

The program uses graphics and animation to train you to play golf as no book or magazine could — it's more like learning the game by video. Also included is an extensive glossary of golf terms that'll teach you to at least talk like a pro — even if you still play like an amateur.

The heart of Golf Teacher's appeal is a series of stacks that deal with five major aspects of the game: woods, irons, the short game, sand play, and putting. The program covers the basics, too — hooks, draws, slices, and fades, among other golfing fundamentals.

Golf Teacher is available from FYI Publishing, P.O. Box 150661, Fort Worth, TX 76108. The company doesn't accept phone orders. — P.S.

STUDIO 2.1

Roger Wagner Publishing has released a significant upgrade to **HyperStudio** version 2. Not only does this new edition include improved painting and editing tools, as well as four disks of clip-art accessories, but it also lets you create "user disks" of stacks that don't require HyperStudio to run. (See "Golf Teacher" at left — the first commercially available stack.) Now anybody who owns or uses an Apple IIGS can see the power of HyperStudio without buying it. Run-time stacks will be available in the public domain as well as commercially.

HyperStudio 2.1 also includes a batch of extended commands (*Xcmds*) to control printers, modems, laser-disc players, and even Apple's CD-ROM player from stacks. One Xcmd even lets you use HyperStudio without a mouse. (This option is free on all on-line services and is available on disk from the publisher for a $10 handling charge.) For more information, contact Roger Wagner Publishing at 1050 Pioneer Way, Suite P, El Cajon, CA 92020, (800) 421-6526, or circle number 350 on the Reader Service card.

— P.S.

E★PLORING THE COSMOS

Travel to the Vegetable Moon or the Urban Planet. Step into the extremely well-placed mouse hole in your kitchen. Peer inside the igloo in your refrigerator and see the sneezing fireplace. If you've done any of these things, you've probably been playing with **Cosmic Osmo**, Activision's latest CD-ROM release.

With imaginations freed by the storage capacity of the compact disc, the software engineers at Cyan worked with Activision's multimedia technology department to create a universe of nooks and crannies to explore. Successor to the popular Manhole, Cosmic Osmo places more emphasis on the "interactive" in "interactive multimedia." There are games to play in Osmo's universe, as well as chemistry and electronics laboratories in which to experiment.

This genre of software, which includes Broderbund's McGee and The Playroom, as well as the HyperCard Amanda Stories, is a sure relief for parents fed up with blast-'em-'til-they're-dead video games. But the price ($79.95) won't come as much of a relief — even if you're one of the few who can afford a CD-ROM player.

When you're finished exploring Osmo's cosmos, pop the disc into your stereo and listen to the soothing new-age soundtrack. For more information, contact Mediagenic, a division of Activision, at 3885 Bohannon Drive, Menlo Park, CA 94025, (415) 329-0500, or circle number 351 on the Reader Service card. **— C.C.**

A NEW WAY TO HEAR CLASSICAL MUSIC

Fans of good music know that "edutainment" is learning about history, the arts, and people as you enjoy your favorite selections. Listening to music has always been a mental exercise. After all, the "lessons" of Beethoven and Mozart are neither simple nor obvious.

Now Warner New Media's **Audio Notes** series eliminates the difficulty of enjoying quality music. Through Apple's HyperCard you can access this product's top-notch compact-disc recordings, with thousands of pictures, commentaries, additional bits of music, analysis, historical facts, and a glossary of hundreds of words, as the music plays.

The latest release in the Audio Notes series is **The String Quartet**, an interactive journey through Beethoven's *String Quartet No. 14*. In 1826 this piece turned the musical world upside down, creating new possibilities for all musicians. This version includes a stunning performance by the Vermeer Quartet (Teldec Records) and commentary by Cynthia Woll, a writer, editor, and musician who heads the classical music division at Warner New Media. She uses the Beethoven *String Quartet No. 14* to introduce you to chamber music on disc.

The series also includes Mozart's famous opera *The Magic Flute*. Both discs require HyperCard, and sell for $66 each at record stores. For information, contact Warner New Media at 3500 Olive Ave., Burbank, CA 91505, (818) 955-6499, or circle 352 on the Reader Service card. **— P.S.**

CD-ROMs listed here require a Mac Plus, Classic, LC, SE, or II with at least 1 megabyte of RAM and an AppleSC or compatible CD drive.

READ ME A STORY

Before kids love to read, they love to be read to. If you have a CD-ROM player, the **Discis Books** series lets kids listen to stories even when no adult is around.

A Discis Book appears on the Macintosh screen as a depiction of actual pages — complete with text and illustrations. Stories by such well known children's authors as Beatrix Potter, Robert Munsch, and Heather McKend come to life as the reader turns each screen page.

Voices, sound effects, and music enhance each story. Teachers and parents can fit the style, speed, and even the language to the individual reader. While Discis Books are suggested for kindergartners through sixth-graders, kids of all ages will enjoy them.

Discis Books range in price from $69.95 to $89.95. Schools can purchase a library of ten books for $750. Available titles include the following:

- **Mud Puddle** (grades K–3) by Robert Munsch
- **The Paper Bag Princess** (grades K–3) by Robert Munsch
- **Thomas' Snowsuit** (grades K–3) by Robert Munsch
- **The Tale of Peter Rabbit** (grades K–3) by Beatrix Potter
- **Benjamin Bunny** (grades K–3) by Beatrix Potter
- **A Long Hard Day on the Ranch** (grades K–3) by Audrey Nelson
- **Heather Hits Her First Home Run** (grades K–3) by Ted Plantos
- **Moving Gives Me a Stomach Ache** (grades K–3) by Heather McKend
- **Cinderella** (grades 3–6) by Sean O'Huigin
- **Scary Poems for Rotten Kids** (grades 3–6) by Sean O'Huigin

To order Discis Books in the United States or Canada, call (800) 567-4321, or write Discis Knowledge Research, 45 Sheppard Avenue East, Suite 410, Willowdale, Ontario, Canada M2N 5W9, or circle 353 on the Reader Service card. **— P.S.**

NOTES from the Appleworks Programmers Association

Users & Programmers Sharing the Power to Create

▼**AW tip:** Small is beautiful! You can execute small files more quickly, especially when minimum memory, speed, or disk space are factors. AppleWorks can quickly and easily move data between files via the Clipboard to help you maintain smaller files and copy pertinent data into report files. Study the expense-account spreadsheet templates illustrated here. You could call **Figure 1** a feeder file and **Figure 2** a collection file. Importing data to a collection file helps you maintain a smaller, more efficient file size.

Note that we copied (OA-C) line 12 of the ExpAcct.Denver file to the clipboard in Rows format, then copied from the clipboard in Values-only format into the ExpAcct.Monthly report file. Then we inserted line 12 between lines containing "—— ," so that the Total formulas in the ExpAcct. Monthly (collection) file would compute the values correctly from each reporting (feeder) file.

Note the]] in row 10 of the first template. You can copy this row to the clipboard in Rows format, then copy it back into the same spreadsheet at row 11 from the clipboard in Formulas and Values format. This method expands the spreadsheet as you see fit without changing its format or adversely affecting relative formula pointers, thus letting you maintain small spreadsheets. The macros tip below takes advantage of this technique.

File: EA.Denver

Figure 1. Feeder file.

Trip Expense Detail

Date	Hotel	Meals	E'mnt	Phone	Air	Auto	Svc	Other	Sub-tot	Remarks
1.02		4.50			215.00				219.50	Breakfast - AirFare LAX-DEN-LAX
1.02						10.00			10.00	Taxi Airport to Hotel
1.02		6.50					5.50		12.00	Lunch - copy service
1.02			42.50			12.00			54.50	Supper Meeting - Jones - Taxi
1.03		5.00						15.00	20.00	Breakfast - Flowers to Jones office
1.03	50.00			4.50		10.00			64.50	Hotel/Denver - phone -taxi to Airport
]]									0.00	
1.03	50.00	16.00	42.50	4.50	215.00	32.00	5.50	15.00	380.50	Denver - Jones

File: EA.Monthly

Figure 2. Collection file.

Monthly Expense Resume

Date	Hotel	Meals	E'mnt	Phone	Air	Auto	Svc	Other	Sub-tot	Remarks
1.03	50.00	16.00	42.50	4.50	215.00	32.00	5.50	15.00	380.50	Denver - Jones
1.10	65.00	23.00	35.00	4.50	320.00	37.00	7.00	9.00	500.50	Portland - Greene
Total	115.00	39.00	77.50	9.00	535.00	69.00	12.50	24.00	881.00	January to date

▼**AW enhancements:** TimeOut CelLink lets one spreadsheet import data from other spreadsheets automatically. This powerful enhancement makes linking data from several spreadsheets easy. CelLink is included on the TimeOut SpreadTools disk from Beagle Bros. Other SpreadTools enhancements include Analyzer, Block Copy, Formula to Value, Quick Columns, Rows to Columns, and more.

▼**AWpersonality:** APA member Randy Brandt, author of TimeOut UltraMacros and several other AppleWorks enhancements, was an English major in college, then a teacher. Randy started programming the Apple II for Beagle Bros, and, fortunately for AppleWorks fans, made it his full-time work. Randy is an avid sports fan, especially of baseball's San Diego Padres. He, his wife, and two daughters have moved recently to the high country of Colorado where Randy intends to continue producing software for the Apple II. But will Randy's loyalty to the San Diego Padres continue?

▼**AW macros:** Using the example ExpAcct.Denver spreadsheet template above, this macro provides an automated method of adding an entry line to a spreadsheet. To maintain minimum size you can use this macro in either the spreadsheet above or in similar applications such as checkbook-balancing programs. You simply need to position the cursor on or above the spreadsheet row that contains the cell containing the string]]. C:<asp:up:oa-F>T<oa-Y>]]<rtn oa-C>T<rtn rtn down oa-M>F<rtn up oa-B rtn>!

For a 5.25-inch disk including a set of templates, macros, and detailed documentation for tips described above, send $4 to the APA at the address below to cover shipping and handling costs. Please include the inCider/A+ issue date with your request.

▼**AW news :** Reports coming out of AppleFest (December 7–8, Long Beach, California) will clearly show interest in AppleWorks and other Apple II software for educators, business owners, and home users. The APA, NAUG, Claris, Beagle Bros, and other Apple II supporters will participate in this important event.

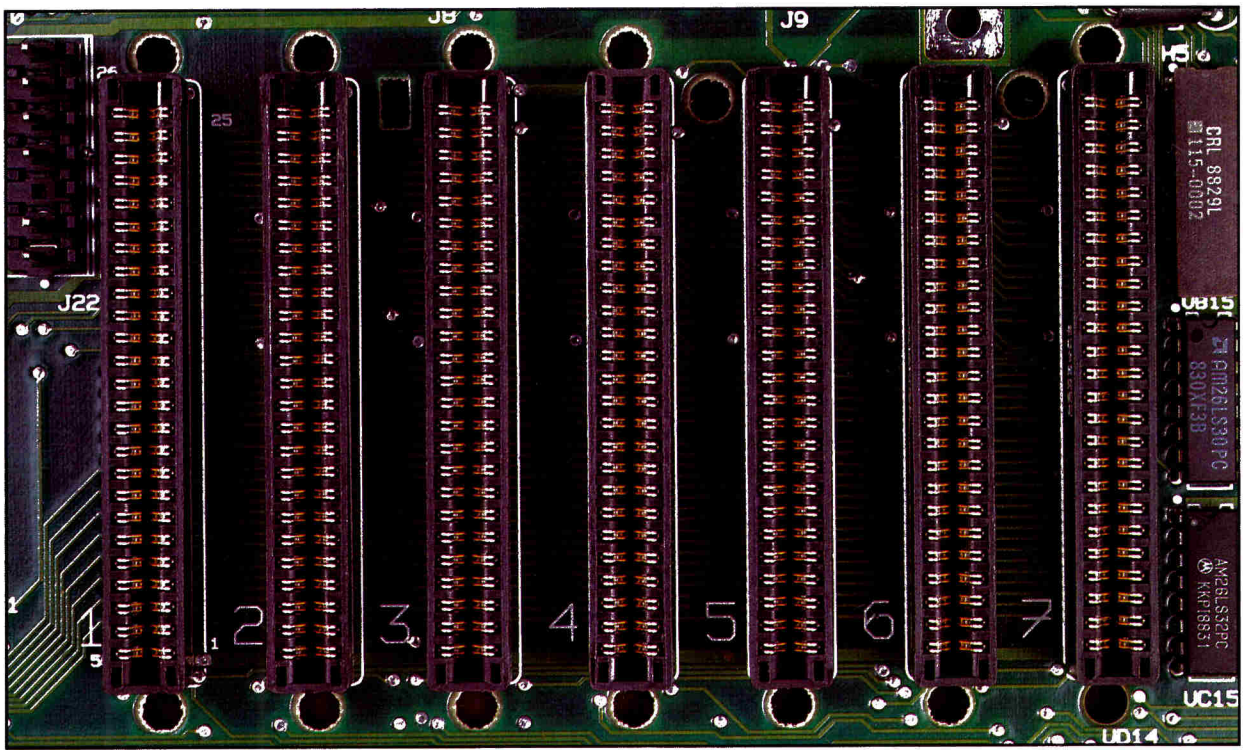
MEMBERS CONTRIBUTING TO THIS MONTH'S NOTES INCLUDE RANDY BRANDT, DAVE GAIR, AND MARK MUNZ (FOR USE OF HIS SCREEN SHOT 3.0). FOR DETAILS ON MEMBERSHIP OR OTHER INFORMATION CONTACT THE APPLEWORKS PROGRAMMERS ASSOCIATION AT 6531 LEXINGTON AVENUE, LOS ANGELES, CA 90038-1451, MODEM APA@PRO-APA.CTS.COM (213) 463-9289, VOICE (213) 469-9916. THE APA IS REGISTERED WITH THE APPLE USER GROUP CONNECTION.

UPDATES

Seven Hills Software has announced a new program for user groups: The company will choose a member of each Apple user group as a **Seven Hills Partner**, who will provide the other members with product demonstrations, product updates, and information about additions to Seven Hills' line of GS software, which includes **GraphicWriter III**, **Disk Access**, and **Font Factory**. User groups with Partners will be entitled to discounts on Seven Hills software. For more information, user-group presidents can contact Earl Childers, Seven Hills Software, 2310 Oxford Road, Tallahassee, FL 32304, (904) 575-0566, or *SevenHills* on America Online and GEnie, *72437,3165* on CompuServe.

Orders placed by Dec. 21st can be delivered by Christmas. After Dec. 14th, be sure to let us know if you'd like Christmas delivery.

This is the most important feature of any computer.



They are called expansion slots and they should be at the top of anyone's checklist of important features when considering the purchase of any new computer. With six to eight expansion slots and a socketed micro-processor, there's almost no limit to how your computer can grow, expand and increase in performance as future technology continues to develop.

At Applied Engineering we have a long history of upgrading and enhancing the capabilities of the Apple II using the expansion slots provided. We have developed memory cards that use technology achieving 1000 times greater memory density than was available at the time the computer was originally designed. We have designed and built co-processor cards, accelerator cards, data acquisition cards, RAM disks, speech synthesizers, stereo sound effects cards, MIDI interfaces and much more.

Without exception, the technology that we have incorporated into these peripherals did not exist at the time the customer purchased their computer.

So if you want to avoid being "locked out" of the improvements that are taking place every day in computer technology, think very, very carefully before you buy any computer that has less than three or four expansion slots (portable laptops excluded).

We at Applied Engineering understand that just because you have expansion slots doesn't necessarily mean that you will choose Applied Engineering when you want to upgrade your computer. Yet we still promote the expansion slot philosophy. Because what we *would* like is for you to have choices as new technologies become available. So you don't have to buy a whole new computer every two or three years. There's an old saying in Silicon Valley, "I don't care how many capabilities you build into your computer, it won't do the one thing I want it to do six months from now."

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Power surges also invisibly threaten your computer's well-being. They occur when voltage spikes surge through your wiring seeking a place to dissipate. If that place is inside your computer, you'll very quickly gain a greater understanding of the laws of electricity. It's not a pretty sight.

Special line conditioning filters and dual surge suppression circuitry protect against surges, reduce noise and provide "clean" power. Six switched AC power outlets line the rear of Conserver to accommodate your computer, monitor and four other peripherals. Thus protecting your computer *and* your peripherals from surges. The outlets are conveniently controlled by three front-mounted LED switches.

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WHAT'S NEW

SOFTWARE

The NEW

At the introduction of the **Mac Classic**, **LC**, and **IIsi**, Apple tried to recapture the its old spirit with a multimedia extravaganza. In fact, the launch seemed to take place in a truly multitasking environment. The introduction featured live satellite television coverage of a small town in Oregon where "everybody has a Mac"; Apple CEO John Sculley dropping the name of recent Nobel Peace Prize winner Mikhail Gorbachev, as if to make a similar claim of changing the world; and Apple USA President Mike "Diesel" Spindler making his sales pitch about Macs. HyperCard stacks written by a group of third-graders from Iowa were shown; college women from Drake University waxed poetic over their Macs; and even Steve Wozniak showed up — driving a golf cart across the impromptu warehouse stage in Fremont, California.

But the best news about the new low-cost Macs was the software third-party developers announced. Some items may interest inCider/A+ readers, and many are available in school packages or as site licenses. Please call us for details.

- T/Maker (1390 Villa Street, Mountain View, CA 94041, 415-962-0195) is bundling its award-winning word processor **WriteNow 2.2** with Reference Software's popular grammar checker **Grammatik Mac 2.0**. This tool for good writing will cost $199 and will work on the Mac Classic and LC without a hard disk or second disk drive.
- T/Maker also bundles four basic applications — the **WriteNow** word processor, **SuperPaint** painting and drawing software, **RecordHolder Plus** for database management, and the **Full Impact** spreadsheet — for only $349. A special version of **DT Launch** from CE Software, a program selector, is included to ease switching between applications.
- Another option in the category of integrated software is **SmartWorks** ($295) from the Leonard Development Group (formerly TML Systems, 9143 Phillips Highway, Building 390, Jacksonville, FL 32256, 904-464-0016). SmartWorks integrates eight applications — outliner, word processor, database manager, spreadsheet, charting, drawing, painting, and telecommunications. A special feature of SmartWorks is its ability to use AppleWorks and AppleWorks GS data files. An upgrade program for AppleWorks owners is available.
- Mainstay's **MarkUp** ($195; 5311-B Derry Avenue, Agoura Hills, CA 91301, 818-991-6450) uses the new microphone on the Mac LC to simplify the process of editing, annotating, and rewriting documents. This software lets a number of different teachers, editors, critics, or collaborators comment on a document. They needn't have the software with which it was written; on any type of Macintosh, instructors can add their comments by speaking into a microphone, typing on the keyboard, or drawing or writing in longhand with the mouse. (You simply use transparent overlays over a screen shot of the original document to draw or write suggestions.)
- Brooks/Cole's **MathWriter: The Scientific Word Processing Program** ($395, $99 student version; 511 Forest Lodge Road, Pacific Grove, CA 93950-5098, 408-373-0728) lets you enter on the Macintosh any mathematical or scientific expression as text rather than graphics. This ability simplifies editing or creating papers, tests, and worksheets.

MACS Arrive!

● Educational programs for the new Macs are available from Scholastic Software (730 Broadway, New York, NY 10003, 212-505-3000). A new title in the **Point of View** series, a research and presentation tool, looks at the American Civil War and Reconstruction. The first in the **Interactive Nova** series uses a videodisc and Macintosh software to solve **The Mystery of Animal Pathfinders**, as originally presented on the PBS science show "Nova." Scholastic has also converted its entire **Math Shop** series to the Mac, including Math Shop, Math Shop Jr., and Algebra Shop.

● MECC (3490 Lexington Avenue North, Saint Paul, MN 55126-8097, 612-481-3500) announced that **Word Munchers** and **Number Munchers**, two successful Apple II products, are now available for the Macintosh. MECC also pre-announced **Wagon Train 1848**, a cooperative learning simulation students can use on an AppleTalk network. Based on The Oregon Trail, it simulates the rugged trek of the pioneers across North America.

● Davidson & Associates (P.O. Box 2961, Torrance, CA 90509, 800-556-6141) has released a version of **Alge-Blaster Plus** for the Macintosh ($59.95) and a new Mac program called **Your Personal Trainer** for the SAT ($59.95). Your Personal Trainer tests you and determines your needs, then coaches you in vocabulary, reading, and math skills. Block 1600, a game included in the Trainer package, makes learning test-taking strategies fun.

● Jostens Learning Corporation (6170 Cornerstone Court East, San Diego, CA 92121-3710, 619-587-0087) has created a networked instructional management system that will support both the Macintosh and the Apple IIGS. Jostens also announced a new version of its **Basic Learning System**, including a **Primary Language Arts Program**.

● Chancery Software (1122 Mainland Street, Fourth Floor, Vancouver, BC V6B 5L1, Canada, 604-685-2041) released **Mac School Find Accounting** and **Mac School District Student Management**, two new products designed to work with the **Mac School Student Information System**. These products simplify keeping and reporting student records and accounts.

● SoftSync/BLOC (800 South West 37th Avenue, Suite 765, Coral Gables, FL 33134, 305-445-0903) announced **Accountant Inc. Professional**, a fully integrated accounting and financial-management package with general ledger, accounts payable, accounts receivable, inventory, payroll, a project manager, and a financial analysis program. It's a complete small-business management program for $595.

● An alert Beagle Bros (6215 Ferris Square, Suite 100, San Diego, CA 92121, 619-452-5500) noticed that the new Mac LC and Classic keyboards put the "escape" key in the wrong place. **Escape!** ($19.95) fixes that.

● And, finally, an innovative product from Don Johnston Developmental Equipment (P.O. Box 639, 1000 North Rand Road, Building 115, Wauconda, IL 60084, 708-526-2682) is **Ke:nx**, a keyboard and mouse emulator that lets you customize the keyboard to meet different physical, cognitive, and visual-perceptive needs. It costs $780, but its worth is incalculable.

— P.S.

Orders placed by Dec. 21st can be delivered by Christmas. After Dec. 14th, be sure to let us know if you'd like Christmas delivery.

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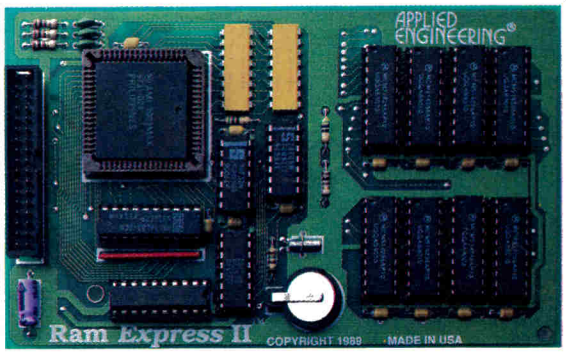

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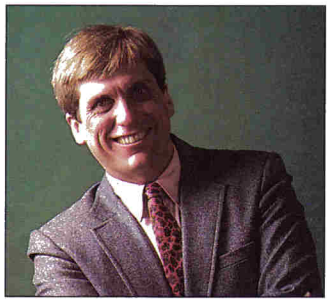

STATTUS REPORT

NO TRESPASSING

By PAUL STATT * SENIOR EDITOR

If Apples are going to advance the art of personal computing, Apple should endow the next generation — including talented, bored hackers — with incentive.

MY MAIL WAS LIGHT TODAY: AN IRATE letter arguing that the Mac LC's Apple IIe emulation card is "an inverted Trojan horse designed to kill the Apple IIe," a press release from Apple, and *The Wall Street Journal*.

The *Journal*'s always fun. Here's the news: Secret Service agents visited the Atlanta home of Edward and Lou Darden. "Agents held Edward and Lou Darden at gunpoint as they swarmed into their son's room, seizing scores of disks, armloads of files, and three computers."

Young Frank Darden, 16 years old and a computer "hacker," was indicted later on felony charges of conspiracy and wire fraud, for entering a computer in the BellSouth phone network illegally. Entering a computer where you're not welcome, according to a federal law passed in 1988, can be prosecuted as criminal trespass — the same crime as breaking into a building. "Ed Darden wishes he had known all of this before he gave his son that Apple II for Christmas eight years ago," the *Journal* concludes. "'I'd have thought twice about it,' he says. 'Maybe we should have given him a bicycle.'"

Speaking of Apple IIs, let's open the mail from Cupertino. It's typical: "Apple Donates $2 Million in Computers to Schools." And just in time, too, when savvy parents are buying bikes instead of computers just to keep their kids out of jail. "With the help of Apple Computer, elementary and junior-high students at a school in rural Louisiana will be working together this fall [1989] using computers to transform oral histories from students' families into an electronic audiovisual 'encyclopedia' of their local culture. And, in Philadelphia, inner-city high-schoolers will use computers for the first time to study botany in a renovated greenhouse."

It's a shame young Frank Darden didn't have an audiovisual encyclopedia to compile, and was nosing around in other people's telephone bills when he should have been sniffing the flowers in a renovated greenhouse — it might have kept him out of trouble. Or would it have?

Why do hackers hack? Is it the thrill of doing something illegal or the excitement of accomplishing something difficult? Believe me, hackers tackle some of computer science's most difficult problems, such as secure codes.

Apple, on the other hand, seems to want to avoid computer science altogether. "Computers are easy" is the Apple corporate chant. Democracy is great for the 99 percent of students who don't care about programming. But what about Frank Darden and the rest of the 1 percent? The brightest of them lack stimulation, and the others play with HyperCard.

Technologically, compiling an audiovisual encyclopedia on a Macintosh with HyperCard isn't sexy. It's fine for kids who know nothing about computers, but I can visualize young Frank Darden napping in the back of the renovated greenhouse while the rest of the class creates a database of flowers. Cracking a code that protects real secrets — that's sexy. So are virtual reality and parallel processors.

Apple could learn a lesson from Westinghouse: It has sponsored a yearly Science Talent Search since 1942. According to a press release, "Emphasis is placed on evaluation by scientists of independent research . . . and answers to open-ended questions designed to elicit evidence of . . . scientific creativity." Frank Darden might have entered a competition designed to show "computer creativity." He might have liked the incentive of a $40,000 scholarship.

When Apple showed *inCider* its new low-cost computers, the Apple spokesman bragged that "Apple computers advance the art of personal computing." If Apple personal computers are going to advance the art, Apple should endow the next generation — including talented, bored hackers — with some incentive. And by sponsoring an open competition, Apple might also prove to irate *inCider* readers that one computer can't "kill" another one, and that any two personal computers are much more alike than they are different. ❑

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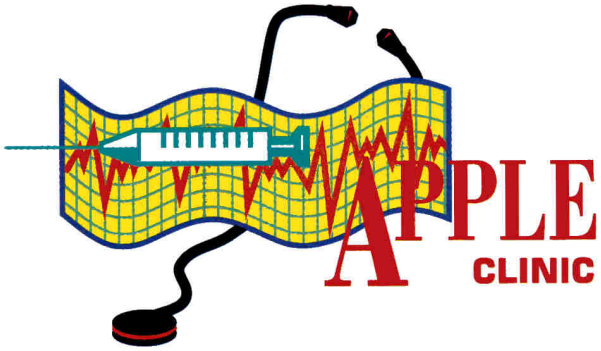

UNDISCOVERED TERRITORY

Tap the hidden power of your Apple II with a ROM road map.

By CECIL FRETWELL

APPLE II INNARDS

I WROTE TO APPLE CLINIC SOME time ago and asked for information about obtaining a copy of *All About Applesoft*, and you indicated that you had no access to this publication.

Are there other publications I might find helpful? I'm interested in the inner workings of Applesoft, not the standard texts put out for programming in BASIC. I guess I'm looking for a disassembled listing of the BASIC interpreter with documents to help me find the INPUT subroutine(s).

Howard C. Bellman
Sepulveda, CA

All About Applesoft *was published by the old A.P.P.L.E. co-op, now called TechAlliance. It's been out of print for quite some time. Try contacting Nite Owl Productions (5734 Lamar Avenue, Mission, KS 66202-2646, 913-362-9898). The company picked up several copies and is offering them currently for $20. Better hurry, though — there aren't many left.*

The only disassembled listing of the BASIC interpreter I know of comes with Roger Wagner's **Merlin 8/16** *assembler (1050 Pioneer Way, Suite P, El Cajon, CA 92020, 619-562-7188, $125). The manual provides instructions on assembling and obtaining a listing of the Applesoft interpreter stored in the read-only memory (ROM) of all Apple IIs. The instructions, however, may not reflect changes made to the IIc, the IIc Plus, and the IIGS.*

BASIC.SYSTEM contains listings proprietary to Apple Computer. Some of us have disassembled listings we use for reference, but we can't publish them because they belong to Apple. Even if you could obtain listings from a third-party source, a new release of the operating system might make them obsolete. When ProDOS was introduced, Apple Computer stated firmly that it had the right to change both the code and key subroutine locations.

For some clues to BASIC.SYSTEM and the PRODOS module code (P8 in the SYSTEM folder of the GS), I suggest you talk to Quality Software (210000 Devonshire, Unit 114, Chatsworth, CA 91311, 818-709-1721). The company's publication **Beneath Apple ProDOS** *indicates the location of the code in memory, but doesn't include source listings.*

For the monitor ROM, key subroutine entry points remain valid across all Apple II systems. Apple made some dramatic changes to the IIc, IIc Plus, and IIGS ROMs, but ROM listings prior to these systems will provide you with a lot of insight.

Some manuals that include the monitor ROM listings are no longer in print; try searching and you may come across leftover copies. Apple Computer published a two-volume series called The Apple IIc Reference Manual, *for example, that contained ROM listings for the Apple IIc. My Apple IIe circa 1983 had a manual called* Reference Manual Addendum: Monitor ROM Listings for IIe Only, *published by Apple Computer.*

If you really want to go back into the archives, the Apple II Reference Manual *that came with my 1982 Apple II Plus included a listing. I haven't seen copies of that book in the stores for years, but my dealer had a couple in his "attic," so I'm sure there are other dealers who have them.*

Another possible source of old Apple manuals is Addison-Wesley Publishing Company's Trade Computer Books Department (Route 128, Reading, MA 01867, 800-447-2226).

Or you can join the Apple Programmers and Developers Association (APDA, Apple Computer Inc., 20525 Mariani Avenue, M/S 33-G, Cupertino, CA 95014-6299, 800-282-273 in the United States, 800-637-0029 in Canada, 408-562-3971 internationally). This group sometimes advertises old Apple manuals in its catalogs.

RAM PROBLEMS ON THE IIGS

I'M HAVING PROBLEMS USING MY random-access memory (RAM) disk with GS/OS version 5.

After formatting my RAM disk, which is a full Apple II Memory Expansion card, I verified it, and the computer told me I had 97 bad blocks ranging from block number 1279 to 1312. I know that's not all the blocks, but those numbers were the only ones on the list.

