

II **COMPUTING**™

FOR **APPLE II** USERS

U.S.A. \$2.95

CANADA \$3.50

DECEMBER / JANUARY 1987

50 Great Gifts!
page 9

**Power Up Your Apple—
More memory, more
speed**

**Sneak a Look:
PaintWorks Plus
for the IIGS**

Wozniak Speaks!

**Plus:
4 Type-Ins
Softstrip Game**

Reviews:

- Puma Running Shoes
- The Toy Shop
- X-10 Powerhouse
- American Cup Challenge
- AppleWorks Books

**Disk Bonus:
Newton's Apple Freeware**



UNREAL.

UNSAFE.

Shard of Spring™



SSI
STRATEGIC SIMULATIONS, INC.

ROADWAR 2000™



SSI
STRATEGIC SIMULATIONS, INC.

UNBELIEVABLY FUN.

SHARD OF SPRING™, the new multiple-character role-playing game from SSI, promises an adventure unbounded by the mundane constraints of reality. It is set in a world where magic overrides the laws of physics, where monsters, gnomes and elves outnumber mere humans. Your quest is to recover the wondrous Shard, the giver of eternal Springtime. This precious crystal has been stolen by a demonic sorceress. Assemble five characters and endow them with different combinations of speed, intellect, strength, endurance, and warrior/wizardry skills. Then guide them wisely through evil dungeons and treacherous lands as they search to regain the Shard. This fantasy game boasts a unique feature: During combat, the tactical screen is an exact zoom-in shot of where you are on the overall map.

On disk for 64K Apple® II series and C-64™. IBM® version coming soon.

In **ROADWAR 2000™**, you get to break a new set of rules, namely the law of safe driving. In the year 2000, bacteriological warfare has ripped apart the very fabric of American civilization. Cities have turned into battlegrounds; the highways, into battlefields. As the patriotic leader of a road gang, you are asked by what is left of the Federal Government to locate eight scientists and return them to a secret underground lab to develop a cure for the dreaded disease. As you crisscross the nation's highways on your desperate mission, you must constantly battle mutants, cannibals, and rival road gangs for new recruits, vehicles, supplies, food, gas, guns, ammunition, and medicine. In this brutal land, they are more precious than gold.

On disk for 48K Apple® II series and C-64™.

For excitement that is unreal and unbearable, check out these games at your local computer/software or game store today!

If there are no convenient stores near you, VISA & M/C card holders can order these \$39.95 games directly by calling **toll-free 800-443-0100, x335**. To order by mail, send your check to: STRATEGIC SIMULATIONS, INC., 1046 N. Rengstorff Avenue, Mountain View, CA 94043. (California residents, add 7% sales tax.) Please specify computer format and add \$2.00 for shipping and handling.

All our games carry a "14-day satisfaction or your money back" guarantee.

WRITE FOR A FREE COLOR CATALOG OF ALL OUR GAMES TODAY.

Apple, Commodore, and IBM are trademarks of Apple Computer, Inc., Commodore Electronics, Ltd., and International Business Machines Corp., respectively.

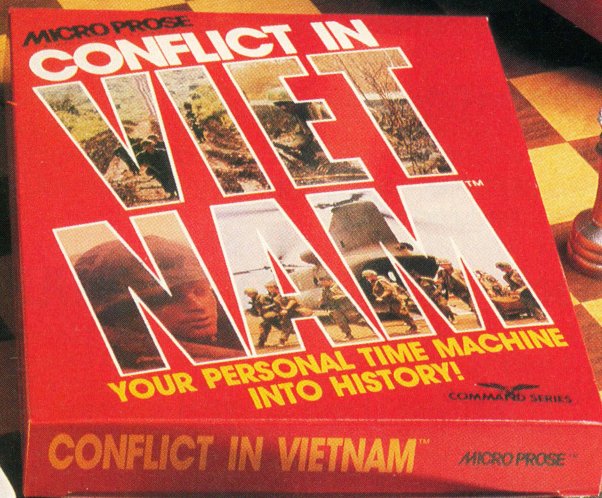
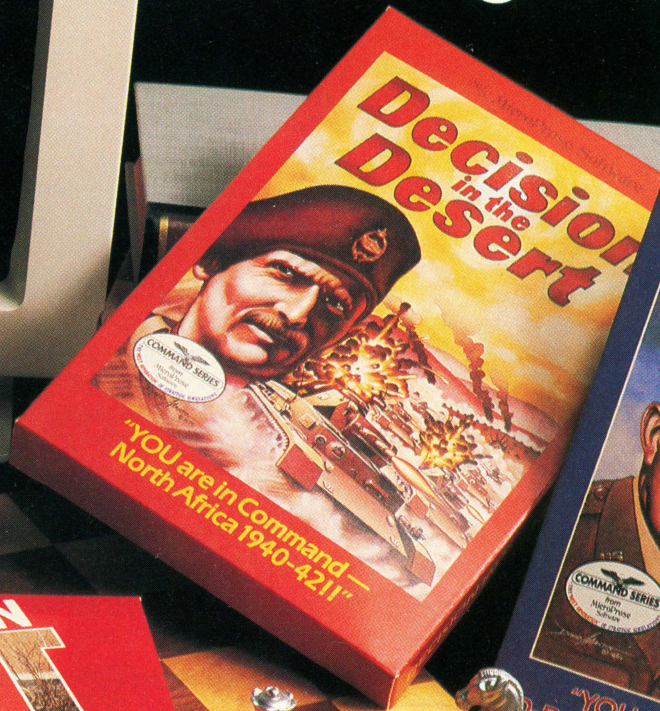


© 1986 by Strategic Simulations, Inc.
All rights reserved.

***Interested
in some of
the products
advertised
in this issue?***

**For FREE product
information...
Just circle the
number(s) on the
Reader Service
Card bound
inside the
back cover.**

Games for the Strategic Mind



For three thousand years, men of intellect have played chess as a means of studying the acquisition of power. Now the power of the personal computer and the genius of MicroProse provide an excitingly authentic way to sharpen strategic skills—in accelerated realtime warfare on the battlefields of Europe, North Africa, and Southeast Asia. Deploy infantry, armored vehicles, or even guerrilla units, then support your troops with artillery or air strikes. Study the terrain features of the great battlefields of history. Factor in supply shortages, weather, and troop morale. As terse combat messages flow into headquarters, respond to the enemy's thrusts and

parries by ordering counterattacks or flanking movements. Or wait for nightfall, and regroup under cover of darkness for a dawn attack.

