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February 1990

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P. 100

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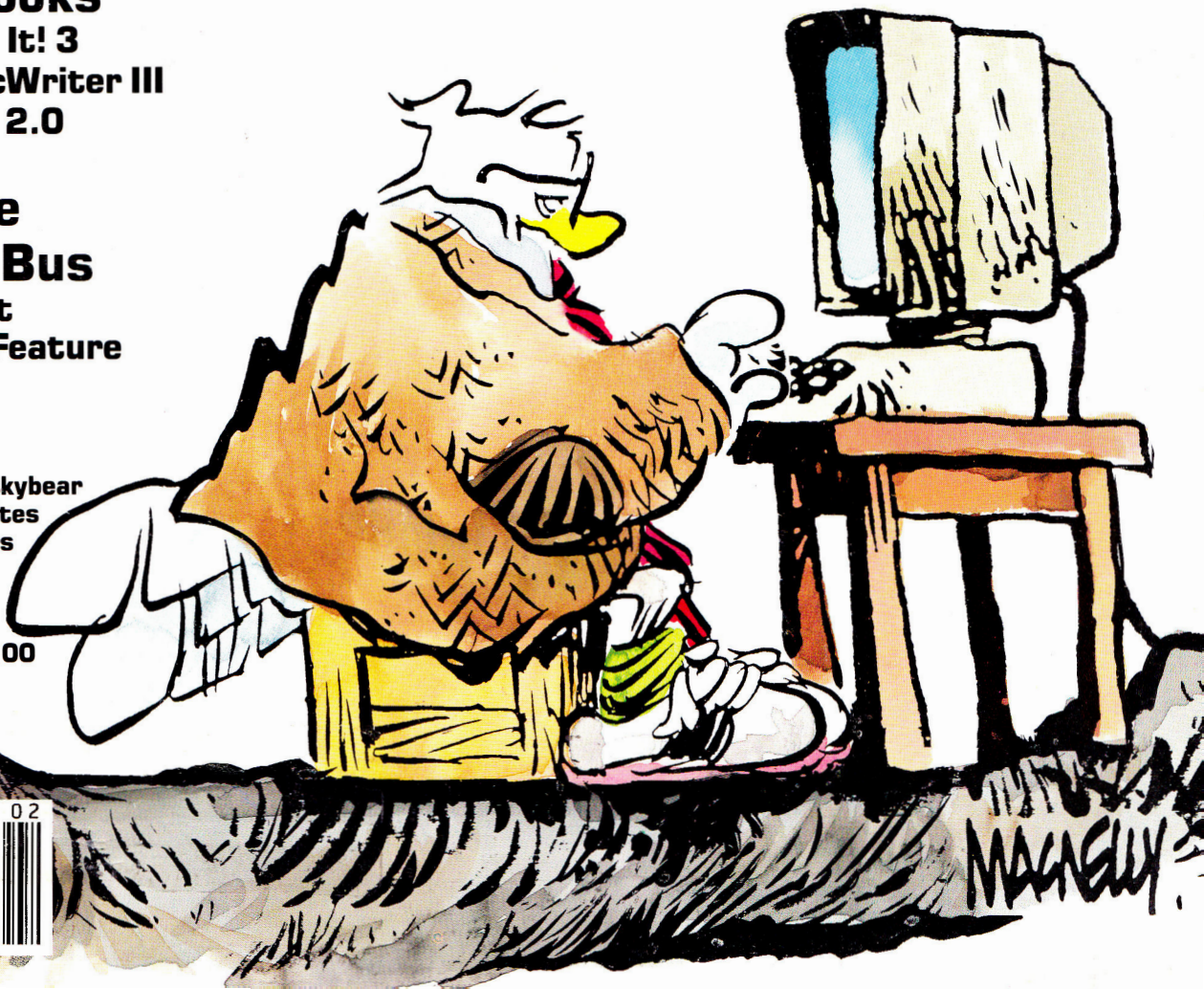

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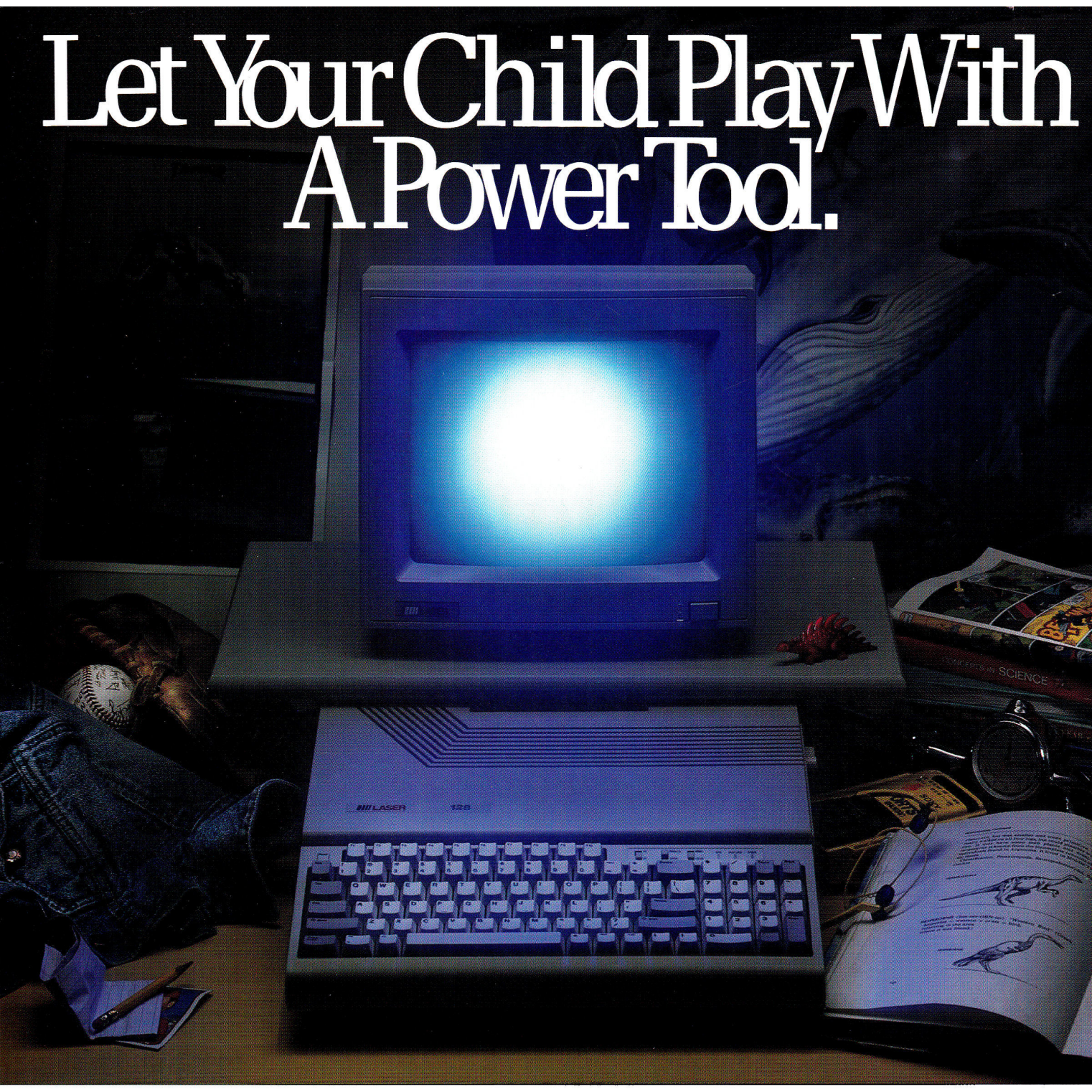

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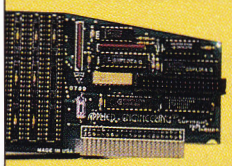

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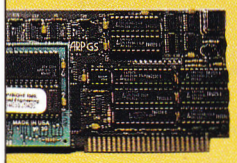

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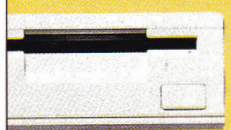

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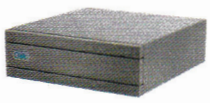

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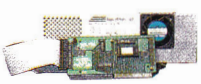

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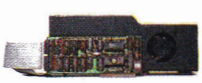

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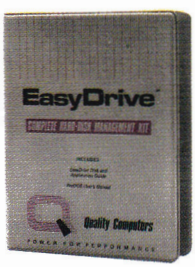

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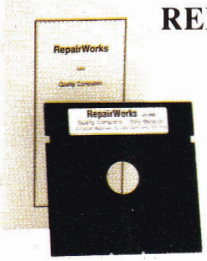

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inCider (ISSN #0740–0101) is published monthly by IDG Communications/Peterborough, Inc., 80 Elm Street, Peterborough, NH 03458. Phone: (603) 924-9471. Second-class postage paid at Peterborough, NH, and additional mailing offices. (Canadian second class mail registration number 9590.) Subscription rates in U.S. are $27.97 for one year, $43.00 for two years and $59.00 for three years. In Canada, $34.97, U.S. funds, one year only. In Mexico, $32.97—one year only, U.S. funds drawn on a U.S. bank. Nationally distributed by International Circulation Distributors. Foreign subscriptions (surface mail), $47.97—one year only, U.S. funds drawn on a U.S. bank. Foreign subscriptions (air mail), $82.97 prepaid, U.S. funds drawn on U.S. bank, one year only. **Postmaster**: Send address changes to *inCider*, Subscription Services, P.O. Box 58618, Boulder, CO 80322-8618. (Send Canadian changes of address to: *inCider*, P.O. Box 1051, Fort Erie, Ontario L2A 5N8.)

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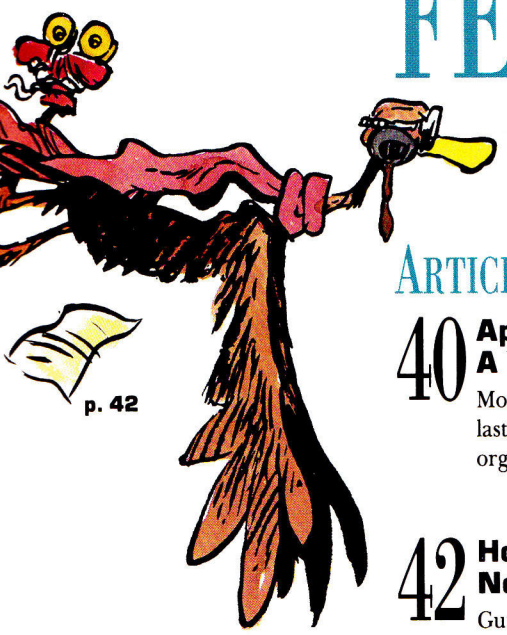

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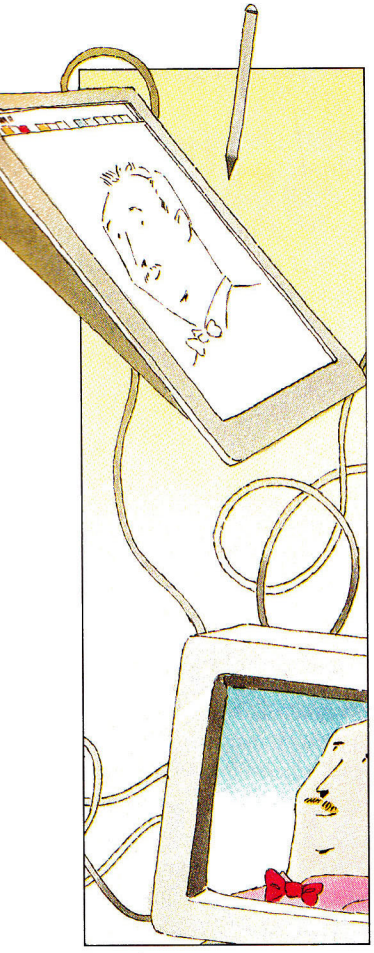

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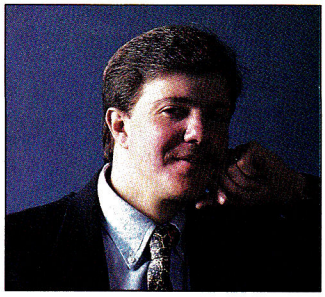

INCIDER'S VIEW

JUST DOING OUR JOB

By DAN MUSE * EDITOR IN CHIEF

As *The Apple II Magazine*, we have an obligation to report on the latest technology. Our primary responsibility is to cover the Apple II market, not create it or try to shape it.

IN CASE THERE'S ANY DOUBT, WE DO READ your letters. We nod in agreement when we read well-written, logical letters. We laugh when we read funny letters. And we get angry when we read letters that aren't based on fact and that imply we're not doing our job, which can be described in three words: *Serve the reader*. Even though some of your comments are hard on our egos, we take your suggestions to heart, so don't stop writing.

We neither nodded nor laughed, though, when we received this letter from a reader in New Hartford, New York: "What should I, an owner of a IIc, think when again and again I am told outright or through [implication] by your magazine that to take advantage of even [a few of the] new developments for the Apple I *must* upgrade to the IIGS? Are you aware that millions of users haven't upgraded? . . . Reading your magazine makes me think I am alone using an orphan machine."

inCider has never said, implied, suggested, or even hinted that Apple II Plus, IIe, or IIc owners "must" upgrade to the GS. We believe many want to upgrade, and many have. As journalists, we're trained to rely on facts, so we'll use our current reader demographics and an analysis of the December issue, the issue that drove the New Hartford subscriber to write, to make our point.

According to our latest readership study, 38 percent of *inCider* readers own an Apple IIGS, 50 percent own a IIe, 35 percent own a IIc or IIc Plus, 9 percent own a II Plus, and a small percentage also own a Macintosh. We rely on this information to help us plan each issue. While GS ownership is increasing rapidly—it was only 20 percent a year ago—coverage of 8-bit Apples still makes up the majority of our material. That doesn't exclude GS owners, because many of them use 8-bit programs.

Of *inCider*'s regular columns, only Apple IIGS BASICs deals specifically with the GS, and it alternates with Applesoft Adviser, which is appropriate for every Apple II owner. AppleWorks in Action covers only AppleWorks—the classic edition; Press Room usually revolves around Publish It!; and Speaking of Graphics covers graphics for both the IIe/IIc and the GS. The three other monthly columns, *inCider*'s View, Stattus Report, and Learning Curve, are opinion pieces on a variety of topics.

I also reread our December departments to see whether we had devoted an inordinate amount of space in that issue to the GS. Of the seven letters in our Letters to the Editor section, only one addresses the GS specifically. Our What's New section covers the following IIe/IIc products: Beagle Bros' TimeOut series and Point-to-Point; FrEdBase (a popular low-cost database that works on a 64K Apple II); The Presenter, a graphics program that works on a 48K Apple II Plus; Publish It! 2 templates; and a IIc hard-disk drive from Chinook. December's Apple Clinic questions deal with the ImageWriter II, IIc text modes, IIc printer ports, and the LaserWriter NTX.

Our three features cover computer accessories, AppleWorks 3.0, and the year in review. Disk-drive cleaners and printer stands know no favoritism. AppleWorks 3.0 is an 8-bit product. "The Year in Review" does have a bit of a GS flavor to it, but could we write such an article and not talk mostly about the GS? As *The Apple II Magazine*, we have an obligation to report on the latest technology.

What about reviews? Our primary responsibility is to cover the Apple II market, not create it or try to shape it. We certainly have our opinions on the direction the Apple II should take, and that's where columns like *inCider*'s View and Stattus Report fit in. In our Reviews section, however, we simply respond to the market: It reflects the latest products available for the II family. The December issue includes reviews of two GS products and three products that run on the IIe, IIc, and GS. In our Game Room section we evaluate two GS games and one IIe/IIc game.

IIe/IIc users, you're not alone. Expect *inCider* to write about the products that are most popular among our readership—AppleWorks, Publish It!, The Print Shop, Dazzle Draw, AppleWorks GS, PaintWorks Gold, and so on. You must also expect us, however, to report on advances in II technology as they occur—that's our job.□

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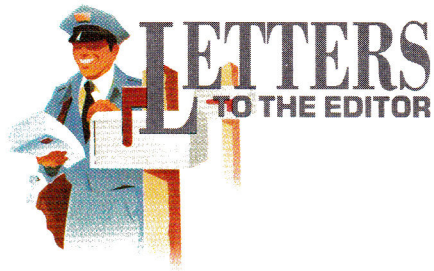

Due Credit

I'D LIKE TO CORRECT A COUPLE OF statements in Joe Abernathy's article regarding my recently joining the team at TML Systems ("Language Gains," What's New, November 1989, p. 18).

First, I am the author of the PRIME bulletin-board system for Apple IIs, not the Protree BBS; Bob Garth of GEnie created the latter. Although Mr. Garth and I are former business partners, I had nothing to do with creating the Protree system.

Second, my first project at TML Systems was TML Source Code Library II, a companion product for TML Pascal II. Tom Leonard, president of TML, is the author of TML Pascal II.

Vince M. Cooper
Apple IIgs Products Manager
TML Systems, Inc.
8837-B Goodbys Executive Drive
Jacksonville, FL 32217

Zippity-Do-Dah

LIKE MR. ZAPIAIN, I'VE BEEN waiting a long time for my Zip Chip replacement (Letters, October 1989, p. 12). When my chip *was* working, I noticed it didn't improve the overall speed of program execution significantly.

I spent a considerable amount of time waiting to print my documents and access my floppy-disk drive. A print buffer or print-spooling program, a RAM card, and a hard disk would have been a much wiser investment. Only after solving the problem of an I/O-bound computer should I have purchased an accelerator.

If you must purhase a Zip Chip, place the order through the U.S. mail and pay for it with a credit card. This way you might obtain some help from the U.S. Postmaster's office. Also, using the credit card lets you cancel the order through disputed billings if the chip fails quickly.

Finally, be sure to send in the warranty-registration card from the back of the Zip Chip manual. Zip must have that card before it will respond to your letter.

Albert P. Will, Jr.
5410 Granada
Amarillo, TX 79109

From this and a number of other letters, it seems that Zip Technology has some problems with the quality of its chips. Dick Stivers, executive vice president at Zip, has told us that the company received a number of faulty chips from suppliers in 1989 and that it's working to improve the Zip Chip's performance. —*eds.*

Segmenting Sorrows

DESPITE SOME VERY NICE AND useful features, AppleWorks 3.0 has one omission that'll create some consternation for folks who work with very large files.

The program addresses RAMWorks and other memory-expansion cards, so you can work with large files on the desktop—but it won't load any files you created previously with earlier versions of AppleWorks and segmented with Applied Engineering software. Also, if you create a file larger than 135K and try to save it, 3.0 won't segment the file.

I haven't read about this shortcoming in any reviews, and if someone doesn't know what's happening, he or she might lose a very large file.

Of course, if you're aware of what's going on, you can split the file into two smaller ones and save them separately. Later, load the two files and combine them on the desktop. This, however, is an unnecessary inconvenience—I was doing it with BASIC programs years ago!

James S. Sibley
226 Mt. Zion Road
Midlothian, TX 76075

Basically Happy

THE LAST THREE PARAGRAPHS concerning Applesoft BASIC in "East of Eden" (Not for Techies Only, November 1989, p. 22) caught my eye. Applesoft BASIC does have limitations as you state, but it's simple to use because the language is "built in."

I tried one of the commercially available 16-bit BASICs. It's a nice program, but too clumsy to use easily. It has too many pull-down menus and makes writing a simple program just too complicated.

Several years ago Apple brought out a 16-bit BASIC—GS BASIC. It's quite simple to use with a set of commands very much like Applesoft, plus a host of new ones. I've used it and it fits the bill nicely. A few months back, however, Apple stated that it would no longer support the program. (Apple seems to have forgotten that it never supported GS BASIC in the first place.) I still believe this 16-bit program is a logical step up from Applesoft BASIC.

I'm one of those "casual programmers" you mention in your article. I like BASIC, which I use primarily for number crunching, and I think computers are a lot of fun. I approach them from that viewpoint.

Roger C. Asman
15383 Blue Skies Court West
Livonia, MI 48154-1515

inCider WELCOMES READERS' COMMENTS. WE RESERVE THE RIGHT TO EDIT LETTERS FOR CLARITY, STYLE, AND SPACE. PLEASE ADDRESS YOUR CORRESPONDENCE TO LETTERS, *inCider*, ELM STREET, PETERBOROUGH, NH 03458.

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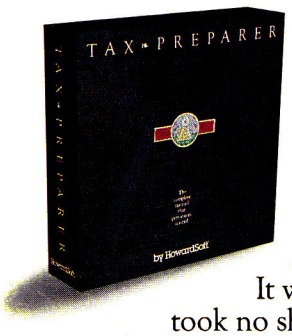

Before buying Tax Preparer, I was skeptical, because it cost less than $300, with annual updates under $100 a year...cheap enough for individuals. But once I saw it I knew it was just about as professional as tax software can get. It was the only package that took no short cuts to accuracy: it transferred hundreds of numbers among IRS forms, computed dozens of worksheets, and recomputed AGI as often as necessary to get an accurate return. And all automatically.

"HowardSoft's attention to detail made all the difference."

Its execution of the Passive Activity Rules was nothing short of brilliant. I didn't have to complete a single IRS worksheet myself. And my lack of computer knowledge wasn't a problem because the program is intuitive to use, and comes with the most complete reference manual I've seen.

But the biggest lifesaver was the hidden automation. I had forgotten to report the self-employment tax for one taxpayer. But when I went back and checked the return, I found that Tax Preparer had already generated and completed the required Schedule SE and reflected it in the return. I also overlooked the new law that requires some taxpayers to file Form 8606 for their IRA; but the returns where this situation existed had a form generated and completed by Tax Preparer automatically! These and the other automatically-generated forms are quite a difference from tax software with "diagnostics" that tell *you* to prepare another form; if it's needed, Tax Preparer just takes care of it itself.

The final printed product really capped it off. The printing was so automatic that we printed all returns for the day while we were closing up the office. The printouts were IRS-ready, complete with automatically cross-referenced supporting statements.

I couldn't have gotten through last tax season without it. In spite of the new laws, Tax Preparer let me handle more clients in less time, without the usual errors and headaches. It was easy! I hate to admit it, but I'll bet plenty of individuals can do their own returns with it."

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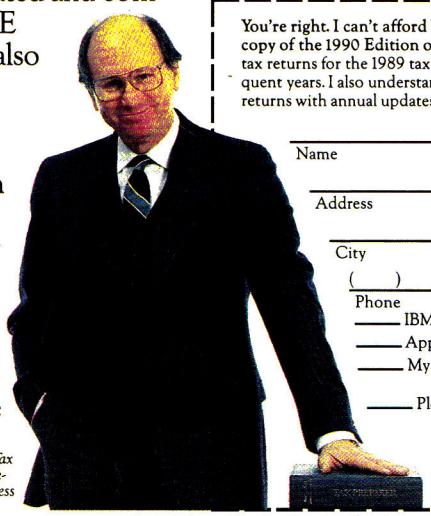

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APPLIED ENGINEERING

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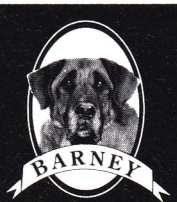

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HARDWARE

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WHAT'S NEW

edited by Paul Statt

AMERICA ONLINE

What do you get when you take the *Apple* out of *AppleLink Personal Edition*? No, not Link Personal Edition—*America Online*.

After more than a year of working with Apple Computer, Quantum Computer Services is going solo with its popular Apple II on-line service, and adding Macintosh users, too.

Apple will remain involved with Quantum and will offer technical news and information through America Online, according to Quantum representatives. The biggest results of the change are that the service is now less expensive and that the software will be available through a greater variety of sources. You can expect to see America Online software bundled with some modem packages.

The marketing thrust behind America Online is to make it affordable enough and easy enough to entice computer users who have historically avoided telecommunications. To make it financially appealing, Quantum is providing the software and membership free, with a 20 percent lifetime discount on connect-time charges to existing AppleLink Personal Edition users and to all charter members who sign on before January 31, 1989.

The monthly membership fee (not subject to the 20 percent discount) for America Online is $5.95, which entitles you to a monthly program guide and one free hour of use per month. After that, the fee is $5 an hour for weekends and evenings and $10 an hour for use during business hours. Also, unlike some other major on-line services, America Online doesn't charge additional fees for access to other available databases.

For more information on America Online, write to Quantum Computer Services, Inc., 8619 Westwood Center Drive, Vienna, VA 22182, (800) 227-6364, or circle number 350 on the Reader Service card. —D.M.

ARMED AND EDUCATIONAL

Rumor has it that robots are the wave of the future: Will they control us, or will we learn to control them? **Robot Arm II Model 90** starts students thinking about robotics early.

Robot Arm II is fun. Teachers love it because it's easy to install (just plug into the game port on any Apple II) and easy to program. Robot Arm understands its own simple language; you don't need BASIC. Younger students and beginners can control Robot Arm II in immediate mode by simply typing in commands to move the arm on any of its five axes. Older, more experienced students can write programs and save them.

HARDWARE

Robot Arm II Model 90 comes complete with an instruction book that includes sample programs and ideas for more, a keyboard template, and programming charts, in addition to a 5¼-inch "Exploring Robotics" disk, all for $310. For more information contact Robot Arm II, 2756 Lake Road, Hilton, NY 14468, or circle number 354 on the Reader Service card. **—P.S.**

BEAGLE BROS GIVES IT AWAY

Teachers who know that Beagle Bros' TimeOut enhancements can make AppleWorks sing, dance, and collect lunch money, take note: Beagle Bros, the Teachers' Idea and Information Exchange (TI&IE), and *The AppleWorks Educator* want to know why and how, in the **TimeOut for Teachers Contest.**

The 26 best lessons created with AppleWorks and any TimeOut enhancement(s) will win valuable prizes: a grand prize, two second prizes, and ten third prizes in each of two categories, grades K–9 and grades 10 and up.

The grand-prize winners' schools will receive site licenses for AppleWorks and one TimeOut product; the winners themselves will walk away with every Beagle Bros TimeOut product, a complete collection of back issues of *The AppleWorks Educator* and a year's subscription to that publication, and a six-month subscription to the monthly TI&IE disk. That's more AppleWorks help than ever assembled before in one place.

Each of the two second-prize winners in both categories receives any three Beagle Bros TimeOut products, a complete set of TI&IE disks (more than 900 templates), six months of the TI&IE disk, as well as a year of *The AppleWorks Educator*. Each of the 20 third-prize winners gets any Beagle Bros TimeOut product of his or her choice and the two subscriptions.

The deadline is April 30, so hurry to send your best AppleWorks work to TI&IE TimeOut Contest, P.O. Box 6229, Lincoln, NE 68506. Be sure to include with your disk a 200-word description of the lesson, and whatever else the judges will need to evaluate it. Entries become the property of the sponsors, who will choose winners on August 15 and announce the names in a subsequent issue of *inCider*. **—P.S.**

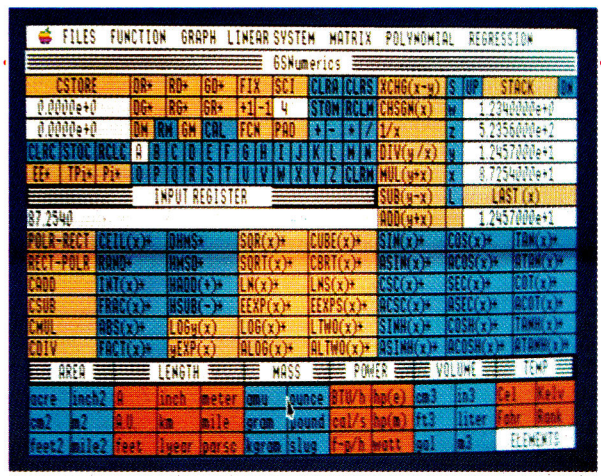
NUMBERS GAMES

SOFTWARE

Apple Computer, *inCider*, and hundreds of schoolteachers have struggled for years to convince the world that a personal computer such as the Apple IIGS is *not* an expensive adding machine. So why are we pleased to see a new product that can turn your GS into a complex, flexible calculator?

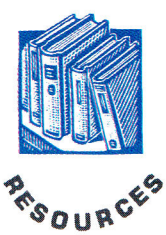
Because **GS Numerics** does the work of a crew of calculators. It's really a short course in basic algebra and trigonometry; GS Numerics makes the analysis of polynomial, trigonometric, and exponential functions easy. It puts the graphics power of the GS to work, enabling any student to draw a graph easily and see what a function looks like.

GS Numerics is complete—no short announcement could possibly list all its features. The scientific calculator alone uses 64 functions and 26 memory locations. GS Numerics should find a place in almost any high school or college math class; it's been tested in Iowa schools.



GS Numerics costs only $139, with a site license available for schools. For more information, contact Spring Branch Software, Rural Route 2, Box 268A, Manchester, IA 52057, (319) 927-6537, or circle number 353 on the Reader Service card. **—P.S.**

ALGORITHM



RESOURCES

"Personal computing has been compromised, and finally dominated, by software that is sold from the pages of every computer magazine on the newsstand."

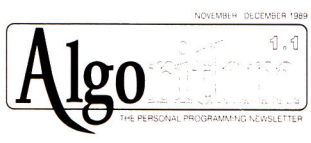
That's the opinion of A.K. Dewdney, the "Computer Recreations" columnist for *Scientific American*, author of *The Turing Omnibus: 61 Excursions in Computer Science*, and now the editor of *Algorithm: The Personal Programming Newsletter*.

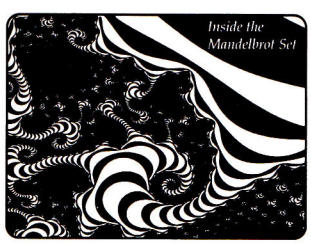
***Algorithm* promises to intrigue everyone who sincerely enjoys computer programming, whether it "pays" or not. Every two months, *Algorithm* publishes articles about creating programs; its readers are encouraged to "write their own programs and . . . to think over substantive issues connected with the enterprise," in Dewdney's words.**

But don't look for program listings. The name of the publication is *Algorithm*, and an algorithm is the means by which a program reaches an end, the method, the *tao* of a program. Don't assume that *Algorithm* is only for professional programmers; it's a great resource for the beginning programmer who's wondering, "But can I have any *fun* programming?"

In the first issue, you might have learned to simulate life, imitate hailstones, and draw Mandelbrot plots, all with simple algorithms. You could have shuddered at a sci-fi story about computers that program themselves. But you wouldn't have seen any classified advertisements in *Algorithm* for any neat Apple II programs—a trend we hope to see reversed.

Anybody who thinks programming is entertaining or educational should be reading *Algorithm*. A year's subscription costs $29.95 (U.S.) from P.O. Box 2237, Westmount Postal Outlet, 785 Wonderland Road, London, Ontario, Canada N6K1M6. —P.S.





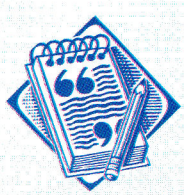
The Emergence of Artificial Life
Hailstone Numbers: Ups and Downs
The Program That Ran a Business

"BASIC is dangerous to the mind."

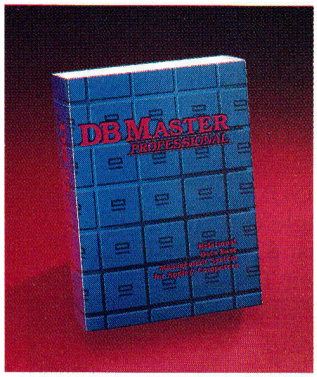
—Jean-Louis Gassee, President, Apple Products

speaking in favor of structured programming at AppleFest/San Francisco, September 1989

QUOTES



PROGRAMS & PERIPHERALS



DB Master Professional by Stone Edge Technologies

DB Master Professional brings the power of a relational database manager to the Apple II. Anyone who needs to keep track of interrelated types of information can utilize *DB Master Professional* to automate record keeping. Relate up to 10 files for automatic data entry, posting and updating. Includes a full featured reports generator, mail merge, password security and AppleWorks compatibility. ..... **$189.**

EDUCATIONAL SOFTWARE

Barron's
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Britannica
Designasaurus .....24.
Designasaurus *(IIGS)* or Revolution '76 *(IIGS)* .....28.
Algebra 1 First Semester or Algebra 1 Second Semester .....29.
Broderbund Geometry *(IIGS)* .....55.
The Family Software Library .....69.
Science Tool Kit Master Module .....50.
Science Tool Kit Module I, II or III .....26.
Type! .....19.
Where in the World is Carmen Sandiego? ....25.
Where in the USA is Carmen Sandiego? .....29.
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Where in the World is Carmen Sandiego? *(IIGS)* .....29.
Where in Time is Carmen Sandiego? *(AP or C+)* .....29.
ByteWorks
Ugly Duckling *(IIGS)* .....32.
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Joshua's Reading Machine *(AP or IIGS & C+)* .....25.
See the U.S.A. .....30.
Once Upon A Time *(IIGS Talking)* .....30.
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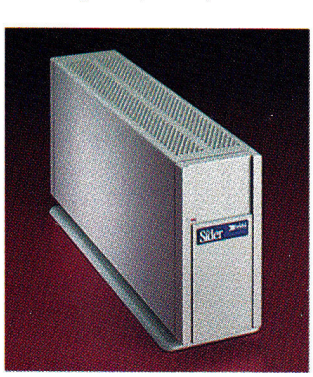
Math Blaster Plus *(IIGS)* or Word Attack Plus *(IIGS)* .....29.
Alge-Blaster Plus *(AP or IIGS)* or Math Blaster Plus .....29.
Grammar Gremlins or Read 'N' Roll .....29.
Spell-It Plus *(AP or IIGS)* or Math Blaster Mystery *(AP or C+)* .....29.
Talking Math & Me *(IIGS)* or Talking Reading & Me *(IIGS)* .....29.
Talking Math Blaster Plus *(IIGS)* .....29.
Word Attack Plus Spanish or French .....29.
Math & Me or Reading & Me .....24.
Electronic Arts
Mavis Beacon Typing .....30.
Mavis Beacon Typing *(IIGS)* .....37.
First Byte/Electronic Arts
The Rhyming NoteBook .....29.
Grade Busters Corp.
Grade Busters 1, 2, 3 .....57.
Grade Busters 4, 5, 6 .....42.
Great Wave
Kidstime II *(IIGS)* .....24.
Learning Company
Reader Rabbit *(IIGS)* or Writing and Publishing Center *(AP or IIGS)* .....36.
Writer Rabbit *(IIGS)*, Think Quick *(IIGS)* or Rockys Boots *(IIGS)* .....30.
Magic Spells *(IIGS)* or Math Rabbit .....24.
Gertrude's Secrets *(IIGS)* .....24.
Think Quick, Writer Rabbit or Rocky's Boots .....30.
Reader Rabbit, Magic Spells or Math Rabbit *(IIGS)* .....24.
Mindscape
Crossword Magic .....34.
Orange Cherry *GS Talking Series:*
Animals, Dinosaurs, Numbers, First Write, First Reader, School Bus, Alpha Chimp, Colors & Shapes, Reading Railroad, Addition & Subtraction, ABC's, Speller, Clock or Money .....42.
Pelican Software Dinosaur Days .....24.
Monsters & Make Believe Plus .....29.
POW! ZAP! KER-PLUNK! .....29.
Roger Wagner
HyperStudio *(IIGS)* .....95.
Sensible Software
Report Card II *(IIe & IIGS)* .....37.
Simon & Schuster
Speed Reading Tutor IV or Typing Tutor IV .....27.
Typing Tutor IV *(IIGS)* .....34.
Spinnaker Kidwriter Gold *(IIGS)* .....31.
Facemaker: Golden Edition .....27.
Kidwriter .....27.
Springboard
Atlas Explorer .....32.
Terrapin Terrapin Logo Plus .....79.
Tom Snyder Productions
Reading Magic Library: Jack and the Beanstalk or Flodd, the Bad Guy .....25.
Weekly Reader
Stickybear Series: Sticky Bear ABC (5¼), Basket Bounce (5¼ or 3½), Bop (5¼), Math I (5¼ or 3½), Math II (5¼ or 3½), Numbers (5¼ or 3½), Opposites (5¼ or 3½), Reading (5¼ or 3½), or Shapes (5¼ or 3½)*(ea.)* .....24.
Basic (5¼), Car Builder (5¼ or 3½), Drawing (5¼), Map Skills (5¼ or 3½), Math Word Problems (5¼ or 3½), Music (5¼), New Talking Alphabet (3½), New Talking Opposites (3½), New Talking Shapes (3½), Parts of Speech (5¼ or 3½), Printer (5¼), Punctuation Rules (5¼ or 3½), Reading Comprehension (5¼ or 3½), Spellgrabber (5¼ or 3½), Townbuilder (5¼ or 3½), Typing (5¼ or 3½) or Vocabulary Development (5¼ or 3½) *(ea.)* .....31.



DF-Series Siders by First Class Peripherals

First Class Peripherals, the leading supplier of hard drives for Apple Computers, announced today the release of a *new* series of SCSI hard drives. The ***DF-Series Siders*** are the fastest, most reliable in the industry, and the only hard drives for Apple users utilizing voice coil technology. The *DF-Series* are available in 20 MB **($535)**, 40 MB **($895)** and 70 MB **($989)**.