On your advice in the October 1989 Apple Clinic, I had an authorized Apple dealer look at my system. (See "RAM Crash," p. 24.) He replaced a chip on the memory board, but I still have those ➪

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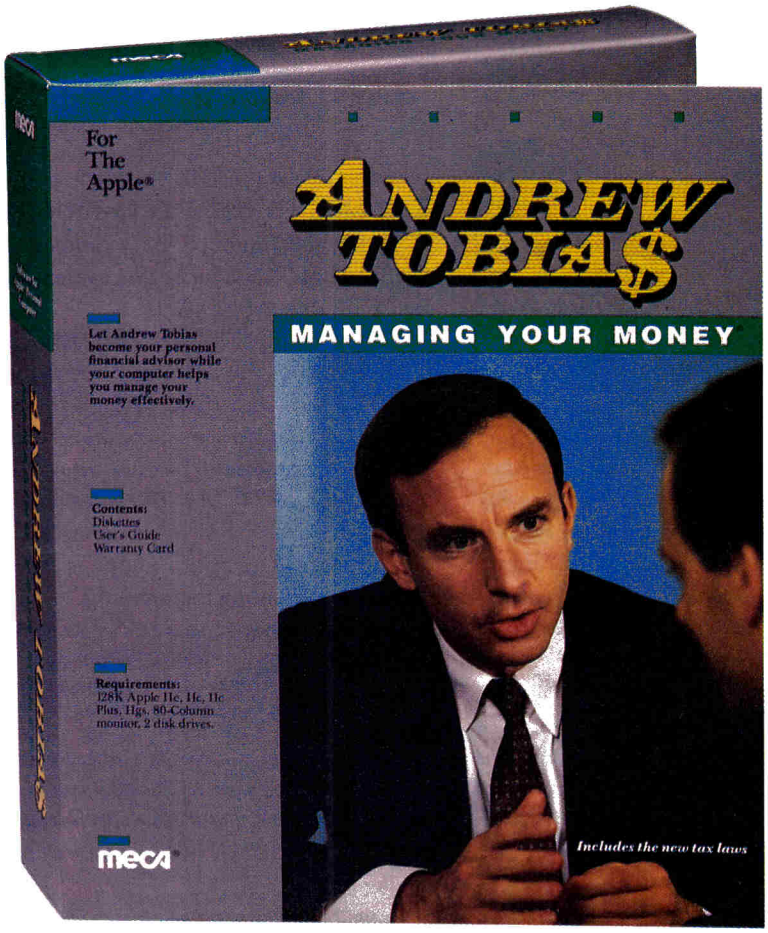

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bad blocks. Is this a GS/OS problem, a RAM-disk problem, or possibly a ROM 01 problem?

Damon Ferguson
Tuscaloosa, AL

To answer your question I turned to my dealer service manager's copy of a 31 Aug 90 AppleLink message "Apple IIGS Memory Expansion Cards: RAM Chip Specs and Vendors."

The RAM chips on the memory-expansion card for the Apple IIGS must be 150ns (nanosecond) chips of 256K bits organized in 256K-by-1-bit configuration. They also must have column-address strobe (CAS) before row-address strobe (RAS) refresh.

Unless the RAM chips on the expansion board conform to these specifications, your Apple IIGS will have intermittent errors. They can take the form of system crashes, lockups, memory errors, and so on. For use on memory-expansion cards for the Apple IIGS, AppleLink recommends Apple part #334-0021.

Publish It! Graphics

I WORK WITH PUBLISH IT! 3 AND would like to use The Print Shop's clip art and other compatible graphics. For instance, I really like the images in Springboard Publisher Works of Art, but I can't transfer them to Publish It! 3.

Susan Herrera
Camarillo, CA

Contact Roger Wagner Publishing, 1050 Pioneer Way, Suite P, El Cajon, CA 92020, (619) 442-0522. According to the company, ***Graphics Exchange*** *($49.95) will do the job.*

What's the Time?

I'M WRITING A PROGRAM THAT needs to measure time to the nearest second or fraction of a second. Can the GS clock give the time to the nearest second or less? How can I access the time with a BASIC program?

Michael Spatzer
Stephens City, VA

If you were working with a desktop program, ticks of a second would be possible. BASIC, however, restricts you to the nearest second.

The BASIC program in the accompanying ***Program listing*** *demonstrates how to read the time. The weekday returned is in the range 1 through 7, with 1 equaling Sunday. The month is in the range zero through 11, with zero equal to January.*

The day is in the range zero through 30. The year is the current year minus 1900. The hour is in the range zero through 23. The minute and the second are in the range zero through 59.

Program listing. Read the GS clock.

```
100 L = 768
110 M = INT (L / 256)
120 S = L - 256 * M
130 FOR I = L TO L + 41
140 READ J: POKE I,J
150 NEXT I
160 POKE L + 26,M: POKE L + 25,S + 42
170 POKE L + 30,M: POKE L + 29,S + 44
180 POKE L + 34,M: POKE L + 33,S + 46
190 POKE L + 38,M: POKE L + 37,S + 48
200 CALL L
210 PRINT "Weekday "; PEEK (L + 49)
220 PRINT "Month   "; PEEK (L + 47)
230 PRINT "Day     "; PEEK (L + 46)
240 PRINT "Year    "; PEEK (L + 45)
250 PRINT "Hour    "; PEEK (L + 44)
260 PRINT "Minute  "; PEEK (L + 43)
270 PRINT "Second  "; PEEK (L + 42)
280 END
290 DATA 24,251,194,48,244,0,0
300 DATA 244,0,0,244,0,0,244,0,0
310 DATA 162,3,13,34,0,0,225,104
320 DATA 141,0,3,104,141,0,3
330 DATA 104,141,0,3,104,141,0,3
340 DATA 56,251,96
```

Using Two Printers

I'D LIKE TO USE BOTH MY IMAGEWriter (long carriage) and ImageWriter II without unplugging one printer and plugging in the other.

I've been told by some experts that I should use an "AB" switch box. My computer dealer, however, claims that this device works only with IBM systems, not Apple.

George Bray
Frankfurt, Germany

I have a feeling the computer-house people may say you can't use a switch box because the back of your computer may not have RS-232C connectors (25-pin connectors with a row of 13 pins on top of a row with 12 pins).

Apple Computer dealers sell cables that have an AppleTalk connector for the ImageWriter II or the IIGS modem port on one end, and a 25-pin connector on the other.

You can use this type of connector with an AB box to "share" parallel printer interfaces in the same manner as do IBM PC systems. This box can also support the arrangement you want — namely, a cable from the computer to the AB box and a cable from each of the printers to the box.

Utilities Extra

I'D LIKE TO USE THE ADVANCED Disk Utility found on the version 5.0.2 /SYSTEM.TOOLS disk that came with my Apple IIGS.

After booting the /SYSTEM.DISK, I remove it from the drive and insert the /SYSTEM.TOOLS disk; when I select *Adv.Disk.Util*, a title appears on screen, followed by a message box asking me to re-insert the /SYSTEM.DISK. After doing that, a title box for the system utilities appears. The options appear to be limited to formatting and quitting. Where are the utilities?

Robert L. Griswold
Stockton, CA

The reason you have to do the "disk shuffle" is that Apple's Advanced Disk Utility is a desktop application that needs fonts and tools from /SYSTEM.DISK in the middle of the loading process.

If your computer setup has two drives, put the /SYSTEM.TOOLS disk into the second drive before you bring up Adv.Disk.Util. *This program allows for partitioning of small-computer-systems interface (SCSI) hard disks.*

In addition, you can use Adv.Disk.Util *to erase, initialize, and zero volumes or partitions. If you don't have a hard disk using a SCSI interface, all you have available are the features you indicate.*

APPLE CLINIC IS A FORUM FOR ANSWERING YOUR QUESTIONS ABOUT APPLE II HARDWARE AND SOFTWARE. ADDRESS YOUR CORRESPONDENCE TO APPLE CLINIC, *INCIDER*, 80 ELM STREET, PETERBOROUGH, NH 03458. BECAUSE OF THE VOLUME OF LETTERS, MOST WON'T APPEAR IN PRINT, BUT WE'LL TRY TO RESPOND IF YOU ENCLOSE A SELF-ADDRESSED, STAMPED ENVELOPE.

AppleWorks Clinic

By the Technical Support Staff of Claris Corporation

Insufficient Memory

I'm really enjoying the improvements Claris has made in the company's latest version of AppleWorks GS 1.1. On occasion, however, I've noted the message "not enough memory to complete this operation." Do you have any suggestions?

AppleWorks GS 1.1 handles memory-intensive operations much better than previous versions. With the increased size of the new System Software 5.0.2, however, you may have noticed that you can load fewer AppleWorks GS modules into 1.25 megabytes of memory. (If you have an older IIgs — ROM 01 — you need to upgrade your machine to 1.25 megabytes.)

Although power users may want to increase their memory, most people will find the minimal amount of memory adequate. If you choose not to upgrade, here are some helpful tips for maximizing your machine's RAM:

- Don't use too many desk accessories, because they consume memory your application may need.
- Adjust your memory allocation by clicking on the RAM icon in the Control Panel under the multicolored Apple and moving both slider switches to OK (zero K).
- Don't open more AppleWorks GS modules than are necessary for your immediate task. For example, if you're doing a graphics-intensive page layout, close all spreadsheet documents. This will close out the spreadsheet module.
- If you use your machine a long time, its memory can become fragmented. To rebuild or refresh your RAM , simply quit AppleWorks GS and restart. With AppleWorks GS 1.1, this has become a much faster procedure.

Copy Destinations

How do I copy a formula from one cell of the AppleWorks GS spreadsheet to a range of adjacent cells? If I copy the source cell to the clipboard with Open apple-C (OA-C), then use the mouse to select the destination range and press OA-V to paste to that range of cells, the program copies the source cell to only the first cell of the destination range. How can I copy the source-cell formula to the entire destination range?

When you want to copy a formula or text from a source cell to an adjacent destination range, try using Fill instead of Copy and Paste. Position the pointer on the source cell, then drag down or across the destination range. Include both the source cell and the destination range in the same selection. Once you've made your selection, choose Fill from the Edit menu and the program will copy the formula to all destination cells. (See pp. 190–191 in the "AppleWorks GS User's Guide" for more information.)

Note: To copy a formula to a set of non-adjacent cells, paste one duplicate of the formula to the first cell of the destination, then use the Fill command to copy that formula to the entire destination range.

What's the Logic?

There seems to be a logic problem within AppleWorks 2.0 and 3.0. When I use OA-L to set two decimal places in a dollar amount, the numbers don't round properly. Why does this happen?

In all version of AppleWorks, OA-L isn't adequate for formatting dollar amounts, because it doesn't round calculations to two decimal places automatically. Instead, use the @Round function to ensure proper rounding. With the AppleWorks 2.x series, use @Round (A1+.00001,2). With AppleWorks 3.0, use @ ROUND (A1,2). (Cell A1 indicates the cell to be rounded.)

Strange Cycles

While attempting to save a document recently in AppleWorks GS I discovered something unusual: Rather than saving the file, the disk drives kept cycling. Can you explain what's happening?

You probably have a space in your filename — GS/OS doesn't allow filenames that contain spaces. Try naming your customer database file Customers.DB instead of Database Customers, for example.

If closing the gaps in your filenames doesn't solve your troubles, make sure that each name is no longer than 15 characters and that it begins with a letter.

Filenames must contain only the letters A through Z (the program ignores case) and the numbers zero through nine.

Also, if you want to use punctuation, the program lets you use only up to two periods. To change your filename to adhere to these rules, simply type over the highlighted name.

Conversion Confusion

How do I convert AppleWorks files to AppleWorks GS database files if I have hidden fields?

When you're converting AppleWorks database files to AppleWorks GS, any fields that are "hidden" in the original file won't transfer to AppleWorks GS.

If the message "You will lose information in the deleted categories" appears when you're importing an AppleWorks database file, then the AppleWorks file includes hidden fields.

To transfer the complete AppleWorks database (both hidden and nonhidden fields) you must open your database file in AppleWorks, enter list view, and press Command-L for layout.

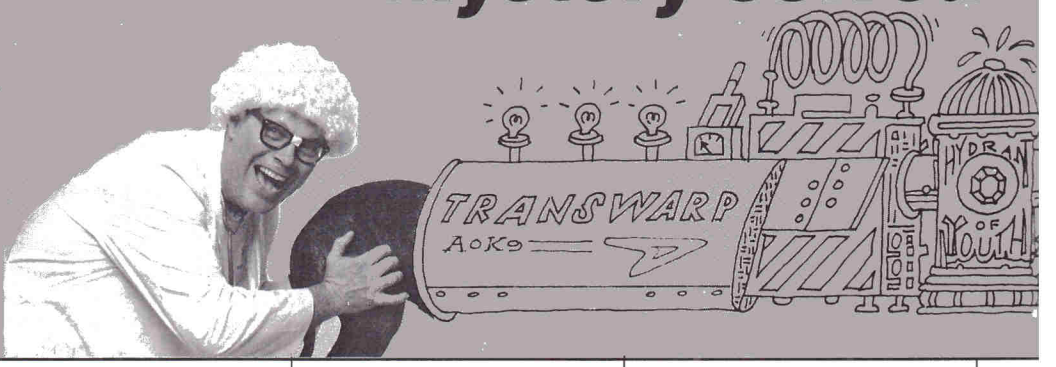
Then press Command-I and a list of the hidden fields will appear. To reinsert a hidden field, highlight the field name (use the up- and down-arrow keys) and press the return key.

Perform this sequence for each hidden field. Continue until there are no fields displayed when you press Command-I. You're now ready to import the complete AppleWorks database file into AppleWorks GS.

If AppleWorks has you stymied, confused, or just plain frustrated, our panel of experts from Claris Corporation can provide helpful answers to your questions. Write to AppleWorks Clinic, *inCider*, 80 Elm Street, Peterborough, NH 03458.

"You silly Sleuth—I've had Barney with me from the beginning. He will be the first dog to test my evil & patented Transwarp Transformer machine. Ha-Ha-Ha, no one can stop me now— NOT EVEN YOU!"

Mystery Solved—



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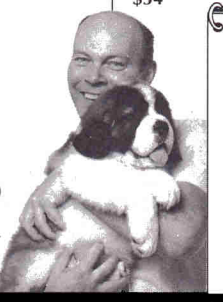

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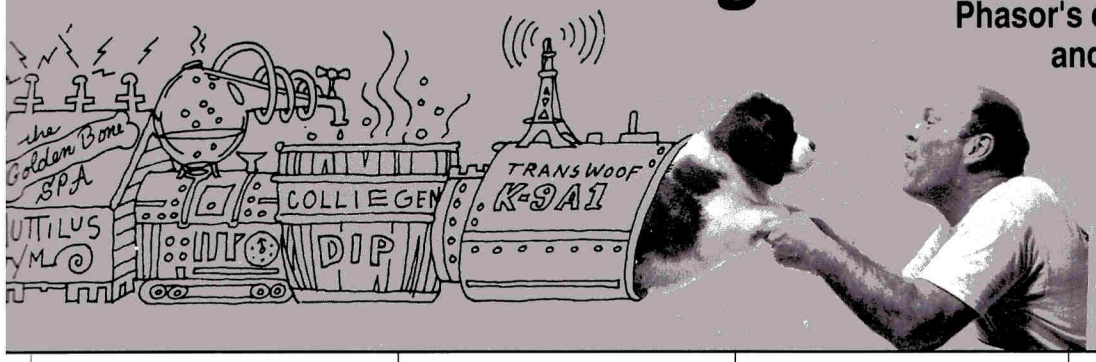

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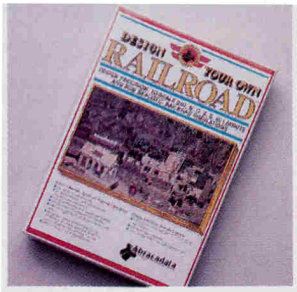

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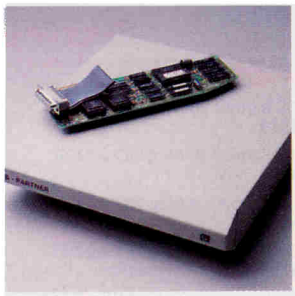

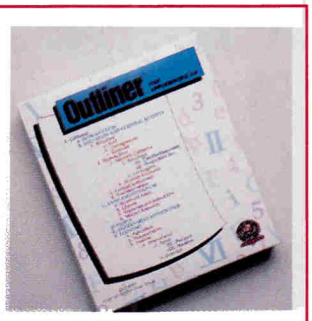

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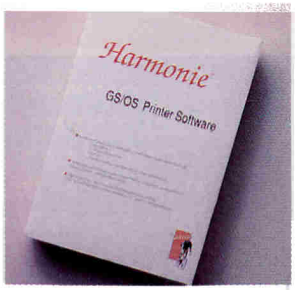

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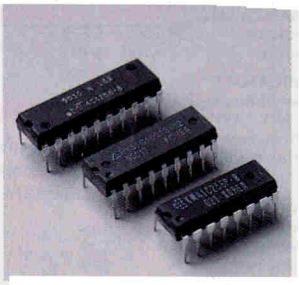

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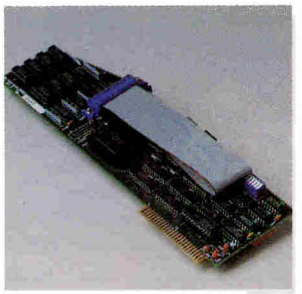

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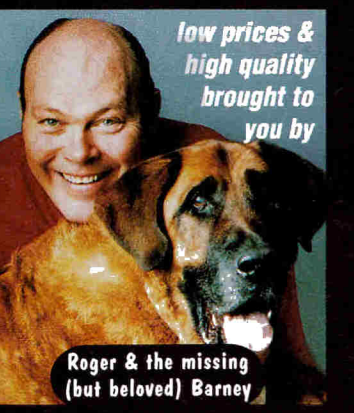

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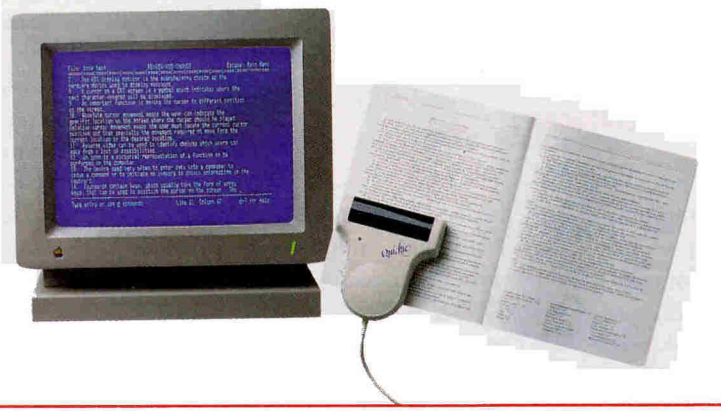

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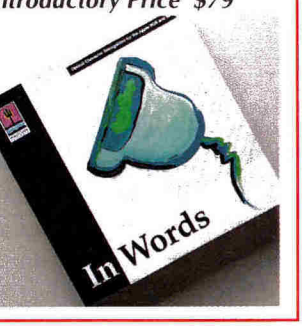

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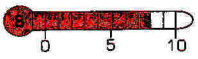
Graphics-design and printing program; 128K Apple IIe, IIc, IIGS; printer required (color printer recommended); $49.95, School Edition $59.95, Lab Pack $119.95; upgrade from original versions of The Print Shop, $20 (free if purchase made after 5/25/89); The New Print Shop Companion $39.95, School Edition $49.95, Lab Pack $99.95; The New Print Shop Graphics Library, $24.95; The New Print Shop Teacher's Guide, $10; The New Print Shop Day Kit, $10

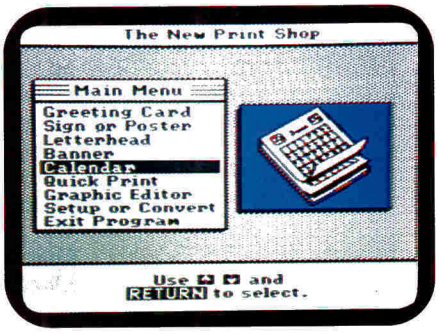


A longtime favorite of desktop publishing — The Print Shop — has finally come of age. With color printing, higher-resolution graphics, and special effects such as flipping and resizing, this latest incarnation, dubbed The New Print Shop, supplants the previous 8-bit version, but doesn't replace The Print Shop GS, far and away the best all-around DTP tool for most GS owners.

For those Apple IIe, IIc, and IIc Plus users who are already Print Shop fans, the many additional features offered by The New Print Shop make the $20 upgrade cost an unusually good bargain. Unfortunately, Apple II Plus owners don't have this option: The New Print Shop not only requires 128K, but also supports additional memory. In fact, the more RAM your computer has, the more complex you can make your design projects.

THE GOOD GETS BETTER

What makes The New Print Shop new? Among other things it includes a more flexible user interface. As before, you select the type of project you want to create from the clearly illustrated main-menu screen. The program still assists your steps through the design process, but now the software checks off important stages automatically as you complete them.



New Print Shop: DTP grows up.

If you choose not to incorporate any artwork on the front panel of a greeting card, for example, the border and graphics check boxes will remain empty. If you've added text, the program fills the message check box. These visual reminders — together with logical sequencing, clearly defined screen headings, and sensible prompting — mean that it's easier than

Photography by • Ed Judice

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ever to design and redesign personal and small-business desktop publications, including side- or top-fold greeting cards, signs, and certificates, as well as letterhead stationery, vertical or horizontal banners, and giant-sized posters.

Advancing a step in any project is as easy as pressing the return key. Going back to enhance or otherwise edit a design means pressing the escape key. The New Print Shop supports menu selection by joystick or mouse, but we prefer interacting with the keyboard. Shortcut commands called *power keys* help you work even faster; instead of searching blindly through the selections of graphics or fonts for the ones you want, simply type the items' names.

The New Print Shop also includes a calendar-making function — yearly, monthly, weekly, or daily layouts for any year. Daily calendars divide your time into hourly increments. For yearly, monthly, or weekly calendars, the program creates a calendar grid automatically and places the dates in their assigned spaces correctly. If your Apple has a built-in calendar/clock, The New Print Shop can read it, saving you the trouble of typing that information.

To customize a calendar just add your choice of graphics, text, and rules at top and bottom. A built-in text editor lets you type in appointments, deadlines, or social engagements. You can even embellish one or more days with clip-art illustrations.

ADD SOME ART

Higher-resolution graphics are a prominent feature of any of the projects you'll create with The New Print Shop. But this modern twist doesn't mean you can't use all those single-hi-res Print Shop graphics you've amassed — a built-in conversion utility makes them compatible. For additional graphics options you can edit existing clip art or draw custom illustrations with the program's graphics editor. And the program's novel quick-print feature lets you create custom graphics from text.

Perhaps the most outstanding graphics enhancement of all is the program's ability to customize layouts as never before. Depending on the amount of memory in your Apple II and the type of project you've chosen, you can use up to four fonts and 26 graphics on a single page. Moreover, you can select each graphic, then move, resize, restyle, and paint in any one of seven crisp colors (black, red, orange, yellow, green, blue, or purple). You can manipulate graphics further either by flipping them horizontally or vertically, or by copying them.

A preview feature helps you visualize your project's development virtually every step of the way. This at-a-glance view doesn't always give a complete picture, nor is that picture always WYSIWYG (what you see is what you get). For example, you must preview the front and inside panels of a greeting card separately, and you can't see the actual color choices. The animated preview for banners, however, is nice.

A fold-out quick-reference card displays the program's font and graphics libraries: ten fonts, 37 single-color and seven multicolor graphics, ten letterhead panels, 12 vertical and five horizontal full panels, three patterns, and 20 borders.

Depending on the nature of the project,

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Circle 297 on Reader Service Card.

you can probably resize your creations. For example, you can increase the size of a poster some 100 times, or shrink a greeting card to gift-tag dimensions. You can also generate as many as 99 copies of a project at one time. The program offers both draft and final printing modes and supports dozens of printers and interface cards. If you're using an ImageWriter II or another color-capable printer, switching from color to black-and-white printing (or vice versa) is as easy as pressing Control-P at the main menu.

QUIRKS

If you want to save completed projects for future use, The New Print Shop will format the data disks you need. The program's save feature warns you if you're about to replace an existing file with one that has an identical name, but it doesn't offer a disk-catalog option to help you name files more consistently.

We're disappointed to learn that we couldn't load a previously saved calendar and direct the program to advance a month. For successive months we had to start from scratch, repeating the steps we took in designing the top and bottom of the prototype.

Minor criticisms aside, The New Print Shop boasts one characteristic that's a hallmark of high-quality software — flexibility. Computer hobbyists today demand freedom of choice, and The New Print Shop gives them more options than ever before.

Cynthia E. Field, Ph.D.
Wakefield, RI

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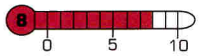

Considering that most Apple II owners rely heavily on AppleWorks, any product that enhances its potential is a significant addition to the software industry. SuperPatch, a utility from Q labs, is just such a product. With a rich harvest of more than 100 patches, SuperPatch helps users tap the power of AppleWorks.

PATCH IT UP

With any of one the product's patches you can change your existing software, meaning you can individualize and personalize your programs. The patch seldom, if ever, changes your software's function — it simply alters the program, making it more suitable to your needs.

SuperPatch offers more than 150 patches for AppleWorks 2.0 and 2.1 and more than 100 patches for AppleWorks 3.0. The patches run the gamut from silly and entertaining to serious and useful: For fun you can use a patch to change the AppleWorks save message from "Carefully saving this file" to "Carelessly saving this

Continued on p. 86

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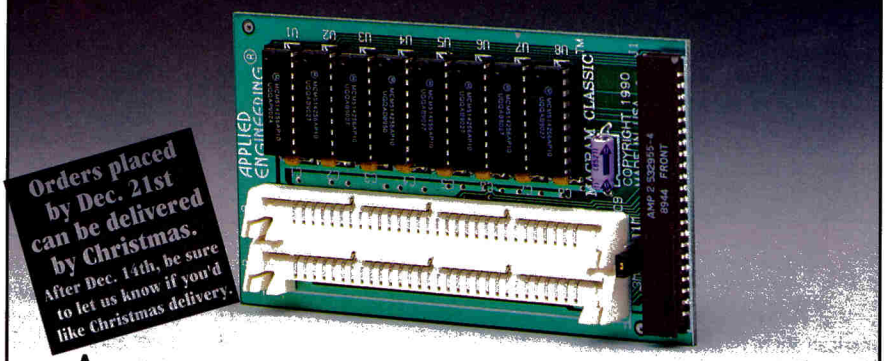

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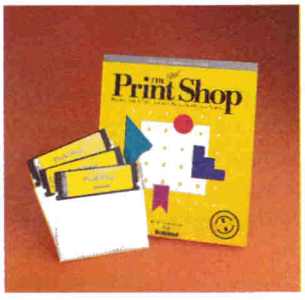

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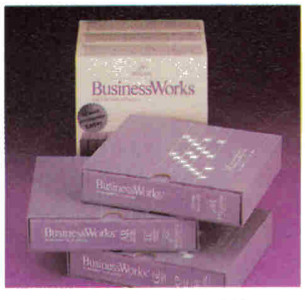

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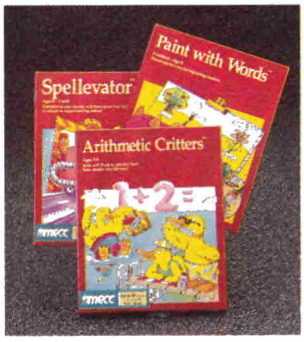

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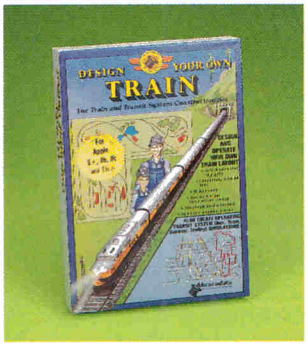

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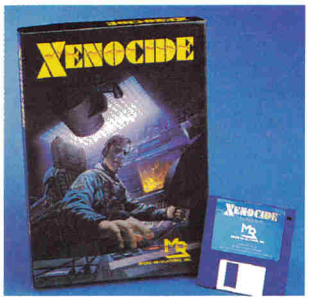

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Meca Software
Managing Your Money v4.0 *(AP & GS)*.....89.
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Invoicer w/A/R & Sales Tracking/Inventory.....139.
Milliken Publishing Medley *(GS)*...75.
Monogram Dollars and $ense.....74.
Nolo Press Will Maker v3.0.....34.
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Sensible Grammar ProDos *(AP & GS)* .....63.
Seven Hills Software
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Timeworks, Inc.
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Graph It!.....45.
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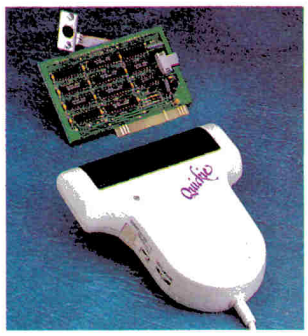

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AE 5.25" Drive.....118.
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Activision
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Charlie Brown's 1, 2, 3's .....19.
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Algebra 1: 1st & 2nd Semester .....48.
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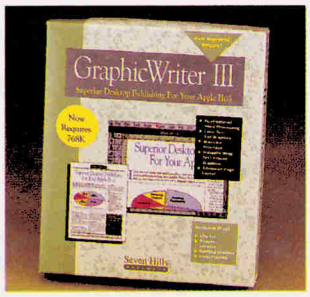

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Reading & Me.....21.
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Grade Busters 1, 2, 3 .....75.

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Essay Ease .....39.

Mindscape
Crossword Magic .....34.

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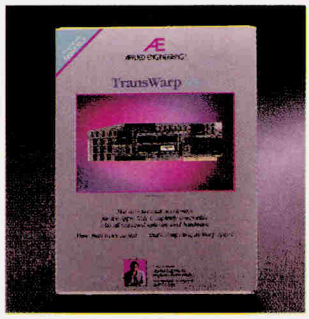

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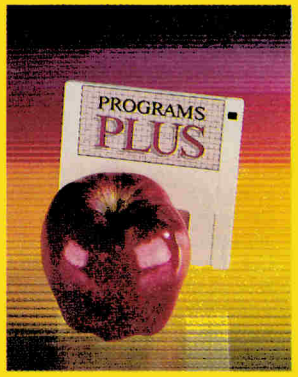

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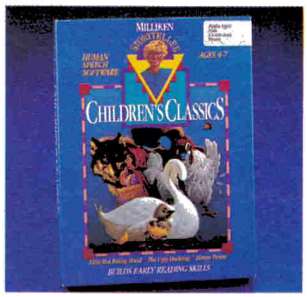

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or Star Saga 2 *(GS)* .....33.

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DataEast
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Bards Tale *(GS)* .....14.
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Cartooners *(GS)*, Bards Tale II *(GS)* 22.
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Pipe Dream.....20.

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Micro League Baseball w/
General Manager & Stats.....24.

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Xenocide *(GS)*.....SPECIAL 29.

Microillusions Firepower *(GS)* .....21.

Microprose
F-15 Strike Eagle
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Pirates *(GS)*.....29.

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Questmaster .....25.
Questmaster *(GS)*.....29.

Mindscape
Balance of Power 1990 *(GS)*.....32.
Gauntlet *(GS)* .....29.
Hostage *(GS)*
or Captain Blood *(GS)* .....29.
Superstar Ice Hockey .....27.

New World Computing
Kings Bounty .....26.
Might & Magic .....19.
Might & Magic II.....36.