As with chess, MicroProse Command Series simulations require only a few minutes to learn at the basic level; yet it would take a lifetime to play out every possible scenario. Program variations permit you to change sides and view the battle from the enemy's perspective, or to alter the balance of forces the generals actually faced. Detailed documentation provides a historical overview, and simple combined joystick/keyboard control of troop movements implements your orders.

The MicroProse Command Series includes *Decision in the Desert*, a simulation of the tank battles waged between Rommel's Afrika Corps and the outnumbered British. *Crusade in Europe* recreates the final year of the Second World War, invasion of Normandy to the Battle of the Bulge.

Conflict in Vietnam depicts the thirty-year struggle for Southeast Asia.

Enact your strategy with a realism the ancients could never have imagined—with the MicroProse Command Series. A game for the strategic mind. . .

The MicroProse Command Series is available for Commodore 64/128, Apple II family (double Hi Res version included), Atari XL/XE, IBM PC/PC Jr., and Tandy 1000 computers, at a suggested retail price of \$39.95.

Commodore, Apple, Atari, IBM, and Tandy are registered trademarks of Commodore Business Machines Inc., Apple Computer Inc., Atari Inc., International Business Machines Corp., and Tandy Corp., respectively.

Available from your local retailer. Or call or write to MicroProse Software directly for further information and Mastercard/Visa orders.

CIRCLE 012 ON READERS SERVICE CARD

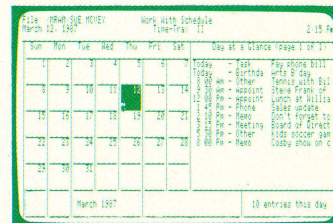
MICRO PROSE
SIMULATION • SOFTWARE

120 Lakefront Drive • Hunt Valley, MD 21030 • (301) 667-1151

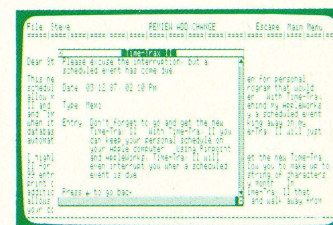
Time-Trax II

Please excuse the interruption, but a scheduled event has come due...

Time-Trax II™ is an active, time and date oriented calendar program. When a scheduled event is due Time-Trax II will beep and display your entry! Time-Trax II will remind you of meetings, appointments, errands, phone messages, birthdays, holidays, bills to pay and much more. With Time-Trax II you can even schedule advance notice reminders so that you are ready for your important event! No more excuses that you forgot to look at your calendar!



Time-Trax II is easy to use. With just a few simple keystrokes you can make, review, copy and edit entries. Easily change the time or date of an event and edit text of any entry. Time-Trax II's cut, copy and paste commands along with its clipboard makes it simple to enter regularly scheduled events. Search for any name, phone number or other information in any entry. Customize Time-Trax II with your own meaningful category labels for your entries. Print out a day, a month or any period of time easily. Keep schedules for any number of users.



And best of all Time-Trax II uses the AppleWorks™ user interface, so if you're using Appleworks you're ready for Time-Trax II!

Busy people everywhere need Time-Trax II. Time-Trax II can be installed as a Pinpoint Desk Accessory and then either run as a normal desk accessory or an active one! When active Time-Trax II will run behind other programs like AppleWorks, Manzanita BusinessWorks™ and Profiler™ and will actually interrupt you while you are working to notify you of a scheduled event!

IIc System Clock

The //c System Clock™ is a perfect addition to any Apple //c or Laser 128. Simply plug it into either your printer or modem serial port and then plug your printer or modem into the //c System Clocks pass through port. Your ProDOS software will then be able to read the time and date.

Included with software to display the time and date on the AppleWorks menu too!



SEIKO® DATAGRAPH 2001

Imagine having your Time-Trax II schedule loaded into a wrist watch. That's exactly what you get with the Seiko Datagraph 2001™. Now you can be anywhere and Time-Trax II will notify you of your important events with an alarm and display on an easy to read 4 line LCD screen. The Seiko Datagraph 2001 version comes complete with Time-Trax II, the Seiko Wrist Terminal (it's also a very nice watch) and a combination ProDOS clock/interface for your computer. No other cards or accessories are needed. We include everything you need.



CPU
Creative
Peripherals
Unlimited, Inc.

Call 800-228-1165 National
714-770-3334 Calif.

SYSTEM REQUIREMENTS

1. ProDOS compatible clock
2. Apple //c, //e (Enhanced //e recommended) or IIGs
3. 80 column capability

PRICING

- | | |
|---|-------------------------------|
| 1. Time-Trax II | \$69.00* |
| 2. Time-Trax II with //e ProDOS Clock | \$158.00 Value Only \$129.00* |
| 3. Time-Trax II with //c System Clock | \$158.00 Value Only \$129.00* |
| 4. Time-Trax II & Seiko Datagraph 2001 (specify //e or //c) | \$229.00 |
| 5. //c System Clock | \$89.00 |
| 6. Pinpoint V2.0 (ordered with any product) | Only \$59.00 |

*Introductory offer

Dealer Inquiries Welcome

AppleWorks, ProDOS and Apple are trademarks of Apple Computer, Inc. BusinessWorks, ProFiler, Seiko, Pinpoint and Laser 128 are trademarks of Manzanita Software, Custom Computer Products, Hattori Corporation of America, Pinpoint Publishing and Virtual Combinatics, Inc., and Video Technology, Inc. respectively. Time-Trax II is a trademark of Creative Peripherals Unlimited, Inc.

