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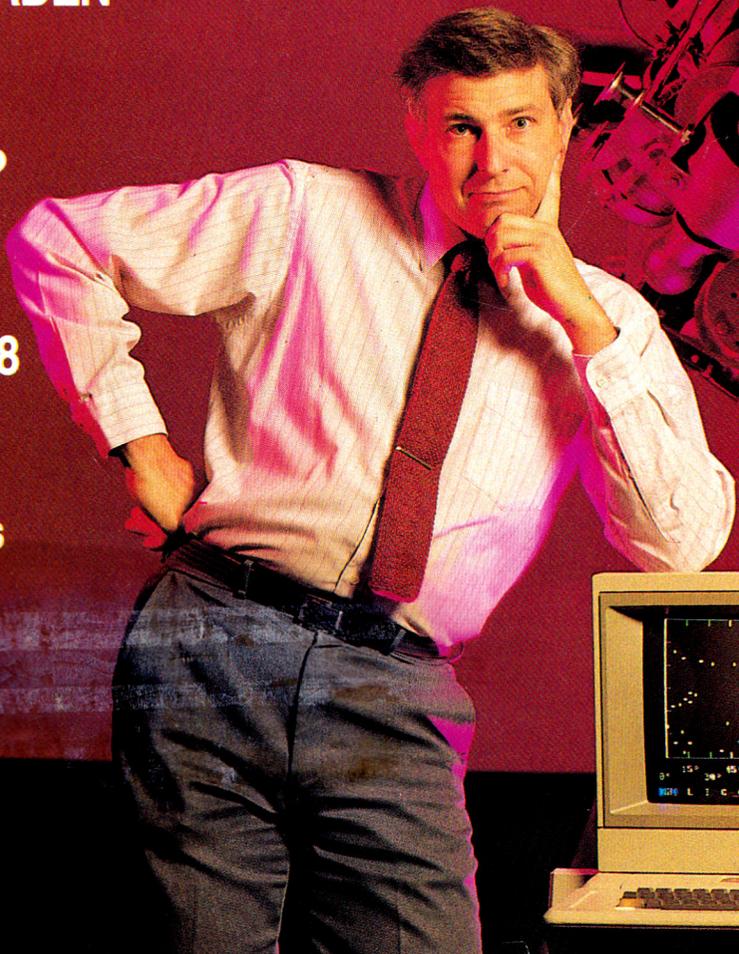
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DO YOU NEED
A ProDOS CLOCK?

HOW TO USE
11Gs MEMORY PG. 78

REVIEWS:

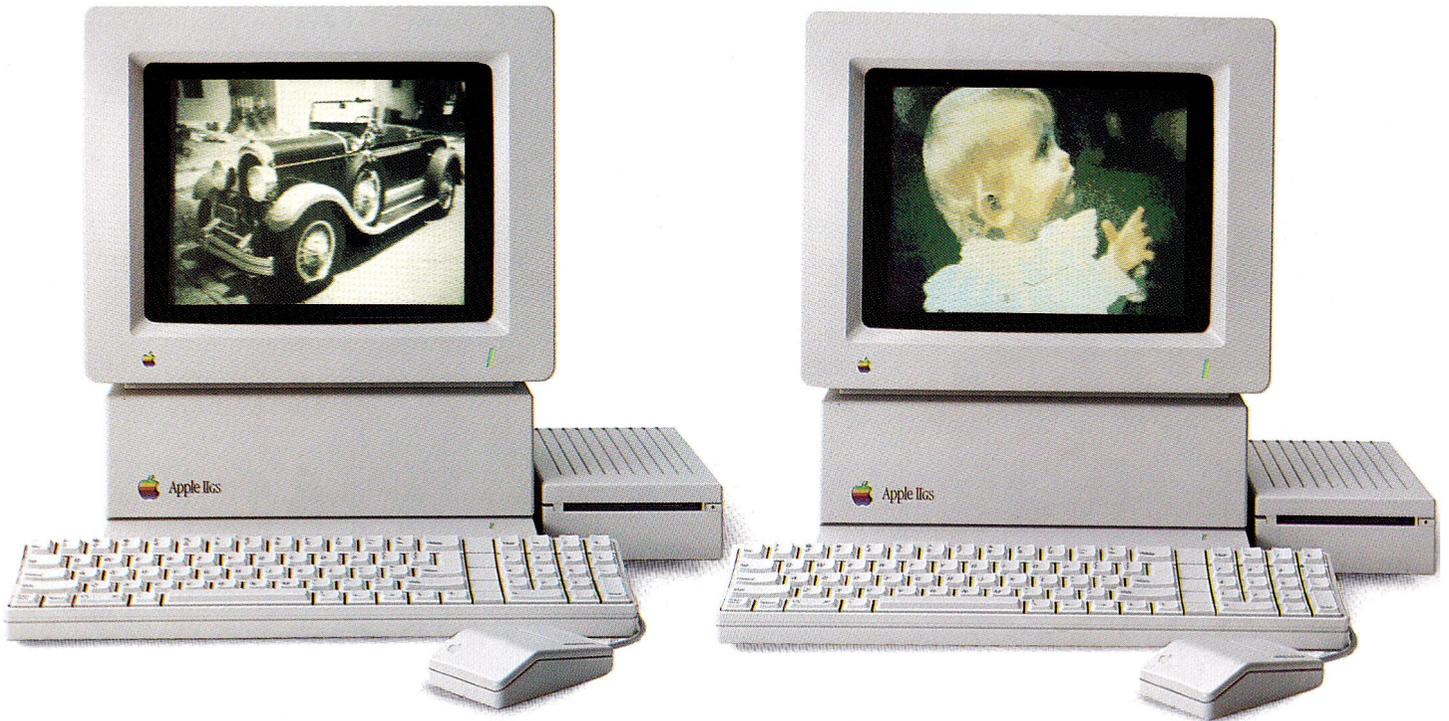
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John Mosley
Griffith Observatory



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- Flush right
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- Headers and footers
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- Indent left and left/right
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For all its capabilities and functions, WordPerfect 1.1 is remarkably easy to learn and use. By utilizing designated function keys and a template, WordPerfect doesn't require you to memorize strings of keystrokes. Features like bold, underline and center are easy to locate and just a couple of simple keystrokes away.

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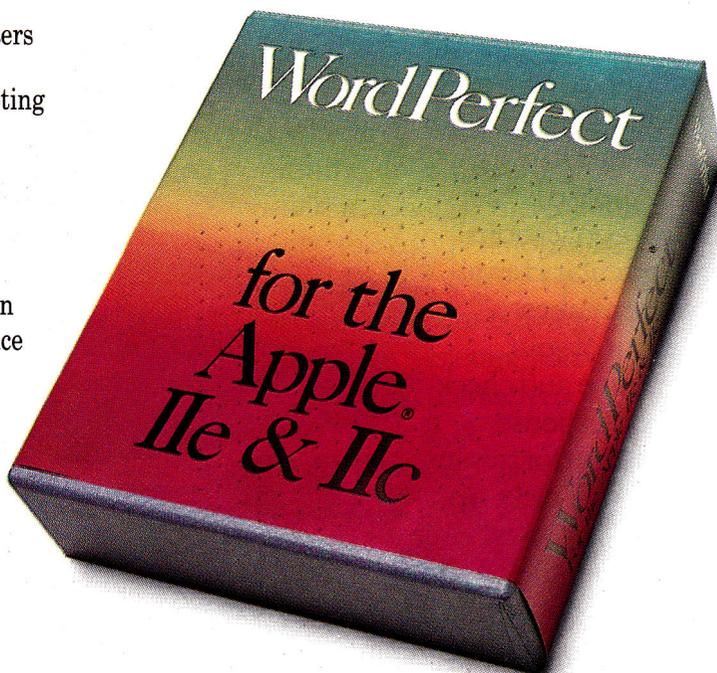
Harvest the Power.

Give your Apple a power boost today. Get WordPerfect 1.1 for the Apple IIe/IIc and IIgs. It's the perfect way to squeeze the most out of your Apple.

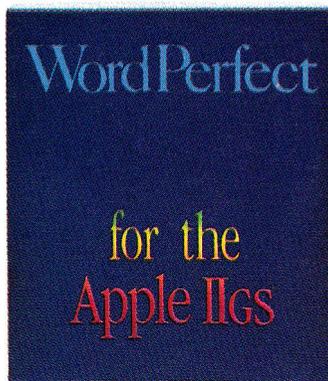
For more information, call or write WordPerfect Corporation, 288 West Center St., Orem, Utah 84057 (801) 227-4000.

*Runs under ProDOS-16.

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If you want power from your IIGs, WordPerfect gives it to you in writing.



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WordPerfect
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*50,000-word dictionary on IIe/IIc.

Spectacular Vernacular.

MultiScribe^{gs}™

StyleWare introduces MultiScribe^{gs}, the first of a new generation of word processors for the 512K Apple® IIgs.™ Like other StyleWare products, this new program was designed for ease of use, versatility and creativity. Using the super high resolution bit-mapped graphics, enhanced processor speed, and expanded memory of the IIgs, MultiScribe^{gs} gives you advanced features such as multiple windowing, color printing and enlarged document size capabilities (print documents as large as memory allows!), creating spectacular writing possibilities.

The hand is almost as quick as the eye!

The fast, easy to use pull-down menus, scroll bars, windows, and dialog boxes of the famous Macintosh™ interface let you change your document as easily as you change your mind. Choose from a variety of type styles, character sizes, fonts, and colors to fit your needs.

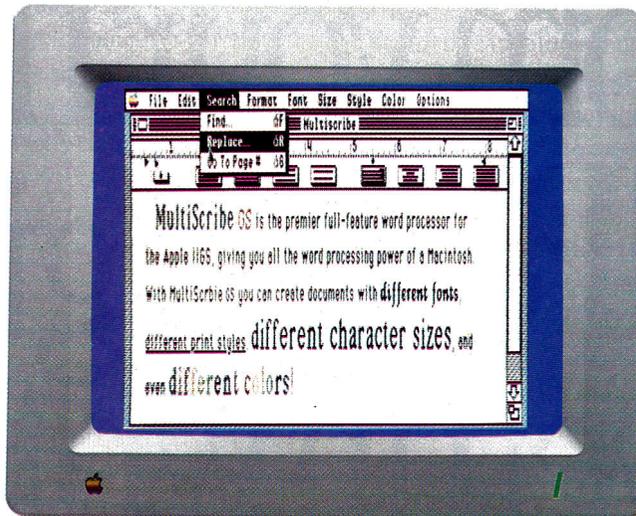
From the screen to the page – without surprises!

Each character size and print style appears on screen exactly as it will when printed. And MultiScribe^{gs} offers near letter quality font-based printing on an ImageWriter II™ and near typeset quality with a LaserWriter™ – giving your work a clean, neat, professional appearance.

Powerfully Professional.

Designed with the serious user in mind, MultiScribe^{gs} is the only word processor you'll ever need for the IIgs:

- AppleWorks™ compatible
- Works with all major Apple IIgs graphics programs including TopDraw and Deluxe Paint™
- Print in color on an ImageWriter II



TopDraw™

For those thoughts that just can't be put into words, StyleWare has created TopDraw. Like MultiScribe^{gs}, TopDraw is designed to challenge the capabilities of Apple's new IIgs. And TopDraw does it with even more color – 4096 colors to be exact!

The shape of things to come!

The first object-oriented graphics program for the IIgs, TopDraw gives you the ability to create drawings based on shapes, or objects, which can be moved, edited and duplicated – giving you virtually limitless drawing potential.

The color of creativity!

Use TopDraw's editing function to edit colors and patterns. Draw with up to 16 colors at once, using color patterns as pen colors or fill patterns, and create millions of color combinations. And because creativity isn't always limited to an 8½ x 11 inch page, TopDraw lets you print your creations up to 8 pages in length and width.

Get serious.

TopDraw is complete with user-defined rulers (metric and English), grids, pens, ellipses, rectangles, rounded rectangles, polygons and freehand objects, horizontal, vertical, diagonal lines, free-form lines, and arcs – and lets you print in multiple colors on an ImageWriter II. And because TopDraw uses object-oriented graphics, its professional-quality LaserWriter output is superior to that of the bit-mapped graphics of paint programs.

Seeing is believing!

See TopDraw, MultiScribe^{gs}, and all the other creative StyleWare products at your authorized StyleWare dealer.

Illustration Sensation.



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ON THE COVER

40—On Screen— Celestial Navigation

You don't have to be a professional astronomer to enjoy the benefits of astronomy software. Whether you want to manipulate the stars and planets or simply gain a better understanding of the heavens, you'll find the sky's the limit with your Apple and the right software.

ARTICLES

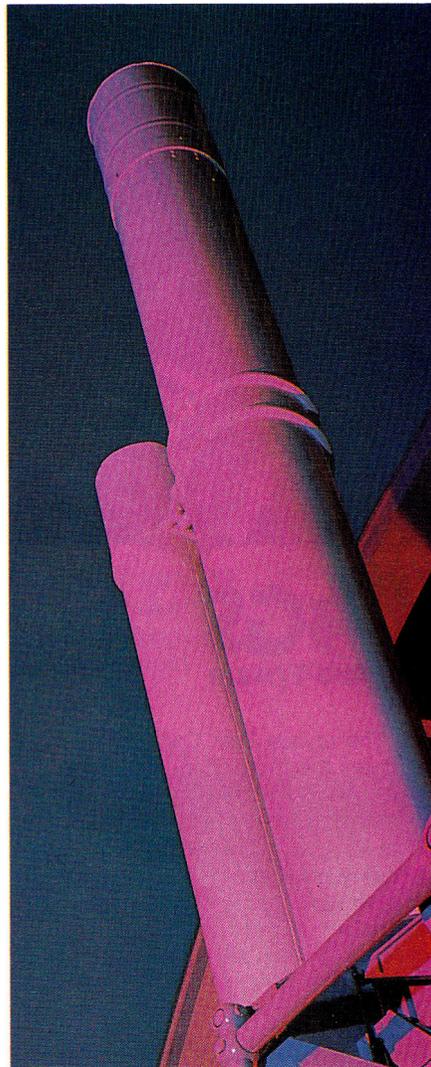
50 Apple's Victory Garden

What do computers have to do with gardening? If your answer is "Not much," then you haven't seen any of these five programs. They'll help you plan a garden and landscape your lawn—and there's even a program to help you identify species of trees.

58 ProDOS Clocks

Does your Apple really know what time it is? It does if you've installed a ProDOS clock. Here's everything you've ever wanted to know about clock cards, including advice on why you might need one.

Featured on the cover: John Mosley, author of "On Screen: Celestial Navigation," p. 40, and the Zeiss Mark IV Planetarium Projector, Griffith Observatory, Los Angeles. The original Zeiss projector, the Mark I, served the Griffith planetarium from 1935 until 1964, when the Mark IV replaced it. As the May 1985 50th-anniversary issue of the Griffith Observer notes, it rather resembles a Brobdignagian ant.



TUTORIALS

AppleWorks in Action	65
Three-Across Mailing Labels <i>by Ruth K. Witkin</i>	
Applesoft Adviser	72
Bug Busters <i>by Dan Bishop</i>	
Mastering the IIgs	78
Tools of the GS Trade <i>by Tom Swan</i>	
Teachers' Choice	83
Creative Play: Tools to Toys <i>by David Goodrum and Joel Robbins</i>	

DEPARTMENTS

inCider's View	8
Teach Your Children Well <i>by Deborah de Peyster</i>	
Letters	10
News Line	16
Spotlight on . . . Running on Apple • More AppleWorks Enhancements • Special Attention • Apples Abroad • Apple Bits	
Status Report	18
Bugs and Bombs <i>by Paul Statt</i>	
Apple Clinic	20
The Name of the RAM • IIc RAM Expansion? • PR#1 and Video, Too • Spitting ImageWriter • SUM Doesn't Add Up • AppleWorks 2.0 Control Codes • End of 80N <i>by Paul Statt</i>	
E.G. For Example	26
Meet the Fake Mouse <i>by Eric Grevstad</i>	
Reviews	30
Award Maker Plus • Principal's Assistant • Quarterback QB-2C • Juice • T-Shirt Shop • The Class Writer • Electronic Writing Workshop • Calliope 128 • Games Editors Play	
New Products	92
Mace on Games	97
Literature as Software <i>by Scott Mace</i>	
Hints/Techniques	100
Number Check • Pedigree Chart • AppleWorks Printing Quirks	
Reader Services	111
Coming Attractions	111
Editors' Choice	112
Shanghai: Tile After Tile	

BENCHMARK RESULTS: 350% FASTER

Than Ordinary Apple IIGS Memory Cards



RamPak 4GS™ Memory Sub-System

Memory Cards can be Dramatically Different

In recent benchmarks, the new RamPak 4GS Memory Subsystem significantly outperformed the Apple memory card and the Applied Engineering GS-RAM card. In tests using Appleworks software, RamPak 4GS increased the Apple IIGS throughput up to 350% compared to ordinary memory cards. Your Apple IIGS runs faster with the RamPak because the exclusive RamPak Memory Management Software reduces the computer's dependence on the disk drive.

Memory Management Software is the RamPak's Secret

Your RamPak comes with our powerful Memory Management Software.

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Our dynamic Cache Allocation feature manages the system memory automatically so your Apple IIGS will always be at peak efficiency. And, it runs great with the standard Apple Ram Disk Utility!

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Available now at your local Apple Dealer

The RamPak 4GS is an important part of any Apple IIGS system. Ask your dealer for the RamPak 4GS and watch your system run up to 350% faster.



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On line 24 hours: (603) 924-9801

inCider (ISSN #0740-0101) is published monthly by CW 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 \$24.97 for one year, \$38.00 for two years and \$53.00 for three years. In Canada and Mexico, \$27.97—one year only, U.S. funds drawn on a U.S. bank. Nationally distributed by International Circulation Distributors. Foreign subscriptions (surface mail), \$44.97—one year only, U.S. funds drawn on a U.S. bank. Foreign subscriptions (air mail), please inquire. **Postmaster:** Send address changes to *inCider*, Subscription Services, P.O. Box 911, Farmingdale, NY 11737. (Send Canadian changes of address to: *inCider*, P.O. Box 1051, Fort Erie, Ontario L2A 5N8.)

Photo & illustration credits: Cover, pp. 41, 42, Cindy Charles; pp. 50, 51, Karl Stuecklen; p. 58, Matthew Foster; p. 59, Imagebuilder Design; pp. 30, 112, Frank Cordelle.

Space Combat Simulation

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DATE: 3 JUNE 2123
 FROM: COMMAND CENTER TERRA
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 CODE: EYES ONLY PRIORITY ONE
 REPORTED HOSTILE ACTION AGAINST MANNED
 INSTALLATIONS CONFIRMED STOP
 ALL VESSELS PROCEED SOONEST INHABITED
 SECTORS TROJAN GROUP STOP
 EQUIP MAX WEAPONS LOAD STOP
 SEEK AND DESTROY ALL UNIDENTIFIED
 MILITARY CRAFT STOP
 THIS IS NOT REPEAT NOT A DRILL STOP
 OPERATION CODE STATUS IS RED STOP
 BEST LUCK STOP

Acceleration presses you deep into your cushioned seat. The ship's hull resonates to the throb of your fusion engines, creating a deep rumble almost below the range of hearing. Speed climbs swiftly. The rocks of the Asteroid Belt hurtle past your viewpoints.

Your apprehension grows....

Until now, a scene like this could take place only in your imagination. If you wanted to picture what it would be like to fly — and fight — in deep space, you could only lean back, close your eyes, and dream.

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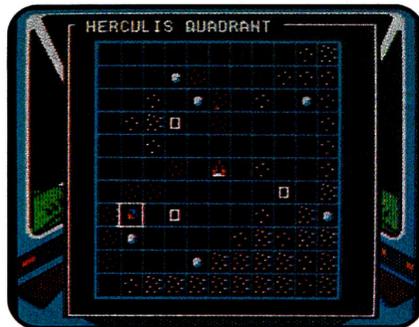
Look-left Dashboard



Forward Dashboard



Look-right Dashboard



Quadrant Map Display



Control Tower View

Sample screens taken from the Apple II.



SIR-TECH

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Sir-Tech Software, Inc.

P.O. Box 245, Ogdensburg Charlestown Mall, Ogdensburg, NY 13669

Look for Deep Space at your favorite Sir-Tech dealer, or call us at (315) 393-6633.

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Teach Your Children Well

by Deborah de Peyster, Editor in Chief



"The level of commitment in the home to computer-aided learning is high."

When most people think of computers and education, they picture a child at a desk in a classroom, with a teacher peering over his or her shoulder. But picture this instead: a child seated at a computer stand in a family room or his or her bedroom with Mom or Dad nearby. That's where most computer-aided learning is happening today.

It's easy to understand why. Most of the support for learning is in the home, not the school. Not only are schools understaffed, but teachers are notoriously underpaid. Financial support for supplies and training is also lacking.

For example, schools have an instructional-supply budget of about \$20-\$30 per student per year, according to Ken Komowski, of the Educational Products Information Exchange, Columbia University. But that money isn't just for computers and software. It covers books, films, videos, and other, more traditional teaching tools. Once a school has purchased that equipment, there isn't too much left over for new software or hardware.

Retailers estimate that a parent, on the other hand, spends anywhere from \$200-\$300 for educational materials the first year he or she owns a computer. Certainly it's easier to learn more when you're getting a steady influx of new, challenging software.

Children in schools don't have ready access to computers. The machines are often housed in a room away from the area in which children spend most of their classroom time. And time spent with the computers is limited. Recent estimates from the Johns Hopkins University Center for Social Organization of Schools report that on average, one computer is available for every 40 students. If that student is in elementary school, he or she spends 35 minutes a week at the computer. If the student is in high school, he or she spends 1¼ hours a week.

At home, the computer is freely available. Sharing computer time at home may mean only three children vying for access, instead of 40 students.

And, finally, the level of commitment to the concept of computer-aided learning is higher in the home than in the classroom. In school, not all teachers are interested in using computers to aid learning. The computer may be there, but not necessarily by the teacher's choice. Many teachers are true evangelists for the use of computers in education, but the majority aren't yet fully behind the concept.

A computer at home, however, is there because the parent put it there. Purchasing a computer required investing not only money, but time and thought, as well. Personal involvement with the machine implies a greater commitment to making the computer useful.

inCider has always valued the role of teachers in education, but at times we've forgotten how important parents are. It's high time we give parents credit for their role in education and help them become even more active and effective.

To aid parents as educators, next month we're beginning a new column called Field Trip, written by Cynthia E. Field. Ms. Field, a regular contributor to *inCider*, will review educational software and tell parents which programs are effective teaching aids in everything from geography to alphabet recognition. Each column will address a single subject, such as verbal skills, and will evaluate programs for 3- to 10-year-olds.

We'll also look occasionally at programs that help parents teach children more complex things that don't fit into the three Rs. We've already found some interesting programs that help parents teach their children about the dangers of drugs, and other principles of safety, such as avoiding strangers, and so on.

We're excited about our new column, and hope you'll be, too. ■

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PWP

Getting Squared Away

The hint for rounding numbers in Applesoft BASIC ("Applesoft Rounding," March 1987, p. 118) is superfluous. The standard method is so easy that no additional hint is necessary. To round a number to the nearest whole, the standard method I've used and taught for years is simply $X = \text{INT}(X + .5)$.

It can be modified to round any decimal position, not just whole numbers, with the expression $X = F * \text{INT}(X/F + .5)$, where F is the rounding factor. For example, to round to the nearest hundred, set F equal to 100, or just use the expression $X = 100 * \text{INT}(X/100 + .5)$. To round to three decimal places (or to the nearest thousandth) use .001 for F, or write $X = .001 * \text{INT}(X/.001 + .5)$.

Suppose you want to round a number to the nearest quarter (.25) or the nearest dozen (12). My method lets you do this easily, as well. To round to the nearest quarter, use the expression $X = .25 * (\text{INT}(X/.25 + .5))$. This rounds to .25, .50, and .75. To round to the nearest dozen, use $X = 12 * (\text{INT}(X/12 + .5))$. This rounds to 12, 24, 36, and so on.

Once again, the rule that applies is $X = F * (\text{INT}(X/F + .5))$, substituting the new rounding value for F. Neither method described in your hint is as easy, or can be expanded to meet these other situations so readily. I find it counterproductive to learn esoteric machine-language programs, or to use fancy PEEKs, POKEs, and CALLs to do things you can do simply in good old Applesoft.

Bill Hooper
P.O. Box 129
Wise, VA 24293

What's so hard about rounding in Applesoft? All you need to correctly round to the nearest integer is the expression $X = \text{INT}(X + .5)$. If you want to round to one or more decimal places, just move the decimal to the right that number of places before adding .5 and truncating, then move the decimal point back to its original position. Thus, $X = \text{INT}(X * 10 +$

$.5)/10$ rounds to the nearest tenth, $X = \text{INT}(X * 100 + .5)/100$ rounds to the nearest hundredth, and so on. This method is simpler and works correctly with negative as well as positive numbers—something Mr. Jones indicates his routine doesn't do.

If even this seems too cumbersome in a program that uses it several times, you can create your own rounding function with `DEF FN R(X) = INT(X * 100 + .5)/100`. Then you can use `FN R(X)` as you would any standard Applesoft function, such as `INT(X)`, or Mr. Jones' `USR(X)` command.

Frances H. Manly
35 Tillinghast Place
Buffalo, NY 14216

It seems that you're making it difficult to round numbers in Applesoft. The basic formula you give is complex, and in my opinion, using machine language is a pain and usually very difficult—it's too darned hard to correct the errors.

Why not simply use the following formula, where N is the number you want to round and the real number 100 is a one with a zero for each decimal place: $\text{INT}((N * 100) + .5)/100$. This works fine for me.

Raymond J. Schuenger, D.V.M.
Thornwood Veterinary Hospital
Box 460 D, Steubenville Pike
Pittsburgh, PA 15205

Taxing Deductions

Martin Blumenthal's notes on "Deducting Your Apple" (March 1987, p. 34) could be misleading as written.

The \$5000 first-year-expense deduction, which will be \$10,000 for 1987, is available provided the equipment is used in a bona-fide business you operate full- or part-time, and which you report on Schedule C. This is known as a Section 179 deduction. With rare exceptions, you can't apply it to the purchase of a computer you use for looking after your investments, even if you make money at it.

Expensing equipment purchases saves a lot of calculation and paperwork over the years, and makes eventual disposal of the equipment

much simpler. Even if your equipment purchases exceed \$5000 of the \$10,000 allowed, you can still expense them up to that amount.

If you also use the equipment for purposes other than business during the year you purchased it, you can expense only the business portion, and, in the case of computers and some other items such as cars, at least 50 percent of the usage must be for business purposes. You can't, as Mr. Blumenthal implies, claim any benefit under Section 176 for a computer you use less than 50 percent for business. You may be able to depreciate a computer you use less than 50 percent for business purposes, but don't try to do it yourself if you need general hints such as those provided by Mr. Blumenthal or myself.

Don't attempt to use any expensing or depreciation procedure without checking the details with a tax consultant or at least a good manual. For those with basic accounting knowledge, I recommend IRS publication 334 (Rev. November 1986), *Tax Guide for Small Business*, available free from the IRS. If you can't understand it, you'll probably need a tax accountant. The guide contains full details and worked examples of Section 179 deductions on pages 36 and 37.

Paul D. Hobson
1306 Kensington Avenue
Oshkosh, WI 54901

Dates and Times

I've just received AppleWorks 2.0, and was looking forward to having my new Apple IIgs load it all into memory and time- and date-stamp my files from my GS time clock. Surprise, surprise—the new AppleWorks comes with ProDOS 1.1.1 and doesn't support the IIgs time clock. After hours of effort, I finally managed to install ProDOS 8 on my AppleWorks disk.

To install ProDOS 8, use your System Utilities disk first to delete ProDOS from AppleWorks. Then copy the file named P8 (ProDOS 8) from your System Utilities disk to your AppleWorks disk with the pathname `/SYSTEM.DISK/SYSTEM/P.8`. Rename

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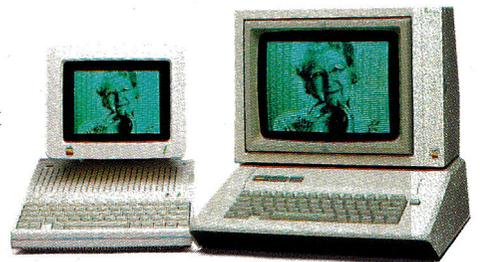


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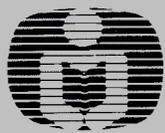
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LETTERS

the P8 file on your AppleWorks disk PRODOS. The new ProDOS looks for a file named Startup, so create the following program from BASIC and save it to your AppleWorks disk under the name Startup:

```
10 D$ = CHR$(4)
20 PRINT D$;"-APPLEWORKS
   /APLWORKS.SYSTEM"
```

This lets your clock set the date and time-stamp all your files, and lets you set the speed from the control panel.

Dean Lane
R.R.#2, Box 246
Newton, IA 50208

Logo Aid

Your readers noted an error in my Apple Logo II program, TransAid ("Learning Languages with Logo," November 1986, p. 101). The TRANSD.LOG program (Listing 4) is one with which I was still experimenting, and contains a bug I introduced inadvertently while trying to add some new features.

In three places in that listing I used the phrase MAKE "R (LIST UPPER-CASE FIRST RL). The primitive RL (for READLINE) returns an empty list ([]) if you press Return with no other keyboard entry, a problem because FIRST can't deal with an empty list. The correct approach is to check for an empty list before using the FIRST primitive. To fix the problem, substitute patches A', B', and C' for A, B, and C in the GET.NEW.DEF, DEL.FM.DIC, and ADD.TO.DIC procedures.

Glenn Thomas
4 Washington Circle
Alexandria, VA 22305

Best of Both II Worlds

The letter from Dr. Ken Flippo (February 1987, p. 8) warrants further comment. I've owned a 128K Apple IIe for four years or so, and one might argue that I have an advantage over Ken in the ability to upgrade. When I began to investigate this possibility, however, I discovered that the GS upgrade for the IIe is a poor economic decision in most cases.

The current cost of a complete, brand-new Apple IIgs system is less than \$3000. The cost of a reasonably comparable IIe upgrade (including RGB monitor, UniDisk 3.5, and mouse) is well over half the cost of a brand-new system. Furthermore, the

upgrade leaves you with still only one computer.

Growing families, growing needs, and growing computers have created a place for the second computer, the option I've chosen. Our new IIgs runs the IIe software I've accumulated over the years (more than \$1000 worth), and I've moved the old workhorse to the kids' room for schoolwork and games.

I'd ask "orphaned" IIc owners to consider themselves no worse off than IIe owners. The upgrade expense doesn't make sense anyway. A new computer may make sense in some situations. I can't imagine how an Apple owner could consider switching to IBM. Dr. Flippo's software investment in his IIc would be lost by such a system change. Why not keep the IIc with all its software, and add the IIgs as a second, compatible system?

B. Paul Choate, M.D.
17530 Pond View Place
Colorado Springs, CO 80908

IIc Owners Aren't Left Out in the Cold

For the last several months, I've been following the letters about the Apple IIgs with great interest. It seems that they can be divided into three main groups—those from people who think it's the greatest thing since sliced bread, those who think, "Why leave my IIc, II Plus, or II out in the cold?" and those who think "Who needs it?"

I own an Apple IIc and use a II Plus at the office, so most of these people are like me: They can do a great deal with their current machines, but they're constantly lusting after a little more. I haven't yet found a business task I couldn't do on one of the Apples to which I now have access, although I sometimes have to work at home on my IIc, which I've expanded to 640K. I plan to purchase another computer, though, because, as a hobbyist, I've come up against the limits of an 8-bit machine a little too often.

I intended originally to purchase one of the non-Apple, 68000 machines, such as an Atari or an Amiga, and keep my IIc because of my large software investment in that machine. Even though there's no upgrade path for the IIc, I applaud Apple for making the IIgs compatible with existing software. This makes it possible for

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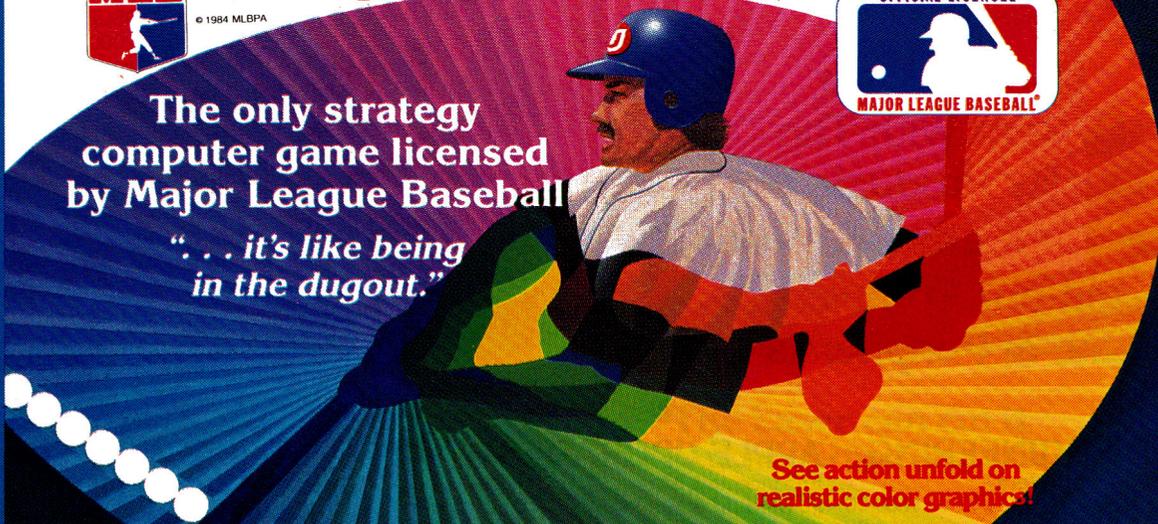


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me to sell my IIc, upgrade to a 16-bit machine, keep my software, and stay with a company I know and trust.

For an industry that's developing so rapidly and making the latest technology available so quickly, I find even that degree of compatibility amazing. To go one step further and offer an upgrade to IIc owners is incredible. Are we already so spoiled as to demand complete compatibility, easy upgrade, low price, and the latest technology?

The IIgs isn't the perfect machine—there are other machines that are faster and less expensive. All things considered, though, I feel neither left out in the cold nor that I have anything for which to apologize. It's just time for me to continue pushing my computing skills as far as they'll go, within the framework dictated by my pocketbook.

James L. Gibson
81-400 Green Avenue
Indio, CA 92201

Just in Case

The "On n GOTO" hint by Edwin D. Thompson (February 1987, p. 120) elegantly handles an uppercase or lowercase reply, but not the possibility of either. Here's a routine that quickly tests an answer for both upper- and lowercase without using IF/THEN statements:

```
10 AN = 1 + ((ANS$ = "Y") OR (ANS$ = "y")) + 2 * ((ANS$ = "N") OR (ANS$ = "n")): RETURN: REM Subroutine to test if "Y" or "N" key was pressed
```

```
1000 PRINT "DO YOU WANT TO SAVE THIS DATA (Y/N)?"
1010 GET AN$: GOSUB 10: ON AN GOTO 1010, 2000 (Line number if "Y"), 3000 (Line number if "N")
```

This subroutine returns the following values for AN: 1 if no key was pressed, 2 if the Y key was pressed, and 3 if the N key was pressed.

In my database programs, where I enter most of the data in lowercase, this routine obviates depressing the caps-lock key when answering a programmed (Y/N) question.