ACCESSORIES

Advanced Gravis
MouseStick ADB *(IIGS)* .....69.
Advanced Gravis' Joystick *(AP & IIGS)* .....43.
Apple Computer Apple Mouse *IIe* .....125.
Apple Mouse *IIc* .....85.
Applied Engineering
TimeMaster II H.O. .....79.
Conserver *(IIGS)* .....95.
Sonic Blaster *(IIGS)* .....105.
IBM Style Keyboard .....115.
Audio Animator *(IIGS)* .....185.
Applied Ingenuity Keyboard X *(IIGS)* .....135.
Big Red Computer
Labels, Labels, Labels .....27.
CH Products Hayes Flight Stick .....52.
Hayes Mach III Joystick .....36.
Roller Mouse ADB *(IIGS)* .....119.
Cutting Edge
EADB-105 Extended Keyboard w/Macromate *(IIGS)* .....149.
Digital Vision Computer Eyes IIE .....109.
Computer Eyes GS .....195.
Ergotron
Mouse Cleaner 360° *(IIGS)* .....15.
Epyx Epyx 500XJ Joystick .....27.
Kalmar
Teakwood Rolltop Disk Case *(Holds 50)* .....18.
Kensington
Mouse Pocket *(Reg. or ADB)* .....8.
Mouseway *(Mousepad)* .....8.
Apple IIe, IIc or IIGS Dust Cover or Imagewriter I or II Cover .....9.
Apple Security System .....34.
Printer Muffler 80 .....43.
Printer Muffler 132 .....58.
AntiGlare Filter IIGS .....39.
System Saver *(Platinum or Beige)* .....59.
System Saver *(IIGS)* .....69.
New Turbo Mouse *(Reg. or ADB)* .....109.
Kraft
Universal 3 Button Joystick *(IIe or IIc)* .....34.
Koala Technologies
Koala Pad Plus w/Graphics Exhibitor .....84.
Kurta IS ADB Tablet w/stylus *(IIGS)* .....289.
Lynx Computer
Turbo Trackball *(IIe or IIGS)* .....65.
MDIdeas Digitizer Professional *(IIGS)* .....129.
SuperSonic *(Stereo Card for IIGS)* .....49.
SuperSonic Digitizer *(IIGS)* .....49.
Mouse Systems
A+ Mouse *(IIc)* .....65.
A+ ADB Mouse *(IIGS)* .....83.
MousTrak MousePad 7"x9" Size .....8.
MousePad 9"x11" Size .....9.
MousePad L/F *(Low Friction)* .....9.
RC Systems Double Talk .....187.
Ribbons
Available colors: black, blue, brown, green, orange, purple, red, yellow, silver or gold
ImageWriter Ribbon-Color .....4.
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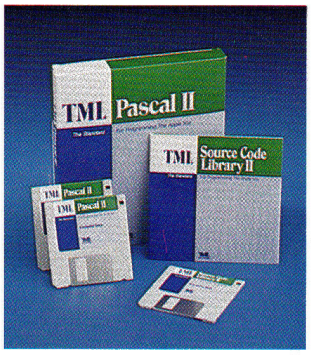
ImageWriter II - 4 Color Ribbon .....9.
ImageWriter Rainbow Pk. (6 Colors) .....20.
Street Electronics
Echo IIB *(AP & IIGS)* .....105.
Echo IIC *(IIc & IIc+)* .....129.
Triad Venture
GDL Graphic Disk Labeler-GS .....22.



TML Pascal II by TML Systems

The standard in Pascal programming with the simplicity of the Apple IIGS personal computer. ***TML Pascal II*** is a complete Pascal programming language combining a fully interactive editor and compiler with pull-down menus and windows. Complete support for Apple's System Software v. 5.0 and GS/OS is also provided. Lets you graphically define menus, windows, dialogs, Icons, etc. .. **$82.**

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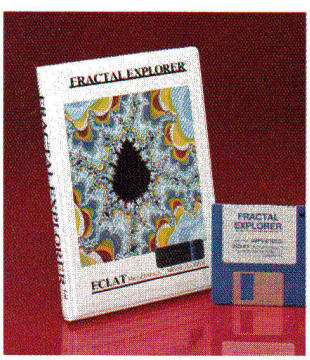
ReadyLink .....75.
Beagle Bros.
TimeOut TeleComm .....***Special*** 45.
Point-to-Point .....59.
Checkmate Technology
ProTERM *(IIGS,IIe,IIc)* .....78.
Compuserve Compuserve Starter Kit .....24.
L & L GBBS .....79.
United Software Industries
ASCII: Express Pro: Prodos .....72.
ASCII: Express Mousetalk 1.5 .....69.



Fractal Explorer by ECLAT Microproducts

An easy to use, fractal creation program which includes a flexible slide-show with dazzling color effects. No numbers to enter. Includes an informative and educational instruction manual. Online help menus and prompts guide the user along the way to create and display striking fractal pictures derived from the Mandelbrot and Julia set. Compatible with popular paint programs. ..... **$28.**

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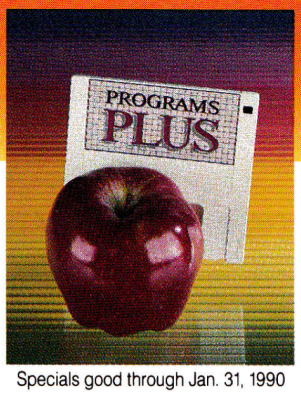
OVERNIGHT



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InnerDrive by Applied Ingenuity

InnerDrive is the original internal hard disk for the IIgs. It comes with a heavy duty power supply, cooling fan and controller card. Already formatted, it requires about 5 minutes to install and it's ready to run. The leader in performance and affordability, it's the fastest and the lowest cost hard disk system. Uses standard GS/OS. Available for the IIe and is compatible with Prodos, Dos 3.3 and MS Dos.

PRINTERS

Apple
ImageWriter II ..... 459.
Brother
M-1109AP *(ImageWriter Comp.)* ..... 249.
Laser Computer, Inc.
Laser 190A w/Serial Interface ..... 239.
Panasonic
KXP-1180I/M2 *(192 cps)* NLQ Mode ..... 199.
KXP-1191I/M2 *(240 cps)* NLQ Mode ..... 269.
Seikosha
Seikosha SP 1000
(Imagewriter Compatible) ..... 235.

Thunderscan by Thunderware

Thunderscan transforms any ImageWriter printer (except the LQ) into an inexpensive, high-quality scanner. All you need is a IIe, IIc, IIc+ or IIgs to turn any printed image into a 16 gray shade, high-resolution Apple II graphic - the highest resolution of any Apple II scanner. And ImageWriter and LaserWriter printer drivers allow for actual size. Now *Thunderscan* offers Apple IIgs specific software. .. **$159.**

GRAPHICS PACKAGES

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Design Your Own Home: Architecture *(IIgs)* or Interiors *(IIgs)* ..... 59.
Design Your Own Home: Landscape *(IIgs)* ..... 59.
Design Your Own Home: Architecture, Interiors or Landscape ..... 47.
Architecture Library 1, 2, 3 or 4 *(AP or IIgs)* ... 21.
Interiors Library 1, 2 or Landscape Library 1 ..... 21.
Activision
PaintWorks Gold or Draw Plus ..... 66.
Paint/Write/Draw *(Not Protected IIgs)* ..... 80.
Baudville Award Maker Plus *(IIe & IIgs)* ..... 24.
816/Paint *(Works On All Apples)* ..... 46.
Beagle Bros. Beagle Draw *(IIgs)* ..... 52.
Berkeley Softworks GEOS *(C+)* ..... 79.
GEOPublish ..... 65.
GEOS, GEOCalc or GEOFile ..... 45.
Broderbund Dazzle Draw *(AP or C+)* or Show Off *(IIgs)* ..... 39.
Print Shop *(AP or C+)* or Fantavision ..... 29.
Print Shop *(IIgs)* or Fantavision *(IIgs)* ..... 39.
Print Shop Companion ..... 25.
Print Shop Graphics Library I, II, III or Holiday Ed. ..... 16.
Print Shop Graphics Lib. Sampler Ed. *(IIgs)* .. 24.
Print Shop Graphics Lib. Party Ed. *(IIgs)* ..... 24.
Eclat Fractal Explorer *(AP or IIgs)* ... ***Special*** 28.
Electronic Arts DeluxePaint II *(IIgs)* ..... 65.
DeluxeWrite w/DeluxePaint II *(IIgs)* ..... 85.
DeluxeWrite *(IIgs)* ..... 52.
EPYX Art & Film Director *(IIgs)* ..... 55.
Printmagic *(AP or C+)* ..... 34.
Create-A-Calendar ..... 21.
Lynx Computer
Supergraphix 256 w/music *(IIgs)* ..... 69.
Roger Wagner Graphic Exchange *(IIgs)* ..... 35.
So What Software Iconix *(IIgs)* ..... 35.
Springboard
Certificate Maker Library #1 ..... 19.
Springboard Publisher 2.0 *(IIe or IIgs)* ..... 79.
Certificate Maker or Newsroom ..... 26.
Fonts For Springboard Publisher *(IIgs)* ..... 19.
Newsroom Clip Art Collection Vol. 1, 2 or 3 ... 14.
Thunderware
Thunderscan Apple *(IIgs, IIe, & IIc)* ***Special*** 159.

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Laser 128 includes an Expansion Slot, RGB Video Output, Parallel Printer Port, and a 10 Key Numeric Keypad!
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Laser Amber Monitor ..... 95.
Laser 128 Disk Drive *(IIgs)* ..... 105.
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Laser 128 Cables *(Parallel, Serial, RGB or Modem)* ..... 16.
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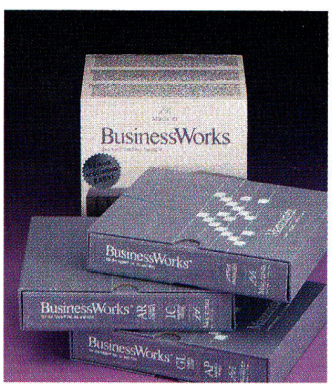

BusinessWorks Bundle by Manzanita

BusinessWorks is the accounting package for small and medium size businesses. Combining G/L, A/P, A/R and inventory control in one flexible package. *BusinessWorks* lets you set up your accounts the way you want. Customize your reports to display the information you want displayed. *BusinessWorks* looks and acts like AppleWorks. *BusinessWorks* is the accounting solution for the Apple II. ..... **$269.**

UTILITIES & LANGUAGES

Absoft AC/BASIC *(16-bit BASIC Compiler for IIgs)* ..... 84.
Big Red Computer
PS Lovers' Utility Set *(AP or IIgs)* ..... 27.
Micol Systems
Micol Advanced Basic *(IIgs) V3.0* ..... 89.
Roger Wagner
SoftSwitch *(IIgs)* ..... 39.
Merlin 8/16 *(IIe, IIc, IIgs)* ..... 75.
So What Software
Disc Commander *(IIgs)* ..... 29.
Hyper Launch *(IIgs)* ..... 35.
Call-Box *(IIgs)* ..... 69.
The Byte Works
ORCA/M Assembler *(IIgs)* ..... 39.
ORCA/Pascal Desktop Debugger *(IIgs)* ..... 80.
ORCA/C Desktop Debugger *(IIgs)* ..... 80.
ORCA DeskTop *(IIgs)* ..... 34.
ORCA/Disassembler *(IIgs)* ..... 32.
TML Systems
TML Basic *(IIgs)* ..... 82.
TML Pascal II *(IIgs)* ..... ***Special*** 82.
TML Source Code Library II *(IIgs)* .... ***Special*** 35.
TML Speech Toolkit *(IIgs)* ..... 45.
Zedcor
ZBASIC 4.0 Interactive Compiler ..... 39.

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VIDEO MADNESS

HARDWARE

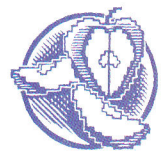
Unless you were carefully listening to all the speeches at AppleFest last September, you probably missed the **VidClip**, a nifty $49 device that can turn your Apple IIGS into a videotape editor.

Apple's Bernie Gifford quietly introduced VidClip as a toolkit that "allow[s] developers to incorporate videotape controls into their computer programs"—and VidClip certainly is that. VidClip developers will be dreaming up interactive programs with and without HyperStudio and Apple's Video Overlay Card; for techie types, VidClip software and cabling mean that any program for the GS can control videotaping.

But for us plain folks who have a videotape recorder or player that uses Sony Control-L and Control-S protocols, the VidClip means that instead of adding title screens and computer graphics to our home videos, we can finally *edit* video sequences. You can create a playlist of scenes with any word processor, attach your GS to the videotape machine, and see only the scenes you want in the order you like. Every videotape becomes "interactive multimedia."

If you already own the right video equipment, VidClip is a bargain at $49. According to Mark Abatte, its designer, the smart cable was "surprisingly easy to build." We're only surprised that nobody built it sooner. The VidClip kit is available from Video Production Controls, 38 Newbury Street, Boston, MA 02116, (617) 236-7006, or circle number 352 on the Reader Service card.

—P.S.



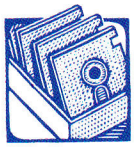
APPLE BITS

•Lots of talk coming from Cupertino: Will Apple spin off the **Apple II division** into a separate company, run by Steve Wozniak? Will Apple introduce a faster **SCSI** card for the GS? Will Apple contract with a **Japanese firm** to produce Apple IIs? Stay tuned.

•Roger Wagner Publishing hopes that **HyperStudio** will be a GS standard by the time Apple decides whether it wants to port HyperCard over. RWP was giving HyperStudio away at Christmas—it worked for Apple.

•If you just can't get enough of Broderbund's attractive sleuth Carmen Sandiego, call (800) 521-6263 and ask for the catalogue for the **Carmen Sandiego Collection**: Carmen clothing, Carmen wristwatches, Carmen posters, and other Carmen paraphernalia are for sale.

BETTER SHOP AROUND



SOFTWARE

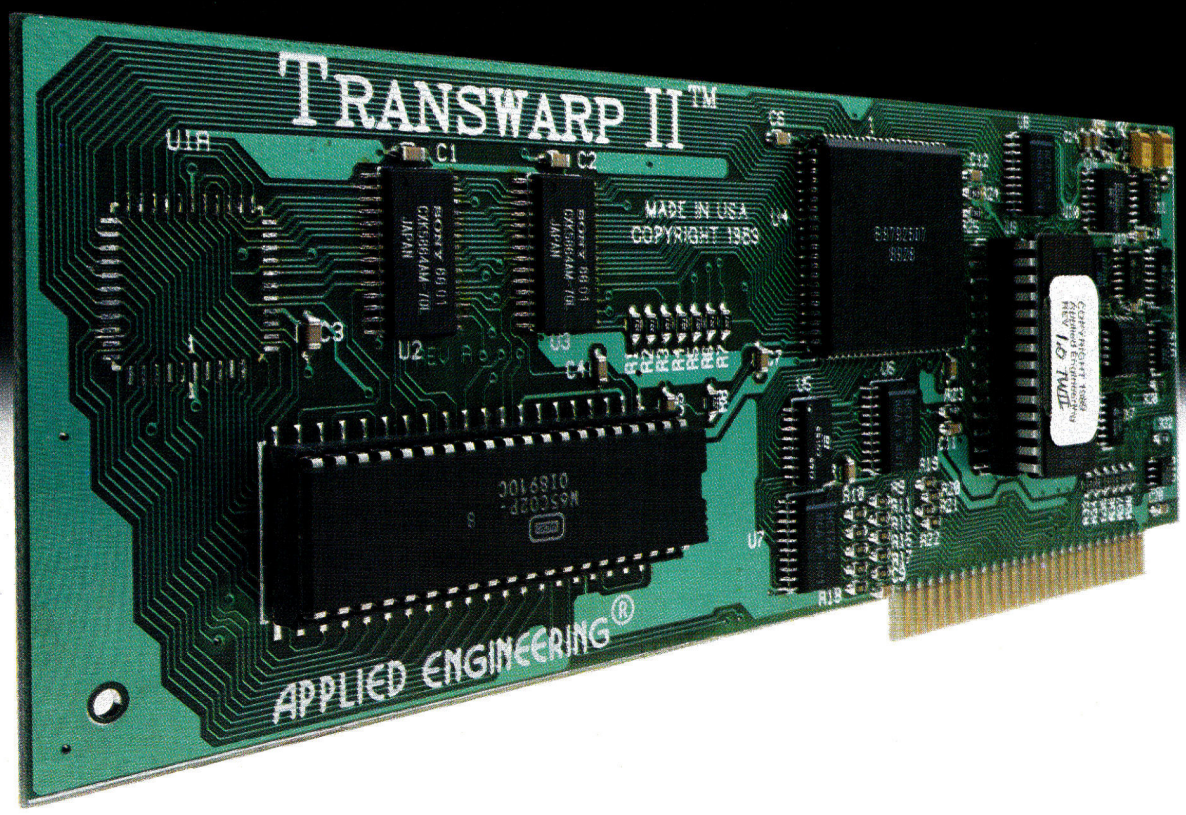
Kids might think the best way to learn about shopping is to wander the aisles of F.A.O. Schwartz for an afternoon, but parents—and Tom Snyder—know better. Before the next consumer generation learns to say, "Charge it," *Little Shoppers Kit* teaches elementary students how to set up a store, understand the value of money, and become smart shoppers.

The program helps the teacher organize activities by assigning jobs and related duties kids must complete. The computer also keeps track of units sold, assists with money transactions, and produces receipts. Included in the $109.95 package is a store complete with groceries, play money, a cash box, shopping bags, and store signs. You'll also find backup disks and a classroom idea book. For more information, contact Tom Snyder Productions, Inc., at 90 Sherman Street, Cambridge, MA 02140, (617) 876-4433, or circle Reader Service number 351.

—E.O.

UPDATES

■When programmers at Claris introduced the new **AppleWorks GS upgrade** to the rest of the company, they booted the program; created a page-layout document with the spreadsheet, database, graphics, word-processing, and even telecommunications modules; and started printing while an older version of AppleWorks GS running on an older GS was still loading the program. Registered AppleWorks GS users can upgrade for $29; the suggested retail price is $229. Call (800) 544-8554.



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Preset speeds slot-by-slot

An individual slot configuration feature allows you to preset speeds slot-by-slot. For example, your 5.25" disk drive slot can remain on the normal setting while the rest of your system runs at maximum speed. Power-up diagnostics troubleshoot every time you turn your computer on.

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TransWarp II's wait/delay feature allows for ROM timing delays, permitting them to work correctly—even when the computer is set on the fastest speed. And sound and joystick controls are also unaffected by the increased speed.

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STATTUS REPORT

THINKING MACHINE

By PAUL STATT * SENIOR EDITOR

Even if machines never think, artificial intelligence can help us understand the real thing.

THAT THE MIND IS A VAST, COMPLICATED computer, and that a digital computer is a simple analog of the human mind, is a persistent metaphor. As a writer I appreciate the metaphor; I've called the central processing unit (CPU) the brain of the computer, just as I've referred to instinct as an animal's read-only memory (ROM). But the metaphor may not be accurate.

Every month I read some strange new phrase in the computer press: *artificial intelligence*, *artificial life*, *virtual reality*. It gladdens an old skeptic's heart to hear Roger Penrose cry that he can see through *The Emperor's New Mind* (Oxford University Press, $24.95). Whether or not you believe he's exposed the nakedness of the AI believers, he has written an incredible book. Penrose argues for one simple fact: Computers can't think as humans think, because some human thinking isn't algorithmic.

An *algorithm*, you may recall, is the way you arrive at an answer in arithmetic. For instance, most of us know an algorithm for multiplying one number by another; that is, we know how to write the two numbers on a piece of paper (one above the other), how to calculate partial products, how to add the partial products, and so forth. We can proceed step by step. We may not remember why we use this algorithm, but we trust that it works.

I know a good algorithm for playing tic-tac-toe; you may know it, too. Follow it and you never lose. The algorithm isn't the same thing as the game's rules, however. Rules tend be simple: You can put your mark into any unmarked square. But to discover an algorithm for winning you must stand up from the game you're playing and imagine all possible games.

Before your computer can do anything—multiply two numbers, move paragraphs in a letter, sort an address list, beat you at tic-tac-toe—someone has to have written an algorithm for that task. Computers work carefully; they're masters of step-by-step reasoning. It's easy to teach a computer to play tic-tac-toe, but harder to teach one how to win.

Penrose argues that no mathematician or physicist has written, or will ever discover, algorithms that embody consciousness. He wants us to believe that "it is our present lack of understanding of the fundamental laws of physics that prevents us from coming to grips with the concept of 'mind' in physical or logical terms." Unlike some Luddite critics of artificial intelligence, Penrose backs up his theory with science—lots of it. It's not an easy argument to follow, but it has its rewards. *The Emperor's New Mind* becomes an encyclopedia of modern science, drawing insights from quantum physics, Goedel's theorem, and neural physiology. Modern mathematics supports his contention that not everything can be proven. For want of a better metaphor, the notion of mind as computer persists.

This is no book for the reader with only a passing interest in science. I read it too quickly, waiting for the big synthesis. If the synthesis never came, it's because Penrose works like a scientist, not a journalist, and is careful not to claim too much. When it comes, the conclusion sounds almost casual: Some things you can't do on a computer. My mother says as much; it's common sense. But puzzling out that common-sense idea, trying to prove a result I knew all along was true, I learned a great deal reading *The Emperor's New Mind*. The question "Can computers think?" reminds me of a child asking, "Why's the sky blue?" It's a simple question and not very practical, but one with much to teach.

So am I canceling my subscription to A.K. Dewdney's *Algorithm: The Personal Programming Newsletter* because I just read an article in it about artificial life, which Penrose proved could never be? No, I'll keep *Algorithm* because I think trying to write algorithms is worth something, even for processes that will never be "computerized."

Remember that the equivalence of computer and mind is a *metaphor*. Poets, who have been using metaphors forever, understand their limits. Robert Frost noted that "all metaphor breaks down somewhere. That is the beauty of it." But that breakdown didn't keep Frost from seeking metaphors, and it needn't stop us from searching for artificial intelligence. Even if machines never think, artificial intelligence can help us understand the real stuff.□

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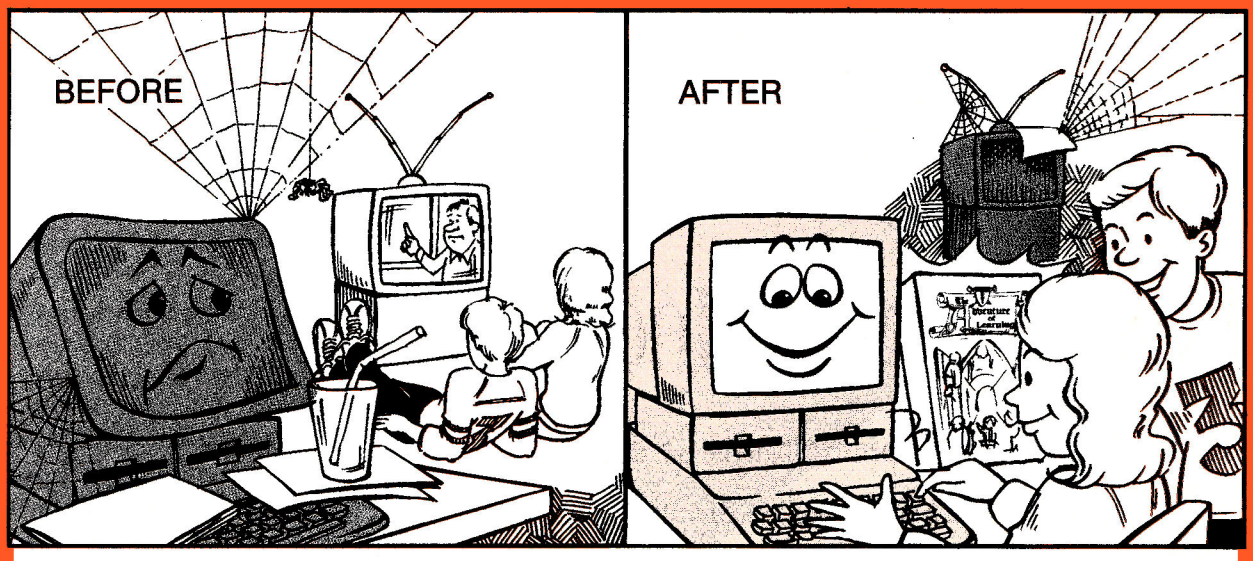

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INPUT/OUTPUT HOOKUP

The IIe's UniDisk is more expensive than the GS' drive because it has a SmartPort-like system built in, to provide similar electrical connections and driver software.

By WILLIAM P. KENNEDY, Ph.D.

MICROFLOPPY MENU

I HAVE AN APPLE IIE AND WANT TO add a 3½-inch disk drive. One dealer told me I couldn't use the 3½-inch drives he had because my IIe couldn't use an Apple SCSI controller. Another told me my IIe was too old to use a 3½-inch drive. (I purchased the IIe in 1985; the motherboard is stamped model 820-0064 B and dated 1982.) What Apple 3½-inch drive can I use with my IIe?

James Stokes
The Colony, TX

Matching a 3½-inch drive with your IIe is simple, James; I haven't a clue why those dealers are so reluctant to make a sale. Your IIe, indeed any IIe or II Plus regardless of age, uses the 800K UniDisk 3.5 drive from Apple or a compatible available from any of several mail-order houses. You'll also need the UniDisk controller card, which goes into one of your IIe's expansion slots, usually slot 5. You can add a second UniDisk without purchasing another controller card. The total cost for drive and controller is approximately $350. For IIc owners, the UniDisk plugs directly into the external disk-drive port. Because of system problems, however, owners of older IIcs (serial number below D510001) need to replace the motherboard. There's no charge if you purchase a UniDisk or Apple modem.

Apple also produces two other 3½-inch drives. One is a standard 800K that connects to the SmartPort (not SCSI) in a IIc Plus, GS, or Macintosh. The SmartPort provides the correct electrical connections and driver software to accept a "bare bones" 3½-inch drive. The UniDisk is more expensive because, to provide similar electrical connections and driver software for the IIe, II Plus, and IIc, it has a SmartPort-like system built in. The other Apple drive is a high-density, 1.4-megabyte floppy you can currently use only with the Macintosh SE/30 or Macintosh II series, although rumor has it the appropriate software drivers will be available soon for the GS and IIc Plus.

SCSI-compatible 3½-inch disk drives aren't available for the Apple II. But the Apple SCSI card plugs into any Apple II with an expansion slot and operates with the various Apple-SCSI-compatible devices such as hard-disk and CD-ROM drives.

KEEP IT CLEAN

I'VE BEEN USING MY APPLE IIC IN A rather dirty atmosphere for some years now, and the keyboard has become sticky and awkward. Is there any way to dismantle the keyboard and clean those keys?

David Kellie-Smith
New York, NY

Disassembly shouldn't be required; the switch connected to each key on the IIc keyboard is somewhat protected by an intervening plastic gasket. I suspect greasy soot has built up around the post that connects the key to the switch—hence the stickiness.

Using a small screwdriver, plus care and patience, pry each key off its plastic post. Once exposed, clean the area around the post with a cotton swab on a stick dipped in isopropanol (rubbing alcohol) and let it dry thoroughly. Clean the key the same way. Finally, put just one drop of household oil at the base of the post and reinsert the key.

I performed this operation on each key of an old IIc we have in the office. Besides everyday abuse, that machine had also gone through a flood, but it still works fine. If your II's keys continue to stick, dirt and grime have probably penetrated into the key switches, in which case your best bet is to replace the keyboard. Contact your local dealer for details.

SUPER-HI-RES APPLESOFT

I'VE WRITTEN SEVERAL PRODOS BASIC programs that I'd like to illustrate with DeluxePaint II-type super-high-resolution graphics. Is there any way I can load and display those pictures from Applesoft?

Jack Brown
Petrolia, CA

In November's Speaking of Graphics Roberta Schwartz and Michael Callery, inCider's graphics experts, discuss the various types of files used to store Apple II graphics on disk.

DeluxePaint II uses what's known as Apple Preferred *format, which ProDOS recognizes as filetype $C0 with auxiliary type $02. Apple may prefer that format. Applesoft programmers find it frustrating, because converting the data in the preferred file to a picture on screen isn't easy. Several rather elaborate machine-language routines are required to decode the encripted, "packed" graphics information and place it into the GS' super-high-resolution graphics memory. Preferred format does have its benefits. For instance, compressing data lets you store many more pictures on disk than uncompressed, 32K* ►

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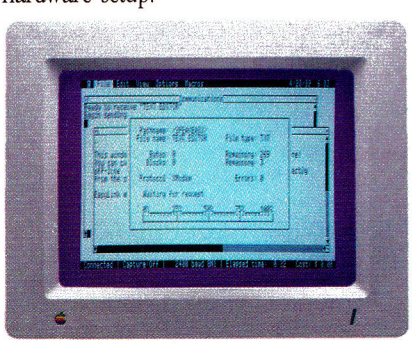

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graphics would allow. I'd like to provide you with those utilities, but editorial deadlines impede my programming time. Perhaps other readers will send me their solutions.

In the meantime, here's a recipe that'll work just as well. Turn to Scott Bowers' "Basic Paint" (October 1987, p. 67). You appear to have the necessary programming expertise, so simply excise from that program the machine-language utilities that enable super-high-resolution graphics mode and those that load and distribute picture files of type $C1 into graphics memory. Graphics stored under that filetype are 32K bytes long and contain uncompressed super-high-resolution bit maps and color-palette information.

Next, obtain a copy of of Jason Harper's shareware product SHR.Convert (version 2.0 or later) from just about any BBS including GEnie and CompuServe. (Reimburse the author if you use the software.) Or purchase Roger Wagner Publishing's Graphics Exchange from your local dealer. Using either utility, transform your DeluxePaint II graphics (filetype $C0) into the simple graphics of filetype $C1 that the Basic Paint utilities will recognize.

PR#0 Trace

THE FOLLOWING APPLESOFT sequence, when exectued as the "Startup" program on bootup, operates correctly under DOS 3.3 by printing the hello message repetitively down the screen:

```
10 PR#0
20 PRINT "Hello"
30 GOTO 20
```

But if I use ProDOS, the following message appears on screen:

```
#20 Hello
#30 #20 Hello
(lots more #30 #20 Hellos)
```

All I'm trying to do is reset the output to the screen after my students use a printer with another program. What's going on?

Al Youberg
Gallup, NM

Al, the syntax for the Applesoft PR#n command, which directs PRINT output to the indicated slot number n, is different when used in "direct" versus "indirect" mode under both DOS 3.3 and ProDOS. Typing in PR#0 next to the Applesoft BASIC prompt ( ]) followed by a Return (direct mode) will invoke that command immediately. PR#0 will proceed to operate properly by PRINTing your Applesoft messages on screen. When executed within a RUNning BASIC program (indirect mode) under DOS 3.3 or ProDOS, however, the correct syntax is PRINT CHR$(4);"PR#0".

The command in your program really didn't work under DOS 3.3, as you had thought. Booting into DOS 3.3 or ProDOS sends PRINT output to the screen automatically. But while DOS 3.3 simply ignored your incorrect use of the indirect PR#0 command, ProDOS mistakes it as the TRACE command. TRACE is a useful debugging tool that prints the sequence of line numbers being executed when you RUN a program. Those numbers are the repeated #30s and #20s you see printed before each Hello in your example. TRACE's syntax is identical in both direct and indirect modes and is cancelled by the NOTRACE command.

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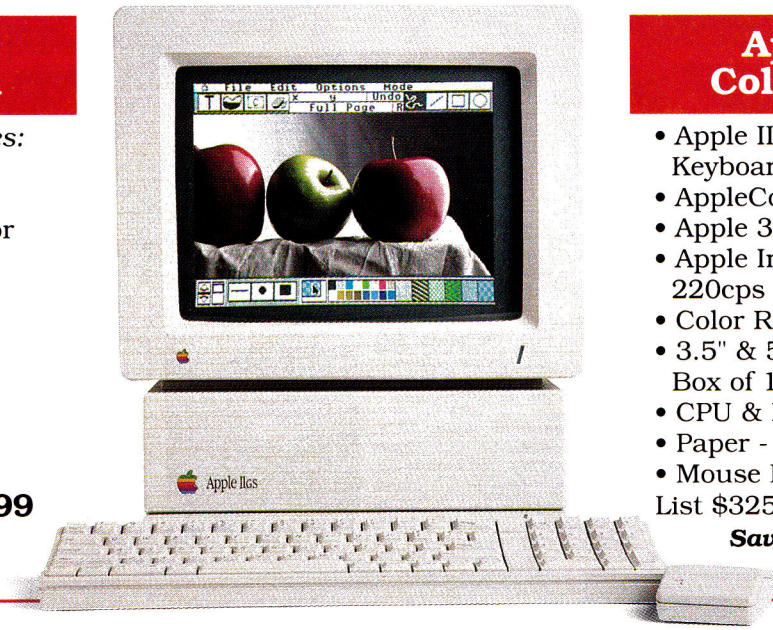

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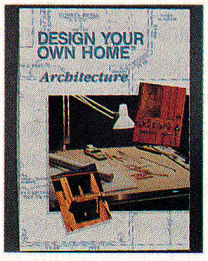

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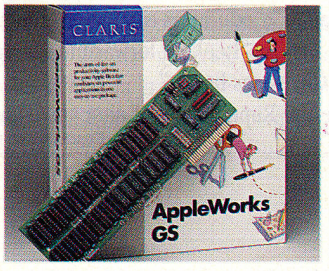

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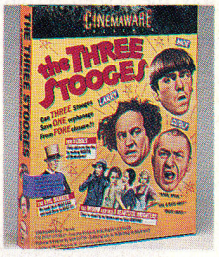

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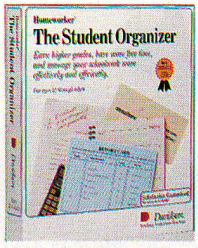

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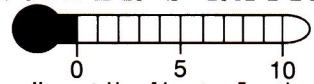


GEOFILE

BERKELEY SOFTWORKS,
2150 Shattuck Avenue, Berkeley, CA 94704,
(415) 644-0883

Database manager;
128K Apple IIe, IIc, IIGS; $69.95

Don't fret if you don't already have a copy of the highly touted GEOS (Graphic Environment Operating System) module. You'll still be able to use geoFile, a new arrival in the ever-expanding Apple II family of GEOS software. GeoFile, a database and form generator, comes with a bootable copy of Berkeley's acclaimed mouse-driven operating system.

GeoFile is slower than most mainstream databases owing to the memory-taxing graphics environment, but it performs admirably in spite of itself and offers most of the options found in mainstream databases. Features include up to 115 fields per record, file size limited only by disk capacity, and compatibility with other GEOS applications and AppleWorks.

GETTING UNDER WAY

Four disks, two manuals, and an interrupt-manager card make geoFile a robust package. One manual is called *Using GEOS*, and the other is specifically devoted to geoFile. GEOS fledglings and experts alike can plunge into geoFile by following the installation process vital to all GEOS application software. Installation configures geoFile and GEOS to your system. GeoFile preliminaries include making backup copies of all disks. New GEOS users should use GEOS, rather than a copy utility, to copy the disks and become familiar with the system.

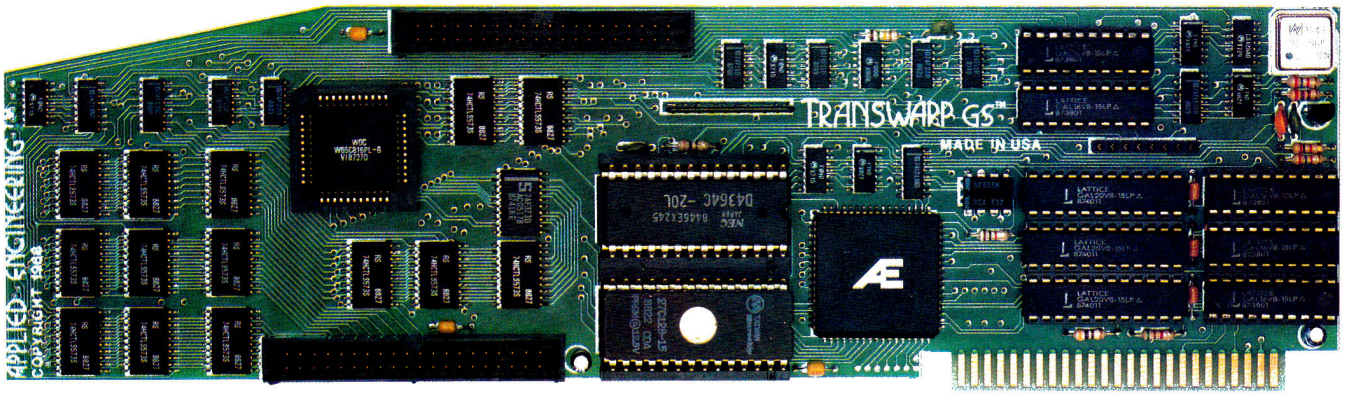
Like other GEOS applications, geoFile uses screen icons. To activate and deactivate functions, use the mouse to move a screen pointer to the image in question, then press the mouse button once or twice to either start or stop a particular action. A well-designed geoFile tutorial gives a far "kinder, gentler" introduction to database management than most such programs with which I've dealt.

Beginning with a lesson in database terminology, you get the usual field, record, and file information, along with information unique to geoFile's forms and layouts. Leading you through creation of a simple name-and-address database, the tutorial quickly turns you loose on a previously created database of chorus members on the geoFile disk.

There's ample opportunity for exploring geoFile in the tutorial. It includes an introduction to the main menu at the top of the screen and also teaches the concept of toggling between form-design and data-entry modes. You'll need both because unlike most databases that use a separate form editor, all geoFile databases are created on a form, or main layout. In form-design mode, you add and modify picture, text, and computation fields by placing rectangular field boxes about the screen. A positioning tag in the upper left-hand corner and a sizing tag in the lower right make placing field boxes easy.

Using the mouse, move the pointer back to the main menu, select data-entry mode, and the sizing tabs disappear from each field box. Position the pointer in a field, press the mouse button, and a cursor appears for entering your data at the keyboard. Thanks to the graphics ►

Photography • Frank Cordelle



Fan mail GS

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environment, you have options for copying, cutting, and pasting information all over your database via the mouse. Such niceties make life with geoFile much sweeter.

The tutorial blazes on with lessons on the finer points of scrolling through records, creating indexes for record sorting, and making secondary layouts in case you don't want to print each record in its entirety. You'll even discover how to incorporate a graphics photo scrap from disk into the previously mentioned chorus database in about half a minute—very impressive.

GETTING DOWN TO BUSINESS

Congratulations, you've finished the tutorial—but you'll still want to keep the manual handy. As you create your own database, you'll need it for future reference, because geoFile is packed with more features than anyone is likely to memorize after just a few sittings. For instance, keyboard shortcuts abound. Memorizing a few saves moving the pointer to the main menu to perform certain functions.

As your database grows, geoFile's string search becomes more important. With that feature, you can search every field in every record for each occurence of a string of text—an option essential for making any database truly useful.

GeoFile's algebraic parser lets you do field comparisons, computations, and mathematical functions. Coupled with a subset option, you can use the parser to determine whether fields within records meet specific criteria to warrant your including or excluding them in that subset and saving those isolated records to disk.