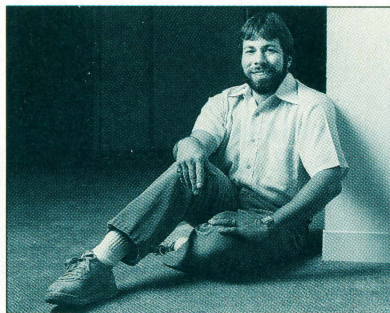
Creative Peripherals Unlimited, Inc. 22952 Alcalde Drive, Suite 160, Laguna Hills, CA 92653

II COMPUTING™

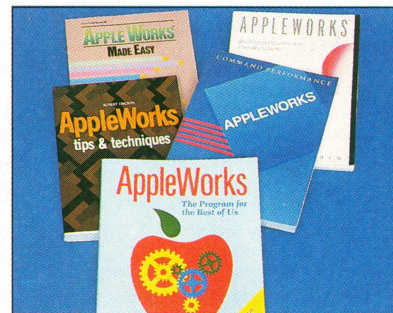
FOR **APPLE II** USERS



50 Great Gifts.....9



Steve Wozniak.....26



AppleWorks Books.....70

Features

- 9 Great Gift Ideas**
by Giselle Bisson
50 Fabulous Apple Products
- 15 Plug-In Power**
by Robert Grossblatt, Frank Hayes and Bill O'Brien
Supercharge Your Apple With Add-On Boards
- 32 Banner Maker**
by William V.R. Smith, III
Holiday Decorations
Type-In Software

Columns

- 54 Sotto Voce**
by Margot Comstock
Reflections by a Former Softalk Editor
- 60 For the Fun of It**
by Neil Shapiro
Games and Entertainment Software
- 63 Advanced Computer Concepts**
by Daniel Wolf, Ph.D.
Thinking About Thinking, Part 3
Type-In Software

Reader Services

- 6 Editorial**
- 7 Reader Forum**
- 78 New Products**
- 82 Advertiser's List**

Software Library

- 33 Contents**
- 34 Softstrip**
- 35 If All This Is New To You**
- 36 Typo II, Typing Checker**
- 51 II Err Is Human**



About the Cover:
Anthony Abuzeide, photographer

Departments

- 14 Game Frame:**
Pond
by Jenny Schmidt
Type-In Software
- 41 Teacher/Parent Tips:**
Lesson Plans for Banner Maker, Almost Perfekt, Pond, Grassroots Bulletin Boards
- 52 Education:**
Almost Perfekt
by John Ratcliff
Type-In Software
- 56 Online:**
Grassroots Bulletin Boards
by Ann Garrison
- 67 Sneak Preview:**
PaintWorks Plus
by Michael Biancalana
- 70 Reviews:**
Books About AppleWorks; Puma's Computerized Shoe; The Toy Shop; X-10 Powerhouse; American Cup Challenge

Publisher

James Capparell

EditorialDeWitt Robbeloth, *Executive Editor*Anita Malmig, *Editor*Frank Hayes, *Assistant Editor*Michael Biancalana, *Programs Editor*Heidi Brumbaugh, *Editorial Assistant*Jon Randall, *Editorial Clerk*Robert Grossblatt, *Contributing Editor***Art & Production**Marni Tapscott, *Art Director*Linda Tapscott, *Assistant Art Director*Mary Webster, *Design/Production Asst.*Katherine Murphy, *Advertising Production Coordinator*Julianne Ososke, *Collateral Printing Coordinator***Contributing Artists & Photographers**Anthony Abuzeide, *Cover Photography*

Tony Grant

Dan Hubig

Mary Rhomberg Lavery

Julie Polunsky

Erik Weber

CirculationMargot Olmstead, *Director*Dixie Nicholas, *Subscription Coordinator*Eric Gupton, *Distribution Coordinator*Daniel Barrett, Ken Warner, *Dealer Sales***Marketing**Jon Loveless, *V.P. Marketing*Gary Yost, *Director*Lisa Wehrer, *Director of Sales***Administration**John Cady, *Assistant Controller*Lorene Kaatz, *Credit & Collections*Suzann Thompson, *Accounts Receivable*Lydia Chee, *Accounts Payable*

Kimberlea Johnson, Lawrence Sumpter,

*Order Processing*Griselda Lopez, *Cash Receipts*Susan Allison, *Administrative Secretary*Dennis Swan, *Receptionist***Advertising Sales**John Taggart, *Director*

(415) 957-0886

See page 82

for regional

Advertising Representatives.

General Offices (415) 957-0886

524 Second Street, San Francisco, CA 94107

Subscription Customer Service

(614) 383-3141

Credit Card Subscriptions

(800) 433-0100 ext. 700

Continental U.S. and Hawaii

Subscriptions: U.S. \$11.97 (6 issues), Action Edition \$59.95 (6 issues with disk). Canada and Mexico \$16.97 (6 issues), \$72.45 (6 issues with disk). Other foreign \$21.97 (6 issues), \$84.95 (6 issues with disk).

Copyright 1986 by Antic Publishing, Inc. All rights reserved. Printed in USA

No part of this publication may be stored in an electronic retrieval system except by the purchaser for his or her own use, nor reproduced by any means (electronic, magnetic, mechanical, optical, photographic, or other) by anyone without prior written permission of the publisher.

II Computing — for Apple II Users is an independent periodical not affiliated in any way with Apple Computer, Inc. Apple, Apple II, Apple II+, Apple IIe and Apple IIc are registered trademarks of Apple Computer, Inc. All references to Apple products are trademarked and should be so noted.

Computers and Vacuum Cleaners

by ANITA MALNIG

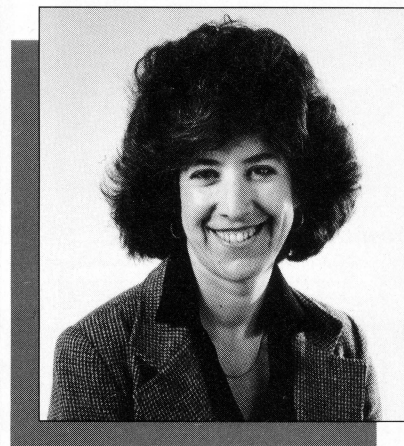
Recently Susan Ohanian, senior editor at *Learning 86*, evaluated computers as a learning tool in a "Personal Opinion" column. She doubts that computers can revolutionize education, and she put the machines in their place, to my thinking, a rather narrow place. At one point she said, "So a computer is a serviceable device — perhaps as useful as a vacuum cleaner — but it doesn't stimulate creativity."