For use with menus, the subroutine is even shorter, and your Apple can make further key checks if you add more keys to the algorithm as follows:

```
10 AN = 1 + (ANS$ = "1") + 2 * (ANS$ = "2") + 3 * (ANS$ = "3")
```

James A. Ronson
11 South Kingslea Drive
Toronto, Ontario
Canada M8Y 2A2

inCider welcomes readers' comments regarding articles, letters, or other topics of interest. We reserve the right to edit letters for clarity, style, and space. Please address your correspondence to Letters, inCider, Elm Street, Peterborough, NH 03458.

CORRECTION

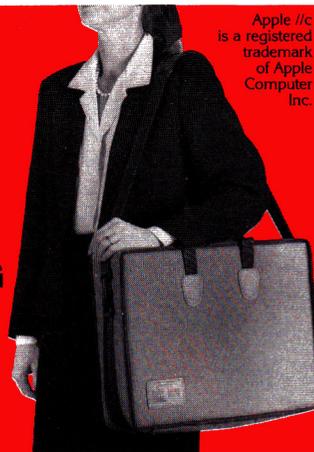
Aliens scrambled the telephone number of the Cyberpunk bulletin-board system in March's News Line (p. 12). You can beam up Cheap Truth at (512) UFO-SMOF—that unscrambles to (512) 836-7663.

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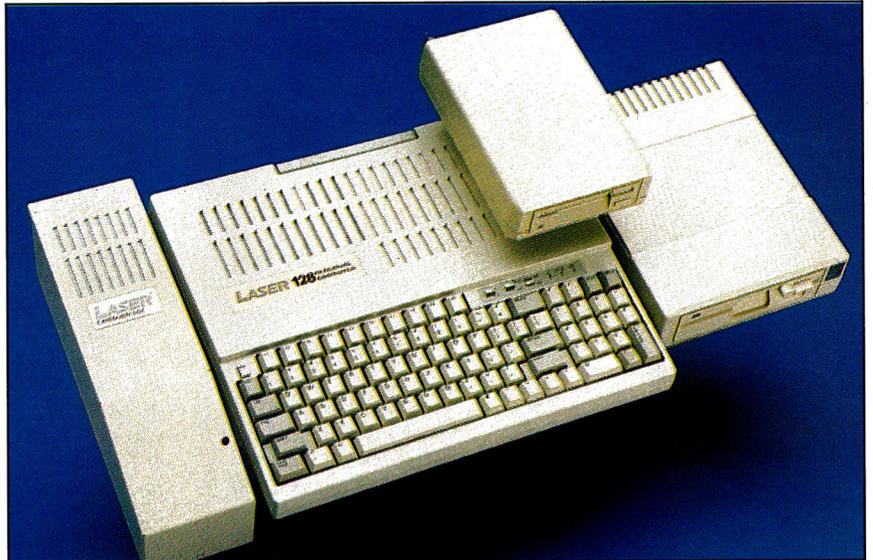
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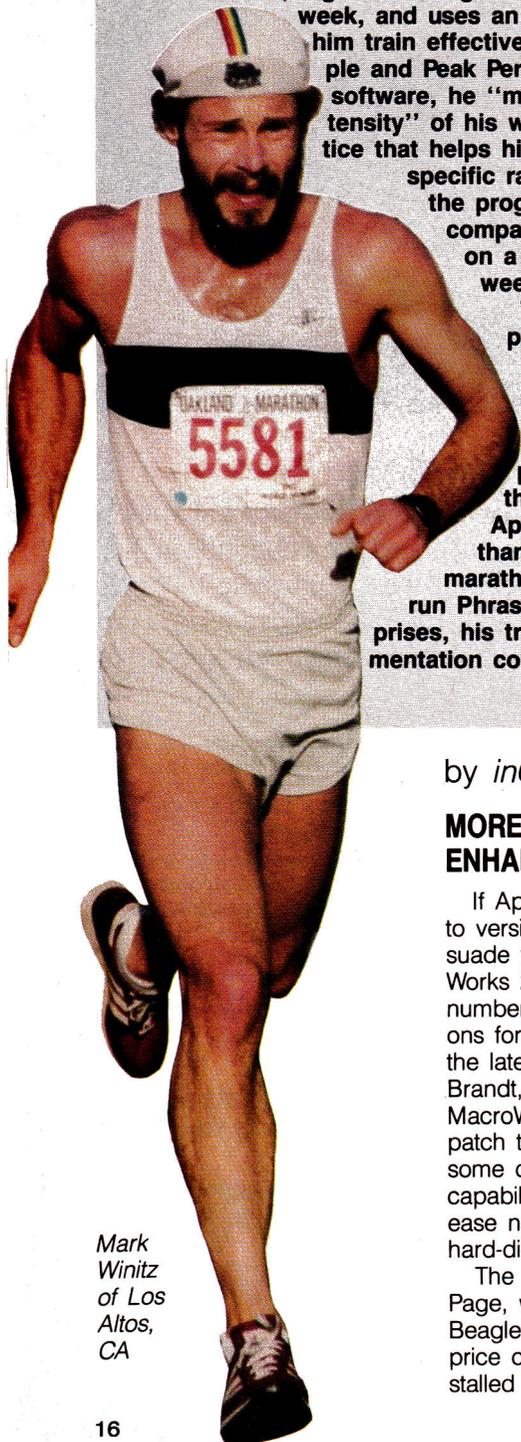


SPOTLIGHT ON . . .

RUNNING ON APPLE

Running and Apple computers are a natural combination to Mark Winitz. Winitz is a veteran of 20 marathons, logs an average of 70-80 miles a week, and uses an Apple II to help him train effectively. With his Apple and Peak Performance: Run software, he "measures the intensity" of his workouts, a practice that helps him peak for specific races. Winitz says the program lets him compare stress levels on a day-to-day and week-to-week basis.

The computer approach seems to have paid off: Winitz' best time in a marathon is an impressive 2:48. By the way, Winitz' Apple does more than prepare him for marathons: It helps him run Phrasemaker Enterprises, his training and documentation consulting business.



Mark Winitz of Los Altos, CA

by *inCider* staff

MORE APPLEWORKS ENHANCEMENTS

If Apple's improvements to version 1.3 didn't persuade you to get AppleWorks 2.0, the growing number of third-party add-ons for 2.0 might. Two of the latest come from Randy Brandt, author of Super MacroWorks; there's a patch to give AppleWorks some desktop-publishing capabilities, and another to ease navigation through hard-disk directories.

The first, called Variety Page, will be marketed by Beagle Bros at a tentative price of \$49.95. Once installed on your copy of

AppleWorks 2.0, it lets you print word-processing documents in two columns, changing timesteps between paragraphs (on ImageWriter printers) by downloading fonts from Beagle's Power Print. Another embedded command lets you insert graphics from Broderbund's Print Shop or disks of Print Shop clip art.

Variety Page will "probably just keep it real simple," Brandt told *inCider*, with one standard size for printed images, "although you can have two [images] in memory at a time, so a new picture can start in the right column halfway down a picture on the left side. Unlike some others that do a straight graphics dump and are pretty slow, we're trying to optimize this for normal text speed."

Brandt plans to sell his other new product, Pathfinder, himself (JEM Software, P.O. Box 20920, El Cajon, CA 92021, \$20). It replaces the "Format a blank disk" option on AppleWorks' Other Activities menu, letting you climb in and out of subdirectories by picking them from a menu instead of typing the full ProDOS pathname.

"The idea is to make it really quick for zipping in and out of directories with a few keystrokes," Brandt said, adding that Pathfinder is compatible with all the rival AppleWorks add-ons he's tested, as well as his own. Brandt plans to contact hard-disk manufacturers about bundling Pathfinder with their systems.

Does Brandt's starting his own company indicate an exit from Beagle Bros, like that of fellow AppleWorks experts Alan Bird (AutoWorks, Program Writer)

and Mark Simonsen (FontWorks) in starting The Software Touch? "Not at all," he said. "Variety Page is going to be a Beagle product, but Mark is doing the printer drivers for it. Alan did the Beagle Compiler. There's a lot of interaction."

"I plan to stay with Beagle for big projects, but do small ones with JEM Software; I have ideas for a couple of other products like Pathfinder that are really too small [for] a Beagle disk and too good [as] a throw-in on the back of another disk." With such camaraderie among competitors, and with Beagle Bros becoming not only a leading software publisher but a famous-alumni association, AppleWorks users and customers should wind up the real winners. —E.G.

SPECIAL ATTENTION

Computers can open doors for the disabled, and Apple has formed a special division devoted to making that happen as often as possible.

Apple's Office of Special Education serves several functions, according to Program Director Alan Brightman. The first is to create an awareness of what disabled people can do with the help of computers. By helping nondisabled people understand and accept the opportunities computers offer disabled users, Brightman says he hopes to change the way handicapped people are perceived.

A second major role of the office, according to Brightman, is to answer questions. The special-education division receives 300-400 calls and letters a day inquiring about programs and technical assistance. The office maintains a BBS (called Apple) on Specialnet to "help people find solutions" to their special-education and computer problems.

The office also encourages third-party developers of equipment for the disabled to promote their products. Through Apple-Link, dealers can access a database of all types of special-education materials, including hardware, software, and peripherals, as well as publications and organizations.

The Office of Special Education works closely with product development at Apple, so that designers will be aware of the needs of the disabled as they create hardware and software. For instance, with its sound turned down, the Macintosh flashes error messages instead of beeping—a boon to deaf users.

"You hear 'Computers can change your life,' and most of the time it's just hype," Brightman explains. "For disabled people, whether they're in attendant care, a hospital, or at home, computers *can* change their lives." —L.L.

APPLES ABROAD

Citizens of France are known for their sophistication and good taste, so it's not surprising that French computer enthusiasts buy a lot of Apple IIs.

According to a recent report in the *Intelligent Elec-*

tronics European Monitor, a London-based trade publication, 30,000 Apple IIs were sold in France last year: That's 57.7 percent of the total (52,000) sold in Europe.

The Macintosh also seems to be catching on in Europe, particularly in France. Apple sold 28,120 Macs in France—37 percent of the 76,000 systems sold in all of Europe.

In 1985, more Apple IIs (83,000) and fewer Macs (44,000) were sold in Europe as compared to 1986. France again dominated in number of machines purchased. So what's the French secret?

According to *Intelligent Electronics*, it's the marketing *savoir-faire* at Apple France: keeping distinct two different types of dealers, "Mac authorised dealers, clearly positioned in the professional market, and Apple II authorised dealers—including some very significant mass merchandisers and the more traditionally hobbyist dealers."

The success of Apple France is in part the work of Jean-Louis Gassée, a vice-president at Cupertino, California-based Apple Computer Inc. Gassée is committed to keeping the Apple II and Mac lines separate while maintaining "peripheral compatibility and data compatibility." In the U.S., though, Apple continues to work through authorized Apple dealers, who sell Macs as well as IIs. —P.S.

We're always looking for news of the Apple world. If you're making news, send your press releases and photographs to News Line, inCider, Elm Street, Peterborough, NH 03458.

APPLE
BITS



■ What do you do after you build the world's most popular microcomputer?

Steve "Woz" Wozniak is studying for his secondary-school teaching certificate. We hear it's his own kids Woz wants to instruct.

■ You may see a **GS "programming environment"** along the lines of MacApp, long before you see a 16-bit BASIC. It should let you use all Apple's tools, but it won't come from Apple.

■ Apple claims it can compact the **disk-based tools** on the IIGs System Disk even more—no more waiting for GS software to boot. Why didn't they do it that way in the first place?

■ Apple fixed the **GS video chip**—hurry back to the dealer where you bought your GS if you still can't read double-hires graphics screens.

■ AppleWorks users who want **desktop accessories**, but don't like having to keep a separate disk just for them in drive 2, should see an alternative to Pinpoint from The Software Touch before Christmas.

■ It's true: AppleWorks 2.0 and a **IIGs** can print on the **LaserWriter** without modification.

■ Apple Writer/LaserWriter guru Don Lancaster and other experts are on line with a **national independent PostScript BBS**, The Swap Shop II (2504 Sycamore, Bay City, TX 77414, modem phone 409-244-4704). There are lots of other subjects and special-interest groups as well as advice and a resource library for Adobe Systems' page-description language PostScript.

■ **Broderbund Software** will soon introduce some games in broader markets, and at costs lower than usual for the San Rafael, California, publisher. Mindscape and Spinnaker have already done the same.

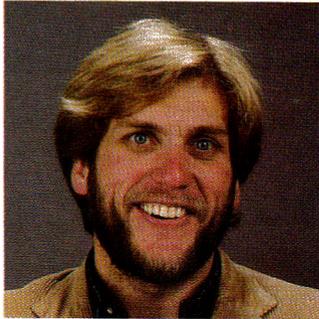
■ The **write-protect switch** on some 3½-inch disks won't work with a UniDisk 3.5 disk drive and the Apple IIGs running ProDOS. Check with your dealer—the Apple 3.5 Drive works fine.

■ If you waited a long time for your new **GS**, or are still waiting, it may be because Apple wanted to flood **schools** with its high-speed Apple II before selling to other consumers. That strategy may also explain Apple's lackluster ad campaign for the GS last Christmas, as well as the delay in the IIe-to-IIGs upgrade.

■ Megahaus cancelled its professional desktop-publishing program, **PageWorks**, in the spring, and has no plans for new GS software. The company still sells MegaWorks, ReportWorks, and ThinkWorks.

Bugs and Bombs

by Paul Statt, Technical Editor



“Sometimes the consequences of software failure are deadly.”

What was the last program you wrote that ran perfectly the first time? That’s not an idle question. Even if you’ve never written a line of code in your life, software reliability is important. You may wonder why none of your programs works perfectly. None does, and sometimes the consequences of failure are deadly.

I wrote a perfect program once. It’s two lines long and prints on screen one fact about my computer:

```
10 PRINT "THE APPLE II IS GREAT"
20 GOTO 10
```

Longer programs do more interesting things because they break the strict sequential order of walking through line 10, line 20, line 30, and so on. What makes my two-liner even remotely interesting is line 20’s GOTO statement, which circumvents the linearity of the program.

More interesting programs add other non-linear statements. In BASIC, GOTO, GOSUB, and IF/THEN statements break the monotonous flow of the program from line to line.

Computer languages need control structures such as GOTO, GOSUB, and IF/THEN. To accomplish different tasks at different times, a program has to call some other part of itself. The more control structures a program uses to loop (GOSUB) or make a decision (IF/THEN), the more flexible it is and the better it responds to “real life,” in which, as you know, anything can happen.

But a larger, more structured program is also a fussy program: It doesn’t like to be touched. A working computer program is something like a “solved” Rubik’s Cube. It looks simple and coherent, but you can’t change the smallest part without changing everything else.

Control structures are a program’s Achilles heel as well as its strong arm: Programming errors called bugs almost always crawl into a program around a looping or conditional control structure. If I’d written the following line 20 by mistake, for example, my program would have stopped before it started:

```
20 GOTO 100
```

The solution here is obvious (replace 100 with 10), but in a larger program it might not be. I might have tried to add line 100: 100 PRINT “THE APPLE III IS GREAT”

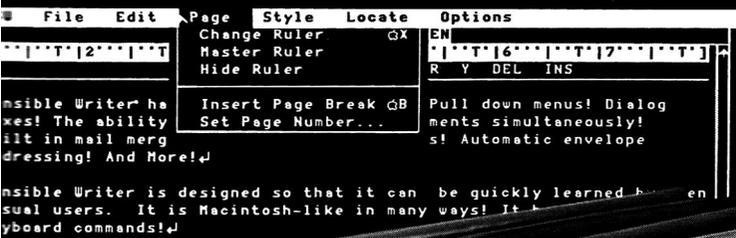
Debugging, or fixing errors, in real programs with hundreds or thousands of lines is real work and especially frustrating because, as in the statement above, every correction carries within it the seed of another bug. Because almost every line in a large program refers to other lines, you have to be very careful about changing a program.

The more powerful the program, the more sensitive it is; the more you try to fix a program, the more can go wrong. These two paradoxes of programming make it all but impossible, even in theory, to write a program that works perfectly under all conditions.

Testing is the only hope for producing reliable software: If you write a telecommunications program, you test it on every machine you can, with all kinds of modems and serial cards, with every printer you can find, with CompuServe, Dow Jones, and The Source, with Ma Bell and Acme Bell. The point is, you have to test it in the real world because you can’t prove logically that a program works.

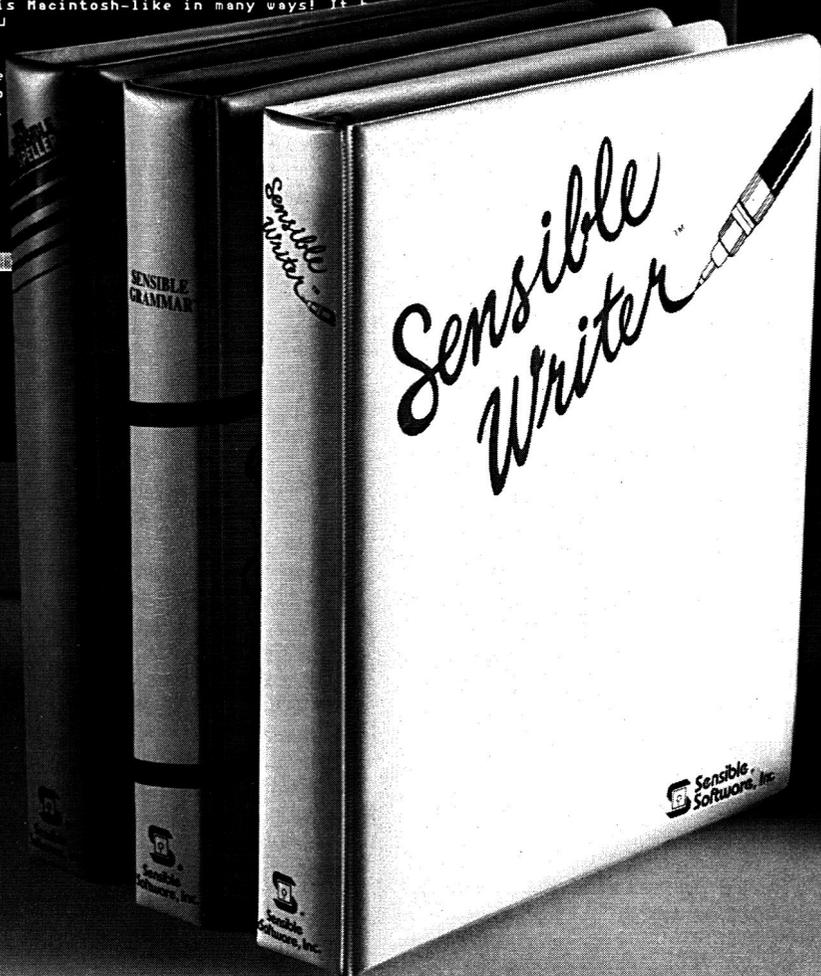
Is using a program “for real” the only possible way to test it? It is now, but I hope it isn’t always. The so-called Strategic Defense Initiative, “Star Wars,” with its 10 million lines of code, hasn’t been tested and can’t be tested short of nuclear war. Current Star Wars tests are about as useful as testing telecommunications between two computers in your living room—it’s not real life.

Would you bet your life that you could send an ASCII file from your computer to mine, on the first try, with no mistakes? I wouldn’t, and that’s why I’m not betting on the reliability of Star Wars and its inherently ticklish software. ■



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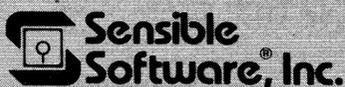
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Stedman's Medical Dictionary, **Sensible Technical Dictionary™** and **Black's Law Dictionary™** are available separately on diskette for use with the **Sensible Speller**. Each is \$39.95. **Sensible Speller ProDOS** now allows you to merge the dictionaries together.



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Circle 84 on Reader Service Card.

by Paul Statt, Technical Editor

Apple Clinic is a forum for discussing Apple II hardware, software, and related subjects. If you have questions or answers, or want to make a statement, write to Apple Clinic, inCider, Elm Street, Peterborough, NH 03458.

The Name of the RAM

I have two questions about the RAM disk on my 128K IIc. In ProDOS, if you CATALOG, S3, you get the listing of the volume /RAM DISK. But when you use the SYS.UTILITIES disk, you get the message VOLUME NOT FOUND. Why not? And how can I transfer a binary file to RAM and use it at will?

Anthony S. Curro
New York, NY

I've been writing a program that uses a great number of small text files. My problem is the time-consuming disk access a program like this requires. To speed things up, I decided to put the text files on a RAM disk. But I encountered a problem when I tried to execute a line such as the following:

```
100 PRINT CHR$(4) "BSAVE/RAM  
/TEST,TTXT,AS$2000,L11800"
```

This line seems logical to me and doesn't offend BASIC, so why does it return a PATH NOT FOUND error?

Don Pelegrin
Green Bay, WI

The extra 64K of random-access memory (RAM) in the IIc and enhanced IIe can be used as a disk drive, or RAM disk, if you're writing your own ProDOS program or using one that recognizes it. The Apple IIc System Utilities disk is an example of a program that doesn't know the RAM disk exists; the ProDOS Filer is one that will work with the RAM disk.

If you use the ProDOS Filer with your IIc, you'll find your RAM disk at once. If you're planning to do much programming, the Filer fits your needs better, anyway. (If you have a IIe, you're in luck—you never have to worry about the System Utilities.)

Using /RAM as a disk drive is easy enough. When you write a BASIC program and want to save it to /RAM, you treat it just like any other disk drive:

```
SAVE /RAM/PROGRAM  
or  
SAVE PROGRAM,S3,D2
```

It's saved, but only until you turn the machine off or reset.

Saving a file of another type—TXT (text), SYS (system), AWP (AppleWorks word processor), AWD (database), AWS (spreadsheet), or even a BIN (binary) file—is tougher, but not impossible, as I learned after hours of trial and error. The problem with line 100 above is that you can't save a file as a text file until you create it; that is, you need line 99 before it:

```
99 PRINT CHR$(4) "CREATE  
/RAM/TEST,TTXT"
```

With ProDOS you can easily use the Ttype command to change file types, but you must first create the file to change it. You can use the CREATE command in ProDOS to do so, but be careful: Unless you tell it not to, CREATE sets up a subdirectory file. The trick to saving a ProDOS file of any type is to create it before you use it, and to make sure you create the right type.

IIc RAM Expansion?

I own a IIc. I'm interested in expanding its memory, but I can't figure out whether various cards will support AppleWorks, or whether everything will run faster with expanded memory. The ads all tout the boards' AppleWorks compatibility, but AppleWorks isn't the only program I run. Do these cards increase clock speed or just add RAM? Do you need special software, or just install the hardware and boot up your program?

Steve Huffstutler
Holland, MI

A RAM-expansion board doesn't make the microprocessor run faster. No micro magic can make the IIc's 65C02 processor address more than

64K of RAM at a time. Clever programmers can make the 65C02 address more than one 64K bank, one after the other, so fast that you'd swear it was working with 128K. Your IIc has two 64K banks of RAM and "bank-switches" between them. (See "Pumping Up the IIe," May 1987, p. 44, "Two Roads to Memory Expansion," August 1986, p. 46, and "Thanks for the Memory," December 1985, p. 18, for more information.)

A megabyte of memory (1024 kilobytes) means 16 more banks of 64K each. If an Apple IIc program were to use all that memory, it would need to switch 18 banks of RAM around, fast.

Multiple bank switching is relatively easy with two banks, but only theoretically possible for 18. Most Apple II programs today are written for the 128K Apple IIc, IIe with extended 80-column card, or enhanced IIe—that is, for machines with two banks.

But RAM-expansion boards exist because programmers can modify software to use more than 128K. Applied Engineering and other companies provide a software patch for AppleWorks; Apple has modified its later versions of AppleWorks to use its own RAM-expansion scheme.

The RAM-expansion business mostly involves AppleWorks. Applied Engineering will give you a software patch for certain other programs when you buy a RAM board, but you have to ask.

Memory expansion works best with AppleWorks. It requires special software unless you buy AppleWorks and an Apple memory-expansion card (or Applied's RamFactor or AST's SprintDisk). It can't speed up program execution.

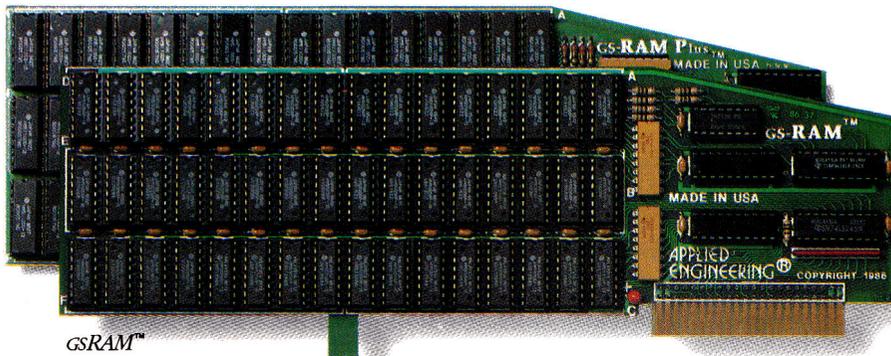
PR#1 and Video, Too

At the Portage Community School we have an ImageWriter I connected to a IIc. Our problem occurs when students print their BASIC programs and run them with the printer turned on. As soon as they turn on the printer by typing PR#1, the Apple sends all output to the printer and the students can't read anything on the video monitor. They have to resort to reading the paper printout to see

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Steve Wozniak, the creator
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what to do next in the program. Is there any way around this problem?

Ralph Ciolkosz
Portage, WI

How many readers have fond memories of the old days of computing, when you wrote your program, ran it, and then looked at the printout to try to figure where you went wrong?

PR#0 turns the printer off, and the Apple starts sending its message to the video monitor again. If your program involves getting input from the screen and passing it to the printer, you probably want to be able to read the screen while you're typing, say, your name. You need a program like this:

```
10 PRINT "What is your name?"
20 INPUT A$
30 PR#1
40 PRINT "Your name is "A$
50 PR#0
60 GOTO 10
```

The idea is to simply use a PR#1 at the point in the program where you want the output to go to the

printer, and PR#0 when you want output to return to screen—to get more input, for instance.

Is it possible to direct output to the screen and the video display simultaneously? I've heard that Integer BASIC allowed it in older Apples. Please write to Apple Clinic if you know how to do this.

Spitting ImageWriter

Whenever I print text on my ImageWriter, every other line is printed very faintly for about two pages, but after that everything prints normally. The problem can be rectified by printing in bold, but then the darkness of the lines varies. The problem is baffling because it affects only text—hi-res screen dumps work fine—and only every other line at that. I tried replacing the ribbon and cleaning the printhead, but nothing seems to work.

Gary Solomon
Providence, RI

A design feature of your printer may be causing the bug.

The ImageWriter II is fast in part because it's bidirectional: It doesn't print the way you would type, finishing one line and going back to start the next. That's the plodding way parallel printers work. The ImageWriter prints like a horse ploughing a field: At the end of each line it turns right around and prints the next from there, backwards.

The ImageWriter often prints better in one direction than the other. Unfortunately, there doesn't seem to be a solution.

SUM Doesn't Add Up

While editing a spreadsheet file in AppleWorks 2.0 the other day, I found a bug.

I had the formula @SUM(D4...D19) in cell D21. It worked perfectly, but failed to add up when I deleted the last cell to be calculated (D19); cell D21 displayed an ERROR message. But I can delete any cell from the first to the next-to-last without problem.

Am I misunderstanding the formula, or is there a bug in Appleworks 2.0?

Chun Yao Liao
Ciudad de La Paz, Argentina

Are you certain you can delete cell D4 without getting an ERROR message in cell D21? Try it again.

Your misunderstanding is a common one: confusing the number zero with nothing. When you delete a cell, there's nothing in it. When you "blank" a cell in AppleWorks, AppleWorks acts as if you put a value of zero into it.

In your formula @SUM(D4...D19), D4 and D19 are special locations that determine what happens when you apply the formula. You can delete any cell between D4 and D19 and still have a working formula, but without the end points AppleWorks doesn't know where to begin or finish.

AppleWorks discourages you from deleting by forcing you to delete entire rows or columns, not blocks or cells. It's best to limit deletions to columns or rows of labels.

AppleWorks 2.0 Control Codes

I recently purchased a Star Power-type printer to use with AppleWorks 2.0 and my Laser 128 computer. The standard printer interfaces don't work,

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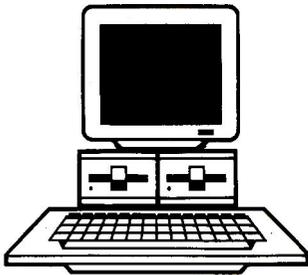
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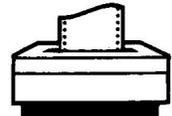
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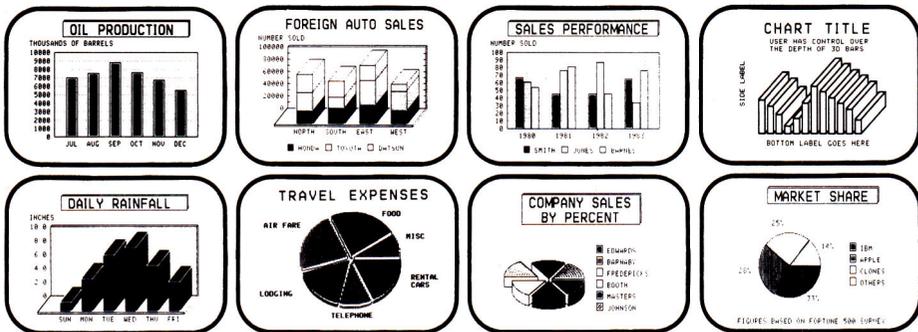
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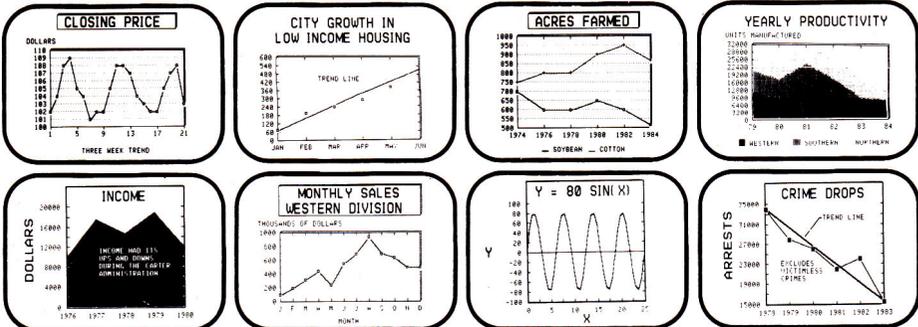
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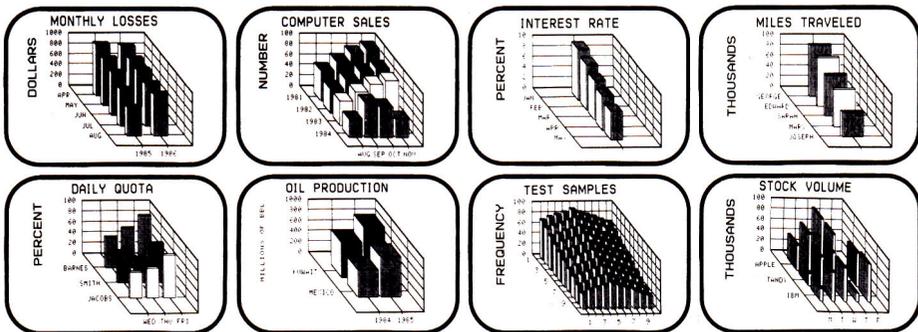
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APPLE CLINIC

and I run into trouble with "stop underlining" and "start superscript." The codes should be Escape-0 and Escape-S-0. The zero won't work and neither will Control-@. Using ASCII characters or hex equivalents doesn't fix it. I called Apple dealers, a Laser dealer, and Star; nobody could help.

Julian Clark
 Brooklyn, NY

Apple Clinic can help. You've found a bug in AppleWorks 2.0. Apple "improved" its printer routines. The biggest change is that certain codes for non-ImageWriter printers have been left out. Control-@ is a common code that's impossible with AppleWorks 2.0.

What to do? You can wait for Apple to see the error of its ways; it usually does and fixes the bug. We've heard that you can copy the SEG.PG—a machine-language routine on the AppleWorks program disk that contains printer information and printing instructions—from an older version of AppleWorks over the SEG.PR on your AppleWorks 2.0 disk. It's dicey at best. We've tried it—sometimes it works, sometimes it doesn't. Find a friendly dealer with several versions of AppleWorks and the ProDOS Filer and experiment. It beats waiting.

End of 80N

Responding to your plea (March 1987, p. 16) for a solution to the 80N problem in AppleWorks 1.1, I offer a foolproof solution I first read in Call-A.P.P.L.E. (June 1986). It's simple—just make sure you're using a copy of the AppleWorks startup disk, and

BLOAD APLWORKS.SYSTEM,TTSYS,
 A\$2000,

Then

POKE 11557,0
 POKE 11558,0
 POKE 11559,0
 POKE 11560,0

into the offending memory and save your work with

BSAVE APLWORKS.SYSTEM,TSYS,A\$2000,
 L\$1DF4

Robert Dietrich
 Bothell, WA

Thanks. Why didn't we think of that? ■



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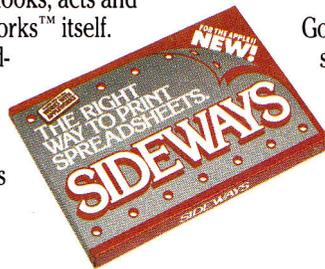
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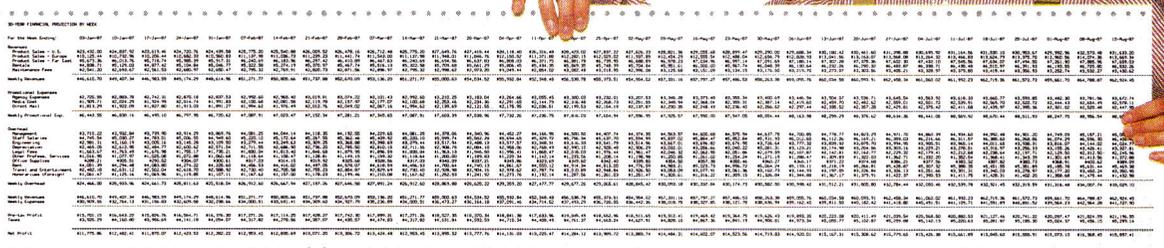
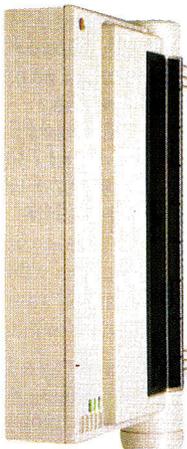
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Circle 295 on Reader Service Card.

Meet the Fake Mouse

by Eric Grevstad, Review Editor



“Watch me do this neat trick without using the mouse.”

Here's something for the next time you're trading trivia at your local user-group meeting. After folks pose the usual puzzles—“What's the ‘delete to end of line’ command in AppleWorks?” or “Betcha no one here knows how to set the clock from BASIC”—smile coolly and ask, “What's the fake mouse?” See if that doesn't stump the panel.

I learned about the fake mouse last month, while reviewing Roger Wagner Publishing's MouseWrite. To me, it ranks right up there with spare fuses under the dashboard and the flotation device under the seat: a way to use mouse-based software under mouseless emergency conditions. You just hold down the open-apple key, tap the solid-apple or IIgs option key, then move the mouse pointer with the cursor arrows and use the solid-apple key as a mouse button. Release the open-apple key when you're finished.

It may be awkward—all right, it may be awful—but I think the fake mouse is terrific. Most times at the *inCider* office, our IIe mouse card is missing and the technical editor won't let me steal the Macintosh mouse and plug it into the Laser. When a new software package arrives, it usually gets its first boot on my rodent-free IIe, and one of my first tests is to try the fake mouse.