A lack of clarity in examples for implementing some of the more complicated geoFile formulas and Boolean, AND, and OR operations left me guessing whether I was performing these complex operations correctly at times. On the plus side, though, the majority of information is straightforward and easy to understand. Armed with a fine tutorial, you're all set to perfom even advanced geoFile operation—even if you possess minimal math and database-management knowledge.

PRODUCING RESULTS

There are numerous choices for printing forms, such as the default form, or main layout, which produces what's displayed on the screen. Another option includes the secondary layout for printing mailing and inventory labels, specialized forms, and anything else requiring the contents of all or just some of the fields for each record.

Select the *Print* option in the main menu and you're ready to get your database on paper. A *Print Setup* window presents you with options for adjusting page length, number of records per page, subset loading, and print quality.

I applaud geoFile's ease of use, but find its lack of speed somewhat troublesome. I was impressed with its accuracy and the overall convenience of designing fields within each form. Home users and small-business offices willing to trade some loss of speed for geoFile's mouse and graphics support certainly won't be disappointed.

Tim Walsh
***RUN* Technical Manager**

NEW TALKING STICKYBEAR SHAPES

NEW TALKING STICKYBEAR OPPOSITES

WEEKLY READER SOFTWARE/OPTIMUM RESOURCE, 10 Station Place, Norfolk, CT 06058, (800) 327-1473

Early-education programs; 512K Apple IIGS, 3½-inch drive; $39.95 each

Isn't it odd that the less sophisticated the computer user, the more sophisticated the technology must be? Such is the case with software written for little people. The power of speech in preschool software can lift such programs from the category of overpriced, computerized workbooks to teaching tools surpassed only by human beings.

Some talking software tries to say so much that it requires a stack of disks for what would otherwise be a simple program. Optimum Resource seems to understand that a full soundtrack isn't feasible for such software until we start programming on CDs or videodiscs.

The New Talking Stickybear products apply the speech capability of the Apple IIGS to excellent advantage. Speech is exceptionally clear, and instead of attempting to speak everything, Stickybear only says aloud what is absolutely necessary.

Optimum Resource has also upgraded Stickybear's graphics and animation to take advantage of the GS' resolution. Children familiar with the old, silent Stickybear will be pleased to see that their ursine friend is as charming and lighthearted as ever, and that his voice and sound effects fit comfortably with our Stickybear expectations.

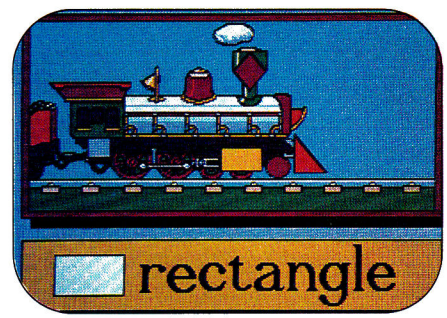
SHAPING UP NICELY

The New Talking Stickybear Shapes is the more complex of the two programs, with three different modules to teach the five basic shapes. Stickybear himself welcomes your child to the program and presents a menu with three activities—*Pick It*, *Name It*, and *Find It*.

The menu advances from option to option on its own, but children can also use the keyboard or mouse to make choices independently. Kids simply press the spacebar or click the mouse button to make their selection.

Pick It helps children learn to recognize forms within a picture and match them with the five basic geometric shapes. First, an illustration with a missing shape appears in the upper two-thirds of the screen. On the bottom third are shapes from which to choose—a circle, a square, a rectangle, a triangle, and a diamond. The child can make a selection with the keyboard or mouse.

If a youngster chooses the wrong shape, an encouraging voice says, "Try again." When the child selects the correct shape, it pops into the scene and the picture comes alive. In one picture, for example, a dog is snoozing in Stickybear's living room. In the middle of the living rooom is an empty space shaped like a



Shapes: Find the hidden rectangle.

square. As soon as the child chooses the square, a roaring tiger appears on a television screen. The dog wakes up immediately, and searches for the intruding beast.

Name It may be a bit more pedestrian, but it lets beginning readers increase and demonstrate their mastery of shape vocabulary. ►

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The program names a shape, and, instead of a picture, the corresponding word appears at the top of the screen. The five shapes appear at the bottom. This time, the correct answer sends the shape bounding across the screen in a pleasantly choreographed pattern.

Find It is the opposite of *Pick It*. This activity challenges youngsters to select a form from the picture that matches the word and shape below. Stickybear reads the word, and all five shapes, with one of them highlighted, appear in the picture.

My daughter's favorite screen shows Stickybear in a hot-air balloon. The balloon is the circle; the basket is the rectangle; and so on. The computer randomly asked her to select one of the five shapes. When she chose the picture segment that matched the requested shape, Stickybear began tossing little red balls out of the balloon. Although Stickybear never gets his balloon off the ground, your children's mastery of shapes and shape words will certainly rise with this program.

ATTRACTIVE OPPOSITES

The New Talking Stickybear Opposites uses only one mode to present its lessons, but it includes 18 different pairs of opposites. The sounds help younger children understand the concept of opposites, rather than just learning the vocabulary.

After Stickybear greets children, a picture illustrating one of the opposites appears along with the written and spoken word. For instance, Stickybear's smiling face illustrates the word *happy*. Pressing one of the arrow keys will turn Stickybear's smile to a doleful droop as the word *sad* appears and is spoken.

Children control the pace and can send Stickybear into a frenzy if they want, pressing the arrow keys as often as they like before pressing the spacebar to see the next picture.

The illustrations are varied; each pair of opposites has two different scenes. Thanks to the GS, the animation and sound will delight young children. My daughter particularly liked water gurgling into or out of a glass as it grew full or empty.

Stickybear Opposites is a particularly comfortable learning environment for young children, because there are no right or wrong answers. Kids can enjoy the process of discovering language and cause and effect.

Like all programs in the Stickybear series, the New Talking Stickybear Shapes and Opposites each include a poster, stickers, and a book, as well as excellent suggestions to parents and teachers for extending instruction. Although designed for children aged 3 to 6, even younger children can enjoy and learn from the new talking versions of these Stickybear classics.

Jeanne Dietsch
Peterborough, NH

TALKING DINOSAURS

ORANGE CHERRY SOFTWARE,
Box 390, Westchester Avenue,
Pound Ridge, NY 10576,
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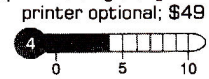
Dinosaur-education program for ages 5–9; 512K Apple IIGS, single 3½-inch disk drive, printer optional; $49



Talking Dinosaurs boasts state-of-the-art digitized voices so clear and distinct you'd swear Mr. Rogers was in the room giving instructions to your children. The program employs an elegant mouse-driven interface and features crisp super-hi-res, 16-color graphics.

FOR THE YOUNGER SET

So why did Talking Dinosaurs earn a fairly low rating? For the money, the program is quite limited. Talking Dinosaurs consists of six self-contained segments, each nicely done and taking advantage of the program's speaking ability.

Most of the modules, however, will appeal only to younger children, and the lack of variety within each module may end up boring even those kids.

WHAT'S IN A NAME?

A good example of what you get with Talking Dinosaurs is an activity called Dinosaur's Names. After you select it from the menu, the program "talks" to you, giving you instructions for the exercise. (You can also get help in any activity by selecting *Instructions* from the menu bar at the top of the screen, or by reading the small manual included with the program.)

Six dinosaurs then appear on screen, each with its name printed beneath the image. Click on one of the six boxes containing a dinosaur

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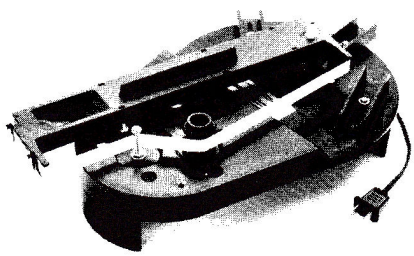

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and Talking Dinosaurs speaks the animal's name.

Now there's nothing inherently wrong with this little activity, but that's all it does. The dinosaurs never change—not position, color, or any other feature. Admittedly, some children might enjoy hearing the names spoken over and over again, but for how long?

OVER AND OVER

Another activity, Dinosaurs: Seek and Find, follows the same format. The instructions are clearly spoken and a full-screen graphic depicting a prehistoric landscape fills the screen. Hidden in the sparse vegetation are five of the six dinosaurs previously encountered—camouflaged, supposedly, by trees and shrubs.

When you "find" one of the dinosaurs, click on it and you'll hear its name. After finding all five, the program takes you back immediately to the main menu. The next time you play the game, the dinosaurs are in the same place as before. The average 7-year-old will probably complete this module in 10 seconds and never go back to it.

TIRESOME TYRANNOSAURUS

The other four activities include Counting Fossils (which consists of counting similarly colored bones that make up a triceratop's skeleton), In Search of Dinosaurs (an activity in which three rows of three animals are displayed and your child must click on the dinosaur in each row), Dinosaurs to Color, and Dinosaurs to Print. Like the other activities, these use the same dinosaurs, and placement never changes.

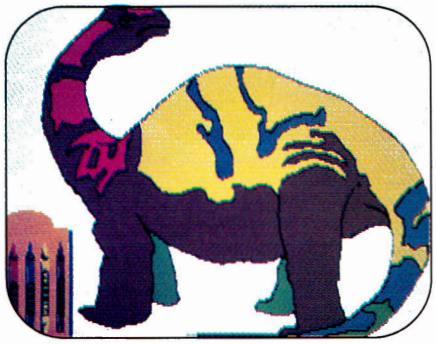
The latter two activities were the only ones that interested my 9-year-old daughter. She enjoyed selecting one of the five graphics crayons and coloring in the four dinosaurs. Talking Dinosaurs uses a simple fill process to flood predetermined areas with the chosen color. At least here, mixing colors provided some variety.

Likewise, printing the dinosaurs (you'll need an ImageWriter, according to the manual) let my daughter use real crayons to color a picture.

ON THE PLUS SIDE

To be fair, the program certainly delivers what it promises in the way of advanced speech without any additional hardware, and the graphics will excite youngsters already enthralled by the subject matter.

Furthermore, each activity does fulfill basic educational objectives, such as making discriminating choices, learning to follow directions, learning basic computer skills, and acquiring rudimentary math skills (by counting the bones).



Coloring a brontosaurus on screen.

For younger users, Talking Dinosaurs might even spark questions that will lead to further noncomputer activities. For instance, it's easy to picture a 5-year-old asking, "What's a fossil?"

SAME OLD STORY

The problem with the program isn't what it does, it's what it doesn't do.

All things considered, Talking Dinosaurs doesn't offer enough variety to hold a child's interest for any length of time. Nor do any of the activities possess enough depth to encourage repeat usage.

This program will definitely appeal to 4-, 5- and even 6-year-olds (or older children in need of remedial activities). But considering its limitations, Talking Dinosaur's current price makes it hard for many parents to justify purchasing it.

IF ONLY

Talking Dinosaurs is exceptional within its confining framework. The speech quality and graphics are impressive. If your child is young, if he or she really likes dinosaurs, and if you don't mind the price of the program, take a look at this offering from Orange Cherry Software. But that's a lot of "ifs."

James Trunzo
Leechburg, PA

Continued on p. 88

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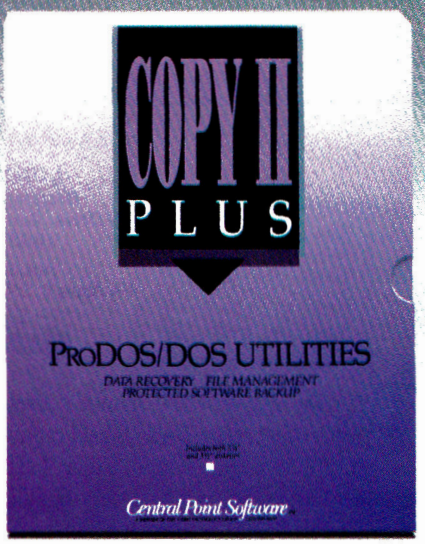

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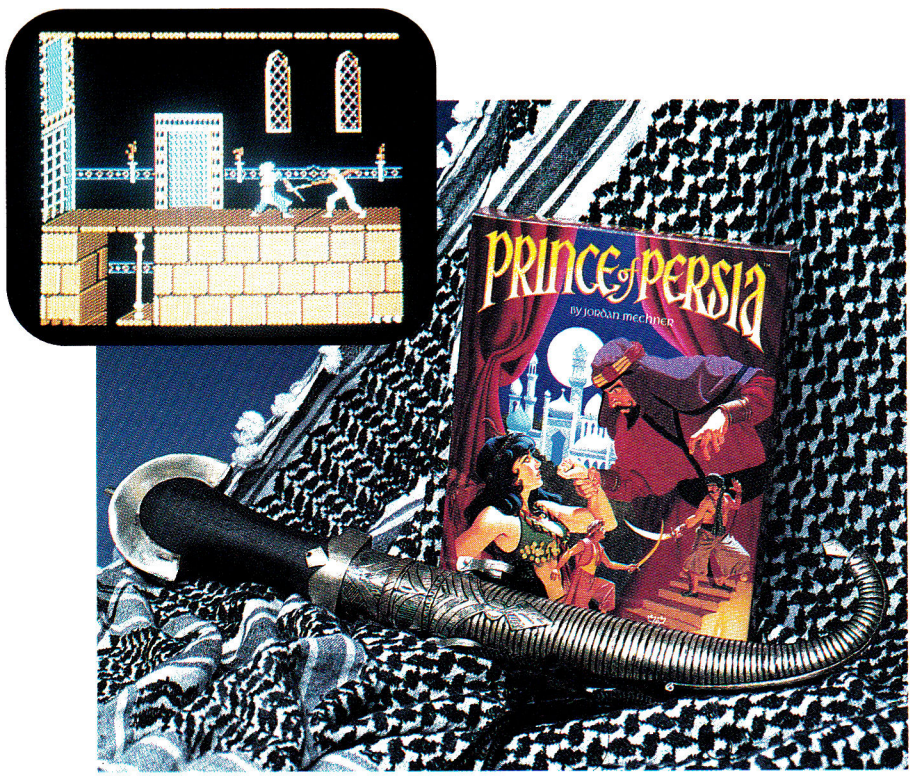

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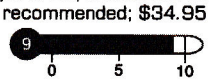

The scenario is classically simple: A lovely princess in ancient Persia is held captive by the ambitious Grand Vizier Jaffar while her father, the Sultan, is away fighting a foreign war. Cast as an adventurer in the Ali Baba mold, you must wend your way up from the crumbling dungeon and through the castle to save the princess and become Prince of Persia.

For some, the fantasy is appealing; most will find game play addictive. Using a joystick (recommended) or designated keys, you guide your on-screen persona through a maze of obstacles, as you step carefully through a gate or between edges of a bladed portal, walk over hidden spikes, and leap over deep abysses—some created as you dash across crumbling floor tiles. No time to rest as you hoist yourself up walls by your fingertips and duel with ever-vicious guards.

All the while you're searching for the right path and the trick that'll open the door to the next level (not another one!), bringing you ever closer to the waiting Jaffar and his captive. To make matters even more desperate, you have 60 minutes of game time allotted to achieve that end. One slip—you leap too soon, fail to see those spikes, or lose a swordfight—will cost you dearly: You start the current level over and lose any intervening game time.

Every level in Prince of Persia is more sinister and challenging than the previous one. You run into more proficient and powerful dungeon guards as you climb higher into the castle, and the booby traps set by the Grand Vizier require increasing skill and ingenuity.

At higher levels (okay, I'll tell you—there are 12), you'll have to deal with some of the vizier's black magic. In one level, for instance, you're literally split in two as you run one way and a dark, shadowy reflection of yourself runs the other way.

Superb double-high-resolution graphics images and responsive, smooth animation work beautifully together to create an almost cinematic experience. With every careful step or running leap, with every thrust and parry, you'll swear Errol Flynn has been reincarnated into your Apple II. Indeed, the game's author, Jordan Mechner, evidently studied many hours of live-action footage from classic swashbuckler movies before rendering similar effects with his animated characters.

Saving your progress once you've achieved the next level is a good strategy; expect to repeat a level many times before gaining access to the next one. And expect to spend much longer than the 60 minutes allotted for the whole game. In fact, expect to spend at least as much time on *each* level.

Bill Kennedy
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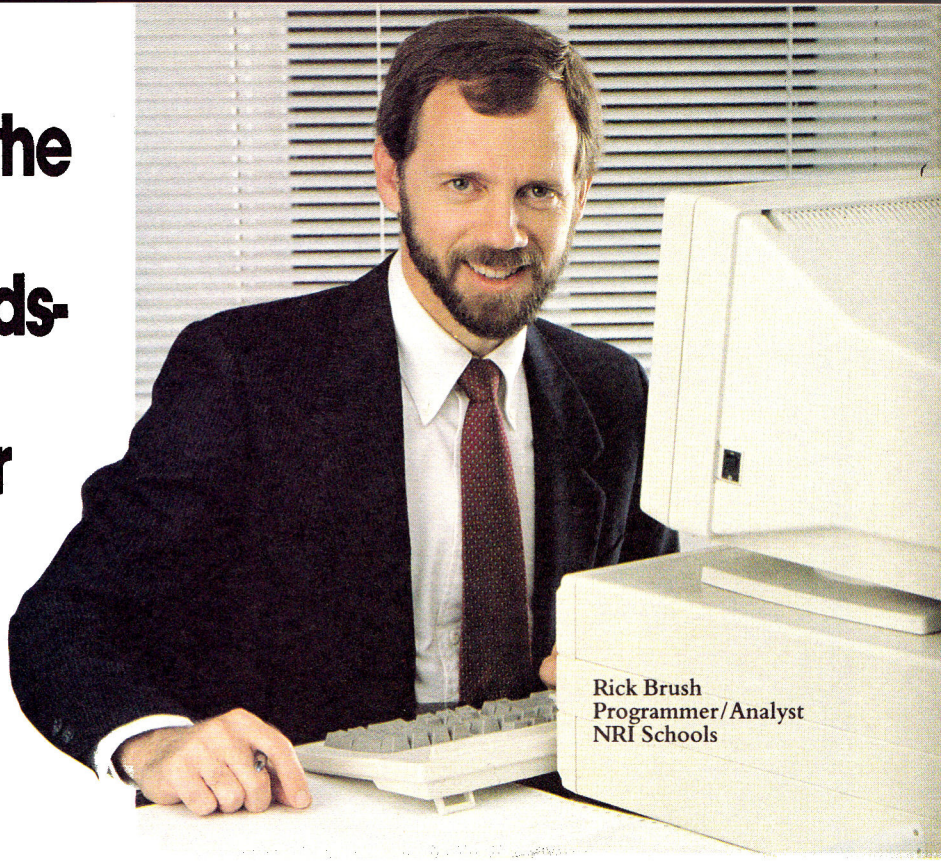

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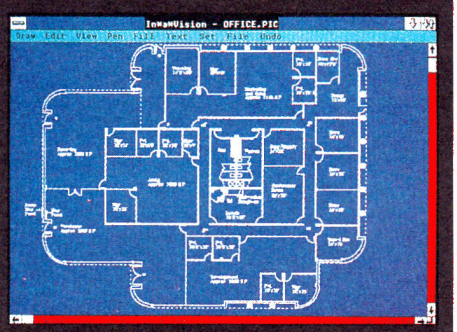
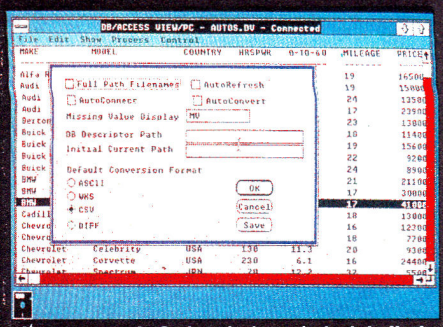
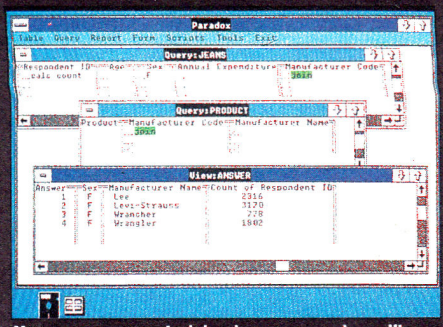


Next, you master Pascal, a multipurpose language often used to develop software for computer-aided design (CAD).



You move on to C—hands down, today's hottest computer language—used for everything from systems programming to artificial intelligence.



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64K Apple II Plus, IIe, IIc, IIc Plus, IIGS; $49.95

This had to happen—a game of wanton destruction for the thinking person, and in my town, no less. Omega is a futuristic simulation in which your critical mission is to design a cybernetic tank with the hardware and software to ensure success against all enemies. Yes, *software*. This is a game of artificial intelligence, and as such, it marks an important advancement in the computer-gaming world.

OSI's the boss of the cybertank corps.

There are hundreds of pages of documentation and a BBS through which you can pit your tank designs against those of all other game owners (of all computer brands). Origin maintains the simulation so fully that even if you have to replace a bad disk, you'll get your orders from the Organization of Strategic Intelligence—your employer.

Omega, occupying four 5¼-inch disk sides plus your data disk, comprises elements of adventuring (outfitting), animated combat (tank-design testing), programming (artificial intelligence), and telecommunications (on-line contests). It customizes itself to your level of interest and expertise and lets you design tanks for team combat.

The real thrust is tank design, particularly a tank's artificial intelligence. You choose drive systems, armor, weaponry, instrumentation, and special items, working up through ten clearance levels until you reach Omega. By that time you have an unlimited budget and can buy the best of everything, and the only factor remaining that distinguishes one tank from another is its A.I. *Your* A.I.

A special programming language lets you impart life to each tank, each with its own personality. Some are shy of water, and some run when wounded. Some work well in groups, some are brazen loners. Bravery pays. Ultimately, you may be able to design a tank that performs better than all others in every situation. That's the point.

Beginners need not be frightened by this talk of artificial intelligence and programming. Using prebuilt A.I. capsules on the resources disk, your tank's logic might be as simple as:

```
Start
  Do Seek
Do Destroy
Goto Start
```

More-advanced programmers will be able to design tank logic that could potentially run to hundreds of lines of code. Given the interrelationships of various cybertank design elements and the potential situations in which a tank can find itself, you could make a career of writing Omega A.I.

After you've designed your killer tank, what do you do? Show it off, of course. Compete for bragging rights. Origin has an entire BBS devoted to Omega. There are contests among cybertank designers, and you can join round-table discussions or trade tanks, landscapes, and intelligence. You can even talk to the game's designer (not that he'll give you any hints). If you don't have a modem, you still can trade your work with friends, and compete against their cybertanks. But to me, the BBS with all the other players present was a big part of the Omega experience.

Is there anything here to criticize? Well, yes. The graphics and sound are somewhat pedestrian, as you'd expect from the IIe. The manuals, commendable in scope, suffer from overwriting and the inaccuracies you'd expect from software ported to half a dozen computer brands. The manuals promise hard-drive support, but it turns out that you can save only your data files on a hard disk; you'll still have to shuffle floppies.

Overall, though, Omega is well done. It's balanced, it's fun, and it represents a unique side of gaming. Omega is mayhem conceived for the programmer, but executed so well that anyone can enjoy it. I recommend it strongly.

Oh—how did the *inCider* cybertank fair in contest? We'll let you know when the results are in—unless the shame is too great.

Joe Abernathy
Houston, TX

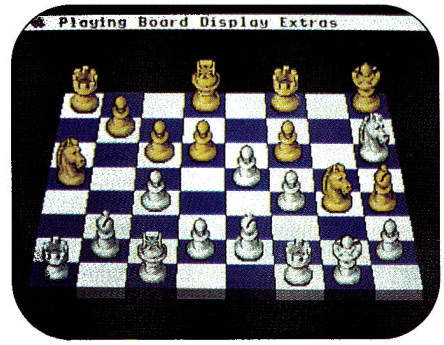
CHESSMASTER 2100

Software Toolworks,
19809 Nordhoff Place, Chatsworth, CA 91311, (818) 885-9000
(distributed by Electronic Arts)

Chess simulation;
64K Apple IIe/IIc; $49.95

I play chess the way I write computer programs—not all that well, not all that often. I do like the game, though, and I've studied it some, so I'm glad professional programmers wrote Chessmaster 2100. Software Toolworks licensed its chess-playing algorithms from Fidelity Electronics, a company that makes dedicated chess machines.

Chessmaster 2100 is good, but it's not invincible. I practiced Chessmaster 2100 for most of my boss' summer vacation. I needed two weeks to beat the machine (playing at its standard settings). When I finally checkmated Chessmaster, my conscience was clear; I'd beaten the computer. The machine hadn't had a bad day; it wasn't worn out; it didn't let me win. I had simply become a better chess player.



Chessmaster's brain keeps you thinking.

Chessmaster 2100 is equally fast and smooth with mouse or joystick. It crams a lot of chess knowledge and a hundred famous games onto two sides of a copy-protected floppy, so nothing's wasted. It's elegant, but it's a game to play, not a screen to watch. The graphics (in 2D or 3D) are serviceable and plain.

Everyone who plays Chessmaster 2100 will become better at chess. Some will improve simply by having an infinitely patient partner, as I did. Others will appreciate that Chessmaster can solve set problems; still others will enjoy reading the informative history of chess. Chessmaster 2100 deserves praise both as a sophisticated bit of programming and for its extensive "knowledge" of chess.□

Paul Statt
***inCider* staff**

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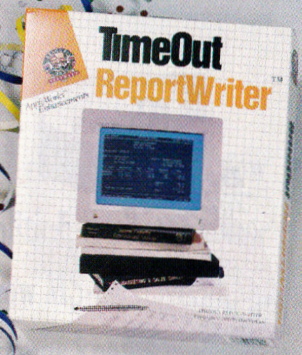

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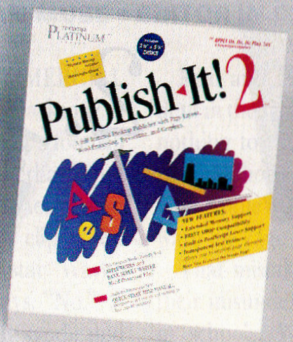

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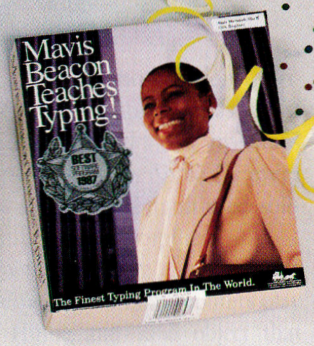

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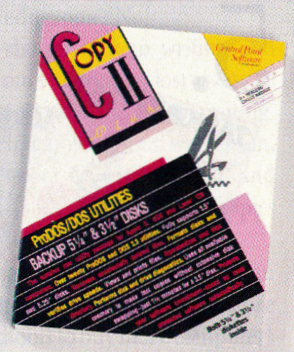

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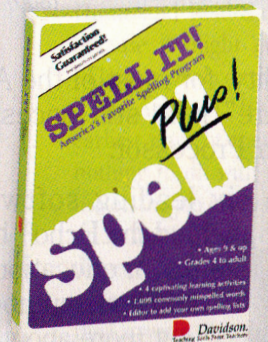

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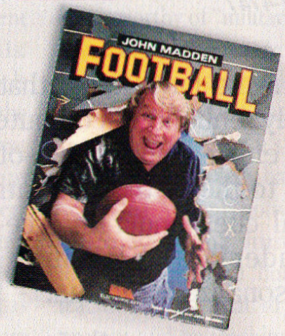

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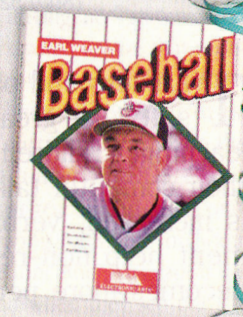

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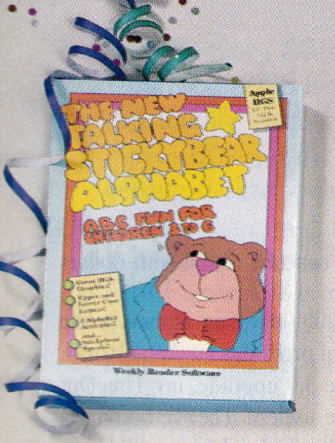

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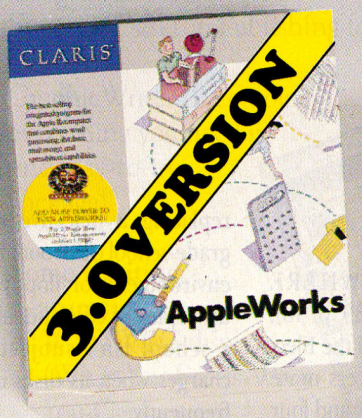

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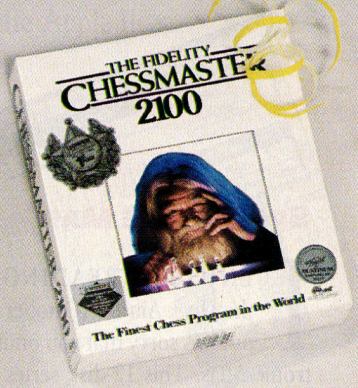

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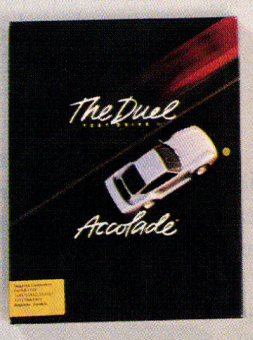

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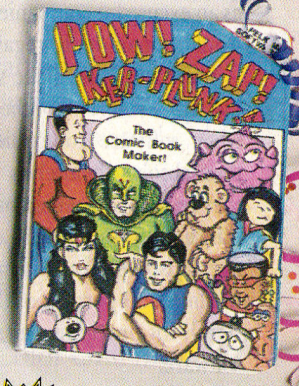

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Over 1000 entries competed for prizes in *inCider*'s second annual Desktop

Apple IIs and A WINNING

By PAUL STATT * SENIOR EDITOR

TIME WAS WHEN EVERY PRINTER WAS A PUBLISHER, AND EVERY PUBLISHER HAD TO BE A PRINTER. HE produced programs for plays, catalogues for schools, perhaps wedding invitations. He might publish a newspaper, too, or even books. Then for a time printing and publishing parted ways. The publisher took over creating the originals of printed works, such as books, magazines, and newspapers, and the printer just put ink on paper. Today, however, every man and woman can act as printer, publisher, and even editor and designer—working a personal printing press called the *Apple II*.

NONPROFIT GROUP: *THE SOURCE*

Maybe it's something about nonprofit organizations that makes them shy, but nobody in the Bergen County, New Jersey, Girl Scout Council wanted to take credit for *The Source*, the guide to Council-sponsored programs, events, and training. But it's something to be proud of. Designed with Timeworks' Publish It!, *The Source* scores with us for size and quality. It's a 70-page book that describes Girl Scout activities. Almost every page includes a tasteful bit of clip art, and every page is clear, easy to read, and, most important, easy to use. Every page includes an enrollment coupon—each one different, but similar to all the others. It's easy on the eye.

Workmanlike is the word that best describes *The Source*—although "workpersonlike" would fit. It doesn't show off, but gets the job done quietly. Evidently that's the way the Girl Scout Council of Bergen County works.

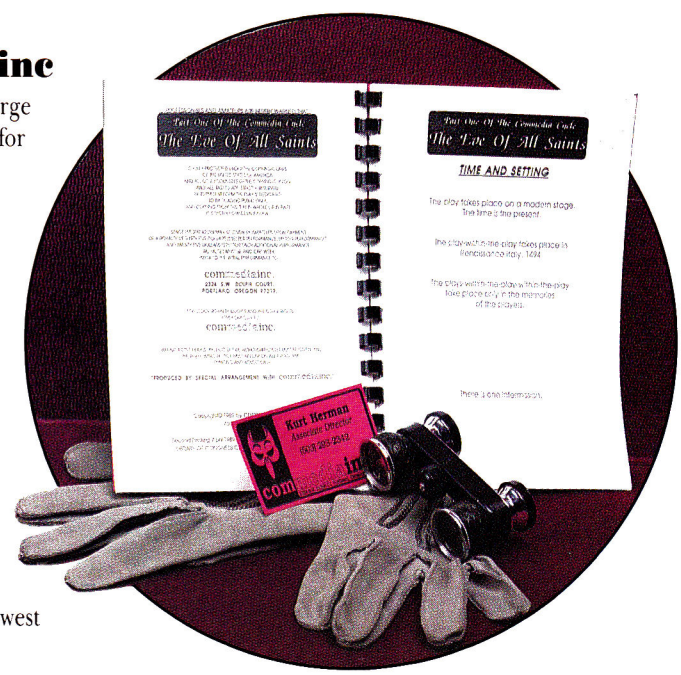
BUSINESS: commediainc

"He writes 'em, I publish 'em," says Kurt Herman of his dad's, George Herman's, plays. "com*media*inc can publish a better, more useful script for less money than Samuel French."

Schools and amateur theater groups are the market for com*media*inc's nine plays. The Hermans can do better work for less money because they use an Apple IIGS, AppleWorks GS, an Apple LaserWriter, and a double-sided photocopier to create their books.

"We're actors," says the younger Herman. That means the plays are printed with the actor in mind; margins are wide for blacking and notes, the books lie flat, and the type is simple and easy to read. The music for com*media*inc's plays is printed with Mediagenic's program Music Studio and the LaserWriter.

The marriage of desktop publishing and theatrical publishing seems to help everyone: Theater companies and schools receive a better product for less money, and many plays that might otherwise be forgotten are kept in print. The Hermans also publish a catalogue with AppleWorks GS; if your group is curious, call com*media*inc, 2324 Southwest Dolph Court, Portland, OR 97219, (503) 293-2342.



Publishing Contest. Here's a look at the top designs in four categories.

Publishing COMBINATION

HOME: *I REMEMBER MOMMA*

Who could resist Mom? Harley Miles (who also won in the education category) might be accused of playing on the judges' heartstrings: He entered his love letter to his mom in the desktop-publishing contest. But even if *I Remember Momma* weren't about the woman we all love, it would be a winner.

I Remember Momma is simple. The drawings were created with Dazzle Draw, the text with Styleware's MultiScribe (now BeagleWrite from Beagle Bros), and a single font. (Our one complaint is that *I Remember Momma* was written entirely in uppercase characters.)

The drawings, as childlike as memory could make them, must have especially touched the mother who received them on her 65th birthday. "I tried to capture some of my reminiscences in this booklet," the author says. "It's amazing what the mind and memory can do." We might add, what an Apple IIc Plus and an ImageWriter II with a color ribbon can do.

EDUCATION: *NEWSMATH*

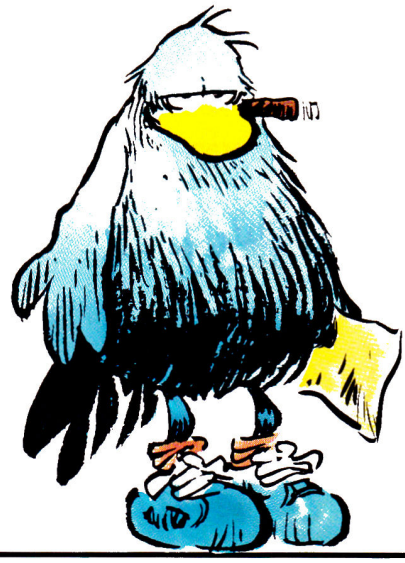
Writing across the curriculum was the catch phrase in education a few years back. *NewsMath* takes that notion—that students who write about biology, geography, history, or math learn the subject automatically—and turns it into *publishing across the curriculum.*

"I tried a relatively simple idea with my General Mathematics II students," says Harley Miles, the modest publisher of *NewsMath* and a teacher at Charlottesville High School in Virginia. "Using information found in news-magazine articles, we wrote mathematics word problems. To provide incentive for the assignment, I compiled the students' work to produce a newsletter." The students, Miles understates, "enjoyed the assignment and took great pride in the work." They must have had a good time with *NewsMath*—these kids obviously took more pride in their work than some professional publishers.

We like *NewsMath* because it's well made. It's not fancy; Miles used clip art judiciously with Timeworks' Publish It! 2 and an Apple IIc Plus, and a basic template that's filled each month. He has a sense for good, simple design.

But other entries look this attractive, as well, we admit. What sets *NewsMath* apart and makes it a prizewinner is *resonance*. It's an idea we wish more teachers would try. How about science or civics papers? Why, in the age of desktop publishing, should teachers and students limit themselves to the same school newspapers and yearbooks they've been printing for years?□

Photography • Frank Cordell



HOT OFF

NEW DEVELOPMENTS

Gutenberg's revolution was just the beginning—today's desktop publishing puts the power of the press at your fingertips. Whatever your medium—certificate, poster, brochure, or newsletter—*print it*, and get your message out there.

By CYNTHIA E. FIELD, Ph.D.
*
CONTRIBUTING EDITOR

LIKE KIDS WHO FANTASIZE ABOUT playing with all the latest toys, just about every Apple II user wants to get into desktop publishing (DTP). And for good reason: What other computer application helps creative folks be more productive while freeing productive types to be more creative?

Choosing the DTP program that's right for you isn't difficult; it's largely a matter of taking a quick hardware inventory, then deciding whether your working style puts the accent on the medium or the message—or both. Whatever the emphasis, DTP products share three important functions: text creation, graphics creation, and page layout. If you've ever made greeting cards, signs, or banners with **The Print Shop** or a similar program, you've already completed DTP basic training. Designing more complex publications such as business stationery or club newsletters, while more challenging and time consuming, isn't all that different.

In this article and the accompanying **Tables** we compare a half dozen state-of-the-art DTP programs: **AppleWorks GS**, **geoPublish**, **GraphicWriter III**, **Medley**, **Publish It! 3**, and **Springboard Publisher**. These products share many features, but each boasts a surprising number of unique ones. Let's take a closer look, but first...

SOME CAVEATS

The *relevance* of a program's capabilities should be more important to you than the sheer quantity of features checked off in any arbitrarily constructed table. After all, if you don't create custom artwork, for example, lack of a spray-paint tool won't matter.