While I agree with Michael Crichton who once said there's not much difference between a blank page and a blank screen, I think computers can enliven the creative process. Many adult writers find writing a first draft on a computer less intimidating than on paper. See an upcoming issue for a review of "Calliope," an idea generator by computer expert David Thornburg (in fact, sit in on a lecture of his if you ever get the chance) and see if *he* can't turn your head about the creative possibilities of computers.

Ohanian goes on to say, "As always, we teachers must take responsibility and not go chasing after every whiz-bang promise. Too many of those promises turn out to be just one more flash in the disc drive."

I couldn't agree more that teachers *must* take responsibility for what they teach. But, if Ms. Ohanian were to see some of the very exciting advances in software I'd bet she would soften stance. Computers, like television, are here to stay. Decry the junk, certainly. But, more positively, become involved, now. The educational computer industry clearly needs teachers to help set a wise course for our young people.

Let's pay attention to the fact that children respond to computers in ways no one really planned. Sure, video games were the initial attraction. But, children respond to a kind of "electronic magic" that happens when



Erik Weber

words go away and come back, when a computer *talks* to them. Look at how speech synthesizers can serve the verbally impaired, how mice can aid the motor-impaired, how a 20-column screen can help the new reader.

We believe you and your family find computers exciting and bring you an issue full of gift ideas for a sparkling New Year. Note our review here of the X-10 Powerhouse home controller. Does this product go one step beyond your vacuum cleaner?

Note our "IIGS New Products" page. Lots of goodies on the way. At this writing, however, I haven't seen a finished product. While I applaud developers for their creative work, our readers need solid reviews of products in-the-flesh.

We wish Apple Computer, Inc. a happy ten-year anniversary. Steve Wozniak, interviewed here, remembers the very beginning when 4K was certainly going to be enough memory. . .

The *II Computing* staff wishes all of you delightful holidays and a wonderful New Year. . . and some stimulating hours at your serviceable computer.//

Anita Malmig
Editor

MUDDYING THE WATERS

I read with great interest your interview with Mr. Del Yocam (August/September 1986). It is always good to hear that others enjoy one's own enthusiasm for something as worthwhile as seeing microcomputers achieve a more dominant role in education. Used properly they can increase motivation while measuring learning outcomes; they free teacher time for instruction by automating management tasks; and they allow individualized instruction more easily than is otherwise possible.

However, to say that microcomputers should "achieve a more dominant role in education" is itself an opinion, nothing more. Any attempt to make it more must be based on research. Do microcomputers really increase motivation or achievement scores? The entire microcomputer education issue turns on this question.

Which brings me to the point of this letter. Some of the things stated by Mr. Yocam give away his position as a marketing representative, not an educator. Some are simply surprising, unless you consider that his interest in education originated because he is "married to a teacher," certainly a happy fact, but hardly qualifying anyone as an expert in the field.

Mr. Yocam's vision of the classroom of tomorrow is typical of anyone whose business is selling computers. Every student has a computer and the teacher just "downloads the assignment." Downloading assignments is not why I became a teacher, and the results of my informal classroom polls suggest that in an all-or-nothing situation, most students would rather be taught by a human being than by a machine. "Visionaries" like Mr. Yocam would remove the last traces of genuine human interaction in cases where, for many students, this is the last and only place they can get any caring interaction at all. Teaching is a human art, it cannot be replaced

by machines (at least not as easily as Mr. Yocam's job can).

As far as quantifiability in education, Mr. Yocam states that "In fact, the more intuitive software, the type of applications that really get in and cause something to happen within the student, won't necessarily be quantifiable at all." Now software may not be quantifiable, but the results of learning must be. What would happen if Mr. Yocam went to his boss and suggested a multimillion-dollar marketing strategy without a thoroughly detailed and quantified plan? He would probably be fired. Microcomputers themselves would not be possible if every step were not strictly quantifiable. Why suggest that learning doesn't have to be? Mr. Yocam suggests that accountability in education is just a spectrum of beliefs in which you have the option of being for or against. To eliminate accountability may be good for computer sales, but it's bad educational policy by any standard.

I have hardly begun to address the issues that have been muddled and confused by Mr. Yocam. In the future, if you are going to do an educational piece, please interview an educator; if you are doing a piece on marketing, then interview a marketing representative. Education has enough problems without having the issues muddled up by a computer salesman. Teaching is becoming a rigorous discipline; it is not an arena in which anyone can claim expertise in order to sell a product.

*James L. Negroni, M.Ed.
Tampa, FL*

Anita Malnig replies:

Del Yocam didn't suggest that a computer should reduce teachers to merely downloading assignments, but that it would allow them to work with more students individually. He never claimed that educational software shouldn't measurably improve learning; in fact, he said he was eager to

learn whether upper or lower skill students would improve test scores the most in Apple's Classrooms of Tomorrow.

Apparently Mr. Negroni feels that Mr. Yocam should never have been interviewed in our education issue because he works for Apple Computer. We didn't interview Mr. Yocam as an educator, but as a business executive who's deeply interested in computers in education — at the company that provides more hardware, software and support for primary and secondary education than any other computer company in America.

As Mr. Yocam pointed out in the interview, the best use of computers in education depends on educators, parents, businesses and legislators working together. We agree — and we hope Mr. Negroni does, too.

SALUTE

In regard to recent Reader Forum letters expressing the desire that you and other magazines would print more Softstrips: It seems to me that you are running a flag up the flagpole and then seeing who will salute it. I am saluting!

*Gerald S. Crenshaw
Garland, TX*

DELIGHT

Browsing at Waldenbooks on my lunch hour, I found the August/September issue of *II Computing*. I was intrigued by the Orrery article, so I bought it. To my great delight, I found two other articles of value: the circle and polygon maker is just what I need for a computer game I'm building, and the clockless date stamp resolves the <NO DATE> issue nicely. The review of desktop accessories was interesting, too. They've proven a nuisance in the IBM environment, especially when coupled with terminal emulation programs. (During the day I'm a computer consultant for a Fortune 250 manufacturer that uses

continued on next page

mainly IBM equipment. In the evening I'm a closet programmer, although not a hacker, on my enhanced IIe.)