My first discovery, all too often, is that it doesn't work. Since finding the fake mouse, I've been trying it with lots of different programs. Sensible Writer supports it. So does the discontinued Version Soft program Mouse Desk, and its reincarnation as the “Apple II DeskTop” on the GS system disk. United Software Industries' MouseTalk goes the fake mouse one better, with its own simpler combination of apple and arrow keys, explained in a help screen that appears automatically at startup on mouseless machines.

But many other mouse-oriented programs, from VIP Professional to PaintWorks Plus, ignore the fake-mouse keystrokes. Not only does this make me look like an idiot when I grab a fellow editor and say, “Watch me do this neat trick without using the mouse,” it also represents a missed opportunity on manufacturers' part. We've all heard about

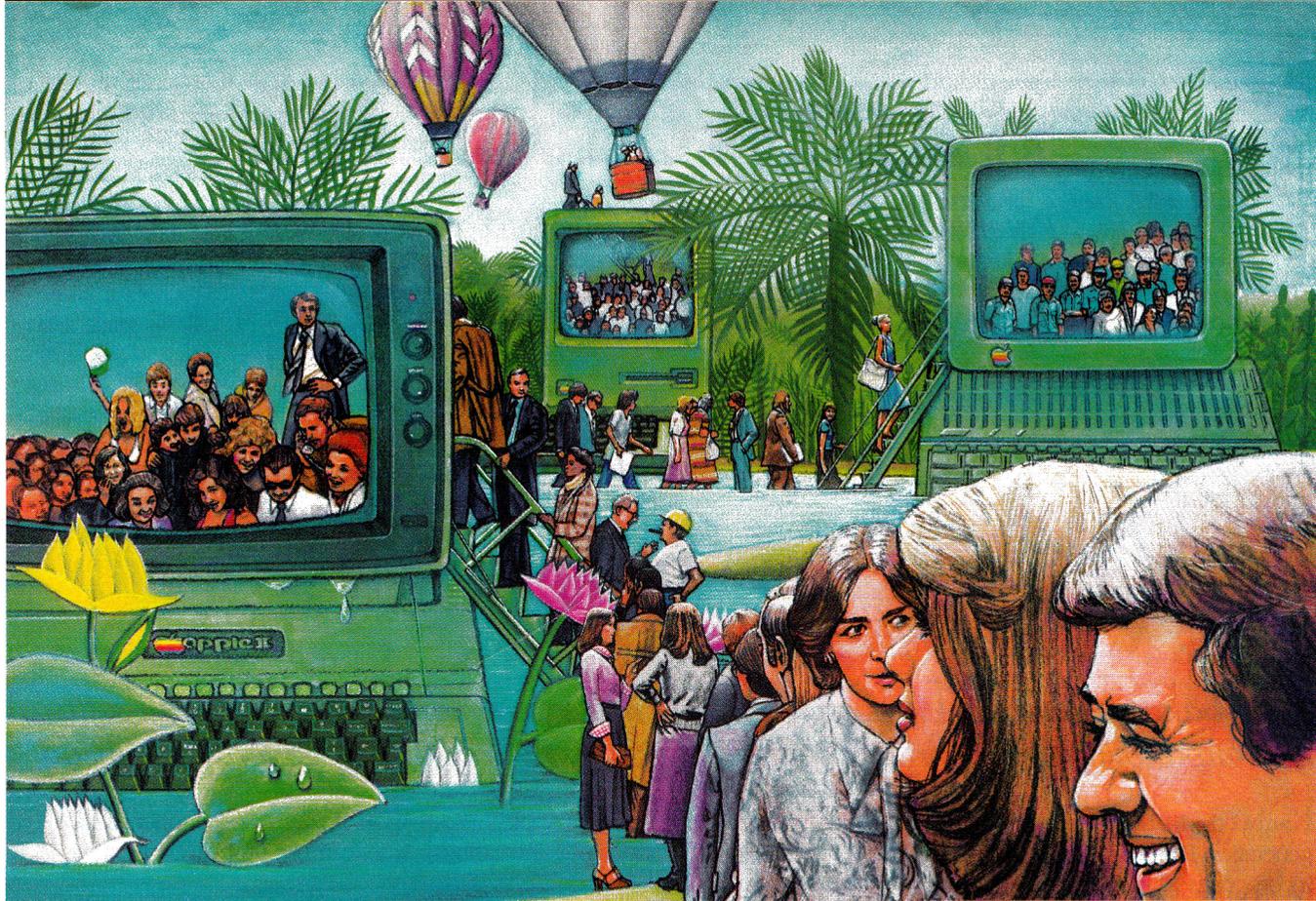
standardizing user interfaces with Macintosh windows or AppleWorks folders, but that's standardization on a broad scale—a matter of programs' overall appearance. How about standardization in little things?

The fake mouse is one example: It would be great if every mouse-driven program supported it, even if the documentation didn't mention it, for occasional use while one's mouse is at the vet's. As another example, how does your word processor delete characters under the cursor? Most programs anticipate that you'll instinctively reach for the delete key as a destructive backspace, removing characters left of the cursor. Wouldn't it be nice if Open apple-Delete always did the opposite, acting as a “forward delete” no matter which program you were using or whether you'd read the manual? (I should have read the Sensible Writer manual; Open apple-Delete in that program deletes an entire line.)

In market categories with well-defined archetypes, some commands are almost standard: Several programs imitate MacWrite's Open apple-X to cut or AppleWorks' Open apple-S to save. WordStar cursor-movement commands live on as ghostly, sometimes undocumented features in glamorous new MS-DOS programs.

Other programs, however, are sheer anarchy—programs that don't use the arrow keys for cursor movement, games with no keyboard equivalents of joystick control. (Cursor-movement commands are often all over the keyboard; I think we've gone downhill since the I-J-K-M standard of Apple II Plus days.) When you play games at work as often as I do, you grow to appreciate those that let you turn off the sound with Control-S, and you get cranky when you try a new game and Control-S doesn't work.

I don't mean to say all programs should be identical or that programmers shouldn't develop new, exciting features. But it's a bustling world, full of impatient people who don't read manuals, yet who blame the manufacturer when they have trouble finding basic, everyday features. Until I met the fake mouse, I never thought I'd describe a clumsy keyboard kludge as user-friendly. ■



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While RamWorks III is recognized by all memory intensive programs, NO other expansion card comes close to offering the multitude of enhancements to AppleWorks that RamWorks III does. Naturally, you'd expect RamWorks III to expand the available desktop, after all Applied Engineering was a year ahead of everyone else *including Apple* in offering more than 55K, and we still provide the largest AppleWorks desktops available. But a larger desktop is just part of the story. Look at all the AppleWorks enhancements that even Apple's own card does not provide and *only* RamWorks III does. With a 256K or larger RamWorks III, *all* of AppleWorks (including printer routines) will automatically load itself into RAM dramatically increasing speed by eliminating the time required to access the program disk drive. Switch from word processing to spreadsheet to database at the speed of light with no wear on disk drives.

Only RamWorks eliminates AppleWorks' internal memory limits, increasing the maximum number of records available from 1,350 to over 25,000. *Only* RamWorks increases the number of lines permitted in the word processing mode from 2,250 to over 15,000. And *only* RamWorks offers a built-in printer buffer, so you won't have to wait for your printer to stop before returning to AppleWorks. RamWorks even expands the clipboard. And auto segments large files so they can be saved on two or more disks. You can even have Pinpoint or MacroWorks and your favorite spelling checker in RAM for instant response.

RamWorks, nothing comes close to enhancing AppleWorks so much.

The Most Friendly, Most Compatible Card Available.

Using RamWorks III couldn't be easier because it's compatible with more off-the-shelf software than any other RAM card. Popular programs like AppleWorks, Pinpoint, Catalyst, MouseDesk, HowardSoft, FlashCalc, Pro-File, Managing Your Money, SuperCalc 3a, and MagiCalc to name a few (and *all* hardware add on's like ProFile and Sider hard disks). RamWorks is even compatible with software written for Apple cards. But unlike other cards, RamWorks plugs into the IIe auxiliary slot providing our super sharp 80 column text (U.S. Patent #4601081) in a completely integrated system while leaving expansion slots 1 through 7 available for other peripheral cards.

RamWorks III is compatible with all

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Highest Memory Expansion.

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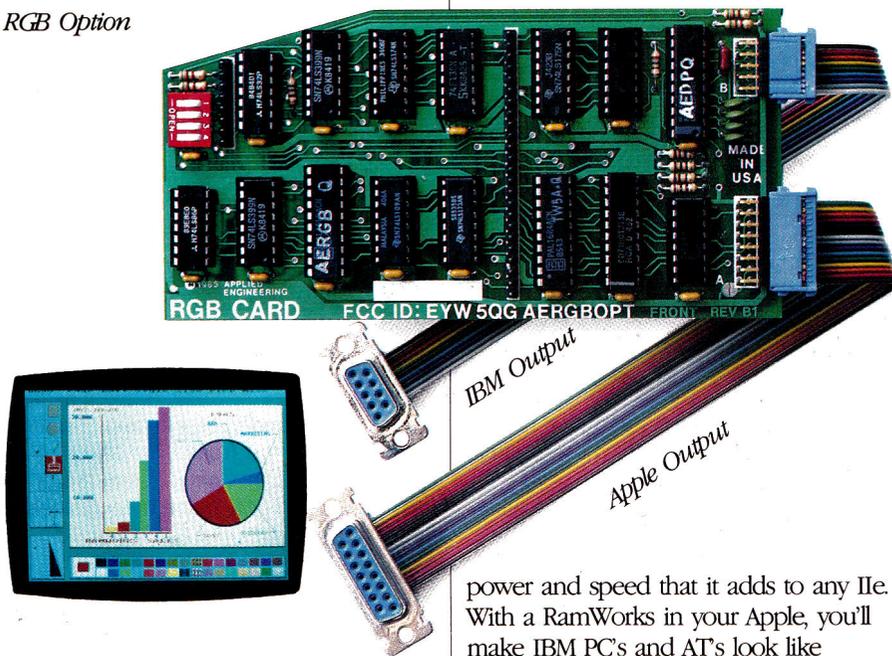
If you've got some other RAM card that's not being recognized by your programs, and you want RamWorks III, you're in luck. Because all you have to do is plug the memory chips from your current card into the expansion sockets on RamWorks to recapture most of your investment!

The Ultimate in RGB Color.

RGB color is an option on RamWorks and with good reason. Some others combine RGB color output with their memory cards, but that's unfair for those who don't need RGB *and* for those that do. Because if you don't need RGB

Applied Engineering doesn't make you buy it, but if you want RGB output you're in for a nice surprise because the RamWorks RGB option offers better color graphics plus a more readable 80 column text (that blows away any composite color monitor). For only \$129 it can be added to RamWorks giving you a razor sharp, vivid brilliance that most claim is the best they have ever seen. You'll also appreciate the multiple text colors (others only have green) that come standard. But the RamWorks RGB option is more than just the ultimate in color output because unlike others, it's fully compatible with all the Apple standards for RGB output control, making it more compatible with off-the-shelf software. With its FCC certified design, you can use almost any RGB monitor because only the new RamWorks RGB option provides both Apple standard and IBM standard RGB outputs (cables included). The RGB option plugs into the back of RamWorks with no slot 1 inter-

RGB Option



ference and remember you can order the RGB option with your RamWorks or add it on at a later date.

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Endorsed by the Experts.

A+ magazine said "Applied Engineering's RamWorks is a boon to those who must use large files with AppleWorks..I like the product so much that I am buying one for my own system." inCider magazine said "RamWorks is the most



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

Steve Wozniak, the creator of Apple Computer

powerful auxiliary slot memory card available for your Iie, and I rate it four stars..For my money, Applied Engineering's RamWorks is king of the hill."

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- Expandable to 16 meg with expander cards, with NO slot 1 interference
- Can use 64K or 256K RAMs
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- RamDrive™ the ultimate disk emulation software included free
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REVIEWS

Award Maker Plus, Principal's Assistant, Principal's Assistant Library; Quarterback QB-2C, Juice; T-Shirt Shop; The Class Writer, Electronic Writing Workshop; Calliope 128; Games Editors Play

Certificate Competitors

AWARD MAKER PLUS

Baudville Inc., 1001 Medical Park Drive
S.E., Grand Rapids, MI 49506, (616) 957-3036

Certificate-printing program; 64K Apple II Plus, IIe, IIc, IIgs

\$39.95

Rating: ■■■■■

PRINCIPAL'S ASSISTANT

PRINCIPAL'S

ASSISTANT LIBRARY

Mindscape Inc., 3444 Dundee Road,
Northbrook, IL 60062, (312) 480-7667

Certificate-printing program and templates;
64K Apple II Plus, IIe, IIc

\$59.95 (Assistant),

\$29.95 (Library), \$79.95 (both)

Rating: ■■■■■

This year more folks than ever before will win awards and honors—not because 1987 is the Year of the Overachiever, but because of products like Springboard's enormously popular Certificate Maker (see review, December 1986, p. 142) and two new copycat programs, Award Maker Plus and Principal's Assistant. All three let you create awards and certificates to express appreciation or recognize the accomplishments of students, employees, friends, and associates.

If these programs themselves received awards, Certificate Maker might be considered Most Innovative, mainly because it was the first program of its kind. Award Maker Plus takes Most Enhanced honors because it takes up where Certificate Maker leaves off, supporting advanced hardware features such as 3½-inch disk drives and color printers. Principal's Assistant, which is intended for academic settings, merits a Most Focused rating.

AWARDS GALORE

Like its rivals, Award Maker Plus is easy to use, although, to borrow a word-processing term, it's not WYSIWYG (what you see is what you get).



If it were, and if it offered more pre-drawn pictures, I wouldn't hesitate to give it a five-star rating.

Like Certificate Maker, Award Maker Plus requires you to keep its award directory or catalog handy. Instead of creating each certificate from scratch, you load and modify one of the 286 design templates supplied on the two Award Maker Plus program disks. (The number is misleading, since many awards are identical save for slight changes in title or layout, but you can create a virtually infinite number of awards by editing the templates.)

To begin creating an award, you type in the number of the template you want—number 116, for example, is an 8½-by-11-inch "Track and Field Award" with a picture of a javelin thrower and room for the winner's name, four lines of text, signature, and date.

Not all Award Maker Plus designs contain graphics; many, if not most,

boast only fancily drawn text. These templates range from "History Award" or "Employee of the Week Award" to "Third Place"; some offer sentiments such as "Congratulations" or "Thank You." Some are empty, offering no pre-designed titles or graphics at all for maximum customization possibilities.

While Certificate Maker offers a number of humorous entries, Award Maker Plus seems more mature—or dull, depending on your point of view. Most awards are serious and professional, though that's not to say you can't take a serious template and whoop it up if you want.

inCider's Ratings

Excellent—remarkable, a must buy	■■■■■
Very good—impressive and recommended	■■■■
Good—average, solid performance	■■■■
Fair—flawed but adequate	■■■
Poor—unacceptable or unusable	■

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Whichever template you select, you can add text in your choice of four fancy typestyles or frame the document with one of ten border designs. Following its competitors' examples, Baudville is preparing "library" disks with more fonts and borders.

Like Certificate Maker and Principal's Assistant, Award Maker Plus has a nifty personalizing feature that might be called "mail merge for awards." The program lets you create and save a disk file of names, then tell

Award Maker Plus to create separate documents honoring some or all of the people on file. This feature makes it a snap to automate printing of your kindergarten class' diplomas or your bowling team's awards.

Four of Award Maker Plus' templates are programmed to accept hires pictures you create with a DOS 3.3 drawing program such as Baudville's Blazing Paddles or Koala's Micro Illustrator. According to a Baudville spokeswoman, some users have

reported success converting double-hires pictures from ProDOS programs such as Broderbund's Dazzle Draw.

Best of all, Award Maker Plus supports color printing on suitable models. Only borders, not text or graphics, can be printed in color, but you really have to see an award with a lavender or kelly-green trellis border to share my sense of glee. Red borders looked pink on my ImageWriter II, but the other 13 colors met my expectations. My friends were delighted with the sense of quality as well as the sentiments that Award Maker Plus documents convey; the program's awards, coupons, and gift certificates look great.

The paper you use can make a difference in the appearance of your awards and certificates. Ordinary 15-pound computer paper gives acceptable quality; Baudville sells parchment paper (at about 10 cents per sheet) if you want really professional-looking printouts. Twenty-pound, 25 percent cotton-fiber paper seems to be a good medium.

All three certificate programs come with stickers you can add to your printed awards to dress them up even more. Award Maker Plus' 20 gold-foil seals appear more authentic than the whimsical seals in the Certificate Maker and Principal's Assistant packages, though they're still a bit bogus-looking for serious awards.

FOR ACADEMIC ACHIEVEMENT

Principal's Assistant stands alone for a number of reasons. Not only is it geared to academic settings, with sample illustrations and awards reflecting school topics and concerns, but it lets you design certificates, handouts, letters to parents, and other documents from scratch.

Like Certificate Maker and Award Maker Plus, Principal's Assistant lets you choose among multiple fonts and borders. Unlike them, Principal's Assistant is a WYSIWYG program—everything you choose is shown on screen, so you can view your document as it develops. This feature, together with command windows in which you select options with the cursor keys, makes Principal's Assistant very easy to use. The choices on the Create a Design menu are so straightforward you'll be able to finish your first award in a matter of minutes.

Along with ten border designs and five fonts, the program offers about 180 illustrations in more than a dozen

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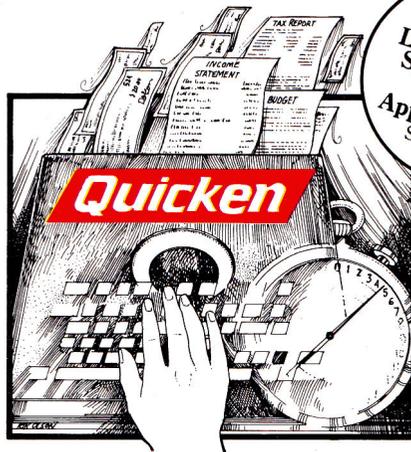
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categories ranging from holidays to sports. The large, well-drawn pictures should appeal to elementary and junior-high-school children and their parents. You can place one or more graphics wherever you like on your certificate or handout, or add your own graphics from Blazing Paddles or Micro Illustrator.

Besides backtracking through choices with the escape key, there's an "oops" command to undo creative mistakes. Once the screen appearance suits you, you can print your document with any of more than 40 popular graphics printers. The program doesn't support multicolor printing, though you can always substitute a single-color ribbon if your printer allows alternatives to black.

Like its rivals, Principal's Assistant offers a library containing more pictures and predrawn documents—118 in all. Load a template by name ("No Ball Playing," "Keep Our School Clean," "Greatest Musician," "Halloween Party"), modify it as you like, and

print it for photocopy or mimeograph duplication.

Principal's Assistant isn't just an award maker. Besides sports and academic awards, club members can create announcements and invitations. Administrators can produce event entry forms and parental-permission slips. The program's fancy graphics and fonts turn ordinarily dull—and perhaps easily ignored—publications into attention grabbers.

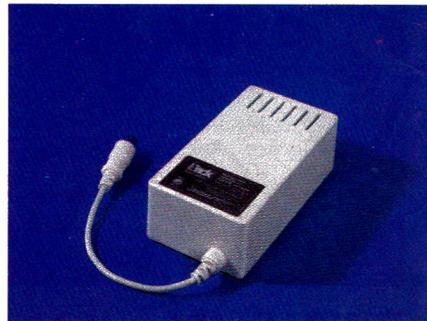
TWO TO CHOOSE

Both programs are copy-protected. Baudville sells an Award Maker Plus backup (5¼- or 3½-inch) for \$7.50, or a hard-disk version for individual users at an additional \$25. A network version for multiuser systems (as in school computer labs) costs \$150. A Principal's Assistant backup costs \$10.

If you're a teacher or school administrator, take a look at Principal's Assistant. It's flexible enough to meet many informal academic-publishing

needs. But don't overlook Award Maker Plus—its advanced features and enhancements make it the best general-purpose certificate-publishing program of the three currently available. ■

*Cynthia E. Field
Wakefield, RI*



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Rating: ■■■■■■

Apple doesn't promote the IIC as a portable system anymore, but there are still advantages to having battery power on standby. If you can't think of any right now, wait until the next time a blackout or brownout zaps that spreadsheet you nearly finished, but didn't save.

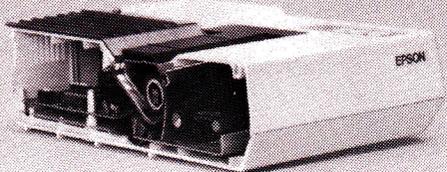
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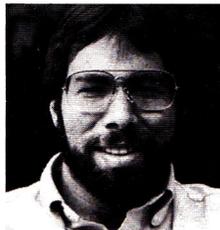


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Steve Wozniak, the creator of Apple Computer

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REVIEWS

mately the same size as the IIc power supply and weighs only two pounds.

The Quarterback has a recessed on/off switch (you need a pen or pencil to change it), which you leave on after installing the unit. You control your computer's power in the usual manner, by pressing the rocker switch on the back of the IIc.

According to the manufacturer, if household current drops below 103 volts AC (from the typical 110-120 volts), the battery kicks in. When I simulated a power failure by flipping the wall switch for my IIc's outlet, Quarterback took over without skipping a byte.

In a total blackout, Quarterback gives you 15-20 minutes of emergency reserve, beeping every 16 seconds or so to let you know you're on backup power. When battery power declines to 10.5 volts DC, the frequency of the beeps increases, alerting you to the urgency of saving any files in RAM. Once household power is restored, the Quarterback's battery recharges, a process that can take up to eight hours.

The Quarterback handles only one energy consumer—the IIc itself. If you use a backlit liquid-crystal display (which draws its power from the Apple and not from a wall outlet), you can continue creating or editing a file during a blackout and still have time to save it. Users of regular monitors, though, will be literally left in the dark. Your monitor will go blank, and you won't be able to see what you're working on. If you haven't memorized your application's save command (such as AppleWorks' Open apple-S or a macro to save all desktop files), find a flashlight and the software manual.

ON THE ROAD

Like Quarterback, Juice can serve as a standby or emergency power source for a deskbound IIc, but it also functions well as a portable power supply (again, for the computer, but not a CRT monitor). Fully recharged (which took about four hours when I tried it), Juice offers up to two hours of power to prepare documents, navigate spreadsheets, or update databases while you're on the go. Juice's extra power means a bit of extra weight—three pounds to Quarterback's two.

The unit attaches securely to the left-hand side of the IIc, latching onto the leftmost vented slots on the computer's top and bottom. So secure is this arrangement that trying to remove Juice presented a delicate challenge; I finally resorted to using a screwdriver to pry the tabs out of the slots. The "impact-resistant" plastic bracket arrived at my office chipped, a condition I attributed originally to damage in shipping; I realize now that the chipped edges are probably evidence of previous testers' extraction tools.

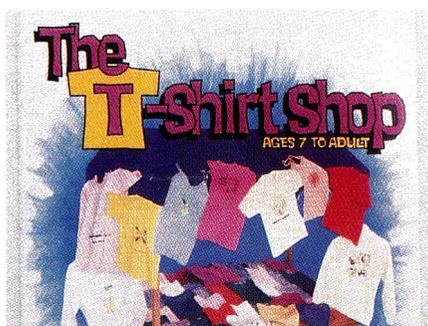
While Quarterback lacks visual status indicators, Juice has four top-mounted light-emitting diodes (LEDs), each accompanied by an easy-to-interpret icon. Two green LEDs indicate that the unit is charging or fully charged. The yellow LED lets you know when you're on backup power. The blinking red one warns you that you're running out of time; it lit with about four minutes of power remaining in my tests.

Juice differs from Quarterback in another way. When you connect Juice to your IIc, you can leave the IIc power switch in the "on" position. You then use the conveniently top-mounted rocker switch on the Juice unit to turn your computer system on and off.

SAFETY FIRST

Depending on your needs, either power unit could make a useful addition to your Apple IIc system. If you're concerned about brownouts and blackouts and require only transient backup power, Quarterback offers peace of mind at a reasonable price. If you want both fail-safe reassurance and portability, Juice does double duty in exchange for its higher cost. ■

Cynthia E. Field
Wakefield, RI



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Spinnaker Software Corp., One Kendall Square, Cambridge, MA 02139, (617) 494-1220

Art program for T-shirt transfers; 128K IIe or IIc, ProDOS; mouse, joystick, color ribbon optional

\$49.95

Rating: ■■■■

This summer, take a good look at the T-shirts people are wearing. There's a good chance some of those fancy, funny tops didn't come from the local sportswear shop, but were created and printed on an Apple computer.

The source of this unlimited variety is the T-Shirt Shop from Spinnaker Software. The double-sided program disk lets you design your own T-shirts or choose from about 45 ready-to-use pictures. The program comes with seven iron-on transfers (called Print 'n' Wear paper), a reordering coupon, and one medium-sized, poly/cotton T-shirt.

READY TO WEAR

Before you load the program, format a blank ProDOS disk so that you can save your artwork. If you have two disk drives, you can copy the second side of the T-Shirt Shop disk, which contains the ready-to-use artwork and text fonts.

The main menu, controlled from the keyboard, joystick, or mouse, consists of Setup, Quickshop, and Workshop functions. The first lets you enter your printer information, which you need do only once unless you change printers.

Quickshop lets you select among supplied graphics, including horoscope symbols, animals, and even Ronald Reagan. Unless your kids are at that age when they love creepy caricatures, you might wish for a wider selection.

After scrolling through the list and

Continued on p. 86

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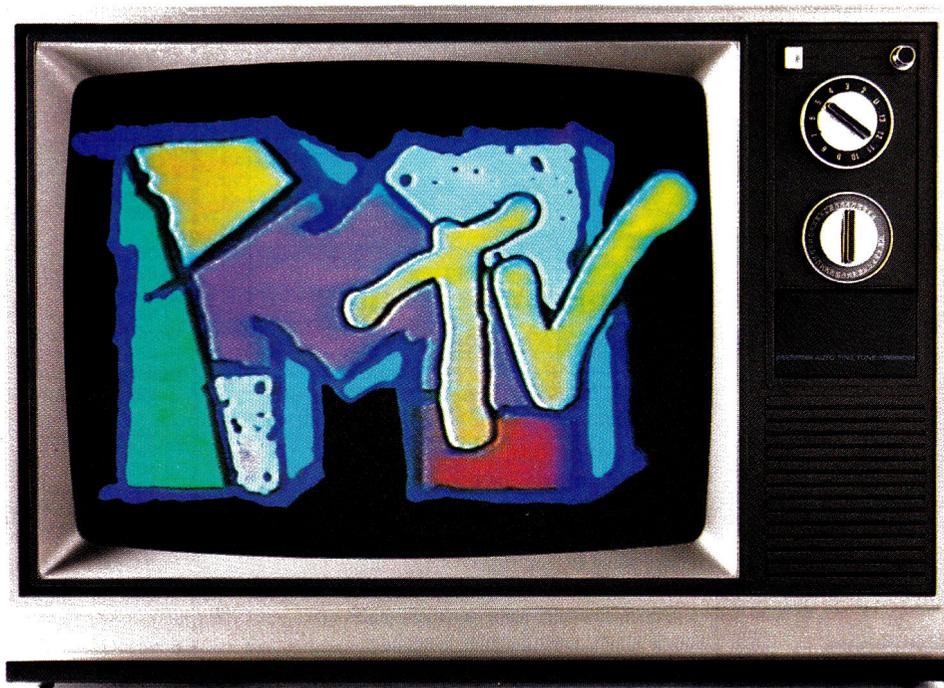
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— On Screen — CELESTIAL NAVIGATION

*Professional and amateur stargazers
alike rely on Apple II astronomy
software to navigate the heavens.*

by John Mosley

There's no substitute for looking at the night sky, but when you do you can't speed up its motion, change the date, or view it from another angle. If you want to manipulate what you see, your Apple II and an astronomy program give you the power to control your on-screen universe and navigate among the stars. And when you look at the real sky again, you'll appreciate its grandeur even more.

WHAT DOES ASTRONOMY SOFTWARE DO?

The Griffith Observatory in Los Angeles, California, handles questions on astronomy from the public, and some of the questions are strange. One caller, for example, wanted to know the date of the full moon in September 1692.

The caller was trying to establish the dates of the Salem witchcraft trials and knew that public meetings were often scheduled for the full moon, when it was easiest to travel at night. Maybe the question wasn't so strange after all, but where do you look up such an obscure piece of information? No book in existence lists the full moons in the 17th century—you have to calculate it for yourself.

One way to figure it out is to use a program like Calendar Conversions. You type in a date; the program gives you the corresponding date in the Julian, Gregorian, or Hebrew calendar. The bonus is that it also gives you the moon's phase on that date. In a minute the caller had the answer: September 25.

Another caller, a researcher trying to establish the historical basis for King Arthur and Merlin, wanted to know whether a solar eclipse was visible from Britain around the year 535 A.D. Standard reference material showed that an eclipse occurred on September 3, 536 A.D., but gave few details. With a program called Moon and Sun, the caller could have discovered that from Galloway, Scotland—the

point from which Merlin is supposed to have observed the heavens—the moon covered 94 percent of the sun's surface at 12:44 p.m.

You may not need to know what the moon was doing 14 centuries ago, but if you do, you can find out with your Apple II and the right astronomy software. The Apple II is a powerful tool for professional research, home, or school.

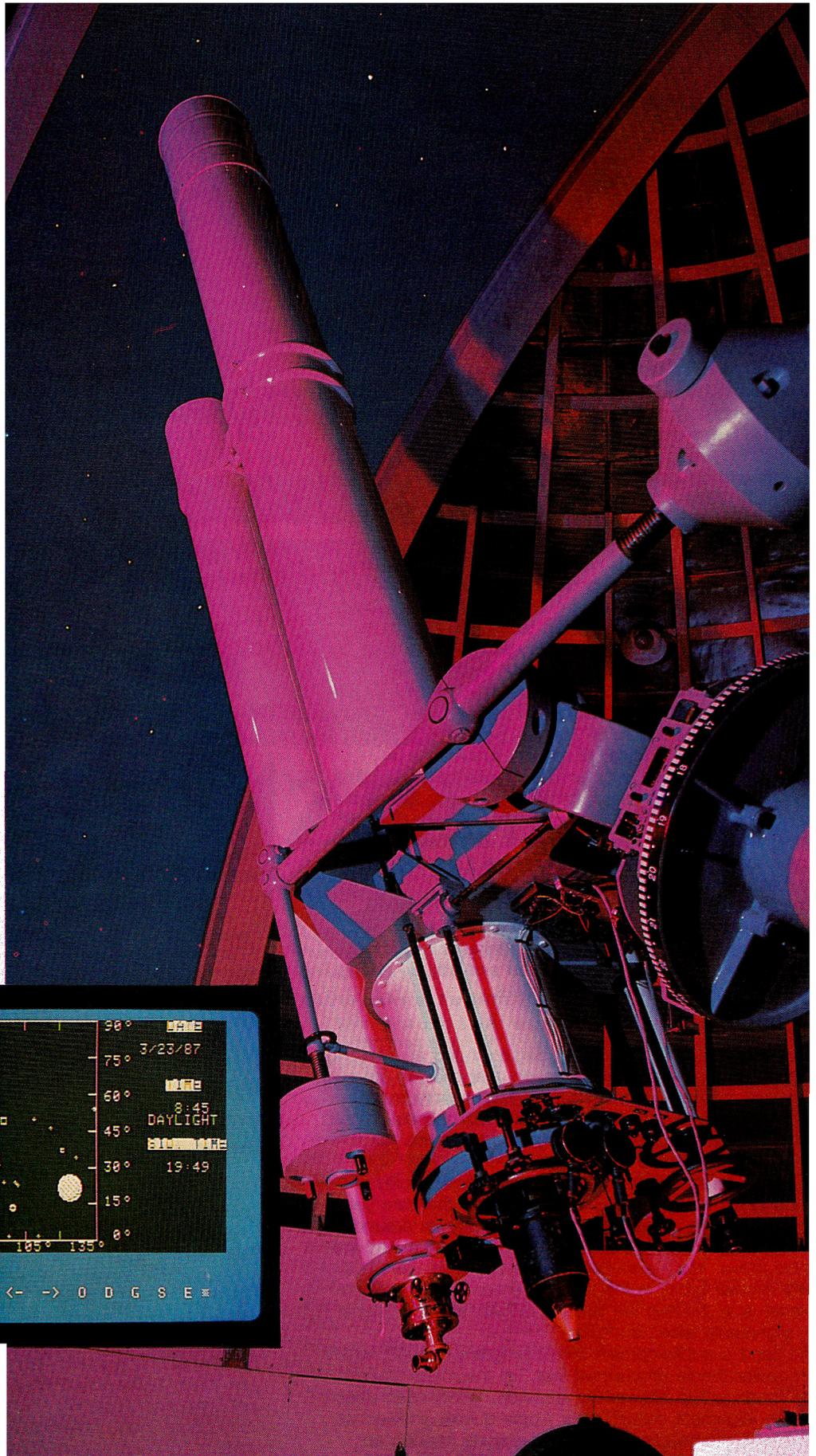
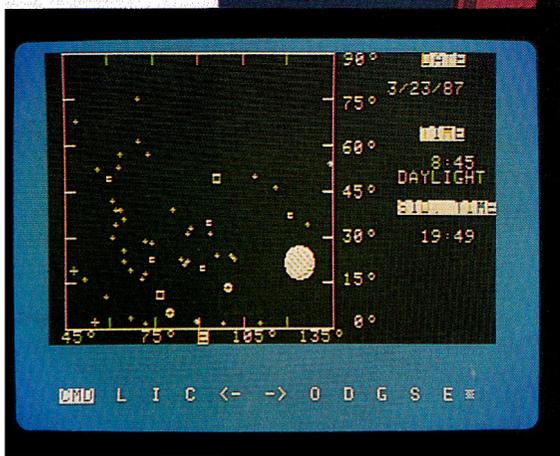
With an Apple you can watch celestial motions from different perspectives; you can re-create historical events, such as planetary alignments at the time of the Star of Bethlehem; you can prepare to observe the sky (when will Venus rise tomorrow?); you can identify objects (which moon of Jupiter is which?); you can print your own star charts and tables; you can control the universe and see bodies with your monitor that you can't see with your telescope.

Whatever your level of expertise, there's an Apple astronomy program that will let you learn more about the universe and our place within it. Let's look at the variety of programs available, starting with those that show the sky. (For details, see the accompanying Product Information box; for information on additional astronomy software, see "Journey Through the Stars," February 1986, p. 18.)

SKY SIMULATIONS

The most useful and common astronomy programs simulate the sky as seen from your backyard. They show the constellations that are up and positions of the planets. Most shrink the entire visible sky to fit your screen, so there isn't a lot of detail. Some let you magnify a small area of the sky for greater clarity. Most let you display and print planet and star positions as tabular data for greater precision.

Twelve-inch and nine-inch telescopes (single mounting) at Los Angeles' Griffith Observatory (right). Screen from Tellstar, a sky simulation from Spectrum Holobyte (below).



My favorite sky simulation is **The Observatory**, a comprehensive program that can keep you busy through many a cloudy night. The screen shows a control panel beside a circular view of the sky. The sky is displayed as it would appear from any place on earth for a 10,000-year period, complete with sun, moon, planets, Jupiter's four major moons, 311 stars, and 108 star clusters, nebulae, and galaxies, plus a quasar. You can choose to see the entire sky from horizon to horizon or zoom in to examine part of it in detail. The Observatory's accuracy is superb, even for events that occurred centuries ago.