Keep in mind, too, that some programs are part of a series or a larger package, but may relate to the other modules in different ways. The geoPublish page-design program, for instance, is part of the integrated GEOS family, which includes a modestly priced word-processor/paint-module combination. Contrast this with AppleWorks GS, a more expensive, six-in-one program that at first blush may seem to offer more features.

Most DTP programs provide multiple methods for performing the same or a similar function. Using "snap to" guides, for instance, means you may not give a hoot about a "missing" auto-alignment capability. Moreover, expert users continually discover

Illustration • Jeff McNelly

THE PRESS IN DESKTOP PUBLISHING

undocumented techniques and devise alternative methods that surprise even programmers. Whatever DTP product you select, you'll come up with tricks of your own.

Finally, while the information in the accompanying **Tables** was accurate at press time, product managers with whom we spoke voiced plans for implementing additional features. For the most up-to-date information in this continually evolving field, contact publishers directly about their latest upgrades.

CHILD'S PLAY

Some fans of **AppleWorks Classic** and **TimeOut SuperFonts** may sigh at all the fuss desktop publishers make about Mac-like programs, but one fact endures: The top contenders among DTP programs for the Apple II sport a graphics interface. True, it can be a memory magnet, and it can be relatively slow. But its benefits are, if anything, understated.

For starters, most program functions are conveniently tucked away in pull-down menus until you need them, though expert DTPers can employ alternate, mnemonic keyboard commands. Help is routinely offered in dialog boxes and occasionally provided, as in GraphicWriter III, through context-sensitive, on-line assistance. Moreover, each program comes with a printed tutorial to get you up and running in a morning's time. And DTP products commonly offer a convenient, fold-flat reference manual as well as a quick-reference card. Without exception, program publishers offer free technical support.

Some of the programs reviewed here let you interact exclusively by keyboard (or joystick), but the mouse reigns supreme as a DTP tool. Screen displays are, with minor exceptions, WYSIWYG (what you see is what you get). While all programs support Epson printers as well as Apple's ImageWriter II and LaserWriter models, half support a number of other dot-matrix printers. (Contact the publishers.)

What if your printer's on the fritz, or you're dissatisfied with print quality? What then? Short of borrowing a wealthy friend's (or your school system's) laser printer, you can still roll the presses. Publish It! 3 can save files in a format that's compatible with the Postscript page-description language; just take your data disk to any laser-printing service bureau that has a Macintosh computer. Or mail your geoPublish files to LaserDirect, a Wisconsin-based laser-printing service. (It supports certain other formats, as well.)

PUT IT IN WRITING

Though current versions of DTP programs can keep pace with speedy typists, these products are no substitute for text-screen-based word processors like AppleWorks Classic. This observation is especially true if your publication is lengthy, or if contributors to your newsletter send ASCII (American Standard Code for Information Interchange) files by modem. Whatever the circumstances, rest assured that DTP programs can import either formatted or unformatted files from nearly any word processor.

Once it gets the text, DTP software can really do wonders. Besides an assortment of finishing touches like tabs, justification formats, and typefaces, styles, and sizes, most programs also offer manual adjustment of character, line, and paragraph spacing for printed results that approach typographic perfection.

Like GraphicWriter III, most DTP programs include routine word-processing functions such as find/replace and sophisticated ►

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ones such as "sticky" spaces. Half the DTP programs we've used come with built-in spelling checkers, but only Medley and AppleWorks GS offer a thesaurus, and only Medley provides automatic hyphenation. Despite its word-processing prowess, however, Medley doesn't print text in color as other color-capable DTP programs such as GraphicWriter III can.

GET THE PICTURE?

To one degree or another, all six DTP products reviewed here let you implement, if not actually create, graphics in bit-mapped and object-oriented forms. *Bit-mapped* images are *painted* with discrete pixels (colored dots), while *object-oriented* designs are *drawn* as complete entities. For example, you might paint a bit-mapped rendering of a detailed logo, but it would be easier to draw the circle with drop shadow that surrounds it.

Programs written specifically for the GS offer a palette of colors and an assortment of painting tools, including variously shaped brushes. These programs share another feature: They readily import super-high-resolution illustrations created with more full-featured paint programs such as **Paintworks Gold**. They can print these illustrations in full color on an ImageWriter II with a four-color ribbon.

Publish It! 3, incidentally, is the only 8-bit program (one that's not written exclusively for the GS, which can use 16-bit software) that can do the same.

Most programs import other, less detailed illustrations (though not necessarily of lesser quality), including clip art created with single-hi-res paint programs, The Print Shop, **Dazzle Draw**, or another double-hi-res package. (Contact the publishers for details.) Untold numbers of these illustrations are practically free for the asking in the public domain.

DTP programs let you enhance your publication with special effects such as rules (lines) of various weights (thicknesses), as well as filled or hollow (noncolored, nonpatterned) shapes. Every program offers at least the basic shapes—rectangles, round rectangles, and circles—you need to create patterned borders or shaded backgrounds for mastheads, tables of contents, sidebars, titles, and headlines.

TURN THE PAGE

Virtually all the programs reviewed here prove that electronic page design, the melding of text and graphics on screen as preparation for printing on paper, can be quicker and easier than traditional pasteup methods.

With Springboard Publisher and Medley you can enter text the moment the program loads, but other products require you to set off areas, sometimes called *regions* or *frames*, where you want text and graphics to appear. These page-layout programs commonly offer a text-frame tool and a graphics-frame tool.

Most DTP products provide layout assistance in one or more forms, including automatic columns and ready-made, magnetic ("snap to") guides that divide the page the way you want and help you align areas precisely. Horizontal and vertical screen rulers and magnified viewing modes make freestyle layouts a breeze. Most DTP programs let you designate "master pages" for creating additional pages

Table 1. General features of six DTP programs compared.

	AppleWorks GS 1.0 v2	geoPublish 2.1	GraphicWriter III 1.0	Medley 2.0	Publish It! 3	Springboard Publisher 2.00
OS	GS/OS	GEOS	GS/OS	GS/OS	ProDOS 8	ProDOS 8
Memory required	1.25MB	128K	512K	1.25MB or 1.125MB ROM v3	128K	128K
Hardware required	3½" drive	—	3½" drive	3½" drive	enhanced IIe, mouse or joystick	3½" drive
Recommended	additional 3½" drive or hard disk	256K, mouse	additional drive	additional 3½" or hard disk	additional drive, mouse	768K, hard disk, mouse
Disk format supplied	3½"	5¼" or 3½"	3½"	3½"	5¼" & 3½"	3½"
Input device	mouse or keyboard	joystick, mouse, or keyboard	mouse	mouse	mouse or joystick	mouse or keyboard
Formats data disks?	n	y	y	n	n	y
Multiple document windows?	y	n	y	y	n	n
Max. document size	99pp	16pp	disk-space dependent	32pp	memory dependent	disk-space dependent
Max. page size "	8½×14	8½×11	17×17	11×14	8½×14	8½×14
"Freebies" included	—	clip art, fonts, templates	clip art, fonts, templates	clip art, templates	clip art	clip art, templates
Accessories available	—	creativity disk, GEOS applications	clip art, fonts, templates, Font Factory	templates	clip art, fonts, templates, Graph It!	clip art, fonts, templates

y = yes n = no max. = maximum pp = pages OS = operating system

that automatically share common elements.

You can also selectively "link" text areas, for articles that flow from column to column and page to page. Nearly every program has the capability to wrap text automatically around graphics frames, but only about half these programs can wrap text horizontally across graphics frames. Fewer still can wrap text around irregularly shaped graphics.

Page design can be picky, but there's a way to bypass the tedium: Simply load one of the preconfigured "style sheets" (templates) most companies provide either free or at a small additional cost. To produce a finished document, import its text, select clip art, and perform minimum fine-tuning. Some newsletter style sheets we've seen, notably those that accompany Springboard Publisher, are exquisitely designed and can save you work.

NEW AND IMPROVED

As *inCider* was going to press with this issue, Timeworks, Milliken, and Seven Hills Software were putting the finishing touches on Publish It! 3, Medley 2.0, and GraphicWriter III, respectively. While we can't publish full reviews until final versions are available, here's a quick peek at the new editions of these established DTP programs.

NEWEST PUBLISH IT!

Two years ago when we reviewed the premiere release of Timeworks' Publish It! ("All the Tricks of the Trade," April 1988, p.26), we were so impressed that we gave that pioneering page-layout program *inCider*'s coveted five-point rating. In the meantime thousands of Apple II users have swarmed to the product and compiled a collective "wish list," prompting designers at Turning Point Software, developers of the program, to enhance the latest version, Publish It! 3, with power and convenience unrivaled in the 8-bit desktop-publishing world. (We used beta version 1 to prepare this preview.)

Among Publish It! 3's most notable enhancements is color-printing capability. Once black-and-white only, desktop-published documents now created on an Apple IIe, IIc, or GS (the IIe must be "enhanced") can incorporate color text as well as color graphics elements, including super-high-resolution clip art.

Select from nine new shading densities (10 percent through 90 percent) for any filled shape, such as a rectangular background for a newsletter's sidebar. Technically designed for compatibility with Postscript laser printers, these gray scales also print attractively on dot-matrix printers. And with an ImageWriter II, you can create filled shapes in yellow, red, orange, blue, green, or purple instead of black.

Publish It! 3's custom grids format columns, rows, and margin settings automatically. The program's new capability to copy and paste objects in groups saves time when duplicating repetitive design elements on a single page or successive pages. And moving among those pages is a cinch, thanks to the program's new "go to page" command.

Never again be frustrated by the accidental jarring of template objects! The "lock object" command accessed via the *Show Specifications* dialog is a boon for desktop publishers for whom precision is key. If you decide to shift an object later, "unlock" it by clicking ►

Table 2. Special text features.

	AppleWorks GS 1.0 v2	geoPublish 2.1	GraphicWriter III 1.0	Medley 2.0	Publish It! 3	Springboard Publisher 2.00
# typefaces	11	9	30	15	6	3
Type styles	pbiuos	pbiuo	pbiuos	pbiuos	pbiuos	pbiuos
Type formats	sb/sp, all uc, all lc, title	sb/sp	sb/sp, all uc, all lc, proper name	sb/sp	sb/sp	sb/sp, inverse
Auto support type C$8 GS fonts?	y	n	y	y	y	n
Spelling checker?	y	n	y	y	n	n
Thesaurus?	y	n	n	y	n	n
Tabs?	y	y	y	y	y	y
Decimal tabs?	y	y	y	y	n	n
Tab leaders?	n	n	y	y	y	y
Custom tab leaders?	n	n	y	n	y	n
Auto hyphenation?	n	n	n	y	n	n
Sticky spaces?	n	n	y	y	y	n
Soft hyphens?	n	n	n	y	y	n

y=yes n=no p=plain b=bold
i=italic u=underline o=outline
s=shadow sb=subscript sp=superscript
uc=uppercase lc=lowercase

on the radio button so named.

Publish It! 3's improved keyboard buffering keeps better pace with fast typists. You can save disk-access time (and manual disk-swapping frustrations) when previewing or printing documents: Just cache your fonts (load them automatically) at startup. Even better, invoke Publish It! 3's "Postscript print to disk" feature and send your file to a service bureau for laser printing.

Among other desirable features in this latest update are convenient file-dialog commands; a cropping box with handles; user-defined tab leaders; and direct installation of so-called GS fonts, hundreds of which are available in the public domain.

Nearly two years and literally dozens of improvements later, Publish It! 3 still requires a meager 128K, though you'll need extended memory (256K or more) for certain features. Best of all, the program is faster and more convenient than ever before. Now that *inCider*'s expanded its rating system, we won't have to stop at five points.

MEDLEY'S NEW HARMONY

While other desktop-publishing programs accent page layout, Milliken Publishing's Medley 2.0 for the Apple IIGS plays a different tune: It's a word processor first, a paint program second, and a page-layout tool third.

Medley's emphasis on word processing is apparent from startup. The word-processing mode's work screen means you needn't design so-called "text areas" before entering information. Just begin typing, or bring in text from AppleWorks or another word processor.

Short of being **WordPerfect**, Medley is perhaps the most full-featured of GS word processors, with customary functions such as search/replace, sticky spaces, and more-or-less WYSIWYG (what you see is what you get) fonts.

Table 3. Page-layout features.

	AppleWorks GS 1.0 v2	geoPublish 2.1	GraphicWriter III 1.0	Medley 2.0	Publish It! 3	Springboard Publisher 2.00
On-screen rulers?	y	y	y	y	y	y
Rulers linked to pointer?	y	n	n	y	y	y
Dimensions	inches	inches	inches, centimeters, picas, points	inches	inches, centimeters, picas	inches, centimeters, pixels
Auto column placement?	y	y (page-layout libraries)	y	n	y	y
Adjustable column gutters?	y	y	y	y	y	y
Max. # columns/page	user-defined	16	user-defined	user-defined	65	9/text frame
Show object specs or coordinates?	n	y	n	y	y	n
Auto group alignment?	n	n	y	n	y	n
Auto gutter margins for binding?	y	y	y	y	n	n
Snap-to guides?	y	y	y	n	y	n
Lock objects?	n	n	y	n	y	n
Auto wrap text horizontally across graphics?	n	n	y	y	n	y
Auto wrap text around graphics frame?	n	y	y	y	y	y
Auto wrap text irregular graphics?	n	n	y	y	n	n
Independent worksheet area?	y	n	y	y	y	n
# view modes	2	2	4+	2	4	3
Go to page # command?	y	y	y	y	y	y
Separate preview mode?	n	n	n	y	y	n

y = yes n = no

But Medley also boasts some extraordinary features, such as automatic hyphenation. Medley's spelling checker and thesaurus, a combination you won't find in any other desktop-publishing program except AppleWorks GS, are based on an 80,000-word dictionary, which you can customize.

Medley lets you keep multiple document windows on screen simultaneously. Resize and move them with the mouse. Each Medley document is inherently limited to 32 pages; if your GS has only the minimum memory required, document size may be more restricted, particularly if you incorporate graphics.

Medley runs under GS/OS System Software 5.02 and features the Apple Human Interface, with nine pull-down menus in word-processing mode alone. You can access program options easily with the mouse, but a generous number of alternate keyboard commands are available.

Medley's rulers let you set up page-formatting options, such as tabs, and lay out art areas, which come in four basic shapes: rectangle, round rectangle, oval, and polygon. Select a shape and draw it with the mouse. Resize any art area by tugging on the pull tabs that appear on its periphery.

Import super-hi-res clip art or draw custom illustrations with the paint tool; its two palettes are similar to those found in stand-alone GS paint programs. Moreover, Medley offers a commendable assortment of paint options, including 48 brush shapes, a spray-paint "splatter" adjustment, and three choices for retaining the native palettes of imported clip art.

Art areas can also contain text: Just convert an art area to a "page part." This feature together with the ability to wrap text around any shape, even an irregular one, would make Medley an attractive alternative to a page-layout program such as AppleWorks GS, if it weren't for one "rub": Medley can be downright disconcerting to use.

For example, you don't lay out text in columns as you do in other programs—neither manually nor automatically. Instead, you "rubber-band" a narrow art area down the page (hold down the mouse button and drag) so that it "intrudes" upon the text, forcing it to align itself into two columns—sort of like Moses parting the waters of the Red Sea. Medley's "fully interruptible" working style may also strike a dissonant chord with some users: You can command a second change before the first is fully executed. If you prefer to see the results of one step before embarking on the next, you may be frustrated by Medley's slow, quirky screen redrawing, a feature that often results in seemingly "lost," or at least disoriented, page contents.

GRAPHICWRITER III

Arguably the most promising desktop-publishing program for the Apple IIGS, Seven Hills Software's GraphicWriter III weds moderately powerful word-processing features with an attractive mix of both object-oriented and bit-mapped graphics capabilities. By now a bug-free version should have replaced the prerelease version we used to prepare this "sneak peek." Despite our low bug tolerance, the flaws we encountered did little to diminish our enthusiasm for the program's overall excellence.

Converts from 8-bit desktop-publishing programs may be pleased to learn that in general some of GraphicWriter III's operations are similar to Publish It!'s—but with crucial distinctions. Chief among them is an easier-to-use text-frame tool. Select the program's double-duty I-beam, click the mouse, and begin typing. Resize the text frame by dragging any of its eight selection handles. ►

PRODUCT INFORMATION

AppleWorks Classic 3.0, $249
AppleWorks GS, $299
Claris Corp.
5201 Patrick Henry Drive
Santa Clara, CA 95052-8168
(408) 727-8227

Bank Street Writer, $69.95
Dazzle Draw, $59.95
The New Print Shop, $49.95
Print Shop GS, $59.95
Broderbund Software
17 Paul Drive
San Rafael, CA 94903-2101
(415) 492-3200

Font Factory, $39.95
GraphicWriter III, $149.95
$25 update from 1.0 or 2.0
$12 demo disk
Seven Hills Software
2310 Oxford Road
Tallahassee, FL 32304-3930
(904) 575-0566

geoPublish, $99.95
GEOS, $69.95
Berkeley Softworks
2150 Shattuck Ave.
Berkeley, CA 94704
(415) 644-0883

Graph It!, $69.95
Publish It! 3, $129.95
Font Pack 1
Font Pack 2
Education Graphics
People, Places & Things
Symbols & Slogans,
$39.95 each
Timeworks Inc.
444 Lake Cook Road
Deerfield, IL 60015
(708) 948-9200

LaserDirect
P.O. Box 20829
Milwaukee, WI 53220-0829
(414) 529-5393

Medley 2.0
Milliken Publishing Co.
1100 Research Blvd.
St. Louis, MO 63132
(800) 643-0008
$129

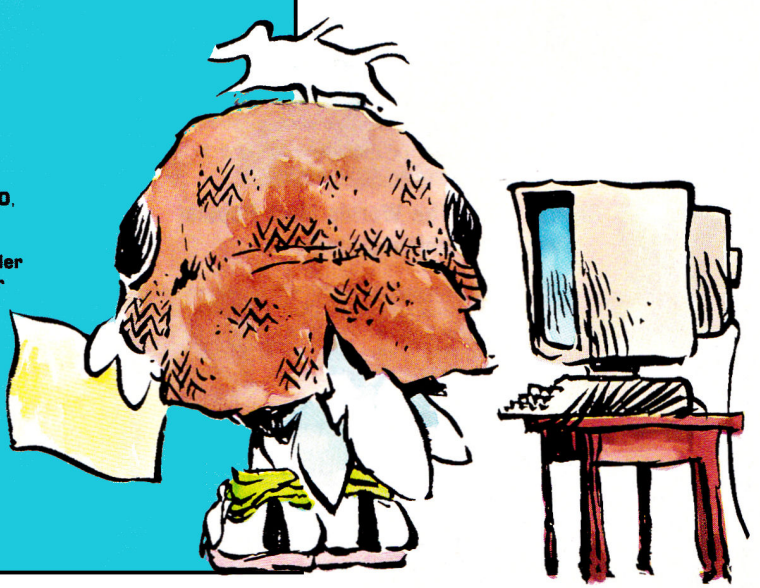
MouseWrite
Roger Wagner Publishing
1050 Pioneer Way
Suite P
El Cajon, CA 92020
(619) 442-0522
$149.95

Paintworks Gold
Mediagenic
3885 Bohannon Drive
Menlo Park, CA 94025
(415) 329-0500
$69.95

Springboard Publisher 2.0,
$139.95
Fonts, $29.95
Assortment Series Sampler
Education Series Sampler
Holiday Series Sampler,
$39.95 each
Springboard Software
7808 Creekridge Circle
Minneapolis, MN 55435
(612) 944-3915

TimeOut SuperFonts
Beagle Bros
6215 Ferris Square
Suite 100
San Diego, CA 92121
(619) 452-5500
$69.95

WordPerfect
WordPerfect GS
WordPerfect Corp.
288 West Center St.
Orem, UT 84057
(801) 225-5000
$179 each



If four page-view modes (*Fit in Window*, *Half*, *Actual*, and *Double Size*) seem insufficient, employ *Scale To* and blow up sections of your page to nearly any size. *Tall Text* mode makes GS fonts displayed on screen more readable for purposes of editing. GraphicWriter III's customizable spelling checker helps, too. Flowing text in a GraphicWriter III document is a snap, thanks to the program's visible, and seemingly foolproof, "linking tags."

Add graphics special effects or create custom illustrations with the program's ample shape and paint tools, or import single-, double-, or super-hi-res clip art. GraphicWriter III's text-formatting capabilities, including *Skip Over* (text wraps horizontally "across" graphics) and *Wrap To* (text cozies up to irregularly shaped illustrations), underscore the program's impressive page-layout power. A necessary, and usually sluggish, evil in any page-layout program, screen reformatting proceeds surprisingly fast in GraphicWriter III—even without a speedup card.

Although GraphicWriter III can probably keep up with your typing, you may want to import large chunks of text from another program. At press time GraphicWriter III could automatically import ASCII text from most word processors, plus formatted word-processing files from **Apple Writer** (now discontinued), **Bank Street Writer**, **MouseWrite**, and **AppleWorks Classic** (including AppleWorks 3.0), with or without **TimeOut SuperFonts** embellishments. "Translators" for other word processors are expected to be offered free by modem through the commercial information services America Online and GEnie, or for a nominal disk-copying charge by mail.

Learning GraphicWriter III's many features need not be daunting. At press time, the program manual was expected to include not just a simple award certificate, but a newsletter project designed to familiarize novices with virtually every program feature. Free templates, clip art, and fonts supplied with the program provide plenty of opportunities for self-paced experimentation.

Some GS owners may think AppleWorks GS too inflexible and Medley too peculiar, and either can be demanding in the RAM-chip department. With its memory-management strengths, GraphicWriter III may be the best alternative for the desktop publisher who wants authentic GS software that not only looks good, but produces good-looking documents, as well.

SO WHY WAIT?

What's DTP? It's news desk, composing room, palette, and drafting table all rolled into one. Thanks to its innumerable features—a range of options and a great degree of flexibility in the way you use those options—state-of-the-art DTP software for the Apple II equips you to handle just about any publishing project that comes along. If you've been waiting for worthy DTP programs to emerge, now's the time to act. Marshall McLuhan's vision of the future is today's reality: Gutenberg's "print man" has been liberated, "electronic man" has been born—and desktop publishing is promoting the exchange of ideas, disseminating the written word on an unprecedented scale, at a lower cost than ever before.□

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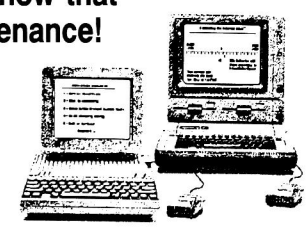

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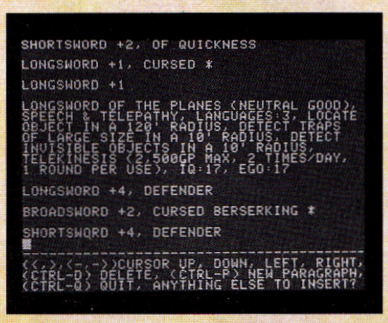

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Circle 68 on Reader Service Card.

By OWEN W. LINZMAYER

Make the ADB Connection

Your GS' Apple Desktop Bus lets you plug in a series of input devices and switch from one to another at will. Whatever your interface needs, the ADB standard puts you on the road to customized communication with your computer.

KEYBOARD NOT CUTting it? Mouse not accurate enough? Do you secretly long for trackballs, graphics tablets, jazzier mice, more elaborate keyboards, and other intriguing input devices? Climb aboard the Apple Desktop Bus and journey beyond the limits of the one mouse and one keyboard Apple provides as standard equipment. The Apple Desktop Bus, a four-wire cable carrying those millions of bits of data from your keyboard into a port on the back of your computer, is one of the GS' most versatile, and underrated, features.

What's so versatile about plugging in a keyboard? It's only the beginning of the input line, that's what—the keyboard isn't your sole mode of communication with the computer. The Apple Desktop Bus lets you *daisychain* your input peripherals—connect one device to another, similar to the way you hook up your 3½- and 5¼-inch disk drives to the SmartPort on the back of your GS. Not only can you connect a mouse on either side of the keyboard, but a multitude of more exotic input devices as well—up to 16 in series. Replacement keyboards and mice abound, as do ADB trackballs, joysticks, graphics tablets, and bar-code and magnetic-strip readers. The Apple Desktop Bus lets you mix and match these devices for a system customized to your individual ►

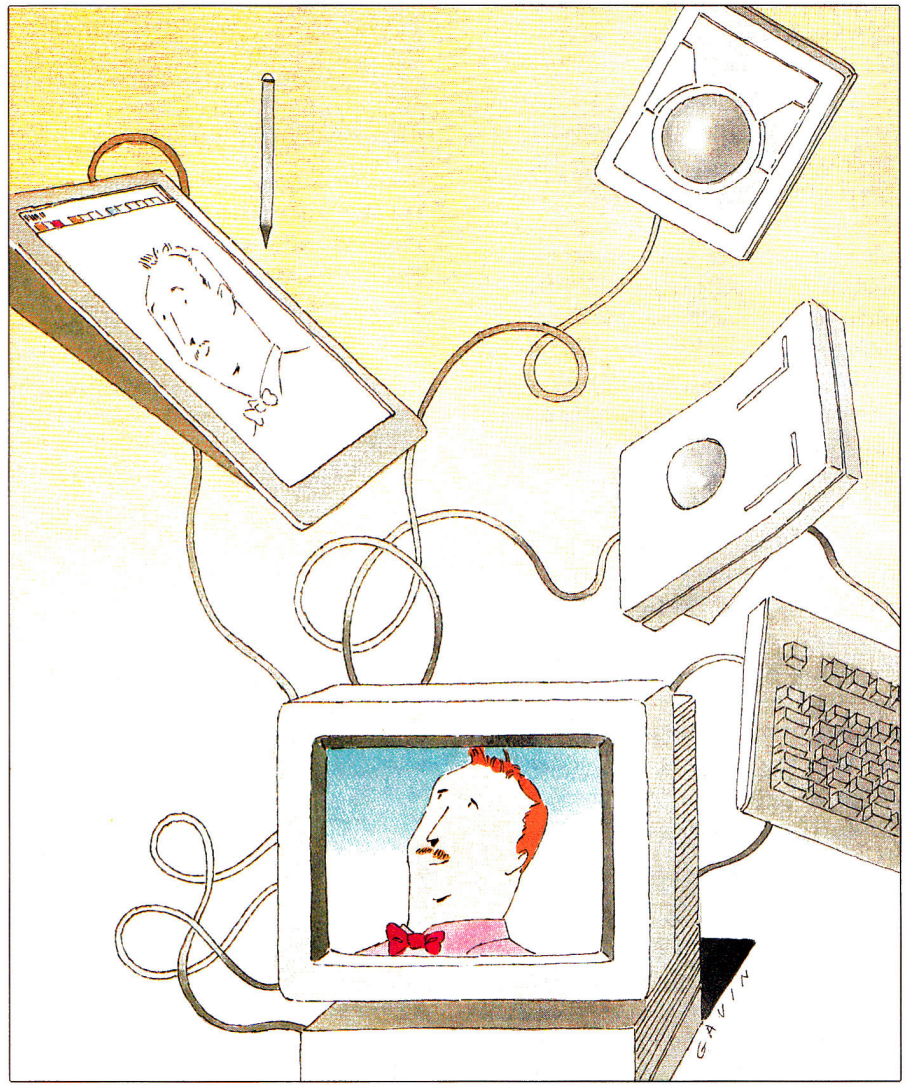


Illustration • Kerry Gavin

work style, needs, and preferences.

There's one additional benefit. ADB is also an electronics protocol, standard on both the GS and the Macintosh—common ground between the machines, so that theoretically you can use any ADB input device for the Mac on the GS. Manufacturers of such products don't often acknowledge the Mac/GS connection in their advertisements or packaging, however. For this evaluation we examined a variety of ADB peripherals designed for the Mac and, with a few caveats, most of them work on the GS, too. Here's the report.

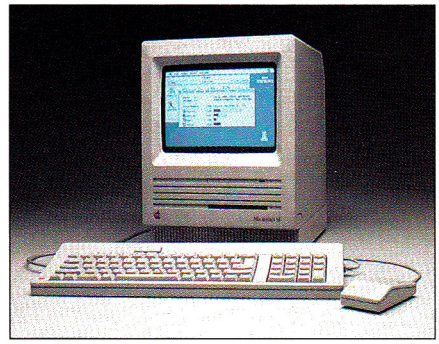
TYPE IT IN

The GS comes bundled with an ADB mouse and keyboard, but if you buy a Macintosh, the keyboard is sold separately from the computer. Apple offers two types of ADB keyboards—**Standard** and **Extended**—and third-party manufacturers are vying for a slice of the pie as well. You can use any of these alternatives instead of the keyboard shipped with the GS—and you can even daisychain multiple keyboards to a single computer, to eliminate crowding if you're playing a two-person game, say, or demonstrating a program to a student. A whole new genre of application software could be developed to exploit the ADB protocol's ability to distinguish between different devices on the bus.

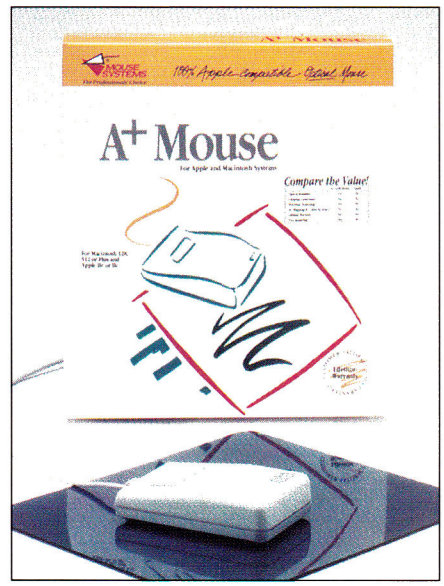
The standard Apple keyboard sold as a Mac option has exactly the same layout as the GS keyboard; only the plastic case and keycaps are different. Functionally the two devices are interchangeable; if your GS keyboard dies, you can swap it for a Mac model without missing a keystroke. The Apple Extended Keyboard has 105 keys in a layout that resembles that of the IBM PC. It features 15 function keys, six dedicated page-control keys, four arrow keys in an inverted-T configuration, and three light-emitting diodes (LEDs) to indicate number-, scroll-, and caps-lock.

Two third-party companies also offer PC-style keyboards. The **Mac-101** from DataDesk International has roughly the same layout as the Apple Extended Keyboard, but the keys have a bouncier feel. Additional LEDs are labeled Power On, Caps Lock, and Window Lock. DataDesk doesn't market its keyboard to the non-Mac community for good reason: The device lacks the reset key required by the Apple II, rendering it all but useless on that series of machines. Ehman Engineering's **Mac-105** (distributed through Cutting Edge) is a lower-cost clone of the Apple Extended Keyboard, but its construction doesn't feel as sturdy and its keys make a pronounced clicking noise when pressed. Apple's unit still looks and feels the best of all, but it's the most expensive of the lot.

Kurta's IS/GS graphics tablet is an outstanding alternative to the mouse for tracing and freehand drawing.



The Mac's Standard Keyboard, shown above, is also compatible with the GS, thanks to the ADB protocol. (Photo courtesy of Apple Computer.)



Mouse Systems' A+ Mouse ADB is an optical device—no moving parts, for precise control and fluid operation.

The Apple Extended Keyboard and its imitators—with their IBM-inspired layouts—were designed primarily as a lever to get Macs into corporate America. In practical workaday use, however, the extra features of these keyboards go largely unused by the majority of Macintosh and GS programs. Most of the indicator lights don't work on the GS, and even the function keys for standard operations don't work as labeled (undo, cut, copy, and paste). To program the function keys to do something useful, you need a macro utility that recognizes extended keyboards. At present, the only such package is Roger Wagner Publishing's **MacroMate**. This utility lets you assign a macro (an automated series of commands or keystrokes that serve as a shorthand substitute for a longer series) to any key on the keyboard. Nevertheless, the one-keystroke convenience the 15 function keys are supposed to provide is elusive—you must press the macro key in conjunction with a "modifier," such as the control, open-apple, or option key.

Even Applied Engineering's **PC Transporter**—a plug-in board that lets your Apple II run MS-DOS programs—requires a custom input-device driver to take advantage of the IBM features of these ADB keyboards. Applied Engineering reports that it currently has no plans to write such a driver. In short, only users who are more comfortable with the IBM layout will benefit substantially from an extended keyboard.

CITY MOUSE, COUNTRY MOUSE

Apple pioneered the use of the mouse as an input device on the Macintosh, and it has since found a warm welcome in the Apple II community. Although a mouse is standard equipment on the GS, Apple's isn't the only model available, nor is it necessarily the best.

The Apple mouse is a mechanical device; a small rubber ball protrudes from a hole in the bottom of the mouse and rotates ►

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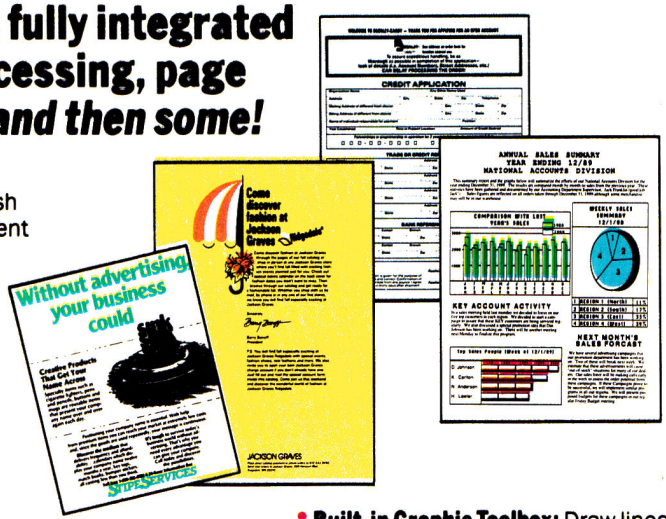

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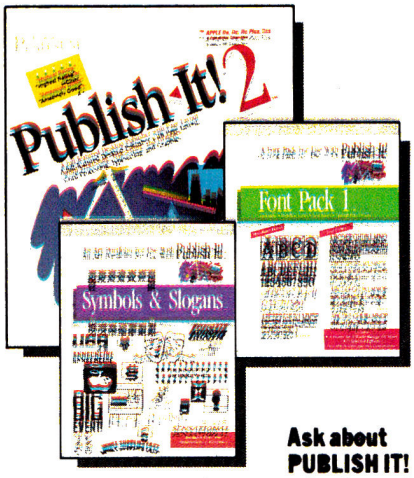

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internal rollers when you move the unit along a flat surface. Your computer translates the motion of these parts into digital signals it then uses to position the cursor on screen. The disadvantage is that mouse parts can slip or get dirty, and they'll eventually wear out. For best results a mouse pad and routine cleaning are required.

Mouse Systems has attacked the vulnerability of the mechanical mouse with an optical challenger. The **A+ Mouse ADB** is a good alternative to Apple's model; it has no moving parts, for more dependable operation. Mouse Systems backs it with a lifetime warranty. The device comes with a 7¾-by-9-inch reflective mousepad embedded with a finely ruled grid the mouse "reads" to register movement.

The A+ Mouse ADB offers precise control and a fluid feel. Its one drawback is that upon initialization, applications think the mouse's button is depressed. This minor annoyance is dismissed by tapping the button once, however. If the GS didn't come bundled with a mouse, the A+ device with its luxuriously smooth action would certainly be the mouse of choice for most folks. Mouse Systems also offers an identical, but non-ADB, version of the **A+ Mouse** for the Apple IIc, IIc Plus, and IIe with mouse card.

ROLL 'EM

Nowadays the mouse is only one of a growing number of pointing peripherals. One of the more popular alternatives is the trackball, a device that provides all the cursor mobility of a mouse in an extremely small space.

A trackball is like an overturned mouse. Instead of sliding the device across a pad, you spin a ball that sits on top of a small pedestal. Trackballs take some getting used to; some people are never truly comfortable with them. Nonetheless, the trackball is quite practical, especially in cramped quarters where flat space comes at a premium.

The Kensington Microware **Turbo Mouse ADB** (actually a trackball) includes a number of handy touches that make it an excellent alternative input device. Thanks to its two ADB connectors, for instance, you can have the best of both worlds by daisychaining a real mouse through the trackball. In addition, two large buttons, one on each side of the ball, make the Turbo Mouse ADB easy to use for right-hander and southpaw alike. And by setting the DIP (dual in-line package) switches on the back of the trackball, you determine which button imitates the standard mouse button and which acts as a click-lock. Press the click-lock once and the trackball acts as though you're holding down the mouse button, freeing you to spin the ball without actually keeping one finger on the button.

The Turbo Mouse ADB also has a unique *chord* feature that lets you choose one of seven command-key sequences (OA-S, save; OA-P, print; OA-O, open; OA-W, close; OA-N, new; OA-Q, quit; OA-Z, undo) you'll invoke whenever you press both buttons simultaneously. For example, select Open ►

Talking to Your GS: ADB Protocol

In computer terms, a *bus* is a conduit through which devices pass information to one another. The Apple Desktop Bus is a standard method of connecting multiple input devices, such as a keyboard and mouse, to the GS. Physically, the ADB consists of a four-wire cable that terminates in a four-pin miniature-DIN *(Deutsche Industrie Normal)* jack. (See the accompanying *Figure* for pin assignments of ADB connectors.)

One handy feature of ADB devices is that, if properly designed with two ADB connectors each, you can daisychain them to one another. That is, you can attach a keyboard to the computer, a trackball to the keyboard, a graphics tablet to the trackball, and a mouse to the tablet, for example.

Although these devices are connected one after the other in serial fashion, the electrical connections to the Apple Desktop Bus are parallel. The benefit is that if one device fails, the other devices are unaffected.

Theoretically, you can daisychain up to 16 input devices to the Apple Desktop Bus port on the back of your GS. In practice, however, the number of devices is limited by the available current (+5 volts at 500 milliamps). None of the devices I tested for this article exhibited any signal-degradation problems working with the minimum configuration of a keyboard and a mouse.

All devices on the bus are able to "talk" to the computer thanks to some special components inside the GS. At the heart of the system is the ADB microcontroller, which works in conjunction with the computer's GLU chip (general logic unit) to manage the interaction of the 65C816 microprocessor and the devices attached to the bus.