*Ann E. Work
Allentown, PA*

FLOWERS BY LASER

During my brief holidays in New York at the end of July, I bought your Graphics issue (June/July 1986) because I was very interested in the front cover. I was hoping to find some information about the hardware and software used to produce this picture, but there was no article explaining the method. Could you please give me some information on how the picture was produced?

I am working on a Ph.D. thesis on iconography at the University of Aix-en-Provence in France, and until now I have used my Apple IIc mostly as a typewriter. Maybe, thanks to you, I will be able to do something more with it!

*Marianne Born-Gabriel
Aix-en-Provence, France*

The editors reply:

According to Brian K. Person at ColorGraphics, Inc., in San Francisco, the cover began as a 35mm color slide of *Sunflowers* by Monet. The slide was digitally scanned by a Crosfield 645M Laser Scanner to a 300 Megabyte Disc Pack linked with a Crosfield 860 Studio. The image was pixelized to produce the low, medium and high-resolution borders, then transferred to four-color process negatives.

NOT II BLAND

I am a recent subscriber to *II Computing* and have been very impressed with the quality of your articles and programs. I would like to raise a small voice in favor of type-in programs and "technical" articles (whatever that means); despite the results of your reader survey, please don't abandon your programming readers of varying abilities for a blander, more homogenous approach. This is almost

exactly what happened to some other publications I used to enjoy.

*David R. Miller
Ottawa, Ontario, Canada*

CASTLE FAN

I am a private in the United States Army, stationed in Germany, and I recently bought an Apple IIc from the local exchange. They do not sell very much software here, so I get most of my programs out of magazines. Most of the programs are not as fun and useful as they are explained to be, which is a big disappointment to me after I spend hours typing in the listing.

That's why I was so pleased with your Education issue. I typed in the Castle game and got it working, and I found it to be one of the best programs I have—a program my kids will use over and over, helping them learn. It is not a boring game like most educational software, but a fun-filled, colorful program, especially when the shapes get colored in.

I also like the program's structure—not a mess of GOTO statements that is very hard to understand, but a complex program broken into steps with each one performing a certain function. Thank you for a job well done.

*Joel J. Svetlovics
APO New York*

ERRATA

Because of a printing error, the diagram for "TypeRight" on page 66 of the October/November issue didn't explain which keys are used at which level in the program. In the diagram, beginner's level keys are green; the keys added at the intermediate level are yellow; keys added at advanced level are purple; and the blue keys are added at expert level, completing the keyboard.

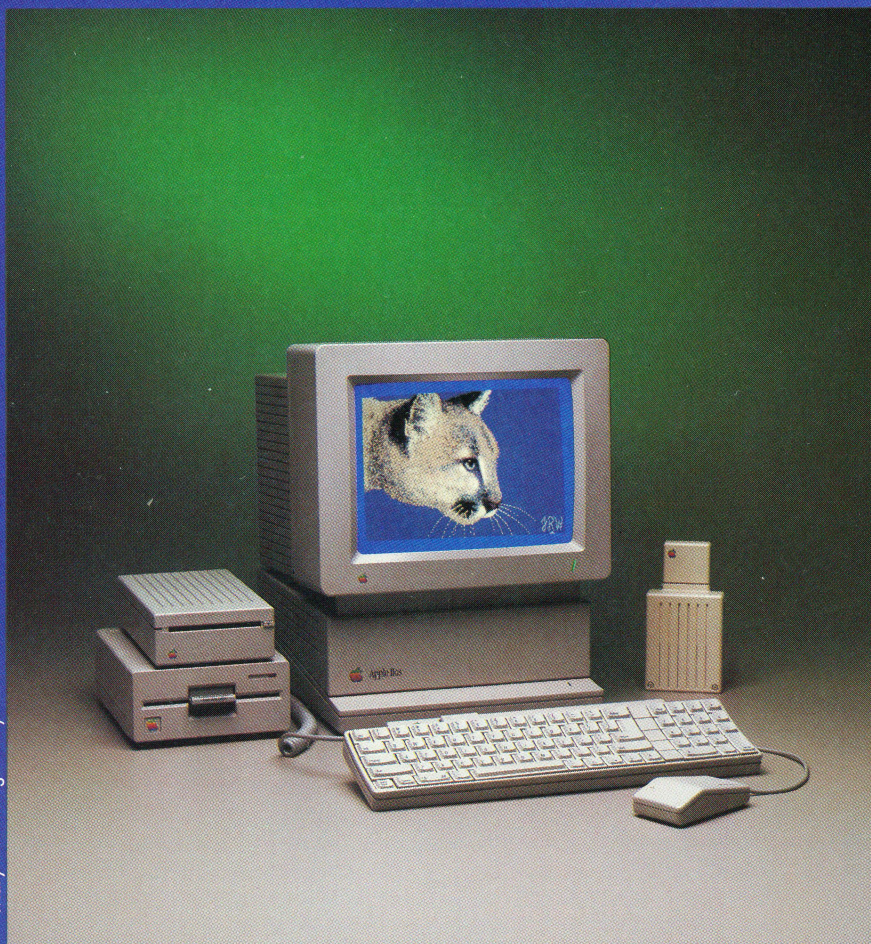
The new address for Apple Computer Clubs International is 175 Middlesex Turnpike, Bedford, MA 01730.