With this simulation I've watched a solar eclipse as observed by Renaissance astronomers, re-created the spectacular conjunction of Jupiter and Venus in 1818, seen Jupiter with its moons as Galileo first saw it in 1610, and previewed upcoming planetary conjunctions. The main drawback is the program's slow speed (about a minute per calculation), which discourages aimless exploring, but it does push a 64K machine to its limits.

Another program worthy of a close look is **Indoor Astronomy**. This amazing program was developed by a private observatory to generate charts of finder stars for use at the telescope. The printout approaches professional quality. It includes a number of stars and deep-sky objects (and you can add more), but not the planets.

Starbase 3000 is a similar, but less useful, program. It prints a 2-by-4-foot chart of the entire sky (except the poles) for the date and location you select. The chart prints in sections in 40 minutes, and you tape them together. Three thousand stars and deep-sky objects, plus the sun, moon, and planets, are included. A disadvantage is that you have to print the chart to use it—you can't view it on screen, and the symbols used to show star brightnesses are somewhat obscure. A separate suite of utilities lets you calculate and print useful information such as sun, moon, and planet rising and setting times, along with phases of the moon.

One of the most popular of the sky simulations is **Tellstar**—probably the only astronomy program you'll find in retail stores. It's cleverly organized and easy to operate. It has some nice options, but I'm annoyed by its low degree of precision. An Apple is capable of substantially greater accuracy than Tellstar affords, so it's suited for only casual sky probing.

People who need simply the positions of the planets without a background star map can use a program like **Planets**, by Charles Kluepfel. Planets takes into account such factors as atmospheric refraction and altitude above sea level, and gives you precise values.

ORRERIES

In 1712 the 4th Earl of Orrery demonstrated an amazing device—a complex mechanical model that showed the solar system as seen from a distance, with the planets in motion around the sun. Smaller mechanical models, called "orreries," are found in classrooms and museums, and now you can own one on disk.

A typical orrery program shows the planets displayed around the sun in their proper positions for the date you select. An option automatically steps the planets around the sun at daily intervals so that you can see the way the planets move. You'll discover that the planets travel on nearly circular orbits in the same direction, that the closer a planet is to the sun the faster it moves, and that planetary alignments aren't unusual.

We used a public-domain orrery program in 1982, when the popular media proclaimed that "all the major planets were lined up," to answer the question, "How often does such an alignment occur?" Our Apple quickly showed us that similar alignments of the major planets happen approximately eight times a decade. It would have been

hard to pull that information out of a long list of planetary positions.

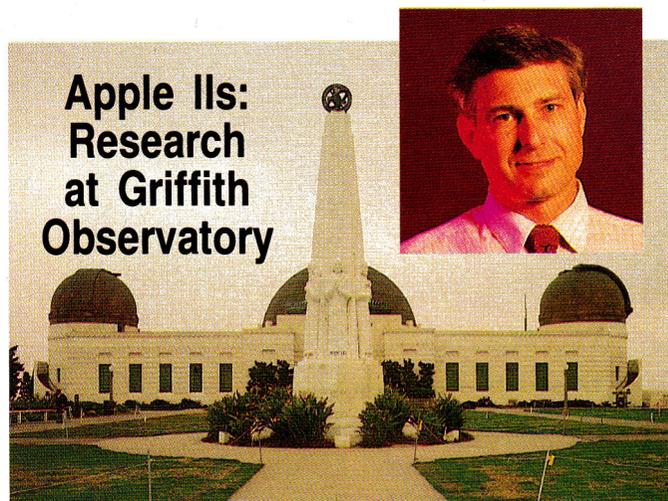
The two best orrery programs are **Planet Locator** by Brad Schaper, in the public domain, and **New Orrery**, by Charles Kluepfel. Schaper's includes the planets through Saturn. Kluepfel's program includes all nine planets and is more accurate, but it's far slower.

ECLIPSES

In ancient times the astronomer's duties included warning the emperor of impending eclipses of the sun and moon so that proper precautions could be taken.

A number of programs predict lunar eclipses (not a difficult feat), but relatively few show eclipses of the sun. The Observatory shows the appearance of a solar eclipse as seen at any moment, but it can't give you a tabular print-out of the circumstances. Two programs stand alone in this regard, and they're surprisingly powerful. Both are by Charles Kluepfel.

The first, **Eclipse Map**, plots the path of the moon's shadow on a low-resolution map of the earth, to let you visualize the geometry of the event. It also prints a useful table of accurate data for a series of points along the path of totality.



John Mosley and his Apple II are on the receiving end of some strange questions.

As program supervisor at Los Angeles' Griffith Observatory, Mosley provides information on astronomy to the public. When people want details about full moons that occurred 300 years ago or solar eclipses that took place in the sixth century, Mosley's the guy who has to find the answers. Without an Apple II, you might say the odds of answering such questions are astronomical. "The Apple II is a valuable research tool. We use it as a library book for answers we couldn't find elsewhere," Mosley says.

Mosley is also in charge of producing planetarium presentations, museum exhibits, and other educational activities. Until a year ago, the observatory used an Apple II to plan all planetarium shows. Apple IIs are still used in the museum, where they run astronomy software that teaches children interesting tidbits about the moon, stars, planets, and universe.

Mosley, an Apple II user since 1982, has also collected more than 50 public-domain astronomy programs. If you're interested, Mosley will send you copies on three double-sided disks for \$10 (to cover the cost of disks and postage). Checks (no purchase orders) should be made payable to John Mosley and addressed to him at 13623 Sylvan Street, Van Nuys, CA 91401. □

—Dan Muse

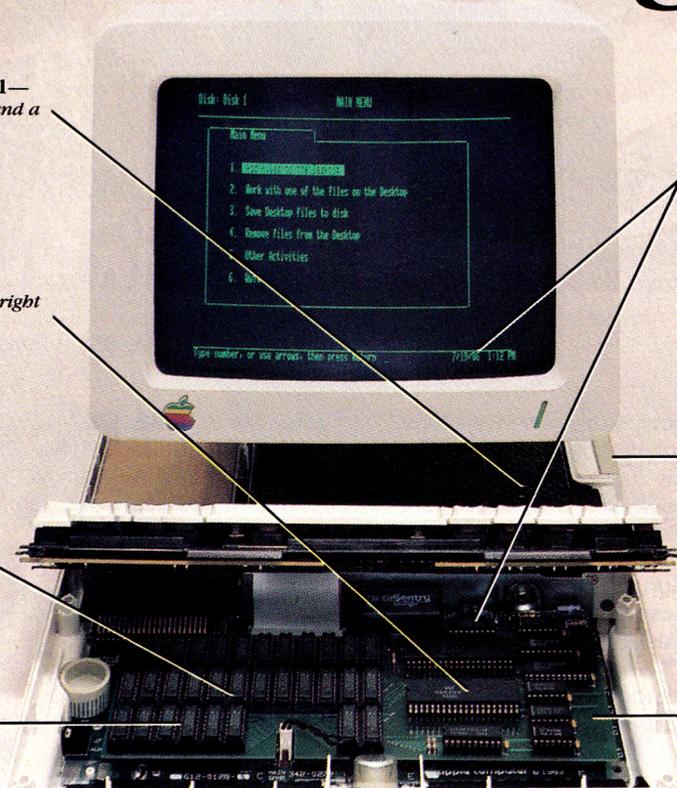
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stamp any PRO-DOS file. And a printer buffer handles printing of AppleWorks files so you can continue working.

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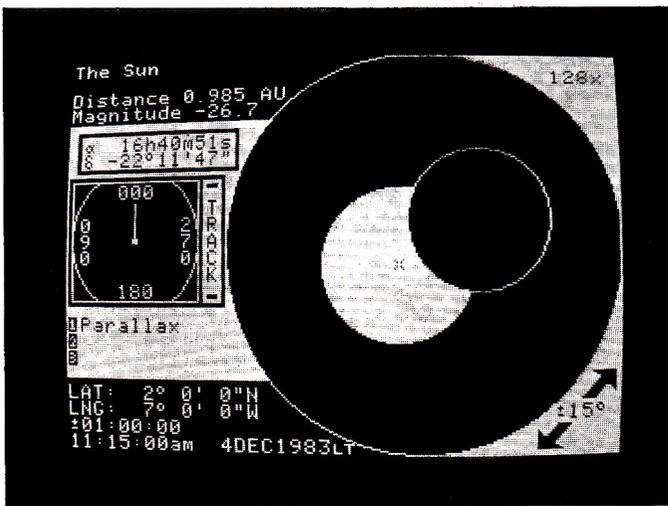
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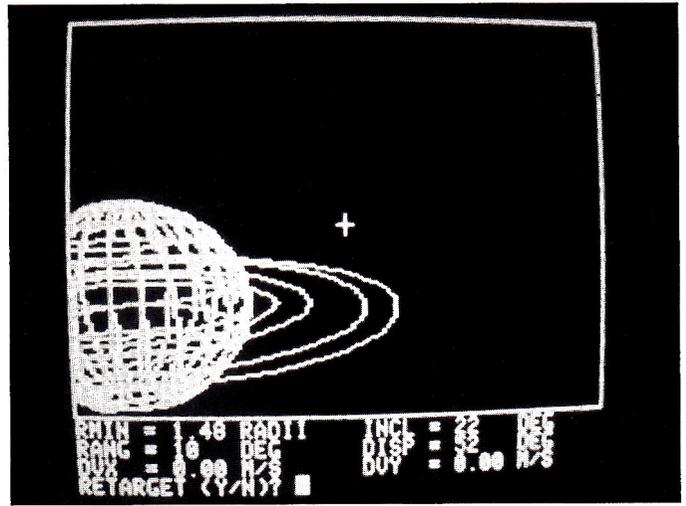
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The Observatory: Simulated solar eclipse as seen from Africa's Ivory Coast in 1883.



Saturn Navigator: The plus sign (+) marks your spacecraft as it approaches the ringed planet.

The second program is **Moon and Sun**, which dispenses with graphics, but calculates an enormous amount of data. You don't even need to know the exact date of an eclipse to begin. Enter a year (536 A.D., for example), and the program tells you that an eclipse probably occurred on September 3. Next enter that date; Moon and Sun gives you the details (in numeric form) of the progress of the moon's shadow as it swept across Ireland, southwest England, and on through Europe.

Now enter the longitude and latitude of Galloway, Scotland, which lies outside the central part of the moon's shadow. The program presents the circumstances of the eclipse as seen from your location: the time the eclipse started, the time it reached maximum, and the time it ended; the percentage of the sun covered by the moon; the sun's bearing along the horizon and its altitude; and much more.

You can also use Moon and Sun to look far into the future. For instance, I found that the next total solar eclipse visible from the Los Angeles area will occur at 10:34 a.m. on May 3, 2106. You can use the program to find out exactly what a coming eclipse will look like from your home town—information that may not be available from other sources.

THE CALENDAR

In centuries past—before the age of astrophysics—the astronomer's main interest was keeping track of the calendar to determine the dates of movable religious feasts. Fixing the date of Easter, for example, which depends on the phases of the moon, requires the services of an astronomer if you want to know the date far in advance.

Today, inexpensive calendars hang on our walls, and any almanac lists our holidays. But what do you do if you're researching events that happened in your grandfather's youth, and you need to know the day of the week for August 14, 1914? Or what if you need to know the number of days between October 5, 1957, and July 20, 1969?

Two programs that can help are **Perpetual Calendar**, in the public domain, and **Calendar Conversions**, by Charles Kluepfel. The first displays or prints a trim little calendar for the month or year you specify. The second converts dates among the Julian, Gregorian, and Hebrew systems.

The Julian calendar was instituted by Julius Caesar the year before his assassination and was modified by Pope

Gregory in 1582. Catholic countries adopted the Gregorian version immediately, while Protestant countries, including England and the American colonies, held out until 1752.

Let's take a familiar example as illustration. George

Product Information

Calendar Conversions, \$11

Eclipse Map, \$25

Moon and Sun, \$27

New Orrery, \$20

Planets, \$23

Charles Kluepfel
11 George Street
Bloomfield, NJ 07003

Reader Service Number 305

The Halley Project

Mindscape
3444 Dundee Road
Northbrook, IL 60062
(312) 480-7667
\$44.95

Reader Service Number 322

Indoor Astronomy

Astro Link
P.O. Box 1978
Spring Valley, CA 92077
(619) 698-9174
\$59

Reader Service Number 306

The Observatory

Lightspeed Software
2124 Kittredge Street
Suite 185
Berkeley, CA 94704
(415) 486-1165
\$49.95

Reader Service Number 307

**Perpetual Calendar
Planet Locator**

For copies of these and other public-domain astronomy programs, send \$10 for three double-sided disks to John Mosley, 13623 Sylvan Street, Van Nuys, CA 91401. Checks (no purchase orders) should be made payable to John Mosley. Additional public-domain programs can be downloaded from the data library in CompuServe's Astronomy Forum. See also sources listed in February 1987, p. 46; May 1987, p. 14; and September 1985, p. 23.

Saturn Navigator

SubLOGIC Corporation
713 Edgebrook Drive
Champaign, IL 61820
(217) 359-8482
\$34.95

Reader Service Number 308

Starbase 3000

Data Reserve
P.O. Box 27925
Denver, CO 80227
(303) 988-2859

Reader Service Number 309

Tellstar

Spectrum Holobyte
1050 Walnut Street
Suite 325
Boulder, CO 80302
(303) 443-0191

Reader Service Number 310





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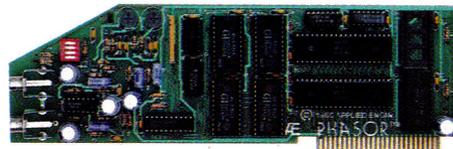
*Steve Wozniak, the creator
of Apple Computer*

What's best, the Phasor works with more off-the-shelf software than any other sound card you can buy. So now all your favorite games — like Skyfox™, Under Fire™, Willy Byte™, Tactical Armor Command™, Maze Craze™, Zaxxon™ and Ultima IV™ — can have shattering sound effects. Educational packages like Music Construction Set™, Guitar Master™ and Music Star™ are also dramatically enhanced.

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The Apple enhancement experts.

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Washington was born on February 11, 1731, while the Julian calendar was still in use, but when he was 21 the colonies adopted the Gregorian calendar, and his birthday was shifted to February 22. (The year was retroactively adjusted to 1732 at the same time.) In either case, he was born on a Thursday, and Calendar Conversions tells you that if he hadn't died in 1799, he would have been exactly 93,502 days old on his birthday this year.

Because the Hebrew calendar is based on the movement of the moon, Calendar Conversions also gives you the moon's phase for the date you choose, as we saw in the example of the Salem witch trials; the program tells us the moon was one day past full when Washington was born.

GAMES AND SIMULATIONS

Before heading to the moon, the Apollo astronauts spent many, many hours in simulators. So do Shuttle astronauts and airline pilots. A simulator gives you a taste of the real mission without the expense and risk of blasting off.

Saturn Navigator is one example of a realistic simulation for the Apple II. This complex package, written by a computer programmer at the U.S. Jet Propulsion Laboratory in Pasadena, California, simulates the flight of a spacecraft to Saturn. There are four stages of flight: Earth to Saturn; injection into an initial orbit around Saturn; maneuvers to refine the orbit; and rendezvous with a space station in near-circular orbit within Saturn's rings.

Don't attempt it unless your head is clear and your evening is free. Patience is the key word; the program's slow. And the game won't appeal to a typical 11-year-old, who thinks a simulation has to show something blowing up realistically. Saturn Navigator requires that you do something not usually associated with video games: think. You'll certainly gain respect for the skill it takes to navigate among the planets.

Another game that takes you around the solar system is **The Halley Project** (reviewed in February 1986, p. 20). Although the comet that suggested the plot of this simulation is long gone, The Halley Project deserves to stick around. Your mission is to pilot a spaceship from Halley's Comet to a specified moon or planet and land there. You peer at the solar system through a window above your control panel.

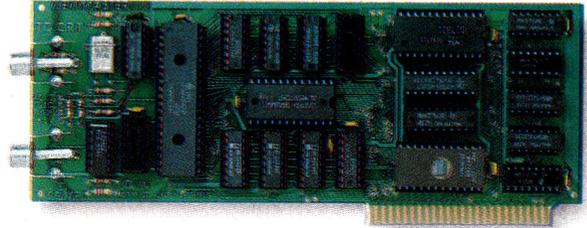
The best thing about this simulation is that the planets' sizes and distances are drawn to the same scale, something virtually impossible to do in the real world because the planets are microscopic compared to the distances between them. Here, you move around *inside* a vast electronic orrery. Having used mechanical orreries for years, I appreciated the chance to zoom around inside one. It gives you a good feel for the sheer emptiness of the solar system. And, like Saturn Navigator, you learn how difficult it is to hit a small moving target far, far away.

In many ways, astronomy programs can't compare to searching the night sky through a telescope. But your Apple is nevertheless a powerful tool that can simulate the heavenly bodies you can't see and calculate their movements, past and future. If you're an astronomy hobbyist, your Apple has the right stuff. ■

John Mosley is program supervisor at the Griffith Observatory in Los Angeles, and a regular contributor to Sky and Telescope. Write to him at 13623 Sylvan Street, Van Nuys, CA 91401.

Viewmaster 80

Now run AppleWorks™ on your II+ and keep full 80 column compatibility!



	BUDEW SOFTWARE	SHIFT KEY SUPPORT	LOW POWER DESIGN	80 COLUMN HOME	7 x 1/2 DOT MATRIX	LIGHT PEN INPUTS	80 COLUMN OVERMODE	INVERSE CHARACTERS
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SUPRTERM		✓					✓	✓
WIZARD 80				✓			✓	✓
VISION 80	✓	✓		✓				
OMNIVISION		✓				✓	✓	✓
VIEWMAX 80	✓	✓		✓				✓
SMARTERM	✓	✓				✓	✓	✓
VIDEOTERM	✓	✓	✓	✓	✓	✓	✓	✓

One look at the chart will give you some of the reasons there's only one smart choice in 80 column cards for your Apple. But the real secret to Viewmaster 80's success is something even better: Total compatibility.

Each Viewmaster 80 includes our powerful AppleWorks expand software, allowing AppleWorks to run on the II+ with only 64K (or more) memory. (We recommend the RamFactor memory card, but any compatible Apple memory card will work.) The software provides our full range of AppleWorks enhancements, including expanded records, word processor, multi-disk saving, time and date display on screen with any PRO-DOS clock, and more!

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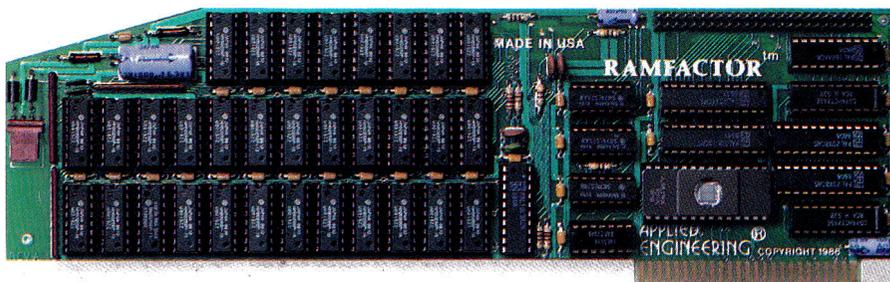
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RamFactor™

Boot any II+, IIe, or IIGs and be up and running your favorite software in less than 1 second.

Now anyone with an Apple II+, Franklin, Laser 128, Apple IIe or IIGs preferring to use slots 1 through 7 can now enjoy the speed and performance that they've been waiting for.

With RamFactor, you'll be able to instantly add another 256K, 512K, or a full 1 MEG on the main board and an expansion connector can address an additional 16 MEG of memory for possible future expansion. Since virtually all software is automatically compatible with RamFactor, you'll immediately be able to load programs into RamFactor for instantaneous access to information. You'll also be able to store more data for larger word processing documents, bigger data bases, and expanded spreadsheets. And with the battery back-up option, you can switch on your Apple and your favorite software will be up and running in less than 1 second!



Very Compatible

All the leading software is already compatible with RamFactor. Programs like AppleWorks, Pinpoint, BPI, Managing Your Money, Dollars and Sense, SuperCalc 3A, PFS, MouseWrite, MouseDesk, MouseCalc, Sensible Speller, Applewriter IIe, Business Works, ReportWorks, Catalyst 3.0 and more. And RamFactor is fully ProDos, DOS 3.3, Pascal 1.3 and CP/M compatible. In fact, no other slot 1-7 memory card is more compatible with commercial software.

AppleWorks Power

There are other slot 1-7 cards that give AppleWorks a larger desktop, but that's the end of their story. But RamFactor is the only slot 1-7 card that increases AppleWorks internal memory limits, increasing the maximum number of records in the database and lines permitted in the word processor, and RamFactor is the only standard slot card that will automatically load all of AppleWorks into RAM dramatically increasing speed and eliminating the time required to access the program disk, it will even display the time and date on the AppleWorks screen with any ProDos clock. RamFactor will automatically segment large files so they can be saved on 5¼", 3½", and hard disks. All this performance is available on the Apple II+,

IIe, Franklin, or Laser 128 when used with an 80 column display. RamFactor, no other standard slot card comes close to enhancing AppleWorks so much.

The "Instant On" Apple.

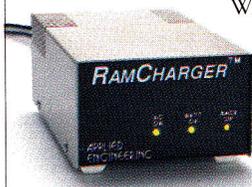
With the RamCharger battery backup option, RamFactor will retain programs and data during power failures or even when you turn your computer off. And because RamFactor plugs into slots 1-7, it's the only memory card that can cold boot an Apple without using slow floppy or hard disks. An available "Y" cable allows one RamCharger to power two RamFactors.

Powerful Program Switcher

With RamFactor, you can organize memory into multiple work areas and switch between them. Each work area can contain different programs and even different operating systems. Now you can switch from one program to another or even switch from AppleWorks to DOS 3.3 to CP/M to Pascal to ProDos in under a second. And with our battery back-up option, you can have permanent storage for up to 20 years.

Features:

- 256K to 1 MEG on main board. Expansion connector for possible further expansion to 16 MEG.
- Fully Apple II Memory Expansion compatible
- Compatible with Apple IIe, II+, IIGs, Franklin and Laser 128
- Battery back-up option allows you to turn on your Apple and run your favorite programs in less than 1 second!
- Automatically recognized by ProDos, DOS 3.3, Pascal, and standard CP/M
- Built-in RamDrive™ software (a true RAM disk not disk caching)
- Systems are directly bootable from RamFactor if desired
- Built-in self diagnostic software
- Automatic expansion with AppleWorks 1.3 or 2.0
- Allows Apple II+ and IIe to run your AppleWorks without buying any additional software
- Accelerates AppleWorks
- Displays time and date on the AppleWorks screen with any ProDos clock
- Fits any I/O slot except slot 3
- Fully socketed and user upgradeable
- Much, much more



RamFactor with 256K	\$239
RamFactor with 512K	\$279
RamFactor with 1 MEG	\$359
RamFactor with 2-16 MEG	CALL
RamCharger backup option	\$179
"Y" cable	\$24

(Allows one RamCharger to power two RamFactors.)

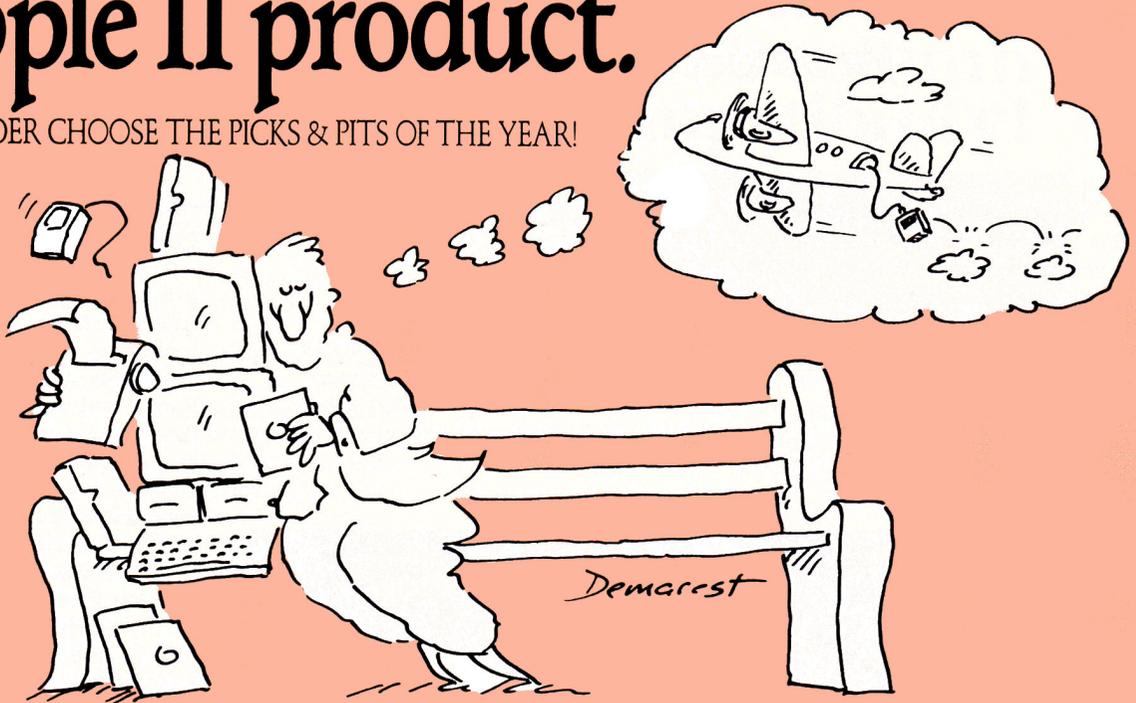
Order RamFactor today . . . with 15 day money back guarantee and our "no hassle" five year warranty. See your dealer or call (214) 241-6060, 9 a.m. to 11 p.m., 7 days, or send check or money order to Applied Engineering. MasterCard, Visa and C.O.D. welcome. Texas residents add 6¼ sales tax. Add \$10.00 if outside U.S.A.

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1 FIRST PRIZE—a trip to a major Apple trade show, including air fare and hotel, where we'll hold the inCider Picks & Pits Awards Ceremony; a year's subscription to inCider; and an official inCider T-shirt.

10 SECOND PRIZES—A year's subscription to inCider; and the inCider T-shirt.

25 THIRD PRIZES—T-shirts.

So send in your ballots. The deadline for entries is August 15. And the winners will be announced in the December issue of inCider.

SOFTWARE

Game _____

Classroom education _____

Home education _____

Creativity program (music, painting, etc.) _____

Printing and publishing _____

Word processing _____

Spreadsheets _____

Database management _____

Communications _____

Finance and accounting _____

Disk/file utilities _____

Programming languages/development aids _____

AppleWorks add-on _____

OVERALL

Most innovative idea _____

FAVORITE PRODUCT OF THE YEAR

WHY: _____

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Hardware expansion card _____

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City _____ State _____

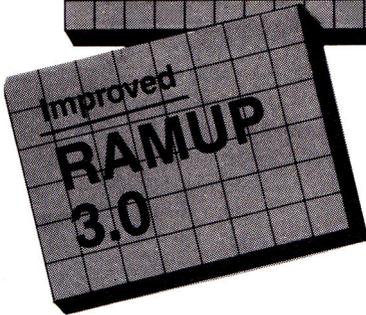
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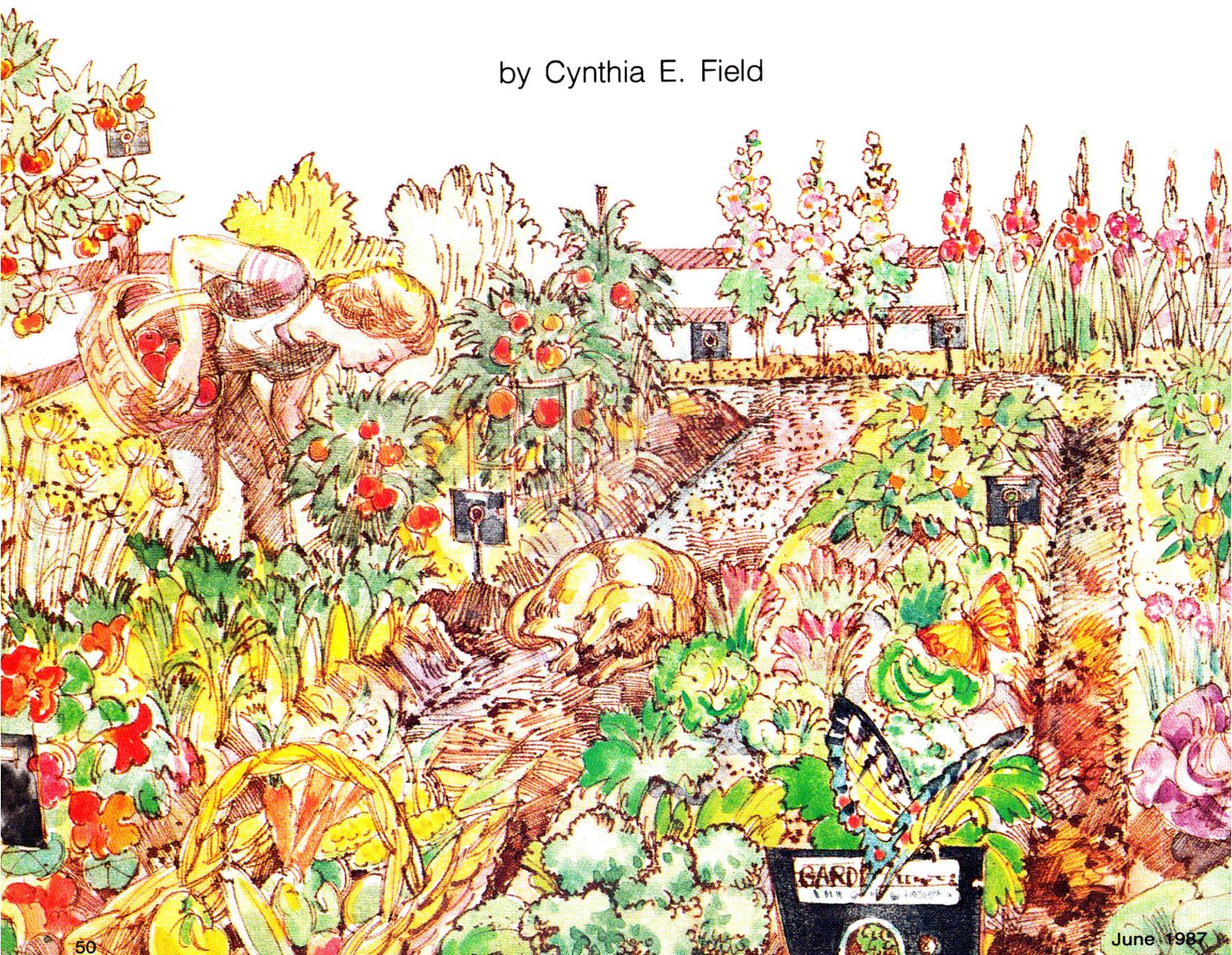
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COMING SOON: On June 1st we will introduce the first online bulletin board, the QC BOARD, dedicated to Applied Engineering technical support and for the products listed in this advertisement. *It will be loaded with answers to your applications questions and great tips on getting the most from your system.* It will also feature a marketplace to buy and sell Applied Engineering hardware. The QC BOARD will be brought to you free of charge from Quality Computers as a public service to our growing customer base.

Apple's **VICTORY GARDEN**

Whatever your botanical specialty—vegetable gardening, landscaping, or natural history—your Apple II and the right program can help you renew your appreciation of plants.

by Cynthia E. Field



As a subliminal symbol of health, wealth—even paradise—the Apple Computer icon is uniquely appropriate. The warm kinship we share with all plants, not just apples, began when the only computers around were the primitive ones encased in Neanderthal skulls—a decidedly low-tech period of human history.

Now that everything seems to have gone high-tech, working with plants can help you cope with the stresses of living in the '80s. According to Michael Buchman, writing in *Prevention* magazine ("Have You Hugged a Hibiscus Today?" July 1985), experts seem to agree that plants, whether in an apartment, garden, landscaped, or natural setting, refresh and restore us.

How can you merge this innate natural bond with your acquired love for computing? No one seems to be marketing a mulcher interface for the Apple II yet, but at least five publishers offer software programs (see the accompanying Product Information box and **Table** for details) to help you develop your interests as a gardener, landscaper, or naturalist.

ELECTRONIC GARDENS

Two gardening database/plotters, **Plantin' Pal** and **The Gardener's Assistant**, help you plan your vegetable garden. Both programs have simple requirements: only 48K and one floppy drive. As their names imply, **Plantin' Pal** is somewhat friendlier, but it's the less capable of the two. It's also less expensive: \$7.99, versus \$39.95 for **The Gardener's Assistant**.

Both programs ask you to describe your garden's dimensions and north-south orientation. **Plantin' Pal** can accommodate garden sizes of up to 36 feet by 60 feet; **The**

Gardener's Assistant lets you plan gardens of any size.

In still other respects, **The Gardener's Assistant** is more flexible than **Plantin' Pal**. You can choose whether to plot rows along your garden's shorter dimension or its longer dimension, for either narrow- or wide-row gardening. **Plantin' Pal** sets up a strictly wide-row plan, which may help conserve space and effort when weeding.

Both programs include built-in databases containing names of vegetables and fruits commonly selected by gardeners nationwide. **Plantin' Pal's** database contains 40 such choices. If you have a question about any of them, you can query the program to display data about growing conditions, maturity, and diseases. The program lists common pests, but omits preventatives.

The Gardener's Assistant selects plants from its database based on your growing region. The program provides information for about 55 vegetables and fruits that grow well in New England gardens, for instance.

An advantage for some gardeners, especially veterans, is the ability to modify the database in **The Gardener's Assistant**. You can file information on up to 100 different plants, eliminate some of the "default" vegetables, and easily add new species and varieties.

Both programs let you play "what if" with your family's produce requirements for fresh use or preparing preserves. This feature and some others are easier to use in **Plantin' Pal**. In fact, **Plantin' Pal**, one of the programs in the "Load'n'go! Software" series from ShareData, requires virtually no manual. Nearly everything you need to know about running the program is displayed on screen. I was stumped only once: I



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appropriate gifts for your friends' homes. For example, a search for living Christmas gifts (red-flowered, winter-blooming houseplants) resulted in six possibilities: the common poinsettia and Christmas cactus and four other, less-familiar plants.

If you prefer, instead of making such a personalized plant list, you can ask the program to list all plants whose names begin with the letter C, for instance. You can then print database information and search results.

Computerized Gardening was designed by the programmers at Living Videotext, the company that became Pinpoint Publishing. You'll notice the similarity between Ortho's built-in calendar, notepad, and calculator features and their counterparts in the Pinpoint desktop-accessories package.

Ortho's Computerized Gardening isn't just another software program—it's an engrossing educational experience. The package includes a number of pamphlets (such as *Growing Roses*), graph paper, and a 192-page, full-color text called *Gardening Techniques*, covering just about every aspect of home gardening, from planting a new lawn to building a cold frame to grafting fruit trees. Although the software database doesn't include vegetables,

the Ortho guide provides copious information on home vegetable gardening.

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What Tree Is This? introduces you to plant identification through dichotomous keys, which resemble IF/THEN statements in BASIC: "IF leaves are arranged alternately on the stem, THEN GOTO the next distinguishing characteristic in this list," for instance. By observing physical traits,

Custom Botanical Software

What if none of the five commercial programs described here suits you? Perhaps you just want a computerized card file of your houseplant collection, or an electronic gardening diary, or a wild-plant-collection database.

With a little bit of planning, you can design a flexible database file that lets you review your gardening successes and failures from one year to the next. I set up an AppleWorks database called (what else?) VeggieWorks to keep all my gardening information in one place—instead of scattered among multiple reference books and notebooks. (See **Figure 1** for a sample printout.) The labels I use are Common Name, Botanical Name, Variety, Source (where I bought the seeds or plants), Form (seeds, sets, plants), Spacing (between plants and between rows), Days to Harvest, Soil, Fertilizer, Pest Prevention, and Comments.