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The Tower of Myraglen *(GS)*
or Alien Mind *(GS)* .....39.

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Transylvania 3 *(GS)* .....15.

Ready Soft
Space Ace *(GS)* .....34.

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Wizardry V: Heart of the Maelstrom 32.

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Chessmaster 2100 *(GS)*.....33.
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Spectrum Holobyte
Solitaire Royale *(GS)*.....22.
Tetris *(AP & GS)* .....25.

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Three Sixty
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The Second Scenario.....36.
2088: The Cryllan Mission *(GS)* ....36.
Secrets of Bharas.....36.

Virginia Reel Software
Anchorman .....29.

Walt Disney
Mickey's Crossword Puzzle Maker..25.

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Landscape .....47.
Design Your Own Railroad .....34.
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Electronic Drawing.....32.
Interiors Library 1, 2 *(AP or GS)*
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816/Paint .....49.
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Beagle Draw *(GS)*.....54.
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Combo Pack *(AP)* ..... 53.
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Nature Disk *(AP)* ..... 21.
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Fractal Explorer *(AP or GS)* ..... 27.
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COLOR+ *(GS)* ..... 49.
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DeluxePaint II *(GS)* ..... 18.
DeluxeWrite w/Deluxe Paint II *(GS)* ..... 27.
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Super GS Award Maker ..... 50.
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Graphic Exchange *(GS)* ..... 32.
Hyper Studio *(GS)* ..... 88.
Saddleback
My Paint *(GS)* ..... 35.
Seven Hills Software
SuperConvert *(GS)* ..... 22.
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SCANNERS
HEAD TO HEAD

QUICKIE VS. LIGHTNINGSCAN

Is a picture really worth a thousand words? More and more Apple II owners are finding out — the easy way. For aspiring graphic artists and desktop publishers in any profession, scanning's a source of fresh ideas and a way to try out new techniques. Thanks to a pair of lightweight, hand-held models of miniaturization, illustrating newsletters, brochures, reports, ads, and a hundred other projects has never been so simple.

By Joe Kohn

Photography ÷ Ed Judice

Over the past year, thousands of Apple II owners have opened the door into the exciting world of computer graphics, thanks chiefly to two new peripherals — **Quickie** (Editors' Choice, June 1990, p. 96) and **LightningScan**, hand-held gray-scale scanners from Vitesse and Thunderware, respectively.

If you're a desktop publisher, you'll dazzle your audience with stunning photos and drawings. If you're a computer hobbyist, you'll impress your friends when you show them enhanced portraits of themselves. If you're a student, you may earn better grades by providing illustrations or maps with your reports. If you're a teacher, you can liven up your classroom presentations with relevant, eye-catching graphics. (Remember, though, that the image you're scanning may be copyrighted — and altering the image doesn't alter the copyright protection, because the new graphic is considered a "derivative" work. The "fair use" doctrine does permit reproduction of copyrighted material without permission or fee payment for the limited purposes of teaching, criticism, news reporting, and research, but be careful what you choose to scan, especially if it's for commercial use.)

Where do you start? Scanners let you capture and enhance images from printed media such as books, magazines, brochures, newspapers, and photographs, and create computer graphics from those images easily and quickly. You can print the results, import them into a paint program for manipulation and colorization, or use them as clip art for desktop-publishing projects. Quickie works with II Plus, IIe, IIGS, and Laser 128 computers; LightningScan works only with the GS. Quality varies with the model you're using: Scanning with a GS can reproduce lifelike, near-photographic-quality graphics and super-hi-res line art; on a IIe or Laser 128, photos and line art become double-hi-res graphics; on a II Plus, you'll get single hi-res.

1600 POINTS OF LIGHT

How do scanners perform their sleight of hand? The secret lies in the marriage of hardware and software: the technology of photocopying and the science of digital image processing come together in a unit about 4 inches wide and 6 inches long. A 6-foot-long cable attaches the device to an interface card, which goes into any available slot in your computer; if you're using a GS, you don't even have to change your Control Panel settings. A Japanese corporation called Omron supplies both Vitesse and Thunderware with identical scan heads, Omron model 1700; the companies repackage the units with their own interface cards and accompanying application programs.

Scanning is easy — and produces the best results — if hardware and software settings are in sync before you begin. Start with the controls on the scan head. Look first for the resolution switch on the right side of the unit. This switch determines the size of a graphic and the image's degree of detail: The higher the resolution (expressed as *DPI*, or *dots per inch*), the larger the graphic appears on screen. You'll see settings for 100, 200, 300, and 400 DPI. Scanning a Polaroid-sized photograph at 100 DPI produces a graphic that's just about the right size to use as a Print Shop GS graphic, say, or as a GS Finder icon. At 200 DPI, it occupies a large corner of the screen; a 300 DPI scan takes up slightly more than half the screen; and at 400 DPI, the scanned image would take up the entire screen. Scans on the GS, ➪

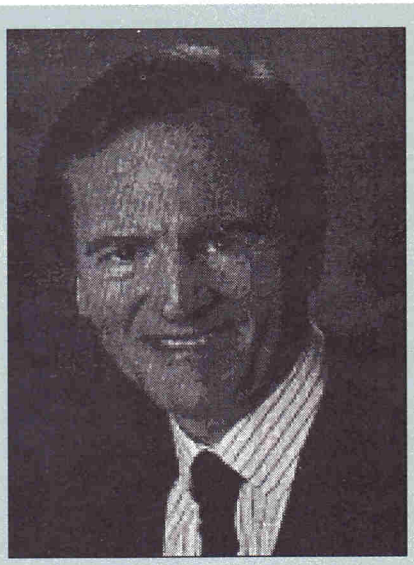


Figure 1. LightningScan, 320-by-200 mode, 400 dots per inch, from 2-by-3-inch glossy color photo.

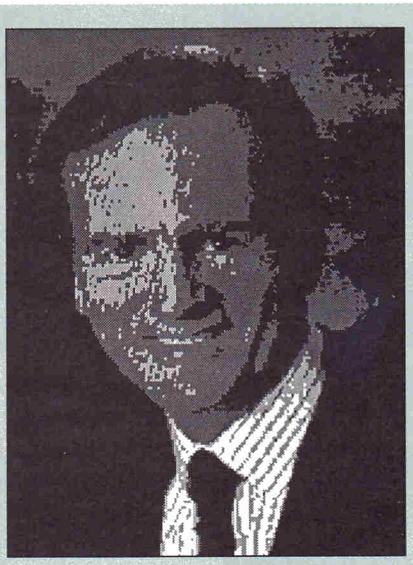


Figure 2. LightningScan, 640-by-200 mode, 400 dots per inch.

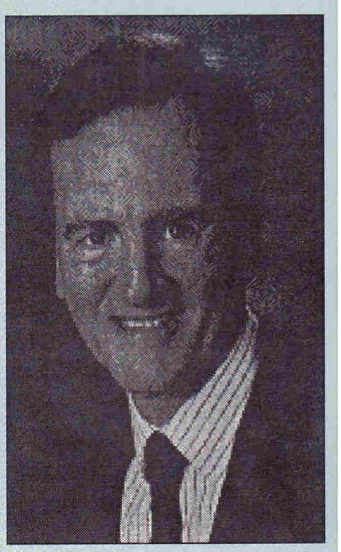


Figure 3. Quickie GS/OS, 320-by-200 mode, 400 dots per inch.

however, can be larger than a single computer screen. Exactly how much bigger depends on the amount of RAM available: The more RAM, the longer a scan can be. Hi-res and double-hi-res graphics, no matter which DPI setting you use, are limited to a single screen.

Now adjust the *letter/photo*, or *dithering*, switch according to the type of source material you're using. Line art and *halftones* (photos that are composed of varying densities of dots on the page, such as those printed in newspapers and magazines) come out picture perfect when the switch is in the letter position. Three other switch positions control the reproduction of glossy photos by the GS — how the scanner will re-create the 16 shades of gray the machine can produce (also known as 320-mode graphics). In actual operation, the different photo positions yield graphics with only very subtle differences. Generally, most users simply opt to use the one letter position and a single photo setting. Experimentation is the best teacher (as well as the most enjoyable method of learning to use the scanner).

The contrast thumbwheel dial, marked *light* and *dark*, generally needs adjustment with each different scan. This feature provides some control over your source image's degree of darkness or exposure —it can help compensate for too much or too little contrast. If you want to experiment, you can start with the switch in the halfway position, scan a portion of the image, then adjust the setting slightly and continue the scan. You'll get a graphic with different gradations of contrast, and you'll be able to see which portion of the graphic is most attractive. Move the switch to the position you prefer.

Now choose the software settings you need (more on this in the next section — specifics vary with the scanner model you're using and the quality of the results you hope to achieve) and you're ready to start.

The clear plastic bar on the underside of each unit contains a bank of 1600 light-emitting diodes (LEDs), arrayed in a single row; you lay your source image on a flat surface, press the start button, and slide the scan bar down the length of the image with the help of rubber rollers on the bottom of the unit. As the scan head rolls over the document, the LEDs project a yellow-green light, which bounces off the page. A sensing device within the unit measures the intensity of the reflected light at regular intervals and translates the relative brightness and the location of each point into digital data.

When you finish the scan, hit the return key and the special interpreter software that comes with the device then organizes the information into a graphics file and re-creates the image on screen. Interestingly, this end of the technology owes a debt to the National Aeronautics and Space Administration's mainframe computers at the Jet Propulsion Laboratory in Pasadena, California: Their sole task is to process incoming signals from far-away spacecraft and to re-create photo-like images — such as the astounding

Quickie Update

Thanks to a boost from its chief competitor in the Apple II hand-held scanner market, Thunderware's LightningScan is now compatible with IIe, II Plus, and Laser 128 machines. In October, Vitesse announced its new **Quickie Update** package: a controller card and two disks of accompanying software that together allow most 100- to 400-dots-per-inch hand scanners for the GS, including ScanMan Plus, Geni, Genius GS 4500, and DFI HandyScan HS3000, as well as LightningScan, to operate with 8-bit computers. The Update package includes a user's guide and is priced at $129. Look for further details in an upcoming issue of inCider. **— eds.**

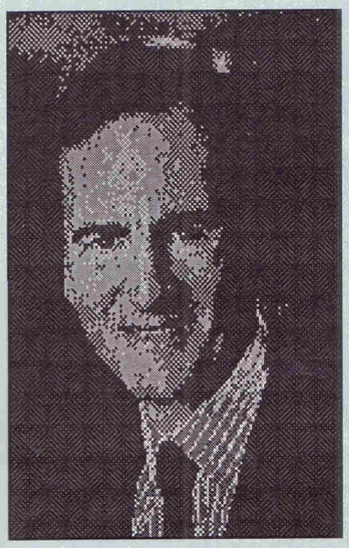


Figure 4. Quickie GS/OS, 640-by-200 mode, 400 dots per inch.

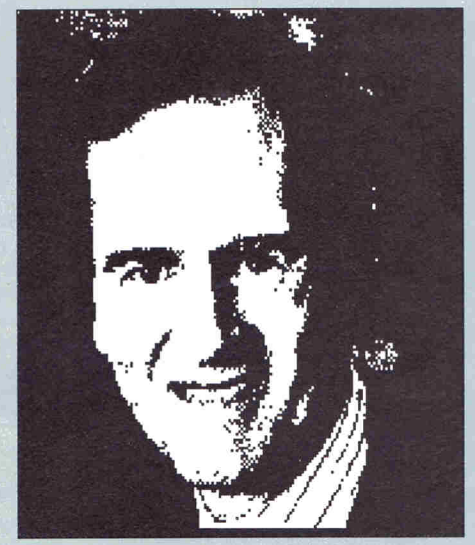


Figure 5. Quickie ProDOS 8, 300 dots per inch, single hi-res.

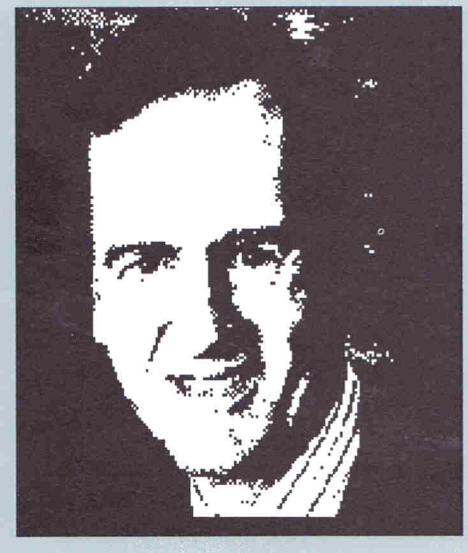


Figure 6. Quickie ProDOS 8, 100 dots per inch, single hi-res.

views we've enjoyed of exploding volcanoes on the moons of Jupiter — from those digital transmissions. Here, the basic principle is the same; though the application is simpler, the miniaturization and streamlining the Vitesse and Thunderware programmers have achieved are small wonders in themselves.

SPEEDING ALONG

Let's examine the software side of scanning in more detail, for that's where Quickie and LightningScan part company. Although each scanner's software produces the same basic results, the programs operate a little differently and as a result offer varying options.

Quickie version 2.02 for the GS comes in stand-alone and new-desk-accessory (NDA) editions, the latter working within other GS/OS programs, such as **AppleWorks GS** and **HyperStudio**. If you call up the NDA within a program using 320 super-hi-res graphics mode, the device will scan in 320 mode, displaying photos in 16 shades of gray; if you call it up within a program running in 640 mode, it will scan in 640 mode, displaying only four shades of gray. In the stand-alone version, you can switch back and forth between 320 and 640 by clicking on a pull-down menu option. Stand-alone Quickie also contains a mini paint program with a "fat bits" mode that can help you clean up a scan after you've finished it.

Recall that you've set the unit's letter/photo switch; your software setting should correspond. Glossy photos reproduce best in the GS' 320 mode, with its 16 shades of gray; choose the software's true gray option, a feature that assigns specific gray shades to areas of the scanned image that aren't black or white and yields remarkable clarity with color photos. The standard default true gray, called *Express*, works quite well for the most photographs, but certain suboptions use different programming techniques and algorithms to fine-tune your graphic. You can also choose to balance the distribution of grays throughout the scan to produce some interesting special effects. Line-art and halftone graphics, each portion of which is simply either black or white, look fine in either 320 or 640 mode. If you like, the software lets you select *pseudo gray*, which adds some gray-tone details at the boundaries of the scanned image to enhance the visual appeal of the graphic.

You also can choose whether you want to scan in *portrait* mode (moving the scanner down the length of the image) or *landscape* mode (moving it left to right, with the software rotating the image 90 degrees for display). That means you can scan images wider than 4 inches, as well as round objects and images that fall near the spine of a book.

Certain Quickie options you need choose just once — the first time you run the program. When you run the software the first time, call up the configuration option and tell the program the number of ➪

A Thunderware Bargain

For a limited time only, Thunderware is offering **LightningScan GS/LC**, a lower-cost hand-held scanner for the Apple IIGS, based on the older Omron 1500 scan head. LightningScan GS/LC ships with the same software and interface card used with the more expensive LightningScan model. GS/LC is a smaller device: The head is about 4 inches wide, but it's only half as long as the other unit. The low-cost version can scan photographs and line art at 100 or 200 dots per inch only; the unit has to interpolate data to display graphics at 300 or 400 dots per inch. Despite this major variation from standard LightningScan technology, GS/LC's output shows only subtle differences from that of the higher-priced model. LightningScan GS/LC is available directly from Thunderware; retail price is $169. **— J.K.**

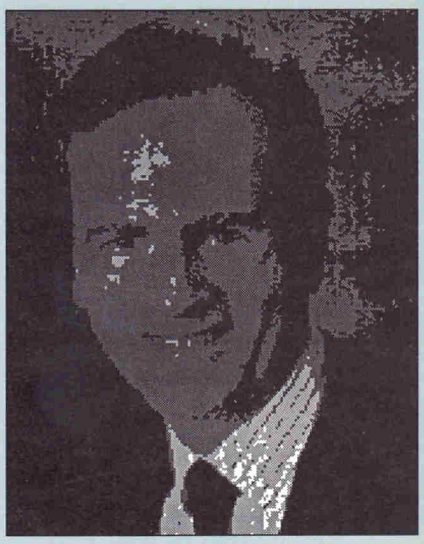


Figure 7. LightningScan GS/LC, 640-by-200 mode, 400 dots per inch.

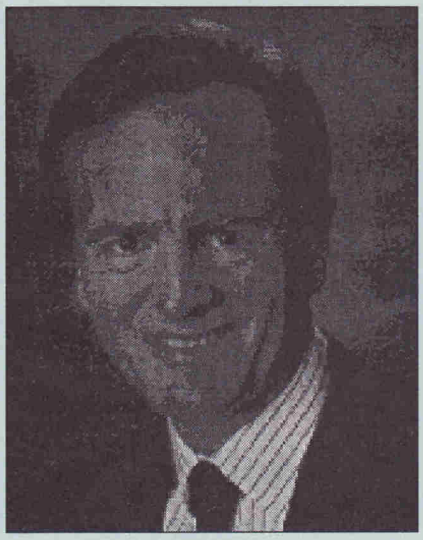


Figure 8. LightningScan GS/LC, 320-by-200 mode, 400 dots per inch.

Figure 9. Quickie, letter switch, 300 dots per inch, line art in black-and-white.

Figure 10. LightningScan, letter switch, 200 dots per inch, line art in 10 levels of gray, contrast enhanced during post-processing.

the slot in which you've installed the interface card. You can also request audio feedback. If you move the scanner too quickly, your image will become distorted; a steady clicking sound from your speaker during a scan will keep you on track. You can toggle the unit's 10-second "timeout" feature — an energy saver that preserves the LEDs by shutting the scan head off if you've pressed the start button without picking anything new up in that length of time.

Once a scan is completed, the image appears on screen within a resizable, movable window. You can display as many windows as the memory in your computer allows. With multiple windows, you can do a series of scans using the many options available and display them next to each other, so that you can see which scan looks best on screen. You can also cut a portion from one scanned image and paste it into another completed scan — ideal for producing comic effects (your dog's head on your cat's body) or for joining scans from an image that's wider than the scan head.

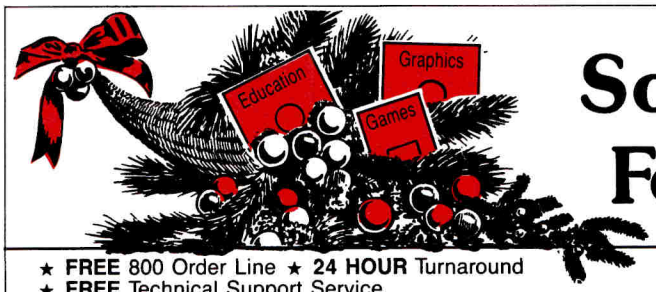
Quickie includes a number of editing tools, as well. You can flip or rotate a graphic horizontally or vertically, invert the entire screen, or resize the graphic. The software supports the GS' clipboard, making the NDA extremely efficient within GS/OS programs that also support the clipboard, such as AppleWorks GS. By copying graphics, or portions of graphics, to the clipboard and then pasting them into an open AppleWorks GS graphics window with a palette, you can colorize your graphics (although the results may be unpredictable). Scan a line drawing, copy it to the clipboard, and paste it into a graphics window to create clip art. Copying a graphic into a feature-packed paint package lets you take advantage of that program's options, as well. Quickie software lets you save your scanned graphics in a variety of formats: screen, paint, Apple Preferred, hi-res, double hi-res, and Print Shop GS.

The ProDOS edition of Quickie's software lets the scanner work with 8-bit Apples — the 64K II Plus and the IIe (enhanced or unenhanced) — and the II-compatible Laser 128. (It also works on the GS, but doesn't take advantage of the unique features of GS/OS, notably 320-mode graphics.) Scans represent the maximum resolution and detail each model can attain. The software comes in two versions: *Quickie.Upcase* works on the II Plus and scans in single hi-res only; *Quickie.System* works on the IIe or Laser 128 and can scan in either single or double hi-res.

All menu screens use the text screen; you make your selections by means of the arrow and return keys. The main menu offers several options, including the all-important *scan the image*, and allows changing maximum length and width before scanning. Width can be 1, 2, 3, or 4 inches; if you select one of the narrower sizes, you can get a longer scan. Height can be 1 to 9 inches, or select all available memory. An aspect correction option let you give the image on screen the same height-to-width ratio as the source image.

Images aren't displayed while a scan is in progress, but audio feedback lets you know whether you're rolling at an acceptable speed. When the scan is completed, just press the return key to return to the main menu. The most important post-processing option available is scrolling the graphic to center it within the screen; because single- and double-hi-res graphics are limited to a single screen, be sure to take advantage of this feature before saving your image. Other options include switching the background color from black to white and inverting the entire image.

Any other editing or printing will require a paint program — Baudville's **8/16 Paint**, for example, which includes separate modules for single-, double-, and super-hi-res graphics, or Broderbund's **Dazzle Draw** perhaps, a double-hi-res program. You can even



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combine scanned graphics with AppleWorks 3.0 word-processing documents, thanks to Beagle Bros' **TimeOut SuperFonts** module. Included in the SuperFonts package is a paint program that will let you edit your scans.

STORM WINDOWS

Thunderware's LightningScan software for the GS comes in two editions, also: a new desk accessory (we reviewed version 1.0) and a stand-alone program (we reviewed version 1.2b1). For 8-bit Apple IIs or full-page scanning, the company offers **ThunderScan**, a cartridge unit that replaces the ribbon on an ImageWriter I or II and reproduces any graphic you can roll through the platen.

At press time these versions of the LightningScan programs were in the beta-testing stage and not yet available to owners; it was anticipated that both would be on the market by the beginning of 1991, as the software is efficient and problem-free. It doesn't include all the editing tools you'll find in Quickie, but in many ways the software does such an excellent job of reproduction (at least with photos) that your images won't need much editing; if you decide to enhance your scans, you can use your favorite paint package. The stand-alone program offers more post-processing features than the NDA, however, including colorization.

In addition to the scanner, interface card, and software, Thunderware includes two tools in the LightningScan package that make it easy to roll the device in a straight line: a "snap guide" and a 13-inch straight-edge ruler. The snap guide is a heavy-duty plastic attachment with straight edges that attaches to the rear of the scanner. When you're ready to scan, lay your image flat and position the ruler at the edge of the graphic; move the scanner so that the snap guide touches the ruler, and you'll be able to move the scanner in a straight line every time.

As with Quickie, the first time you run LightningScan's software, you need to indicate the number of the slot in which you've installed the interface card. The only other configuration option is to indicate whether you want to display your graphic in progress during the scan. (Quickie does this automatically.) Although what appears on screen during a scan looks

Word Power

Borrowing artwork is fine, but what about that other important part of your publication? Think of all the typing time you put in —wouldn't it be handy if scanners could import text, as well?

With a new program called **InWords** from WestCode Software — a company founded by Beagle Bros Alan Bird, Rob Renstrom, and John Oberrick — your Quickie or LightningScan can do just that. InWords, priced at $129, is based on optical character-recognition (OCR) software that lets you scan text from books, magazines, newspapers, or any other printed document and save it as a standard ASCII file or an AppleWorks word-processing document. It operates under ProDOS 8, and works on Apple IIe and IIGs computers. The software sports an AppleWorks-style interface, so anyone familiar with that program should feel right at home with InWords.

InWords can input more than 50 characters per second, or 3000 characters per minute — far faster than retyping. The program comes with a library of recognizable font styles and sizes; with the training module included, you can "teach" it to recognize virtually any other type style from any printed medium, as well.

Set the scan head to letter and use 300 DPI for most text styles. Setting contrast is trickier: If it's too light, InWords won't be able to distinguish individual letters; if too dark, letters will run into each other.

Once you've set up the hardware, the program offers a number of options, including horizontal and vertical scanning, merging two scans into a single file (letting you scan a full 8.5-inch page in two passes), and narrow-column scanning — isolating a single column and ignoring everything else on the page.

The screen remains blank during the scan; when you're finished, press Return to see an enlarged image of your text. Choose the zoom function to see the entire document if you want to check alignment and quality. (Although InWords can compensate for some skewing, it works best when you scan steadily and straight.)

If the document looks good, press Return to enter recognition mode. InWords begins reading the letters in the image and displays recognized text at the bottom of the screen. If InWords doesn't recognize a particular letter or symbol, it stops and displays an enlarged image of the unrecognized character, and prompts you to enter the correct letter. That's also how InWords learns to recognize new type styles; it then creates a font template and stores it on disk.

Text editing comes next; it's much like AppleWorks' word-processing module. Check your material for accuracy against the original and make any necessary corrections, then save it to disk as an ASCII text file, with or without carriage returns at the end of each line, or as an AppleWorks word-processing document.

Near-automatic text input is destined to vastly increase the appeal of hand-held scanners. Sports enthusiasts can input team statistics and create an AppleWorks database easily. Students can input material from textbooks or encyclopedias and then find all references to a particular subject quickly with their word processor's search or find function.

Computer enthusiasts can enter source code and program listings from magazines and technical manuals more efficiently. People with impaired vision can input small-sized text, then display it on screen magnified. The practical, day-to-day applications of OCR are limited only by your imagination.

— J.K.

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nothing like the completed graphic, getting visual feedback is important and fun: For one thing, you'll know immediately whether you're scanning in a straight line. If not, just press the *R* key to start over. The software also provides audio feedback.

The stand-alone software always comes up in 320 super-hi-res mode; the NDA comes up in whatever mode its surrounding application program is running. To start, just pull down the *Scanner* menu and choose the only item — *New Scan*. A dialog box appears with three options: 16 shades of gray, 10 shades of gray, and line art. Click on the appropriate choice and you're ready to scan. A note on the scan length you can complete before running out of memory is displayed next to those options. Because all scans created with the stand-alone software are in 320 mode, use the *Display* pull-down menu to convert to 640 mode if you prefer (for use with another 640-mode program, such as HyperStudio or AppleWorks GS). LightningScan software handles the translation superbly. Despite 640's limitation of four shades of gray, very little tone or detail is lost. LightningScan saves graphics in a variety of formats, including Apple Preferred, single screen, PaintWorks, and Thunderware. The latter lets you load your image into a special application, included in the package, before saving in single- or double hi-res.

As adroitly as LightningScan handles photographic reproductions, line art is a slightly different story. Becoming adept at capturing black-and-white graphics takes some time and some experimentation. You can use either line-art mode or 10 shades of gray, but they tend to create large graphics that can span several screens. Choose a low DPI setting on the scan head and adjust the contrast to get a pure black-and-white image.

You may want to load a large line-art graphic into a separate graphics utility, such as Roger Wagner Publishing's **Graphic Exchange** or Jason Harper's program **SuperConvert**, published by Seven Hills, to rescale it to a smaller size while maintaining the correct aspect ratio; it's an entirely effective work-around method of overcoming LightningScan's single inconvenience. (Note that Thunderware provides an elegant way to switch into another program. From the LightningScan desktop, pull down the *File* menu and click on the *Transfer* option. A program-launcher dialog box appears. Just double-click on the program you want to run — no quitting to the Finder.)

Once a scan has been completed, several post-processing options are available. Under the *Display* pull-down menu you'll find options for adjusting brightness and contrast if your graphic is still too light or too dark, letting you even get rid of unwanted dots. As you change the contrast or brightness, the software also modifies the color palette; a bar graph displays the distribution of the 16 grays in the current selection. Now call up the *filter* option and you'll see several windows on screen. The largest displays your completed graphic — your gray-scale image has become color instantly; a smaller one displays all colors in the graphic's palette. You can edit each color by adjusting the red, green, and blue slider bars, or swap the entire palette for another one. With enough experimentation you should be able to colorize your entire graphic easily enough that when you load it into a paint program, you can complete the process with a couple of mouse clicks on the fill tool.

HANDS ON

No matter what your line of work is, no matter how good an artist you are, we all need to communicate as effectively and efficiently as possible; professional-quality illustrations add detail, substance, and sophistication to your notes, newsletters, presentations, and reports. For work or play, at home, in school, and in the office, lightweight, compact scanners simply offer you more graphics options than ever before — and while you're at it, you'll probably have more fun with your computer than ever before, too. ❑

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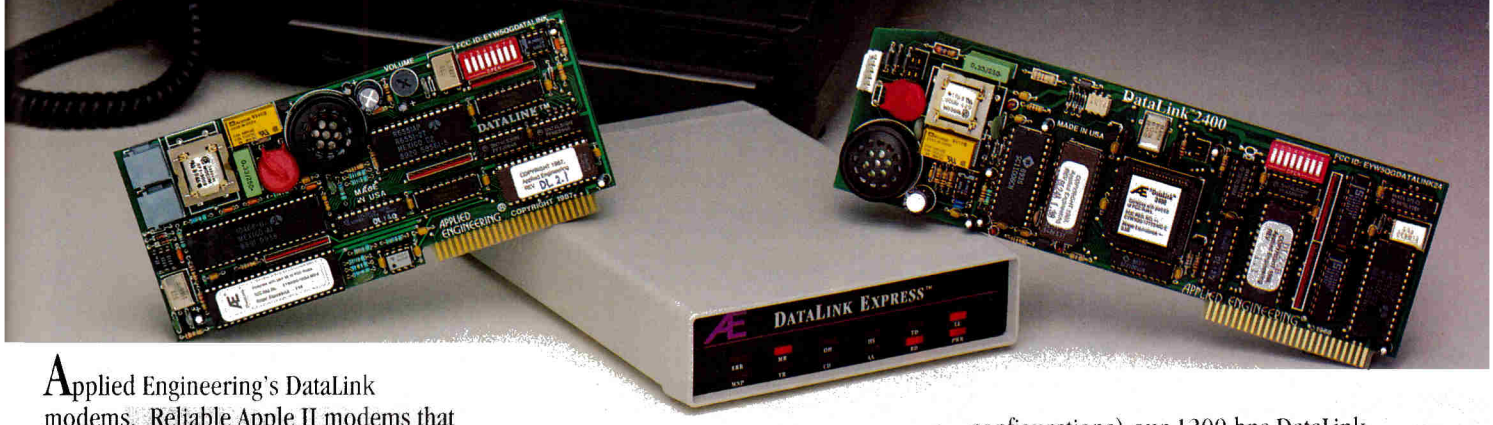

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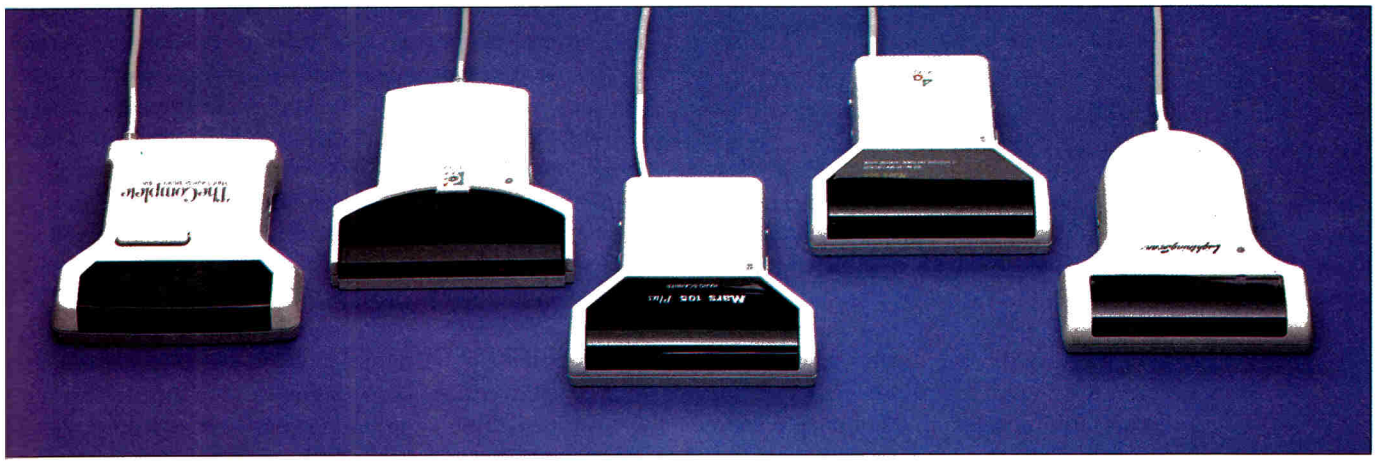

Left to right, Complete PC Half-Page/400, ScanMan 32, Mars 105 Plus, Mars 800, LightningScan 400.