II BITS

This issue's Action Disk edition includes two more Applesoft BASIC programs from **Newton's Apple**, the popular PBS science show; this month the subjects are Mirrors and Inertia. You can download the programs from Apple forums on CompuServe and The Source, or get them from many local user groups. You can also get the entire Action Disk directly from *II Computing*—see the ad on page 74 for details. . . . It's easy enough to find your **local user group**—just call Apple Computer, toll-free, at 1-800-538-9696, and ask for extension 500. Tell them your zip code, and they'll tell you about the Apple user group nearest you. . . . Starting this issue there's a **Reader Service** number at the end of every article. Tell us which articles you like best by circling the numbers on the Reader Service card. . . . New York City's **School of Visual Arts** now offers a Master of Fine Arts degree in Computer Art. It's the first MFA program for computer artists at an accredited art college in the U.S. . . . **Polarware/Penguin Software** reduced prices on their entire software line at the beginning of June and, according to Polarware President Mark Pelczarski, the results have been phenomenal—with prices cut in half, they're selling six times as many programs. Games like *Oo-Topos* are now \$17.95, and Apple II books originally published by Softalk are only \$2.95. . . . **Electronic Arts** has also lowered prices on some software; their Software Classics line includes Pinball Construction Set and Archon, which are now priced at \$14.95. . . . The **Young People's Logo Association** offers a newsletter, a forum on CompuServe, a bulletin board and on-line library called "The Jester's Court," and a software exchange with more than 100 disks of Apple II programs written in Logo, PILOT, Pascal and BASIC. For more information, write to YPLA at 1208 Hillsdale Drive, Richardson, TX 75081.//

50 Great Gift Ideas for Your Apple II

Selected by the II Computing staff
Compiled by GISELLE BISSON



Mary Rhomberg Lavery

If your friends own Apple IIs, you already know what they want. But if the only apple you're familiar with comes in Granny Smith or Pippin, wandering into a computer store can be a bewildering experience. II Computing comes to the rescue with this 1986 Gift Guide. Of the thousands of products out there, our reviewers and staff think these are among the best.

Giselle Bisson is a writer specializing in high-technology who's written for publications including InfoWorld and Antic.

DECEMBER / JANUARY 1987

Apple IIgs

It is the ultimate Apple II, and perhaps the ultimate gift: the sleek, fast Apple IIgs computer. Create pounding surf, symphonies and synthesized speech so clear, it can read your child a bedtime story. Draw in every shade of color from crimson to pale violet—4,096 in all. And do this all with the speed of a 16-bit microprocessor—nearly three times as fast as an ordinary Apple II. The mouse is standard equipment, for new programs that use pull-down menus and super hi-res graphics. Compatible with your existing library of Apple II software, the IIgs truly lives up to the motto 'Apple II Forever.' Computer with 256K RAM, mouse and detachable keyboard. \$999.

Apple IIc Now expandable to one megabyte of RAM. \$940.

Apple IIe The old workhorse. \$850.

Apple IIgs Upgrade Converts your IIe to a IIgs; available early in 1987. \$499.

AppleColor RGB Monitor For the IIgs. \$499.

Apple Monochrome Monitor 12-inch, for all Apple IIs. \$129.

AppleColor Composite Monitor 14-inch, for all Apple IIs. \$379.

Apple 3.5 Drive For the IIgs. \$399.

Apple 5.25 Drive For all Apple IIs. \$299.

Apple 20SC Hard Disk 20 megabytes; requires SCSI interface card. \$1,299.

Apple SCSI Interface Card For IIgs or IIe. \$129.

Apple Personal Modem \$399.

AppleMouse For IIc, \$69. For IIe, \$99.

Apple IIc Carrying Case \$15.99.

Apple Computer, Inc. 20525 Mariani Ave.,
Cupertino, CA 95014. (408) 996-1010.
CIRCLE 216 ON READER SERVICE CARD

continued on next page

1 Okimate 20

Print out your own computerized Christmas cards, letters, wrapping paper and banners—in color. The Okimate 20 prints superscripts, italics and underlining at 80 characters per second in draft mode and a fantastic near-letter-quality at 40 cps. Be sure you get the necessary Plug 'n' Print interface for your Apple II. \$268. Okidata, 532 Fellowship Road, Mount Laurel, NJ 08054. (609) 235-2600; 1-800-OKIDATA (technical).

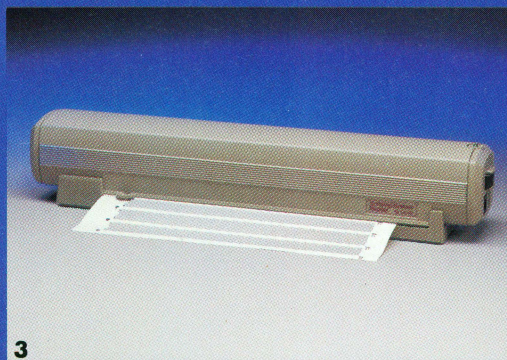
CIRCLE 217 ON READER SERVICE CARD



2 Avatex 1200-Baud Modem

On sale it may be as low as \$199, but the Avatex is no bargain-basement item. This Hayes-compatible 1200-baud modem can autodial and autoanswer, works with both touch-tone and pulse dial telephones, includes a telecommunications program, and is covered by a one-year warranty. \$299.95. E+ E DataComm, 2115 Ringwood Ave., San Jose, CA 95131. (408) 263-1833.

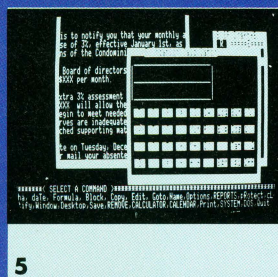
CIRCLE 218 ON READER SERVICE CARD



3 Cauzin Softstrip System

No more typing, no more disks. The Softstrip reads software—including many II Computing programs—from paper. To read the software, simply lay the Cauzin Softstrip Reader over the program. You can even make your own strips to store backup files on paper or print, copy and mail your own programs inexpensively. \$199.95. Cauzin Systems, 835 South Main St., Waterbury, CT 06706. 1-800-533-7323; (203) 573-0150 in Connecticut.