You can do the same. Unless you anticipate complicated searches or reports, you can also set up records in Bank Street Filer, ProFiler, PFS:File, or any other simple database-management program.

Some of the data you type into each record (Eggplant, for instance) will come from gardening guides, seed catalogues, or botany books. Some of the most valuable information will come from your own experience. You may even want to add labels to indicate Yield or Quality. You can determine your own Quality Index (a value of, say, 1 to 10) that takes into account

the vegetable's yield, appearance, taste, and ease of preservation. As the seasons pass, your database grows, and your memory fades, you can quickly and effortlessly print a list of the varieties that consistently give the best yields.

Landscape gardeners take pride in being able to identify the plants they tend. Naturalists like to point to a tree or wildflower, name it, and perhaps recount an anecdote about the plant's usefulness to early settlers of the region or its importance as a source of medicinal drugs.

All sorts of outdoorsy folks can set up simple database files. The landscaper's notebook might consist of Plant Name, Plant Family, Fertilizer Requirements, Pruning Notes, and so on. Depending on how technical you want your database to be, you might even include labels for other taxonomic categories.

You can print reports detailing the answers to questions such as the following: Which of my landscape plants are evergreens? What kinds of groundcovers do I have? How many varieties of roses have I cultivated?

The naturalist can use his or her database (see **Figure 2**) to print plant-identification labels to attach to actual specimens mounted on herbarium paper. If you identify a plant incorrectly, it's a snap to edit your database record and print a new label. Whatever your specialty, you can tailor the database manager you prefer to your own needs and interests. □ **—C.F.**

Figure 1. Report produced with VeggieWorks, the author's own home-grown AppleWorks database file, listing the contents of her vegetable garden and cultivation data.

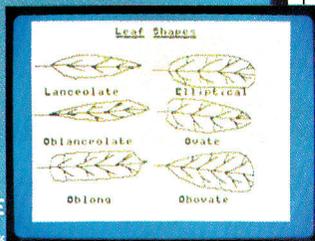
Common Name	Variety	Spacing	Days to H
Garlic	Elephant		
Eggplant	Early Bird Hybrid	18 inches	50
Broccoli	Romanecco (Italian)	18 inches	64
Onion	Hybrid Red Mac	3 inches	65
Pea	Frizette (French)	2 inches; provide support	65
Tomato	Bogger	2-2.5 ft.	75
Winter Squash	Early Butternut Hybrid	4-6 ft.	85

Figure 2. Printout from the author's Digital Herbarium AppleWorks database file, a record of wild plants with common name, scientific name, location, and date of find.

Phragmites communis	Poa pratensis
Tall reed	Kentucky bluegrass
Anthophyta	Anthophyta
Monocotyledonae	Monocotyledonae
Gramineae	Gramineae
Galilee salt marsh	Front yard
Aug 86	May 86

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What Tree Is This? offers a lesson in leaf anatomy.

you can "key out" or identify the tree, shrub, or herb you're curious about.

Keep in mind that *What Tree Is This?* is limited to 25 species. It's not a field guide, since it's not anywhere near exhaustive; you can't collect random samples of leaves and then use the program to identify them all. There's no reason such an electronic field guide can't be produced, but *What Tree Is This?*, at least in its current version, is simply a learning tool for home or classroom.

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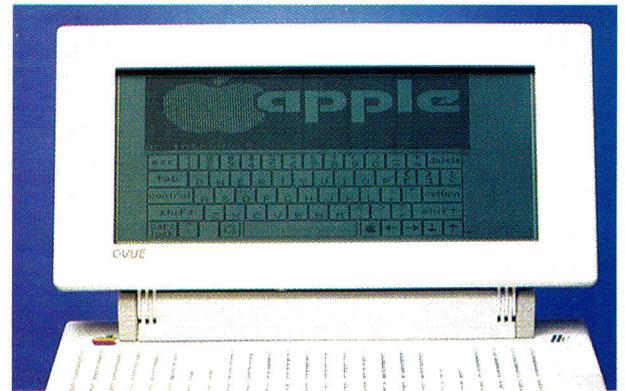
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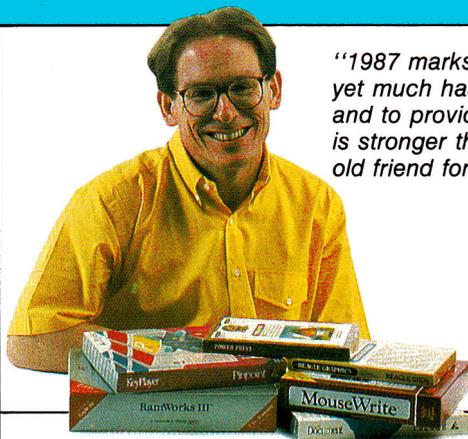


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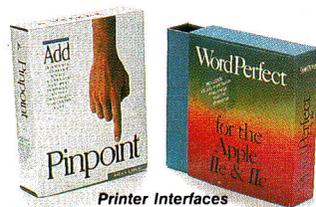
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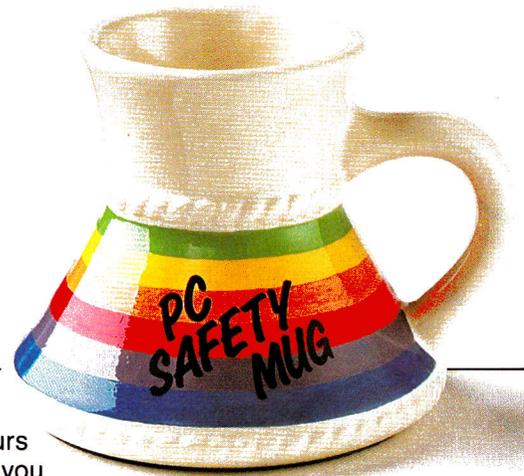
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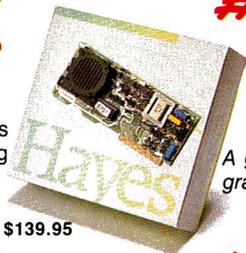
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ProDOS Clocks

If you need to know the date and time you last worked on a particular file, or if you want to gain a better understanding of ProDOS and the inner workings of your Apple II, a ProDOS clock can lend a hand.

by Paul Statt, *inCider* Technical Editor

ProDOS clocks can be intimidating—the manuals for the three reviewed here read as if they were written by someone who touches in assembly language—and that's a shame. Even if the only code you've ever written is PR#6 to boot a disk drive, you can use a ProDOS clock profitably.

Who needs a ProDOS clock? If you needed a wristwatch or a cuckoo clock to get through the day before you bought a computer, you need a ProDOS clock. Each time you create or modify a ProDOS file, the clock "stamps" it with the time and date (see the accompanying sidebar, "We Interrupt This Program," for a discussion of the frequency of time checking); it can measure the time it takes for you to accomplish tasks on your Apple; it can even turn the lights in your home on and off at the proper hour if you add a BSR (a standard interface for home-control products) option to it. And if you're not a programmer, a ProDOS clock is a great way to start thinking about the insides of your Apple, about PEEKs and POKEs and BASIC programming.

A ProDOS clock performs two functions—it keeps time, and it announces the time to your Apple's operating system, ProDOS. The timekeeping end is fairly simple, using a quartz clock similar to the type commonly found in wristwatches and small appliances. The ProDOS business is more complex. It requires two types of software: the "firmware" that's built into your ProDOS clock card to turn time into a form the

computer understands, and the utility that comes on disk, which sets the time and date on the clock card.

INSIDE A PRODOS CLOCK

A quartz clock keeps time by counting the expansions and contractions of a tiny piece of quartz, a crystal. As electrical current runs through it, it expands and contracts with the regularity of a pendulum. Only a minute amount of electricity, supplied by a small battery, is required.

The types of batteries used in ProDOS clocks vary. The **Thunderclock** (see the accompanying Product Information box for manufacturer addresses and pricing for the three clocks mentioned here) uses two standard alkaline 1.5-volt N cells, the kind that powers cameras. (You can buy them in photo-equipment stores.) They're cheap, easy to find, and most importantly, they don't leak. **Clockworks** runs on a single 3-volt lithium "coin cell," a round, flat battery about the size of a quarter, available in electronics-supply stores. They're replaceable, though harder to locate than other types. The **Timemaster H.O.** uses a nickel-cadmium battery that's attached to the card and recharges every time you turn on your Apple.

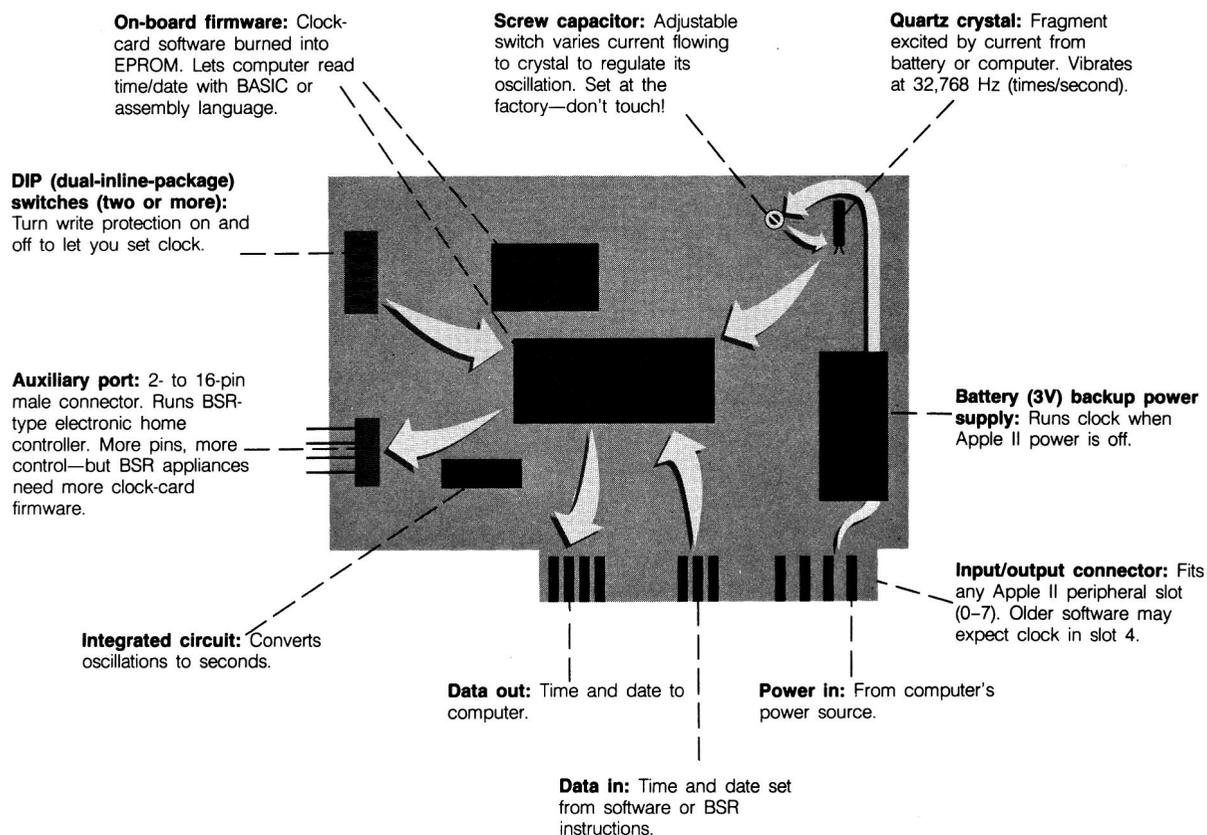
As long as you use your Apple occasionally, the Timemaster H.O. will keep accurate time; the batteries in the others will have to be replaced. Remember that a clock without a battery is useless; the clock can run on your Apple's power supply, but only when the machine is on.

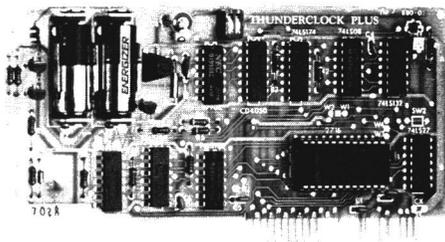
The quartz crystal takes the steady *direct current* from the battery and converts it to a regularly oscillating flow, or *alternating current*. The crystal is supposed to vibrate at 32,768 *hertz*, or cycles per second. If the temperature inside your machine is higher or lower than usual, or if your quartz crystal is a bit old, that frequency may vary. Each clock card has a capacitor that controls the direct current flowing into the quartz crystal, and thus the frequency of vibration. (By turning the tiny screw on the capacitor, you can adjust the clock: A clockwise turn speeds it up, counter-clockwise slows it down. It's unlikely you'll ever need to do this, but it's good to know you can. See the accompanying **Figure** for details of clock-card anatomy.)

The clock card turns these vibrations into time, just as the gears in a mechanical watch convert the slow unwinding of a spring into varying rates of rotation in the second, minute, and hour hands. Integrated circuits (ICs) on your clock card count oscillations of the quartz crystal: 32,768 of them make a second, 60 seconds make a minute, and so on until it gets to 365 days in a year. The largest IC on the clock card is the read-only-memory (ROM) chip that contains the software for getting the time and date to ProDOS.

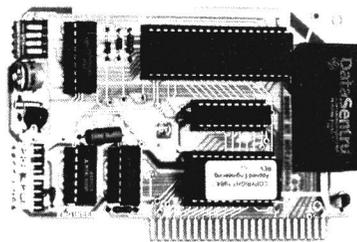
Firmware varies from clock to clock—not every clock, for instance, supports the Pascal or CP/M operating system. (All of them support ProDOS and DOS 3.3, and add

Figure. Standard clock-card anatomy.

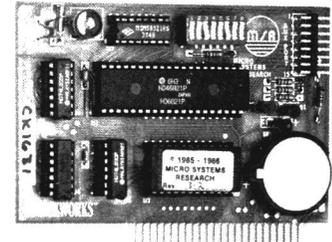




Thunderclock



Timemaster H.O.



Clockworks

a date/time-stamping routine to DOS 3.3.) Each clock stores the time and date in different formats (see the accompanying **Tables**). Note that not every format includes every bit of information—for instance, the year. If you know you're going to need the year, make sure the clock you buy supports it.

PRODOS AND TIME

Apple's ProDOS contains built-in provisions for time and date, even if your computer doesn't. Any program that

Table 1. Possible formats for time and date storage in ProDOS clocks.

Format	Sample
24-hour ASCII	MON FEB 16 17:43:15
AM/PM ASCII	MON FEB 16 05:43:15 PM
Mountain Computer Appleclock	02/16 17:43:15.387
Timemaster	3 02/16/87 17:43:15
Numeric	02,03,16,17,43,14

Table 2. Three ProDOS clocks: features compared.

		THUNDERCLOCK	TIMEMASTER H.O.	CLOCKWORKS
HARDWARE	battery quartz crystal estimated accuracy on-board firmware auxiliary output DIP switches	2 alkaline N cells 32,768 Hz ±6.001% 1024 bytes (1K) BSR-type, 2 pins #1 write-protect/set	1 rechargeable 3V NiCad cell 32,768Hz ±0.005% (plus synchronization) 2048 bytes (2K) BSR-type, 8 pins #1 write-protect/set #2 mode #3 enable/disable IRQ interrupts #4 enable/disable NMI interrupts	1.3V lithium coin cell 32,768 Hz N/A 4096 bytes (4K) BSR-type, 16 pins #1 write-protect/set #2 enable/disable IRQ interrupts #3 enable/disable NMI interrupts #4 enable/disable 1/min. interrupts #5 enable/disable 1/hour interrupts #6 connect/disconnect aux. port I #7 connect/disconnect aux. port II
SOFTWARE	operating systems ProDOS DOS 3.3 Pascal* CP/M* programming languages BASIC (Applesoft & Integer) Pascal Assembly interrupts time modes millisecond timing	yes yes (plus time/date stamp) yes yes yes (programs included) yes yes (programs included) 0Hz 64Hz 256Hz 2048Hz a.m./p.m. ASCII 24-hour ASCII Mountain Computer Appleclock numeric no	yes yes (plus time/date stamp) yes yes yes (programs included) yes yes (programs included) 0Hz 1/800Hz (1/hour) 1/60Hz (1/min.) 1Hz (1/sec.) 1024Hz a.m./p.m. ASCII 24-hour ASCII Mountain Computer Appleclock Timemaster numeric yes	yes yes (plus time/date stamp) no no yes (programs included) yes yes (programs included) 0Hz 1/800Hz (1/hour) 1/60Hz (1/min.) a.m./p.m. ASCII 24-hour ASCII Mountain Computer Appleclock Timemaster numeric yes
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		N/A = information not available * may be available at extra cost	**best technical-support line in the business, but the number (214-241-6069) isn't printed	

Applesoft Date Stamping Under ProDOS

Apple's ProDOS won't stamp a date onto program files unless you have a ROM clock. This useful feature, conspicuously absent from Apple's ProDOS, is a pure RAM routine that lets you set the date and store the values.

Because it's a RAM problem, Applesoft BASIC can fill the need easily. When ProDOS is active, the date (that is, the month, day, and the last two digits of the year) is stored in RAM at memory locations 49040 and 49041 (or at bits in \$BF90 and \$BF91 of the monitor). If no ROM system clock is installed, a PEEK at 49040 and 49041 will always return zeros, unless dates are otherwise placed there in RAM. To set the date in RAM, you must POKE into memory two encoded numbers that really function as three.

Listing 1 is a date-stamping utility that encodes the two required numeric values. **Listing 2**, on the other hand, is a short accessory that decodes the two numbers POKEd into memory addresses 49040 and 49041, and displays them as three.

If you're tired of getting the date from your Apple in a format you can't translate, or really see something missing from your programs when you catalog your BASIC program disks, you'll appreciate these short routines.

These two brief programs are designed as complementary utilities: You can use them separately or together to control date stamping in Applesoft BASIC. DateStamp (**Listing 1**) works well as a startup program, or you can modify it for inclusion in any Applesoft application. DateCheck (**Listing 2**) can function as a stand-alone date-reporting program (perhaps with a ROM clock installed) or a startup that runs DateStamp whenever you need it. □ —Merle C. Harton, Jr.

Listing 1. DateStamp.

```

5 REM Set startup date with DateStamp
10 HOME: PRINT "Type in Month/Day/Year"
20 PRINT: PRINT "Use this format: 2,15,87"
30 PRINT
40 INPUT "DATE? ";MO,DY,YR
50 PRINT: PRINT "The date is: "; INVERSE:
PRINT MO;"/";DY;"/";YR: NORMAL
60 PRINT
70 INPUT "IS THIS CORRECT? ".N$
80 IF N$="Y" OR N$="y" THEN GOTO 100
90 IF N$=<"Y" OR N$ <"y" THEN GOTO 100
100 A = 49040: B = 49041: GOSUB 120
110 NEW: END
120 POKE B,2 * YR + (MO > 7)
130 POKE A,DY + 32 * (MO - 8 * (MO > 7))
140 RETURN: END

```

Listing 2. DateCheck.

```

5 REM Check the current date with DateCheck
10 HOME
20 DY = PEEK (49040) - INT (PEEK (49040) / 32 * 32)
30 YR = INT (PEEK (49041) / 2)
40 MO = (PEEK (49041) - YR * 2) * 8 +
INT (PEEK (49040) / 32)
50 PRINT "THE CURRENT DATE IS: ";MO;"-";DY;"-";YR
60 PRINT: PRINT "Change the date? <Y> <N> ";A$
70 GET A$
80 IF A$ = "Y" OR A$ = "y" THEN GOTO 100
90 IF A$ = <"Y" AND A$ <"y" THEN HOME: NEW: END
100 PRINT CHR$(4);"RUN DATESTAMP"
120 END

```

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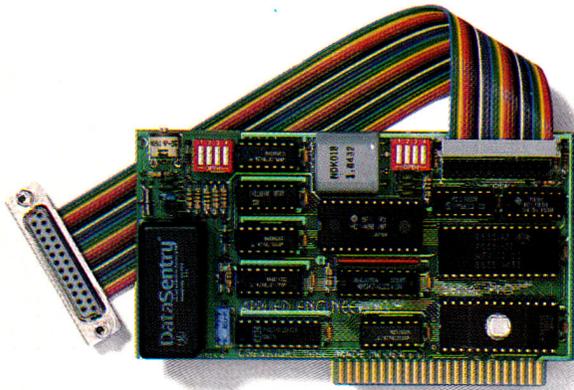
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runs under ProDOS can find the time and date, which ProDOS stores in memory locations 49040-49043 in your Apple. If you've installed a ProDOS clock in one of your peripheral slots (traditionally slot 4, because some programmers write software for the Apple II that assumes the clock will reside in that slot), the clock will read the time and date into those locations. If you don't have a clock, ProDOS knows it won't find any data in those locations and so ignores them, unless you've put numbers there manually. (See the accompanying sidebar, "Applesoft Date Stamping Under ProDOS," for more information.)

The date and time are always stored in the same place in Apple memory: bytes 49040, 49041, 49042, and 49043 (hexadecimal BF91-BF93). Your clock keeps time in a straightforward way—the hour in byte 49043 and the minutes in 49042—but it keeps the day, month, and year in two bytes, 49040 and 49041. That means that the code for the month is split between the two bytes.

You can see the time and figure out the date by PEEK-ing into those memory locations. A PEEK is like a microscope that lets you look into the tiniest cells of your Apple's memory. To see what's in bytes 49040-49043, just type in and run this simple BASIC program:

```
10 PRINT PEEK(49043)
20 PRINT PEEK(49042)
30 PRINT PEEK(49041)
40 PRINT PEEK(49040)
```

If you have a ProDOS clock and are running ProDOS BASIC, you'll see numbers like these:

```
13
1
174
107
```

The first two are the time in hours and minutes; the third and fourth stand for the day, month, and year.

If you don't have a clock, you can put almost anything into those memory locations. You can put the time in pretty simply: Just POKE 49043,X and POKE 49042,Y, where X is number of the current hour and Y the number of minutes after the hour. (If a PEEK is like a microscopic view into the guts of your Apple, a POKE is like surgery: It changes the number in the specified location.)

It's not easy, however, to enter the date. March 11, 1987, doesn't look much like 174 107 to you or your Apple. You have to play with the numbers a bit. (The formula for conversion is complex, but your Apple can calculate it for you—see **Listings 1** and **2** in "Applesoft Date Stamping Under ProDOS.")

Product Information

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Reader Service Number 320

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Reader Service Number 321

If you want the time and date, but don't want to buy a clock, you have three options. You can POKE in the right numbers when you start; you can type in **Listings 1** and **2**—DateStamp and DateCheck, respectively; or you can use the Time/Date Utilities on the ProDOS User's Disk. But if you'll need the time and date regularly, it's best to buy a clock.

What does a ProDOS clock do for you? Its primary purpose is to "stamp" each ProDOS file with the time and date of its creation and its last change—you see them when you catalog a disk. That's really all ProDOS can do with a ProDOS clock. When you boot up AppleWorks, for instance, the first message you see asks you to "enter the current date or press Return." The date you see is the date ProDOS reads from your clock, or the last date you typed in. The date is written on the ProDOS file called APLWORKS.SYSTEM, and won't change until you or the clock alters it.

Whether or not you program, ProDOS clocks are useful. If you're willing to do a little programming, ProDOS clocks are great fun. They're also a good way for beginners to learn about programming. ■

We Interrupt This Program

How often does your clock check the time? ProDOS checks its special memory locations (40940-40943) every time you use a BASIC.SYSTEM command, such as CATALOG, CREATE, READ, SAVE, and others. But if you do a little programming yourself, you may want your program to check the clock more often. Interrupts let you control the frequency of clock watching.

The Apple II system software uses interrupts to let a program that's running in the 6502 microprocessor stop for a moment to get information from an input/output card in an I/O slot. It's almost as if your Apple's doing two things at once.

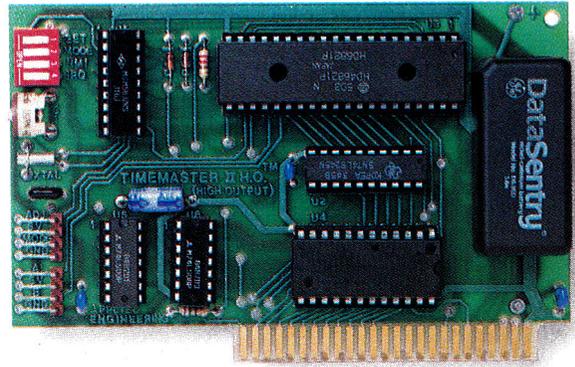
Apple IIs, however, don't use interrupts to simulate computers that can actually do two things at once (multitasking machines), so the interrupt routine has to be short. This means you usually have to write in assembly language, and that it probably won't do much more than get the time from a clock or, to use a modem as an example of another type of I/O card, check to see whether the phone's ringing.

The 6502 runs at about 1 megahertz, or a million cycles per second (hertz). You can set interrupts on your clock card to break in as rarely as never (0Hz) and as often as 2048 times a second (2048Hz; see **Table 2**).

To get an idea of how interrupts work and why they have to be short, imagine trying to read a million pages an hour. If you have to stamp each page with the time and date (that is, interrupt your reading a million times an hour), finishing the book will take longer, but not significantly so. Stamping the pages (the interrupt routine) takes a tiny fraction of the time required to read the million pages (the main program). But if your interrupts aren't short (for example, if you interrupt your reading to write down notes on each page), the "interrupt routine" can take almost as much time as the "main program." □

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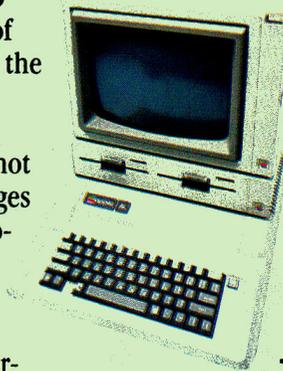
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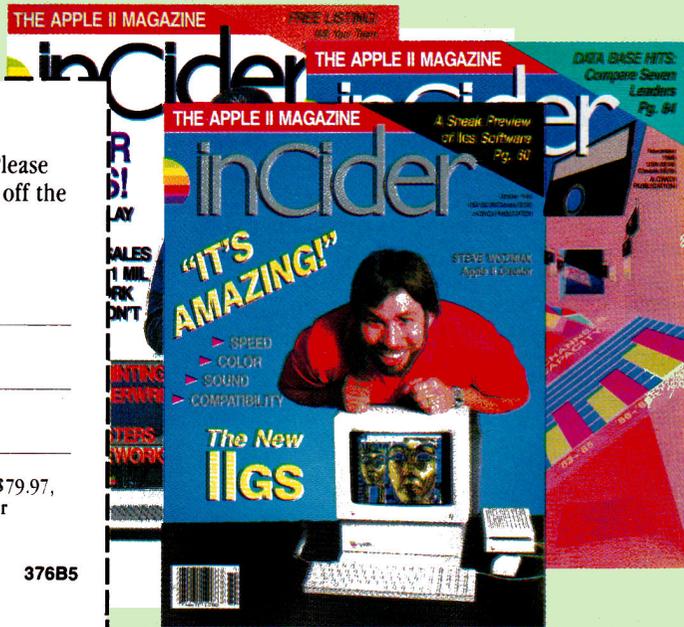
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Three-Across Mailing Labels

Can you print triple mailing labels with AppleWorks? Yes indeed!



by Ruth K. Witkin

A letter in the November 1986 *inCider* ("Action with AppleWorks," p. 10) sent me scooting to my trusty Apple IIc. Here, courtesy of reader Judith Classen of Albuquerque, New Mexico, was the solution to the intriguing problem of how to get AppleWorks to print mailing labels three across. With pounding heart and sweaty palms, I started up *Olde Trusty* and followed each step of the procedure. And sure enough, it works. It works just fine.

If you missed Judith's letter or my column, "Customer Mailing Labels with AppleWorks" (March 1986, p. 54), to which she refers in her letter, or need more detailed instructions, stay tuned. You're about to create a report format that does indeed print three names across, just like the ones shown in **Figure 1**.

The fast approach is to use MYLABELS, the database in last month's column, which prints one-across return-address labels. You can use regular printer paper to get an idea of what three-across labels look like, so don't bother with label paper now.

If you created the MYLABELS database, bring it on screen, then skip to "Printing the Database as an ASCII File." If you haven't created MYLABELS yet, refer to the detailed steps in "Creating Return-Address Labels" (May 1987, p. 70) or use the following summary:

- 1) Make a new file for the database and name it *MYLABELS*.
- 2) In the Change Name/Category screen, type three category names: **Name**, **Street**, and **City/State/Zip** (press the return key after each category). Now press the escape key.
- 3) Press the spacebar to enter the Insert New Records mode. In Record 1, type your name, your street address, and your city, state, and zip code. (Press the return key after each entry.) When you hit the return key after the last entry, you should see an empty Record 2 on the screen. Press OA-Z twice to zoom to multiple-record layout.

4) Now make 14 copies of your record. Press OA-C to start the Copy command. Press Return to confirm *Current record*. Type **14** and hit the return key again.

5) Press OA-S to store the database on disk.

PRINTING YOUR DATABASE AS AN ASCII FILE

You now have all 15 of your records in the Review/Add/Change screen. The next few steps create a report format, then print the database to disk as an ASCII file. Simply put, ASCII (American Standard Code for Information Interchange) is a standard method of representing characters by numeric codes that tell your computer which character is which.

Press OA-P to bring up the Report Menu. Now type **3** and press the return key to create a new label format. Type **THREE.ASC** and press the return key again to name the new report. From the Report Format screen, press OA-P and type **4** to print *A text (ASCII) file on disk* (or, if you have more than one printer, the number that selects the ASCII file), and hit the return key.

AppleWorks now asks for a *pathname*, which tells the program where to find your file. The pathname consists of the name of your data disk and your filename, each preceded by a slash. I stored my file *THREE.ASC* on a disk named *DATA20*; therefore, my pathname is */DATA20/THREE.ASC*. Type your pathname and press the return key. AppleWorks stores your file on disk and returns you to the Report Format screen. In the words of Confucius, "The palest of notes is worth a thousand memories," so jot down your pathname.

CREATING A NEW DATABASE AND TRIPLE-LABEL FORMAT

Now press the escape key three times to return to the Main Menu. Press the return key to bring up the Add Files menu. Now create a new file for the database from a text (ASCII) file by typing **4**, pressing Return, typing **2**, and pressing Return again.

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APPLEWORKS IN ACTION

Figure 1. Return-address labels printed three across with AppleWorks.

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Ruth K. Witkin 5 Patricia Street Plainview NY 11803	Ruth K. Witkin 5 Patricia Street Plainview NY 11803	Ruth K. Witkin 5 Patricia Street Plainview NY 11803
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Figure 2. Report format that prints three-across labels with the records in the MYLABELS database.

File: THREELABELS REPORT FORMAT Escape: Report Menu
Report: THREELABELS
Selection: All records

```

=====
Category 01                      Category 04                      Category 07
Category 02                      Category 05                      Category 08
Category 03                      Category 06                      Category 09
=====
    
```

-----Each record will print 6 lines-----

Use options shown on Help Screen ?-? for Help

AppleWorks next wants to know the number of categories you want in each record. You're printing three categories three across (3 x 3), so type **9** and press the return key. At the pathname prompt, type your pathname exactly as you typed it before (/disk name/filename), and press the return key.

Now AppleWorks asks for a new filename. Type **THREELABELS** and hit the return key again. That odd-looking Review/Add/Change screen now contains five numbered categories (01 to 05) instead of the category names you entered earlier, and five tiers of records arranged side by side. If the screen were twice as

wide, you'd see Categories 01 to 09 and all 15 records.

You're now working with a new file called **THREELABELS**, which doesn't contain any report formats, so the next step is to create one that looks like **Figure 2**: Press OA-P to bring up the Report Menu screen. Type **3** and press the return key to tell AppleWorks you want to create a label format. Type **THREELABELS** to name the report, and hit the return key again.

POSITIONING THE CATEGORIES

AppleWorks now brings up nine categories (01 to 09) with your cursor on Category 01. The first three cate-

gories are fine. A bit of fancy finger-work positions the other categories and makes your screen look like the one in **Figure 2**: Press the down arrow key three times to place the cursor on the *C* in *Category 04*. Now hold down OA-right arrow to scoot Category 04 to the right until the *t* in *Category* is aligned with the first *R* in *REPORT FORMAT*. Leave your cursor where it is and hold down OA-up arrow until *Category 04* is immediately below the double dashed lines.

In the same way, bring *Category 05* to the place immediately below *Category 04*: Press the down arrow key four times, then hold down the left arrow key until the cursor is atop the *C* in *Category 05*. Hold down OA-right arrow to move it to the right, then OA-up arrow three times. Repeat this process to bring *Category 06* to the place immediately below *Category 05*.

In the same way, position categories 07, 08, and 09 so that the *C* in *Category* is aligned with the *E* in *Escape: Report Menu*. Remember, when you're not shifting a category, use the left and down arrow keys to glide the cursor across the screen. When you shift a category, be sure the cursor is on the *C* in *Category*, then use the OA-right arrow and OA-up arrow keys to do the work.

Now that the categories are all in place, delete three lines so that the information prints properly on the label: Press the down arrow key to move the cursor below *Category 09* and press OA-D three times. The screen should now read "Each record will print 6 lines."

PRINTING YOUR LABELS

The standard AppleWorks margins are fine for these labels, so there's no need to change them. Assuming you're using standard one-inch labels ($\frac{1}{8}$ inch plus $\frac{1}{16}$ inch between labels), tell AppleWorks that the paper length is one inch so that the labels print continuously with no extra lines at the top or bottom of a page and no form feed between pages: Press OA-O to bring up the Printer Options screen. Type **PL** and press the return key. Type **1** and hit the return key again.

You don't need a report header at the top of each page of labels. Toggle the header setting from *Yes* to *No* by typing **PH** and hitting the return key.

Next, check the SC setting to be sure it's *No*. If it's *Yes*, some printer codes are still embedded from last

Figure 3. Three-across label format created for the records in the MAIL LIST database.

```
File: THREEACROSS          REPORT FORMAT          Escape: Report Menu
Report: THREEACROSS
Selection: All records
```

```
=====  
Category 01 <Category 02  Category 09 <Category 10  Category 17 <Category 18  
Category 03                Category 11                Category 19  
Category 04                Category 12                Category 20  
Category 05                Category 13                Category 21  
Cat <Cat <Category 08      Cat <Cat <Category 16      Cat <Cat <Category 24
```

-----Each record will print 6 lines-----

Use options shown on Help Screen ?-? for Help

month's AppleWorks in Action. Type **SC** and press the return key. Press Return again to confirm *No*. Hold down the shift key and hit ^ (the ex-

ponent key). Now press the escape key to return to the Report Format screen.

To see what the labels look like,

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"print" them to the screen: Press OA-P to bring up the Print the Report screen. Type **2** to select *The screen* (or, if more than one printer is listed, the number corresponding to *The screen*), and press the return key. And here are nine labels. Looking good! Press the return key again to display the other six labels. Hit the return key to return to the Report Format screen.

You're all set, so turn on your printer. Now press OA-P to start the Print command. Type **1** (or the printer number) and press Return twice. (The second time confirms *one copy*.) The printer starts working, and here are 15 of your return-address labels printed three across!

Now press OA-S to store the database on disk. After saving, AppleWorks returns to the multiple-record layout in the Review/Add/Change screen. The same techniques can produce two-across labels, too.