The case is small, but it packs a lot of power — boost your graphics creativity with a portable scanner and give your desktop publications that professional touch.

Free-market economics has finally hit the graphics-hardware business — and Mac users are reaping the benefits: Stiff competition among scanner manufacturers has produced a number of hand-held units with input resolutions more powerful than those of some desktop models costing three times as much. Even if you're working on a low-end black-and-white machine — a 1-megabyte Mac Plus or SE, or a 2-megabyte Classic — with a dot-matrix ImageWriter printer, you can still take advantage of scanned graphics to enhance your desktop publications. (Scanning gobbles up memory, of course, so the more RAM you have, the more you can do with the technology.)

Let's take a look at five low-cost gray-scale models for the Mac line: Complete PC's **Half-Page Scanner/400**, Thunderware's **LightningScan 400** (the Apple IIGS version is reviewed in the accompanying feature, "Scanners Head to Head," p. 44), Marstek's **Mars 105 Plus** and **Mars 800**, and Logitech's **ScanMan Model 32**. All are similar in construction, with three hardware units (SCSI interface box, AC power adapter, and scan head with cable) and software for image capture and rudimentary graphics editing. In addition, Marstek's models come with Digital Darkroom, a high-end image-enhancement application from Aldus/Silicon Beach. Compatible optional programs include optical character-recognition software, such as Olduvai's **Read It! OCR Personal**, for automatic scanned text input.

The five models reviewed here include a gray-scale control, a brightness wheel, and a resolution switch on the scan head. Complete PC has a stabilizing third wheel on its underside to prevent wobbling during scans; LightningScan and the two Mars models come with alignment guides to increase the accuracy of the source material's positioning. All five units claim true gray-scale capability, but they actually capture only 1 bit of information — black or white — for each portion of the page sampled. They simulate true gray-scale information (multiple bits representing various shades of gray) by *dithering* — adding clusters of black and white pixels. The accompanying

By CAROL S. HOLZBERG, Ph.D.

software converts the image to true gray scale on a color or gray-scale monitor or to dithered gray on a monochrome.

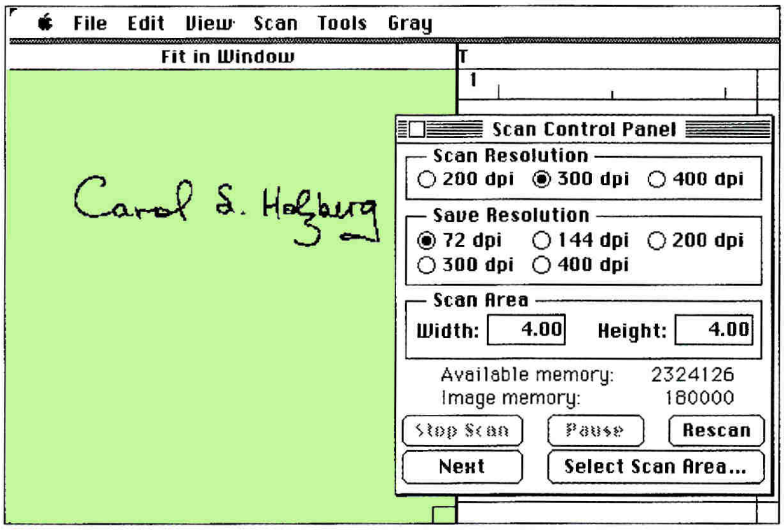

Figure 1. Complete PC, 300 dots per inch, medium brightness, gray-scale switch 1 (black-and-white).

When comparing resolution capabilities, keep in mind that the maximum print resolution of the ImageWriter II is only 144 dots per inch; the LQ can print at 216. The LaserWriter standard is 300 dots per inch; any higher resolution produced by scanning is irrelevant for most Mac-compatible printers.

A COMPLETE SYSTEM

Complete PC's Half-Page Scanner/400 ships with version 1.5 of the company's SmartScan image-editing

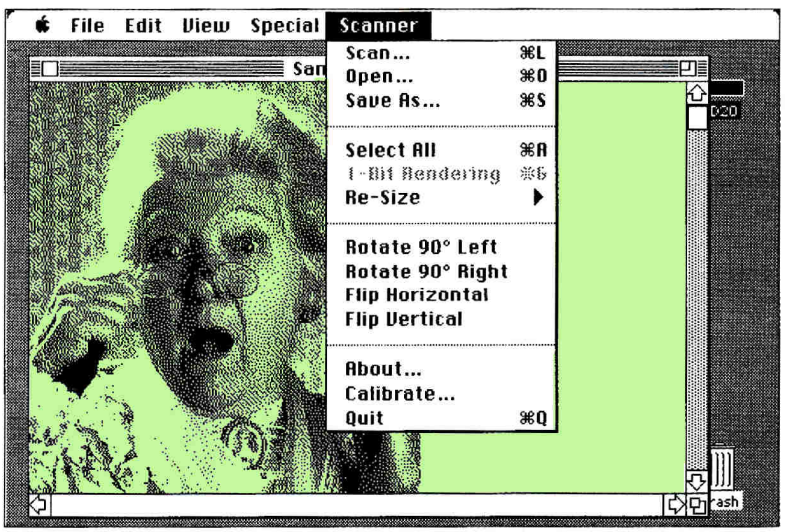

Figure 2. LightningScan options (desk-accessory version), including loading and saving in PICT, Paint, ThunderScan, and TIFF formats and conversion of dithered bit-map images to gray scale. Image displayed as 1-bit dithered rendering on monochrome monitor.

software. It can convert dithered images to four, 16, or 256 levels of gray; on a gray-scale or color monitor, you can use special-effects filters to sharpen, smooth, lighten, darken, crop, rotate, and pixel-edit the image. Yo can also convert gray-scale TIFF and PICT images fron 256 levels of gray to two (black-and-white).

SmartScan offers three viewing options: *Dot-for-Do* (original size), *Fit in Window* (reduced), and *Fat Bi* (enlarged four times). Ruler settings along the top an left side of the display provide sizing guidelines. *Fat Bi* mode lets you edit your image pixel by pixel for pre cision work. In addition, the toolbox provides six basi image-editing features: *selection*, *grabber*, *pencil*, *erase rotation*, and *inversion*, which reverses pixels from blac to white. In *Dot-for-Dot* mode, the software also offe a *Crop* command from the *Edit* menu that works i conjunction with the selection tool to delete all portion of your image that fall outside the selected area.

Two unique high-end options round out the package *Scale by Percentage*, which reduces your scanned imag to as little as 10 percent of its original size, or enlarge it by up to 200 percent; and *Scale by Dimension*, whic lets you size an image's height and width to fit a par ticular space. Note that SmartScan can't splice togethe multiple scans.

LIGHTNING FAST

LightningScan comes with ThunderWorks, powerful image-editing program, with sophisticate gray-scale capabilities, including 13 special-effec filters, such as *sharpening*, *blurring*, *despeckling*, *diffusion relief*, and *edge detection*. Filters are compatible wit monochrome Macs' simulated gray-scale images, to

ThunderWorks comes as a stand-alone applicatio (version 1.0.3) or as a desk accessory (*DA*, version 2.4 The DA has limited functions, but lets you scan image without quitting the application you're running, so yo can paste a graphic directly into an open documen Both versions let you convert 1-bit scanned images t gray-scale files you can edit with 256 levels of gray.

The DA offers only two editing tools: rotation in 9 degree increments, either left or right, and horizont or vertical flipping. Both editions offer six basic pain style tools: selection, eraser, lasso, grabber, pencil, ar magnifying glass. A *join files* feature lets you merg multiple scans into a single file to produce a full-pag image. You can adjust brightness and contrast in th 1-bit files you've converted to gray-scale images.

ImageWriter users have several options, includin hardcopy in three sizes — *full* (72 dots per inch *original* (scanned size), and *current display* — plus stati tical output, with information on dots per inch, brigh ness and contrast, and more; and *diffused dithering*. more faithful rendering of the original.

PAIRING UP

Mars 105 Plus and Mars 800 are of the same bas construction; the 800 model includes a resolutio setting of 800 dots per inch, however, plus a selecti of four halftone patterns, ranging from 4-by-4- to 8-b 8-pixel blocks. A metal alignment ruler is included wi

both models, along with a clip-art sampler containing a number of high-contrast line-art elements. Marstek also markets a 5-inch scanner, **Mars 128**.

Marstek bundles two software applications with its hand-held scanners: ScanLink 1.0, processing software for image capture and minor touchups, and Digital Darkroom 1.1, a high-end graphics-manipulation program from Aldus/Silicon Beach. ScanLink's setup command configures the software to work with the particular Marstek model you're using and the dots-per-inch setting you've chosen; you must follow this configuration procedure each time you scan. A *display while scanning* option is offered. You must also specify your image's maximum length and width. No provision for rescanning is available; you must discard the image in the scan window first.

ScanLink includes five viewing modes: *Fat Bits*, showing each dot as an 8-by-8-pixel square; *Full Size*, showing the image at screen resolution; *Actual Size*, presenting the image in its original size; *Zoom In*, enlarging the image in increments of 100 percent; and *Zoom Out*, reducing the image in increments of 50 percent. The program's selection tool and limited editing functions (rotation and horizontal or vertical flipping) work only in *Full Size* mode. Scrolling isn't provided; you can't edit portions of an image larger than the display.

To manipulate a scanned image, start by saving it as a 1-bit TIFF file and export it to Digital Darkroom. (ScanLink includes no pixel-editing function.) The program features a number of sophisticated editing tools and special-effects filters for enhancing gray-scale images, but many of them aren't discernible on a monochrome Mac. ScanLink offers five save-file formats (TIFF, PICT, EPS, MacPaint, and Postscript), but during our testing, trying to save in any format but TIFF or PICT resulted in errors and system crashes. In addition, Digital Darkroom refused to open ScanLink documents saved in PICT format. There are a few bugs to work out in this system if the software is going to utilize the scanners' capabilities fully.

SCANNING THE FIELD

Logitech's ScanMan Model 32 is a little wobbly, owing to its small roller wheels. The package includes no plastic guide or ruler, either. Prop the scan head against a straight edge for optimum results.

ScanMan lets you achieve 32 levels of gray with an 8-bit video card and a color monitor; you can save in 8-bit TIFF or PICT 2 format. If you have Apple's 4-bit portrait monitor or a monochrome Mac, your scans will be simulated halftones. Save options are Paint, PICT, and 1-bit TIFF. Like ThunderWorks, the accompanying ScanMan program comes as a stand-alone application or as a desk accessory. The software offers two scan modes: *line art*, for black-and-white drawings, and *gray*, for photos and color illustrations. In *gray* mode, you can control image brightness and contrast; in either mode, you can access a tool palette and the *Transform* menu for image editing. Pencil, eraser, and zoom functions are included, plus a shade palette with 32 grays. You can rotate your image or a selected portion of it left

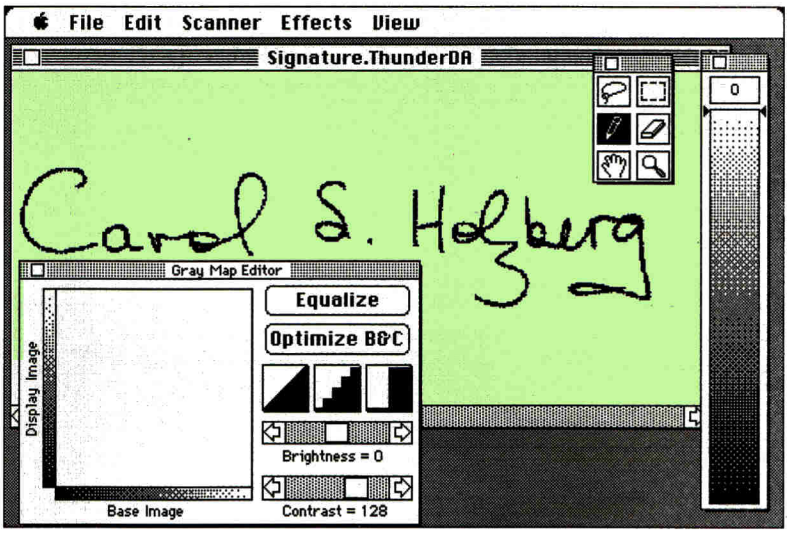

Figure 3. LightningScan with ThunderWorks; note gray palette, tool palette, and gray-map editor with brightness and contrast controls.

or right, flip it horizontally or vertically, or invert it (black pixels become white, and white become black).

At press time there was no image merge for accommodating larger illustrations (although that feature should be available by the beginning of 1991), but ScanMan is the only control program reviewed here that lets you scan sideways. Print options include *screen-image size*, *original-document size*, and *custom*, limited only

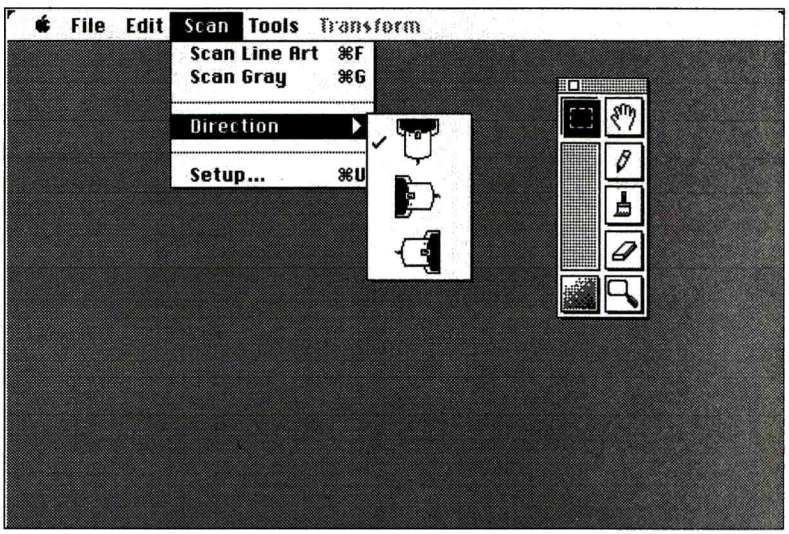

Figure 4. ScanMan software, showing directional controls and tool palette with 32 shades of gray.

by available memory. Like Complete PC's Half-Page unit, ScanMan's software tells you the amount of memory remaining as you scan.

DRESSING UP

Portable scanners are perfect for incorporating photos, small pen-and-ink drawings, cartoons, maps,

and technical illustrations into fliers, mailers, newsletters, and announcements. Even with midlevel to low-end systems, these handy little devices are a shot in the arm for would-be designers. Mac LC owners will

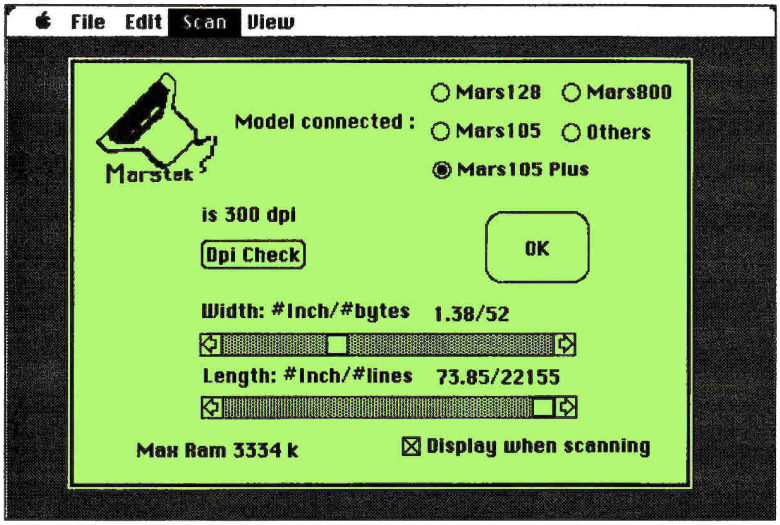

Figure 5. Marstek's ScanLink software, showing dots-per-inch check and display-while-scanning option.

revel in the abundance of high-quality artwork available for colorization with their favorite paint programs, and for monochrome Macs that can't display true gray scale, intelligent scanners can fill in the gaps to produce attractive, subtle shading. It's a buyer's market in graphics these days — if you need professional-looking illustrations and your budget's limited, a hand-held scanner can make all the difference. ❑

PRODUCT INFORMATION

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1983 Concourse Drive
San Jose, CA 95131
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$399

LightningScan 400
Thunderware Inc.
21 Orinda Way
Orinda, CA 94536
(415) 254-6581
$495

Mars 105 Plus, $459
Mars 128, $399
Mars 800, $549
Marstek Inc.
17795 Skypark Blvd. #F
Irvine, CA 92714
(714) 833-7740

Read It! OCR Personal 2.0
Olduvai Corp.
7520 Red Road
Suite A
South Miami, FL 33143
(800) 822-0772
(305) 665-4665
$249

ScanMan Model 32
Logitech Inc.
6505 Kaiser Drive
Fremont, CA 94555
(415) 795-8500
$499

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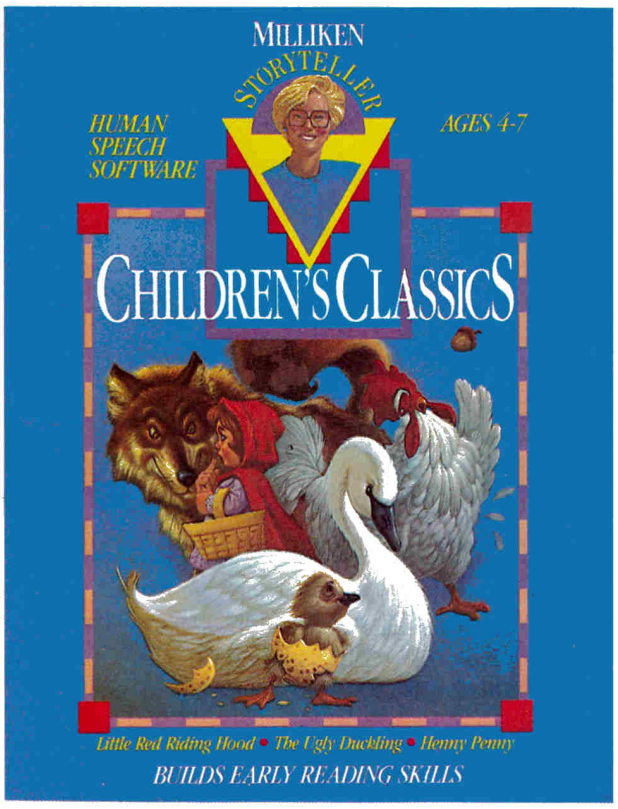

AGES 4-7

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- Animation
- Underlines words as they are spoken
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AppleIIgs and Macintosh

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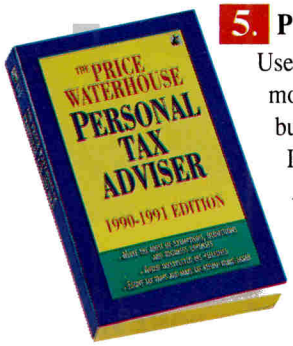

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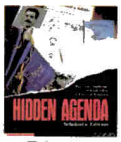 Hidden Agenda Interactive NOVA

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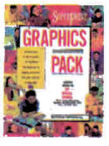
Scholastic Process Writer  Math Shop Series

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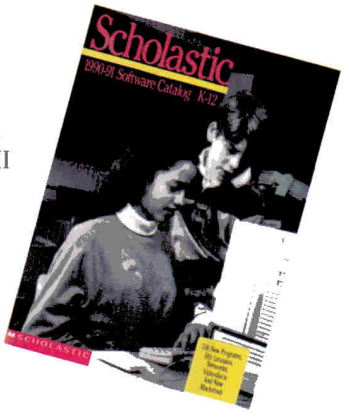

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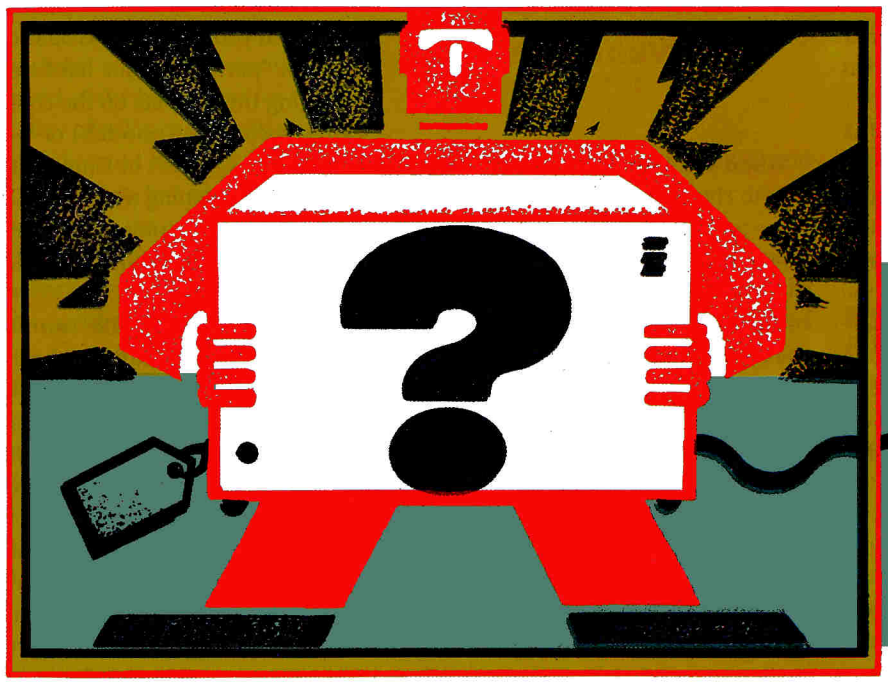


A hard-disk drive is probably the biggest investment you'll make in your computer system. In this first installment in a six-part series, we look at some key questions to ask before you buy.

By Gary R. Morrison and Walker Archer

What makes the personal computer truly "personal" is its ability to store data for future use. In early personal computers, every line of every program and every bit of data had to be typed in each time you used the machine.

Then came the cassette recorder, which let you save or record programs and data on magnetic tape. Finally, the floppy-disk drive appeared. Once you could save your spreadsheet data or word-processor files to disk, the computer became a more useful tool.

Since then, Apple computers have improved dramatically in the amount and types of data storage available: from the 143K Disk II in the early 1980s, to 800K 3.5-inch disks, to hard-disk drives that hold more than 100 megabytes (M) of data.

If you use your Apple II regularly, you might want to consider adding a hard drive to your system. A hard drive is an expensive purchase, however, and there are several questions you should ask before you hand over your money.

WHY DO I NEED ONE?

The two major advantages of a hard-disk drive are *speed* and *convenience*.

No doubt about it — hard drives are fast. A hard disk rotates faster than a floppy disk and the data residing on it is packed more densely. As a result, hard disks generally operate five to ten times faster than floppy disks. For example, on an Apple IIGS with a TransWarp card, an 85K word-processor file that takes 47 seconds to load from a 5.25-inch floppy disk and 38 seconds to load from a 3.5-inch disk takes only five seconds to load from a hard-disk system with the Apple II High Speed SCSI Card.

Because you can store both programs and data on a hard disk, these same speed increases are evident when you load applications such as AppleWorks, The Print Shop, Merlin, or ORCA into your computer's memory. For example, on a GS with a TransWarp card, it takes less than eight seconds for AppleWorks to boot up and ➪

load onto a 1M memory card from a hard disk; it takes 27 seconds to accomplish the same start-up process from a 3.5-inch disk, and 35 seconds plus one disk swap to boot AppleWorks from a 5.25-inch floppy disk. You'll also see improvements when you run disk-intensive programs such as Managing Your Money, because you won't have to wait as long for data and programs to load.

As for convenience, a single hard disk can store an entire collection of floppies. For example, a 20M drive stores the equivalent of 144 5.25-inch floppies or 25 3.5-inch disks. You can copy your programs and data from your floppies to the hard disk, and you won't have to trade floppy disks when you work. In addition, you no longer need to segment large files on different floppy disks; hard drives have the capacity to store dozens of large AppleWorks data files.

WHAT IS A HARD-DRIVE SYSTEM?

A hard-disk-drive system has two major components — the hard drive itself and the *controller card* — plus a cable to connect them. The hard drive consists of one or more aluminum disks enclosed in a special airtight container that prevents contamination from dust, humidity, smoke, and various other environmental hazards. Each platter is coated with an oxide material, similar to a floppy disk's, that records magnetic pulses. The platters rotate at high speed within the container. Riding on a cushion of air generated by the rapid spinning of the platters, a read/write head floats just above their surface.

The hard-drive controller card serves as an interface between an Apple IIe or GS computer and the hard drive. Most often the controller card should be installed in slot 7 in the computer. Because the Apple IIc has no slot to accommodate a controller card, the few hard drives available for that machine put the board in the same case that houses the drive unit and then use signals from the Smartport to control the drive. Most Macintosh computers have a built-in interface for hard-disk drives.

"The two major advantages are speed and convenience."

When you purchase a hard drive, be sure to check the cable that connects the drive to the interface. Some drives use a 50-pin connector, while others have a 25-pin type. Check to see that the other end of the cable matches the connector on the controller card, too.

Another factor to consider is where the drive will sit in relation to your computer. Some drives are shipped with a short cable (18 inches). If you need a longer one, see your dealer to determine the maximum length (usually 6 feet).

Most hard-drive systems for Apple II computers are "external" drives designed to be freestanding units that sit on the desk next to the computer. Applied Engineering manufactures an "internal" drive called the Vulcan, which mounts inside the Apple II case and replaces the power supply. All current Macintosh computers are designed to accept an internal hard drive, but they also have a connector for adding another external type. Although the physical size of hard drives varies, many modern external models are about the size of Apple's original 5.25-inch floppy-disk drive.

HOW MUCH STUFF CAN I STORE?

With the wide variety of drives on the market, selecting one has become as difficult as buying a car. Just a few years ago, the most popular size for Apple II hard drives was 20M. Today, you have the option of purchasing a drive with 100M or more. Prices range from about $500 for a 20M hard drive to $1000 or more for a 100M drive. Although such prices may appear high, the cost per megabyte changes drastically with the size of the drive. For example, 1 megabyte on a 20M drive costs about $25, while 1 megabyte on a 100M drive costs around $10.

Before you rush out and buy a 100M drive, remember that the ProDOS operating system can access up to only 32M on one volume or drive. That doesn't mean that you're limited to 32M drives. You can "partition" your hard drive by changing the jumpers on the controller card (as with CMS' models) or via software (such as Apple's or Chinook's SCSI Utilities). Partitioning tricks ProDOS into thinking you have more than one drive in the slot, each of which can have a capacity of 32M.

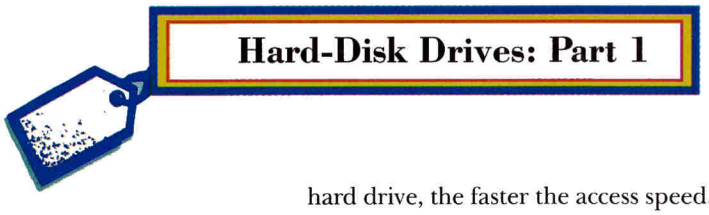
ProDOS restricts the number of volumes you can manage, but those limits are liberal. On all Apple II computers you can have two devices (or drives) in each slot. This feature lets you have two 32M partitions while using only one slot and interface card. If you have a GS and use ProDOS you can trick the computer into allowing up to four partitions on one drive (128 megabytes) by placing the card in slot 5. When you use four partitions, the GS firmware will automatically make it look as if any partitions over the two-partition limit are mapped to slot 2.

Although this method works for some people, there are some serious drawbacks. First, if you use a RAM disk, you'll be able to see only three of the partitions on the hard disk. Second, you must give up the 3.5-inch disk while using the hard drive, because they both map to slot 5.

GS/OS for the Apple IIGS is even more flexible than ProDOS. If you use an Apple-SCSI-compatible hard drive (more on SCSI protocol below) and install an Apple SCSI card in the GS, you can have up to seven hard drives or other SCSI devices connected to that card. There's a catch: When you switch to a ProDOS program, such as AppleWorks, you'll be able to access only the first two partitions, or the first four if the card is in slot 5.

HOW MUCH STORAGE SHOULD I BUY?

The size of the hard drive you buy should depend on how much money you



have available and how much you use your computer. Your personality makes a difference, too. Are you reckless and fast, or careful and slow? Some daring individuals store all their programs and data on their hard drives and essentially stop using floppy disks. More-conservative users prefer to keep their data stored on floppy disks, trading the convenience and speed of the hard drive for the relative safety of a floppy disk. Of course, a floppy disk could fail, but chances are you'd lose only a few files. Some users perfer to have have two hard drives and copy their work from one to the other as a daily backup.

If you decide to store both programs and data on your hard drive, you'll need more storage capacity than if you stored only programs. In either case, you can estimate your current needs by adding up the size of all the program and data files you want to store on the hard-drive system. A good guideline is 144 5.25-inch floppy disks or 25 3.5-inch disks per 20 megabytes.

Determining your future needs is more difficult. Remember, you can't expand a hard drive; if you run out of space, you'll have to add a drive to your system. Also, you'll probably need more disk space than you anticipate. For example, the AppleWorks GS program alone requires approximately 1.5M. To allow room to move, a rule of thumb is to add 25 to 50 percent to your estimate. For example, if you have 100 floppies you want to copy to your hard drive, consider a size larger than 20M. If you have an Apple IIe you'll probably want at least a 20M drive, while a GS owner will probably want at least a 40M drive, because both GS programs and data files tend to be larger.

WHAT KIND OF INTERFACE DO I NEED?

A few years ago, the major hardware manufacturers agreed on a standard way to connect computers with storage devices such as hard drives. This protocol, called the *small-computer-systems interface* (*SCSI*, pronounced "scuzzy"), specifies how a computer and its peripherals should communicate. All popular

"A single hard disk stores the contents of an entire collection of floppies."

hard-drive systems for the Apple II and the Macintosh claim to adhere to the SCSI standard.