Because ADB cables have only one data line, your computer and the ADB devices must communicate asynchronously—in one direction at a time. The computer sends commands or data to a device, and the device then responds by sending data back to the computer. Your GS can address one specific device or all devices on the bus. A command sent by the computer's microprocessor is an 8-bit word consisting of a 4-bit command code and a 4-bit field that specifies the device to address. The 16-device limit of ADB protocol is a reflection of the syntax of this binary command byte. (Two possible values raised to the fourth power equal 16.)

The 4-bit address field uniquely identifies the device type as *encoded* (keyboard, for example), *relative* (mouse), or *absolute* (graphics tablet). Apple has reserved five other device types for future definition. The computer can distinguish among nine similar devices (or fewer), allowing a group of friends to control the individual members of a computerized baseball team, for instance, with nine joysticks connected to a single ADB port. If Apple were to rally developers behind ADB protocol, the incredible range of multiplayer games and tutorial applications that could be created has the potential to redefine the way we work and play with computers.□

—O.W.L.

Pin	Description
1	data
2	reserved
3	+5 VDC at 500 milliamps
4	ground

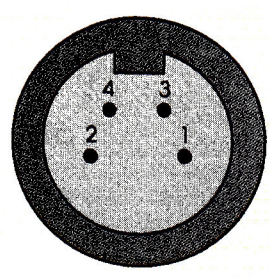

Figure. Four-pin mini-DIN jack: pin assignments of ADB connectors.

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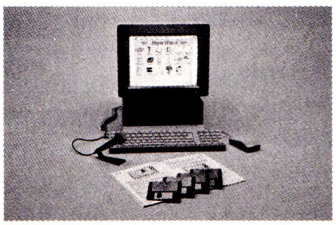

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apple-S as the chord command to save documents without moving your hand from the trackball to the keyboard. Early versions of the Turbo Mouse ADB had problems implementing the chord feature on the GS; you can exchange your device for a working replacement.

The ball in the Turbo Mouse ADB is made of hard plastic and is roughly the size of a billiard ball. A hint of friction is evident when the ball spins in its socket, but with an effortless flick of the finger the ball has enough momentum to send the cursor flying the length of the screen. And with a feature called *automatic acceleration*, the Turbo Mouse ADB senses the speed of the ball and moves the cursor accordingly. The faster the ball spins, the greater the distance the cursor covers.

This ability to jump freely around the screen makes a trackball excellent for programs that require a lot of pointing and clicking. And for those who are comfortable enough with the trackball to do detail work, the Turbo Mouse boasts resolution (fineness of movement on screen) that surpasses that of a mouse: 200 versus 90 dots (increments of movement) per inch, respectively. Kensington also sells a non-ADB version of the **Turbo Mouse** for the IIc, IIc Plus, and IIe equipped with a mouse card.

Like the Turbo Mouse, Abaton's trackball **ProPoint** also uses a billiard-sized ball and has a large standard button and smaller click-lock button, both located on the front left corner (not very convenient for lefties). You can't switch the functions of the buttons, nor is any chord feature included. Most damning, however, is that the ProPoint (at least in its current incarnation) doesn't work correctly on the GS. You can move the cursor around, but the device sends random button clicks to the computer, wreaking havoc on menu selections.

Asher Engineering rounds out the field with its low-priced **Lynx Trackball**. With two large buttons to either side of a small ball, the Lynx is practical for lefties and righties alike. On the left is the standard mouse button; the one on the right engages click-lock mode. You can't alter these designations.

The real difference between this device and its competitors is that the Lynx ball is embedded instead of resting in its own socket. As a result, the Turbo Mouse ADB and ProPoint both offer free-spinning, smooth action, while the Lynx has too much friction and virtually no momentum. In addition, you can turn the Turbo Mouse or ProPoint upside-down and the ball drops out for easy cleaning of the rollers underneath. Cleaning the Lynx, on the other hand, requires disassembly. For these reasons we hesitate to recommend the Lynx over the Turbo Mouse ADB, but it *is* less expensive, and it comes with both a 30-day money-back guarantee and a lifetime warranty.

"The Apple Desktop Bus lets you mix and match input devices for a system customized to your individual needs and preferences."

STICK TO IT

Want to use a joystick as a mouse? If you do, you'll need the **Mirage ADB** from CH Products. This multifeatured interface box turns any Apple-compatible joystick with a DB-9 connector into a high-performance ADB mouse alternative. The unit features an absolute mode and five separate rate-of-movement modes to fine-tune the action to your taste. Absolute mode makes the joystick act and track like a mouse. Wherever you position the stick, the cursor follows. In rate modes the cursor moves in the same direction as the stick handle, with ever-increasing speed as you push the stick farther from the center.

The **Mach IV Plus ADB**, a controller also from CH Products, incorporates all the features of the Mirage ADB in a high-precision joystick. It plugs into an ADB port and the DB-9 hand-controller connector on the back of the GS. A small sliding switch on the bottom of the unit determines whether the Mach IV acts as a mouse replacement or a regular joystick. Turning the unit over every time you want to change mouse/joystick and rate/absolute modes is an annoyance I could do without. Get used to it, though, because in absolute mode you've got to flip a switch every time you move between the two super-hi-res graphics modes of the GS.

The Mach IV Plus ADB has two large buttons on each side of the joystick, plus one positioned on the top of the stick like a firing button. They work like standard mouse buttons; there's no click-lock feature. Double-clicking is awkward, because you must hold the joystick steady so that the cursor's positioned correctly when you press the button. The Mach IV lacks a second ADB port, making it impossible to daisy-chain additional devices, so you'd better be sure you like the joystick enough to forfeit a real mouse.

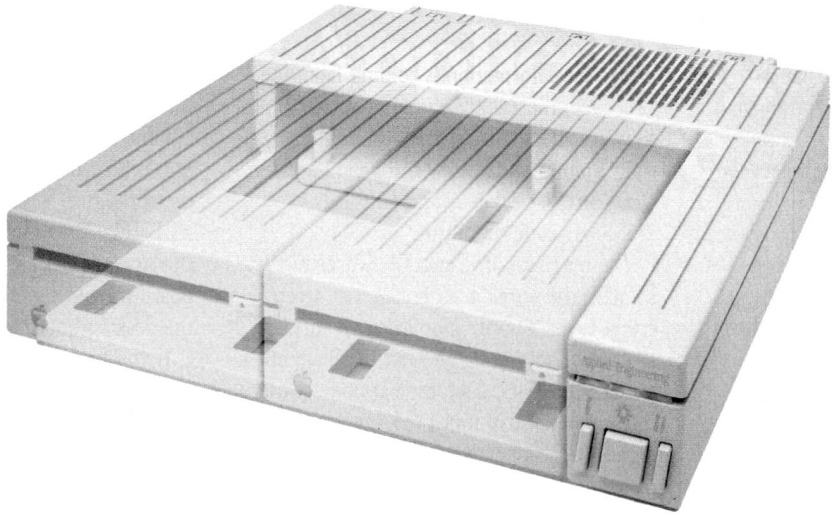
Both the **Mirage** and the **Mach IV Plus** are available as non-ADB devices for the IIc, IIc Plus, and IIe equipped with a mouse card.

BACK TO THE DRAWING BOARD

Kurta, the company that first made graphics tablets available for personal computers, markets an ADB unit for the GS called the **IS/GS Input System.** This unit is made up of a small drawing board and an electronic pointing device. Anyone who has ever tried to do freehand drawing or image tracing with a mouse can attest to its inappropriateness for the task. By contrast, the IS/GS was built for it. Place your original artwork beneath the sheet of clear plastic covering the drawing surface, and move the pen to trace the image and to use all the familiar tools of your favorite paint program. Pulling down menus and making command selections are easy, too.

Kurta supplies alternative pens and cursor-pointing devices in both corded and wireless configurations. I tested a corded pen with the button in the point of the pen itself. Just push down on the tablet to click—very natural, and second nature in a matter of minutes. Some programs, however, the Finder among them, have difficulty recognizing when you're holding the pen's point to the tablet, making marquee selections and tracing impossible.

The IS/GS comes with PenWorks, a new desk accessory (NDA) that configures the tablet as either an absolute or a relative device. In absolute mode, the surface of the tablet corresponds directly to the graphics screen. Move the pen to the middle of the tablet, and the cursor is centered on screen—exactly what you want for tracing. ►



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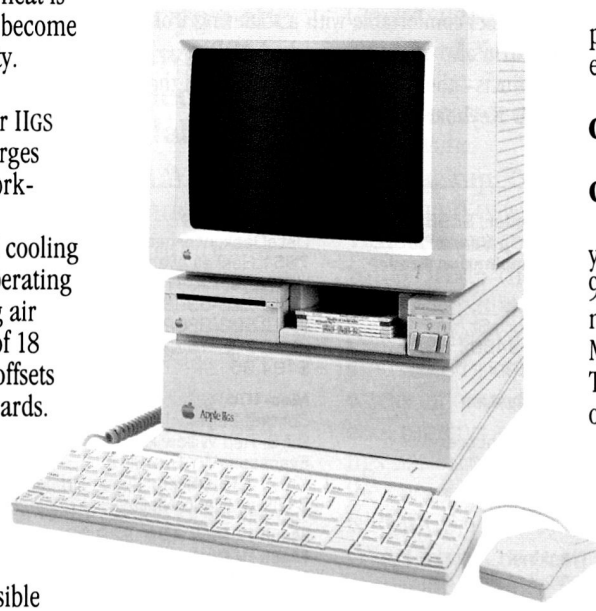
Power surges are another invisible risk to your computer's well-being. Power surges occur when voltage spikes surge through your wiring looking for a place to dissipate. If that place is inside your computer, you'll very quickly gain a greater understanding of the laws of electricity. It's not a pretty sight.

Conserver incorporates special line conditioning filters and dual surge suppression circuitry to 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 switches with LED indicators.



For beauty, we gave Conserver the same sleek lines of the IIGS and a perfectly matched platinum color. To reduce desktop clutter, the unit was cleverly designed to house two 3.5"disk drives, or one drive and the special diskette holder we include.

Conserver. The cool, safe choice to protect your IIGS from its invisible enemies.

Conserver $99

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To order or for more information, see your dealer or call (214) 241-6060 today, 9 am to 11 pm, 7 days. Or send check or money order to Applied Engineering. MasterCard, VISA and C.O.D. welcome. Texas residents add 7% sales tax. Add $10 outside U.S.A.

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In relative mode, the tablet acts like a mouse. If you pick up the pen and move it to another location, the cursor stays put.

PenWorks should let you switch between the two modes from within any program that conforms to the desktop interface. In practice, however, I couldn't change the setting to relative mode without removing the NDA from the boot disk. Kurta claims to be working on a PenWorks update that should fix these problems, but until it's released, test your IS/GS with any software packages with which you plan to use it.

MEMBERS OF THE BAR

Perhaps the most esoteric ADB device is the **PC-3850** combination bar-code/magnetic-strip reader from TPS Electronics. (Single-function readers are also available.) This small box has a slot on top through which you slide magnetic-encoded cards, plus a corded wand attached to the front to read bar codes. It's a self-contained unit that gets its power from the ADB port. Just plug it in and it's ready to go.

When you pass the wand over a bar code, the reader checks the validity and accuracy of the data automatically. If the scan is correct, the unit beeps once and the data contained in the bar code are entered into the active program as if you'd typed them on the keyboard. And because the computer thinks the information is coming from the keyboard, the PC-3850 is compatible with all software. It can also distinguish automatically among UPC (universal product code), Code 3-of-9, Codabar, and Interleaved 2-of-5 bar-code standards.

The magnetic-strip module works just like some of the public telephones that accept credit cards. Simply slide the card through the device so that it can read the magnetic strip on the back. Like the bar-code reader, the magnetic-strip unit performs some logical-consistency checks on the data and transmits them only if valid. The current application accepts the incoming information as if it had been typed on the keyboard. The reader can recognize ABA Track 2, ANSI × 4.16, and ISO 3554 magnetic-strip formats.

EXTRAS

The four-pin mini-DIN connectors Apple uses for its ADB ports are manufactured exclusively by **Hosiden America**. Only one U.S. firm distributes them: Advanced Electronic Support Products. AESP will sell individual connectors to hobbyists who want to build their own ADB devices, but if you don't feel comfortable with a soldering iron, the firm also offers two finished ADB products—the **ADB Dual Extender** and the **ADB Keyboard Extension**.

The Dual Extender is a small box that turns the one ADB port on the back of your GS into two. Instead of plugging the mouse into the keyboard, and the keyboard into the computer, both devices plug into the ADB Dual Extender. Among other things, this arrangement lets you place the keyboard in your lap and leave the mouse on the desk without its cable getting in the way.

If you find that the standard keyboard cable isn't long enough to reach your lap, there's always AESP's ADB Keyboard Extension, a 6-foot ADB cable. (Kensington Microware offers a similar 7-foot **Extra-Long ADB Cable**.) Keep in mind that the total length of cable connecting all ADB devices shouldn't exceed 5 meters (16 feet 5 inches), or signal degradation may occur.

Take advantage of Apple's Desktop Bus standard—check these alternative input peripherals to find the arrangement that meets your needs most precisely, the interface that feels most natural for the task at hand. For work or play, your GS was designed with ease of use in mind; when ADB devices help you talk to your computer, they make that partnership grow.□

CONTRIBUTING EDITOR OWEN W. LINZMAYER IS AN ASSOCIATE EDITOR OF *MACUSER*. WRITE TO HIM c/o *INCIDER*, 80 ELM STREET, PETERBOROUGH, NH 03458.

PRODUCT INFORMATION

ADB Dual Extender, $29
ADB Keyboard Extension, $25
Hosiden America Mini-DIN Parts, variable pricing
Advanced Electronic Support
1810 N.E. 144th St.
North Miami, FL 33181
(800) 446-2377
(305) 944-7710

Apple Standard Keyboard, $129
Apple Extended Keyboard, $229
Apple Computer
20525 Mariani Avenue
Cupertino, CA 95014
(408) 996-1010

A+ Mouse ADB, $119
A+ Mouse, $99
Mouse Systems Corp.
47505 Seabridge Drive
Fremont, CA 94538
(415) 656-1117

Bar-Code Reader, $595
Magnetic-Strip Reader, $525
PC-3850 Combination Reader, $745
TPS Electronics
4047 Transport St.
Palo Alto, CA 94303
(415) 856-6833

IS/GS Input System
Kurta Corp.
3007 East Chambers
Phoenix, AZ 85040
(800) 445-8782
(602) 276-5533
$395

Lynx Trackball
Lynx Computer Products
Asher Engineering Corp.
15115 Ramona Blvd.
Baldwin Park, CA 91706
(800) 824-3522
(818) 960-4839
$99.95

Mac-101 ADB
DataDesk International
7651 Haskell Avenue
Van Nuys, CA 91406
(800) 826-5398
(800) 592-9602 (CA)
(818) 780-1673
$194.95

Mac-105
Cutting Edge
97 S. Red Willow Rd.
Evanston, WY 82930
(307) 789-0582
$189 w/ MacroMate

Mach IV Plus ADB, $89.95
Mach IV Plus, $89.95
Mirage ADB, $39.95
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CH Products
1225 Stone Drive
San Marcos, CA 92069
(800) 624-5804
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(214) 241-6060
$499 (768K)
installation kit, $49 GS, $39 IIe/II Plus

ProPoint
Abaton
48431 Milmont Drive
Fremont, CA 94538
(800) 444-5321
(415) 683-2226
$140

Turbo Mouse ADB, $169.95
Turbo Mouse, $169.95
Extra-Long ADB cable, $39.95
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251 Park Ave. South
New York, NY 10010
(212) 475-5200

Diver: David Westbrook, President of Applied Ingenuity. Photo: Phil Blood of Adventure Diving Center, San Dimas.

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THE TAXMAN COMETH 1

Get a jump on your income taxes with an AppleWorks spreadsheet and an array of speedy, reliable formulas.

By RUTH K. WITKIN

IF MY MAIL IS ANY INDICATION, last January's AppleWorks in Action ("Preparing Your Income Taxes," p. 54) was clearly my most popular 1989 column. It attracted tons of letters.

Some readers had trouble entering the long formulas, others commented on what I could do differently or better, some asked for more filing categories, and still others just wanted to let me know what a super spreadsheet it was. Good hearing from all of you.

Figures 1 and **2** show this year's version of the income-tax spreadsheet. It takes into account new payment schedules, presents the full spectrum of filing possibilities, and uses some pretty snappy formulas. It resembles Form 1040 to a marked degree, but it's not meant to produce a ready-to-file return.

There's so much to tell you about the spreadsheet that I've had to split it into two columns. This month you'll enter all labels in **Figures 1** and **2** and formulas up to and including Formula 20.

Next month you'll enter the rest of the formulas plus all labels and formulas for alternative minimum tax (AMT), a method designed to ensure that people with a sizable income pay at least some tax on it. With more than 40 different formulas in the entire spreadsheet, you're bound to find something new and challenging at every turn.

The same admonition applies this year as last: *Caveat taxpayer*—let the taxpayer beware. Tax laws change almost daily. Before filing, check the schedules, deductions, and allowances to make sure everything shown here is still valid.

GOOD NEWS

A little fanfare, please. I'll be using AppleWorks 3.0 in this and future columns, which makes a difference this month in formula construction, formula copying, and spreadsheet printing.

With 3.0, you can put text strings into formulas by using double quotation marks, identify a series of absolute or relative cell references during copying by hitting OA-Return or OA-R, and print a wide spreadsheet without having to identify columns for each page. If you haven't done so already, I recommend you upgrade to AppleWorks 3.0. It's loaded with great new features.

A SPREADSHEET FROM SCRATCH

Load AppleWorks and create a new spreadsheet file named **TAXES89**. Now follow these instructions to set up the spreadsheet:

Lines. For horizontal lines, type quotation marks first, then hold down the equal or minus-sign key. For vertical lines, type the vertical-bar character twice in D1, center the characters, copy down column D, then copy all of column D to column L.

Column width. Use OA-L to change the width of columns from the current nine characters: Column A to 63 characters, B to 11 characters, C to 2 characters, D to 4 characters, E to 20 characters, H to 6 characters, I to 10 characters, K to 8 characters, and L to 4 characters. Columns F, G, and J remain at 9 characters.

Entries. Referring to **Figures 1** and **2**, enter all labels and numbers *except numbers in formula cells*. Each formula cell is highlighted, with or without a formula number beside it.

- *Indented labels.* In columns A and E, indent one, two, or three spaces. (For example, indent one space in A4 and E9, two spaces in A20, and three spaces in A34.) Type quotation marks and press the spacebar the proper number of times before typing. In J53, indent five spaces and in F1, indent eight spaces.
- *Spacing.* Type a space *after* typing the labels in H6, I47, J47, and J53.
- *Arrows.* In E3, type quotation marks, press the spacebar, and type eight minus signs and a greater-than (>) sign. In E4, use seven minus signs; in H3, two minus signs; and in H4, four minus signs, each followed by a greater-than sign.
- *Percentages.* Type the numbers in H27 through H45 as decimals—for example, **.15** in H27. Use OA-L to format those cells for *Percent* with no decimal places. In G49, type **.075**; in G50, **.1**; and in G51, **.02**. Format those cells for *Percent* with one decimal place.
- *Short lines in column B.* Type quotation marks, press the spacebar, then type 10 minus signs.

Formats. Use OA-V to set a standard value of *Commas* with zero decimal places. Use OA-L to center the spreadsheet title in A1 and right-align the labels in H6, I6, F24, G24, G47 through K47, and F59. When you finish, press OA-S to store the spreadsheet on disk.

ENTERING FORMULAS

Enter the formulas in the locations shown in **Figures 1** and **2**. Place the cursor on the ►

Not all modems are created equal.

The right modem can change the way you use your computer. Modems allow you to step outside the limitations of your own hardware and software. But the degree to which you are benefitted by your modem is directly proportional to the quality of modem you select.

Not all modems are created equal. A new generation of 2400 baud modems, both internal and external, have appeared on the scene as of late. While Hayes AT compatibility and equivalent raw transmission speed can be expected, there are differences. Some are subtle. Others, quite significant.

Expensive features *and* low cost

Applied Engineering's entry into this market, the DataLink 2400,™ was designed to combine the features of expensive modems with the price of low-cost modems.

Frankly, some of the DataLink 2400's advantages are subtle. Like the ability of our firmware to intuitively accept commands in both upper and lower case, thus avoiding the nuisance of being ignored for forgetting to press the "shift" key.

Other advantages are more evident. Like the inclusion of sophisticated, genuinely useable communications software, something others offer as an expensive option.

Hardware considerations:

While most people just plug the DataLink 2400 in and go, advanced users will find a host of sophisticated features like the ability to select firmware defaults of baud rate, data format, parity and control interrupts. Other modems require a set of obscure commands when running from firmware or don't allow you to disable interrupts.

Our DataLink 2400 has two non-volatile ROMs for pre-setting and storing different configurations. It saves you the hassle of setting up configurations every time. We also included the ability to save phone numbers in non-volatile ROM, so you don't have to hunt for often-called numbers.

Some modems can't redirect hardware handshake lines even though most bulletin board software packages require these lines to be changeable - the DataLink 2400 can.

The software story.

We make sure you've got the right software. We include our own.

And the software we include *(OnLine 64** for the II+ and 64K IIe, *DataTerm* for the IIGS and IIe) comes thoroughly documented, *non-copy protected* on two 5.25" disks and one 3.5" disk, and positively loaded with features others don't have. Like VT52 terminal emulation, enabling you to address more bulletin boards and use them easier.

Our transfer protocols aren't limited to Xmodem. We include Xmodem, Ymodem, 4modem, ProDOS Xmodem and Turbo Xmodem. We also employ binary packing, squeezing and unsqueezing—techniques that divide, combine and compress files to save you time and long distance charges.

Some bulletin boards require different data formats. If you can't change formats you can't use them. Our software lets you change formats. Others don't.

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- Full Hayes AT compatibility
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**OnLine 64* and DataLink have most, but not all the features of *DataTerm* and DataLink 2400 respectively.

cell receiving the formula, build the formula, and press Return.

Protect each formula immediately after creating it: With the cursor on the formula cell, press OA-L and hit Return to confirm *Entry*. Type **PN** to select *Protection Nothing*.

FORMULA 1: TOTAL INCOME

Formula 1 adds income amounts (B4 through B18) to produce total income in B20. Formula 1 includes B3 (an empty cell) and B18 (a line).

Cell location: B20

Formula: @SUM(B19.B3)

Remember, protect this and every other formula as you create it.

FORMULA 2: TOTAL ADJUSTMENTS

Formula 2 adds adjustments to income (B23 through B30) to produce total adjustments in B32.

Cell location: B32

Formula: @SUM(B31.B22)

FORMULA 3: ADJUSTED GROSS INCOME (AGI)

Formula 3 subtracts total income (B20) from total adjustments (B32) to produce adjusted gross income in B34.

Cell location: B34

Formula: +B20−B32

FORMULAS 4–6: DEDUCTIONS IN EXCESS

Each of the following formulas copies the amount generated by Formula 23 in the work area.

Cell location 4: B37

Formula 4: +K49

Cell location 5: B44

Formula 5: +K50

Cell location 6: B46

Formula 6: +K51

Cells K49 through K51 are empty, so the formulas produce a zero in each cell, not the amounts shown in **Figure 1**. From this point on, most of your results will be different from those shown.

FORMULA 7: TOTAL DEDUCTIONS

Formula 7 enters the larger of two numbers—either the sum of deductions in B36 through B46 or the standard deduction in H8 through H22 (which it finds by using the LOOKUP function), based on filing status in F4.

Cell location: B48

	A	B	C
1	TAX FORECAST FOR 1989		
2			
3	INCOME:		
4	Wages, salaries, tips, etc.	61,425	
5	Interest income (taxable amount)	3,550	
6	Dividend income	600	
7	Refund of taxable state and local income taxes	820	
8	Alimony received	0	
9	Net business income or (loss)	14,325	
10	Net capital gain or (loss up to $3000)	1,050	
11	Taxable pensions, annuities, IRA distributions	0	
12	Taxable scholarships, prizes, grants	0	
13	Rents and royalties minus expenses	1,855	
14	Net income from partnerships and rental property	0	
15	Income from estates and trusts	0	
16	Unemployment compensation	0	
17	Taxable Social Security amount	0	
18	Other income	0	
19			
20	TOTAL INCOME	83,625	1
21			
22	ADJUSTMENTS TO INCOME:		
23	Reimbursed employee business expenses	425	
24	Deductible IRA contributions	4,000	
25	Keogh contributions and SEP deductions	1,891	
26	Self-employed health insurance deduction	0	
27	Net passive losses from limited partnerships (reduced by 80%)	0	
28	Penalty on early withdrawal of savings	0	
29	Alimony paid	0	
30	Other adjustments	0	
31			
32	TOTAL ADJUSTMENTS	6,316	2
33			
34	ADJUSTED GROSS INCOME (AGI)	77,309	3
35			
36	DEDUCTIONS:		
37	Unreimbursed medical/dental expenses (exceeding 7.5% of AGI)	1,257	4
38	State and local income taxes	1,234	
39	Real estate and property taxes	4,555	
40	Mortgage and investment interest	1,022	
41	Other deductible interest expenses	0	
42	Personal interest (deductible portion-limit 40%)	0	
43	Charitable contributions	1,500	
44	Casualty and theft losses (exceeding 10% of AGI)	0	5
45	Moving expenses	0	
46	Other deductions (exceeding 2% of AGI)	0	6
47			
48	TOTAL DEDUCTIONS (or standard deduction if greater)	9,568	7
49			
50			8
51	PERSONAL EXEMPTIONS	8,000	9
52	TAXABLE INCOME	59,741	10
53	REGULAR TAX CALCULATION (before credits)	12,705	
54	TAX CREDITS (child care, elderly, business, housing, etc.)	375	11
55	REGULAR TAX CALCULATION (after credits)	12,330	
56	TAX WITHHELD AND ESTIMATED TAX PAID	12,930	12
57	AMOUNT YOU OWE OR (REFUND)	(600)	
58	SOCIAL SECURITY OWED ON BUSINESS INCOME	1,865	13
59	NET TAX EXPOSURE (income tax and social security owed)	1,265	
60			14
61			

Figure 1. Complete tax-forecast spreadsheet.

Formula: @MAX(@SUM(B47.B36),
@LOOKUP(F4,H8.H22))

Your result should be *8,311*.

FORMULA 8: PERSONAL EXEMPTIONS

Formula 8 multiplies number of exemptions in F3 by $2000 (the amount you can claim for each exemption) and enters the result in B51.

Cell location: B51

Formula: +F3*2000

FORMULA 9: TAXABLE INCOME

The Test statement in Formula 9 subtracts total deductions (B48) and personal exemptions (B51) from adjusted gross income (B34). If the result is less than or equal to zero, the Then statement enters zero as the taxable income in B52. If the result is greater than zero, the Else statement enters the result of that same calculation as taxable income.

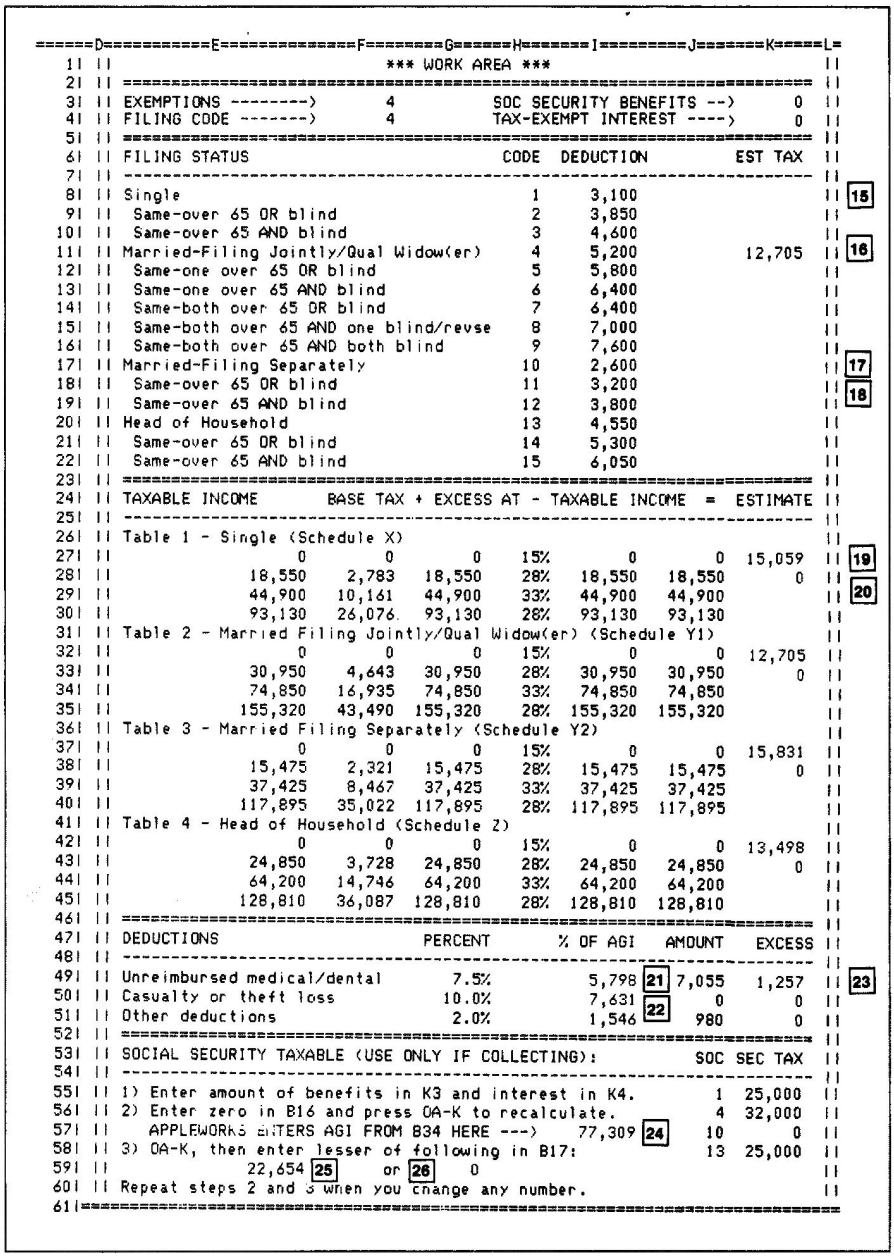
Cell location: B52

Formula: @IF(B34−(B48+B51)<=0,
0,B34−(B48+B51))

Your result should be *60,998*.

FORMULA 10: REGULAR TAX CALCULATION (BEFORE CREDITS)

Formula 10 copies the largest amount



```
======D==========E==============F========G======H=======I=========J=======K=====L=
  1| ||                          *** WORK AREA ***                              ||
  2| || ============================================================================ ||
  3| || EXEMPTIONS -------->       4          SOC SECURITY BENEFITS -->       0  ||
  4| || FILING CODE ------->       4          TAX-EXEMPT INTEREST ---->       0  ||
  5| || ============================================================================ ||
  6| || FILING STATUS                                CODE  DEDUCTION      EST TAX  ||
  7| || ---------------------------------------------------------------------------- ||
  8| || Single                                         1     3,100                  || 15
  9| ||  Same-over 65 OR blind                        2     3,850                  ||
 10| ||  Same-over 65 AND blind                       3     4,600                  ||
 11| || Married-Filing Jointly/Qual Widow(er)         4     5,200         12,705   || 16
 12| ||  Same-one over 65 OR blind                    5     5,800                  ||
 13| ||  Same-one over 65 AND blind                   6     6,400                  ||
 14| ||  Same-both over 65 OR blind                   7     6,400                  ||
 15| ||  Same-both over 65 AND one blind/revse        8     7,000                  ||
 16| ||  Same-both over 65 AND both blind             9     7,600                  ||
 17| || Married-Filing Separately                    10     2,600                  || 17
 18| ||  Same-over 65 OR blind                       11     3,200                  || 18
 19| ||  Same-over 65 AND blind                      12     3,800                  ||
 20| || Head of Household                            13     4,550                  ||
 21| ||  Same-over 65 OR blind                       14     5,300                  ||
 22| ||  Same-over 65 AND blind                      15     6,050                  ||
 23| || ============================================================================ ||
 24| || TAXABLE INCOME       BASE TAX + EXCESS AT - TAXABLE INCOME  =  ESTIMATE   ||
 25| || ---------------------------------------------------------------------------- ||
 26| || Table 1 - Single (Schedule X)                                             ||
 27| ||            0         0        0    15%         0         0      15,059   || 19
 28| ||       18,550     2,783   18,550    28%    18,550    18,550           0   || 20
 29| ||       44,900    10,161   44,900    33%    44,900    44,900               ||
 30| ||       93,130    26,076   93,130    28%    93,130    93,130               ||
 31| || Table 2 - Married Filing Jointly/Qual Widow(er) (Schedule Y1)             ||
 32| ||            0         0        0    15%         0         0      12,705   ||
 33| ||       30,950     4,643   30,950    28%    30,950    30,950           0   ||
 34| ||       74,850    16,935   74,850    33%    74,850    74,850               ||
 35| ||      155,320    43,490  155,320    28%   155,320   155,320               ||
 36| || Table 3 - Married Filing Separately (Schedule Y2)                         ||
 37| ||            0         0        0    15%         0         0      15,831   ||
 38| ||       15,475     2,321   15,475    28%    15,475    15,475           0   ||
 39| ||       37,425     8,467   37,425    33%    37,425    37,425               ||
 40| ||      117,895    35,022  117,895    28%   117,895   117,895               ||
 41| || Table 4 - Head of Household (Schedule Z)                                  ||
 42| ||            0         0        0    15%         0         0      13,498   ||
 43| ||       24,850     3,728   24,850    28%    24,850    24,850           0   ||
 44| ||       64,200    14,746   64,200    33%    64,200    64,200               ||
 45| ||      128,810    36,087  128,810    28%   128,810   128,810               ||
 46| || ============================================================================ ||
 47| || DEDUCTIONS                      PERCENT      % OF AGI    AMOUNT    EXCESS  ||
 48| || ---------------------------------------------------------------------------- ||
 49| || Unreimbursed medical/dental        7.5%          5,798 21  7,055     1,257  || 23
 50| || Casualty or theft loss            10.0%          7,631      0         0     ||
 51| || Other deductions                   2.0%          1,546 22    980         0  ||
 52| || ============================================================================ ||
 53| || SOCIAL SECURITY TAXABLE (USE ONLY IF COLLECTING):          SOC SEC TAX     ||
 54| || ---------------------------------------------------------------------------- ||
 55| || 1) Enter amount of benefits in K3 and interest in K4.        1   25,000     ||
 56| || 2) Enter zero in B16 and press OA-K to recalculate.          4   32,000     ||
 57| ||    APPLEWORKS ENTERS AGI FROM B34 HERE --->    77,309 24    10        0     ||
 58| || 3) OA-K, then enter lesser of following in B17:              13   25,000     ||
 59| ||             22,654 25     or 26    0                                      ||
 60| || Repeat steps 2 and 3 when you change any number.                          ||
 61|============================================================================== ||
```

Figure 2. Work area.

calculated (that is, any amount greater than zero) in the estimated-tax cells (K8 through K22) and enters it in B53.

Cell location: B53

Formula: @MAX(K8.K22)

Your result should be *0*.

FORMULA 11: REGULAR TAX CALCULATION (AFTER CREDITS)

The Test statement in Formula 11 subtracts tax credits (B54) from estimated tax before credits (B53).

If the result is greater than zero, the Then statement does the same subtraction, entering the result in B55 as the regular tax calculation after credits. Otherwise, the Else statement enters a zero.

Cell location: B55

Formula: @IF(B53−B54>0,B53−B54,0)

Your result should be *0*.

FORMULA 12: AMOUNT YOU OWE OR (REFUND)

Formula 12 subtracts the amount of tax withheld and estimated tax paid (B56) from regular tax calculation after credits (B55) to produce the amount you owe or the refund you can expect in B57.

Cell location: B57

Formula: +B55−B56

Your result should be *(12,930)*.

FORMULA 13: SOCIAL SECURITY OWED ON BUSINESS INCOME

The Test statement in Formula 13 checks to see if net business income (B9) is greater than $400.

If it is, the Then statement enters in B58 the amount in B9 multiplied by 13.02 percent or 6249.50, whichever is less. If B9 contains an amount less than or equal to $400, the Else statement enters a zero.

Cell location: B58

Formula: @IF(B9>400,@MIN(B9*
.1302,6249.6),0)

FORMULA 14: NET TAX EXPOSURE

Formula 14 adds the amount you owe or your refund (B57) and Social Security owed on business income (B58) to produce your net tax exposure.

Cell location: B59

Formula: +B57+B58

Your result should be *(11,065)*. This completes the formulas shown in **Figure 1**, so press OA-S to store everything on disk. Now start the Work Area formulas in the locations shown in **Figure 2**.

FORMULA 15: ESTIMATED TAX − SINGLE FILER

The Test statement in Formula 15 compares filing code (F4) with status code (H8). If they agree, the Then statement adds the estimated-tax amounts calculated in the Single schedule (K27 and K28) and enters the result in K8. If they don't agree, the Else statement enters invisible double quotation marks (""), which make K8 appear empty. Text strings, used here in a basic form, are an exciting new feature in AppleWorks 3.0.

Cell location: K8

Formula: @IF(F4=H8,K27+K28,"")

Even though the formula is in the cell, the cell shows nothing.

COPYING FORMULA 15

Copy Formula 15 into two cells below it: With the cursor on K8, press OA-C to start the Copy command. Press Return twice to confirm *Within worksheet* and the *Source*. Now move the cursor to K9, type a period, move the cursor to K10, and hit Return. To tell ►

AppleWorks which cells are *No change* and which are *Relative*, press Return, type **R**, and hit OA-Return. Each formula cell now looks empty.

OA-Return is a 3.0 feature that tells AppleWorks the rest of the cell references are *No change*. If the rest of the cell references were *Relative*, you'd hit OA-R instead.

FORMULA 16: ESTIMATED TAX —MARRIED FILING JOINTLY OR QUALIFYING WIDOW(ER)

Formula 16 works the same as Formula 15, but either enters either estimated tax for married couples filing jointly and qualifying widows/widowers (K32 and K33), or makes K11 look empty.