If there's a problem with your labels (for example, one label on a page or

gaps between labels), your printer may need the top-of-page setting changed to *No*. Here's how to do it: Return to the Main Menu and type **5** to bring up the Other Activities menu. Type **7** to *Specify information about your printer(s)*. Type **4** to *Change printer specifications*. Type **2** to select *Accepts top-of-page commands*. Type **Y** to change the value to *No*. Press the return key after each selection. Be sure that item 3—*Stops at end of each page*—is set to *No*.

A FEW FINAL COMMENTS

These techniques work well in the MYLABELS database because you have only one record (your own) with which to contend, and few, if any, updates. A typical database contains a variety of records you need to update often, and the oddball format of five categories per record is bound to get in your way. Clearly, you can insert and delete records, but you can't arrange or select them—and that's a serious drawback.

Your best bet is to maintain a standard database; before you print any labels, go the ASCII route to create a temporary file that produces three-across labels, then delete it after you print. An ASCII file such as THREE.ASC shows up in the Delete Files listing only as type *Other*, so it's worthwhile to identify it by appending .ASC to the filename.

Figure 3 shows a three-across label format for the records in the MAIL LIST database (March 1986, p. 54). It's a tad more challenging to create because MAIL LIST has more categories, some of which (FIRST/LAST NAME and CITY/STATE/ZIP) you must combine. The techniques are the same as for MYLABELS. If you intend to create this format in MAIL LIST or a similar database, here are a few tips:

- 1) When you create a new file from the ASCII file, specify three times the number of categories with which you're working. For example, MAIL LIST has eight categories, so you specify 24.
- 2) When you position the categories on screen, don't be concerned about truncating any names, as with the combined CITY/STATE/ZIP categories. For example, squeezing Categories 06, 07, and 08 to fit on one line produces *Cat <Cat <Category 08*, which works fine. The first two *Cats* are the truncated Categories 06 and 07.
- 3) Left-justify the combined categories as if you were printing one across. The less-than sign (<) shows the left-justification.
- 4) It helps to have a hardcopy of the Report Format screen showing the original category names, so that you have something to refer to when you shift the numbered categories around.

Next month, you'll use the word processor to produce two pages of an employee handbook and, in the process, create a page footer. ■

Ruth K. Witkin is a consultant in computer applications for business. Write to her at 5 Patricia Street, Plainview, NY 11803. Enclose a self-addressed, stamped envelope if you'd like a personal reply.

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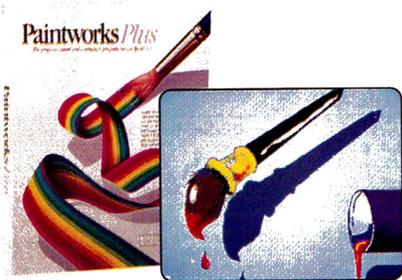
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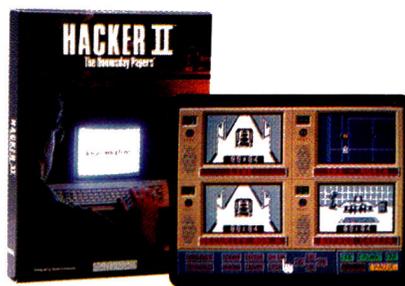
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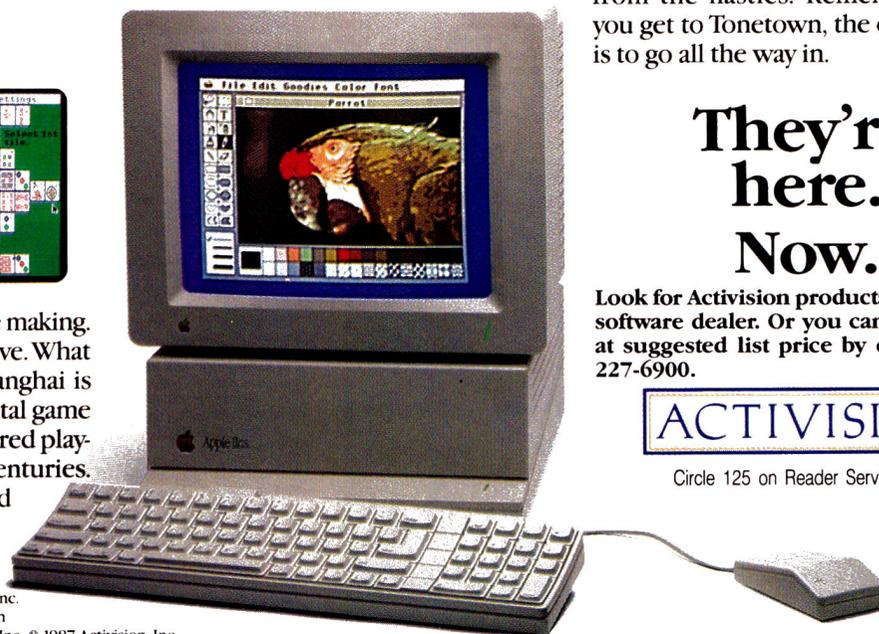
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Bug Busters

Debugging takes the fun out of programming, but a few simple techniques can make it easier.



by Dan Bishop

People who write computer programs know how frustrating it can be to “debug” code to make it work. If you’ve typed in a program from a printed listing, you’ve probably been confronted with an error message when you first tried to run the program. Even good typists make occasional errors when typing program code because of its arcane nature. One misplaced or missing colon or a couple of transposed characters are enough to render a program useless—and trying to find the problem will drive you to distraction.

This month I’ll discuss some of the more common problems to look for when you’re debugging a program, and suggest some techniques for making it easier to correct them.

TYPOGRAPHICAL ERRORS

The error you’re most likely to encounter is the typo. Whether you’re entering an original program or copying one from a printed listing, those brain-to-finger signals sometimes get out of sync, so that what you type isn’t what you want. Misreading the program listing is another source of error in this category.

Some typos are easier to catch than others. You can usually find and correct them by reading the code carefully, but certain typos are more subtle. PRIMT, for example, is one common error that’s not so easy to find—the shapes of M and N are so similar that your mind automatically substitutes an N when it sees the PRI and T. You might read the same line of code five times before catching this error.

Try to find a letter O and a numeral zero in a listing from your printer. Study these two characters long and hard, imprinting firmly in your mind the differences in their appearance. The next time you debug a program, think of these differences and watch for an inadvertently typed O or zero. A little practice makes this error much easier to spot.

Another character that’s often mistaken for a number is lowercase l typed instead of a one. The L appears in uppercase in your listing, though, so it’s less likely to cause

problems. On the other hand, uppercase I is frequently mistaken for a one when you read code in a listing—a more difficult error to discover.

Some programs use blank spaces as more than just an aesthetic addition. The exact number of spaces may be critical in a particular program. If you’re debugging a program that contains quotation marks with spaces between, check this code carefully. Two quotes with no space between them is quite different in meaning from quotes with one space between. Try comparing character positions in that row with the characters a row above or below it to determine the exact number of spaces needed.

How important do you think a simple comma can be? Code that contains READ/DATA statements also contains commas to separate the data elements. Every comma in such a listing is critical. Your Apple expects commas in certain positions to match data with the proper variables.

Some data statements contain two or more commas appearing together. Depending on the situation, some data lines end with two commas, while others have no comma at the end. Each comma marks the place for a data element, whether actual data are present there or not.

Missing data or commas result in an OUT OF DATA error. The READ command tells your Apple to read another data element, but, if a comma is missing, the computer thinks it has reached the end of the data list. With no more data to read, an OUT OF DATA error occurs.

Less obvious is the case in which one of the data elements is out of position. This could result in the program reading the wrong data element—a state name for a city, for example, or a zip code in place of a state. If this happens when you run your program, check the data lines.

Improperly placed data elements can result in error messages that seem to have no relation to the data lines in your program. For example, if the Apple reads your data out of sequence, it may be trying to read a name into a nonstring variable, pro-

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ducing a TYPE MISMATCH error. The computer then tags the read line, rather than the data line, as the offending line in your program.

Suppose you read an alphabetic string into a variable that requires numeric data. Your program might later use the VAL function to convert the string of digits to a number for use in a division problem, but if VAL operates on an alphabetic string, the result will be zero. The error? Division by zero!

Another common error is leaving out REM statements when entering programs from a listing. You know that your Apple ignores anything that follows REM, so, to save time and effort, you type in your program, leaving out the REM lines. When you run it, though, the Apple returns an UNDEF'D STATEMENT error. A GOSUB, GOTO, or THEN command probably refers to one of the REM lines you left out—a vital part of the program if it marks the beginning of a subroutine.

Have you ever run into a RETURN WITHOUT GOSUB error? You check

your listing and find a GOSUB as clear as the nose on your face. What could be wrong here? Most likely, you forgot to use an END statement to separate the main program from your subroutines. When the Apple executes the last statement in your main program at, say, line 190, it moves on to the next line of code, which may be the first line of a subroutine. The computer works its way through the subroutine until it reaches the RETURN command. But this time, there's no GOSUB to direct the computer to execute the subroutine. To correct this error, add line 200 END if line 190 is the last line in your main program.

CHECKING VARIABLES

Applesoft converts your BASIC code to machine language and executes the resulting commands line by line. When an insurmountable problem occurs, the program halts and displays an error message with the number of the line that was executing when the error occurred. Many peo-

ple don't know that all the variables the program uses are still accessible and retain their current values when the program stops.

You can take advantage of this fact when you debug your program. Let's suppose your program crashes at a certain line number. Check your program listing to determine the variables that part of your program uses, then run the program again. It will crash at the same place, but now you can obtain the value of each variable by typing PRINT, followed by the variable name, for each of the variables. For example, entering PRINT XY displays the value XY had when the program crashed.

Compare the actual values of the variables with the ones you expected them to have. Any discrepancies might lead you to the source of the problem.

Another little-known fact is that you can start program execution from any line by typing GOTO, followed by the number of the line from which you want execution to begin. Unlike the

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RUN command, GOTO doesn't initialize variables that reside currently in memory. Your Apple uses whatever values the variables have when you enter the GOTO command.

Suppose you want to test just a portion of your program starting at line 2500; you note that this code segment uses the variables A, B, and XY. From command mode, enter values for these three variables, then enter GOTO 2500:

```
A = 25 (press Return)
B = 12 (press Return)
XY = 0 (press Return)
GOTO 2500
```

Your Apple begins executing the program starting at line 2500, using the values you entered for A, B, and XY. This gives you a chance to observe what happens to these values as the computer executes the troublesome program segment.

THE STEP-THROUGH

If all else fails, you can often find a program bug by stepping through the code, line by line, by hand. The object is to determine exactly what your Apple does at each step.

Start at the beginning of the program or subroutine that produces the bad results. To track your program's progress, mark off several columns on a sheet of paper. At the top of each column, write the name of one of the variables appearing in this section of code. Determine each variable's starting value before the first statement executes. Then analyze each command in your program, and note the changes in each variable's value as a result of that command.

Be very careful in your analysis. A common problem is knowing ahead of time the value a variable should have, and writing that value down. But you want to know the actual value: In a sense, you must pretend you're the computer, and assign and change values *only* as the program instructs.

If your code has a looping instruction, cycle through the loop for the number of steps called for, crossing off old values on your list and replacing them with new ones. You might be surprised at the number of program errors that result from using the wrong value for a loop counter when the program executes a loop. Remember that your Apple increments the loop counter *before* it tests its value to decide whether to end the loop. For example, the looping in-

struction FOR I = 1 TO 30 ends when I has a value of 31.

Nested IF statements are also a common problem. To wade through code containing several layers of nested IFs, write out the complete set of conditions necessary to execute the conditional branch at each level. The accompanying **Figure** shows how to do this with the example in the **Program listing**.

If you're tracking a lot of variables or stepping through a long code seg-

ment, you can automate the process. Add a subroutine to the end of your program (after the last END statement) to merely print the values of all variables:

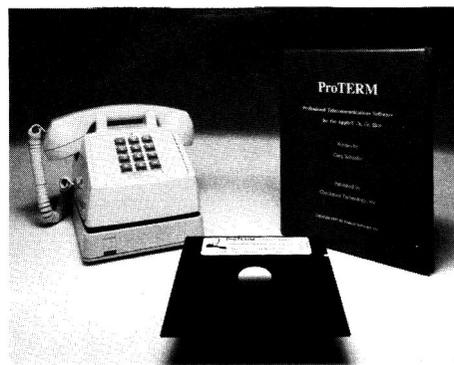
```
20000 PRINT "X="X"; Y="Y
      "; ABC="ABC
20010 PRINT "TEMP="TEMP
20020 RETURN
```

Send the output to your printer so that you'll have a permanent copy.

Use as many PRINT statements as you need to display the current value

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of each variable. Now place GOSUB 20000 calls into your program at frequent intervals, even every other line. Be sure to place one immediately before the line at which your program crashes. Run the program again. Now you'll be able to see the values change as the program runs, and when it crashes, you'll have the full set of values to analyze.

TRACE AND NOTRACE

If your program contains several conditional branches or subroutine calls, you might find it helpful to trace the program line numbers as each line executes. Applesoft BASIC has a built-in TRACE command that switches such a function on, and a second command, NOTRACE, that turns it off.

Enter TRACE in command mode. No visible change takes place, but, when you run your program, your screen (or printer) fills with line numbers in addition to the program's usual output. Each time a new line in

your program executes, TRACE displays its line number, giving you a chance to verify that the program is executing the subroutines and branches you intended. When the program stops (or crashes), don't forget to enter the NOTRACE command to turn the function off.

TRACE and NOTRACE commands you place within your program let you turn the trace process on or off in selected parts of your program. You can then check only the code you believe is giving you problems.

STOP AND CONT

You can force your program to stop at any line by inserting a STOP command right after the last line you want the program to execute. This gives you the chance to use any of the methods above to test the values of your variables, turn the trace function on or off, or even change the values of certain variables.

Program listing. Nested IF statements can produce unexpected results if they're not carefully constructed.

```

1 IF A = B THEN
2 IF C < 0 THEN
3 IF B > XYZ THEN
4 ...
    
```

Figure. Analyze nested IF statements by clearly stating the conditions necessary for each level before it can assume control.

For line 2 to execute:

A must equal B

For line 3 to execute:

A must equal B AND

C must be less than zero

For line 4 to execute:

A must equal B AND

C must be less than zero AND

B must be greater than XYZ

When you're ready to resume execution, enter CONT while still in command mode. Your Apple will again take over, starting with the next command following STOP. All the variables retain their values as the program resumes.

A useful debugging technique is to place several GOSUB 20000:STOP: commands into your program, adding at the end (line 20000) the PRINT subroutine illustrated above, to list the values of all variables. Now program execution halts whenever a list of variables is displayed, giving you time to study their values before continuing to run the program. Enter CONT when you're ready for the program to resume execution.

ATTENTION TO DETAIL

Programming is one of the most exacting tasks ever invented. It can also be one of the most frustrating, particularly when a bug defies explanation. As you gain practice entering and studying program code, you'll develop an attention to detail that will eventually make debugging much easier. The suggestions I've outlined here, along with techniques you develop for yourself, will speed that process along. ■

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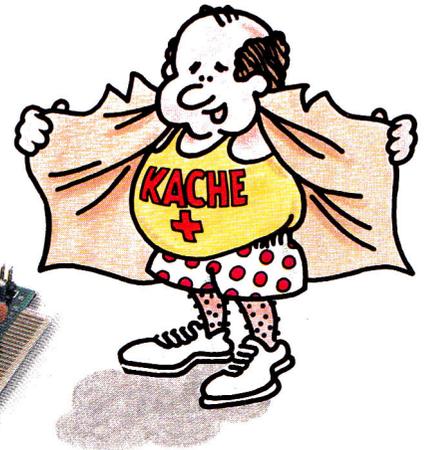
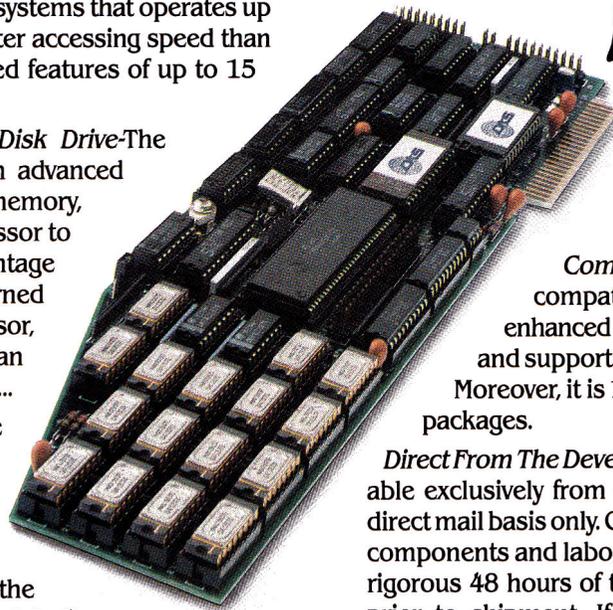
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Tools of the GS Trade

Experimenting with the Memory Manager and the Program Launcher helps you get the most from your GS.



by Tom Swan

With up to 8 megabytes of RAM, plus an additional megabyte of ROM, the GS is wealthy in memory. Handling these riches is the job of the Memory Manager, a tool of the trade for every GS programmer.

A QUICK LAUNCH

Even if you're not a programmer, you can take advantage of the Memory Manager's abilities. For example, after running a program, you normally return to the Program Launcher and double-click the name of the next program you want. You can also click a program name, then click the Open button to run it. Either way, the Launcher is a sort of grand switching terminal that lets you transfer among other programs.

But how do you return from Applesoft BASIC to the Launcher to run 16-bit programs, such as PaintWorks or ORCA/M, which you can't run directly from BASIC? You may observe that some programs return automatically to the Launcher, while others force you to reboot, a time-consuming affair because it forces the Memory Manager to completely reinitialize memory, ignoring what might still be there. Wouldn't it be helpful if instead you could return directly to the Launcher and not make the Memory Manager work so hard?

To see the problem, try an experiment. Boot a copy of your system disk. After a moment, you'll see the Launcher display. Double-click file BASIC.SYSTEM to start Applesoft BASIC. (Or click the name once, then click the Open button or press Return.) You should now be in ProDOS Applesoft BASIC. To return to the Launcher, type -PRODOS. This loads ProDOS and runs the startup program, which on the system disk is usually the Program Launcher.

If you try this, you'll notice the Launcher takes a long time to reappear. A quicker way is to go back to Applesoft BASIC and, instead of running ProDOS, type -SYS.UTILS/SYS-UTIL.SYSTEM to run the GS System Utilities (SU). Press Escape, Return, Return to quit SU, and observe what happens: You immediately return to the Launcher!

This experiment indicates that running another system program (file type SYS) avoids reloading ProDOS simply to return to the Launcher. With that in mind, I wrote Relaunch (see **Listing 1**), a short BASIC program that duplicates what SU does when it ends. Type it in and save it as RE-LAUNCH. Then type RUN RELAUNCH to return quickly to the Launcher from Applesoft. Be sure to save this program *before* you run it. If you type

Listing 1. Relaunch.

```
10 REM ReLaunch the Launcher
20 REM (C) 1987 by Tom Swan
30 REM
40 READ N
50 FOR I = 0 TO N - 1
60 READ D
70 POKE 16384 + I, D
80 NEXT
85 POKE 1012, PEEK (1012) + 1: REM invalidate power-up byte
90 CALL 16384
110 REM Data Section
120 REM
130 REM Number of bytes to poke
140 DATA 13
150 REM
160 REM MLS to execute ProDos Quit command
170 DATA 32, 0, 191, 101, 6, 64
180 DATA 4, 0, 0, 0, 0, 0, 0
190 REM
200 END
```

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RUN before saving, you'll return to the Launcher, but lose the BASIC program in memory.

HOW RELAUNCH WORKS

Relaunch POKEs a short machine-language program into memory at hexadecimal address \$4000 (16384 decimal). The machine-language program executes a ProDOS Quit command (code \$65), reloading the startup program—usually the Launcher. Lines 40–80 transfer to memory the values from the data statements in lines 140–180. Line 140 indicates the number of bytes to transfer.

Line 85 invalidates the ProDOS power-up byte at address \$3F4 (1012 decimal) by adding one to that byte's current value. Then line 90 calls the machine-language program that Re-

Listing 2. Machine-language program POKEd into memory by Relaunch.

RELAUNCH:	JSR	\$BF00	;Call ProDOS MLI
	DFB	\$65	;Command = Quit
	DW	PARAMS	;Address of parameters
PARAMS:	DFB	4	;Number of parameters
	DFB	0, 0, 0	;A total of
	DFB	0, 0, 0	;6 zero bytes

launch just POKEd into memory. In assembly language, that program looks like **Listing 2**.

AND FINALLY . . .

The GS toolbox's sophisticated Memory Manager helps programs fully use up to 16 megabytes of memory. But even if you don't write your own programs, you can use the ideas presented here to help the

Memory Manager better use all the memory available to it. It's one of the tools of every GS owner's trade. ■

Tom Swan is the author of Pascal Programs for Data Base Management and Mastering Turbo Pascal, published by Howard W. Sams. Write to Tom at P.O. Box 206, Lititz, PA 17543.

Tricks, Tips, and Tidbits

STICKY KEYBOARDS

If your keyboard is stuck and programs ignore your commands no matter what you type, try this: Press Open apple-Control-Escape and select the control panel from the Desk Accessories menu. Select Options and turn off Keyboard Buffering (the third command from the top). Then press Return, Escape, Return, Return to "rejoin the program in progress," as they say in TV.

Turning off keyboard buffering this way often fixes a sticky keyboard. (If it doesn't, you may have to reboot.) This problem occurs when programs wait for specific keys—for example, Control-C—but you accidentally type, say, Control-X. If the program doesn't know about keyboard buffering, which stores multiple characters as you type them, it continually rejects the first character in the buffer (Control-X in this example) as though you were typing that key over and over. Turning off keyboard buffering clears the buffer and lets you type something else. Of course, well-written programs clear the buffer before waiting for specific characters. Unfortunately, many Apple II programs don't.

BOOTING TO RAM DISKS

If your GS has at least 512K of

memory, you can make /RAM5 your startup disk. This lets your GS simulate a disk drive in memory to speed operations normally slowed by numerous disk reads and writes.

To boot /RAM5, you must format (initialize) it. Formatting places the Bootstrap Loader, the special software ProDOS requires, on the first sectors of all boot disks.

To set your RAM-disk size, press Open apple-Control-Escape and select the control-panel RAM-disk option. Set minimum RAM-disk size to 256K. (Other values may work, too.) Press Return, Escape, Return, Return to leave the control panel. If you change the RAM-disk size, turn off your GS, wait 30 seconds, then turn it back on. You must shut off the power for your new setting to take effect. Next, follow these steps to make /RAM5 the startup disk:

- 1) Boot to your system disk. Open DESKTOP.SYS:16 to run the desktop program.
- 2) Type Open apple-S or choose the Special menu's Format a Disk command.
- 3) Select one of the listed drives for formatting, probably S5,D2 (slot 5, drive 2). Click OK and type RAM5 as the disk name.

4) You should see the message, "Do you want to format RAM5?" If you do, click OK. If not, click Cancel and select a different drive in step 3.

5) Copy the System folder and ProDOS file to /RAM5. First, double-click the system-disk icon to open its window. Then click and drag each file to the RAM5 icon, releasing the mouse button when the icon darkens.

6) Type Open apple-Q or choose the File menu's Quit command to return to the Launcher.

7) Type Open apple-Control-Escape and select the control panel. Use the Slots option to set the Startup slot to *RAM disk*. Press Return, Escape, Return, Return to go back to the Launcher. Then click the Quit button and press Return to reboot to /RAM5.

APPLE PASCAL RAM DISKS

Apple Pascal 1.3 lovers can boot to a RAM disk, too. Follow these steps:

- 1) Boot as you normally do. Execute the Apple Pascal Formatter and specify volume 5. Type RAM5 for the volume name. You must format the RAM disk before booting to it.

Continued on p. 82

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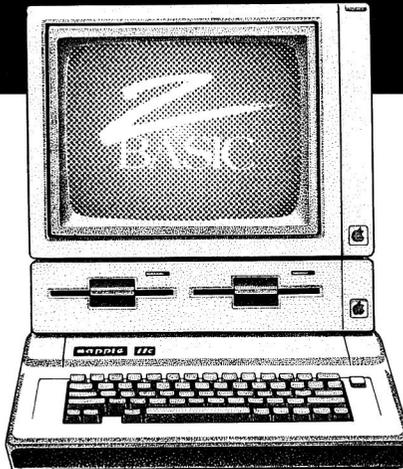
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MASTERING THE IIGS

Continued from p. 80

2) Press Escape to quit the formatter, and type F to run the Filer.

3) Transfer at least SYSTEM.APPLE, SYSTEM.PASCAL, SYSTEM.MISC-INFO, and SYSTEM.LIBRARY to RAM5:. You can also transfer other System files and programs.

4) Type Q to quit the Filer. Then type Q a second time. Take out your boot disk and answer Y to the prompt "Do you wish to exit the Pascal system?" You'll receive execution error #9, which is normal. Press Control-Reset to boot. You'll receive another error, "Check startup Device!" This, too, is normal.

5) Type Open apple-Control-Escape and select the control-panel Slots option. Set the startup slot to *RAM disk* and press Return, Escape, Return, Return. You should again see the traveling Apple and error message.

6) Type Open apple-Control-Reset to boot Apple Pascal to RAM5:. Notice that this changes the RAM disk to unit #4: instead of #5:, its normal volume number.

Booting to RAM drives is a great way to speed up your computer and take advantage of the Memory Manager toolset. In fact, given a choice between a second disk drive and extra memory, I'd purchase the memory. Even though disk copying is more difficult with a single drive, a RAM drive speeds processing faster than any number of physical disk drives.

SYSTEM SPEED

The Control Panel lets you select normal or fast system speeds. Normal speed matches that of other Apple IIs; fast is about 2½ times quicker. Usually, you run the GS at its faster setting, but you might want to run some programs—especially action games—at the slower setting. To select normal system speed, press Open apple-Control-Escape to bring up the desk-accessory menu, select the

Listing 3. Slow system speed.

```
10 REM Change to slow speed (1MHz)
20 REM
30 V = PEEK (-16330)
40 IF V >= 128 THEN POKE -16330,V - 128
50 FOR I = 1 TO 400
60 PRINT I;" ";
70 NEXT I
80 END
```

Listing 4. Fast system speed.

```
10 REM Change to fast speed (2.8MHz)
20 REM
30 V = PEEK (-16330)
40 IF V < 128 THEN POKE -16330,V + 128
50 FOR I = 1 TO 400
60 PRINT I;" ";
70 NEXT I
80 END
```

Control Panel, then select System Speed and use the arrow keys to change speeds. Remember to press the return key or the change won't take effect.

There are two other ways (though not as well known) to change the system speed. The GS gives you little control over the first way. Whenever it reads or writes to disk, it automatically switches to the slow setting, thus keeping disk formats compatible among all Apple IIs. I suspect some clever programmer will eventually figure a way to read and write disks at the faster speed, giving up compatibility but achieving high-speed data transfer to disk.

The third way to change speeds is to set or reset the high bit of location \$C036 (-16330 decimal). Setting the high bit at that location switches to fast mode; resetting that bit switches to slow mode.

The short BASIC programs in **Listings 3** and **4** demonstrate how to change from one speed to another. You could convert these programs to subroutines and include them in programs you want to run at one speed or another. Be aware when using this method that the change lasts only while the program runs. When it ends, the speed goes back to its previous setting. □

—T.S.

Creative Play: Tools to Toys

The versatile AppleWorks spreadsheet becomes a game board in this easy-to-set-up template.



by David Goodrum



and Joel Robbins

With all the work and tutoring your Apple's done in the last few months, we'd almost forgotten that you can use it for game playing, as well. So, for the sake of balance, we present Find the Gold, a game that should provide hours of entertainment at home, and give your students at school a new pastime that's fun and educational.

Find the Gold, for one or more players, is similar in structure to the popular battleship games, but it's a game of peaceful strategy, not war. Since it's played within AppleWorks' spreadsheet, you won't have to shut down that program.

CREATING THE GAME

To set up the template (see **Figures 1** and **2**), make a new file for the spreadsheet from scratch and name it FIND GOLD. Now press OA-V to set standard values, choose *recalculate*, *frequency*, and *manual* so that the spreadsheet doesn't try to calculate each time you enter a formula. Press OA-V again and choose *recalculate*, *order*, and *rows*.

The spreadsheet consists of three grids. Columns A through O (**Figure 1**) form the game board, where the player enters his or her guesses. Columns AA through AO contain the formulas that compare the guesses to the numbers in the third grid (columns BA through BO), hidden from the player's view (**Figure 2**).

Follow these steps to set the column widths:

- 1) Place your cursor in cell A1 and press OA-L (Layout).
- 2) Choose *columns*.
- 3) Use the right arrow to highlight all columns through O, and press Return.
- 4) Choose *column width*.
- 5) Press OA-left arrow seven times to reduce each column's width to two spaces, then press Return.

Use a similar procedure to reduce the following columns to the number of spaces indicated:

P-X	1 space
Y	3 spaces
Z-AA	1 space
AB-AO	2 spaces

AP	3 spaces
AQ	2 spaces
AR-AX	1 space
AZ	1 space
BA-BO	2 spaces
BP	1 space
BQ	2 spaces

Now use the steps above to increase the width of column AY to 24 spaces, using OA-right arrow instead of OA-left arrow in step 5.

ENTERING FORMULAS

Move your cursor to cell AA1. (Remember that you can look in the lower left corner for the cursor's cell location.) Type in the formula that compares the player's guesses to the hidden numbers, then copy it into each cell in the grid from columns AA to BO:

```
@IF(A1 + BA1 = (1 + BA1),BA1,0)
```

Here's how the formula works. The player enters a one (1) into one or more places within the first grid to guess where the gold is hidden. When he or she calculates, the formula compares the guess to the hidden numbers, and, if it's correct, reveals the hidden number and its position in the grid. If the guess is incorrect, the formula displays a zero.

Now follow these steps to copy this formula into the other cells:

- 1) Leave the cursor in cell AA1 and press OA-C (Copy).
- 2) Choose *within worksheet* and press Return.
- 3) Press Return again to choose AA1 as the source cell to be copied.
- 4) Press the period (.) key to begin a range as the destination.
- 5) Use the down arrow to highlight through cell AA14, and press Return.
- 6) Press R four times. (All cell references are *Relative* to other cells.)
- 7) Leave the cursor in cell AA1 and press OA-C again.
- 8) Choose *within worksheet* and press Return.
- 9) Use the down arrow to highlight the cells through AA14, and press Return.
- 10) Press the period (.) key to begin range.

late until he or she has found all the gold in as few guesses as possible.

VARIATIONS

For home, parties, or the classroom, try some of the following variations.

Variation 1: After someone has hidden the sacks, players can take turns trying to find them. Of course, the other players can't watch the first or successive players, and the player with the fewest guesses wins. Follow these steps to set up the screen for the next player:

- 1) Place the cursor in cell A1.
- 2) Press OA-B (Blank).
- 3) Choose *block* and hit Return.
- 4) Use the right and down arrows to highlight all cells in the block from A1 through O14.
- 5) Press Return.
- 6) Press OA-K (calculate) to reset the totals.

Variation 2: In this version, one player hides the sacks while another tries to find them. The first player then sets up the same number of groups of sacks of equal value for the second player to find. The player using the fewest guesses wins.

Variation 3: Form competing teams, giving each team five minutes to find the sacks. The team with the best sacks-to-guesses ratio wins.

Variation 4: Hide the sacks in the shape of a letter of the alphabet as an extra clue. If your school has a lab with a number of computers, load the same template with the same sack pattern into every machine. Students can race to see who finishes first with the fewest guesses (time/guesses ratio).

Students and teachers can discuss the logic used to establish playing strategies. Students can study which hiding patterns and cache shapes are hardest to locate, and which guessing techniques are best. For example, is it better to go for smaller groups of sacks with higher values per sack, or larger groups with smaller values? Is it better to place your guesses randomly, or to use a pattern? After they've played a few games and know who hid the sacks, students may discover their opponents' strategy for hiding them.

Next time we'll help you design templates you can use in your home-

Figure 2. Game set-up section (columns AQ-BQ).

File: FIND GOLD	REVIEW/ADD/CHANGE	Escape: Main Menu
====AQRSTUUVWX=====AY=====ZBABBBCBDBEBFBGBHBIBJJBKBLMBNBOPBQ		
1		1
2		2
3		3
4	5 5 5 5	4
5	5 5 5 5	5
6		6
7		7
8		8
9		9
10		10
11		11
12		12
13		13
14		14
15		
16		
17		
18		

AQ1		
Type entry or use @ commands		@-? for Help

economics or family-planning class at school, and to keep track of your own monthly expenses at home. ■

David Goodrum and Joel Robbins are developers of SchoolWorks templates

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Continued from p. 37

highlighting your selection, you can position the chosen graphic anywhere you like on the screen. You can then add messages, modify your picture, and fill in areas with color in solids, stripes, or patterns. Unfortunately, the color palette consists only of black, white, blue, green, purple, and orange. There's no red or yellow.

CUSTOM TOPS

If you're eager to create your own designs, the Workshop option lets you easily modify the ready-to-use graphics. Did you ever wonder what Einstein would look like with a haircut? Here's your chance to find out.

Whether modifying Medusa or creating your own designs or lettering, Workshop offers many MacPaint-like options: Spray for an airbrush effect, Fill to color in areas, Zoom to magnify your drawing for detailed work, and Erase to blank out areas or fix mistakes. You have the same color choices as in Quickshop, and can brush or spray colors in solid or mixed patterns or draw one dot at a time or lines up to ten pixels long.

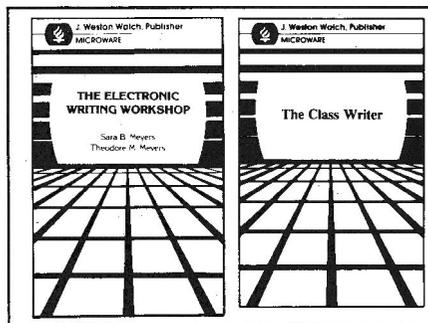
To work on specific areas, you "grab" a section of the screen by enclosing it within a frame and locking it in place. The Drop function places the frame elsewhere, while Copy duplicates it on another part of the screen. You can toggle the Solid/Blend option to cover or reveal what's behind the dropped frame. The Flip feature makes a mirror image of a frame, turns it upside down, or inverts colors—trading black and white, purple with blue, and green with orange. The possibilities are endless, limited only by your imagination.

Workshop mode supports different typestyles for captions or text—Computer or Regular font in small lettering; Cheyenne or Boston in medium; only Cheyenne in large. All styles are available in standard or italic.

When you're ready to print, T-Shirt Shop offers the choice of printing directly on paper (to double-check your design) or printing in reverse on Print 'n' Wear paper for correct left-right orientation when you transfer your picture to the shirt. You must first tape the transfer paper to regular computer paper, then feed it through the printer as usual. Print 'n' Wear paper tends to slip around in the printer, so tape it carefully. The transfer is then ready for ironing (supervision is recommended for younger artists).

Except for missing red and yellow and disliking some of the bizarre graphics, I found the T-Shirt Shop to be an enjoyable, functional drawing program. It provides unlimited design possibilities and creative fun for all ages. ■

Diane Morgan
Hopkinton, NH



Learning to Write Right

THE CLASS WRITER

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Rating: ■■■■

Getting students to learn the process of writing can be a chore: You show them how to write, then let them try their hand at it. The Electronic Writing Workshop and The Class Writer, two releases from J. Weston Walch, are designed to do the job without needless drudgery.

These aren't games; they get kids writing right away. The Electronic Writing Workshop uses outline-style frameworks to teach the concept of story development, while The Class Writer is a basic word processor with some neat tricks for kids.