In theory, any drive from any company that follows the SCSI standard should be able to work on any Apple II equipped with a SCSI card and on a Macintosh with its built-in SCSI port. Unfortunately, different manufacturers implement the SCSI interface in various ways, resulting in drives that aren't Apple-SCSI compatible. If you plan to add a second hard drive or a CD-ROM drive to your system, you'll probably want to select products that are Apple-SCSI compatible; you'll need only one interface card. Also, if you want the option of moving your hard drive between your Apple II and a Macintosh, you'll need an Apple-SCSI compatible drive.

HOW FAST SHOULD MY HARD DRIVE BE?

Different hard-drive systems store and retrieve data at different rates. One measure of that speed is the *average seek time*, the time it takes the drive's read/write heads to move to the location on disk where the data is stored. It happens so quickly that it's always expressed in thousandths of a second, or *milliseconds*. It's expressed as an average because the read/write heads may not always have to go from one end of the platter to the other. As you'd expect, hard drives with low average seek times are faster than drives with higher average seek times. For example, a hard drive with an average seek time of 25 milliseconds will find data and programs on the drive about twice as fast as a hard drive with an average seek time of 65 milliseconds. In general, the larger and more expensive the hard drive, the faster the access speed.

The access time of the drive, however, is only one measure of drive speed. Of more concern is how fast the data is transferred from the drive to your computer's memory, or vice versa. This *throughput speed* is more a function of the computer, operating system, interface card, and cables. You can spend money purchasing a "faster" drive that in reality will work no faster than a "slower" drive owing to the limitations imposed by the system. Remember — even the slowest hard drive is many times faster than a floppy-disk system.

WHAT'S INSIDE A HARD-DISK DRIVE?

Another factor to consider is the drive mechanism. Many hard-drive manufacturers purchase the actual mechanism from another manufacturer and then add the power supply, fan, and cables. The two most common types of mechanisms on the Apple market are manufactured by Seagate and Connor. If you prefer a particular drive mechanism, you may want to ask your dealer or manufacturer what type of mechanism is used. Some mechanisms are simply better than others in both speed and reliability.

Mechanisms are built differently and can vary widely in durability. Manufacturers calculate the *mean time before failure*, or *MTBF*, for each drive mechanism. This rating is an estimate of how many hours of use the drive will survive, based on lab tests. While MTBF ratings can be useful in rating a drive's life expectancy, they aren't a good indication of how well a drive will stand up to abusive situations, such as dropping.

Important factors in drive reliability and speed are the types of components used internally in the mechanism. Many hard-drive mechanisms now use *plated media* (a hard coating over the magnetic medium to keep read/write heads from scratching it when the drive is bumped) and *voice coil actuators*. An *actuator* is the device that moves the read/write head back and forth across the platters to access files. The most common type of actuator to date has been the stepper ➪

motor. A newer mechanism, the voice coil actuator, is faster and more accurate.

A second aspect to be aware of is the air flow through the housing. How coolly does the drive operate? While the greatest threat to a drive is a sudden sharp movement such as dropping or bumping, another problem is heat. As with all electronic devices, heat can shorten the life of your hard drive, and in this case lead to loss of data.

ANYTHING ELSE?

When all else is equal, there are other factors to consider when you purchase a hard drive. If you have limited desk space, you should consider the physical size of the hard drive. For example, a Chinook 100M drive uses less than one-third of the desk space that a 46M Relax drive requires. The Relax model, however, is only one-third the height of the Chinook.

Some hard drive/controller card combinations require you to power up the hard drive and allow the drive to reach speed before turning on your computer. Other systems let you turn on both the computer and the hard drive at the same time. This feature is more convenient if you like to use the on/off switch on a power strip to control your computers. Drives connected to the Apple SCSI card must be powered up before you turn on the computer. If you're considering an Apple-SCSI-compatible system, you'll need a separate power switch for your hard drive. You may want to consider Applied Engineering's Conserver or Kensington's System Saver GS.

While you're looking at hard drives, you might want to listen to the drive and determine how much noise it makes. Hard drives run continuously and the hum of the drive is annoying to some people. Noise can come from the internal motor that runs continuously or during disk access when you load or save a file.

PARKING PROBLEMS

Another consideration is how you "park" the heads of the drive. When you turn off the power on a hard drive and the platters stop spinning, the drive read/write heads no longer have a cushion of air on which to float, so they settle into physical contact with the platters. "Parking" the drive heads means moving them to an area that doesn't contain data. If the drive is bumped in the parked position, the heads won't be able to scratch the platter in an area that contains data. You should always park the heads before moving your hard drive. Some systems park the heads automatically after a period of inactivity; others force you to park the heads manually by running a utility program, which may or may not come with the hard drive.

"The larger and more expensive the drive, the faster the access speed."

If you need to transport your drive, you might want to consider a hard-drive system with removable media. These drives store data on a cartridge that typically holds 45M of data. You can remove the cartridges for safe transportation. You can also buy additional cartridges to use for backup or as extra storage.

MATCHING HARDWARE AND SOFTWARE

Manufacturers of Apple II and Macintosh drives try to make it easy to install their systems and use their products. Many drives come formatted from the vendor, and most also come ready to boot. You can install the interface card in the appropriate slot and boot your system from the new hard drive.

If the drive isn't formatted or if it's formatted for another system, find out what utilities are shipped with the drive. Some manufacturers provide the necessary utilities to format and partition the drive.

If you purchase a SCSI drive for your Apple II, it might arrive with Mac software. In this case, you need to use a SCSI utility such as Chinook's SCSI Utilities, the GS' System Software, or software supplied with your interface card to format and partition your drive.

CARE AND FEEDING

Finally, you'll want to consider the disk-management software that comes with the drive. Because your programs will now be on the hard drive, you'll no longer need to change disks and reboot the computer. But how do you select the different programs?

If you have an Apple IIGS or a Macintosh, you'll have access to the Finder, which lets you launch programs, delete files, and create new folders. A number of program selectors and utilities are also available for the Apple II. The more common ones are Quality Computers' EasyDrive, Glen Bredon's ProSel, and Vitesse's Wings. Each of these applications lets you build a menu of the programs on your hard drive. All you need to do is highlight the program's name to run it. When you're finished with one application, you're returned to the program selector so that you can choose your next application.

Next month, we'll look at the interface issue in more detail. How important is it that you buy a hard-disk drive that adheres to the SCSI standard? And if you don't go with SCSI, what other choices do you have? ❑

GARY R. MORRISON IS AN ASSOCIATE PROFESSOR IN THE DEPARTMENT OF CURRICULUM AND INSTRUCTION AT MEMPHIS STATE UNIVERSITY, WHERE HE TEACHES COURSES IN INSTRUCTIONAL DESIGN AND TECHNOLOGY. HE IS THE AUTHOR OF THE PROGRAM REPAIRWORKS, PUBLISHED BY QUALITY COMPUTERS, AS WELL AS *THE APPLE II HARD-DISK PRIMER*, PUBLISHED BY THE NATIONAL APPLEWORKS USERS GROUP. WALKER ARCHER IS MANAGER OF SOFTWARE DEVELOPMENT AT QUALITY COMPUTERS, AND HAS BEEN WORKING WITH APPLE COMPUTERS SINCE 1980. GARY MORRISON AND WALKER ARCHER ARE ALSO THE AUTHORS OF AN ON-LINE COURSE IN C PROGRAMMING FOR THE GS. WRITE TO THEM C/O *INCIDER*, 80 ELM STREET, PETERBOROUGH, NH 03458. ENCLOSE A STAMPED, SELF-ADDRESSED ENVELOPE IF YOU'D LIKE A PERSONAL REPLY.

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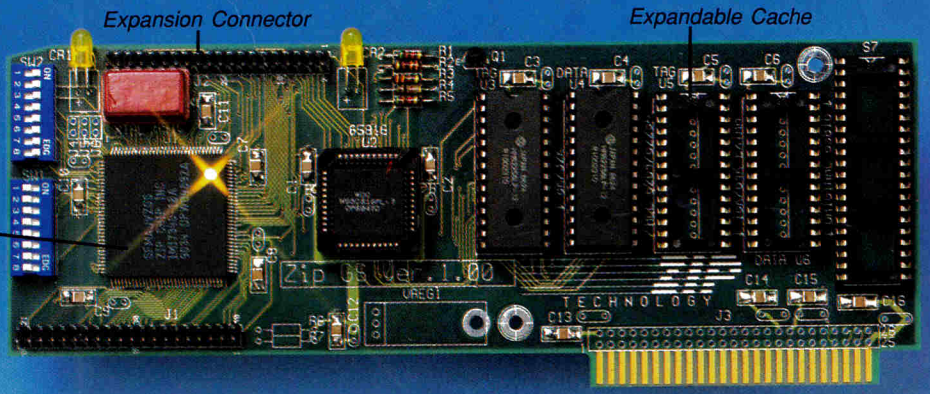

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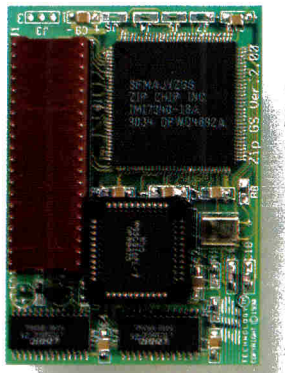

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SNEAK PREVIEW

SmartWorks

By JEFF CABLE * WEST COAST EDITOR

When you say "Apple II software," people think of AppleWorks. When you say "Macintosh software," people think of several programs — most of which are high-priced and narrowly focused. With eight applications and a modest price tag, SmartWorks may be a wise choice if you're shopping for a do-it-all integrated program for your home or classroom.

Even today, after six years of the Macintosh's existence, there has yet to be an integrated program as well-rounded and intuitive as AppleWorks for the Apple II machines.

— Steve Wozniak

IT'S ALWAYS BEEN TRUE that a computer is only as good as the software you can run on it: Even the fastest, most powerful computers are nothing but expensive chips and boards without software to harness their power. While the Macintosh is a sophisticated computer with hundreds of standout programs, until now it has lacked one master-of-all-applications integrated product. **SmartWorks**, a new program from the Leonard Development Group, formerly TML Systems (9143 Phillips Highway, Building 390, Jacksonville, FL 32256, 904-464-0016), may be the integrated software that does for the Mac what AppleWorks did for the Apple II.

SmartWorks sports eight modules: word processor, spreadsheet, database manager, outline processor, charting program, drawing software, paint program, and communications application. If you're familiar with the Apple IIGS, it'll remind you of a certain integrated program from Claris Corporation. If you've ever used AppleWorks GS, you'll feel right at home with SmartWorks.

MOUSE THAT ROARED

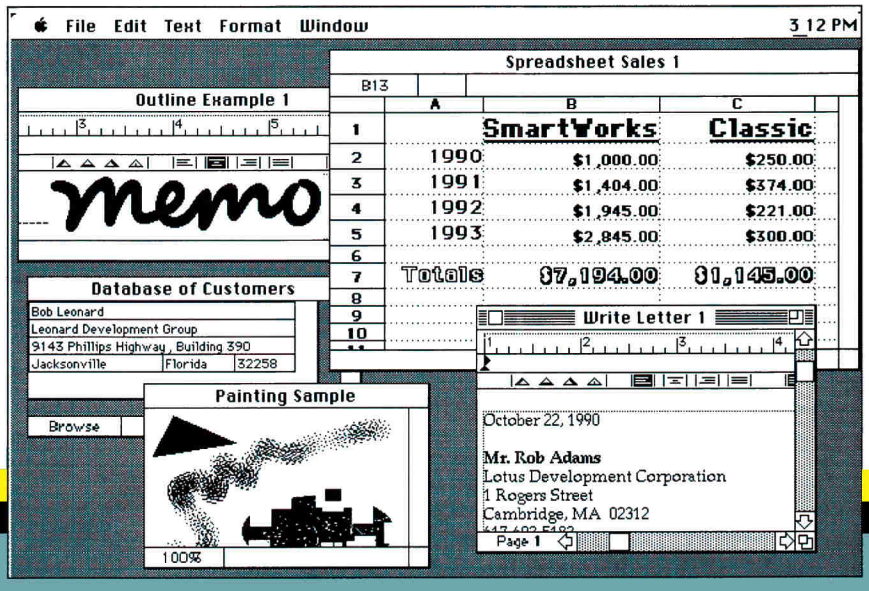
SmartWorks is going head to head with Microsoft Works, which so far has been the AppleWorks of the Mac world. The Leonard Development Group's taking on Microsoft could be described as the biggest David-versus-Goliath battle, since, well, David and Goliath. Company size notwithstanding, SmartWorks has many advantages over Microsoft Works. In short, each module in SmartWorks delivers more functions than its Microsoft rival. For example, while Works offers a minimal number of graphics tools in its word processor, SmartWorks offers a separate and full-featured drawing program in which you can create artwork, then paste it into the word-processing module.

The Leonard Development Group has an extensive programming background with the 8-bit Apple II and the IIGS, so it's not surprising that it realized the significance of importing both AppleWorks and AppleWorks GS files directly. You don't have to save an AppleWorks file as an ASCII text file to convert it to Macintosh format. By including XTND file translators (developed and licensed by Claris), SmartWorks lets you retain all the formatting and type styles of your original AppleWorks or AppleWorks GS document.

MORE THAN MACWRITE

When you open the word-processor module, you'll swear you're looking at MacWrite II. Not only do the two programs look similar, but most of the features of MacWrite II are included in SmartWorks. Key elements include the ability to mix graphics with text, visible page guides, headers and footers, mail merge, search and replace, full font manipulation, and colored text. SmartWorks goes one step further than most other Macintosh software packages, letting you color

Smooth integration of eight modules makes SmartWorks much more than the sum of its parts.



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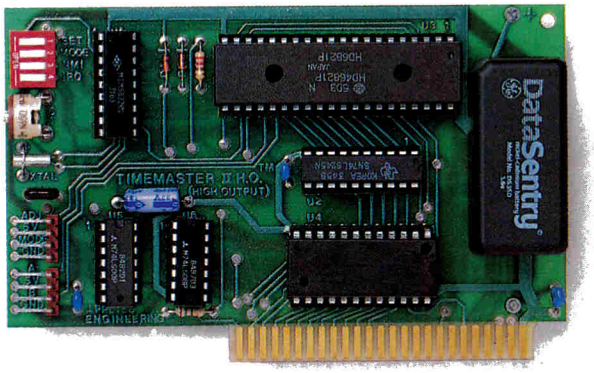

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text in one of 256 different hues instead of the standard choice of six or seven.

Another unique word-processing feature is the module's custom tab marker. Here, you can set it to align on any specified character. Some word processors — AppleWorks GS, for one — have a tab marker for aligning numbers by decimal point. SmartWorks, however, lets you align a tab with any character you like.

SmartWorks also includes a 100,000-word spelling checker and a 660,000-word thesaurus that work in any of the eight modules, even the painting and drawing programs. The spelling checker does everything you'd expect, but the thesaurus seems to do more. When you search through it for a better word, you're presented with numerous synonyms. You can either choose one of the options or look up a synonym for one of the suggested words. This feature makes it much easier to find the word that suits your meaning best.

Some people like to load a word processor, write a paper, print the document, and turn off the computer. Others prefer to organize their thoughts before actually putting them on paper. If you lean toward the systematic approach, SmartWorks' outline processor eases your task. Whether you're writing a paper, giving a presentation, or just getting your ideas together, this module will help you put your material in a logical order. It's similar to a word processor, but each topic gets its own field. Within each topic, you can add multiple subtopics and move topics from one area to another. The result, in theory anyway, is an organized, smoothly flowing chain of ideas.

SPREADSHEETS EXCEL

Even if you consider yourself a spreadsheet snob, the SmartWorks spreadsheet module should be more than adequate. With 16,000 cells vertically and 243 cells horizontally, you'll have plenty of room to move.

Like Microsoft Excel, this spreadsheet has a sorting feature similar to that of a database manager; for example, you can sort your spreadsheet alphabetically or by date. Other interesting features include colored text, a full range of fonts and type sizes in any cell, and a *Go to Cell#* option that as you'd expect takes you to an exact location. You can also set defaults for font and style within the spreadsheet.

Another feature of the SmartWorks spreadsheet, one that most other Macintosh programs of this type lack, is the ability to show grid lines and headings on screen without printing them.

Comparing numbers in a spreadsheet is informative, but seeing your data in graph form is more appealing and often more informative. SmartWorks' charting module lets you transform your raw spreadsheet data into a powerful graphics representation. You're not limited to bar graphs and pie charts, either: You can also choose line charts, area fill charts, horizontal bar graphs, coin stacks, plotting, and more. Although the chart is created in black-and-white originally, you can select all or any portion of the graphic and change to one of 256 different colors.

STILL WAITING

SmartWorks' database manager wasn't complete in the beta copy we previewed, but what we did see was impressive. This free-form database manager lets you move and resize fields to fit almost any need.

Even fields themselves can contain different kinds of information: You can define a field for text, numbers, time/date, pictures, memos, calculations, or

summaries. In addition, you can add sound to the database module in a special field as long as you have an appropriate input device connected to your Mac. (Sound input is included with the LC and the IIsi. If you have any other Mac model, you can add sound with Farrallon's MacRecorder unit.)

DRAWING ON GRAPHICS

One of Microsoft Works' biggest downfalls is its lack of graphics capabilities. SmartWorks, however, is rich with graphics features. The drawing module seems to borrow heavily from MacDraw II. But in addition to the standard drawing tools (ovals, boxes, curves, lines, and text), SmartWorks includes some features MacDraw II doesn't. For example, a tool called *multigon* draws a shape with as many sides as you want: You can specify three sides for a triangle or eight sides if you want an octagon.

The *spec* tool is another nifty feature. This on-screen box shows you the coordinates of the mouse continously. You can change the measurements from inches to centimeters, millimeters, picas, or points if you prefer. It's particularly handy for creating detailed drawings.

SmartWorks also includes a painting module; it doesn't offer anything you wouldn't find in most other programs of that type, however — you get a standard selection of brushes, pencil, paint bucket, circles, and boxes. Although this module is part of a superb package overall, individually it pales in comparison to the rest of the program. It's nice to have a module that allows freehand painting, but where are the advanced color capabilities and other more innovative tools?

TELECOMM TOOLS

The Leonard Development Group tops off the SmartWorks package with a communications module. If you own a modem, you'll find all the standard features for entering phone numbers, setting baud rates, and transferring files. In addition, unlike Microsoft Works and AppleWorks GS, the SmartWorks communications module includes terminal-emulation capabilities. This option is especially helpful if you use your system to connect to computers at work.

SmartWorks is also the first program to implement Apple's new *Communications Toolbox*. This new set of enhancements incorporates important modem settings in one window, making your telecommunications tasks at least a little easier.

BARGAIN PRICES

SmartWorks carries a retail price of $295; the discounted education price, however, is only $129. And if you're a registered user of 8-bit AppleWorks, AppleWorks GS, or Microsoft Works and want to trade in your software for SmartWorks, the price is $99.

The Leonard Development Group will have to sell several thousand copies of SmartWorks before it comes anywhere near unseating Microsoft Works or exceptional stand-alone programs such as MacWrite II or MacDraw II. Based on this preview, though, SmartWorks seems to have the horsepower to take a run at the top Mac programs.

Even if it weren't smoothly integrated, you'd be wowed by the strength of SmartWorks' individual modules, which are comparable to the leading stand-alone packages in their respective categories. But SmartWorks is greater than the sum of its parts. And its aggressive educational pricing should help it find acceptance in schools — a place where no Mac program has established dominance yet. So who knows? After six years, the Macintosh may finally have its AppleWorks. ❑

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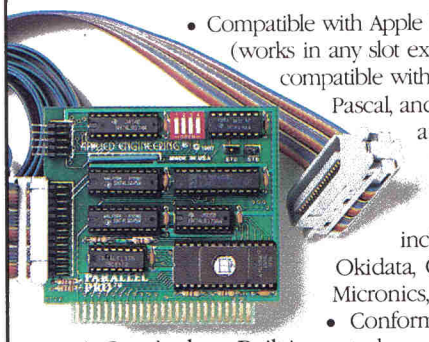

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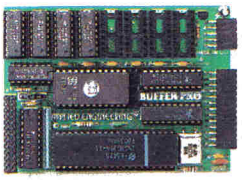

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GRAPHICS GALLERY

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By DEBORAH GREH, Ed.D.

AS EVEN PROFESSIONAL ARTISTS know, there's nothing more frightening or intimidating than a blank sheet of paper or an empty canvas or computer screen. "Where do I start?" "What will I create?" "Do I even have anything to say?" Whether trying to write a school term paper, prepare a presentation, or create an image with pen or pencil, these questions have haunted all of us at one time or another. Artists, writers, and musicians face these questions on a daily basis. Sure, for some the ideas flow like a river downstream. One idea gives way to another and another and another; it grows and multiplies — for a while. When an artist finds a theme that works, he or she will explore it from top to bottom, inside and out, but eventually the idea becomes exhausted and the artist must begin the search again. So you're not alone. The "empty canvas" is terrifying for established and would-be artists alike.

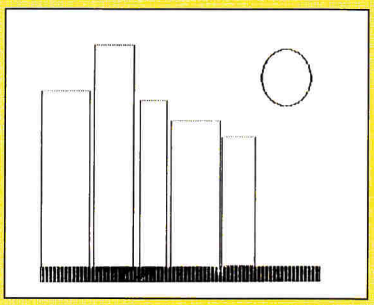

Figure 1. Screen dump of preliminary computer drawing for Cityscape, by Deborah Greh.

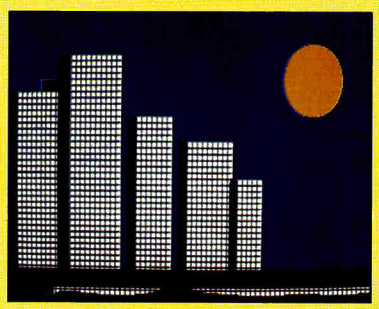

Figure 2. Finished screen version of Cityscape.

Before you can get those ideas to flow easily, however, you must become comfortable with your medium and its tools. If you're new to computers and computer graphics, nothing can block your creativity more than being frustrated with the mechanics of your software. Last month we suggested you get used to that electronic canvas by selecting, in turn, each of your program's tools, then drawing and overlapping simple shapes. We also introduced you to the *Undo* command, hoping to encourage you to experiment with your newly created images. (See "Play's the Thing," p. 76.)

If you're using an Apple II, you're probably working with one of the more popular graphics programs — Broderbund's Dazzle Draw, Baudville's Blazing Paddles and 816/Paint, Electronic Arts' DeluxePaint II, or Mediagenic's PaintWorks Gold. All these packages are good, but if you have yet to pick a program and you have a GS, consider the new kid on the block, Platinum Paint from Beagle Bros (this month's Editors' Choice, p. 112).

No matter what package you choose, you'll probably need to become familiar with its freehand drawing tool. Also, you should investigate how well the software works with your input device, particularly if you're not using a GS and a mouse. Find out whether the program supports your peripherals and sports an easily accessible *Undo* command as well as cut, copy, and paste, and curved-line and arc tools. Discover its colors, fonts, and text options. You also may want to know whether your

program will let you import images and clip art from other sources.

You won't need all of these capabilities to create a simple image. In fact, depending on your equipment, some of these features are useless. If you don't have a color monitor, for example, thousands of hues mean nothing. If you own a color monitor, but can print images only in black-and-white, you may find the hardcopy disappointing.

More sophisticated computers, such as the Mac, support more sophisticated tools. Macintosh paint programs, such as SuperMac Technology's PixelPaint, Silicon Beach Software's SuperPaint 2.0, and Deneba Software's Canvas 2.0, often refine basic abilities to shrink, enlarge, flip, and rotate a "captured area" of an image. And some also sport unique gradient fills, blend and smudge options, custom palettes, perspective, animation capabilities, tiling, and custom paintbrushes.

Of course, the more tools there are, the more you have to learn. Although having access to all of these tools is handy, they aren't necessarily what you need to get started. Even if your program doesn't include a myriad of options, it'll work just fine. You don't need to rush out and buy another software package.

Now that you've become master of your tools, you can let those ideas flow. But what's the best place to start? How do you even get an image on screen? And what concept should you use?

Ideas come from anywhere. Some of you may want to create a landscape or cityscape, others cartoon characters, and still others prefer technical drawings, such as floorplans or diagrams. But don't restrict yourself to one theme — go with your imagination. You'll be in good company. In fact, Leonardo drew everything from portraits (the *Mona Lisa*) to compositions based in landscapes (the *Madonna of the Rocks*) to technical drawings of flying machines and submarines. Van Gogh turned to nature as the basis of most of his work, but he also painted portraits and interiors. Many Americans (Winslow Homer, Andrew Wyeth, Edward Hopper) turned to the fabric of the country — its people and places — for inspiration. Surrealists, such as Salvadore Dali, roamed the world of dreams. Still others, the abstract expressionists in particular, such as Jackson Pollack and Franz Kline, let the paint and canvas guide them; they approached the canvas with an idea, but let the image redefine itself during its creation.

Is there a drawing, painting, photograph, or poster you've always admired? Is there an artist you know, whose works you particularly like? If there's no particular image you can think of, go to books and magazines; search through them and see if there are images that intrigue you or make you think. Save pictures and photos: Use some for inspiration, others as reference tools. And don't forget to look at software; some computer games have exciting graphics. The point is you have to look.

Is there an alternative to the hard work of coming up with an idea? We could tell you what to draw by giving you an assignment. We could take the building of that image step by step — you draw as we instruct. That might work for a while and you'd probably learn some techniques. But you'd also tire of the image quickly, and put little effort into its creation. Besides, we want you to produce unique and individual images. Although this method is one way of learning, an important part of becoming an artist is spending time to develop your skill. The only way you'll enjoy practicing is to design something you like.

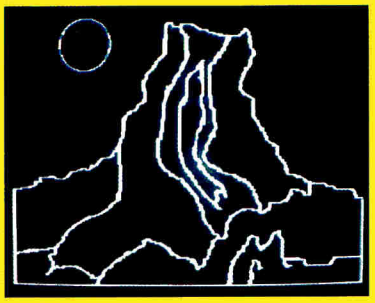

Figure 3. Preliminary screen drawing for Mountains, by Lisa Cook.

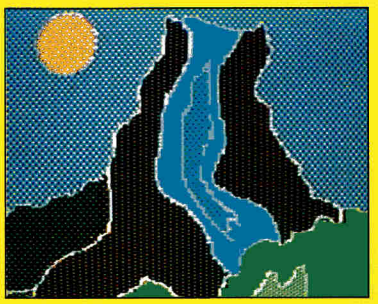

Figure 4. Finished screen version of Mountains.

Once you've come up with an idea, put it in rough form — decide what you want to draw and where you want to place it on screen. You may want to begin sketching your idea by using the freehand drawing tool or brush. Try to copy a simple line drawing to the screen. What kind of line drawing? Perhaps a sketch you've done, or a cartoon character. Try to make the image on screen look like the original. Be careful and patient: You'll probably find your input device hard to control. Lines will jut out when you don't want them to, or you may find making a smooth curved line nearly impossible. In a sense you're learning to see and control the movement of your hand in relation to the image on screen. It's no easy task.

Years ago, before "how to" videos were even thought of, artist John Nagy gave drawing lessons on television. At the beginning of each show he'd let the viewers see the final picture, then take them through step-by-step instructions to create the drawing. By basing all objects on basic geometric forms, he simplified the steps in creating a complex design. Viewers learned to build a barrel with a cylinder, a truck with a series of cubes, and apples and oranges with spheres.

The tools graphics packages provide are ideal for this approach. Use the geometric tools, such as the box, oval, and line commands (both straight lines and curves) to establish the basic form and outline of your image. Once you've drawn the basic shape, you can go back and refine your image by drawing more lines and erasing others.

Every tool an artist uses has its own unique characteristics. Just as a painting created in oils will differ from a painting created in watercolor, artwork created on computers has its own style. Because the screen is made up of pixels, for example, your image probably will look jagged. (A diagonal line of pixels produces a stair-step effect.) And you may be limited by your computer's size and color capability. Even if you use a digitizer or a scanner to take an image from a still or video camera, and transfer it to the computer screen, it'll look different from the original. Part of the fun of working in this new medium is exploring its potential and limitations. If you want to create an image ➪

Hands On

If you're feeling that all is lost and controlling your drawing tools is utterly hopeless, don't give up! When teaching students to draw (and, more importantly, to see), I usually give them an exercise called "contour drawing" that you can try with pencil and paper. It forces you to study an object and gain control.

- Select an object to draw. (I usually suggest that my students start by trying to sketch their hands.)
- Place a piece of paper on a desk or table.
- Get into your drawing position.
- Now, turn your body away from the paper — face as far away from the paper as you can and still be comfortable. (If you're right handed, turn to the left.) You'll be drawing without seeing what you draw.
- Focus your eye on an edge of your hand and position your pencil on the paper.
- With your eye, follow the edges of your hand slowly. As your eye moves over your hand, move your pencil over the paper, following your finger's every bend. Don't speed up and don't stop until you're finished.
- Now look at your drawing. If you've followed these directions, it probably won't look anything like your hand. Don't be discouraged; you're learning eye/hand coordination all over again, and it takes time and practice.
- Repeat this exercise with other objects.

Once you think you've got the hang of it, go back to the computer and try the same exercise with the mouse and freehand drawing tool. Remember, your eyes should be viewing the screen rather than the object you're drawing.

— D.G.

that looks exactly like an oil painting, buy oils and canvas. High-end graphics workstations (those that cost thousands of dollars), can mimic paint and brush to produce images that look like photographs. They offer thousands of colors and resolution so fine that pixels are practically invisible. At this point in technology, however, these workstations are too expensive for most people. Until they undergo a rapid reduction in price, we'll continue working with our Apple IIs and Macs, creating unusual and distinctive pieces of art.

The April issue will be the next time you see this column. The series is going on a brief hiatus, because I'm waiting to hear from you. I'd like to see some of the imagery you've been creating, and listen to any problems you've encountered. Are you having difficulty with perspective? Shading? Let me know. When we return we'll share your triumphs and frustrations. ❑

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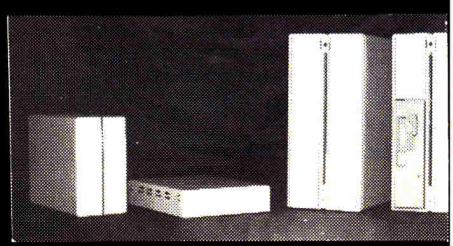

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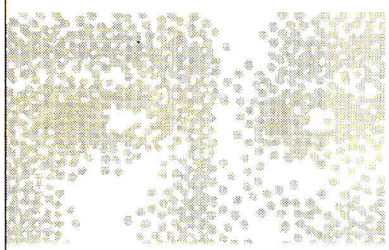

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FEATHERING THE NEST

Calculating your retirement income can help you enter your 'golden years' with financial security and peace of mind.

By RUTH K. WITKIN

WHETHER THE BIG DAY IS JUST around the corner or off in the distant future, shaping a comfortable and secure retirement nest takes some planning. This month you'll take a critical look at the amount of money coming in during your retirement, the amount that will go out, and what you can do to make sure both sides balance — at the very least.