Cell location: K11

Formula: @IF(F4=H11,K32+K33,"")

The formula produces a zero. Copy Formula 16 into five cells below it: With the cursor on K11, press OA-C and hit Return twice. Move the cursor to K12, type a period, move the cursor to K16, and hit Return. Press Return, type **R**, and hit OA-Return. You now have more empty-looking cells.

FORMULA 17: ESTIMATED TAX —MARRIED FILING SEPARATELY

Formula 17 works the same as Formula 15, but either enters estimated tax for married couples filing separately (K37 and K38), or makes K17 look empty.

Cell location: K17

Formula: @IF(F4=H17,K37+K38,"")

Your result should be an empty-looking cell. Copy Formula 17 into two cells below it: With the cursor on K17, press OA-C and hit Return twice. Move the cursor to K18, type a period, move the cursor to K19, and hit Return. Again, press Return, type **R**, and hit OA-Return. More empty-looking cells.

FORMULA 18: ESTIMATED TAX —HEAD OF HOUSEHOLD

Formula 18 also works the same as Formula 15, but either enters estimated tax for filers who are heads of households (K42 and K43), or makes K20 look empty.

Cell location: K20

Formula: @IF(F4=H13,K42+K43,"")

Again, the cell looks empty. Copy Formula 18 into the two cells below it: With the cursor on K20, press OA-C and hit Return twice. Move the cursor to K21, type a period, move the cursor to K22, and hit Return. As usual, press Return, type **R**, and hit OA-Return.

FORMULA 19: ESTIMATE FOR SINGLE FILER (SCHEDULE X)

Figure 2 shows four tax schedules for 1989: Schedule X for single filers, Schedules Y1 and Y2 for married filers and qualifying widows and widowers, and Schedule Z for heads of households.

Each schedule contains three lookup tables—one in columns E and F, another in columns G and H, and still another in columns I and J.

The tax calculations involve three types of information, and the AppleWorks LOOKUP function can work only with lookup tables consisting of two adjacent columns or rows. Hence three tables, each consisting of two columns of information.

Formula 19, entered in K27, K32, K37, and K42, produces the estimated tax for its respective schedule.

The formula starts by getting the base tax (column F), determined by the level of taxable income up to a percentage of any amount in excess of that level until reaching the next level.

In K27, for example, Formula 19 searches E27 through E30 to find the largest number less than or equal to the taxable income in B52. When it finds that number, it retrieves the corresponding number (the base tax) in F27 through F30.

Next, Formula 19 searches G27 through G30 for the largest number less than or equal to taxable income and retrieves the corresponding percentage from H27 through H30. It then multiplies this percentage by the result of subtracting taxable income, which it finds by searching I27 through I30 and retrieving the corresponding number in J27 through J30.

This is the excess income between levels. The formula adds base tax and excess tax to produce the estimated tax in the single-filer category.

Formula 19 is too long to enter in the traditional manner, so you'll use my "edit-in" technique. In straight entry mode, the word *Value* takes up room on the entry line; in edit mode, the line is empty, allowing more room for the formula. But first, here's the formula:

Cell location: K27

Formula: @LOOKUP(B52,E27.E30)+
(@LOOKUP(B52,G27.G30)*(B52
-@LOOKUP(B52,I27.I30)))

Place the cursor on K27, type the number **1**, and hit Return. AppleWorks now has something to edit. Press OA-U to enter edit mode and hit OA-Y to get rid of the *1* on the edit line. (It still shows in K27.)

Now type the entire formula carefully. When you finish, double-check every character. If everything agrees, press Return. If something's amiss, use the left-arrow key to move to the problem and correct it. Your result should be *15,473*.

FORMULA 20: TAXABLE INCOME OVER TOP OF SCHEDULE

Formula 20 is a nested IF formula that satisfies the surcharge provision eliminating 28 percent of personal exemptions if taxable income exceeds the top amount in the respective schedule.

In K28, Formula 20 looks at taxable income (B52) to see if it's greater than the top amount in the schedule (J30). If this is the case, Formula 20 evaluates its Then statement, which is the nested IF formula.

The Test statement in the nested IF formula checks to see if the number of exemptions (F3) multiplied by 560 (28 percent of the standard exemption of $2000) is greater than 5 percent of taxable income less the top amount in the schedule.

If this is so, the Then statement in the nested IF formula calculates 5 percent of taxable income less the top amount and enters the result in K28. If it isn't so, the Else statement in the nested IF formula multiplies the number of exemptions by 560.

If taxable income is less than or equal to the top amount in the schedule, the Else statement in the first IF formula enters a zero instead.

Cell location: K28

Formula: @IF(B52>J30,
@IF((F3*560)>.05*(B52-K30),
.05*(B52- J30),F3*560),0)

Edit in Formula 20. Enter *1* in K28, press OA-U to enter edit mode, and hit OA-Y to erase the *1* on the edit line. Type the entire formula, check every character, then press Return. Be sure to protect Formulas 19 and 20, because you're about to copy them to the other schedules.

COPYING THE FORMULAS

Place the cursor on K27, press OA-C, and hit Return. Press the down-arrow key to identify K27 and K28 as the *Source* and hit Return again. Move the cursor to K32 and hit Return again.

AppleWorks now asks if B52 is *No change* or *Relative* in its new location. Hit this sequence of keystrokes for Formula 19: Return, **R**, **R**, Return, **R**, **R**, Return, Return, **R**, **R**.

AppleWorks now highlights B52 in Formula 20. Here's the sequence for Formula 20: Return, **R**, Return, Return, **R**, Return, **R**, and Return. Your result should be *13,056* in K32 and *0* in K33.

Repeat these steps to copy Formulas 19 and 20 to K37 and K38 (results *16,246* and *0*), then K42 and K43 (results *13,849* and *0*). Press OA-K to recalculate the spreadsheet. In K11, you now see *13,056*. Press OA-S to store the spreadsheet on disk.

PRINTING THE SPREADSHEET

Printing is at hand, so turn on your printer. Press OA-O to bring up the Printer Options screen, and change the following settings: *CI* (characters per inch) to **12**, *LM* (left margin) to **.7**, and *RM* (right margin) to **.7**. Press OA-S to store the spreadsheet on disk, which also returns the spreadsheet to the screen.

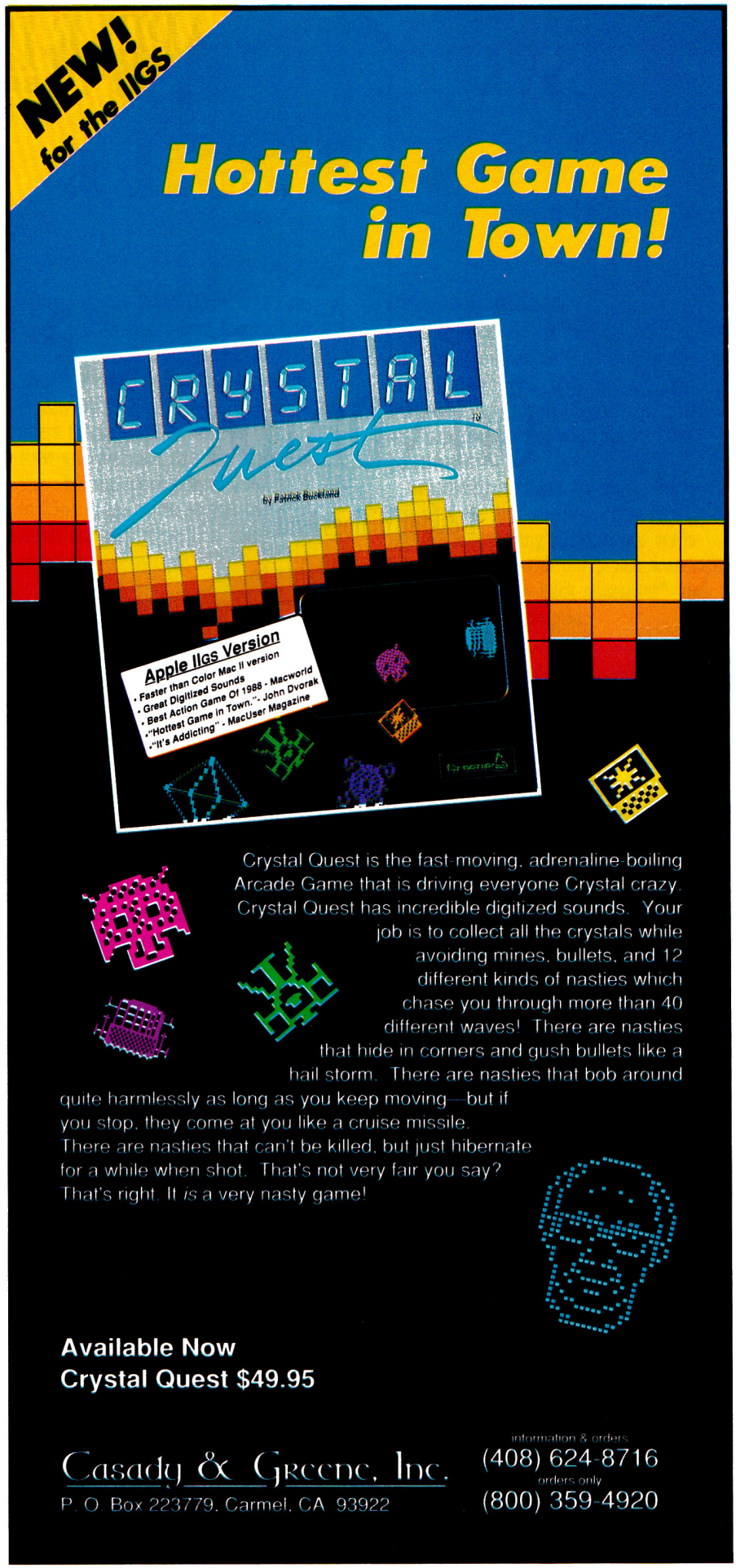
This spreadsheet prints on two pages. In the olden days (before AppleWorks 3.0), you'd have had to tell AppleWorks which columns to print on which page. Those days, happily, are gone forever. After AppleWorks prints the first page, it continues by itself printing any leftover columns on second and succeeding pages.

Now press OA-P and hit Return to confirm *All*. Press Return to select the printer (or type a printer number, then Return). Type today's date (or, if you have a computer clock, type @—the *at* sign), and hit Return twice. The printer whirs away, producing both pages of the income-tax spreadsheet.

NEXT TIME

Next month you'll complete this spreadsheet, adding the rest of the formulas and the entire AMT (Alternative Minimum Tax) section. It's a real treat.□

RUTH K. WITKIN IS A CONSULTANT IN COMPUTER APPLICATIONS FOR BUSINESS. SHE'S THE AUTHOR OF THE POPULAR TEMPLATE/HANDBOOK SERIES *SUCCESS WITH APPLEWORKS* (*INCIDER*, IDG COMMUNICATIONS/PETERBOROUGH), *THE BEST BOOK OF APPLEWORKS* AND *MANAGING WITH APPLEWORKS* (HOWARD W. SAMS & CO.), AND *PERSONAL MONEY MANAGEMENT WITH APPLEWORKS* (JOHN WILEY & SONS). WRITE TO HER AT 5 PATRICIA STREET, PLAINVIEW, NY 11803. ENCLOSE A SELF-ADDRESSED, STAMPED ENVELOPE IF YOU'D LIKE A REPLY.



OPEN DIALOG

Desktop dialogs lend elegance and credibility to the programs you create.

By JOE ABERNATHY

THE APPLE IIGS DESKTOP HAS A carefully crafted way of communicating with you. It's called the *dialog*. This elegant interface requests the information needed to complete a command, cautions you as to when you're about to make a mistake, or prompts you to fill out an entire data-entry form. In fact, whenever a desktop program communicates with you, there's a dialog for the job.

Dialog boxes are implemented with the help of a software tool set called the *Dialog Manager* (TOOL21), which is built into the IIGS. To use the Dialog Manager, you must first be using a language compiler that supports tool calls. For BASIC, that means one of the three compilers: Micol, TML, and AC/BASIC. Finally, you must see to a number of tool-set interdependencies implied in any program that implements desktop-style features.

For **AC/BASIC**, the accompanying source-code listings will show you everything you need to make your dialogs work. For **TML BASIC**, you must use a desktop program shell of some sort to start the underlying tools, such as the Window Manager, that the Dialog Manager requires. If you don't have such a shell program, you can obtain mine free from *inCider* by sending a stamped (65¢ or appropriate postage for foreign destinations), legal-sized, self-addressed envelope. For **Micol BASIC**, you'll need a shell such as that included with the compiler beginning with version 3.1.

While it isn't necessary to follow *this* column, a full mastery of dialogs will demand that you buy both volumes of the *Apple IIGS Toolbox Reference*, along with the *Apple Human Interface Guidelines* (Addison-Wesley, Reading, MA). You can find all three references at your bookstore, or via mail from the **Apple Programmers and Developers Association** (APDA, 290 SW 43rd Street, Renton, WA 98055, 206-251-6548). A beta-level revision to the toolbox references that includes GS/OS version 5.0 information is available only through APDA, although this information is not yet germane to any of the BASIC compilers. (Note that Micol and AC/BASIC are compatible with GS/OS version 5.0. TML BASIC is compatible with ProDOS 16 version 3.2.)

WORK SMARTER, NOT HARDER

The Dialog Manager is one of the smartest tool sets in the IIGS, and that helps you look good. The standard dialog features allow text editing; multiple-choice buttons; check boxes, which let you customize program operation; and radio buttons, which let you select among a group of options, such as paper size for printing. Dialogs may contain icons such as the ones the Finder uses, or entire picture images; they may contain custom controls, such as a thermometer that monitors the progress of a disk operation.

The Dialog Manager can produce three families of dialog windows: modal dialogs, modeless dialogs, and alerts. *Modal dialogs* are those that demand your input, such as "Information is about to be erased. Continue?" *Modeless dialogs* are those that hang out in the background, like a spelling checker, waiting to be of use. *Alerts* are communications between you and the program, such as "Please wait for a time-consuming disk operation."

Like most Toolbox features, dialogs require that the programmer supply a list of information defining what the dialogs should do, and when and how. If you're implementing a simple dialog for something like the "About this program" window, almost everything in the list will have a default: You won't have to do much work. With each level of sophistication you add, however, things get more complex from a programmer's standpoint, so that you might eventually find yourself managing hundreds of lines of code for a sophisticated game screen implemented via the Dialog Manager.

The list of information a dialog requires is called a *data structure*, and it highlights the overriding weakness of all the existing BASIC compilers. BASIC just wasn't built for sophisticated data structures; it was built for strings and arrays. The people who wrote the modern compilers, not wanting to lose the flavor of BASIC, haven't seen fit to provide an extended set of data structures. Rather, each offers its own quirky interface to the Toolbox. So we end up with tradeoffs.

Throughout all our BASICs—in every language compiler—there are tradeoffs that create a bit more work for you than otherwise might be the case. Don't let yourself become discouraged. If you're trying to master dialogs or any other desktop programming task, jot down the structure of the "pure" call as it appears in the toolbox references; examine any similar source code you can find, no matter its language; consult your compiler ►

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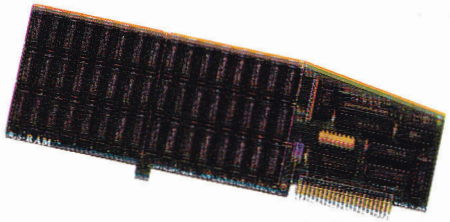

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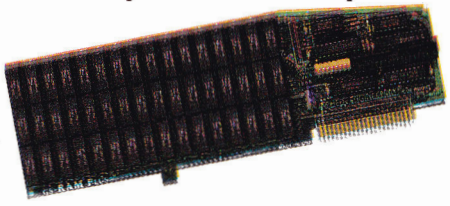

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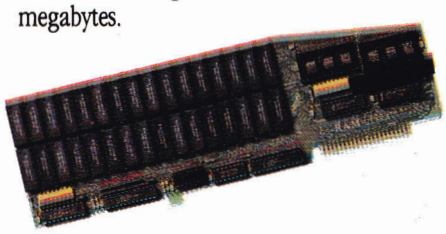

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manual, particularly in regard to its handling of data structures; and make it work.

BRING IT TO LIFE

Each BASIC compiler makes you walk a different path in getting dialogs up and running, but there are more similarities than it would seem. To illustrate this column, I wanted to create a dialog through which you might build a mailing list respectable enough to even fit into business-quality applications. What do we need to do this? A set of very predictable actions, it turns out:

- Prompt the user for input.
- Get input. In the case of a dialog, that means allowing the manipulation of text, and of various types of buttons.
- Analyze and act on the input, or determine the final state of each item in a dialog box and react accordingly.

To build a dialog that does this, you'd do the following:

- Create a new dialog, adding each item individually. Display the dialog.
- Write a loop to handle the dialog's logic. In the case of a one-button ("OK") dialog, your logic would just wait for any event to occur. Once anything transpires, you know OK was chosen.

In more advanced dialogs, you'd check for action in specific item types and specific items and react accordingly. If you have four radio buttons and click on the third one, you must deselect the other three and make sure the one that took the dialog hit is selected. Check boxes must be turned on and off. You can check for actions in standard pushbuttons, and depending on the buttons you create, initiate a suitable response. As for EditLine text items, Dialog Manager handles all the details for you—unless you use AC/BASIC, which makes you monitor mouse clicks and TAB keys.

- Determine the results of your interaction with the dialog. Extract the EditLine strings into usable form; set a flag showing which of the radio buttons was chosen; set individual flags for each check item to determine whether it was turned on or off. Handle standard pushbuttons as needed; if you create an "OK" button with an itemID of 1, Dialog Manager will consider it the default and accept *Return* as though it were a mouse click on the OK button.

TML BASIC, despite being incompatible with IIGS system software published since 1987, stays the closest to the intent of the Dialog Manager as described in the toolbox references. So let's examine the logic for managing our mailing-list dialog in TML. To do so, look ahead to **Listing 1**, directly below the _NewDItem calls, at the DO/UNTIL loop.

First, an exit flag is set to empty. The first checks made thereafter are for clicks on the OK or Cancel buttons; either of these events sets *exit%*, which makes the control loop exit.

If you get past exit%, you know you've done something in one of the other fields, so check to see which type of dialog item took the hit. If it was a radio item, store that particular item in a variable, so that you can use the information later; then cycle the status of the radio buttons to make sure only one is selected.

If your item type was "check item" instead of "radio," check to see whether the check item is currently on or off, then switch it, because a click means you want it to be in the only other state available. In the example dialog, the "Preferred%" variable will be set if the customer in question is a preferred customer, or set to zero otherwise.

Having made it through the entire logic loop, that takes care of everything except determining what was typed in the EditLine items.

►

Listing 1. TML BASIC mailing-list dialog.

```
'    This source code implements a mailing list dialog suitable for use
' in business applications. It includes the necessary logic to let a user
' interact with the dialog features; and the logic to extract the results
' of the user's interaction, including EditLine text items, check boxes,
' radio button items and standard buttons.

' If you are using my TML starter shell, you can add the address dialog to
' your shell with the following source code:

' Add "DoAdrDlog" to the SetUpMenus procedure:

PROC SetUpMenus                 ' Build the menus and menu bar
 ...

MENUDEF 16,DoSound              ' Play a sound file
MENUDEF 17,DoAdrDlog            ' Address list dialog

...

ENDPROC

' Add this label to the shell:

DoAdrDlog:
  PROC AddressDlog              ' Requires DESKTOOLS library
RETURN 0


' Change the "GoodiesMenu" procedure in the file DESKTOOLS
' so that it reads like this:

DEF PROC GoodiesMenu            ' Create goodies menu
  LOCAL MenuStr$
  MenuStr$ =          ">> Goodies \N5\0"
  MenuStr$ = MenuStr$ + "==Play Sound\N266\0"
  MenuStr$ = MenuStr$ + "==Address Dialog\N267\0"
  SET(GoodMenuStr!(0)) = ^MenuStr$
  _InsertMenu(EXFN_NewMenu(VARPTR(GoodMenuStr!(1))),0)
END PROC GoodiesMenu


' Add this procedure, which does the actual work, to DESKTOOLS:

' ------------------------------------------------------------------------
' Address Dialog. Displays a dialog to allow entry of information for
' an address list, then retrieves the information entered. Demonstrates
' how to use all of the standard dialog items -- buttons, radio items,
' check boxes, edit lines.

DEF PROC AddressDlog
  LOCAL Dialog@,itemHit%,MyStr$,Cancel$tr$,Item1$,Item2$,Item3$,Item4$
  LOCAL Item5$,Item6$,Item7$,Item8$,Item9$,Item10$,Item11$,Item12$
  LOCAL Item13$,Item14$,Item15$,Item16$,Item17$,Item18$,Item19$,Item20$
  LOCAL Item21$,Item22$,Item23$,Item24$,Name$,Title$,Company$,Street$
  LOCAL City$,State$,Zip$,Nation$,Areacode$,Phone$,Sales%,Preferred%
  ' The dialog window rectangle:
  _SetRect(VARPTR(aRect%(0)),8,18,632,195)
  ' Get a handle to the dialog:
  Dialog@ = EXFN_NewModalDialog(VARPTR(aRect%(0)),1,0)
  _SetForeColor(0)        ' black letters on
  _SetBackColor(15)       '   white background

 ' Create each item in the dialog. The position of each item is determined
 ' by the four parameters given in the _SetRect call:

  Item24$ = "Sales to Date"
 _SetRect(VARPTR(aRect%(0)),354,34,450,43)
 _NewDItem(Dialog@,26,VARPTR(aRect%(0)),15,VARPTR$(Item24$),0,0,0)

  Item23$ = "Phone"
 _SetRect(VARPTR(aRect%(0)),359,14,399,23)
 _NewDItem(Dialog@,25,VARPTR(aRect%(0)),15,VARPTR$(Item23$),0,0,0)

  Item22$ = "Nation"
 _SetRect(VARPTR(aRect%(0)),20,117,66,126)
 _NewDItem(Dialog@,24,VARPTR(aRect%(0)),15,VARPTR$(Item22$),0,0,0)

  Item21$ = "State"
 _SetRect(VARPTR(aRect%(0)),241,96,281,105)
 _NewDItem(Dialog@,23,VARPTR(aRect%(0)),15,VARPTR$(Item21$),0,0,0)

  Item20$ = "City"
 _SetRect(VARPTR(aRect%(0)),34,96,64,105)
 _NewDItem(Dialog@,22,VARPTR(aRect%(0)),15,VARPTR$(Item20$),0,0,0)

  Item19$ = "Street"
 _SetRect(VARPTR(aRect%(0)),19,75,66,84)
 _NewDItem(Dialog@,21,VARPTR(aRect%(0)),15,VARPTR$(Item19$),0,0,0)

  Item18$ = "Company"
 _SetRect(VARPTR(aRect%(0)),11,54,68,63)
 _NewDItem(Dialog@,20,VARPTR(aRect%(0)),15,VARPTR$(Item18$),0,0,0)

  Item17$ = "Title"
 _SetRect(VARPTR(aRect%(0)),28,33,66,42)
 _NewDItem(Dialog@,19,VARPTR(aRect%(0)),15,VARPTR$(Item17$),0,0,0)

  Item16$ = "Name"
 _SetRect(VARPTR(aRect%(0)),33,13,66,22)
 _NewDItem(Dialog@,18,VARPTR(aRect%(0)),15,VARPTR$(Item16$),0,0,0)

  Item15$ = "Joe Abernathy"
 _SetRect(VARPTR(aRect%(0)),73,10,319,23)
 _NewDItem(Dialog@,17,VARPTR(aRect%(0)),17,VARPTR$(Item15$),20,0,0)

  Item14$ = "526-9711"
 _SetRect(VARPTR(aRect%(0)),459,11,561,24)
 _NewDItem(Dialog@,16,VARPTR(aRect%(0)),17,VARPTR$(Item14$),8,0,0)

  Item13$ = "713"
 _SetRect(VARPTR(aRect%(0)),404,11,446,24)
 _NewDItem(Dialog@,15,VARPTR(aRect%(0)),17,VARPTR$(Item13$),3,0,0)

  Item12$ = "77266-6046"
 _SetRect(VARPTR(aRect%(0)),216,114,318,127)
 _NewDItem(Dialog@,14,VARPTR(aRect%(0)),17,VARPTR$(Item12$),10,0,0)

  Item11$ = "U.S."
 _SetRect(VARPTR(aRect%(0)),71,114,197,127)
 _NewDItem(Dialog@,13,VARPTR(aRect%(0)),17,VARPTR$(Item11$),10,0,0)
```

Continued

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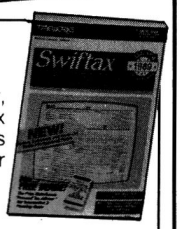

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```
    Item10$ = "TX"
  SetRect(VARPTR(aRect%(0)),287,93,317,106)
  NewDItem(Dialog@,12,VARPTR(aRect%(0)),17,VARPTR$(Item10$),2,0,0)

    Item9$ = "Houston"
  SetRect(VARPTR(aRect%(0)),71,93,221,106)
  NewDItem(Dialog@,11,VARPTR(aRect%(0)),17,VARPTR$(Item9$),12,0,0)

    Item8$ = "P.O. Box 66046"
  SetRect(VARPTR(aRect%(0)),71,72,317,85)
  NewDItem(Dialog@,10,VARPTR(aRect%(0)),17,VARPTR$(Item8$),20,0,0)

    Item7$ = "First Word"
  SetRect(VARPTR(aRect%(0)),72,51,318,64)
  NewDItem(Dialog@,9,VARPTR(aRect%(0)),17,VARPTR$(Item7$),20,0,0)

    Item6$ = "Tech Support"
  SetRect(VARPTR(aRect%(0)),73,30,319,43)
  NewDItem(Dialog@,8,VARPTR(aRect%(0)),17,VARPTR$(Item6$),20,0,0)

  Item5$ = "Over 2000"
  SetRect(VARPTR(aRect%(0)),401,96,494,105)
  NewDItem(Dialog@,7,VARPTR(aRect%(0)),12,VARPTR$(Item5$),0,0,0)

  Item4$ = "1000-2000"
  SetRect(VARPTR(aRect%(0)),401,80,498,89)
  NewDItem(Dialog@,6,VARPTR(aRect%(0)),12,VARPTR$(Item4$),0,0,0)

  Item3$ = "500-1000"
  SetRect(VARPTR(aRect%(0)),401,64,490,73)
  NewDItem(Dialog@,5,VARPTR(aRect%(0)),12,VARPTR$(Item3$),0,0,0)

  Item2$ = "0-500"
  SetRect(VARPTR(aRect%(0)),401,49,465,58)
  NewDItem(Dialog@,4,VARPTR(aRect%(0)),12,VARPTR$(Item2$),1,0,0)

  Item1$ = "Preferred Customer"
  SetRect(VARPTR(aRect%(0)),353,116,519,125)
  NewDItem(Dialog@,3,VARPTR(aRect%(0)),11,VARPTR$(Item1$),0,0,0)

  CancelStr$ = "Cancel"
  SetRect(VARPTR(aRect%(0)),230,142,308,156)
  NewDItem(Dialog@,2,VARPTR(aRect%(0)),10,VARPTR$(CancelStr$),0,0,0)

  ' Any dialog item given an item reference number of one (in the
  ' NewDItem call) will be the default item, meaning the user can
  ' press return to activate the default. In most cases, item 1
  ' should be the OK button:

  OKStr$ = "OK"

  SetRect(VARPTR(aRect%(0)),344,142,391,156)
  NewDItem(Dialog@,1,VARPTR(aRect%(0)),10,VARPTR$(OKStr$),0,0,0)

  ' Dialogs that do anything more than wait for a default OK event
  ' must supply the logic for dealing with the various dialog items.
  ' This is shown below:

  ' Process events until OK or Cancel pressed:
  exit% = 0           ' Set by OK button
  DO
    itemHit% = EXFN_ModalDialog(0)
    IF itemHit% = 1 THEN exit% = 1     ' OK
    IF itemHit% = 2 THEN exit% = 1     ' Cancel
    myhit% = EXFN_GetDItemType(Dialog@,itemHit%)
    IF myhit% = 12 THEN          ' it was a radio item
      Sales% = itemHit%          ' store for later use
      SetDItemValue(1,Dialog@,itemHit%)
      ' Cycle the radio buttons on and off:
      IF itemHit% <> 4 THEN
        SetDItemValue(0,Dialog@,4)
        END IF
      IF itemHit% <> 5 THEN
        SetDItemValue(0,Dialog@,5)
        END IF
      IF itemHit% <> 6 THEN
        SetDItemValue(0,Dialog@,6)
        END IF
      IF itemHit% <> 7 THEN
        SetDItemValue(0,Dialog@,7)
        END IF
      END IF
    IF myhit% = 11 THEN          ' check item
      myval% = EXFN_GetDItemValue(Dialog@,itemHit%)
      IF myval% = 0 THEN
        SetDItemValue(1,Dialog@,itemHit%)
        Preferred% = 1           ' store for later use
      ELSE
        SetDItemValue(0,Dialog@,itemHit%)
        Preferred% = 0           ' store for later use
        END IF
      END IF
    UNTIL exit% = 1

  ' Extract strings from EditLine items. To use these, you can
  ' do a simple "PRINT Name$", etc. (Note that these values must be
  ' assigned to global variables to be used outside this procedure:
  GetIText(Dialog@,17,VARPTR$(Name$))
  GetIText(Dialog@,16,VARPTR$(Phone$))
  GetIText(Dialog@,15,VARPTR$(Areacode$))
  GetIText(Dialog@,14,VARPTR$(Zip$))
  GetIText(Dialog@,13,VARPTR$(Nation$))
  GetIText(Dialog@,12,VARPTR$(State$))
  GetIText(Dialog@,11,VARPTR$(City$))
  GetIText(Dialog@,10,VARPTR$(Street$))
  GetIText(Dialog@,9,VARPTR$(Company$))
  GetIText(Dialog@,8,VARPTR$(Title$))

  ' All done:
  CloseDialog(Dialog@)
END PROC AddressDlog
```


Circle 139 on Reader Service Card.

WYSIWYG Editors

Something that'll simplify programming GS desktop elements such as dialogs is worth its weight in gold. Two recent products sporting WYSIWYG (what you see is what you get) desktop editors deserve platinum: *Design Master* (Byte-Works, 4700 Irving Boulevard Northwest, Suite 207, Albuquerque, NM 87114, 505-898-8183) and *CallBox TPS* (So What Software, 10221 Slater Avenue, Suite 103, Fountain Valley, CA 92708, 714-964-4298, $99). With WYSIWYG tools, creating and editing Apple's Human Interface Guidelines desktop simply involves selecting desktop elements from pull-down menus and, using a mouse, placing them onto the 320- or 640-graphics desktop with clicks and drags.

Chris Haun promotes his creation, Design Master, as a desktop "prototyping" tool. The results are source-code compatible with most of the 65816 assemblers and advanced languages available for the GS, including C, Pascal, and BASIC.

CallBox TPS also includes a WYSIWYG image editor for the creation of icons, cursors, and pixel elements for 320- and 640-mode super-high-resolution GS graphics screens, plus an Applesoft BASIC interface package.

Now even the novice programmer can personalize his or her desktop environments quickly and easily.□

—Bill Kennedy, Technical Editor

The _GetIText tool call handles that; it extracts the EditLine information into strings usable in any traditional fashion for which you'd use a string.

That's it for the logic, and it's really pretty simple programming for something that can do so much. The differences among the three compilers are minor, and notes in the source-code listings alert you to the differences that do exist. (See **Listings 2** and **3**.) Note that at the time I wrote this column, the new version 3.1 of Micol BASIC supporting direct desktop programming was still in beta release, and wouldn't support the sample address dialog. You'll find an "About..." dialog—which works—in its place by way of example.

The source-code listings, save that for Micol, show how to implement every standard dialog item. By looking over these examples for just a few moments, you should be able to use them as a basis for creating any standard dialog of low- to medium-level complexity. You won't outgrow them until you reach the point at which you want to define custom procedures for updating the appearance of custom dialog items. And at that point, you won't need me.

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The biggest drawback to using dialogs is designing their layout. The IIGS screen is based on a grid of either 320 by 200 pixels or 640 by 200 pixels. A sophisticated dialog, such as those in my examples, might have 20 or 30 elements of varying sizes. Now where, with 64,000 or 128,000 screen positions, does each element go? The Dialog Manager isn't smart enough to decide that for you. What you have to do, then, is design each dialog in its entirety before you write a single line of code.

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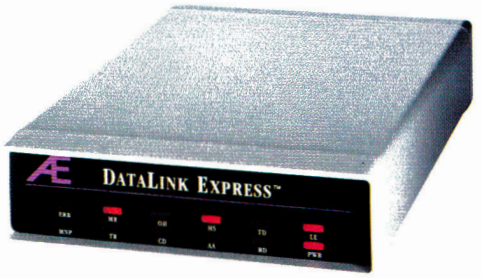

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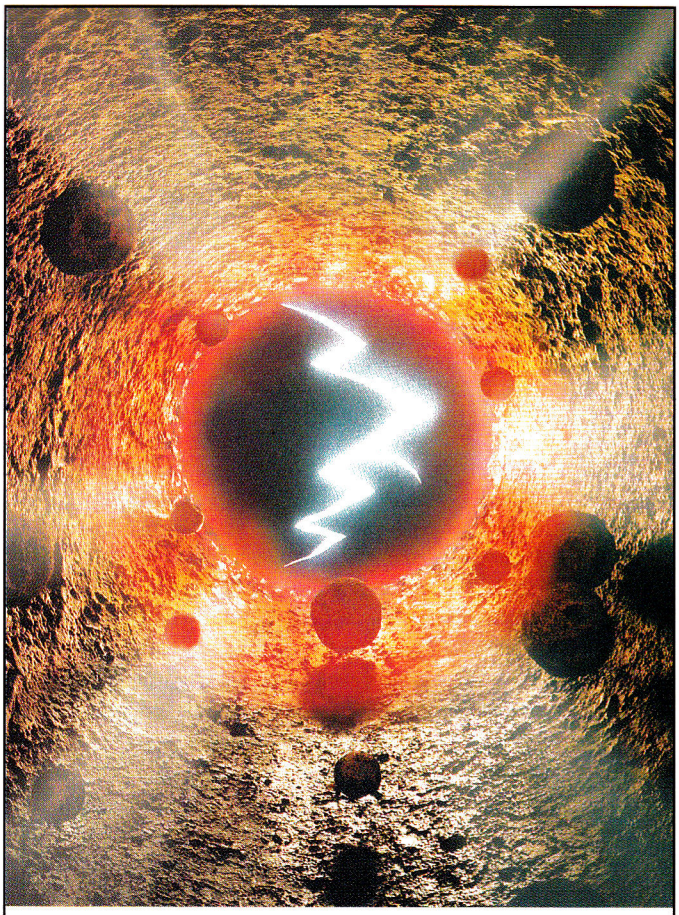

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Listing 2. Micol Advanced BASIC dialog sample.

```
'    This source code implements an "About ..." this program dialog. Because
' the version of Micol BASIC supporting desktop programs was still in beta
' release at the time of this writing, it was not possible to implement the
' mailing list dialog.
'    This source code is designed to be called from a Micol-style desktop
' menu such as those used in the examples on the Micol v3.0 and later disks.

' Add these data structures at the top of your program:

DIM Array (100)              { dialog data structure array }
DIM Array$ (100)             { dialog text strings array }


{ ------------------------------------------ }
{ About_Dialog                               }
{ Create standard "About ..." dialog box.    }
{ Based on an example by Ron Lewin.          }

PROC About_Dialog [ Control ]
  Array (0) = Control
  CASE_OF Control
    DO 0                     { Close the Dialog }
      DIALOG (Array (, Array$ ()
      ENDDO
    DO 1                     { Create new Dialog Box }

      { First, you feed all of the text items into a text array: }
      Array$ (1) = "Micol BASIC Program Shell"
      Array$ (2) = "By Joe Abernathy"
      Array$ (3) = "OK"

      { Now, you feed all of the attributes of each dialog item into
        an array. Compare this method with that used by TML. Although
        Micol's method is easier to understand, it takes about four
        times as much typing: }
      Array (1)  = 30        { Position of Dialog Box, Y Minimum }
      Array (2)  = 70        { X Minimum }
      Array (3)  = 100       { Y Maximum }
      Array (4)  = 500       { X Maximum }
      Array (5)  = 3         { Dialog Box contains x Items }
      Array (6)  = 1         { This Item Reference #, default}
      Array (7)  = 10        { Y Min of Item }
      Array (8)  = 10        { X Min of Item }
      Array (9)  = 25        { Y Max of Item }
      Array (10) = 400       { X Max of Item }
      Array (11) = 15        { Item type }
      Array (12) = 0         { Enable this Item }
      Array (13) = 0         { Item value, your own }
      Array (14) = 1         { String element 1}
      Array (15) = 2         { This Item Reference, any unique value }
      Array (16) = 30        { Y Min of Item }
      Array (17) = 10        { X Min of Item }
      Array (18) = 45        { Y Max of Item }
      Array (19) = 400       { X Max of Item }
      Array (20) = 15        { Item type, text }
      Array (21) = 0         { Highlight Item }
      Array (22) = 0         { Item Status }
      Array (23) = 2         { String element 2 }
      Array (24) = 3         { item ref.    }
      Array (25) = 50        { y min }
      Array (26) = 10        { x min }
      Array (27) = 65        { y max }
      Array (28) = 100       { x max }
      Array (29) = 10        { item type, button }
      Array (30) = 0         { item enabled }
      Array (31) = 0
      Array (32) = 3         { string 3 }
      { Display the dialog: }
      DIALOG (Array (, Array$ ( )
      MOUSE (Array()         { Monitor Response to Dialog }
      { When we get here, an item hit has occurred. First, get
        a handle to the dialog for use by other tool calls. For
        this simple dialog, the handle isn't used, but it would
        be by most dialogs: }
      Dialog_LSB% = Array (0)  { Keep Dialog Pointer for TOOLBOX call}
      Dialog_MSB% = Array (1)

      { Now see which item took a hit: }
      Item% = Array (0)

      { There's only one item, so we know the OK button took the hit.
        Hence, we do nothing but shut things down and exit: }

    ENDDO
  ENDCASE
ENDPROC { About_Dialog }

{ ------------------------------------------ }
{ DoAbout                                    }
{ Build "About Shell" Dialog Box.            }

{ This activates the dialog, then closes it: }
PROC DoAbout
    GOSUB About_Dialog [1]       { Create }
    { .. and wait for OK button to be clicked }
    GOSUB About_Dialog [0]       { Close }
ENDPROC { DoAbout }

{ ------------------------------------------ }
{ Main                                       }
{ Program execution occurs here.             }

{ This shows how you would implement the logic
  for a main control loop in Micol, and act on
  a mouse selection in the "About ..." item: }

PROC MenuTask                { heartbeat loop }
    REPEAT
        MOUSE (Array ()
        Task_Value = Array (0)
        UNTIL Task_Value = 17
    Menu_Item = Array (9)
    Menu_Number = Array (10)
    GOSUB Do_Menu [2]        { Highlight Menu }
    CASE_OF Menu_Item
        DO 256               { About }
            GOSUB DoAbout
```

Continued

Circle 264 on Reader Service Card.

Continued

```
                ENDDO
            DO 257                  { Open }
                { ... }
                ENDDO
            DO 258                  { Close }
                { ... }
                ENDDO
            { ....... }

            ENDCASE
        ENDPROC { MenuTask }

        { This master routine calls the above menu interpreter,
          which handles actual program flow: }

        ROUTINE Main
            HGR2                    { 640x200 graphics }
            GOSUB SetUp             { start other tools }
            GOSUB Do_Menu [1]       { set up menus }
            GOSUB Do_Menu [7]       { allow NDAs }
            TOOLBOX (27, 21: 0, 270, 4) { FixFontMenu }
            MOUSE (Array ()         { show menus }
            REPEAT
                GOSUB MenuTask
            UNTIL Done!             { Done! is set by QUIT item }
            GOSUB ShutDown          { shut down tools }
        END { Micol Shell }
```

Listing 3. AC/BASIC mailing-list dialog.