CIRCLE 219 ON READER SERVICE CARD



4 Computereyes

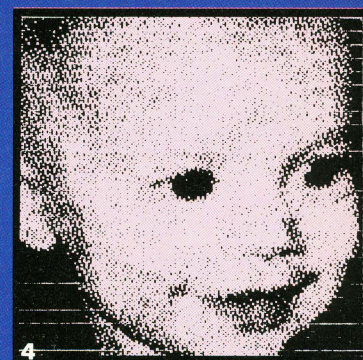
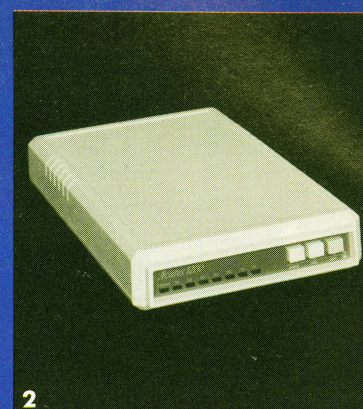
Bored with your computer? A digitizer adds some excitement to your life. Soon, you'll be digitizing everything (and everybody) in sight with a video camera, capturing images from movies on your VCR or television set, retouching the photos with graphics programs, and even printing them out on posters and greeting cards. Digitizer interface and software, \$120. With a black-and-white camera, \$399.95. Digital Vision, Inc., 14 Oak St. Suite 2, Needham, MA 02192. (617) 444-9040.

CIRCLE 220 ON READER SERVICE CARD

Swyftware

Plug the Swyftcard into slot 3 of your IIc and you have a word processor, BASIC workspace and text editor and (with a serial card) telecommunications ability the moment you turn on your Apple. Also available as software for the IIc. \$89.95. Information Appliance, Inc., 1014 Hamilton Court, Menlo Park, CA 94025. 1-800-982-5600; 1-800-562-7400 in California.

CIRCLE 221 ON READER SERVICE CARD



5



6



7

AE Timemaster II H.O. Clock

Would you like your communications program to automatically dial up CompuServe to download information while you sleep? Do you want to know when your disk files were updated last? The AE Timemaster can do this and more—it even tells the time, and the NiCad battery should keep it "ticking" for 20 years. \$129. Applied Engineering, P.O. Box 798, Carrollton, TX 75006. (214) 241-6060.

CIRCLE 222 ON READER SERVICE CARD

5 Foundation

It's a ProDOS-compatible word processor, database and spreadsheet rolled into one—but it's not AppleWorks. Foundation also has features that AppleWorks left out, like an appointment calendar, calculator, notepad and a mail-merge feature that helps you transfer information from one file to another with simple pop-up menus. Requires 128K. \$250. Foundation Corp., 506 West Armitage Ave., Chicago, IL 60614. (312) 880-5761.

CIRCLE 225 ON READER SERVICE CARD

6 Pinpoint

It may be the closest you'll ever get to the paperless office. These "desk accessories" pop up in windows while you're using AppleWorks (and most other ProDOS programs) so you don't need to save your file and boot up another program in order to jot a note, address a letter or call a friend. Includes an appointment calendar, notepad, modem or voice telephone dialer, a program to mix Dazzle Draw graphics with AppleWorks text, envelope addresser, calculator and typewriter. \$69. Pinpoint Publishing, P.O. Box 13323, Oakland, CA 94661. (415) 654-3050.

CIRCLE 223 ON READER SERVICE CARD

7 Catalyst

Install even copy-protected ProDOS programs onto 3.5 disks, Apple's ProFile or the Quark QC10 or QC20 hard disk drives, then switch between programs by simply clicking on icons with a mouse. 3.5 or 5¼-inch disk. \$149; \$40 with purchase of Apple's UniDisk 3.5. Quark Inc., 2525 West Evans, Suite 220, Denver, CO 80219. (303) 934-2211.

CIRCLE 224 ON READER SERVICE CARD

New Apple software pages 74 and 75

UPGRADE POLICY

Products that are developed exclusively for The Catalog are backed by an excellent upgrade policy. Just send your current original program disk with proof of purchase and specify the revision you want. We will copy the new version directly onto the original disk. Please include \$7.00 for upgrade and handling fee. Send it to The Catalog Upgrades, 524 Second St., San Francisco, CA 94107.

PRODUCT WARRANTY

The Catalog warrants that the products sold in this catalog will operate properly and be free of defects for a period of 30 days. Should you require warranty service, assistance or information, contact: The Catalog, 524 Second St., San Francisco, CA 94107—(415) 957-0886.

GUARANTEE OF COMPLETE SATISFACTION

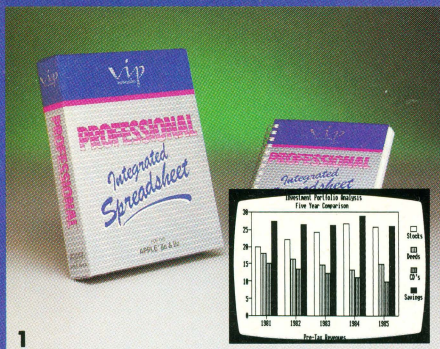
We guarantee every product we sell to be free of defects and to operate properly. If you are not completely satisfied, or if any item is defective, just contact our customer service department by mail, or phone within 30 days of receipt of merchandise to arrange for a prompt replacement. Only returns in good condition, with the original packaging materials will be accepted.