FILL IN THE BLANKS

The premise of the Electronic Writing Workshop (EWW) is interesting—the program shows kids a title and a "story starter" paragraph, then has them fill in the rest of the story by answering a series of five prompts, guiding students through the development of a story. For "Alone in the Wilder-

ness," the story of a boy named Andy who takes off to live on his own, prompts ask students to describe Andy's campsite, his scariest night, his funniest adventure, and what he learned from living in the wild.

The program includes 15 prepared entries, ranging from tales of animals and aliens to a story about the world's largest banana split—topics that should prove appealing to younger kids.

You can edit the supplied stories, or create your own story frameworks by entering up to 15 sets of titles, starter paragraphs, and prompts. You can also edit the 1200-word workshop dictionary: add, delete, or review words, then transfer the dictionary from the teacher's disk to a student disk.

Once the dictionary is loaded onto a student disk, kids can use it by pressing Control-W, then choosing the first letter of the word they want to check. For instance, if a child isn't sure *balloon* is spelled correctly, he or she can view all the words in the workshop dictionary beginning with B.

The EWW editing commands are cumbersome. Instead of moving the cursor, the left and right arrows are used for deleting text; you steer the cursor with control key/letter combinations. Users whose instincts or experience make them reach for the arrow keys will find themselves accidentally deleting letters with the horizontal arrows and blundering into the help menu when they try the down-arrow key. The program is also slow accepting text. If you're a fast typist, you may miss a character or two while entering your story frameworks.

Once a set of stories is loaded to a student disk, children can write and edit their answers to the prompts. These responses are limited to one screen following the prompt. The student can then save the response, go back and edit it, or edit the entire story after answering all five prompts.

A SIMPLE SLATE

Once they've gotten a feel for developing a story with EWW, it's time for students to try writing their own. The Class Writer won't win any awards for speed, either, but it's easy to use and offers a good introduction to writing with a word processor. The small number of editing commands in The Class Writer are easy to remember. The basic commands are those you'd expect: The arrow keys serve for cursor movement; Control-C centers a

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Beagle Compiler author Alan Bird leaves for work.

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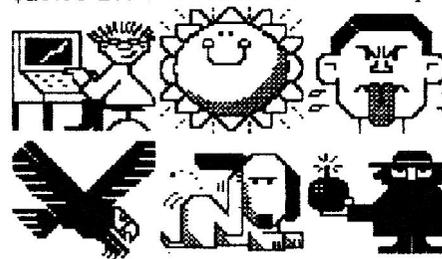
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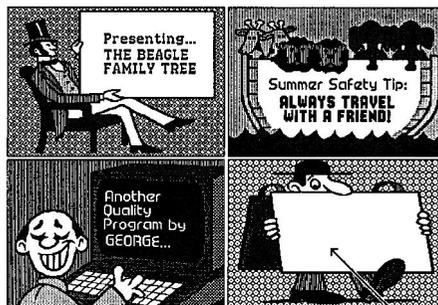
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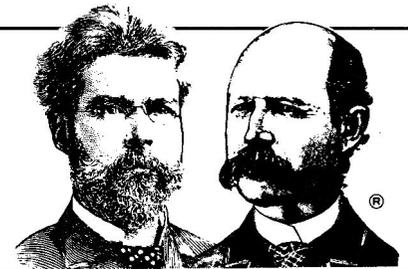
Print "hard copies" of almost any image. No programming knowledge is required.

Or, Applesoft programmers can use Triple-Dump's routines as part of their own BASIC programs.

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line; Control-B prints in boldface; and so on.

The upper-left portion of the screen always shows instructions for accessing the main menu or the help screen, should students want to check a command quickly. The name of the file on which you're currently working appears to the right of the help commands. Text is displayed in 40 columns—easier for younger kids to read.

The View function is one of The Class Writer's strongest features. The left side of the View screen shows how your document will appear when printed, complete with line and paragraph shapes and the results of your embedded control codes (underlining, centering, right and left margins, and so on). The actual text appears on the right side of the screen, with the cursor following the graphics view and the text simultaneously.

Of the two Walch programs, The Class Writer is definitely my favorite.

It's a rather simple word processor, but well suited for children first learning the concept. It's slow accepting text, but I don't know many grade-school kids who are touch typists, so speed shouldn't be a major problem.

SOFTWARE WITH CLASS

Neither Walch program is copy-protected, and the documentation for each encourages teachers to "make as many copies as you need for use with your own students." It also states that teachers can make copies of the command cards or quick-reference sheets if they need to. This refreshing policy can do a great deal toward getting software into teachers' and students' hands. Affordable distribution like this can be as important to an educational-software package's effectiveness as the program itself—especially since the programs are less than \$30 apiece.

The Electronic Writing Workshop and The Class Writer are a good pair of programs. Despite its sluggish re-

sponse and somewhat closed design, the Workshop should be effective teaching kids to put events into proper order as they construct a readable story. With that in mind, they can move to The Class Writer's freer form to create stories from scratch. ■

Life Low
inCider staff

Catch Your Ideas

CALLIOPE 128

Innovision, P.O. Box 1317, Los Altos, CA 94023, (415) 964-2885

Idea processor and outliner; 128K Apple IIe, IIc, IIgs
\$59.95

Rating: ■■■■

It's easy to get off on the wrong foot with Calliope 128. The program's documentation is filled with immodest talk about doubling your efficiency and unleashing your mind's energy, using the latest theories of creative

KIX: The Hard Disk Manager!

KIX is designed for power-users who want to increase their productivity and the ease-of-use of their Unidisk or hard disk system. It includes a menu program for launching applications and a family of 25 utilities for organizing and managing files on the disk.

KIX utilities replace the cumbersome ProDOS Filer. With simple commands you can quickly copy, move, rename, or delete a file; create, delete, or list a directory; format a disk; or copy a volume.

But that's not all! KIX expands the functionality of ProDOS. You can merge and compare files; print directories; search the disk for key words or filenames; write- or read-protect sensitive files; date-stamp files (without a clock card); dump the screen to a printer; and much, much more.

KIX works with AppleWorks and most other ProDOS-based software. It can reside on disk or in RAM and is compatible with all Apple II drives and memory expansion cards.

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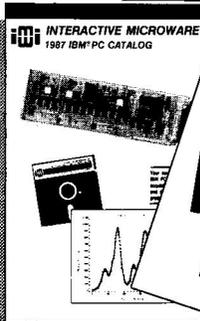
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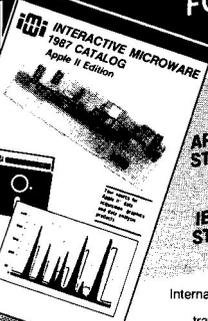
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idea capturing devised by scholars and psychologists (the manual includes a bibliography). After such highfalutin stuff, it's a surprise to find the program's written mostly in BASIC, with all the sophisticated word-processing power of the INPUT command. You may also stumble over the lack of hierarchical structure usually associated with idea or outline processors; there's no "Section 1, Section 1.1" business with Calliope.

But if you approach it on its own terms, Calliope is intriguing, innovative software. It takes a free-form, brainstorming approach—slapping ideas on screen first and editing, rearranging, and linking them later. In fact, the central idea's so good you'll wish the program worked a little better. It's a poor text editor, and often takes more keystrokes than you'd expect.

THINK FAST

Calliope works fine with one-drive systems. You can copy the program to any ProDOS disk or directory, and

there's room on the disk for several data files.

The manual contains ample instructions and suggestions for use, ranging from taking phone messages to serving as a primitive boilerplate or letterhead for correspondence. A simple help screen appears when you type Open apple-Slash—not, contrary to the instructions, Open apple-? (shifted slash).

Calliope opens to a blank screen, on which the arrow keys move the cursor through a 16-row, three-column matrix for individual ideas. (You can have up to 40 ideas in memory or in a file.) With the cursor in a blank space, you "capture" an idea by pressing the return key and typing a two- or three-word label or description. You can edit a label later, but it's still a BASIC INPUT statement with a question-mark prompt and no editing commands except moving the cursor left or right and retyping.

The point is to catch your ideas before they fly away, jotting labels as quickly as you can press Return twice

(once to end the first label and move the cursor, again to start another). Calliope defaults to a readable alternate-row arrangement, letting you record 20-odd ideas before the screen gets crowded.

When you want to enlarge a thought, move the cursor to its label, select it with the return key, and press Open apple-T. This toggles between the idea screen and a text window, with label at top and room for 23 lines of 40-column text below. The tab key doesn't work, and backspacing requires pressing the left arrow, then Delete (which erases the character under the cursor). There are commands to delete a word and move the cursor a word at a time, but you'll never mistake Calliope for a word processor.

Once you've scribbled down your ideas, Calliope comes into its own. Simple open-apple commands let you move labels (and their hidden text) to different places on screen, or cut, copy, or paste labels or undo a

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move. (A buffer holds the last idea cut or copied.)

Select an idea, select another, press Open apple-L, and the ideas are linked—connected by a line drawn, if you squint, from a little “out” box by the first to the “in” box of the second. In this way, you assemble an outline—put the pieces of your introduction together, arrange the parts of your thesis, then hitch the end of the introduction chain to the start of the thesis cluster, and so on.

Various commands let you delete links or clear or redraw the screen, but one limitation (included for the sake of following link paths at printout time) is a sure-fire stumbling block for users who think in terms of flowcharts

or organizational charts. Links can't split or diverge, one idea pointing to two or more others, though the reverse is allowed: Different ideas can point to or converge on a common destination. The restriction makes sense in terms of finished outlines or stories, though it can be frustrating earlier in the creative process, when an idea sometimes triggers two others.

All done? The print menu lets you print all the ideas in a file or just the current cluster (the selected idea and those below it), with or without labels atop the text paragraphs. Calliope is smart enough to detect a circular chain or loop back to the top idea, stopping after one printing instead of endlessly repeating itself. It's up to

you to be smart enough to make sure your top idea is selected when you give the command; twice I carefully linked my first through fifth ideas and received a printout of only the fifth (my most recent selection during the linking process). Also, speaking of extra keystrokes, you must answer prompts for all five print-option choices to change any one.

Printouts are nice, but unformatted. Single-spaced text dumps to a printer connected to slot 1, with no attention to margins or page breaks. A Calliope outline can, however, be a good head start on a finished document; a “print to disk” command saves your file's or cluster's text screens as an ASCII file with no extra carriage re-



GAMES EDITORS PLAY

The assistant editor's upside down at Mach 1, the technical editor's buying a vowel, and the review editor's running for President. It must be 4:00 on Friday afternoon, and this must be inCider's bimonthly sampling of recent game releases.



Eric Grevstad plays...

“And If Re-elected...” Focus Media Inc., 839 Stewart Avenue, P.O. Box 865, Garden City, NY 11530, \$65.

Are any teachers reading this? “And If Re-elected” is classroom software, not a home game, but it kept me playing past dinner one night. The game casts you as a

U.S. President seeking a second term, facing 12 ordered or random crises ranging from an incompetent Commerce Secretary to a Soviet invasion of Iran. Between crises, you court or “stroke” special-interest groups, deciding whether to support farmers or senior citizens—but there isn't time to woo every group, and a move that puts pluses into your “Blue Collar” column may mean minuses from big business.

Being the incumbent gives you a big edge; I won even when I adopted the role of a wildly liberal young woman. I had to out-preach Pat Robertson and out-hawk Jesse Helms to be defeated. It would be nice, too, if the special-interest questions weren't always the same or if expensive campaign promises led to fiscal crises later—with more memory and disk space, the game could be a domestic equivalent of Balance of Power. Even so, “And If Re-elected” is an enjoyable political simulation, with realistic trade-offs and options (a costly commitment here, a speech full of platitudes there).

Dr. Ruth's Computer Game of Good Sex, Microcomputer Games Division, Avalon Hill Game Company, 4517 Harford Road, Baltimore, MD 21214, \$29.95.

Everyone at *inCider* is over 21 and the male editors stopped work when someone brought in *Sports Illustrated's* swimsuit issue, but Dr.

Ruth's Computer Game of Good Sex didn't hold anyone's interest. This definitely adult, mildly educational pastime asks partygoers to spot the true or false items on screens of four sex-related statements or definitions, while a time limit ticks away. (Do you feel pressure to perform?) The questions' color typeface, incidentally, is unreadable on monochrome monitors.

Despite frequent disk flipping to load questions, the same items soon recur. Bonus questions present some interesting (though usually easy-to-guess) case studies with counselor Ruth Westheimer's answers, but others range from explicit gynecological details to trick vocabulary questions and jokes, such as “True or false: Bocce ball is a sexual position favored by Italian men.” Dr. Ruth's Game offers occasionally thoughtful advice for puzzled couples, but on the whole it's more textbook than titillation.



Paul Statt plays...

Conjecture, Robert Scott Enterprises, P.O. Box 1408, Auburn, WA 98071, \$34.95.

Wheel of Fortune is a silly kid's game dressed up for TV with a gorgeously gowned, voluptuous blonde, isn't it? The game itself—if you can overlook the lovely Vanna White—is a bore, right?

Maybe not. Conjecture is a clone of television's hottest game

turns (only those at the end of paragraphs), easily readable by AppleWorks or other ProDOS word processors.

You can also save a file in Calliope format, preserving both the text screens and the idea screen showing their links and positions. While the quit command gives you the option of saving the current file, the load command doesn't—you can lose a new or changed file without warning by loading another from disk.

Calliope helps you catch random ideas and sort them into sensible patterns; if you keep individual ideas small enough to fit into its 40-column screens, Calliope goes beyond many idea processors in letting you turn

show (in case you've missed it, it's "Hangman for Dollars"), moved from the boob tube to the Apple II. An on-screen hostess named Suzie is Vanna's hi-res double; Suzie is sexy, but not the main attraction. Greed isn't the draw, either. It's play money you take home from Conjecture—no VCR, no furs, no dinette sets. You spin the wheel, you guess some letters, you win or lose. It takes a little skill and a lot of luck.

But it's strangely compelling. I can't resist crosswords, secret messages, and word puzzles, and I can't resist Conjecture. It's a great party game; I've played by myself and with the rest of the staff. We solved our own puzzles—Conjecture comes with 1600, but you can make up more—with less work and more laughs than the canned ones.

That personal touch lifts Conjecture above earthly games to the ranks of immortals such as Carmen Sandiego—games that are as educational as they are entertaining. Teachers, parents, or Vanna fans can create custom puzzles to teach children the names of the Presidents or the parts of a flower. You can pay more for "educational software" developed by professors or "entertainment software" written by illiterate poets, but you won't have more fun.

brainstorm sessions into finished paragraphs, saved in ASCII format as not just an outline, but a decent first draft of a paper or article.

Unfortunately, the mechanics of using the program can derail your train of thought. My word-processing habits tend toward hasty deleting and retyping; Calliope prefers you go back and edit individual letters or characters, in a painstaking departure from the brainstorming technique of the idea screen.

The idea screen can trip you up, too. The top-down printing links I mentioned illustrate a common trap, the necessity of checking which idea is selected along with what you want to do and where the cursor is. The

program screams for mouse control; I can't count the times I've laboriously moved the cursor to an idea and pressed Open apple-T, only to see the text screen for a different idea. Move the cursor to an empty space and start typing a label, and the program beeps in wild protest.

Nevertheless, the more I used Calliope 128 and learned its foibles, the more I could appreciate its simple central idea. Somewhere between the advertising claims of academic brilliance and the homely limitations of the program code, there's a nice, freewheeling thinking tool. ■

Eric Grevstad
inCider staff



Lafe Low plays...

Jet, SubLogic Corp., 713 Edgebrook Drive, Champaign, IL 61820, \$39.95.

When I first started Jet, I thought it would be suitable for "Games Editors Try to Play." The more I cruised around in my F-18 and F-16 fighters, though, the more I felt like a Top Gun pilot.

Jet starts simply—just crank up maximum thrust, launch your Hornet from an aircraft carrier or your Fighting Falcon from an airbase, pull up at just the right moment but not too steeply, don't forget to level out, don't forget to turn off the afterburners or you'll be out of fuel in no time, retract the landing gear, turn on your radar and range finder, watch your altitude and airspeed, and start searching for your targets, but don't fly through the airspace above them or you'll be swallowing missiles. Piece of cake.

After a while, though, I got the hang of it—doing barrel rolls and buzzing the control tower in free-flight mode, strafing enemy cruisers on target runs, and getting shot out of the sky in dogfight mode. The latter two give you plenty of firepower, and plenty of bad guys with firepower of their own. Whichever game you choose, you're in for quite a trip. I'm getting good at dodging missiles, but I'm still trying to land safely on the deck of my carrier.



Dan Muse plays...

Championship Baseball, Gamestar/Activision, 2350 Bayshore Parkway, Mountain View, CA 94043, \$34.95.

If one game of computer baseball doesn't quench your thirst for the national pastime, how about a whole season? Championship Baseball lets you set up your own team and compete in a 24-team league.

You can't use historical teams like the '69 Mets, as in simulations such as SubLogic's Pure-Stat Baseball, but you can create your own team—rating each player on a scale of one to three in the areas of batting, catching, running, and throwing. The catch is that Willie Mays would rate a 12 under this system, and no player's total can exceed eight. You can make a home-run hitter, but he'll have a lousy throwing arm.

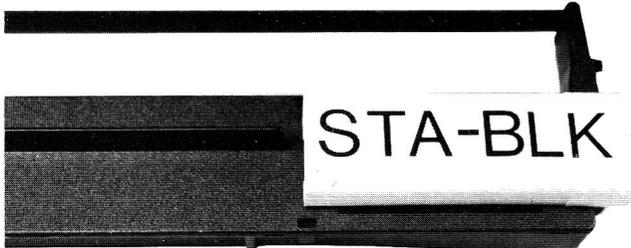
As in Accolade's Hardball, the screen shows two views of the game, a catcher's-eye perspective and an overview of the field. This makes Championship Baseball a hitter's game, because you can time the pitch and watch the ball break. I was able to score 13 runs off the computer in only my third game; in Hardball, I was lucky to score one.

I like Championship Baseball. It isn't the quintessential computer game, but when it comes to baseball I'm a tough critic. □

NEW PRODUCTS

edited by Lafe Low

Hardware



STA-BLK

Thanks to a large-capacity reservoir, the STA-BLK printer cartridge reinks its ribbon to produce up to 500 pages of type before refilling.

BACK IN THE BLACK

Replenish your printer ribbon to produce consistently clear copies of your work. The STA-BLK (pronounced *stay black*) **printer cartridge** automatically reinks the ribbon for more pages of high-quality print—about 500 pages of text, compared to about 50 for a standard ribbon. The demand valve releases ink onto the ribbon as printing removes it; the refillable ink reservoir holds ten times as much fluid as a standard ribbon cartridge. STA-BLK fits several popular Epson, Apple, and other printers. It sells for \$39.95 from Chronos Computers, 4186 Sorrento Boulevard, Suites G & H, San Diego, CA 92121, (800) 443-0100. Circle Reader Service number 362 for more information.

EASY INTERFACING

Interface your ImageWriter II and Apple Personal Modem to your computer quickly and easily with the Super Serial Pro. This **serial-interface card** is fully compatible with Apple's Super Serial Card. Simply plug it into the mini 8-pin connector on the ImageWriter II and Personal Modem, flip one switch to set serial parameters, and you're on line. The Super Serial Pro retails for \$79.95 from Apricorn, 10670 Treena Street, Suite 10, San Diego, CA 92131, (619) 271-4880. For more information, circle Reader Service number 358.

A SOUND IDEA

Tap directly into the power of the Ensoniq chip in your Apple IIs with The SuperSonic Digitizer. This **audio digitizer** lets you input audio signals directly to the Ensoniq chip. You can record, edit, and play back voices, music, and sound waveforms. The SuperSonic Digitizer is an add-on board for the SuperSonic Stereo card, giving you the functions of an additional card without using another slot. The digitizer takes line audio level as input to the Ensoniq chip, where it's digitized and stored in memory. The package comes with software for editing, recording, and saving audio. The digitizer incorporates low-noise filters for clean audio signals before digitizing; high-speed sampling and hold circuitry ensure accurate samples. The SuperSonic Digitizer sells for \$39.95. The SuperSonic Stereo card retails for \$59.95, from MDIdeas, 1163 Triton Drive, Foster City, CA 94404, (415) 573-0580. For more information, circle Reader Service number 363.

SHARING FILES

Link a Mac Plus to your Apple IIe or GS for exchanging data and sharing files. The Data Exchange is a **SCSI hard-disk drive** featuring 320 megabytes of mass storage. The package includes proprietary software that converts Mac and II files for easy use on either machine. You can convert an AppleWorks word-processor file, for instance, to work with MacWrite. The SCSI drive's multiple partitions support one Macintosh and up to five IIe or GS computers and peripherals via a SCSI II interface card. The Data Exchange is available for \$7995 from CMS Enhancements, 3080-A Airway Avenue, Costa Mesa, CA 92626, (714) 549-9111. Circle Reader Service number 360 for more information.

CLEAN UP YOUR ACT

Keep your computer system clean and operating smoothly—you'll run less risk of data loss and also protect yourself from eyestrain. The Networkx Head & Screen Maintenance Kit is a complete **cleaning system** for monitors and 5¼-inch disk-drive heads. The package includes a non-aerosol bottle of Networkx Head Cleaning Fluid,



Link your Mac and Apple II for file sharing with the Data Exchange SCSI hard-disk drive.



The Networx Maintenance Kit cleans drive heads and monitor screens for smooth system operation.

two head-cleaning disks for single- or dual-drive systems, and 20 CRT screen-cleaning pads premoistened with an antistatic solution. The Maintenance Kit retails for \$29.95 from Networx, 203 Harrison Place, Brooklyn, NY 11237, (718) 821-7555. For more information, circle Reader Service number 361.

Product descriptions contained in this section are based on information supplied to us by the respective manufacturers. These announcements are provided solely as a service to our readers and do not constitute endorsement by inCider of any given product.

LET THE SCREEN SHINE

Prevent glare and reflections from distorting your computer-screen image. Sun-Flex **antiglare filters** for CRT screens can improve contrast by blocking diffuse reflections from brightly colored walls or background light. These matte-black microfiber filters fight glare by providing a shadow-box effect, a technique similar to slats on a Venetian blind, but on a smaller scale. The snap-on Sun-Flex SuperScreen filter for monochrome monitors costs \$29.95; the model for color monitors sells for \$34.95. The Sun-Flex Protector conductive filter for hi-res monitors sells for \$49.95. Contact Sun-Flex for details at 20 Pimentel Court, Novato, CA 94947, (415) 883-1221, or circle Reader Service number 359 for more information.

Sun-Flex, an antiglare filter for your monitor screen, blocks reflections with a shadow-box technique.

Software

GS DATABASE

The Softwood GS File **database-management system** for the IIgs features original graphics, pull-down menus, scroll bars, and dialog windows. Softwood GS File presents your database in both list format, giving an overview of multiple records at a glance, and form view for specific record information. While you define your database, the program automatically creates a default form you can modify easily. Softwood GS File lets you import and convert AppleWorks databases, too. The program retails for \$149.95 from Softwood Company, Box 2280, Santa Barbara, CA 93120, (805) 966-5884. Circle Reader Service number 354 for more information.

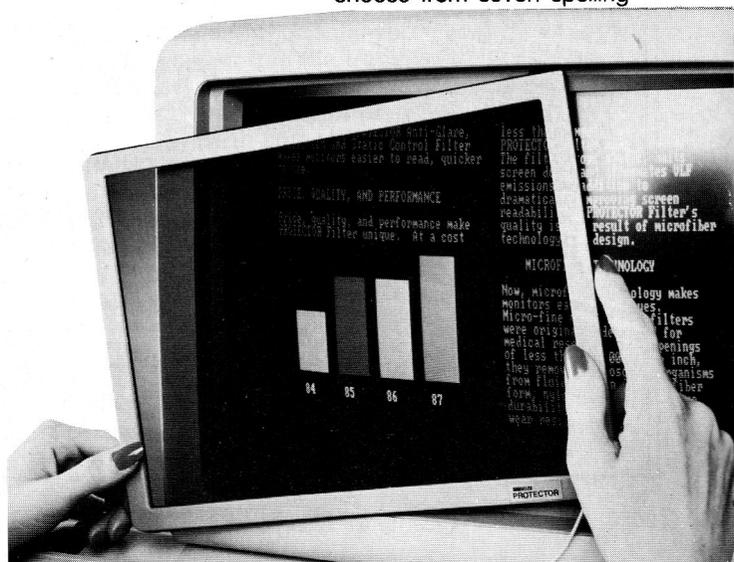
CHARTING A COURSE

Create full-page flowcharts and organizational charts with Charts Unlimited, a **graphics- and text-processing system**. The

graphics worksheet measures 123 columns by 90 rows; since that's too much to fit on the screen at once, a View function shrinks it to one-eighth size to show the overall picture. Charts Unlimited offers a set of common flowchart symbols such as boxes and arrows. You can also create your own objects and store them in a library on your disk. Text-editing capabilities let you enter, insert, and delete characters anywhere on the worksheet. Charts Unlimited sells for \$49.95 from Graphware Inc., P.O. Box 373, Middletown, OH 45042, (513) 424-6733. For more information, circle Reader Service number 355.

CUSTOMIZED SPELLING

Individualize Your Spelling, a new **spelling-education** program, includes 4350 of the most frequently written words in the English language—words that appear in newspapers, magazines, books, and other media. Teachers and students can add their own words to the list. You can choose from seven spelling



levels, each containing 300, 400, 600, or 750 words. High-frequency words are organized into 30 lessons per grade. The program includes action graphics, pretests, and a Wise Owl Report indicating a student's score and specific recommendations for improvement. The program sells for \$39.95 for each grade level (2-8) or \$249.95 for the entire curriculum, from Educational Concepts Labs, P.O. Box 613, Brooklyn, NY 11215, (718) 376-5750 or (516) 968-9163. Circle Reader Service number 365 for more information.

SPEAK UP

Covox has released software for use with its Voice

Master module to create high-quality voice output. The Speech Construction Set is a **speech-editing tool** that lets you create synthesized speech from data encoded with the Voice Master. The resulting speech is digitally constructed from the user's voice, so the sound is clear and natural. The Speech Construction Set features routines for editing and modifying the amplitude of stored speech for refined quality during playback. The Speech Construction Set sells for \$49.95 from Covox, 675-D Conger Street, Eugene, OR 97402, (503) 342-1271. For more information, circle Reader Service number 353.



Accolade's Comics: an interactive comic book with intrigue, adventure, and arcade fun, too.

COMICS COME TO LIFE

Get involved in the comics in Accolade's Comics, the first **interactive comic book**. Accolade's Comics features two themes, dozens of story lines, and eight arcade-like games. The story centers around a spy named Steve Keene who foils evil plots for the Chief of Spystuff. You determine where the story goes by selecting from a series of possible answers that can lead to dead ends, deep trouble, or other themes and story lines. When you get Keene into a trap or other embarrassing situation, you must play an arcade game to get him out. Accolade's Comics retails for \$44.95 from Accolade, 20883 Stevens Creek Boulevard, Cupertino, CA 95014, (408) 446-5757. Circle Reader Service number 356 for more information.

skill levels, permanent recordkeeping for any number of students, problem sets, and test and instruction modes. You can print any problem set or student-record report. Number Master sells for \$39.95 alone, \$69.95 with teacher facilities and recordkeeping accessories, \$250 for a school lab pack, from The Home School, 3611 Boundary Street, San Diego, CA 92104, (619) 284-9769. Circle Reader Service number 351 for more information.

WEATHERING THE STORM

Chart weather patterns on a map of the U.S. with Weather Basics. This program can give students a feel for what meteorologists do as they organize outside information on weather maps and models, drawn on screen with 33 symbols. You can save up to 12 maps on data disks for later use. Forecasts can be as detailed or as general as you like. The program sells for \$39 from Yaker Environmental Systems, P.O. Box 18, Stanton, NJ 08885, (201) 735-7056. Additional data disks are \$3.95 each or \$3.50 for 15 or more. Circle Reader Service number 357 for more information.

MASTERING MATH

Number Master, a new **arithmetic-education** program from The Home School, can help develop and sharpen math skills in addition, subtraction, multiplication, and division. Number Master features help windows, counting, flashcards, individual review, varied math problems and

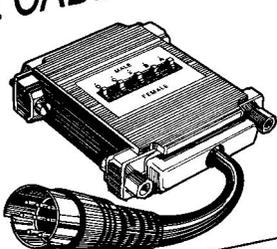
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Product Updates

● Sell a friend—no, not really. That's Broderbund's new offer for Bank Street Writer users. You can upgrade to **Bank Street Writer Plus** by mailing in your program disk and \$30—but you can reduce the cost of the upgrade by selling a friend on Bank Street Writer Plus. If one friend buys the program, your upgrade will cost \$15. If two friends buy it, your upgrade is free. For more information, contact Broderbund Software at 17 Paul Drive, San Rafael, CA 94903, (415) 479-1170.

● More on **Bank Street Writer Plus**—you can now get the program on 3½-inch disks through Broderbund's disk-exchange program. You can swap one or both disks or keep your 5¼-inch disks and buy the 3½-inch disks and the user's manual. Swap one disk now for \$5 postage and handling; swap your backup disk later for \$10 and another \$5 postage and handling; or swap both disks at once for \$10 for the backup plus \$5 postage and handling. If you want to keep your 5¼-inch disks, you can buy the 3½-inch version and documentation for \$50 plus \$5 postage and handling. Call Broderbund for details at 17 Paul Drive, San Rafael, CA 94903, (415) 479-1170.

● BPI Systems has lowered the price of its **BPI Entry Series Accounting** program to \$249 per module. The Entry series includes General Accounting, plus Accounts Receivable, Accounts Payable, Payroll, Inventory, and

Job Cost programs that can function as stand-alone applications or work with the General Accounting package. Get in touch with BPI Systems at 3001 Bee Cave Road, Austin, TX 78746, (512) 328-5400.

● Never a dull moment in the software industry. **Spectrum Holobyte**, publisher of simulation software (notably the submarine adventure Gato), has merged with **Nexa Corporation**, a software-development firm specializing in entertainment, application, and CAI (computer-aided instruction) software. The newly formed company, Sphere Inc., has been acquired by **Pergamon Press** of London, England. Pergamon has more than 120 products circulating in the British software market. Its acquisition of Sphere gives it an opportunity in the U.S. marketplace—it should prove interesting.

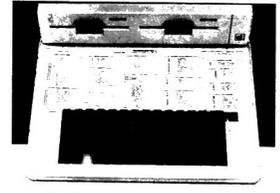
● Orange Micro has made upgrading to its **ProGrappler** parallel-interface card easier and less expensive. Owners of any parallel-interface card from Apple Computer, Apricom, Interactive Structures, Microtek, Practical Peripherals, Quadram, Street Electronics, Texprint, Thirdware, Tiger, Wizard, and of course, Orange Micro, can get the ProGrappler for \$55, plus \$7.50 for shipping and handling. "No-name" or counterfeit boards, serial interfaces, dedicated buffer cards, or any other nonprinter interface products are ineligible for exchange. For more information, contact Orange Micro, 1402 Lakeview Avenue, Anaheim, CA 92807, (714) 779-2772.

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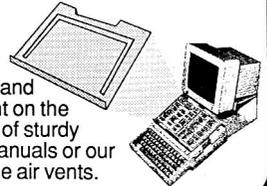
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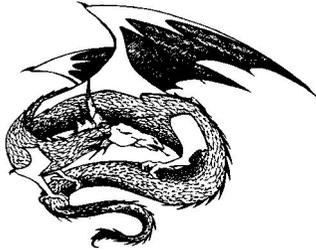
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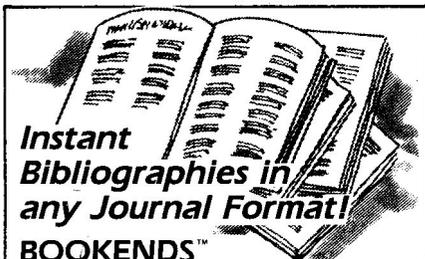
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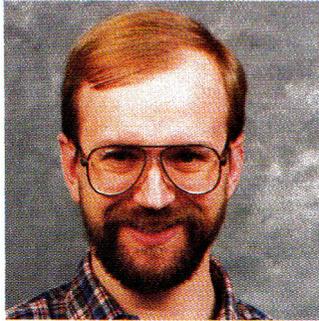
Reader Service	Page	Reader Service	Page
70	ACE Computer Company . . . 106	251	MGR Software 95
*	AST Research CV2, 1	137	Magic Soft 96
125	Activision 69	6	Master Media Supply 107
*	Applied Engineering 21, 28, 29, 35, 43, 45, 46, 47, 62, 63, 98	127	Megamax 89
20	Atlaz Computer Supply 107	173	Micro Data Products 74
14	Azure Mountain Products 106	234	Micro Data Products/CMS 108
176	BTE Computer 84	224	MicroLeague Sports Association 13
279	Banana Software 111	98	NEXO Distribution 106
229	Beagle Bros 87	55	National AppleWorks Users Group 67
225	Black Sun 107	167	Nine to Five Software 82
71	Borg Industries 106	37	OKS 77
149	Brickhouse Software 106	120	Orange Micro 6
83	Business Computer Exchange/BCE 108	77	PIE 106
*	Business Computers of Peterborough 56, 57	43	Pacific Technologies 107
267	Cable Distributors 107	276	Pinpoint Publishing 79
60	Central Point Software 76	273	Precision International 55
62	Central Point Software 15	*	Preferred Computing 31
266	Cheatsheet Products 95	50	ProComp 73
227	Checkmate Technology 75	128	Programs Plus 70, 71
79	Coit Valley Computers 36	269	Public Domain Exchange 37
124	CompuServe 27	136	Quality Computer 49
111	Computer Direct 104, 105, 108	16	Quinsept 111
142	Computer Plus Co. 106	198	Redmond Cable 94
76	Computist 66	297	Rodeo Products 108
271	Cyborg, Inc. 61	165	Roger Coats 14
134	Dayton Computer Co. 108	84	Sensible Software 19
275	Dresselhaus 34	85	Sensible Software 96
201	EPYX 101	30	Signum Microsystems 107
11	FastFind 106	143	Silicon Express 53
295	Funk Software 25	218	Sir-Tech Software 7
146	Golem Computers 23	232	Soft-Byte 74
66	H&E Computronics 109	292	Softdisk 22
216	Helpworks Software Corp. 108	96	Softronics 32
161	Heritage Associates 108	38	Spectral Graphics 24
88	HowardSoft CV3	73	Street Electronics 68
	inCider Magazine	239	StyleWare 4
	inCider Sub Ad 64	282	Tevex 99
*	Intelligent Software, Inc. 12	53	The Enhancers 106
9	Interactive Microware 88	*	Third Wave Technology Inc. 85
12	Interactive Microware 88	68	Thunderware 11
193	Intuit 33	15	Uptime 9
36	JED Design 107	178	Vernier Software 108
191	K & A Crylics 107	199	Wenger Corp. 38, 39
181	Kensington Microware CV4	272	WordPerfect 2
91	Kyan Software 88	281	WordPerfect 3
*	Lightspeed Software 111	289	Zedcor, Inc. 81

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Literature as Software



by Scott Mace

“Computerized novels can take you beyond the ordinary text adventure.”

I like libraries. It makes me comfortable and secure to have walls of words, beautiful and wise, all around me. I always feel better when I can see that there is something to hold back the shadows.”

I wonder if science-fiction and fantasy author Roger Zelazny knew that one day, the book for which he wrote those words in 1970 would be turned into a software program. Today, Zelazny's wall of words is moving across computer screens.

Nine Princes in Amber, written five years before personal computers arrived, was a prophetic book indeed. The main character wakes up in an observation cell, unable to remember who or where he is, or why he's there. (See Mace on Games, February 1987, p. 113, for a review of Thomas Disch's *Amnesia*, a computer game with a similar opening.)