The budget spreadsheet in **Figure 1** lets you list current and retirement income and expenses as if you retired today. Because inflation makes life's necessities cost more in the future, I've included a lookup formula that adjusts retirement expenses based on an inflation factor. (See **Figure 2**.)

The inflation-factor area contains six lookup tables consisting of two columns of cells — H and I, J and K, L and M, N and O, P and Q, and R and S. The lookup formula searches the first column, or the *scan cells*, for a number relating to the years until retirement in P77. When it finds that number, the formula retrieves the corresponding cell's inflation factor from the second column. (We gleaned the inflation factors from the *Encyclopedia of Banking and Financial Tables*. It's wise to consider them as a general guide, not an infallible crystal ball.)

Load AppleWorks and create a new spreadsheet file named **RBUDGET**. When you see the *Review/Add/Change* screen, enter the horizontal and vertical lines that separate the entries into an easy-to-read grid. Referring to **Figure 1**, enter a double line in row 2: With the cursor on A2, type quotation marks, hold down the equal sign until the sign reaches the right edge of D2 (yes, D is correct), and press Return. Leave the cursor on A2 and copy the entire row to the clipboard: Press Open apple-C (OA-C), type **TR** (for *To clipboard* and *Rows*), and hit Return. Move the cursor to A56 (yes, 56 is correct) and copy from the clipboard: Press OA-C and type **F**.

In the same way and on your own, use the minus sign to create a single line from B4 through D4. Copy the row to the clipboard, then copy from the clipboard to B19, B33, B54, and B58.

Next, enter the vertical lines: With the cursor on A3, type quotation marks and the vertical character (shift-backslash), then hit Return. Leave the cursor on A3 and copy the character to A4 through A59: Press OA-C and hit Return twice. Move the cursor to A4, type a period, move the cursor to A59, and hit Return.

Now copy that entire column to the clipboard: Leave the cursor on A3 and press OA-C. This time, type **TC** (for *To clipboard* and *Columns*) and hit Return again. Move the cursor to C3 and copy from the clipboard: Press OA-C and type **F** (for *From clipboard*). Copy the vertical line to E3 and G3 in the same manner.

Before you continue setting up your spreadsheet, turn off automatic recalculation to speed the entry process: Press OA-V and type **RFM** (for *Recalculate Frequency Manual*). Now dive in:

Column width. All columns are now nine characters wide. Use OA-L to reduce columns A, C, E, and G by eight characters (to one); increase column B by 23 characters (to 32); and increase D and F by ten characters (to 19). Here's a shortcut for the rest of the columns: Reduce columns H through S by four characters (to five), then increase I, K, M, O, Q, and S by one character (to six).

Labels format. Use OA-L, *Block*, and *Label format* to right-justify cells B5 through B59. Center the labels in B3 through F3.

Table long lines. Referring to **Figure 2**, enter the long lines in columns H through S (rows 60, 62, 75, and 87) in the inflation-factor section.

Table short line. To create the short line in H64, type quotation marks, press the spacebar three times to indent, type seven minus signs, and press Return. In the next step you'll copy this line to the other cells.

Numbers formats. Use OA-V to set a *standard value* format of *dollars* with no decimal places. Then move to H65 and use OA-L and *Block* to give H65 through H74 *commas* format with no decimal places. Next, give I65 through I74 *commas* format with one decimal place.

Here's a neat shortcut for entering the short line in row 64 and the cells' formats: Place the cursor on H64, press OA-C, and type **TB** (*To clipboard* and *Block*). Move the cursor to H74, then to I74, and hit Return. Now place the cursor on J64 and press OA-C. Type **F** and hit Return. In the same

We don't recommend plucking your Vulcan off a table and dragging it along the ground.

But it's nice to know you could.

October 30, 1990

Gentlemen:

I use my Apple IIGS with a Vulcan and an AE A/D converter at professional waterski tournaments to measure jump distances. I wish to commend you on the durability of your Vulcan Hard Drive.

I was using the computer at the U.S. National Waterski Championships in August when a gust of wind picked up the canopy under which we were operating. Wires running to my system were attached to the canopy and when the canopy blew away, it pulled the computer with the Vulcan off the table and onto the ground, dragging it along the ground some twenty feet. I was actually in the process of writing data to the hard disk at the time.

Even though the incident pulled many of the attaching wires out of the computer, no damage occurred to the computer or the hard drive. I subsequently verified all of the data on the hard drive and found no errors and no bad or damaged blocks in either ProDOS or MS-DOS (I use half my storage for my PC Transporter's MS-DOS files and half for ProDOS).

Needless to say, I am very grateful for a soundly built and well-engineered product.

Sincerely yours,
Roger Dilling
Milledgeville, Georgia

We hope you never drag your hard disk through the dirt, but can appreciate the engineering required to make the above letter possible. Until recently, if you wanted a hard disk for your Apple, you had to add an outdated, boxy external to your desktop clutter. Now, with Vulcan™ on the scene, you have an internal to consider. One that's lightning fast, clean, powerful and affordable.

A glance at the other computer manufacturers; IBM, Compaq, Dell, Mac, tells you something. They're all very different systems, but all come with internal hard disks (it's hard to even find a Mac these days without an internal hard disk). The reason? Internals are the latest advance. The modern storage solution. They become a transparent part of your system, and in the case of Vulcan, actually enhance the rest of your system.

Enhancing the rest of your system. Many feel Apple's standard power supply is insufficient. Add a Vulcan and you make a significant improvement to the rest of your system. The high efficiency power supply in Vulcan is rated in excess of 70 watts, nearly double the capacity of Apple's standard power supply and that of other drives. Vulcan power supply components are heatsinked to the aluminum case for cool operation and long life. And we added an ultra-quiet, flush-mounted cooling fan to keep things cool inside. Vulcan actually beefs up your power supply. External hard disks drain it.

Ease of use. Most hard disks are pretty intimidating. It's frustrating to bring home a new hard disk, only to discover you've got to spend a lot of time setting up for your particular operating system, partitions and formatting. Vulcan comes pre-formatted, pre-partitioned and includes the latest Apple Operating System. You'll be using your Vulcan within minutes. Just pull out your old power supply, plug the Vulcan in it's place, insert the card and turn on the computer. Vulcan will boot to your familiar Apple Finder in a few seconds. Now *that's* ease of use.

Incider/A+ Magazine put it simply in their "Best of the Best" Holiday Shopping Guide: *"The best internal hard disk is the Vulcan from Applied Engineering - you can use it with DOS 3.3, ProDOS or GS/OS, and it comes with its own fan and power supply".* Vulcan incorporates the most popular standard protocols for a hard disk and includes an ultra-fast 16-bit data bus controller, not the less expensive 8-bit others use. And since Vulcan is fully compatible with our PC Transporter, you can create ProDOS or MS-DOS storage space, in addition to GS/OS, DOS 3.3, CP/AM or Pascal 1.3. No

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	A	B	C	D	E	F	G
1			RETIREMENT BUDGET				
2							
3		MONTHLY INCOME OR EXPENSE		BEFORE RETIREMENT		AFTER RETIREMENT	
4							
5			INCOME				
6			Employment	$6,605		$0	
7			Interest & Dividends	$95		$119	
8			Real Estate Rentals	$0		$0	
9			Corporate Securities	$110		$147	
10			Business Partnership	$0		$0	
11			Life Insurance Annuities	$0		$192	
12			IRA/Keogh Retirement Plans	$0		$1,792	
13			Social Security	$0		$1,400	
14			Company Pension	$0		$767	
15			Veterans Pension	$0		$125	
16			Withdrawal From Savings/Invest	$0		$500	
17			Other	$0		$125	
18			TOTAL INCOME	$6,810	1	$5,167	
19							
20			FIXED EXPENSES				
21			Rent or Mortgage	$923		$575	
22			Utilities	$110		$60	
23			Telephone	$66		$76	
24			Life Insurance	$185		$0	
25			Health Insurance	$340		$200	
26			Medicare/Catastrophic	$0		$8	
27			Car Insurance	$70		$65	
28			Home & Property Insurance	$40		$25	
29			State & Federal Taxes	$2,000		$325	
30			Debts & Loans	$172		$150	
31			Other	$0		$0	
32			TOTAL FIXED EXPENSES	$3,906	2	$1,484	
33							
34			FLEXIBLE EXPENSES				
35			Food & Beverages	$200		$200	
36			Clothing	$300		$175	
37			Meals Out	$400		$450	
38			Property Maintenance	$300		$50	
39			Household Furnishings	$225		$50	
40			Car Gas/Maintenance	$100		$100	
41			Transportation	$200		$40	
42			Medical (Unreimbursed)	$40		$60	
43			Dental (Unreimbursed)	$30		$35	
44			Drugs (Unreimbursed)	$15		$25	
45			Savings & Investments	$500		$0	
46			Recreation & Education	$100		$200	
47			Travel & Sightseeing	$75		$350	
48			Gifts & Contributions	$100		$25	
49			Personal Grooming & Fitness	$50		$50	
50			Laundry & Dry Cleaning	$40		$25	
51			Newspapers/Magazines/Books	$15		$20	
52			Other	$0		$0	
53			TOTAL FLEXIBLE EXPENSES	$2,690	3	$1,855	
54							
55			TOTAL MONTHLY INCOME	$6,810	4	$5,167	
56			TOTAL MONTHLY EXPENSES/TODAY	$6,596	5	$3,339	
57			TOTAL MONTHLY EXPENSES/RETIRE	--		$5,342	6
58							
59			MONTHLY REMAINING OR (SHORT)	$214	7	($175)	8
60							

Figure 1. Retirement budget with sample entries. Highlighted cells contain formulas.

manner copy the line and formats into L64, N64, P64, and R64. Format P77 to show *commas* with no decimal places.

Now enter the labels (not the numbers) shown in **Figure 1**. You don't have to press Return after; simply move the cursor to the next cell and save your keystrokes. To center the title, *RETIREMENT BUDGET*, in B1, type quotation marks, press the spacebar 27 times, and type.

After you complete the budget labels, enter the labels *and* numbers in the lookup tables shown in **Figure 2**. (Remember to indent the text in H80 one space.) The percentages you'll find in row 63 and column I are labels, not numbers, so type quotation marks before each one. You need to type quotation marks before the formulas, too. To make things easier, after typing the numbers in H65 through H74, copy them to the clipboard, then to J65, L65, N65, P65, and R65.

The highlighted areas in **Figure 1** show the formula locations. Read how the formula works, then place the cursor on the cell receiving the formula. Move the cursor to cells shown in the formula and type everything else. When the formula is complete, compare each character on your screen with the description here. If everything agrees, press Return. If something's amiss, press the escape key and start again.

FORMULA 1: Total Income. The first formula adds your *INCOME* (D6 through D17) to produce the *TOTAL INCOME* in D18. All SUM formulas include the blank cell above the first number in the list. If you insert rows later between this blank cell and the last number in the list (directly above the SUM formula cell), AppleWorks will adjust the cell references to account for the new rows.

Cell location: D18

Formula: @SUM(D17.D5)

You now see a zero in D18. With the cursor on D18, press OA-L and hit Return to confirm *Entry*. Type **PN** (for *Protection Nothing*). Protect every other formula the same way. When you copy the formulas, AppleWorks will copy the protection, too.

FORMULA 2: Total Fixed Expenses. This formula adds the list of *FIXED EXPENSES* (D21 through D31) to produce the *TOTAL FIXED EXPENSES* in D32.

Cell location: D32

Formula: @SUM(D31.D20)

FORMULA 3: Total Flexible Expenses. By adding the spreadsheet's long list of *FLEXIBLE EXPENSES* (D35 through D52), this formula produces *TOTAL FLEXIBLE EXPENSES* in D53.

Cell location: D53

Formula: @SUM(D52.D34)

FORMULA 4: Total Monthly Income. The fourth formula copies *TOTAL INCOME* from D18 to D55.

Cell location: D55

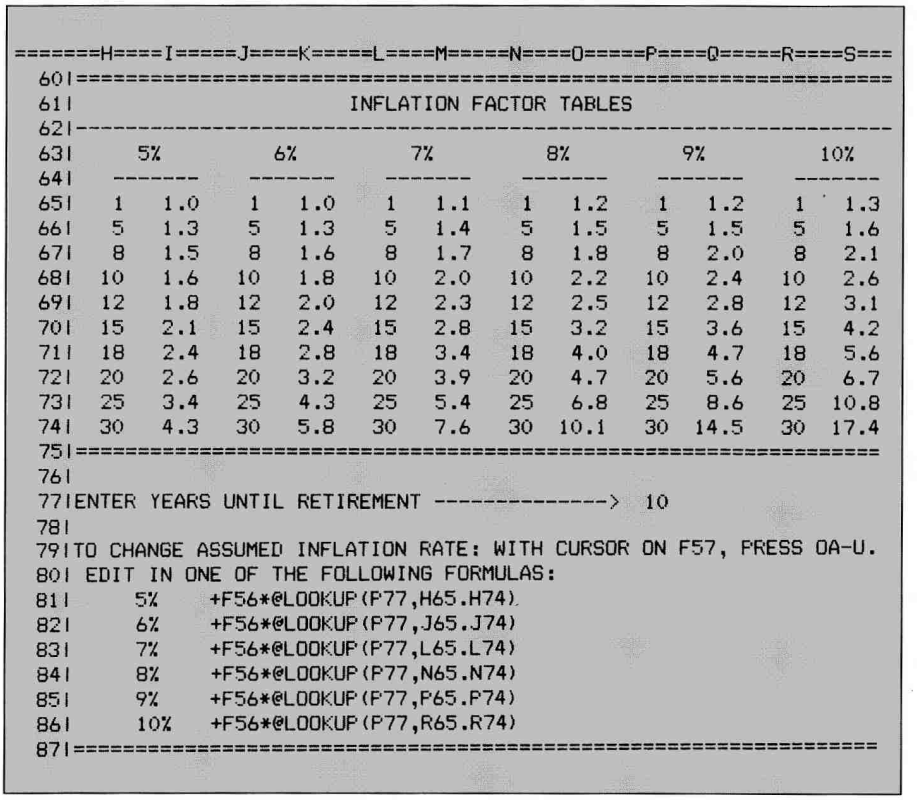
Formula: +D18

FORMULA 5: Total Monthly Expenses/Today. This formula adds *TOTAL FLEXIBLE* and *FIXED EXPENSES* (D32 and D53) — expressed in today's dollars — and enters the result in D56.

Cell location: D56

Formula: +D53+D32

Now copy Formulas 1 through 5 to the *AFTER RETIREMENT* column, where they can perform the same calculations: Place the cursor on D18, press OA-C, and hit Return. Move the cursor to D56 and hit Return again. Press Right Arrow twice, and hit Return again. All cell references are *relative*, so press OA-R. Now enter the rest of the formulas.



```
=======H====I=====J====K=====L====M=====N====O=====P====Q=====R====S===
  60|=================================================================
  61|                        INFLATION FACTOR TABLES
  62|-----------------------------------------------------------------
  63|     5%          6%          7%          8%          9%          10%
  64|    -------     -------     -------     -------     -------     -------
  65|   1   1.0     1   1.0     1   1.1     1   1.2     1   1.2     1   1.3
  66|   5   1.3     5   1.3     5   1.4     5   1.5     5   1.5     5   1.6
  67|   8   1.5     8   1.6     8   1.7     8   1.8     8   2.0     8   2.1
  68|  10   1.6    10   1.8    10   2.0    10   2.2    10   2.4    10   2.6
  69|  12   1.8    12   2.0    12   2.3    12   2.5    12   2.8    12   3.1
  70|  15   2.1    15   2.4    15   2.8    15   3.2    15   3.6    15   4.2
  71|  18   2.4    18   2.8    18   3.4    18   4.0    18   4.7    18   5.6
  72|  20   2.6    20   3.2    20   3.9    20   4.7    20   5.6    20   6.7
  73|  25   3.4    25   4.3    25   5.4    25   6.8    25   8.6    25  10.8
  74|  30   4.3    30   5.8    30   7.6    30  10.1    30  14.5    30  17.4
  75|=================================================================
  76|
  77|ENTER YEARS UNTIL RETIREMENT ------------->  10
  78|
  79|TO CHANGE ASSUMED INFLATION RATE: WITH CURSOR ON F57, PRESS OA-U.
  80| EDIT IN ONE OF THE FOLLOWING FORMULAS:
  81|      5%    +F56*@LOOKUP(P77,H65.H74)
  82|      6%    +F56*@LOOKUP(P77,J65.J74)
  83|      7%    +F56*@LOOKUP(P77,L65.L74)
  84|      8%    +F56*@LOOKUP(P77,N65.N74)
  85|      9%    +F56*@LOOKUP(P77,P65.P74)
  86|      10%   +F56*@LOOKUP(P77,R65.R74)
  87|=================================================================
```

Figure 2. Inflation-factor table in retirement budget.

FORMULA 6: Total Monthly Expenses/ Retire. Formula 6 calculates expenses that are adjusted for an average rate of inflation. The formula looks up the number of years until retirement in P77, then scans the first column in the 5 percent lookup table for a matching number. When it finds a match, it retrieves the inflation factor from the corresponding cell to the right, then multiplies flexible and fixed expenses in F56 by this factor.

Cell location: F57

Formula: +F56*@LOOKUP (P77,H65.H74)

As noted in the inflation-factor table, you can edit this formula based on your own assumptions.

FORMULA 7: Monthly Remaining or (Short) Today. Formula 7 subtracts *TOTAL MONTHLY EXPENSES/TODAY* (D56) from *TOTAL MONTHLY INCOME* (D55) and enters the result in D59.

Cell location: D59

Formula: +D55–D56

FORMULA 8: Monthly Remaining or (Short) at Retirement. Formula 8 subtracts *TOTAL MONTHLY EXPENSES/RETIRE* (F57) from *TOTAL MONTHLY INCOME* and enters the result in F59.

Cell location: F59

Formula: +F55–F57

The formula has no entries to work with, so *NA* (for *not available*) appears on screen.

The formulas are complete, so press OA-S to store the spreadsheet on disk. Now enter the practice numbers shown in the non-highlighted areas of **Figure 1**. Again, simply type a number and move the cursor to the next cell needing a number. AppleWorks will enter dollar signs and commas, so there's no need to type them. Whenever you want to see the results, press OA-K to recalculate. Type **10** in P77. When you've finished, press OA-K to recalculate everything, then press OA-S.

The retirement budget is 140 characters wide and prints 12 characters per inch. Press OA-O to bring up the *Printer Options* screen, type **CI** (for *Chars per Inch*), and press Return. Type **12** and hit Return again. Next, set margins: Type **LM** (*Left Margin*) and press Return. Type **9** and hit Return again. Type **RM** (*Right Margin*) and press Return. Type **9** and hit Return again. Turn off the header so that it doesn't interfere with the lookup table when you print: Type **PH** and hit Return. Press OA-S.

Now turn on your printer. Press OA-P to start the *Print* command and hit Return to confirm *All*. Confirm the printer or type your printer number and hit Return twice. Don't be alarmed that the printer skips two pages between the budget and the inflation tables. Their odd location — below and to the right of the budget — makes them print on a separate page. This setup, however, gives you total freedom to insert and delete lines.

When you make your own entries, list income and expenses before and after retirement, then enter the years until retirement in P77. You can use any number of years, not only those in the lookup tables. The lookup formula in F57 will find the number less than or equal to your number and multiply the amount in F56 (monthly expenses in today's dollars) by the corresponding factor. The formula in F57 calculates an assumed inflation rate of 5 percent because this percentage corresponds with the scan cells in H65 through H74. If you enter **10** in P77 (number of years to retirement), it works with *1.6*, the factor corresponding to scan number 10. If you enter **17** in P77, it works with *2.1*, the factor corresponding to scan number 15. You get the idea.

If you want to assume a higher rate of inflation — say, 7 percent annually— edit in the scan cells for that table. With the cursor on F57, press OA-U to put the formula on the edit line and press OA-E to switch to the overtype cursor. The scan cells in the 7 percent lookup table are L65 through L74. Hold down the right- arrow key until the cursor rests on the first *H* in the original formula. Type **L** to replace *H* and hold down the right-arrow key until the cursor rests on the second *H*. Type **L** again, and hit Return. Even with recalculation turned off, you'll see a new result in F57. To get the effect on the monthly amount remaining in F59, press OA-K to recalculate.

Keep in mind that this spreadsheet doesn't take into account first-year or one-time-only expenses after retirement, such as moving costs and fees involved in buying and selling a home. It's a good idea to create a separate spreadsheet especially for that purpose. ❑

WRITE TO CONTRIBUTING EDITOR RUTH WITKIN AT 5 PATRICIA STREET, PLAINVIEW, NY 11803.

DESKTOP GENEALOGY

Dig through those boxes and unearth your family records — this month we'll help you trace your history.

By CYNTHIA E. FIELD, Ph.D.

UNLESS SCOFFLAWS AND VILLAINS lurk in your family background, you're probably as proud of your heritage as the next Apple II user. Now, thanks to desktop-publishing programs such as **Publish It! 3** and **GraphicWriter III**, you can turn desktop genealogy into a perfect family or classroom project. With the template you'll design this month, your ancestral charts can become handsome keepsakes and gifts.

GOING TO THE DOGS

One great advantage of a desktop-publishing template like this one is its flexibility: Not only can you use it to create a family tree, but if you have a pedigreed pet, you can record the purity of its breeding. As a matter of fact, we created our first genealogy template at the request of dog breeder Joan B. Young, owner of the kennel Kinouk's Shibas in Piedmont, Oklahoma. Young, who's been a kennel owner for some 27 years and has raised Siberian huskies, malamutes, and akitas, now raises shibas, an intelligent and hardy Japanese breed.

Young's kennel provides customers with a pedigree chart for each puppy. Instead of filling in preprinted layouts with a typewriter, however, Young wanted to create charts with Publish It! 3 on her Apple IIc, so that she could incorporate her letterhead and logo. By substituting analogous tools, you should be able to create equally good-looking charts with any desktop-publishing program.

When Young sent us the preprinted chart form she'd been using, we set to work replicating its four-generation layout with Publish It! 3's line and rectangle tools. **Figure 1** shows our blank template, containing about 23 objects; specifications are provided in the accompanying **Table**. Use the line tool to create the places where you'll later add the names of the sire and dam as well as the pup's grandparents.

On Young's template, each set of great-grandparents and great-great-grandparents — the third and fourth generations, respectively — branches like a tuning fork, so we used the rectangle tool to create each area. Then to erase or at least cover up the right-hand sides of these rectangles, we drew *invisible* rectangles. (To create an invisible rectangle, draw an ordinary rectangle, select it, then switch to a white pen color. Because the background on the page is white, a white object doesn't show when printed, but covers up objects that lie underneath.)

When you're done laying out lines and rectangles, save the file as *Pedigree.Blank* and print a sample to make sure everything looks perfect. If something's amiss, make any necessary adjustments. To ensure that objects won't be nudged out of alignment inadvertently when you begin to fill the chart, select each object and lock it in place by using the *Show Specifications* feature. (Some DTP programs may not offer this option, however.) Resave the template as *Pedigree.Blank*.

To type ancestors' names in the appropriate places, you have to overlay every line or rectangle with a text frame. In a chart such as this one, Publish It! usually permits only 16 text frames. If you create a separate text frame for each set of ancestors, you'll have one extra text frame for your letterhead at the top of the page.

If you want to include your name and address at the bottom of each four-generation chart, you'll need to conserve the number of text boxes you use. For example, try placing one large frame over all four sets of paternal great-great-grandparents, so that you'll have text frames to spare. This method let Joan Young include her logo as well as her name and address on each chart. No matter which method you choose, remember to save your completed template.

FAMILY TRAITS

Once you've created your text frames, simply insert the I-beam into a frame, select a font, and begin typing the animals' names. If one text frame includes the names of two grandparents, just press the return key to space down from one line to the next.

When you've finished typing all the names, you'll probably need to adjust the text frames' positions, so that the names don't sit too close to the chart's lines. For a peek at your chart's printed appearance, use Publish It!'s handy *Preview* mode by

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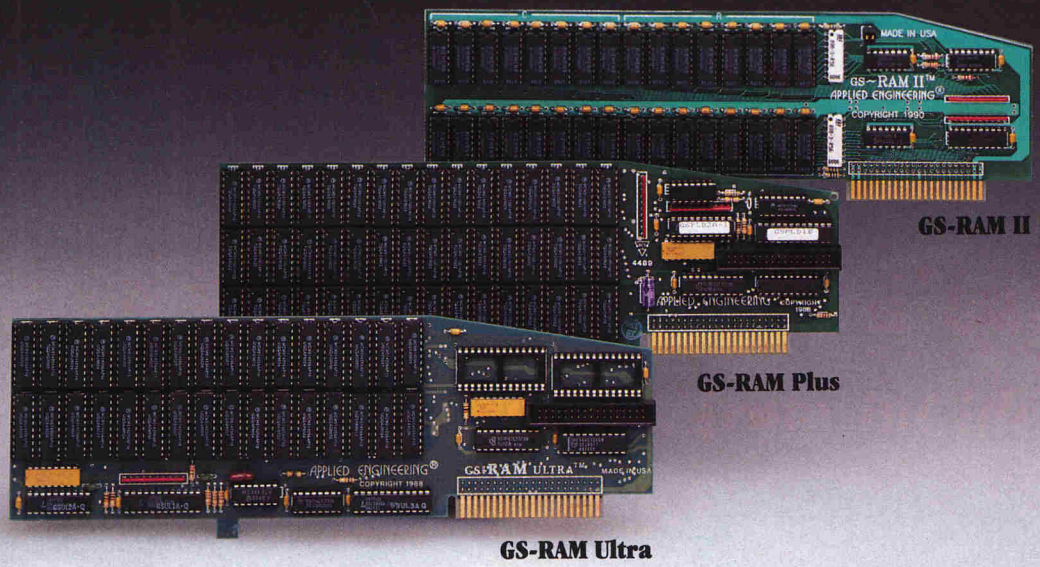

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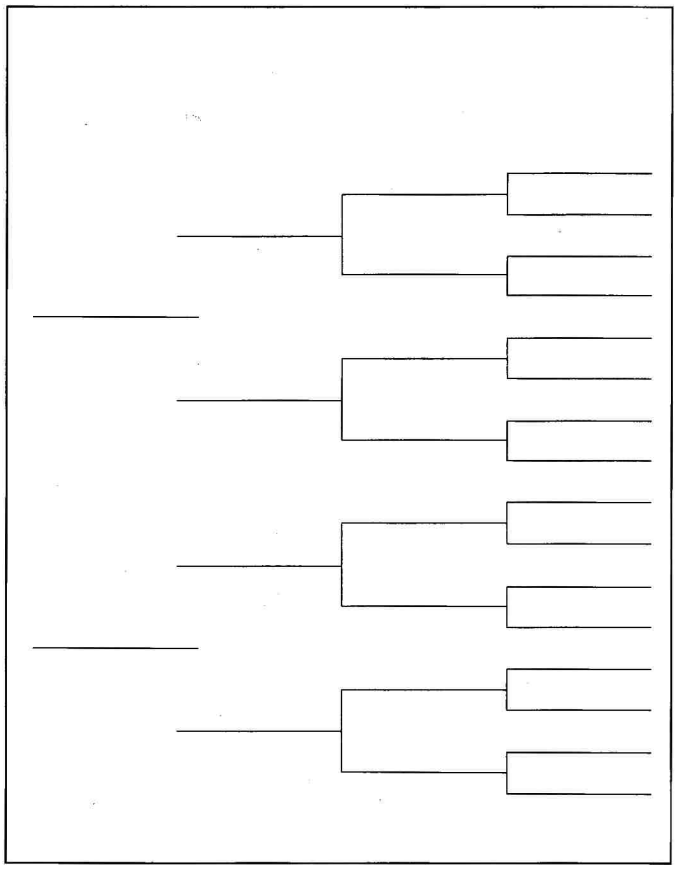

Figure 1. Blank pedigree template.

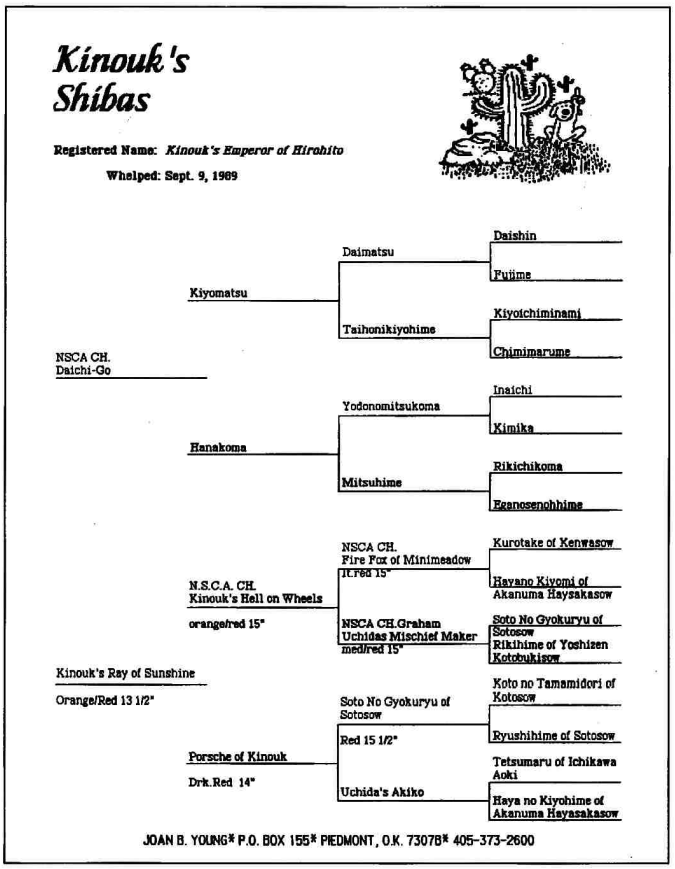

Figure 2. Pedigree chart.

either pressing Open apple-K (OA-K) or pulling down the *File* menu. Save each finished chart with a new, specific name that distinguishes it from the blank template.

Figure 2 displays the pedigree chart Young created for Kinouk's Emperor of Hirohito. Young used an enlarged *Ravinia* font for the kennel's name, but an ordinary 12-point font for the bulk of the text. Experiment with different fonts to vary the effect. If pedigree names are especially long, switch to a smaller type size.

In addition to each ancestor's name, coat color and height data are included. Young also preceded some names with the designation *NSCA CH* (National Shiba Club of America Champion). To dress up her charts, Young experimented with different kinds of computer paper — including pink neon. When she used an ImageWriter II printer with multicolor ribbon, she printed these designations in their customary red color by selecting the given text, pulling down the Publish It! 3 *Font* menu, and selecting the red color option.

AUTOMATIC ANCESTORS

Because these shibas have such long names, Young wanted to cut down on her data-entry time by creating templates for each sire/dam pair as well as for each litter — that way she'd need to type only the newborn pups' names and whelping date. By turning to John Thompson, author and publisher of **JMS Canine Pedigree 3.0**, a database program designed specifically for kennel owners who use Publish It! 3, Young received the help she needed.

The beauty of Thompson's program is not only its ordinary database functions, but its ability to display a prototype pedigree chart on screen, then save the data in ASCII format as a Publish It!-ready file. Along with the main database program, Thompson includes a ready-made Publish It! 3 template complete with linked text frames.