```
'    This source code implements a mailing list dialog suitable for use
' in business applications. It includes the necessary logic to let a user
' interact with the dialog features; and the logic to extract the results
' of the user's interaction, including EditLine text items, check boxes,
' radio button items and standard buttons.

' The routine in your program that monitors events in pull-down menus
' must contain routing to the address dialog. If you are using my
' inCider AC/BASIC utility/program shell, your menu control procedure
' should look like this:

menuproc:                                   ' Interpret menu events
  menunum = MENU(0)                         ' Read which menu
  itemnum = MENU(1)                         ' Read which item
  IF menunum = 1 THEN                       ' .. FILE menu
    IF itemnum = 1 THEN                     ' New
      GOSUB 10
    ELSEIF itemnum = 2 THEN                 ' Edit
      GOSUB 20
    ELSEIF itemnum = 3 THEN                 ' Delete
      GOSUB 30
    ELSEIF itemnum = 4 THEN                 ' Print
      GOSUB 40
    ELSEIF itemnum = 5 THEN                 ' Type File
      GOSUB 50
    ELSEIF itemnum = 6 THEN                 ' Quit
      GOSUB 60
    END IF
  ELSEIF menunum = 2 THEN                   '  GOODIES menu
    IF itemnum = 1 THEN                     ' Show picture
      GOSUB 70
    ELSEIF itemnum = 2 THEN                 ' Play a sound file
      GOSUB 80
    ELSEIF itemnum = 3 THEN                 ' Address dialog
      GOSUB 90
    END IF
  END IF
RETURN

' This is an associated subroutine that actually builds the menus of your
' program, including the "Address Dialog" selection. Again, this procedure
' will fit directly into your inCider AC/BASIC shell:

SUB DoMenu                                  ' Create menu bar
  FOR p = 1 to 6                            ' Eliminate screen flicker
    FOR e = 0 to 12 STEP 4                  ' by whiting-out the menu bar
      PALETTE p,e+0,1,1,1                   ' before building it.
      NEXT                                  ' Thanks to Lee Rimar of
    NEXT                                    ' Absoft for the code.
  MENU 1,0,1," File"                        ' Build FILE menu
  MENU 1,1,1,"New"                          '   and its entries ...
  MENU 1,2,1,"Edit"
  MENU 1,3,1,"Delete"
  MENU 1,4,1,"Print"
  MENU 1,5,1,"Type"
  MENU 1,6,1,"Quit"
  MENU 2,0,1," Goodies"                     ' Goodies menu header
  MENU 2,1,1,"View Picture"                 ' View SHR picture
  MENU 2,2,1,"Play Sound"                   ' Play a sound file
  MENU 2,3,1,"Address Dialog"               ' Get address info
  FOR p = 1 to 6                            ' Restore original palette ..
    FOR e = 0 to 12 STEP 4
      PALETTE p,e+0,0,0,0
      NEXT
    NEXT
END SUB

' This is the actual dialog work procedure:

' ---------------------------------------------------------------------
' Address Dialog. Displays a dialog to allow entry of information for
' an address list, then retrieves the information entered. Demonstrates
' how to use all of the standard dialog items -- buttons, radio items,
' check boxes, edit lines.

90:
  WINDOW 2,"",(8,18)-(632,195),2
  EDIT FIELD 1,"Joe Abernathy",(73,10)-(319,23),1
  EDIT FIELD 2,"526-9711",(459,11)-(561,24),1
  EDIT FIELD 3,"713",(404,11)-(446,24),1
```

Continued

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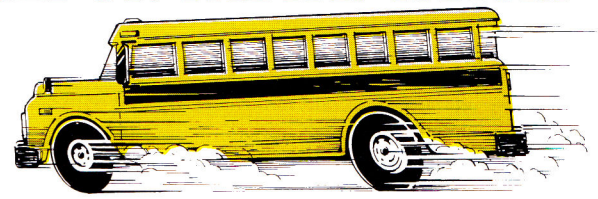

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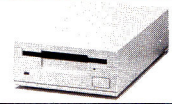

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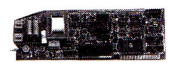

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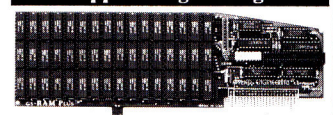

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```
    EDIT FIELD 4,"77266-6046",(216,114)-(318,127),1
    EDIT FIELD 5,"U.S.",(71,114)-(197,127),1
    EDIT FIELD 6,"TX",(287,93)-(317,106),1
    EDIT FIELD 7,"Houston",(71,93)-(221,106),1
    EDIT FIELD 8,"P.O. Box 66046",(71,72)-(317,85),1
    EDIT FIELD 9,"First Word",(72,51)-(318,64),1
    EDIT FIELD 10,"Tech Support",(73,30)-(319,43),1
    BUTTON 7,1,"Over 2000",(401,96)-(494,105),3
    BUTTON 6,1,"1000-2000",(401,80)-(498,89),3
    BUTTON 5,1,"500-1000",(401,64)-(490,73),3
    BUTTON 4,2,"0-500",(401,49)-(465,58),3
    BUTTON 3,1,"Preferred Customer",(353,116)-(519,125),2
    BUTTON 2,1,"Cancel",(230,142)-(308,156),1
    BUTTON 1,1,"OK",(344,142)-(391,156),1
    LOCATE 5,42
    PRINT "Sales to Date"
    LOCATE 3,42
    PRINT "Phone"
    LOCATE 14,2
    PRINT "Nation"
    LOCATE 12,30
    PRINT "State"
    LOCATE 12,2
    PRINT "City"
    LOCATE 9,2
    PRINT "Street"
    LOCATE 7,2
    PRINT "Company"
    LOCATE 5,2
    PRINT "Title"
    LOCATE 3,2
    PRINT "Name"

    ' Set up dialog event trapping:
    preferred = 0          ' preferred customer flag
    finished = 0           ' exit flag
    ON DIALOG GOSUB DoAddress
    DIALOG ON
    WHILE finished = 0
      WEND
    DIALOG OFF
    WINDOW CLOSE 2
    MENU
  RETURN

  ' Process events:

  DoAddress:
     myevent = DIALOG(0)          ' Find out what occurred
     itemhit = DIALOG(1)          ' ...
     myfield = DIALOG(2)          ' ...
     DIALOG OFF                   ' No interrupts to confuse things
```

Continued

Continued

```
    IF itemHit = 1 THEN finished = 1          ' OK
    IF itemHit = 2 THEN finished = 1          ' Cancel
    IF myevent = 1 THEN                       ' button clicked
      ' radio buttons:
      IF itemhit = 7 THEN
        Sales = 7                 ' Store for later use
        BUTTON 7,2                ' Cycle radio button status
        BUTTON 6,1
        BUTTON 5,1
        BUTTON 4,1
        END IF
      IF itemhit = 6 THEN
        Sales = 6                 ' store for later use
        BUTTON 7,1
        BUTTON 6,2
        BUTTON 5,1
        BUTTON 4,1
        END IF
      IF itemhit = 5 THEN
        Sales = 5                 ' store for later use
        BUTTON 7,1
        BUTTON 6,1
        BUTTON 5,2
        BUTTON 4,1
        END IF
      IF itemhit = 4 THEN
        Sales = 4                 ' store sales level for later use
        BUTTON 7,1
        BUTTON 6,1
        BUTTON 5,1
        BUTTON 4,2
        END IF

      ' check box item:
      IF itemhit = 3 THEN
        IF preferred = 1 THEN     ' unset button, flag
          preferred = 0
          BUTTON 3,1
        ELSE
          preferred = 1           ' set customer flag
          BUTTON 3,2
          END IF
        END IF
      END IF
    IF myevent = 7 THEN                       ' TAB in edit field
      theitem = myfield + 1                   ' increment pointer
      IF theitem > 10 THEN theitem = 1
      EDIT FIELD theitem
      END IF
    IF myevent = 2 THEN                       ' mouse click in edit field
      EDIT FIELD myfield
      END IF
    ' Extract strings from editline items. To use these, you can
```

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Continued

```
        ' do a simple PRINT Name$, etc. :
        Name$ = EDIT$(1)
        Phone$ = EDIT$(2)
        Areacode$ = EDIT$(3)
        Zip$ = EDIT$(4)
        Nation$ = EDIT$(5)
        State$ = EDIT$(6)
        City$ = EDIT$(7)
        Street$ = EDIT$(8)
        Company$ = EDIT$(9)
        Title$ = EDIT$(10)
        DIALOG ON
    RETURN
    ' END of source code listings.
```

enough to get an idea of what you want, but not nearly good enough to come up with professional results.

To do that, you'll have to start with your best guess, make allowances for the varying pixel sizes of each letter in each field that's to be displayed, then fiddle with exact screen locations through a couple of dozen recompilations. Ugh.

Then there are layout utilities, but they're no perfect solution. Using a program such as **Dialog Layout Utility**, you can create each dialog element and drag it to the screen position you want. When you're done, you can save the layout as Pascal or assembly-language source code. Ostensibly, someone using one of these languages should be able to paste this output code directly into a program, but in practice the output isn't up to par for serious programs. The one feature it does have, however, is precise screen locations.

So in half an hour, you can lay out your dialog and get a nice printout or text file showing where everything should go. You'll still have to do the programming, but there's really nothing hard about that—write a few lines of code and paste those lines into your source file again and again. Just change the screen location for each item, and perhaps its type and default status.

There are a number of "mouse locator" desk accessories available for download and from user-group libraries. While you may think one of these utilities will serve the same purpose as DLU, it's not true. First, they don't account for the size of an entire dialog item including text and graphics. And, just as important, they produce global screen coordinates, as opposed to the local screen coordinates you'll need to position anything in a screen window.

DLU is freeware available from most on-line services. You may contact its author, Scott Aitken, at S.AITKEN on GEnie, or SAITKEN on America Online.

The future of dialog design lies in resource management, built into the language compiler. With such a compiler, you'd design a dialog by going through a point-and-click routine, which would subsequently generate the source code for the task at hand. This is a welcome, although untried, idea that is being explored now on the Macintosh, and less successfully on the GS. It'll be a while before any standards appear, and longer yet until it means anything to BASIC.

Until that time, we have a firm understanding of one of the most elegant tools in the IIGS, and we have robust examples enabling us to fully implement dialogs of our own. Where do you go next?

ON ALERT

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can explore the use of alerts, too—dialogs you can program to react at increasing levels of interactivity based on up to three repititions of an action (often, three repititions of a mistake). Note that alerts require only minimal logic to check for user input, and only one informational field more than the lowest-level dialog—a field specifying which alert graphic to use.

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Modeless dialogs, which act as a standard window available at all times, are another challenge. The actual logic for a modeless dialog is covered here. The added concern in this case is monitoring all windows that might be available on the desktop at any one time. You'll have to have in your main program logic a way of knowing when the dialog window has been selected. (You can do this most easily with an empty global variable set when a mouse-down event occurs in the dialog window.)

DETAIL WORK

Ultimately, you can create full custom dialogs to meet needs only you can imagine. To do this, you'll need to fully understand your compiler's memory-management techniques (AC/BASIC won't do in this case), as well as QuickDraw II screen drawing, and perhaps even graphics design and animation algorithms.

You can take this as far as you want. The one thing that's most important to remember, no matter what your goal, is to execute the details right. Your goal is within your grasp.□

CONTRIBUTING EDITOR JOE ABERNATHY IS A JOURNALIST WITH *THE HOUSTON CHRONICLE*. HE'S A CERTIFIED APPLE DEVELOPER AND THE AUTHOR OR COAUTHOR OF EIGHT APPLE II PROGRAMS. WRITE TO HIM C/O *INCIDER*, 80 ELM STREET, PETERBOROUGH, NH 03458. ENCLOSE A SELF-ADDRESSED, STAMPED ENVELOPE IF YOU'D LIKE A PERSONAL REPLY.

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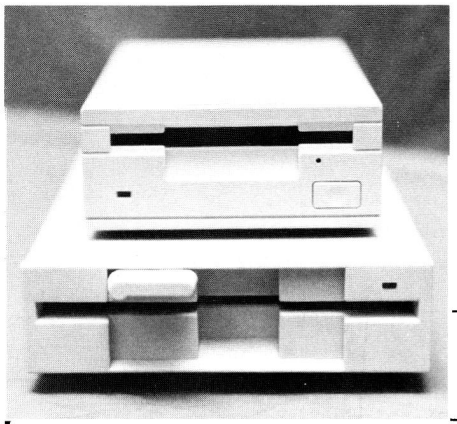

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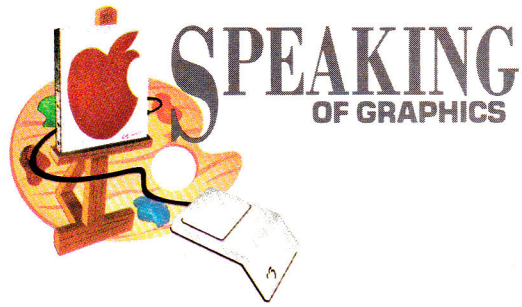

THE LINEUP

A little programming knowledge can help you understand that sophisticated commercial graphics software you're using.

By ROBERTA SCHWARTZ and MICHAEL CALLERY

WE'VE COME A LONG WAY, BABY. WHEN we started using the Apple II more than a decade ago, virtually no paint programs existed. To create graphics, we had to program them. It didn't take long, however, for professional programmers to realize that many people bought Apple computers because of their graphics capabilities, and paint programs soon began to appear. With these primitive programs you could paint a screen, but you had to be patient, because many of them worked only with the keyboard as the input device. To draw an upward vertical line, for example, you pressed *I* repeatedly; to draw a downward vertical line you pressed *M*, and so on.

We often wax nostalgic about the old days and wonder whether those of you who haven't had the incentive to learn programming aren't missing something. Knowledge comes from understanding, and that's why, in most disciplines, students start by learning to do things "the old way." Biology students, for example, use light microscopes before learning to use electron microscopes, while art students learn how to mix paint from pigments before using it from the tube. If you learn a little about computer languages, you'll learn a bit about how the programmers created the sophisticated software you've been using, and you'll develop an appreciation of the craft.

A program is simply a list of instructions, or commands, given to a computer. The computer steps dutifully through the program line by line, executing each instruction as it comes. The easy part of programming is learning the language for giving the instructions; the hard part is learning how to put these instructions together in the correct order so that the computer will do what you want.

For this month's exercise we're using a language called Applesoft BASIC to program low-resolution graphics. Both BASIC and lo-res graphics mode are available on every Apple II. To get into BASIC on the IIGS, boot your standard system disk, and from the program launcher or the Finder run the program BASIC.SYSTEM. From 8-bit Apple IIs, just boot your ProDOS disk.

We chose lo-res graphics because the pixels are large and it's easy to see what your program is doing. We're also willing to bet that many of you haven't tinkered with this interesting and fun graphics mode.

In the world of graphics, the computer system need supply you with only one *primitive*, or fundamental command, to enable you to do everything. This primitive is often called *PLOT*, and it puts a single pixel on screen at a specified location. Of course, most systems, especially Apples with their wonderfully complex graphics toolboxes in ROM (read-only memory), provide you with much more.

The Applesoft instruction to activate lo-res graphics is *GR*. This one instruction not only activates lo-res graphics, it also clears the screen to black, sets the current plotting color to black, and provides a text area (for four lines of text) beneath a graphics area. The 40-by-40-pixel graphics area is a grid (picture a sheet of graph paper) where *x* and *y* represent the horizontal and vertical positions for each pixel that will appear on that grid. Numbers between 0 and 39 specify these positions. The upper left corner of the screen is designated 0,0 and the lower right corner is 39,39. To plot a single lo-res pixel, we use the instruction PLOT x,y.

Before plotting, we must set a color for the pixel with the instruction COLOR = c. In this command, *c* must have a value between 0 and 15. (Zero is black, 15 is white, and the numbers in between are assigned to other colors.) ►

Program listing. Draw.Line.

```
5 REM Set up lo-res graphics
10 GR
15 REM Set color to yellow
20 COLOR=13
25 REM Assignment statements that set starting point of the line
30 X1=5
40 Y1=5
45 REM Set ending point of the line
50 X2=35
60 Y2=25
65 REM Calculate distance between start and end
70 DX=X2-X1
80 DY=Y2-Y1
85 REM Decide how many steps are needed
90 ST=DX
100 IF DY>DX THEN ST=DY
105 REM Calculate steps for x and y direction
110 XI=DX/ST
120 YI=DY/ST
125 REM Set beginning plotting points
130 X=X1
140 Y=Y1
145 REM Loop and plot
150 FOR I = 1 TO ST
160 PLOT X,Y
165 REM Increment X and Y to next pixel position
170 X=X+XI
180 Y=Y+YI
190 NEXT I
195 REM Plot last pixel
200 PLOT X2,Y2
```

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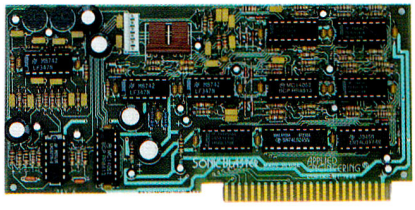

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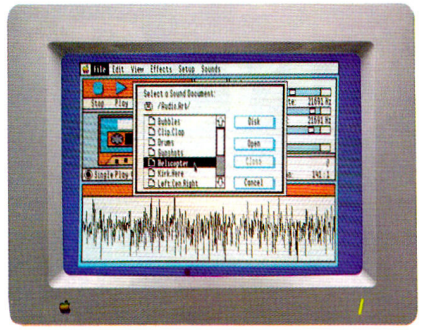

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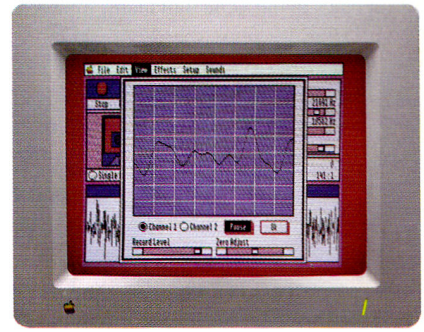

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Try it. Start up your Apple, type the GR command, and experiment with the colors and PLOT commands. To program graphics successfully, you must develop an innate sense of the screen's x and y coordinates. Nothing fosters this awareness better than experimenting with the PLOT command.

In addition to the three graphics commands discussed, the accompanying **Program listing** uses three others.

The most important is the *assignment statement*. The statement LET X = 10 tells BASIC to store the number 10 in memory under the name *X*. To retrieve this value later, you need use only the name in the appropriate command. *PRINT X*, for example, prints *10* on screen. Note that Applesoft BASIC accepts the command without the word *LET*, so we can simply say X=10.

The second command, IF/THEN, is a *decision instruction*. These two words always appear together in the same statement. Between *IF* and *THEN* we must specify a condition; after *THEN* we must give another BASIC command. For example, the instruction might read as follows:

```
IF A = B THEN PLOT 4,5
```

BASIC executes the THEN instruction (to plot 4,5) only if the condition (A = B) is true. If the condition is false (if A doesn't equal B), BASIC ignores the instruction after the THEN and skips to the next line of the program.

The final command we're using, FOR/NEXT, is a *counting instruction*. Like IF/THEN, these words are always paired, but they usually appear in different program statements. Between the *FOR* and the *NEXT*, we can include as many other commands as we like, as long as the first command is a counting statement, as in the following:

```
FOR I = 1 TO 10
DO THIS
DO THIS
DO THIS
NEXT I
```

In this case, BASIC would repeat the three commands between FOR and NEXT ten times. FOR/NEXT creates a *loop*.

Draw.Line is going to instruct the computer to draw a line. Before we can use the instructions we've learned to create a program, we must figure out how to draw this line without the computer. In programming jargon, we must find the *algorithm*. Fortunately, we don't have to start from scratch. Decades of research in computer graphics have resulted in many

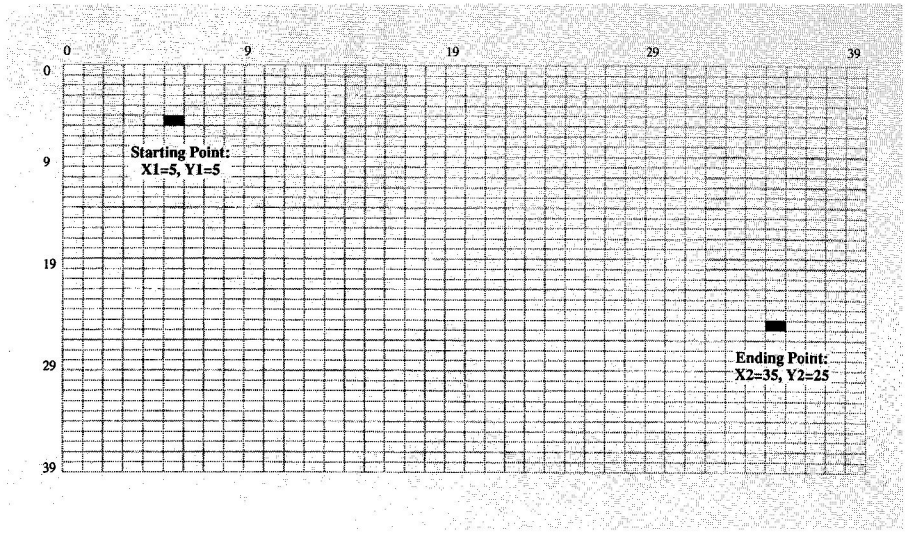


Figure 1. Each pixel occupies a square. Coordinates start at 0,0, not 1,1.

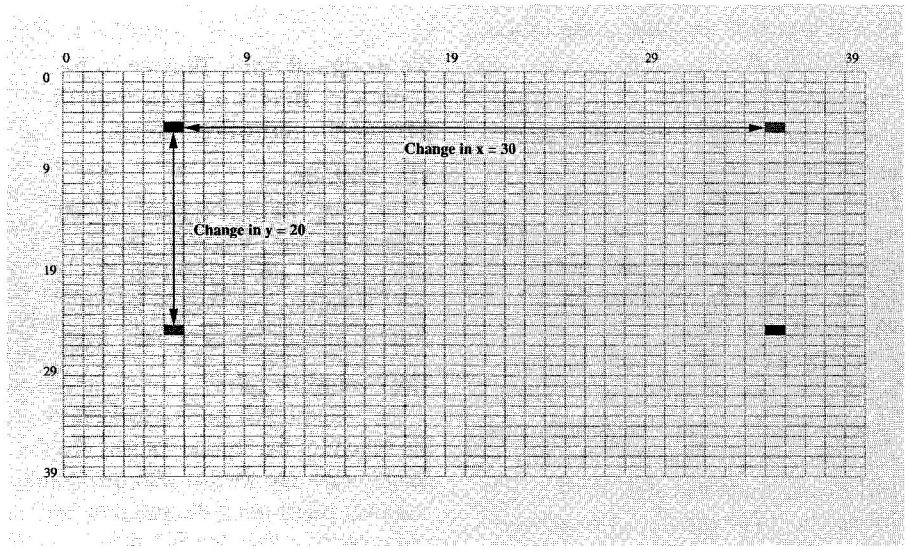
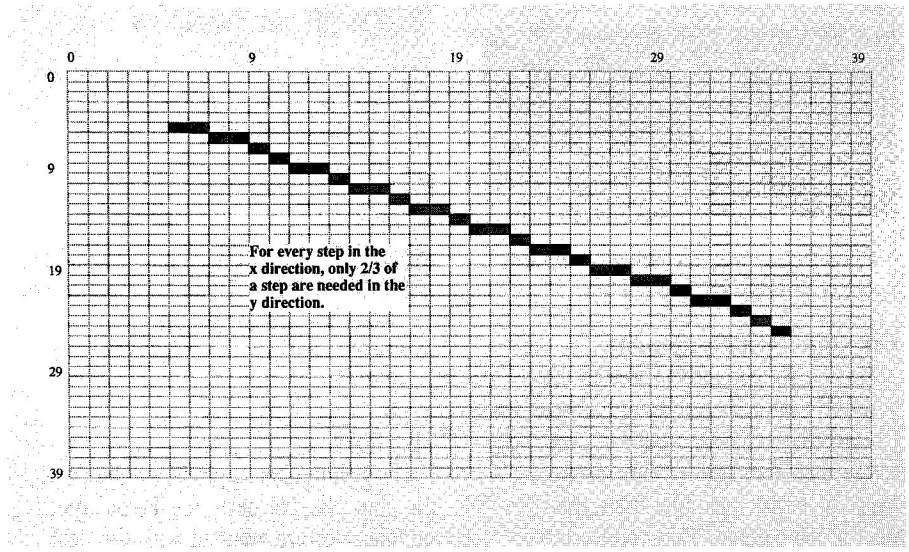
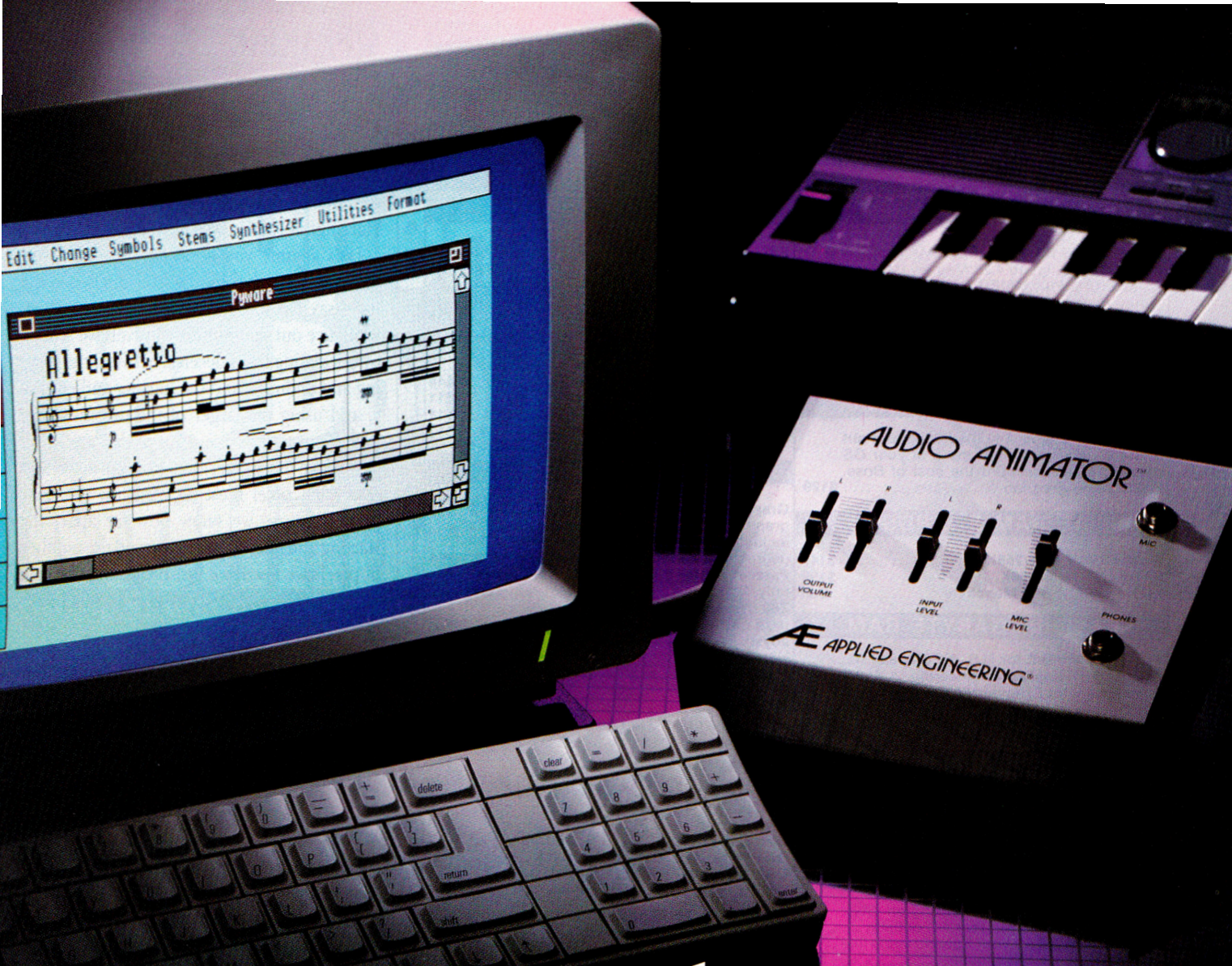


Figure 2. Larger difference is number of pixels you need.



► **Figure 3.** X and y differences unequal; line shows aliasing.



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reference books of algorithms. We're using an algorithm called the *symmetrical digital differential analyzer*, or DDA, from the book *Computer Graphics: A Programming Approach* by Steven Harrington (McGraw-Hill, 1983).

Let's assume you know the beginning coordinate and the ending coordinate of the line—say 5,5 to 35,20. (See **Figure 1.**) First, we figure out the number of pixels we'll need by calculating the difference between the starting and ending x and the starting and ending y, and using the larger of the two numbers. (See **Figure 2.**)

Now we must determine how far down and over each pixel must be from the previous pixel. Because we know how far apart the starting and ending points are and the number of pixels we need, we just divide the distance by the number of steps to give us our increment. (See **Figure 3.**) That's it. We have enough information to write the program. When you type it into your computer, you can omit the lines that begin with REM. These statements aren't commands; they're remarks that explain what the program is doing.

Draw.Line assumes that the starting coordinates, X1 and Y1, are smaller than the ending coordinates, X2 and Y2. DX and DY are the distance between the coordinates, ST is the number of pixels you need, XI and YI are the increments between pixels, and X and Y are the actual plotting coordinates.

By the way, this program will work on the hi-res graphics screen, too. Simply change *GR* to *HGR*, *COLOR =* to *HCOLOR =*, and *PLOT* to *HPLOT*.

We hope this example will whet your appetite for more. If so, you'll find more information about these and other Applesoft BASIC commands in the *Applesoft Tutorial* that came with your computer or in the recent book *Mastering Applesoft Graphics* by David Miller (Scott, Foresman Computer Books, 1989).□

WRITE TO ROBERTA SCHWARTZ AND MICHAEL CALLERY C/O *INCIDER*, 80 ELM STREET, PETERBOROUGH, NH 03458.

Editor's note: The clip-art program Stretch-a-Sketch, described in last month's column (p. 94), is available from Mike MacDonald directly. Send a 5¼-inch disk and a stamped, self-addressed mailer to Mint Software, Stretch-a-Sketch Freeware, 6422 Peggy St., Baton Rouge, LA 70808.□

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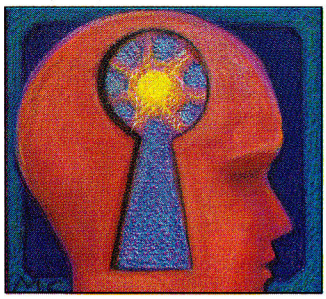

LEARNING CURVE

THE ART OF MATHEMATICS

By DAVID D. THORNBURG, Ph.D.

Mathematics possesses an inherent beauty—it is "the language with which God has written the Universe."

LAST SEPTEMBER WE EXPLORED THE Gingerbread Man ("An Ordered World," p. 110)—a simple program that produces an exquisitely complex graphics pattern by repeating a simple mathematical calculation and plotting the results on screen. Because of the tremendous response I received from that article, I've chosen another mathematical topic with a number of interesting characteristics. First, it produces beautiful graphics patterns. Second, these patterns result from the behavior of a simple function—one well within the grasp of high-school students. And, third, this month's program once again uses the Apple II as a "math microscope," a tool that lets anyone explore conceptual space and go where no thoughts have gone before!

This month's column explains the theory behind the graphics program. If you'd rather start by creating pictures, you may want to enter the program (see **Listing 1**) and start playing with it. At some point, though, you should go back and read the technical description to understand the mathematics. For an excellent, in-depth (but very readable) description of the branch of mathematics highlighted here, I recommend Robert Devaney's book *Chaos, Fractals, and Dynamics*, published by Addison-Wesley (Reading, MA).

GETTING STARTED

As a starting point for our exploration, let's look at the behavior of a very simple function, x^2. We'll pick a starting value for x and apply this function repeatedly to see what happens. For example, if we start with $x = 0.5$, then $x^2 = 0.25$. If we square that value we get 0.0625, and so on. It's clear that repeated iterations of this function will bring us closer and closer to zero.

Suppose now that we were to start with another value—$x = 2$, for example. In this case, repeated applications of the function would yield 4, 16, 256, and so on. In this instance repeated iterations would increase boundlessly. It's only when we take a special case ($x = 1$) that the iteration produces a stable intermediate result. This boundary point, $x = 1$, is a member of the *Julia set* for this function. This set is named after the French mathematician Gaston Julia, who explored the properties of repeated iterations of polynomial expressions. Technically, the Julia set is the boundary of the set of points that escape to infinity on repeated iterations.

This example is somewhat boring. Fortunately, a very simple modification of our example produces some fascinating results. Let's look at this function:

$F_c(z) = z^2 + c$

where z and c are both complex numbers. (A complex number is one you can express in the form $z = x + iy$, where $i = \sqrt{-1}$.) To find the Julia set of this function, we choose a value for the complex constant, c, then examine the behavior of $F_c(z)$ when it's iterated over and over again. Each set of iterations is performed for a particular value of z. Some starting values will escape to infinity and others will converge to zero. The boundary between the two defines the Julia set.

A graphics display of the result is easy to generate. Each starting point for z has two components: the "real" part (x) and the "imaginary" part (y). These two numbers correspond to a point on the computer display screen. Depending on the function's behavior, the screen location is painted one of

Listing 1. Plotting a function.

```
10  HGR : HOME : VTAB (21)
20  INPUT "C1 = ";C1
30  INPUT "C2 = ";C2
40  FOR J = 0 TO 180
50 Y0 = (90 - J) / 60
60  FOR I = 0 TO 240
70 X0 = (I - 120) / 60
80 X = X0:Y = Y0
90  FOR K = 1 TO 20
100 X1 = X * X - Y * Y + C1
110 Y = 2 * X * Y + C2
120 X = X1
130 Z = X * X + Y * Y
140  IF Z <  = 4 THEN  NEXT K
150  HCOLOR= 0
160  IF K < 20 THEN  HCOLOR= 1
170  IF K < 4 THEN  HCOLOR= 2
180  IF K < 2 THEN  HCOLOR= 3
190  HPLOT I,J
200  NEXT I
210  NEXT J
220  END
```

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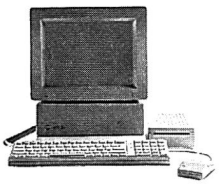

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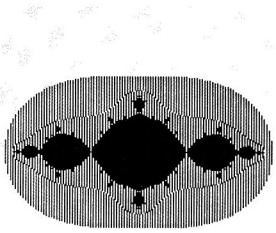

Figure 1. Julia set contour map for C1 = −1, C2 = 0.

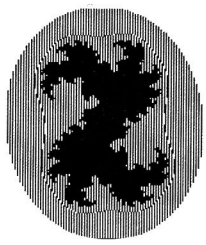

Figure 2. Julia set contour map for C1 = 0.36, C2 = 0.1.

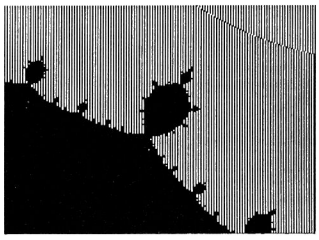

Figure 3. Blow-up of region containing a small bulb in Figure 1. Magnification = 10.

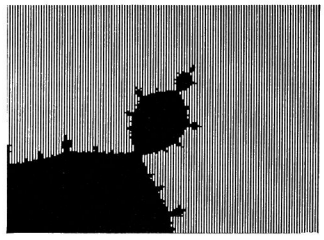

Figure 4. Another blow-up of tip of bulb in previous figure. Magnification = 50.

several colors. If the result moves toward zero, the dot is painted black. If it escapes quickly to infinity, it's painted white, and if it escapes slowly, the dot's painted with other colors to create a "contour map" of this function's dynamics. The way to tell if the function will escape is to see whether its magnitude ever exceeds 2. (See Devaney's book for a more extensive explanation.)

Listing 1 plots the contour map for the following function:

$F_c(z) = z^2 + c$

Each point on screen corresponds to a different x and y value, ranging from x = −2 to x = 2 and y = −1.5 to y = 1.5. This area is adequate to show the Julia set for many interesting values of *c*.