The answers to those questions unfold in the rest of the book, an exploration of Amber, a superworld of which our Earth is just a pale shadow. The game, published by Telarium/Spinaker (One Kendall Square, Cambridge, MA 02139, 617-494-1200, \$14.95) and designed by Mike Amadeo and 19 other people, is one of a new genre of computer-game adaptations that can enrich your appreciation of printed works, and give you an experience that goes beyond what ordinary text adventures provide.

Most of these software adaptations, with a few notable exceptions, are similar to traditional text adven-

tures. In these games, you often find yourself in the same predicament as the main character at the start of the book. That's certainly true in the case of *Nine Princes in Amber*, and I advise you to play the game a bit before reading the book.

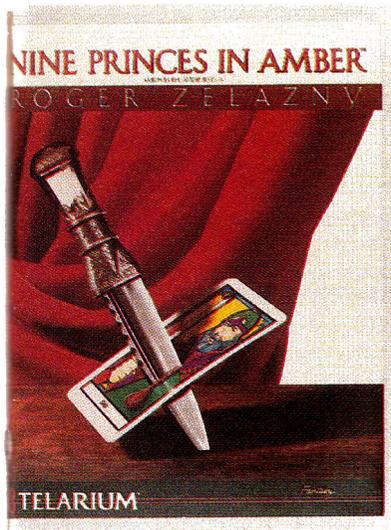
Events in many such computer games, though, unfold differently from the way they do in books. Unlike a movie adaptation, which often leaves us saying, “The book was much better,” software doesn't have to follow the book word for word. In fact, it's better when it doesn't. On the down side, while you can usually finish reading a novel in a reasonable amount of time (except those by Proust and Joyce), you'll have to out-smart the game's designers or reach for a hint sheet to get to the end of computerized stories.

The extent to which authors get involved with computer adaptations of their books varies widely. A few years ago I talked to Ray Bradbury about the Telarium adaptation (\$14.95)

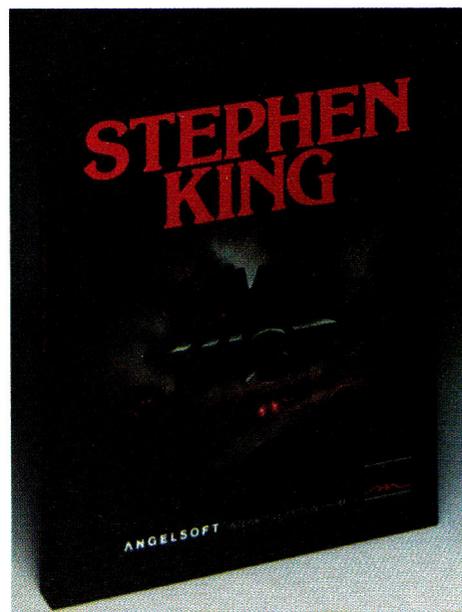
of his novel **Fahrenheit 451**. Bradbury is busy, like many authors, and he seemed content to coach the software-development team, to approve or disapprove the work at various stages, but he didn't have the time or the incentive to do the computer adaptation himself. If an author sees enough of the path the game is taking to give the work his informed “blessing,” that's a good endorsement.

Other Telarium book adaptations include **Rendezvous with Rama**, by Arthur C. Clarke (\$14.95), and **Dragonworld** (\$14.95), by Byron Preiss and Michael Reaves. Clarke was more involved with the adaptation of his book than many authors, so the software follows the novel's plot and characters closely. The Apple II version probably reaches the limits of what you can do with 8-bit software.

Preiss and Reaves took even more interest in the adaptation of their work: They created a whole new story line that picks up from the end of their book.

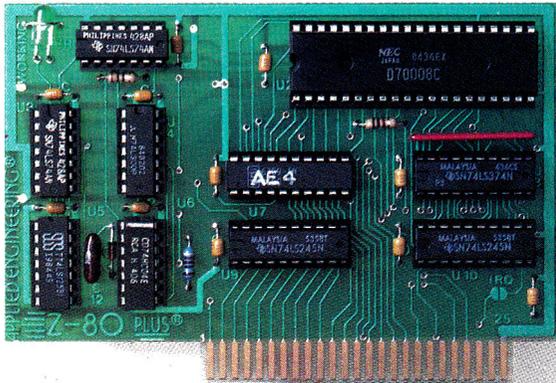


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MACE ON GAMES

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Some writers, such as Douglas Adams, go a little crazy when they discover computers, and end up switching from print to software. Adams is the author of **The Hitchhiker's Guide to the Galaxy**, from Infocom (125 CambridgePark Drive, Cambridge, MA 02140, 617-432-6000, \$39.95). The computer adaptation was wildly successful in part because Adams poured his soul into it, with witty responses to your most imaginative moves.

The Mist, designed by Angelsoft and soon to be available from Mindscape's Thunder Mountain Division (3444 Dundee Road, Northbrook, IL 60062, 312-480-7667, \$9.95), brings Stephen King's frightening novella to life. Trapped in a supermarket in New England, you watch helplessly as an unearthly white fog surrounds the building and people begin disappearing. Inside, a panicky crowd begins to pay heed to a Satanic old lady who demands a human sacrifice to appease the bogeymen.

The Mist, a text-only adventure, follows King's graphic descriptions of horror closely and adds plot twists. For instance, your Scout wagon, the only source of escape, is crushed. How will you get out of this one?

INACCURATE RENDITIONS

Publishers need to pay special attention to character descriptions in novels before portraying them on screen in software. You'd expect the same attention to detail in a movie adaptation, so why not here? It's distressing to see the main character of **I, Damiano** (Bantam Software, 666 Fifth Avenue, New York, NY 10103, 800-223-6834,

\$39.95) wearing clothing of the wrong color on the front of the package.

I, Damiano isn't the title of any of R.A. MacAvoy's books about the Wizard of Partestrada, but it incorporates themes from all three Damiano books, such as witchcraft, the plague, and the overall struggle between good and evil.

I found P.A. Golden's adaptation a bit heavy-handed at times: A gauge between the words *good* and *evil* constantly reminds you of how morally defensible your actions are. You can advance in any number of ways, but if you use too much black magic, your character's gauge will read all evil: You'll be damned and lose the game. This may make for better game play, but it detracts from the simulation of 14th-century Europe. Perhaps the game would be better if you could turn the gauge off and guess how much of a rat you've been.

MORE TO COME

What can we expect from adaptations in the future? More authors like Zelazny will begin to write books that fit naturally into computer-game adaptations. It's hard enough to write a book, but writing the same story for a computer game, too, is even more difficult. A few years ago, some novelists began to write story lines exclusively for computer games, and this trend will continue.

Either way, good old books are here to stay. Like Corwin, the speaker in *Nine Princes of Amber*, I love walls of books myself. Related software can only enhance our appreciation of them. ■

Scott Mace is editor and publisher of Microcosm, a monthly newsletter on computer games. Write him at 6510 Copper Ridge Drive #T-1, Baltimore, MD 21209.

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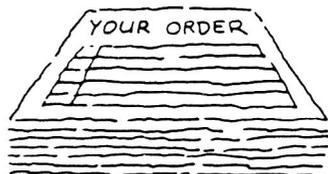
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Apple users know that there's always an easier way to get the job done. A shortcut here, an elegant twist there. That's what Hints/Techniques is all about. It's an information swap for readers who want to share their programming pointers, DOS tips, hardware secrets, AppleWorks applications, WPL enhancements, and all those other insights that make you go "Aha!" in the night. So read on and see if you don't find just the solution you've been looking for.

Number Check

by L.M. Manelis

As some experts have suggested, you can use a word processor to write programs: Just print your word-processed listing to a text file, then EXEC the file for BASIC. But the convenience of a word processor may make you lose track of line numbers.

You may copy a line to another place and modify it, for example, but forget to change the line number. If you then EXEC the text file, you'll lose the original line. Other problems arise if you move lines and forget to renumber them, or divide a line and forget to number the second portion.

I usually make some of these errors after I've typed about 50 lines. To catch them, I run Number Check (see the **Program listing**), a program written for ProDOS, when I debug, to be sure line numbers are in sequence without duplication.

USING NUMBER CHECK

To use Number Check, run it before you EXEC the text file. If the file has no line-number problems, Number Check displays a line count and tells you there are no repeated line numbers. If there's a problem, Number Check notes it and displays the number of lines checked to that point. The line count, which includes blank lines, helps you locate the problem in your text file. Number Check also lists repeated line numbers.

You can send Number Check's output to a printer by typing PR#1 before running it, then PR#0 after. The screen display is more compact, though, and probably all you'll

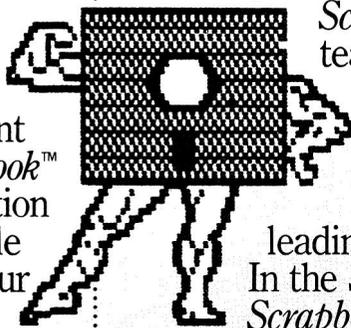
Program listing. Number Check.

```
100 REM =====PROGRAM NUMCHECK
110 DIM N(1000):MX = 63999: GOTO 250
120 REM -----SORT ROUTINE
130 J = 1
140 J = 2 * J: IF J < = N THEN 140
150 GOTO 190
160 FOR I = 1 TO N - 1:K = I
170 X = J + K: IF X < = N THEN IF N(K) > N(X) THEN T = N(K)
      :N(K) = N(X):N(X) = T:K = K - 1: IF K THEN 170
180 NEXT : PRINT "-";
190 J = INT (J / 2): IF J THEN 160
200 RETURN
210 REM -----INCREMENT LINE COUNT AND INIT FOR NEW LINE
220 LC = LC + 1: HTAB 5: PRINT LC " ";L$ = "":L = 0
230 RETURN
240 REM -----BEGIN PROGRAM
250 D$ = CHR$(4):B$ = CHR$(7):Q$ = CHR$(34):OV = - 1
260 DEF FN DIG(C) = C > 47 AND C < 58:R = 13:S = 32:E = 216
270 PRINT : PRINT : INPUT "FILE NAME: ";F$: ONERR GOTO 600
280 IF LEN (F$) THEN PRINT D$"VERIFY"F$: POKE E,Z
290 PRINT D$"OPEN"F$: PRINT D$"READ"F$
300 PRINT : PRINT "LINE COUNT": PRINT "-----"
310 REM -----BEGIN MAIN LOOP
320 ONERR GOTO 500
330 GET C$: POKE E,Z:C = ASC (C$)
340 IF L THEN 390
350 IF C = S THEN 320
360 IF C = R THEN GOSUB 220: GOTO 320
370 IF NOT FN DIG(C) THEN GOSUB 220: HTAB 11: PRINT "CHAR
      "C$" STARTS LINE; NO #.": GOTO 470
380 REM -----LINE HAS AT LEAST 1 NONSPACE CHARACTER
390 IF FN DIG(C) OR C = S THEN L$ = L$ + C$:L = 1: GOTO 320
400 REM -----LATEST CHARACTER IS NOT DIGIT AND NOT SPACE
410 V = VAL (L$): GOSUB 220
420 IF V > MX THEN HTAB 11: PRINT "#"V" IS TOO BIG."
430 IF V < OV THEN HTAB 11: PRINT "#"V" IS AFTER #"OV".":N(
      0) = 1
440 IF V = OV THEN HTAB 11: PRINT "#"V" FOLLOWS ITSELF."
450 OV = V:N = N + 1:N(N) = V: IF C = R THEN 320
460 REM -----SKIP PAST NEXT RETURN
470 ONERR GOTO 500
480 PRINT D$"READ"F$,F1": POKE E,Z: GOTO 320
490 REM -----END MAIN LOOP
500 POKE E,Z: PRINT D$"CLOSE": IF N < 2 THEN 580
510 REM -----CHECK FOR DUPLICATE NUMBERS
520 PRINT : PRINT : PRINT "CHECKING FOR REPEATS--";
530 IF N(0) THEN GOSUB 130:N(0) = 0
540 FOR I = 2 TO N
550 IF N(I) = N(I - 1) THEN PRINT " #"N(I);:N(0) = 1
560 NEXT : IF N(0) = 0 THEN PRINT "NONE";
570 REM -----NORMAL END OF PROGRAM
580 PRINT : PRINT : END
590 REM -----ABNORMAL END
600 POKE E,Z: PRINT : PRINT B$"CAN'T VERIFY FILE "Q$F$Q$"."
```



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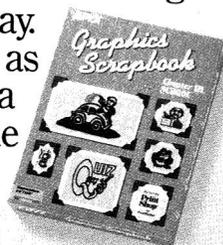
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need—you can always use Control-S to stop and start scrolling.

Pressing Control-C stops Number Check prematurely. If the text file is open, Number Check stops after looking for repeated numbers among those encountered so far, or stops immediately with the system error message FILE(S) STILL OPEN. In either case, your text file is unharmed. If you receive the error message, just type CLOSE and press the return key to continue using the file without rebooting.

Number Check examines the beginning of each text-file line, character by character. It skips initial spaces, and, if the first non-space character isn't a digit, displays a warning (line 370). Otherwise, it concatenates the initial digits and tests their value (lines 420-440), alerting you if the value is greater than a maximum (line 110) or less than or equal to the preceding line number. Line numbers ordinarily appear in ascending order, and Number Check just displays the line count as it works through the text file.

Number Check stores all line numbers as it tests each line, then checks for repetition when it reaches the end

of the file. If the numbers aren't already in order, Number Check sorts them to bring repeated numbers together. (Number Check uses a shell sorting routine that prints dashes to show it's still working.)

The program scans the ordered array of numbers and prints each suspect number as many times as it occurs, whether repetition in the text file is immediate (line 440) or with intervening line numbers. If line 780 occurs three times, for example, the program prints the number 780 twice.

Number Check works on text files containing up to 1000 numbered lines. If you want a greater limit, increase the value in the dimensioned array in line 110. Each text-file line can have up to 239 characters (Applesoft's limit). More characters won't stop the program, but will probably produce one or two incorrect notes. (This quirk results from the READ command in line 480; the F1 option doesn't get past the next Return that follows an excessively long text field.)

CORRECTING YOUR FILE

Edit your text file carefully. The sequence 100, 10, 80, 90, for example,

produces only one warning note, in response to line number 10. If you then change 10 to 110, a problem will still exist. The safest approach is to correct your file and run Number Check again to make sure no problems remain.

Sometimes, though, you may deliberately type your line numbers out of sequence, knowing your Apple will sort them when you EXEC your file. In this case, Number Check serves to just point out where the sequence is interrupted.

The maximum value for line numbers is set to 63999 (see line 110), the biggest line number Applesoft allows. You can change this to a lower value to reserve some numbers for other lines you want to EXEC into your program. You could use these lines to write your BASIC program back to a text file for further editing with your word processor. And if you make major revisions, you can run Number Check again, enhancing your word processor's effectiveness. ■

Write to L.M. Manelis at 5251 Galitz, Apt. 207, Skokie, IL 60077.

Pedigree Chart

by J.J. Pastorek

Weston George's excellent article, "Trace Your Roots with AppleWorks" (November 1986, p. 107), points out that an integrated program like AppleWorks can fill many needs of family-history buffs. However, the ability to print pedigree charts from disk files is essential, and is provided only by specialized genealogical software.

Actually, you can generate excellent charts from AppleWorks using a custom macro with Beagle Bros' MacroWorks. You transfer ancestor information from an AppleWorks database to a spreadsheet, then copy it to a pedigree-chart template on the spreadsheet.

Follow these steps to create a five-generation chart:

1) Create an AppleWorks spreadsheet template in the desired format for the multigeneration pedigree chart. I included spaces for 31 blocks of in-

formation of six cells each in my template for a five-generation chart.

2) Transfer information from your AppleWorks database by printing it to a DIF file on disk. Print 31 files in numerical order following the Ahnentafel ancestor-numbering system. Each file contains up to six entries.

3) Create an AppleWorks spreadsheet from the DIF file. Print from this spreadsheet to another DIF file with the rows option, then prepare another spreadsheet from the second DIF file. The latter spreadsheet contains 31 blocks of information in rows 1 through 6, columns A through AE. The columns correspond to ancestor numbers one through 31, from left to right.

4) Copy the six rows of information from the second spreadsheet to rows 1 through 6 above the top row of the template generated in step 1.

5) Use a custom macro to copy the

31 blocks of information from rows 1 through 6 to the appropriate blocks of the template. One macro produces a five-generation chart containing the information lifted from the database in step 2.

The resulting five-generation ancestor chart is equal in quality to those prepared with genealogical software. Like such programs, this procedure requires no retyping, precluding the possibility of error. It also lets you easily edit your files and change the formatting.

You can, of course, create ancestor charts that go beyond the fifth generation or contain more than six entries for each ancestor. ■

Write to J.J. Pastorek at 9335 West Dammuth Drive, Baton Rouge, LA 70815.

AppleWorks Printing Quirks

by Dennis LaMonica

Anyone who has tried to print a series of items with AppleWorks—address an envelope, print a letter, then print a spreadsheet report, say—knows that printers don't always work as expected.

I use the AppleWorks printer file for the Epson RX-80, and the custom printer file using RX-80 parameters, which have the Epson's enhanced-print modes. I use the Apple-supplied parameters for printing draft copies and the custom parameters for near-letter-quality printing.

When I tried to address an envelope with an addressing template I wrote and my RX-80, I used the AppleWorks clipboard to copy the address from a word-processed letter, then set the paper length (PL) at the beginning of the template to four inches for the envelope and printed it with either printer driver. Later, when I pressed the Epson's form-feed button, the paper moved only four inches, indicating that AppleWorks had changed the printer's paper-length default value.

When you set the paper length from the printer-options menu at the beginning of a word-processing document, AppleWorks sends the printer an ESCAPE "C" n sequence, which sets the top of form and page length to the number of lines in the form. This occurs from the word processor only if you set PL at the beginning of the document. AppleWorks doesn't send this code if you don't embed PL from the printer-options menu.

If you set PL to print a document that's more or less than 11 inches long (for example, four inches for envelopes), then print another document with the custom printer parameters without resetting the paper length at the beginning, AppleWorks will format this document with the default value of 11 inches.

It appears to print properly until AppleWorks sends a form feed to get to the top of a new 11-inch page: The printer is still set for the shorter

form you indicated for the last printed document, which used the PL option, set for four inches. The outcome depends on where the printer thinks the top of form is, and when AppleWorks sends the form feed. Generally, though, the second page won't print at the proper place with respect to the top of the next sheet of paper.

If you follow the same sequence, but choose the Epson RX printer from the Print menu instead of the custom printer, the second document will print properly, because the AppleWorks-supplied Epson RX printer driver always sends the printer-initialization code, Escape-@ (for the Epson—all codes discussed here are Epson codes), before printing the document. This sets the printer parameters to their initial values, where the page length is set at 11 inches.

AppleWorks has no provision for sending initialization codes to custom-installed printers, though. Therefore, if AppleWorks changes a form-length value internally, you must reset it at the beginning (even if you want the default value of 11 inches), or initialize the printer, to bring the printer's internal values to their defaults or a form length of 11 inches.

SWITCHING MODULES

AppleWorks always sends the print-control codes before, as well as during, printing, but it doesn't reinstate any values after printing. For example, if you print a letter at 17 characters per inch, exit AppleWorks, then list a BASIC program on your printer, the listing will print at 17 characters per inch (cpi).

A similar situation occurs if, from within AppleWorks (with the Epson), you use the *word processor* with the elite (12-cpi) type size to print a letter, then print a *spreadsheet* at 17 cpi. You set the 17-cpi code in the printer-options section of the spreadsheet (send codes to printer), and the spreadsheet prints at 12 cpi, not 17 cpi; the 17-cpi size isn't available, since the printer first receives the code for 12 cpi.

Remember, you set 12 cpi from the word processor, and nothing changed that value. The 17-cpi code only set an internal flag in the printer, so that when you set a ten-cpi code later, the printer will *then* print at 17 cpi. In other words, the 17-cpi code will print 17 cpi only when you first set ten cpi.

The sequence above is specific to the Epson RX-80 printer; other printers behave differently, but the point is that various print modes aren't available from all other modes. It's interesting that AppleWorks doesn't send initialization codes from the spreadsheet or database as it does from the word processor when using the supplied Epson RX printer parameters.

So where does all this lead? You can ensure that your printer is set to its default values prior to printing: When you specify the code to send to your interface card from the "Specify information about your printer(s)" option, specify the interface-card initialization code *and* the printer-initialization code.

For the Grappler interface card and Epson RX-80, type Control-I ON Escape-@ without any spaces between characters. In this sequence, Control-I ON tells the Grappler not to append carriage returns or echo to the screen. The Grappler ignores Escape-@, which initializes the printer to the default values it has when you turn it on. Your Apple therefore knows the state of the printer each time you access it. This technique works from AppleWorks, BASIC, and every program that lets you enter interface-card setup codes.

Entering a printer-initialization code along with the interface-initialization code helps eliminate at least some of those unanticipated things, which, like trolls, occur just as you think you're home free. ■

Write to Dennis LaMonica at P.O. Box 147, Panama, NY 14767.

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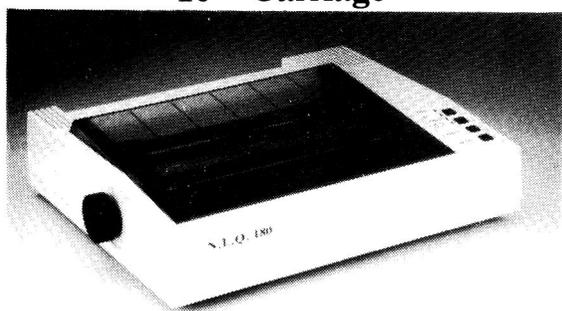
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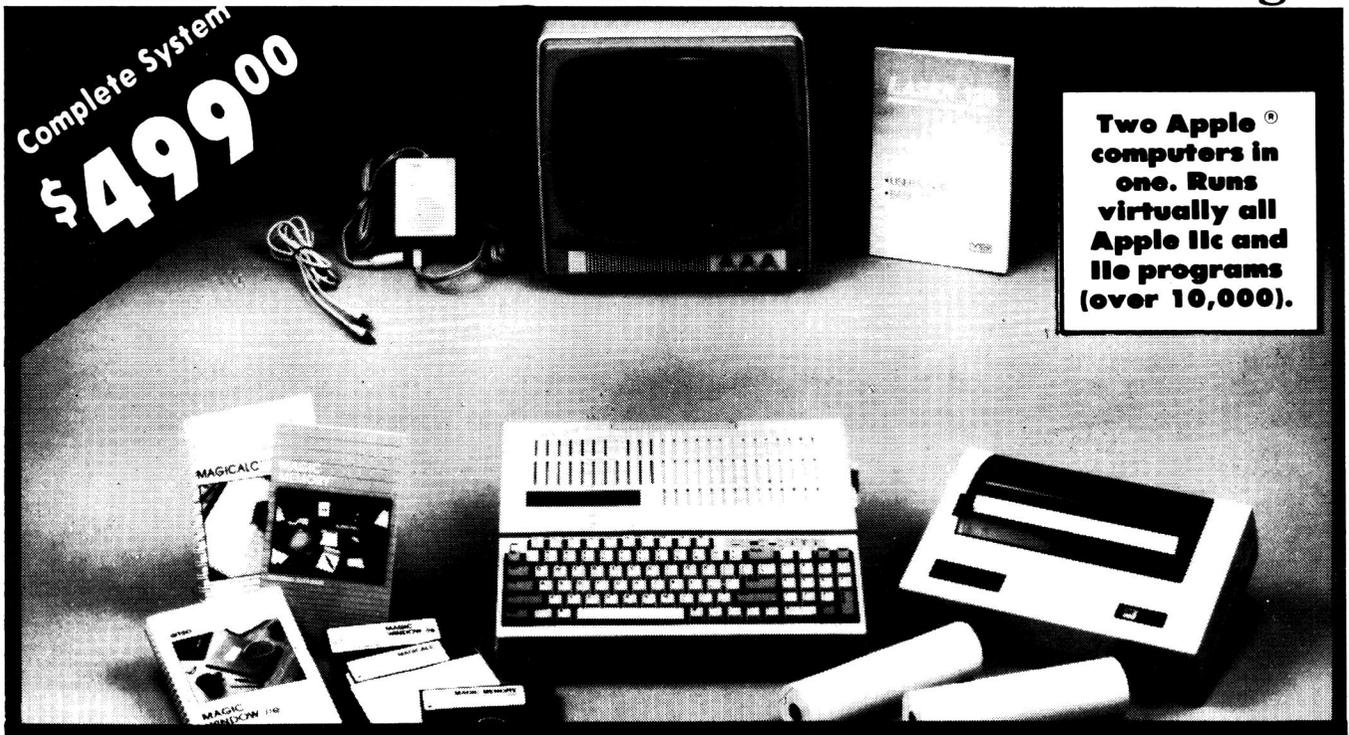
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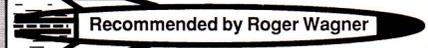
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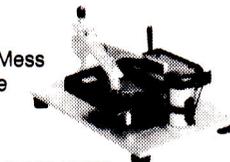
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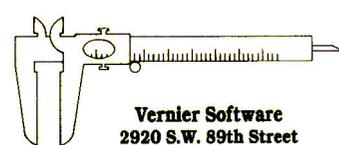
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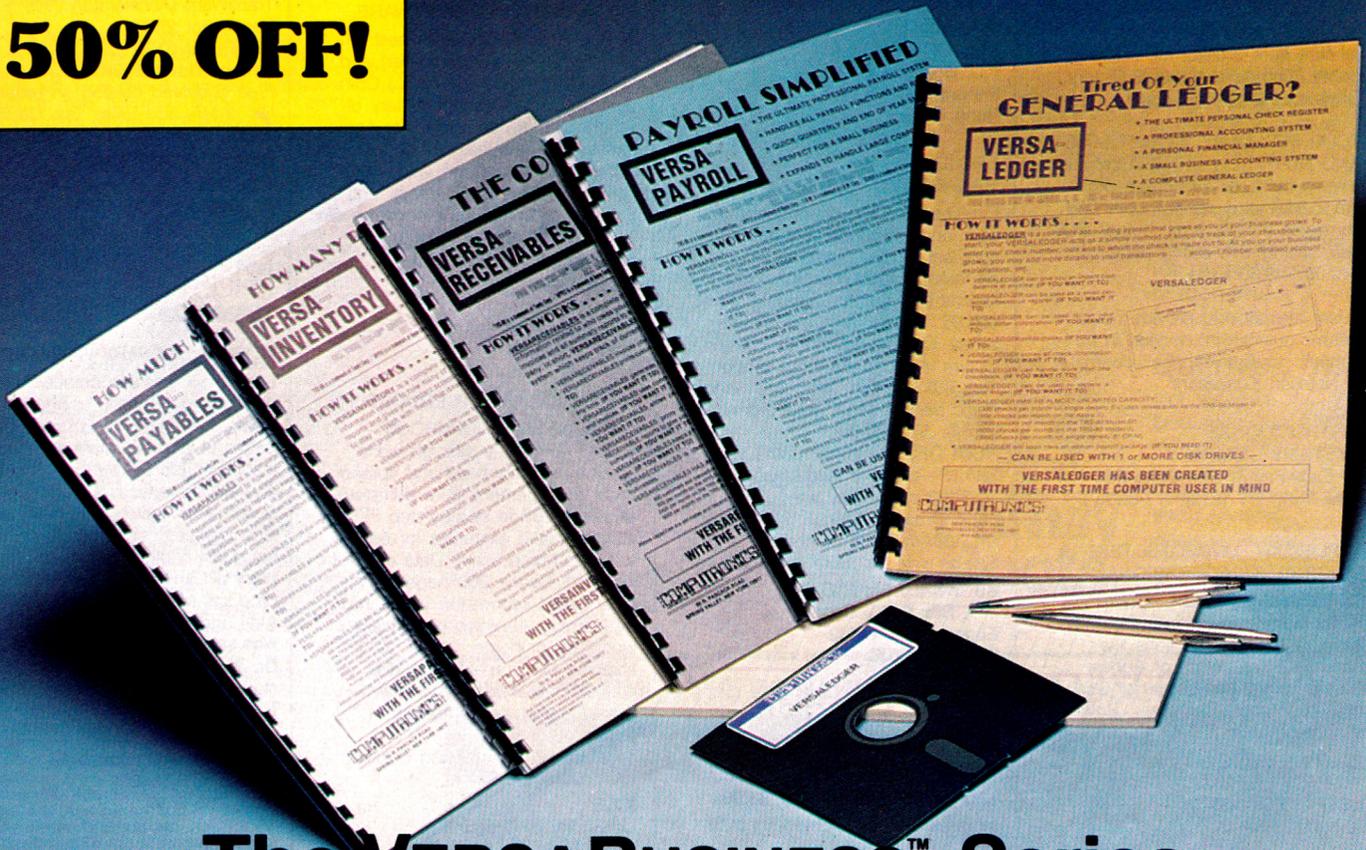
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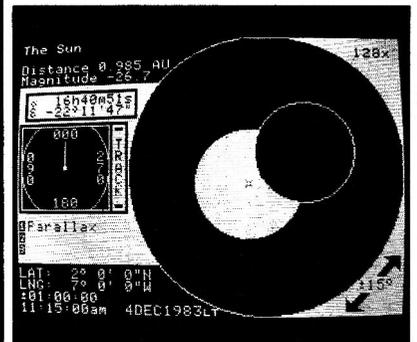
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Shanghai: Tile After Tile

We had all kinds of sensible reasons for not putting **Shanghai** on this page. We don't usually pick games for Editors' Choice (we've done so only once before—*Intrigue* in July 1986); after all, there's our Mace on Games column in each issue and Games Editors Play every other month in the Reviews section. Shanghai isn't even a new game, though it's new to the Apple II—it was a smash hit on the Macintosh last year, and its noncomputer version goes back centuries before that. The IIGS edition (\$44.95) is much prettier and easier to use than the 8-bit Apple II game (\$39.95).

But our objections to Shanghai faded once we started playing—and playing, and playing. Designer Brodie Lockard's best-seller is based on the old Oriental game mah-jongg, a simple solitaire puzzle in which you remove pairs of values from a 144-tile pyramid. Besides finding matched pairs of values and suits or symbols, you can take only tiles that are free to move horizontally; not those trapped between others in the three-dimensional stack.

It takes a minute to learn the rules and ten seconds to get the technique—with the GS mouse, you simply click on the first tile and double-click on the second to remove a pair. (The 8-bit version offers tolerable joystick or dreadful keyboard control, but looks sharp on monochrome monitors.)

The trouble is, Shanghai is unbelievably addictive. With a

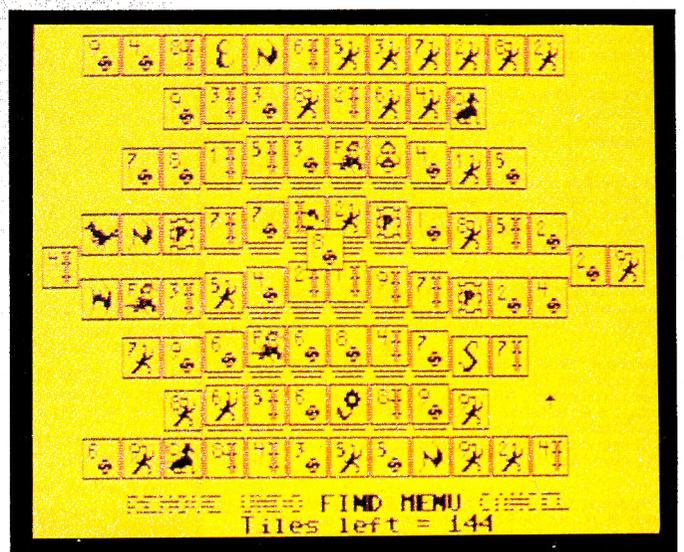
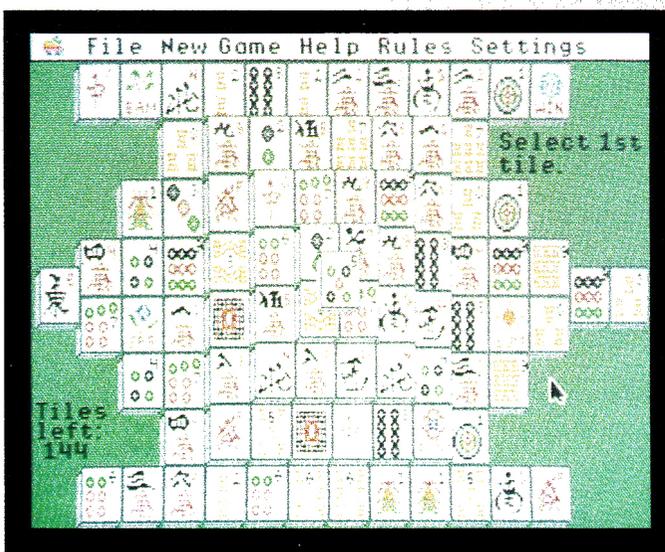
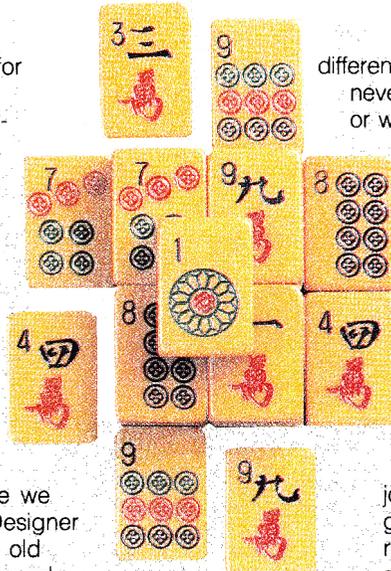
different randomly sorted stack every time, you never know whether the puzzle will be easy to solve or whether planning ten moves ahead will prove useless; you may triumphantly whittle the pyramid to nothing one time, then struggle to get below 100 tiles the next.

If you tire of playing alone, you can challenge a friend in timed competition or save or load games from disk. If you tire of playing fair, there's a pull-down help (and cheating) menu. A few other games have kept us playing after 5:00 p.m.; Shanghai had us staying late and coming into the office early the next morning.

Assistant Editor Lafe Low started with jokes about Shanghai "stacking up to other games," but soon became as intrigued as the rest of us: "I think it's neat that Activision did such a good job of transferring an ancient game into such an interesting and addictive computer program."

Agrees Managing Editor Dan Muse, "I don't know how a game with no spaceships, lasers, spies, villains, violence, bats, or balls could be so habit-forming, but Shanghai is. Once you get going, it's hard to put the mouse down. I'm not addicted yet, but I can see how it would happen to those with less willpower, like Grevstad and Statt."

This month's decreased office productivity is due to Activision Inc., 2350 Bayshore Parkway, Mountain View, CA 94043, (415) 960-0410. ■



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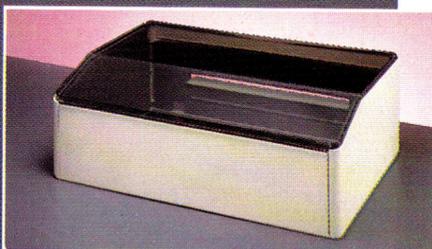
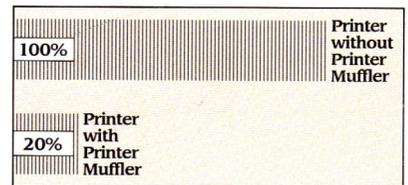
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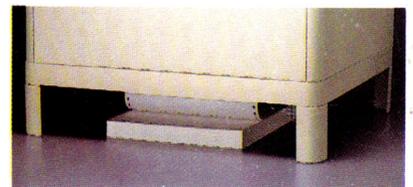
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