Linking text frames affords two great advantages. First, you can overcome Publish It!'s 16-text-frame limit because all linked frames count as only one article. Second, when you import text into the document, information flows from one frame to the next, filling each pedigree chart automatically. A carriage return here and there may be all you need to fine-tune the design before printing.

Thompson's clever use of the link tool isn't limited to dog pedigrees. Gary C. Walters, a New York broadcast engineer and Publish It! aficionado, uses the same method to import class-reunion names from an AppleWorks database file to a template that produces name badges. Before making the transfer, he creates a report in the database and prints it to the word processor via the AppleWorks clipboard. Thompson's pedigree template differs from ours because it goes back three generations instead of four, incorporates more information about each sire and dam, and localizes that information into a separate rectangle for each parent. The overall result is a less cluttered look. (See **Figure 3**.)

PEOPLE POWER

Although we designed this chart for Young's business, you can adapt our template easily to track your genealogy. Simply use the template *Pedigree.Blank*, but rename it *Genealogy.4* to reflect its new

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status. Before we begin we must face the facts: You may have a difficult time coming by four generations' worth of ancestral information. After all, how many of us know our maternal great-great-grandmother's maiden name? Having a few blank lines in your genealogy chart may be okay, but you don't want too many gaps.

But short of doing extensive research to fill those holes, you can still create good-looking genealogy charts such as those shown in **Figure 4** by simplifying your chart to include only three generations. Select, unlock, and delete all objects for the fourth generation. As you delete the objects listed under *GREAT GREAT GRANDPARENTS*, you'll need to lengthen the invisible rectangles listed under *GREAT GRANDPARENTS*. After you add text frames where needed, save this three-generation template as *Genealogy.3*. When you're ready to create your first chart, type the names of your relatives in the appropriate spaces. If you want to add other data, such as birthdays, birthplaces, marriage dates, and death dates, you may need to use a 9-point type style.

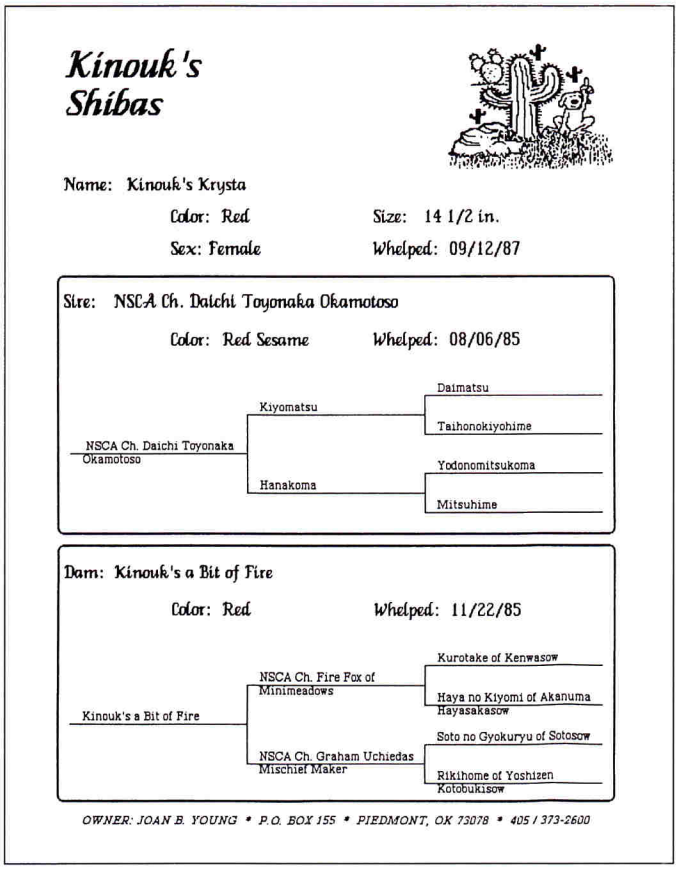

Figure 3. Simplified pedigree chart created with Canine Pedigree 3.0 and Publish It! 3.

Once you've completed your family tree, why not share your work with relatives? These charts make great birthday cards. To spice them up, try adding a large text frame at the top of each chart and typing the recipient's name and birthday. In the area between the father's and mother's names we like to include a clip-art illustration of a tree, although digitized photos add a classy touch.

For final printing, we use **Desktop Design** papers from PaperDirect. As you can see in **Figure 4**, each sheet sports a preprinted, full-color border. Use **Ambassador** for a somewhat formal-looking design, **Bouquet** to capture the look of autumn, and **Red, White and Blue** for a patriotic effect.

When you delete the fourth-generation section of the template, any remaining objects seem to shift left. To center the chart properly in the printer, line up the left edge of a sheet of Desktop Design paper with the built-in alignment notch located on the back of the ImageWriter II. Now insert the paper until it meets resistance from the platen, and press the line-feed button six times. (This type of adjustment is a lot easier than unlocking and shifting all the objects on the *Genealogy.3* template.)

Save each chart under a specific name before printing, then press OA-P. The paper setup we described in the paragraph above ensures that the printer will advance the paper properly and skip the top border on each piece of Desktop Design paper. You may have

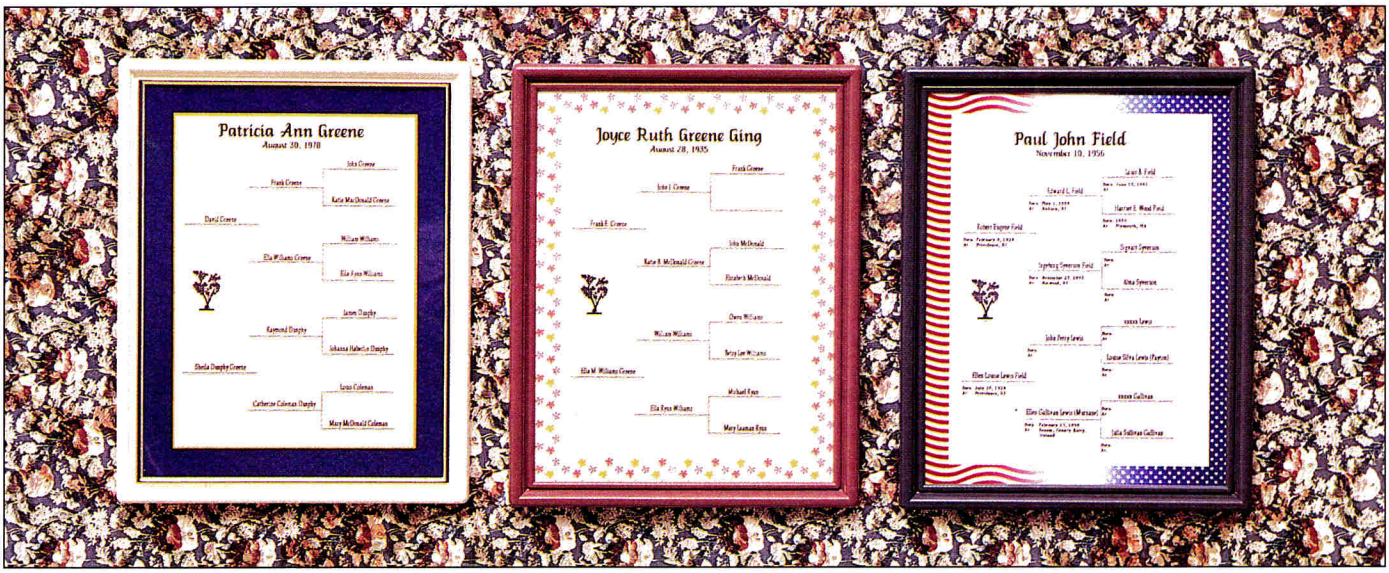

Figure 4. Finished samples with three generations.

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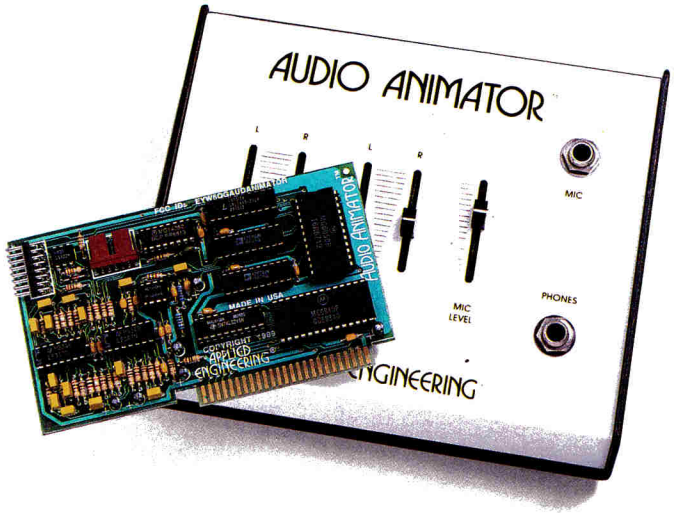

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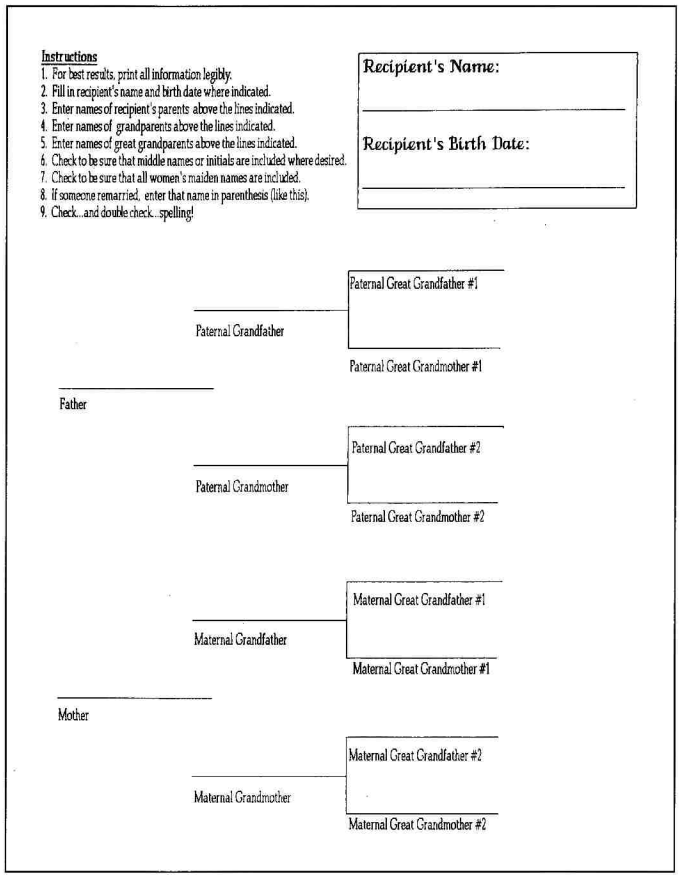

Figure 5. Genealogy worksheet.

to make adjustments if you use paper with differently sized borders.

When friends and relatives see the charts you've created, they'll probably enlist you to design more. To make it easier for data gatherers and desktop publishers alike, put together a genealogy-information form like the one shown in **Figure 5**.

Start with the blank three-generation chart *Genealogy.3* and type the terms *Father, Mother, Paternal Grandfather, Paternal Great Grandfather #1*, and so on into the text frames. Use carriage returns so that these titles end up under the lines on the chart, then you (or your friends) can type the names of ancestors above the lines. When you sit down to work at the computer, you'll be able to transcribe names from this look-alike chart instead of deciphering names and relationships from disjointed handwritten notes.

On our genealogy request form we reserve an area at the top for the *Recipient's Name* and his or her date of birth. Finally, we offer a brief set of instructions for anyone filling out the chart. For instance, we remind people to include middle names or initials and to double-check all spelling. After designing the fill-in sheet, be sure to save it as *Genealogy.Form* or use another meaningful name.

Whether your emphasis is on people or pups, Apple II desktop genealogy charts rival ordinary handwritten or typewritten ones. Custom-designed pedigrees provide kennel owners with a way of proving the value and purity of their breeds; ancestry charts can help biology students learn more about genetics; framed genealogy charts printed on deluxe papers give hobbyists an attractive alternative to run-of-the-mill birthday cards. What are you waiting for? Get started on your next DTP project today. ❑

Object	Left Start	Top Start	Width	Height
PARENTAL GENERATION				
sire line	0.500	4.750	2.000	n/a
dam line	0.500	8.750	2.000	n/a
GRANDPARENTS (top to bottom)				
line 1	2.250	3.750	2.000	n/a
line 2	2.250	5.750	2.000	n/a
line 3	2.250	7.750	2.000	n/a
line 4	2.250	9.750	2.000	n/a
GREAT-GRANDPARENTS				
rectangle 1	4.250	3.250	2.000	1.000
rectangle 2	4.250	5.250	2.000	1.000
rectangle 3	4.250	7.250	2.000	1.000
rectangle 4	4.250	9.250	2.000	1.000
invisible rectangle 1	6.219	3.500	0.031	0.500
invisible rectangle 2	6.211	5.493	0.050	0.500
invisible rectangle 3	6.213	7.491	0.043	0.506
invisible rectangle 4	6.213	9.494	0.050	0.502
GREAT-GREAT-GRANDPARENTS				
rectangle 1	6.250	3.000	2.000	0.500
rectangle 2	6.250	4.000	2.000	0.500
rectangle 3	6.250	5.000	2.000	0.500
rectangle 4	6.250	6.000	2.000	0.500
rectangle 5	6.250	7.000	2.000	0.500
rectangle 6	6.250	8.000	2.000	0.500
rectangle 7	6.250	9.000	2.000	0.500
rectangle 8	6.250	10.000	2.000	0.500
long invisible rectangle	8.716	2.925	0.104	7.600

Table. Specifications for four-generation pedigree chart (all dimensions in inches).

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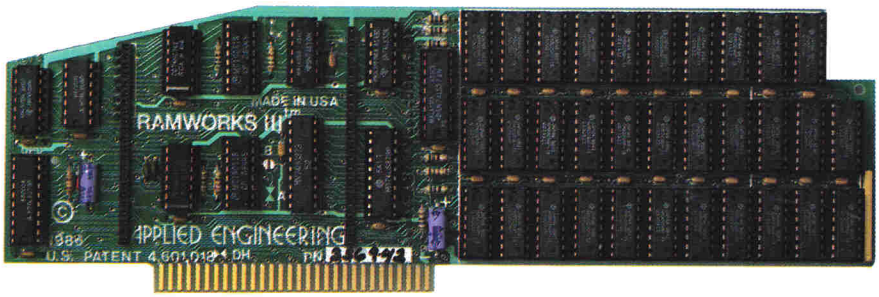

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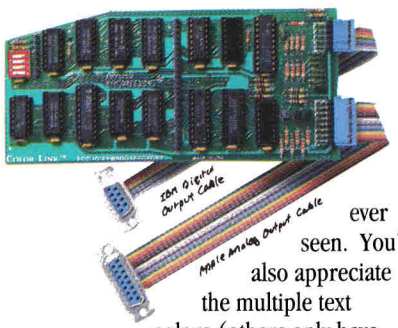
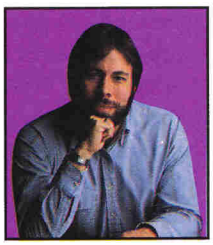


ever seen. You'll also appreciate the multiple text colors (others only have green) that come standard. But the RamWorks RGB option is more than just the ultimate in color output because unlike others, it's fully compatible with all the Apple standards for RGB output control, making it more compatible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



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Continued from p. 37

file." If you're more straitlaced you can use a different patch to customize the desktop-index display.

BEST OF THE BUNCH?

Any number of patch programs are available for AppleWorks, but SuperPatch stands out for several reasons. To begin with, SuperPatch is exceptionally easy to use. It's entirely menu driven, making the installment process a simple matter of step-by-step selection.

Also, this product is extremely complete and includes a utility that de-installs as well as installs patches. The documentation is even well written and understandable.

SuperPatch's manual is one of its biggest assets because it explains thoroughly what the patches will and won't do, eliminating all guesswork and unnecessary experimentation. By providing examples and options for using the various patches, and anticipating problems concerning the product's compatibility with certain software and hardware products, the manual helps you avoid problems.

GOODIES

Although not everyone will find each patch useful, most AppleWorks users will want to utilize the patch that sets up the continuous display of desktop space. Knowing the amount of available memory can help you protect your RAM-resident data files. If you have large amounts of data in the Clipboard or have opened too many files before trying to perform functions that exceed the memory of the computer, damage will occur before you see the memory warning. With this patch you can monitor your desktop memory and act appropriately when you reach your system's memory limitations.

Another useful patch is Blister Quit. If you use it carefully it bypasses many of the time-consuming and annoying procedures that occur each time you quit AppleWorks. With this patch you'll no longer need to answer a series of questions before you can quit a file. Many times you'll want to go through the procedures, but when no new save is necessary, you simply want to shut down your machine without any hassles. Blister Quit provides you with this option.

A third patch that'll please many AppleWorks 3.0 users changes the path or sub-directory to a mousetext folder symbol, and converts disk and disk volume to mousetext disk symbols. These are purely cosmetic patches, but if you're using a graphics interface, why not go all the way?

Other useful patches let you substitute mousetext for regular text fonts; replace full-height superscripts with half-height superscripts; employ all print features from within AppleWorks (such as foreign-language character sets, italics, and uni-directional printing); and reverse confusing no/yes queries to more logical yes/no.

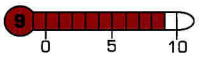
SuperPatch lets you change AppleWork's appearance, sound (disabling or changing the error tone), and even performance. It's a tribute to Apple Computer that AppleWorks readily accepts the integrated use of macros and patches. It's a tribute to SuperPatch that you can personalize your programs in an effortless, practical, enjoyable manner.

Jim Trunzo
Leechburg, PA

COLOR 'N' CANVAS

Wings For Learning
1600 Green Hills Road, P.O. Box 660002, Scotts Valley CA, 95067-0002,
(800) 321-7511, (408) 438-5502

Full-featured paint program for elementary classrooms; 1-megabyte Apple IIgs; color printer recommended; $99



Giving children brushes and paint is like presenting them with an invitation to be creative. Provide those same children with access to Color 'n' Canvas, Sunburst's high-powered GS paint program, and you can expect magic. With palettes of red, green, blue, and yellow, students can work with a variety of color. This program comes complete with lesson plans, worksheets, and black-line masters suitable for elementary-school classrooms. Educational support notwithstanding, even home users will find it appealing.

LOADED WITH OPTIONS

Sporting graphics icons, pull-down menus, dialog boxes, and a WYSIWYG (what you see is what you get) display, Color 'n' Canvas has the look and feel of a typical GS or Macintosh application.

A menu bar at the top of the screen offers conventional file, edit, font, and style options. You'll use the mouse to select menu operations, but the usual keyboard command equivalents will access functions, such as copy, cut, paste, new, open, save, and undo. Many of the program's array of features are so intuitive, novices will be up and painting with a minimum of effort.

Ease of use is just one of Color 'n' Canvas' many strengths. The *File* menu includes a convenient command that lets you format a data disk from within the application. The *Font* menu contains six typeface options, so that you can add stylized text to your painted certificates, bulletin-board pin-ups, greeting cards, or other creative endeavors.

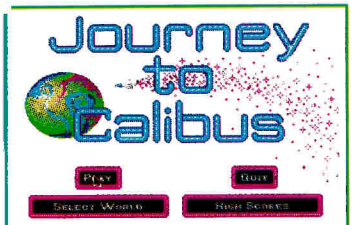
You can print text in your choice of style, alignment, and point size. Choose either plain, boldface, italic, or underlined text, and left, middle, or right justification. The *Style* menu shows point sizes ranging from 8 to 36 initially, but larger point-size options are available only if you check the *Scale Fonts to unsupported point size* box in the *Teacher Options* menu. When this option isn't selected, the program restricts selections mainly to 10 and 12 point sizes.

DRAW IT WITH STYLE

The program's paint-tool menu sits directly beneath the menu bar, with 15 point-and-click icons. Artists can select from four geometric shape tools to draw lines, squares, circles, or triangles. Clicking once on a shape tool lets you draw a solid representation of that shape, with a border the same color as the line tool. Clicking on the shape a second time instructs the program to paint a shape with no border. If you select the shape a third time, you can paint it without a color fill.

The Color 'n' Canvas ray tool makes it possible to draw star-like shapes with lines originating from a center point. The paintbrush lets you sketch freehand. You can alter the width or shape of the paintbrush stroke by clicking on the brush-shape tool. It offers a choice of ten preconfigured shapes that the palette's other tools can draw. The edit-brush command in the *Effects* menu lets you modify existing brushes or create a brush of your own ➪

Public Domain Software



GS103 & GS104 Cosmocade: Brian Greenstone has done it again! Brian is the author of the fantastic commercial game called Xenocide. Now he has released a two-disk game called Cosmocade. It is actually two games in one. On the first disk, you must Journey to Calibus in a fast-paced arcade style game. Part two is called Naxos. A joystick and 768K is required. This is a shareware game.

IIGS Games

GS30 Shareware Card Games: This disk contains SHR versions of Casino Solitaire, Slot Poker, Pyramid Solitaire & Monte Carlo.

GS105 Space Clusters: This game is a clone of Gaxalian. Use a joystick to shoot the invaders before they can swoop down and destroy your ship. A fast-paced game.

GS45 Two Shareware Arcade Games: Orbizone is an outer space shoot 'em up arcade game. In CHIPS and Dips, the player must roam the screen collecting objects.

GS61 One-Armed Battle: A six-reel slot machine game based on the classic dice game called Oh Shoot

GS65 Entertainment: Yahtzee Fourplay Tetrotrix Tanks & Senseless Violence

GS88 PicMix: This program turns any SHR graphic into an on-screen jigsaw puzzle

GS79 Plunder!: Escape the treasure room without being blown to bits by the bombs

IIGS Sound & Music

GS53 SoundSmith: This shareware program is the hottest music program available for the IIGS. Plays up to 14 tracks.

GS54, GS55, GS56, GS57, GS66 & GS97 SoundSmith Song Disks: Six full disks of SoundSmith music files. Order one or all 6.

GS102 SoundSmith Carols: A collection of SoundSmith Christmas carols.

GS94 Modulae: If you liked Nucleus, then you'll love this sound and graphic demo program which really shows off the IIGS.

GS63 HyperStudio Sound Effects: A collection of sounds in ACER format which are just right for use with *HyperStudio*.

HyperStudio Stacks

HS08 HyperSpace: Two educational stacks that teach about our solar system and man's attempts to explore it.

HS09 Presidential Stack: Graphics of all the presidents and biographical trivia.

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GS100 Holiday Print Shop GS Graphics: An all-new collection of graphics for use with *Print Shop GS*. All the graphics have a holiday theme. There are seven different Santas, Valentines, Easter Bunnies, Thanksgiving turkeys, fireworks, Jack-o-Lanterns, a wreath, angels, and much, much more. Copyright (c) 1990 Big Red Computer. Only $3.50.

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GS07, GS08, GS29, GS35, GS77 & GS78 Graphics, Fonts and Borders for Print Shop GS. Six completely different disks for use with *Print Shop GS*. Each disk contains at least 72 graphics and all but GS35 also contains borders and fonts. A sheet showing what is on each graphic is shipped with the disk. Each disk is only $3.50.

GS48 GIF Graphics: 75 colorful graphics in GIF format plus an all-new IIGS graphic utility program to view or convert them.

GS59, GS64, GS67, GS73, GS74, GS86, GS87 & GS98 Super Hi Res Clip Art: These 8 disks contain clip art graphics that we either converted from the Mac or scanned in on the IIGS. They're great for use with *AppleWorks GS* or *HyperStudio*.

GS15 & GS31 320-Mode Color Screens: These two disk contain 320-mode full color graphics which are for IIGS paint programs.

GS40 Fractals & Animations: This disk contains 11 programs that create animated computer graphics or fractal displays.

GS49 Star Trek Montage: A collection of SHR graphics based on Star Trek.

GF02 Display Fonts: A collection of GS-type fonts for use with most GS programs.

P350 & P351 Multi-Colored Graphics for The New Print Shop: These two disks contain all new graphics for The New P.S.

GS96 3200-Color Graphics: See the full potential of the IIGS with this slide show of 3200-color SHR graphics.

GS80 PaintWorks Animations: Animated graphics and a special viewer program.

GS42 Space Sights & Sounds: Digitized photos and digitized sound files from NASA.

IIGS Utilities

GS47 GS/OS Goodies: Our all-time best selling disk. This disk contains over 20 brand new desk accessories including D.T. Painter, Screen Saver & GS Catalog. It also has IconEd and SCSI Utilities.

GS83 Customize GS/OS: Load fonts and desk accessories on the fly, plus A2.FX, Finder.Patcher, Instant Icon and RunQ.

GS99 Twilight Screen Saver: This shareware CDev is a completely modular screen saver which operates under the Graphic Control Panel. This is a must-have program for all IIGS owners.

GS76 Productivity Disk: This disk is loaded with useful tools including Write-It!, a desk accessory which is a complete word-processing program.

GS93 IIGS Telecommunications: If you own a modem, you need this disk. It contains the GS-verison of Shrink-It plus a host of other telecomm programs.

K301 DB Master 1.0.1 3.5" Version: A complete shareware database management system for the Apple IIe, IIc or IIGS.

GS62 Desk Accessories: Included on this disk are DA's that allow you to format a disk, copy and view files, control an ImageWriter printer, preview fonts and locate files on your hard disk. Plus a Tetris-like NDA game.

GS32 FontAsm: This is the best shareware GS-font editor available. Plus it comes with several new fonts.

GS14 Sound Studio: This program allows you to play and manipulate digitized sounds.

GS22 UtilityWorks: This shareware program has the ability to load, save, and print any type of SHR graphic, text file, AppleWorks WP file, icon file, GS-font file and much more. A very useful program.

GS101 SHR Christmas Graphics: We've put together a wonderful collection of Christmas graphics on this disk. All of the graphics are in 320 mode and are suitable for use in most IIGS paint programs. Included are angels, Santa Claus's, a nativity screen, a reindeer and much more. We've included two graphic viewing programs on the disk. A great stocking stuffer. Only $3.50.

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design. Teachers may deactivate the edit-brush option by turning it off from the *Teacher Options* screen.

As in all conventional paint programs, a marquee tool cuts and pastes selected sections of the canvas, and an eraser tool wipes away any unwanted blunders. Select the undo icon and the screen reverses your last action. Add captions or labels to drawings with the text tool. You can type text (in one of 16 super-hi-res colors), simply by making a selection from the color palette at the bottom of the screen. Use the magnifying tool to zoom in on a particular screen area and fine-tune the artwork. If the magnified area isn't the one you want to work in, simply select the hand tool to move the canvas. While you're in magnifying mode you can work with any paint tool.

Your screen's a magic canvas.

COLOR YOUR WORLD

Create interesting effects by painting against a background color, or turning on mirror mode and using any one of nine mirrors to reflect the drawing over lines of symmetry. If you choose the set-grid option, you can determine the distance your pointer moves when drawing geometric shapes.

The program offers two color palettes, each with a choice of 16 tints. Kids can paint a screen in either standard or default colors, but not both. Accessing editors from the *Color* menu enables artists to modify colors in the selected palette. A red-yellow-blue (RYB) editor lets kids select a color from the palette and see the primary colors that are mixed to create it. The red-green-blue (RGB) editor operates in a similar fashion, but allows more variation and color control. Also, the RGB editor doesn't specify a selected color's makeup in terms of primary colors.

Kids can play with color mixtures simply by clicking on arrows at the top or bottom of the color bars. As they click on the plus or minus arrows, the color changes in the edit-color box. If they replace a color on the color bar that was used on the painted canvas, that canvas color changes to match the newly edited hue.

TEACHERS ONLY

As always, Sunburst's *Teacher's Guide* provides well-written documentation for all program features. It includes tutorials to help youngsters become familiar with the program's paint environment and suggestions for off-line activities.

A special section on teacher options provides information about accessing or dimming (turning off) software options during program operation. For example, instructors can choose to disable the grid or mirror-mode functions or decide not to let youngsters edit colors or brushes. Educators even may deselect the background-file option, so that a background file doesn't load automatically when Color 'n' Canvas launches.

The manual's only shortcoming is that it lacks an index. If you want to find information about a particular topic in a hurry, you'll have to thumb through the table of contents.

GLITCHES

I encountered a couple of surprises while putting Color 'n' Canvas through its paces. In checking the Control Panel (in the *Apple* menu) for compatible printers, I discovered that the program has a driver only for a direct-connect ImageWriter; therefore, it won't work with an AppleTalk-connected or LaserWriter printer. The screen dump on page 32 of the manual incorrectly indicates otherwise.

When I tried to quit the application and return to the Finder to see if different printer drivers had been placed in another file folder, I discovered the software's second quirk. Color 'n' Canvas is a

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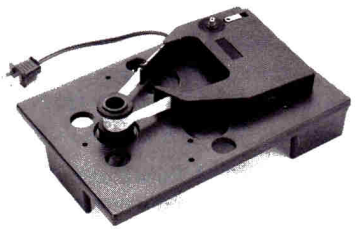

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program that literally won't quit. Selecting *Quit* from the *File* menu merely initiates a reboot. At startup, the application opens directly to the paint window and bypasses the Finder.

Printer-driver limitations notwithstanding, Color 'n' Canvas is a full-featured electronic paint program with several built-in powerful functions. It encourages youngsters to experiment with a variety of creative tools and gives them the freedom of artistic expression.

You decide whether the program's place is in the home or the classroom. Whatever the setting, Color 'n' Canvas is a good way to bring out the Van Gogh in all of us.

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

POINT OF VIEW: AN OVERVIEW OF UNITED STATES HISTORY

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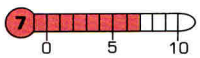
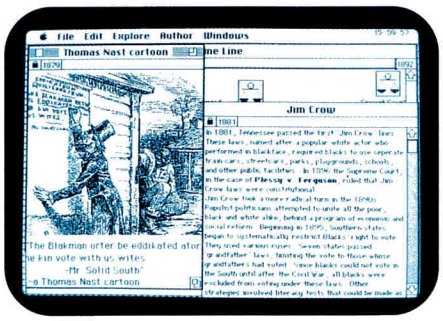


If you're looking for a way to encourage kids to think about American history rather than just memorize facts and events, close those books for a moment and boot up Point of View: An Overview of United States History. With this unique Macintosh program, our country's heritage comes to life. By providing junior- and senior-high-school students with copies of original documents and eyewitness testimonies, as well as pictures, maps, essays, and statistics, this program helps kids learn to analyze information, place data in context, and formulate hypotheses for research. (To utilize the software effectively, however, they'll need considerable instruction.)

The package ships with eight floppies containing a detailed historical database (1756 to the present), 2000 pages of historical documents, and 140 data tables from the U.S. Census Bureau. Although the program runs on a floppy-disk system,



Your Mac makes history come alive.

you'll end up swapping disks constantly. If you install Point of View on a hard disk instead, be prepared to give up more than 5 megabytes of free space to complete the installation.