Here's how it works. First, specify the real and imaginary parts of the constant *c* (C1 and C2). Next, the program picks a starting value for the real and imaginary parts of z (X0 and Y0). The program evaluates the function in lines 100–120, then checks it in lines 130–140 to see whether the function has exploded. If it hasn't exploded in 20 tries, the program assumes the point is stable or that it converges to zero. (That may not be the case, of course, but 20 iterations bring us close enough to see some neat results within a reasonable amount of time.)

The program then assigns a color for the plotted point based on the number of iterations before explosion. If the function blows up immediately, the program paints a white dot on screen. If it blows up in fewer than four tries, the dot is purple. If the function takes between four and 19 tries, the dot is green. Otherwise we assume the point converges to zero and the dot is black.

Figures 1 and **2** show two pictures that result from choosing different starting values for C1 and C2. As you can see, each picture is unique.

Unless you're using an Apple IIc Plus or an accelerator card, this program will run quite slowly. You can speed up the process by taking advantage of a pattern's symmetry. As long as the origin is in the center of the screen, the point (x,y) is the same as the point (−x,−y). You can almost double the plotting speed by reducing the limit of J in line 40 from 180 to 90 and by adding the following line:

195 HPLOT (240 − I),(180 − Y)

To gain even more speed, it would be nice to have a "sketchpad" that lets you test values of C1 and C2 quickly to see whether anything interesting results. **Listing 2** provides a low-resolution version of the program, which you can run to see a coarse outline of the contour map. Because each dot on screen is really a horizontal rectangle in lo-res graphics, the resulting contour map is distorted. On the other hand, the larger number of colors lets you plot more escape contours. Some of the patterns generated with this program are quite pretty in their own right.

THINGS TO LOOK FOR

If you look at **Figures 1** and **2** you'll notice that certain features seem to be repeated at different scales. For example, **Figure 1** appears to be built from a set of bulbs to which still other bulbs are connected. If you rewrite the program to examine regions at higher magnifications, you can see that the structure of these Julia sets is quite complex. **Figures 3** and **4** show progressive magnifications of the attachments to one of the smaller bulbs on the upper right side of **Figure 1**.

There's a virtual universe of discoveries to be made with this simple program. Whether you're a student, a teacher, or someone who just enjoys computer exploration, you'll find much to hold your attention here. Rather than turn your computer off at the end of the day, why not have it create some new contour maps, for instance? You'll find yourself coming up with some exquisite patterns no one has ever seen before—and it all stems from a simple equation.

I wish every student who fears math had an opportunity to explore programs like this. Too many people think of math as just numbers and convince themselves that the subject is beyond their comprehension.

Truth is, mathematics lies at the heart of many professions. Those who avoid it block their future. But even more importantly, mathematics possesses an inherent beauty. To quote Galileo, "Mathematics is the language with which God has written the Universe."

Listing 2. Lo-res version.

```
10  GR : HOME : VTAB (21)
20  INPUT "C1 = ";C1
30  INPUT "C2 = ";C2
40  FOR J = 0 TO 39
50 Y0 = (20 - J) / 10
60  FOR I = 0 TO 39
70 X0 = (I - 20) / 10
80 X = X0:Y = Y0
90  FOR K = 1 TO 20
100 X1 = X * X - Y * Y + C1
110 Y = 2 * X * Y + C2
120 X = X1
130 Z = X * X + Y * Y
140  IF Z <  = 4 THEN  NEXT K
150  COLOR= 0
160  IF K < 15 THEN COLOR=16 - K
170  PLOT I,J
180  NEXT I
190  NEXT J
200  END
```

If you love math, share it with youngsters and help them learn that math is a topic they can play with and manipulate in a concrete fashion. As you and your family or students explore this month's program, send me a list of your favorite values for C1 and C2 and I'll try to publish a gallery of artistic creations later this year.□

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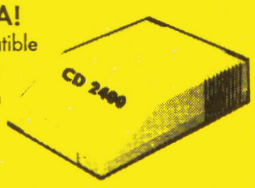

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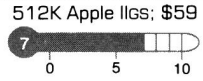

Everyone knows that money talks, but in this case that's not all that bad. Talking Money, from Orange Cherry's Talking Schoolhouse series, comes with five activities to teach youngsters aged 5–7 how to count money and make change.

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The Apple IIGS graphics interface and program operation are so intuitive that youngsters will be able to work with hardly any adult supervision.

Children use a mouse to navigate through the menu options and make selections. Dialog boxes with large-print, single-word choices and graphics icons simplify the process. For example, youngsters can vary the program's speech volume by selecting *Adjust Sound* and clicking on the *Louder* or *Softer* button. They can change activities by clicking on *Exit* to return to the Main Menu. When they select an option in the Main Menu, the computer will tell them what to do.

In the first activity—Money Talks—children click on a coin or bill to hear its name. Kids work with a quarter, dime, nickel, penny, $5 bill, or $1 bill. Only the head side of each item appears. When children click on a piece of money, its written form appears on screen, and the program speaks its name.

It's a good idea for youngsters to check out every different piece so that they can learn to recognize the program's graphics representations. This exercise will minimize difficulties later on: Without the Money Talks review, it's easy to confuse nickels with quarters.

Money Values requires children to click on a coin or bill to find its value. Clicking on the quarter, for instance, prompts the computer to say, "Twenty-five cents." A graphic appears on screen showing a picture of a quarter on one side of an equal sign and two dimes and

Money talks as kids learn to count.

a nickel on the other side. The numeric representation for a quarter (*25 cents*) also appears on screen. Only one combination of coins appears for each coin or bill.

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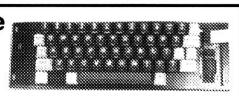

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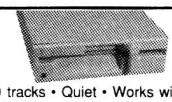

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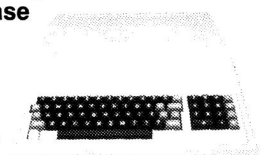

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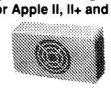

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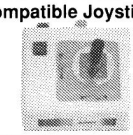

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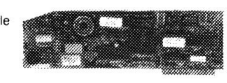

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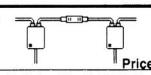

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their values. Three possible totals appear at the bottom of the screen. Children must click on the right solution. If they choose correctly, the computer responds with audiovisual and verbal reinforcement.

Unfortunately, the program doesn't let kids figure out the answer on their own when they respond incorrectly. If a child picks the wrong answer, the computer states, "That is not correct. Here is the correct answer...." Giving them the answer so quickly minimizes the incentive for children to work out the solution on their own.

Adding Coins and Bills is very similar to Adding Coins, except that it's a little more difficult. Bills and coins appear on screen together. Once again, kids must total the values to come up with the right answer from three possible solutions shown at the bottom of the screen. As before, kids receive reinforcement for correct answers. The program again gives them the solution if they pick the wrong answer.

The final activity—Cash Register—is the most challenging assignment. An item appears in both picture and word form at the top of the screen, along with its purchase price. The program shows a picture of the coin(s) or bill(s) kids will use to make the purchase. They have to calculate the amount of change, count the change in the two possible solutions depicted on screen, then click on the correct answer.

For example, one item for sale is a safety pin priced at 3 cents. The program indicates the child must pay with a quarter. How much change does he or she receive? Is it the group of coins with two pennies and two dimes or is it the group of coins with a penny, a nickel, and a dime? Correct answers earn audiovisual reinforcement; wrong answers prompt the computer to give the correct response.

All activities in Talking Money are sequential. Each builds on previously learned information. The first four games are simple enough for a kindergartener to play. The final activity demands adding and subtracting skills that even first-graders will find challenging.

After children complete ten questions in any activity, a score card appears on screen, stating the number of questions they answered correctly. Their score for that activity also appears as a percentage. Adults will have to read the scorecard to their youngsters; the computer doesn't.

Talking Money will teach young children to recognize money and appreciate its value. The graphics representations are well done and digitized speech enhances the program. Kids can investigate money values at their own pace, proceeding with activities when they feel ready. Nevertheless, the program is expensive for what it offers.

While children will initially enjoy the program's activities, they may tire of them quickly because the presentation formats are unvaried. My 6-year-old helper was frustrated that the program didn't offer her a second chance when she answered incorrectly—especially when she knew the correct answer, but chose the wrong option by mistake.

Graphics and speech alone don't make a truly great educational program. To succeed, the software must be able to grow with the child. Talking Money has no such growth potential. There are no editing options to customize activities to the needs of individual children; in addition, the software is copy protected. For the price, it should at least come with a backup.□

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

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DOMINO THEORY

Apple users know there's always an easier way to get the job done. A shortcut here, an elegant twist there—that's what Hints & Techniques is all about. Bracketed numbers in program listings refer to *inCider*'s Applesoft Proofer Program. For your copy send a self-addressed, stamped envelope to Proofer, c/o *inCider*, 80 Elm St., Peterborough, NH 03458.

DOMINO PUZZLE

By David Leithauser and Sandy Jones

DOMINO PUZZLE IS A GAME OF strategy in which the kids'll probably edge out the adults. The object is simple: Match up the numerals on the adjacent sides of four "dominoes" by swapping or rotating the blocks. (See the accompanying **Figure** for an example of a completed game.) The player who matches the highest number of adjacent numerals in the fewest number of moves is the game winner.

Type in the accompanying **Program listing** and SAVE it as Domino.Puzzle. When you RUN it, the program asks you for a difficulty level and whether you want to scramble the blocks. If you answer no, the game will appear automatically; keep in mind that you'll be able to only rotate the blocks. If you do want to scramble the dominoes, the program then asks whether you want to be able to rotate them. Answering no means you can only swap blocks.

After you set up the game, four domino blocks appear on the left side of the screen; they're arranged in a square and are labeled 1A, 2A, 1B, and 2B. On the right is a list of options. To play, select a letter to *(R)otate* a block if available, or *(S)wap* the locations of two blocks. Then enter the desired block number(s). For example, to rotate the upper left-hand block, press R and answer the prompt with 1B (or 1b). The program then asks whether you want to rotate the same block again. The Move indicator counts each time you select swapping or rotating. It doesn't acknowledge your choice to rotate several times, though.

If dinner's ready before you've completed a game, select *(D)isk save* from the menu. The program saves the current game as a file called DOMSAV on disk. The next time you RUN Domino Puzzle, it'll give you the option to restart that saved game. If you want to begin anew, the program deletes the old game.□

Write to David Leithauser and Sandy Jones at 4649 Van Kleeck Drive, New Smyrna Beach, FL 32169.

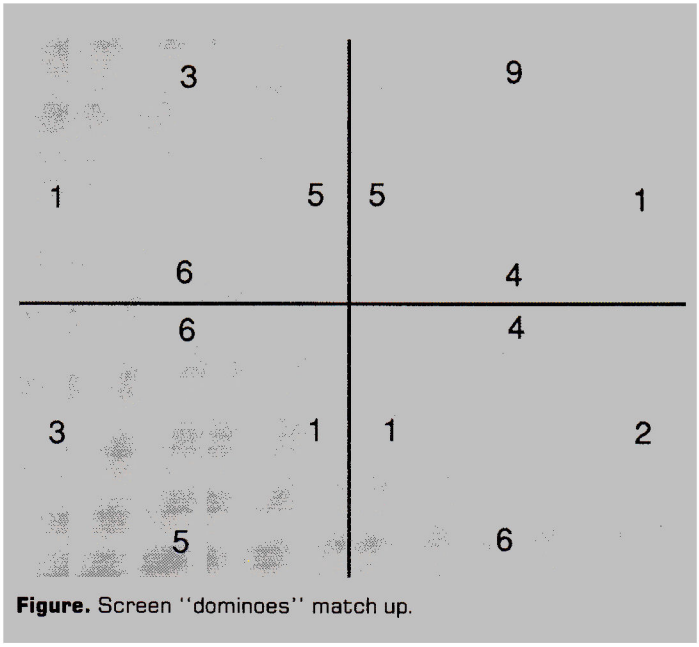
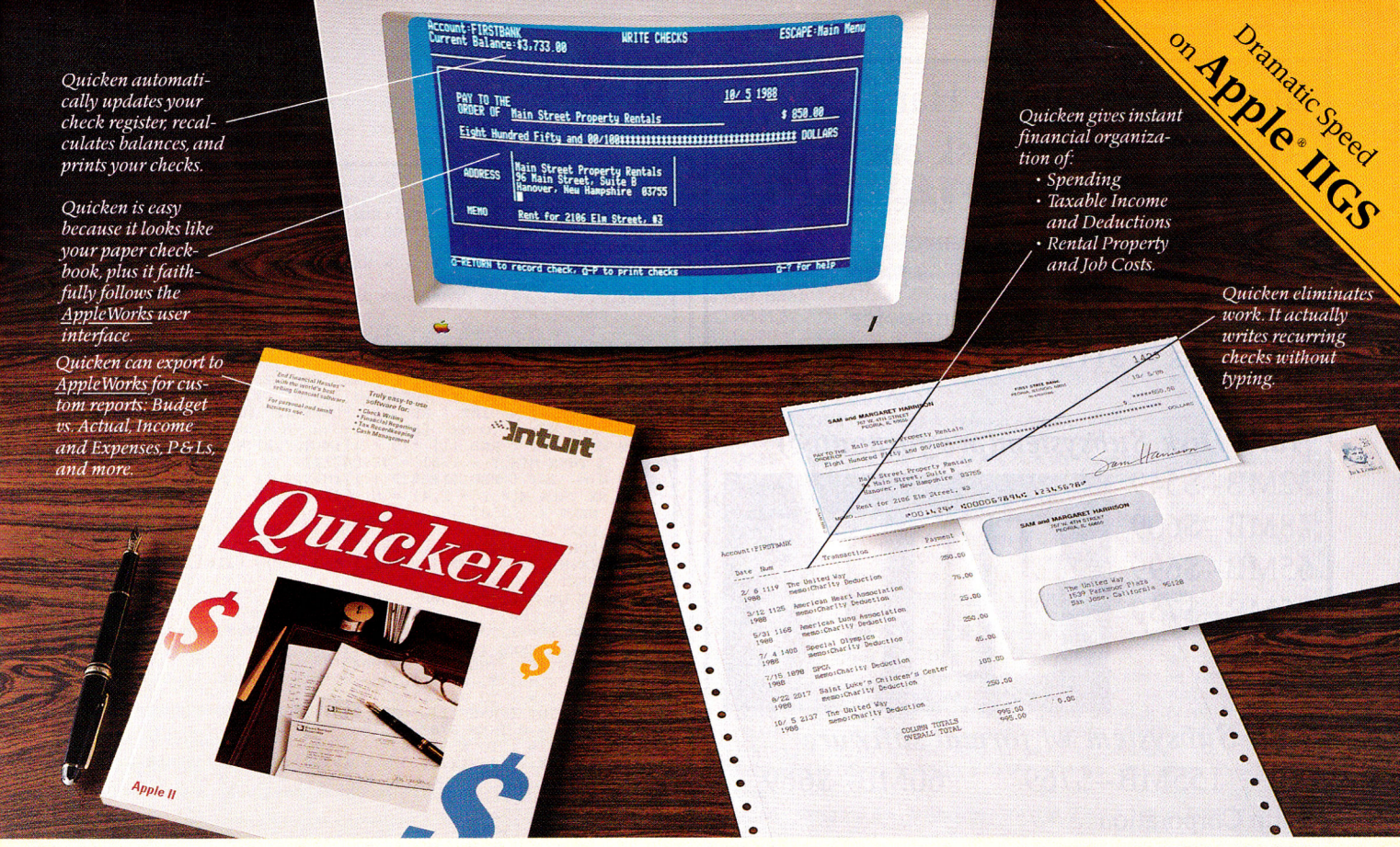


Figure. Screen "dominoes" match up.

Program listing. Domino Puzzle.

```
1  REM  DOMINO PUZZLE  [2692]
2  REM  by David Leithauser  [3861]
3  REM  Apple Conversion by Sandy Jones  [6197]
4  REM  Copyright 1989, inCider  [4847]
10  HOME : CLEAR : DIM M(5,4,4)  [2353]
20  VTAB 5:S$ = "Domino Puzzle": GOSUB 48100: PRINT   [3148]
25 S$ = "by David Leithauser": GOSUB 48100: PRINT   [5543]
28 S$ = "and Sandy Jones": GOSUB 48100: PRINT : PRINT
     [5162]
30 D$ =  CHR$ (4): PRINT  CHR$ (17): ONERR  GOTO 100  [1582]
35 F$ = "DOMSAV": PRINT D$;"VERIFY"F$  [3154]
40 S$ = "Load previous game (Y/N)? ": GOSUB 48100: GOSUB
    49000: IF YN = 0 THEN  PRINT D$;"DELETE "F$: GOTO
    100  [10921]
50  PRINT D$;"OPEN";F$: PRINT D$;"READ";F$  [3861]
55  INPUT NX: INPUT NY: INPUT GT  [1573]
56  FOR X = 1 TO NX  [1066]
57  FOR Y = 1 TO NY  [1065]
58  FOR Z = 0 TO 4  [956]
60  INPUT M(X,Y,Z)  [1781]
62  NEXT Z  [480]
64  NEXT Y  [413]
66  NEXT X  [410]
68  INPUT MV  [620]
70  PRINT D$;"CLOSE";F$: PRINT D$;"DELETE";F$  [3733]
72  HOME : GOSUB 50000: FOR X = 1 TO NX: FOR Y = 1 TO
    NY: GOSUB 51000: NEXT Y: NEXT X  [5315]
74  HTAB 24: VTAB 1: PRINT "Move # ";MV;  [4087]
```

Continued



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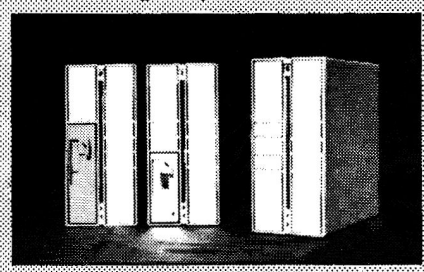

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HINTS & TECHNIQUES

Continued

```
 76  GOTO 1003  [1194]
 100  POKE 216,0: PRINT "Difficulty level (1-3)? ";  [3216]
 110  GET A$: IF A$ < "1" OR A$ > "3" THEN 110  [2761]
 115  PRINT A$  [624]
 120 NX =  VAL (A$) + 1:NY = NX: IF NY > 4 THEN NY = 4
      [3637]
 121 GT = 1: PRINT "Scramble pieces (Y/N)?";: GOSUB 49
     000  [3175]
 122  IF YN = 0 THEN GT = 2: GOTO 130  [2093]
 124  PRINT "Rotate pieces (Y/N)?";: GOSUB 49000  [5763]
 126  IF YN THEN GT = 0  [1199]
 130  GOSUB 50000  [311]
 140  FOR Y = 1 TO NY  [823]
 150 M(1,Y,4) =  INT ( RND (1) * 9 + 1)  [3099]
 160  FOR X = 1 TO NX  [826]
 170 N =  INT ( RND (1) * 9 + 1):M(X,Y,1) = N: IF Y >
     1 THEN M(X,Y - 1,3) = N  [4772]
 180 N =  INT ( RND (1) * 9 + 1):M(X,Y,2) = N: IF Y <
     NX THEN M(X,Y + 1,4) = N  [4736]
 190  NEXT X  [350]
 200  NEXT Y  [293]
 210  FOR X = 1 TO NX  [962]
 220 M(X,NY,2) =  INT ( RND (1) * 9 + 1)  [3164]
 230  NEXT X  [390]
 235  IF GT = 2 THEN 300  [1062]
 240 Z = 1  [607]
 250  FOR Y = 1 TO NY: FOR X = 1 TO NX:M(X,Y,0) = Z:Z =
     Z + 1: NEXT X: NEXT Y  [5214]
 255  IF GT = 1 THEN 400  [1084]
 300  FOR X = 1 TO NX  [1078]
 310  FOR Y = 1 TO NY  [1105]
 320 N =  INT ( RND (1) * 3 + 1)  [2008]
 330  IF N = 0 THEN 370  [1316]
 340  FOR Z = 1 TO N  [1042]
 350 T = M(X,Y,1):M(X,Y,1) = M(X,Y,2):M(X,Y,2) = M(X,Y
     ,3):M(X,Y,3) = M(X,Y,4):M(X,Y,4) = T  [9706]
 360  NEXT Z  [517]
 370  NEXT Y  [524]
 380  NEXT X  [547]
 390  IF GT = 2 THEN 500  [936]
 400  FOR X = 1 TO NX  [822]
 410  FOR Y = 1 TO NY  [817]
 420 RX =  INT ( RND (1) * NX + 1):RY =  INT ( RND (1)
      * NY + 1)  [4100]
 430  FOR Z = 0 TO 4:T = M(X,Y,Z):M(X,Y,Z) = M(RX,RY,Z
     ):M(RX,RY,Z) = T: NEXT Z  [6676]
 440  NEXT Y  [342]
 450  NEXT X  [285]
 500  FOR X = 1 TO NX: FOR Y = 1 TO NY: GOSUB 51000: NEXT
     Y: NEXT X  [3569]
 1000 MV = MV + 1: HTAB 24: VTAB 1: PRINT "Move # ";MV
      ;  [3729]
 1003  FOR X = 8 TO 19: HTAB 24: VTAB X: PRINT "
           ";: NEXT X  [6075]
 1005  IF GT <  > 1 THEN  HTAB 24: VTAB 2: PRINT "(R)o
     tate";  [2155]
 1010  IF GT <  > 2 THEN  HTAB 24: VTAB (3 - GT): PRINT
     "(S)wap";  [3998]
 1015  IF GT <  > 2 THEN  HTAB 24: VTAB (4 - GT): PRINT
     "(H)int";  [3957]
 1020  HTAB 24: VTAB (5 - GT): PRINT "(D)isk save";  [4356]
 1030  HTAB 24: VTAB (6 - GT): PRINT "(Q)uit";  [2522]
 1035  HTAB 24: VTAB 8: PRINT "Do which? ";  [3494]
 1040  GET A$: IF A$ = "" THEN 1040  [1909]
 1050  IF GT <  > 1 THEN  IF A$ = "R" OR A$ = "r" THEN
     2000  [3797]
 1060  IF GT <  > 2 THEN  IF A$ = "S" OR A$ = "s" THEN
     3000  [3847]
 1070  IF A$ = "D" OR A$ = "d" THEN 4000  [2564]
 1080  IF A$ = "Q" OR A$ = "q" THEN 5000  [2691]
 1085  IF GT <  > 2 THEN  IF A$ = "H" OR A$ = "h" THEN
     6000  [3765]
 1090  GOTO 1040  [1211]
 2000  PRINT A$;  [427]
 2010  HTAB 24: VTAB 10: PRINT "Rotate which";: HTAB 2
     4: VTAB 11: PRINT "block? ";  [5380]
 2020  GOSUB 52000  [836]
 2090 T = M(X,Y,1):M(X,Y,1) = M(X,Y,2):M(X,Y,2) = M(X,
     Y,3)  [6604]
 2100 M(X,Y,3) = M(X,Y,4):M(X,Y,4) = T  [4268]
 2110  GOSUB 51000  [1383]
 2120  HTAB 24: VTAB 15: PRINT "Rotate";: HTAB 24: VTAB
     16: PRINT "again ";: HTAB 24: VTAB 17: PRINT "(Y/
     N)? ";  [8111]
 2130  GET A$: IF A$ = "Y" OR A$ = "y" THEN 2090  [2987]
 2140  IF A$ <  > "N" AND A$ <  > "n" THEN 2130  [3221]
 2150  GOTO 1000  [1187]
 3000  PRINT A$;  [439]
 3010  HTAB 24: VTAB 10: PRINT "First ";: HTAB 24: VTAB
     11: PRINT "block? ";  [5135]
 3020  GOSUB 52000:X1 = X:Y1 = Y  [1976]
 3030  HTAB 24: VTAB 12: PRINT "Second";: HTAB 24: VTAB
     13: PRINT "block? ";  [5677]
 3040  GOSUB 52000  [836]
 3050  FOR Z = 0 TO 4:T = M(X,Y,Z):M(X,Y,Z) = M(X1,Y1,
     Z):M(X1,Y1,Z) = T: NEXT Z  [6544]
 3060  GOSUB 51000:X = X1:Y = Y1: GOSUB 51000  [3399]
 3070  GOTO 1000  [1047]
```

```
4000  REM  Save as DOMSAV  [1163]
4020 D$ =  CHR$ (4): PRINT D$;"OPEN";F$: PRINT D$;"RE
    AD";F$: PRINT D$;"WRITE";F$  [5882]
4025  PRINT NX: PRINT NY: PRINT GT  [1673]
4030  FOR X = 1 TO NX  [950]
4040  FOR Y = 1 TO NY  [977]
4050  FOR Z = 0 TO 4  [905]
4060  PRINT M(X,Y,Z)  [827]
4070  NEXT Z  [409]
4080  NEXT Y  [416]
4090  NEXT X  [615]
4100  PRINT MV  [602]
4110  PRINT D$;"CLOSE";F$  [2727]
4120  HTAB 24: PRINT "Saved as DOMSAV"  [1861]
4130 A$ = "": PRINT  [883]
5000  PRINT A$;:SC = 0  [969]
5010  FOR Y = 1 TO NY  [841]
5020  FOR X = 1 TO NX - 1  [1151]
5030  IF M(X,Y,2) = M(X + 1,Y,4) THEN SC = SC + 1  [3361]
5040  NEXT X  [285]
5050  NEXT Y  [306]
5060  FOR X = 1 TO NX  [974]
5070  FOR Y = 1 TO NY - 1  [1398]
5080  IF M(X,Y,3) = M(X,Y + 1,1) THEN SC = SC + 1  [3522]
5090  NEXT Y  [410]
5100  NEXT X  [417]
5110  HTAB 24: VTAB 10: PRINT "Score= "SC;  [3587]
5120  HTAB 24: VTAB 11: PRINT "out of "(NY * (NX - 1)
    ) + (NX * (NY - 1));  [5627]
5130  HTAB 24: VTAB 15: PRINT "Play ";: HTAB 26: VTAB
    16: PRINT "again";: HTAB 24: VTAB 17: PRINT "(Y/N
    )? ";  [7690]
5140  GOSUB 49000: IF YN THEN  RUN  [1647]
5150  HOME : END  [405]
6000  PRINT A$;:HN = HN + 1  [1364]
6010  FOR X = 1 TO NX  [822]
6020  FOR Y = 1 TO NY  [817]
6030 HN = X + (Y - 1) * NX: IF M(X,Y,0) <  > HN THEN
    6070  [4106]
6040  NEXT Y  [336]
6050  NEXT X  [343]
6060  HTAB 24: VTAB 10: PRINT "No more";: HTAB 24: VTAB
    11: PRINT "hints.";: GOTO 6300  [5957]
6070  FOR HX = 1 TO NX  [986]
6075  FOR HY = 1 TO NY  [954]
6080  IF M(HX,HY,0) = HN THEN 6120  [1505]
6090  NEXT HY  [481]
6100  NEXT HX  [494]
6110  HTAB 24: VTAB 11: PRINT "Error! ";: GOTO 6300  [2969]
6120  HTAB 24: VTAB 11: PRINT "Swap "; STR$ (HY); CHR$
    (64 + HX);  [4460]
6130  HTAB 24: VTAB 12: PRINT "and "; STR$ (Y); CHR$
    (64 + X);  [3808]
6300  HTAB 24: VTAB 14: PRINT "Press";: HTAB 24: VTAB
    15: PRINT "Space Bar";  [5608]
6310  GET A$: IF A$ <  > " " THEN 6310  [2207]
6320  GOTO 1000  [659]
48000  IF  LEN (S$) < 39 THEN  PRINT  TAB( (40 -  LEN
    (S$)) / 2);S$: RETURN  [3813]
48010  PRINT S$: RETURN  [1069]
48100  IF  LEN (S$) < 39 THEN  PRINT  TAB( (40 -  LEN
    (S$)) / 2);S$;: RETURN  [4593]
48110  PRINT S$: RETURN  [941]
49000  GET A$: IF A$ <  > "Y" AND A$ <  > "y" AND A$ <
     > "N" AND A$ <  > "n" THEN YN =  INT ( RND (1) *
    9 + 1): GOTO 49000  [7506]
49010 YN = 0: IF A$ = "y" OR A$ = "Y" THEN YN =  - 1  [3633]
49015  PRINT A$  [888]
49020  RETURN  [453]
50000  HOME  [407]
50010  FOR X = 1 TO NX  [1334]
50020  FOR Y = 1 TO NY  [1361]
50030  VTAB 5 * Y - 2: HTAB 5 * X - 2: PRINT "+---+
    "  [3941]
50040  FOR Z = 1 TO 3: HTAB 5 * X - 2: VTAB Z + 5 * Y
    - 2: PRINT "|   |  ";: NEXT Z  [5870]
50050  HTAB 5 * X - 2: VTAB 5 * Y + 2: PRINT "+---+
    "  [4562]
50060  NEXT Y  [688]
50070  HTAB 5 * X: VTAB 1: PRINT  CHR$ (64 + X);  [2580]
50080  NEXT X  [765]
50090  FOR Y = 1 TO NY: HTAB 1: VTAB 5 * Y: PRINT  STR$
    (Y);: NEXT Y  [3099]
50100  RETURN  [573]
51000  HTAB 5 * X: VTAB 5 * Y - 1: PRINT M(X,Y,1);  [3765]
51010  HTAB 5 * X - 1: VTAB 5 * Y: PRINT M(X,Y,4);" "
    ;M(X,Y,2)  [3608]
51020  HTAB 5 * X: VTAB 5 * Y + 1: PRINT M(X,Y,3);  [2354]
51030  RETURN  [457]
52000  GET A$: IF A$ = "" THEN 5200  [2157]
52010  IF  VAL (A$) < 1 OR  VAL (A$) > NY THEN 52000  [3275]
52030  PRINT A$;:Y =  VAL (A$)  [2601]
52040  GET A$: IF A$ = "" THEN 52040  [2190]
52045  IF A$ > "Z" THEN A$ =  CHR$ ( ASC (A$) - 32)  [3275]
52050  IF A$ < "A" OR A$ >  CHR$ (64 + NX) THEN 52040
    [4209]
52060  PRINT A$;:X =  ASC (A$) - 64  [2821]
52070  RETURN  [433]
60060  REM  NEXTY  [887]
```


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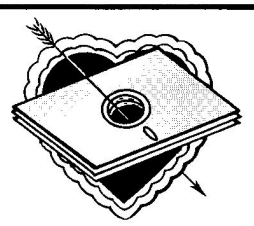

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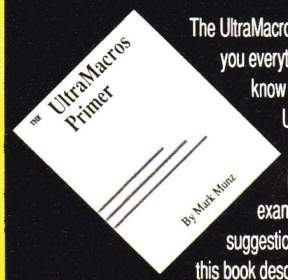

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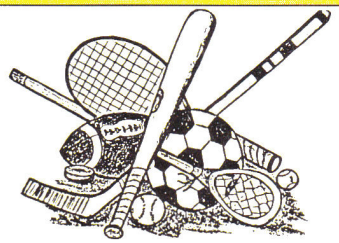

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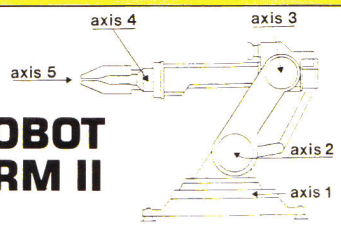

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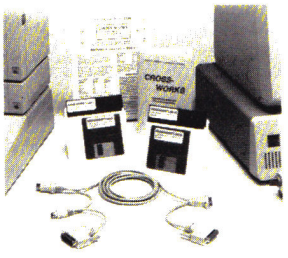

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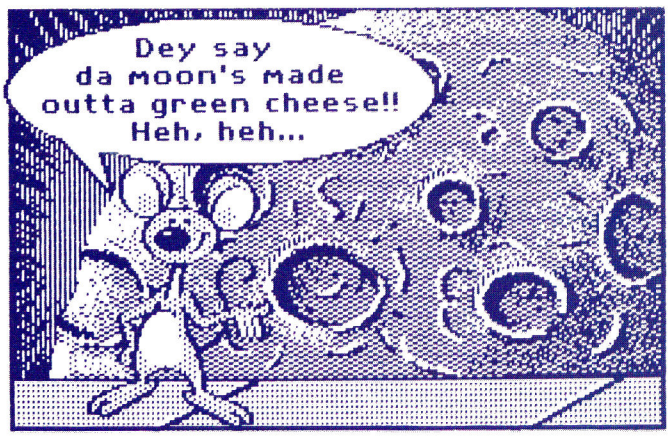

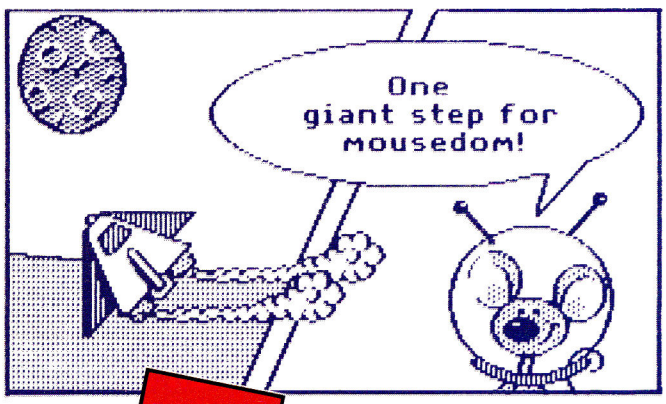

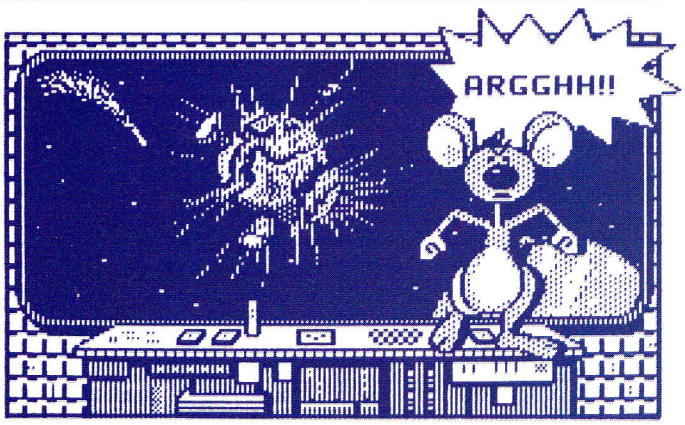

THE BEST PART ABOUT SUNDAY morning is spreading out the paper on the living-room floor and grabbing the comics for a few chuckles—you can lose yourself in the funnies and forget about all the bad news for a while. Well, now you don't have to wait until the end of the week for a little comic relief. Pelican Software's **Pow! Zap! Ker-plunk!** lets you put together your own comics and stories—using different backgrounds, all sorts of whacky clip art, and, of course, a variety of heroes, heroines, and villains. Pick a scene, choose your characters and props, then add speech bubbles to narrate the story—it's as easy as that.

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"Pow! Zap! doesn't have any pictures of my heroes—Calvin and Hobbes," says Review Editor Lafe Low, "but there are plenty of good guys and bad guys to make just about any type of comic you like. It's so easy to use, you may not need the Sunday funnies any more."

The home edition of Pow! Zap! Ker-plunk! sells for $49.95. The school edition, which includes backup copies and a teacher's guide, is priced at $59.95. Pelican has already created additional art disks for Pow! Zap! Ker-plunk!, at $19.95 each. They work with other Pelican programs such as Monsters & Make-Believe, as well. Pow! Zap! Ker-plunk! is distributed by Learning Lab Publishing, Inc., 21000 Nordhoff Street, Chatsworth, CA 91311, (818) 341-9611.□

EDITORS' CHOICE SINGLES OUT ONE PRODUCT EACH MONTH THAT THE *inCider* EDITORS FEEL IS A SIGNIFICANT ADDITION TO THE APPLE II FAMILY OF PRODUCTS. PRODUCTS EVALUATED ARE AMONG THE MOST RECENT RELEASES AND MAY NOT BE AVAILABLE YET FOR RETAIL DISTRIBUTION.

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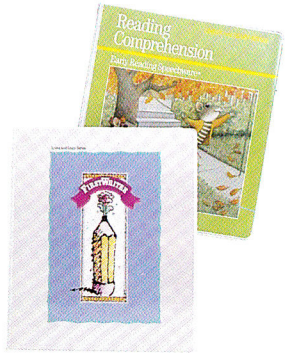

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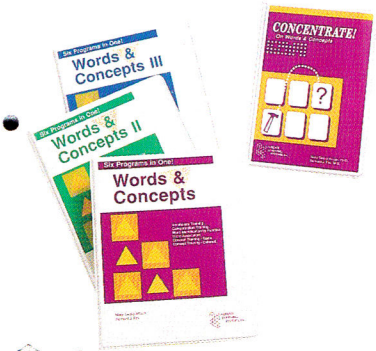

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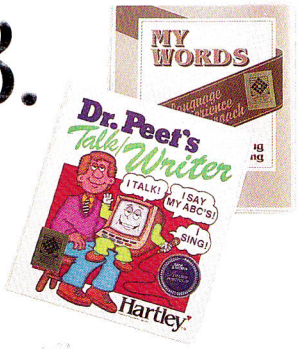

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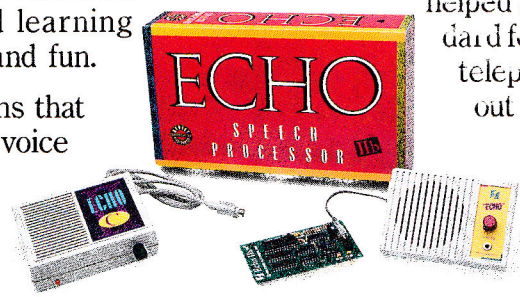

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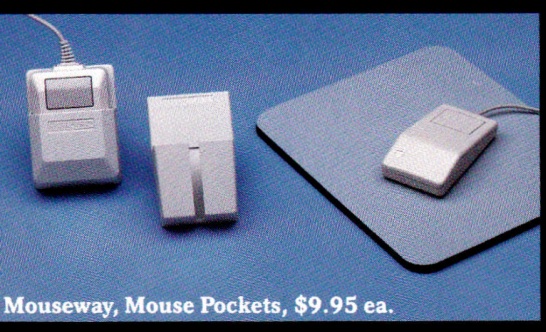

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