Point of View functions as an authoring tool in addition to serving as a resource for historical facts and figures. In multimedia-like fashion, history buffs can link graphics, sounds, and animated clips with text descriptions of historical events to generate electronic slide shows. Kids can add speech clips and digitized illustrations to their descriptive accounts, and teachers can craft overhead transparencies to supplement in-class lectures. There are even tools to join Point of View materials with external videodisc footage.

THE TIME MACHINE

Students can explore Point of View data by topic or time line, and view the information from varying perspectives. There are 24 topics from which to choose, including art, business, education, immigration, inventions, and world events. Each topic has its own icon that's located in its own timeline. If students choose to examine a topic by the milestone perspective, for example, they can click on the milestone icon and read about the significant points in that particular topic's development. To supplement this information students can link a subject's milestones with other perspectives, such as charts, maps, essays, and documents.

The program's charts display numerical data in columns, lines, or tables, and its ➪

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maps show numeric data by geographic region. Students even can configure the charts and maps to change dynamically over time — you can set them to portray population changes from one year to another. Seeing the screens update right before your eyes is an impressive sight.

By selecting the essay view, students can read text commentary during a presentation, take notes, or jot down ideas. As with charts and maps, students can make the essays time dynamic — then each essay's information will change to represent its time period.

Choosing document view calls up original source materials such as laws, speeches, diaries, and so on. The pictures view consists of drawings, digitized graphics, or scanned maps. Students can even incorporate special effects: The video option provides software tools to link Point of View presentations to materials on videodisc; the sound option plays high-quality, realistic digitized speech, music, and so on through the Macintosh speaker; and the autoscroll feature animates maps and charts.

The package also comes with six preconfigured multimedia presentations, each consisting of a series of linked data screens. Viewers work through a presentation by clicking with the mouse.

Topics include the battle for an eight-hour work day, the question of end of slavery versus real freedom, a discussion of the Barbary pirates, the history of the United States Electoral College, and the emergence of railroads.

BOGGED DOWN

Timelines, photographs, essays, charts, statistics, and pictures enable researchers to create lively presentations, while the software provides several tools for examining historical events. Although its interactive format involves students in the historical process, the software isn't without problems.

Scholastic Software has packed so much information into the disks that the product is a bit overwhelming. The *Instructor's Manual* contains five lesson plans for introducing the prepared presentations in class, but there's no step-by-step tutorial to take students through the data-acquisition process for even one of these presentations. Even though the manual provides a model of exploration to illustrate how a student might investigate a topic, it mistakenly assumes that students know how to operate the program. Operational instructions are limited at best.

I found the tutorial in the *User's Manual* confusing and unfocused. Terminology in the text doesn't always match options available in the pull-down menus. Scholastic Software could remedy several of these problems by programming one of the prepared sample presentations as an in-depth walk-through tutorial, highlighting all program features.

Scholastic Software can't solve the other problems so easily. Screen refresh on a Macintosh SE (68000 CPU) is painfully slow. When the program moves from one screen to another, it updates all open windows on the desktop. You'll notice a dramatic slow-down if you have several open charts and maps. Additional disk functions also operate slowly. It took Point of View more than two minutes to update the open-view dialog from milestone view to all views. When I next selected open view, it still took more than 30 seconds for the dialog box to appear on screen. The go-to-date feature requires you to type the date in month/day/year format; if you merely want to investigate by year, the go-to-date feature won't let you browse.

Slow-speed operating problems notwithstanding, the software's steep learning curve, in addition to its expensive price tag, are extremely problematic for successful classroom use. Until Scholastic revises Point of View's documentation thoroughly so that program operation becomes less confusing, instructors will find the software more trouble than it's worth. Point of View has great potential, but in its current state it's a difficult resource to use. ❑

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

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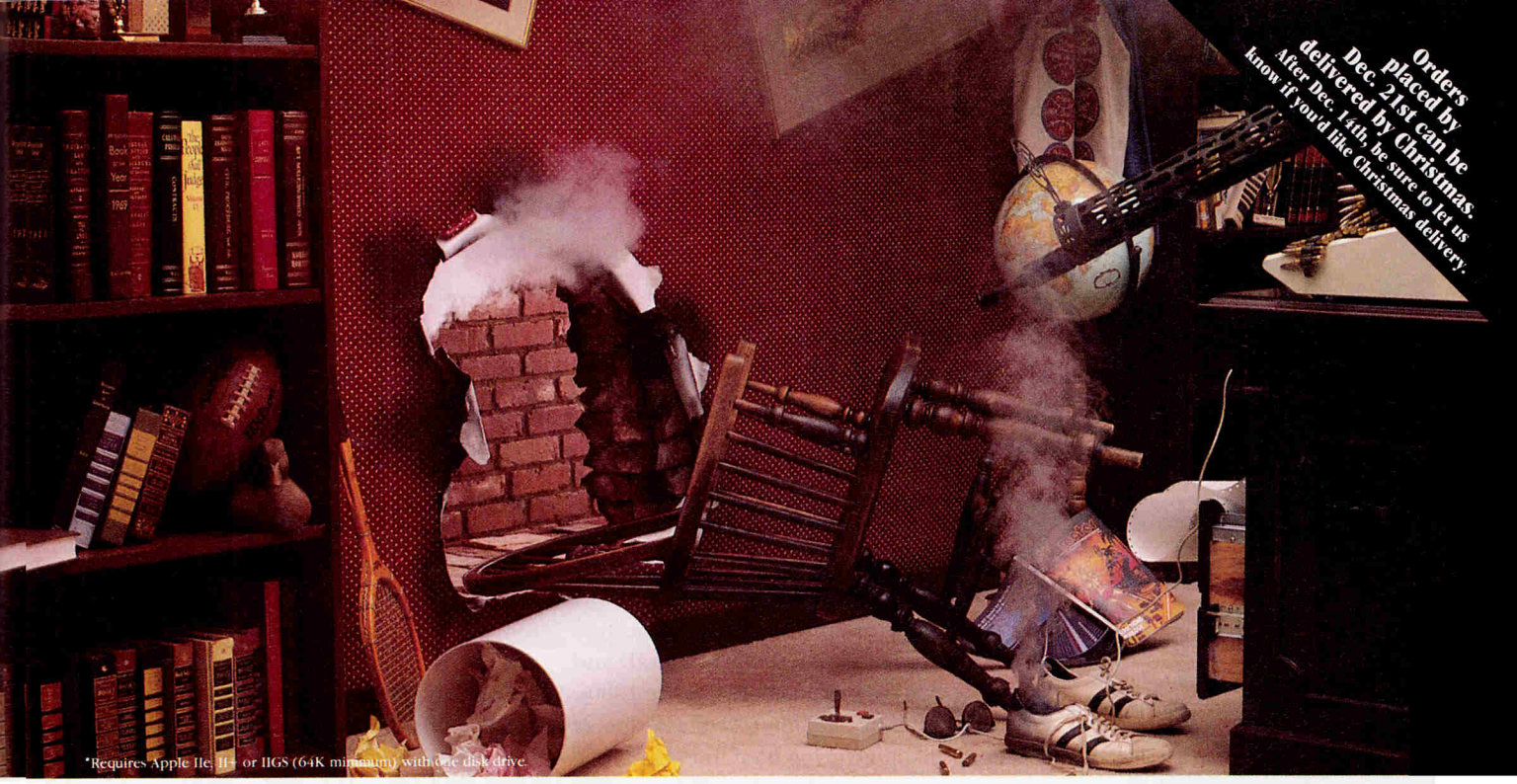

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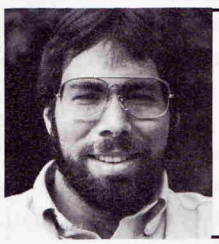

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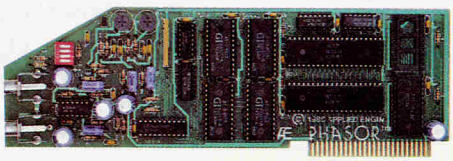

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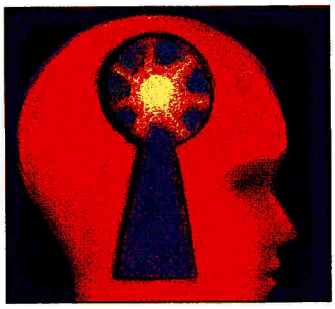

LEARNING CURVE

PARADIGM PARALYSIS

By DAVID D. THORNBURG, Ph.D.

Now that computers have become indispensable desk accessories, we can analyze the forces that will propel the next phase of our technological development.

JANUARY FIRST MARKS THE BEGINNING of the last decade of the 20th century, a time that will almost certainly see the solidification of the enormous social, governmental, and technological changes that began in the 1980s. Enormous external alterations — the decline of our aging manufacturing base, the rise of the service sector, and political transformations around the world — mask more fundamental changes that affect the lives of all of us everywhere.

In business and in education, technology has facilitated many of these changes. And now that computers have become indispensable desk accessories, we can analyze the forces that will propel the next phase of our technological development.

NEWTON'S IDEAL

The 19th-century industrial model that provided the foundation for our growth was connected to a prevailing paradigm based on Newtonian physics — the notion that we could predict the movement of markets as we could that of a falling body, and that the industrial giants' strong center would attract business.

In a parallel development, education was thought of as the filling of a vessel. A solid base of knowledge coupled with the ability to write and perform calculations was all anyone needed to secure a lifetime job with a single employer.

As the 20th century progressed, Newton's ideas broke down on close inspection, and our model of the universe underwent a revision. Einstein's notion of mass as energy, Bohr's theories of the duality of waves and particles, and Heisenberg's principle of the inherent uncertainty of quantum events destroyed forever the clockwork universe epitomized by classical physics.

QUANTUM SHIFTS

This modification of the paradigm is reflected in our daily lives. Technology, of course, is making this transformation possible, but it's the shift in our perspective that's critical. To see this, imagine a quantum experiment in which a photon (a light particle) is directed to a diffraction grating. When it hits the grating, it behaves like a wave and is sent off in a new direction. Our traveling photon may then hit a photocell, where it's detected as a particle. Depending on its interaction with other objects, then, the photon can behave like a wave or a particle.

Now take a look at the fax machine, a model of modern communication. Your document starts in one office in particle form (as a sheet of paper). Then it's placed on the fax machine where the information is sent as electronic signals (waves) to the receiving machine, on which it reappears as a physical sheet of paper (in particle form).

Contrast this mode of communication with the older "Newtonian" model, in which we place a letter in an envelope and send it through the mail. As the cost of carrying mail physically is rising, the cost of transmitting correspondence electronically is falling, making the new paradigm less expensive than the old one. Also, this new form of communication has another benefit — you can fax a message halfway around the world in less than a minute. As consumers continue to purchase millions of inexpensive fax machines every year, our Newtonian postal service risks losing its high-profit first-class mail to electronic technology.

EVERYTHING'S RELATIVE

Another characteristic of the new physics is that in subtle ways time, space, and matter coexist and interrelate. From the perspective of relativity theory, we see the business office, for example, in a new light. Many thousands of people have decided that their work space is wherever they are. Passengers have turned plane cabins into airborne offices, for instance — some people listen to recorded courses on goal

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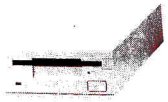

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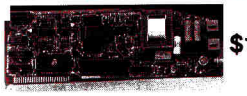

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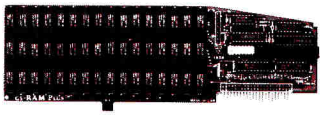

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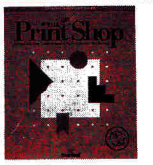

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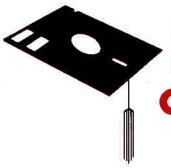

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achievement, while others work with their laptop computers or talk on the phone. The "home office" now exists at 30,000 feet and is moving at close to the speed of sound.

Shouldn't our schools reflect a similar idea? Computers need to be where children are, and children need to be wherever learning takes place best. For some activities the classroom is perfect. For others, the library, zoo, or forest would be more appropriate. But for learning to take place in any environment, the modern tools of learning (such as calculators and computers) need to be with the student, not locked away in a room.

The success of the laptop-computer market has less to do with technology than with attitudes. The original personal computer of the 1970s was personal in ownership but not in use — it sat on a desk, not in a person's immediate possession. Today's laptops and notebook machines are truly personal — you can use them at your desk, or while sitting under a tree. Some laptops (such as the Macintosh portable) are a bit hefty, and none is Apple II compatible (yet), but, as the October Learning Curve suggests ("Keeping Pace with Time," p. 82), we're approaching a time when functional computing power will be within both the economic and physical reach of everyone.

IN THE CLASSROOM

And what impact does the new paradigm have on education? Tragically, so far it's been small. Most schools are stuck in the 19th-century backwaters of technology, relying on chalk and pens while many a kid's bedroom contains a television, a computer, and a CD player. Even at this stage of computer development, classroom machines are often seen only as boxes on which to run fixed applications, rather than as vehicles with which we can extend and expand our thinking.

As for placing a computer in the hands of every child to use in accordance with the "anywhere, anytime" paradigm of 20th-century physics, many people reject the suggestion that we should give this technology to children — even though it would cost less than 1 percent of the projected price of bailing out the savings-and-loan crisis. I think this resistance comes from fear of change, not empty wallets.

Paradigm paralysis is common, but its effects can be devastating. The nation that flocked to oat bran in response to a study conducted with only 250 patients still can't accept the benefits of educational technology, even though hundreds of thousands of students are demonstrating its worth every day.

The clock is ticking its way to 2001. We have ten years to bring education into the 20th century. As users of personal computers, you can help others understand the benefits of the technology in extending each student's ability to explore the inner space of concepts and ideas. Break through paradigm paralysis and make 1991 the year that all students and staff members at your school receive universal access to technology. ❑

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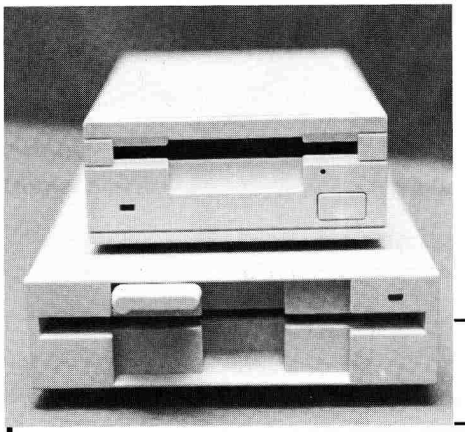

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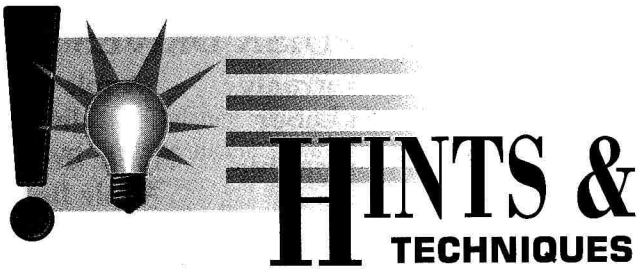

THE SCREENING ROOM

Apple users know there's an easier way to get the job done. A shortcut here, an elegant twist there — that's what Hints & Techniques is all about. It's an information swap for readers who want to share their programming pointers, hardware secrets, AppleWorks applications, and all kinds of other insights.

BASIC COLOR MATCH

By Chris Duggan

IF YOU PROGRAM THE APPLE IIGS in BASIC, you've probably already learned that you can change the colors of the text, the background, and the border on the computer screen without using the Control Panel. All you have to do is POKE the proper color values into the machine — and voilà — instant rainbow effects.

For instance, the simple command *POKE 49204, X* changes the color of the border. (*X* represents one of the 15 pri-mary GS colors: 0 = black, 1 = red, 2 = dark blue, 3 = purple, 4 = dark green, 5 = dark gray, 6 = medium blue, 7 = light blue, 8 = brown, 9 = orange, 10 = light gray, 11 = pink, 12 = light green, 13 = yellow, 14 = aqua, and 15 = white.)

But you may not know that there's a single POKE that can also change the colors of the text and background. You could use the complex formula *POKE 49186, (Y+(Z*16))*, where *Y* represents the color you want the background to have, and *Z* indicates the text color. Or you can simply use the accompanying **Table** to choose those hues; read across for background and down for text. Call that number *W* and *POKE 49186, W* for a color combination that's easy to program. ❑

Write to Chris Duggan at 128 Czech Hall Place, Yukon, OK 73099.

GOT A HINT OF YOUR OWN? *INCIDER* WOULD LIKE TO SEE IT. IF WE CAN USE IT IN HINTS & TECHNIQUES, WE'LL BUY IT FROM YOU. SEND YOUR TIP TO *INCIDER*, 80 ELM STREET, PETERBOROUGH, NH 03458.

Table. GS text and background color combinations.

	BACKGROUND COLORS															
	black	d. red	d. blue	purple	d. green	d. gray	m. blue	l. blue	brown	orange	l. gray	pink	l. green	yellow	aqua	white
TEXT COLORS																
black	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
d. red	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
d. blue	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47
purple	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63
d. green	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79
d. gray	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95
m. blue	96	97	98	99	100	101	102	103	104	105	106	107	108	109	110	111
l. blue	112	113	114	115	116	117	118	119	120	121	122	123	124	125	126	127
brown	128	129	130	131	132	133	134	135	136	137	138	139	140	141	142	143
orange	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159
l. gray	160	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175
pink	176	177	178	179	180	181	182	183	184	185	186	187	188	189	190	191
l. green	192	193	194	195	196	197	198	199	200	201	202	203	204	205	206	207
yellow	208	209	210	211	212	213	214	215	216	217	218	219	220	221	222	223
aqua	224	225	226	227	228	229	230	231	232	233	234	235	236	237	238	239
white	240	241	242	243	244	245	246	247	248	249	250	251	252	253	254	255

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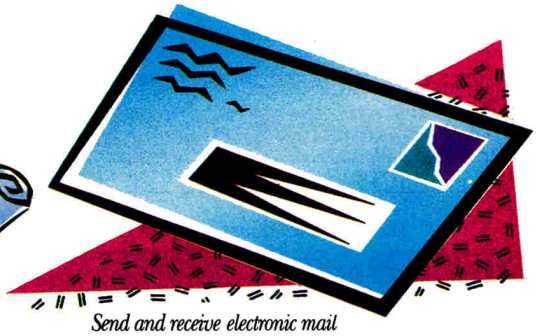

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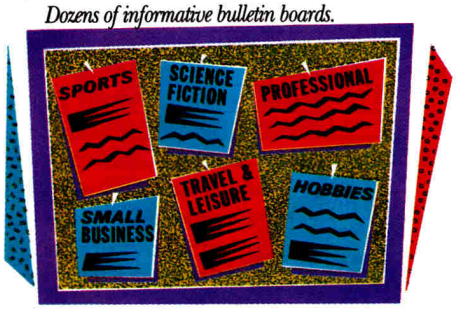

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AE UD Controller for IIe/II+	$ 69
Kensington Anti-Glare screen GS	$ 39

Product Spotlight

InnerExpress enhancement for Inginuity drives-	**$ 69**
Emerald Visions Full Screen 3200 color paint program-	**$ 79**
GS-Numerics Algebra 2/Trig Math system-	**$107**
Quickie Hand Scanner IIgs/IIe/II+	**$195**
Graphic Disk Labeler-	$24.50

Salvation Series:

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Renaissance-	$28.95
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Deliverance-	$28.95

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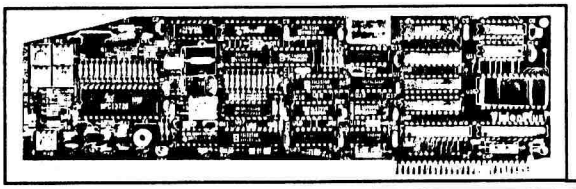
HP500-	$615
HP500/Harmonic Laser bundle-	$639
HP500/Epson Emulation card/ Harmonie bundle-	$695
HP DeskJet Inkjet replacement-	$ 18
HP Emulation cartridge for use w/ DJ 500 & 8-bit software-	**$ 75**

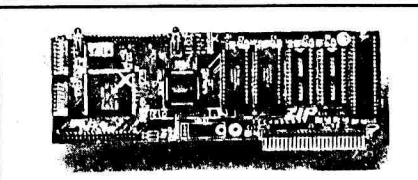


Visionary-

The realtime video digitizer for the GS. $289

Zip Board GSX

Model 1600 8 MHz accelerator board for the GS. $257



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Apple IIgs Color RGB Monitor	$460
Apple 3.5 Drive IIgs	$329
Apple ImageWriter II Color printer with 32k buffer	$459
Magnavox Color RGB Monitor CM8764074G with cable	$319

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AE DataLink 2400 bps Internal	$179
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AE DataLink 2400 bps Express with MNP Level 5	$239
Cardinal 2400 bps External	$109
Cardinal 2400 bps External with MNP Level 5	$181
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LEARNING CURVE

AUTHOR	TITLE	ISSUE	PAGE
Thornburg	Renaissance in Education	Jan	108
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Orbizone	Low	May	32

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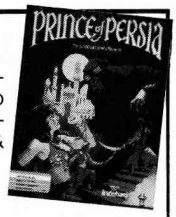

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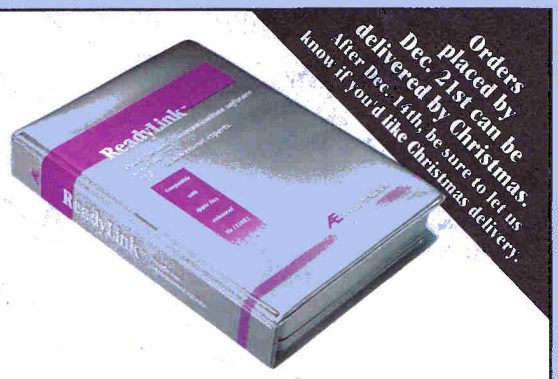

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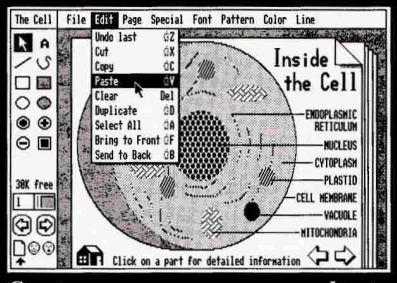

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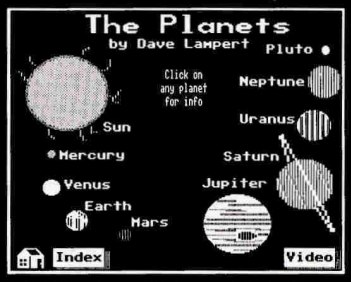

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EDITORS' CHOICE

The Fine Art of Platinum Paint

Not everybody favors the Apple interface for every application, but you seldom hear the complaint that a mouse, some icons, and a pull-down menu bar don't make sense in a paint program (although we have heard that painting with a mouse is like drawing with a bar of soap).

Computer painting software and the Apple interface don't have quite the long-term relationship as do spreadsheets and personal computers, but they go back a long way. Bill Atkinson's MacPaint was shipped with the original Macintosh in 1983; MousePaint, by the same author, accompanied Apple's IIc Mouse that same year; and Atkinson even created the HyperCard painting program that still comes free with every Mac.

No paint program has ever been bundled with the Apple IIGS, but this machine has had its share of compatible programs: Activision rolled out PaintWorks with the GS, and DeluxePaint from Electronic Arts followed quickly. But EA's and Activision's interest in the GS market waned quickly.

PLATINUM PAINT, however, is published by a company committed to the GS — Beagle Bros will support Apple II software probably longer than Apple. But there's a great deal more to be said for Platinum Paint than that it comes from the first name in Apple II software.

- Platinum Paint can import and export graphics in all popular GS and 8-bit II formats, and even in MacPaint format. And you don't have to give up any art created with another program. (If you're the owner of any commercial Apple II paint program, you can receive $50 off the price of Platinum Paint until December 25.)
- The palette editor in Platinum Paint lets you work with your choice of 16 colors from a possible 4096. With its unique color-selection tools that let you make a hue warmer or cooler, darker or lighter, plus mix or blend colors, Platinum Paint stops you from searching blindly for just the right shade.
- Keyboard command shortcuts save you the trouble of pulling down a full menu, and you can modify almost every one of Platinum Paint's commands with a keystroke. For instance, holding down the apple key while using the lasso tool means that the lasso won't shrink to fit the object you've thrown it around. You're in control.
- A palette editor makes it easy to touch up or add color to scanned black-and-white images. With scanner prices dropping, anybody can be an artist.
- Platinum Paint offers a selection of brush types as well as sizes to create more lifelike renderings — charcoal and wash brushes among seven other kinds.

The tools — paintbrush, airbrush, pencil, eraser, and the rest — as well as the menu items, such as fat bits and color cycling, are the same ones you'll see in many other paint programs. Platinum Paint's handling of the basics sets it apart, however — it's fast and easy to understand.

"It's great to see a full-featured GS paint program that not only takes advantage of the machine, but also exploits the capabilities of the latest version of GS/OS.

"It's surprising that Electronic Arts and Mediagenic never revised DeluxePaint II and PaintWorks Gold, which are both great programs. But it's not surprising that Beagle Bros has once again shown marketing savvy as well as great programming skill," says Editor in Chief Dan Muse.

The Apple interface and the MacPaint style are the standard in computer art, and Beagle Bros sets the standard in Apple II software. It's a potent combination.

Platinum Paint is priced at $99.95 and requires an Apple IIGS with 1 megabyte of RAM, a 3.5-inch disk drive, a color monitor, and System Software 5.0.3 or later. For more information, contact Beagle Bros, 6215 Ferris Square, Suite 100, San Diego, CA 92121, (619) 452-5500.

Our Editors' Choice column singles out one product each month that the inCider editors feel is a significant addition to the Apple II family. Products evaluated are among the most recent releases and may not be available yet for retail distribution.

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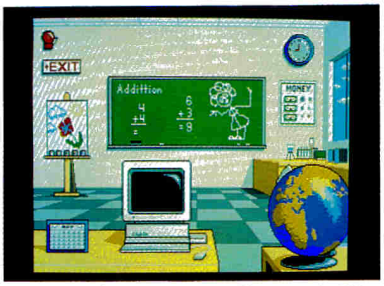

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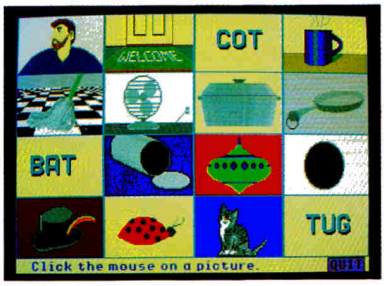

Talking First Words uses voice and animation to introduce children to nouns and verbs.

Talking Multiplication & Division provides a human voice to help kids with basic math skills.

These new programs join the 15 others listed here to form the Talking Schoolhouse Series, which educators and parents across the country are hailing as the most outstanding software available for the IIGS. IBM PS/2 and TANDY 1000 versions will be ready for shipment shortly.

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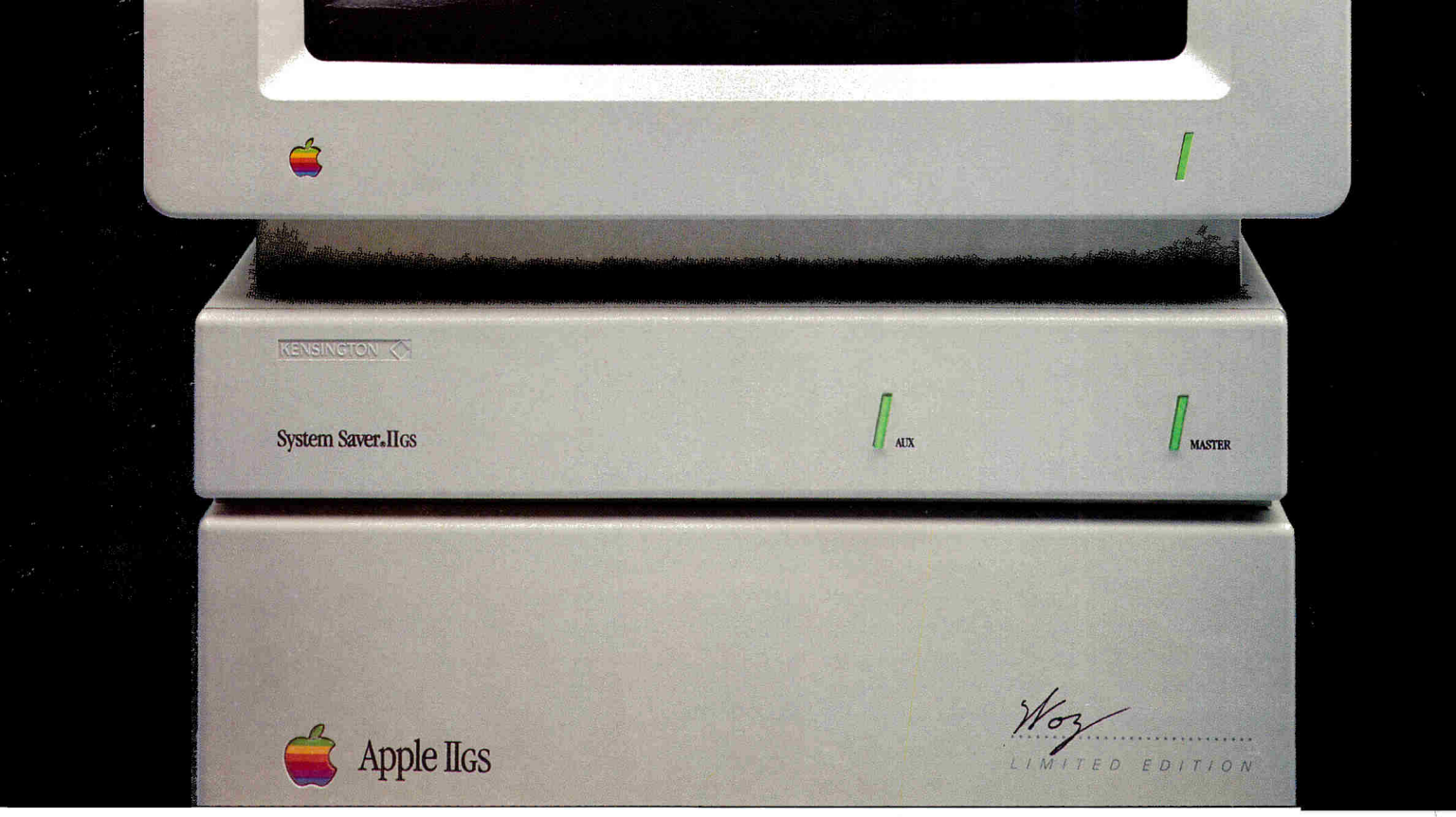

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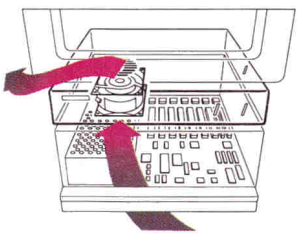

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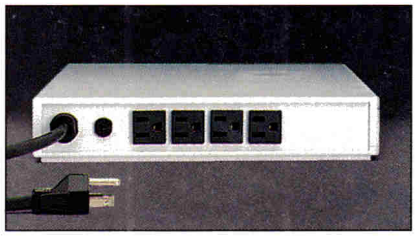

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