NAME _____
ADDRESS _____
CITY _____
STATE _____ ZIP _____

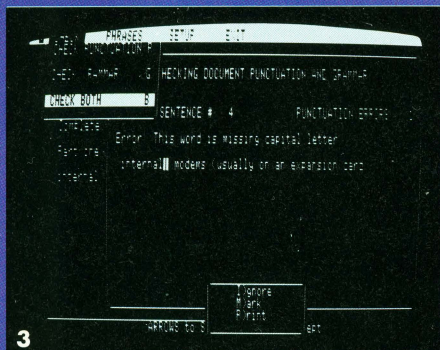
PLACE
STAMP
HERE

THE CATALOG™

**524 Second Street
San Francisco, CA 94107**



1



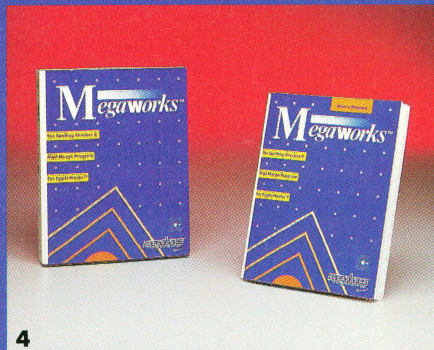
3



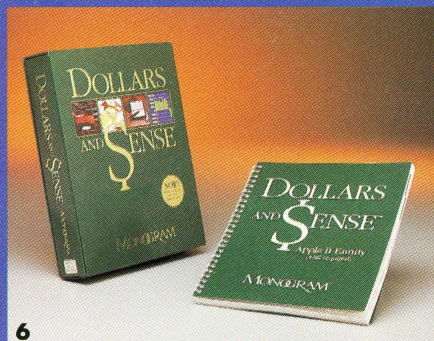
5



2



4



6

1 VIP Professional

Admit it: you've always wanted Lotus 1-2-3, but you've never wanted an IBM PC. VIP Professional is a Lotus clone in every way but one—it's easier to use, with windows, icons and mouse control. It uses Lotus commands, is compatible with 1-2-3 files, has a database that stores 8,192 records and creates five different kinds of graphs. Requires 256K and mouse on the IIe or IIc; \$249.95. Requires 512K on the IIGs; \$299.95. VIP Technologies, 132 Aero Camino, Santa Barbara, CA 93117. (805) 968-4045.

CIRCLE 226 ON READER SERVICE CARD

2 MouseWrite

If you ever wished you could whisk the cursor from one spot to another in a document, if you ever wanted to save a file or format a disk without leaving the screen, or cut and paste copy from one window to another, MouseWrite is for you. It formats type, has a built-in clock, mail-merge and printer buffer, and is ProDOS compatible. Requires 128K. \$149.95. Roger Wagner Publishing, Inc., P.O. Box 582, Santee, CA 92071. (619) 562-3670.

CIRCLE 227 ON READER SERVICE CARD

3 Sensible Grammar

If your correspondence sounds like lawyers have slaved over it, maybe you need Sensible Grammar. This clever program guides writers through the complex and frequently baffling rules of punctuation and usage, and compares text written with most word processors against 1,500 commonly misused English phrases in categories such as Pompous, Vague, Sexist, Legal and Redundant. 3.5 and 5¼-inch disks. \$99.95. Sensible Software, Inc., 210 S. Woodward Ave., Suite 229, Birmingham, MI 48011. (313) 258-5566.

CIRCLE 228 ON READER SERVICE CARD

4 MegaWorks

Holiday correspondence would be so easy if you could write just one Christmas letter with AppleWorks, check it for spelling errors, then take the addresses from your database and crank out hundreds of letters, each individually personalized with name and address. It's possible with this AppleWorks-compatible mail-merge and 40,000-word spelling checker program. \$125. Megahaus Corp., 5703 Oberlin Dr., San Diego, CA 92121. (619) 450-1230.

CIRCLE 229 ON READER SERVICE CARD

5 Bank Street Filer

Think of it as an electronic file cabinet. A filing program so simple a child can use it: extremely friendly, tells you what to do every step of the way, and never forgets to ask "Are you sure you want to do this?" \$69.95. Broderbund Software, 17 Paul Drive, San Rafael, CA 94903. (415) 479-1170.

CIRCLE 230 ON READER SERVICE CARD

ASCII Express Professional

With a built-in text processor, type-ahead buffer, 1200-baud speed and support for all file transfer protocols including Kermit, ASCII Express is simply the best telecommunications program for the Apple II. Requires serial interface. \$129.95. United Software Industries, 8399 Topanga Canyon Blvd., Suite 200, Canoga Park, CA 91304. (818) 887-5800.

CIRCLE 231 ON READER SERVICE CARD

CompuServe

You'll never know how addicting the power of information can be until you log onto CompuServe. For as little as 10 cents a minute, education forums, a medical library, the Grolier Encyclopedia, airline reservations, a shopping mall, banks, games, 200,000 friends from around the world and perhaps even love are at your fingertips, 24 hours a day. Swap software and short cuts with other Apple users, and even participate in "live" conferences with Apple luminaries like John Sculley, Jean-Louis Gasse and Steve Wozniak in the Apple II Forum. A subscription includes a manual and \$35 worth of connect time for \$39. CompuServe, P.O. Box 20212, 5000 Arlington Centre Blvd., Columbus, OH 43220. 1-800-848-8199; (614) 457-0802 in Ohio.

CIRCLE 232 ON READER SERVICE CARD

Dow Jones News/Retrieval

If you're a stock broker, investor, market researcher or business owner and want your news first, Dow Jones News/Retrieval is a necessity. Read *Wall Street Journal* and Securities Exchange Commission news off the wire, get portfolio management assistance and consult the stock quotes from the comfort of your home or office. A subscription costs \$75 plus \$12 a year and connect time charges start at 20 cents/minute. Dow Jones News/Retrieval, P.O. Box 300, Princeton, NJ 08540. 1-800-832-1234.

CIRCLE 233 ON READER SERVICE CARD

6 Dollars and Sense

January looms ahead, but it's not too late to whip some sense into your personal or small business finances. Dollars and Sense writes checks, sets up budgets, computes taxes and reminds when to pay the bills. Transfer data from Dollars and Sense into the AppleWorks spreadsheet, or make transactions automatically with the included

continued on next page

MoneyLink program and an online banking service. Beginners will appreciate the disk tutorial and indexed documentation. Requires 48K with 5¼-inch disk, 128K with 3.5 disk. \$119.95. Monogram, 8295 South La Cienega Blvd., Inglewood, CA 90301. (213) 215-0529.

CIRCLE 234 ON READER SERVICE CARD

1 Ortho's Computerized Gardening

Expert advice from Ortho brings your garden into the computer age. Punch in a plant name and this gardening database gives botanical names, blooming season, light, soil, water and feeding requirements for 750 plants. Tell Computerized Gardening your zip code and get a list of all the plants that will grow in your area. Includes the color-illustrated, 192-page book *Gardening Techniques*. Requires 64K, 80 columns and ProDOS. \$49.95. Ortho Information Services, 575 Market St., San Francisco, CA 94105. (415) 894-5792.

CIRCLE 235 ON READER SERVICE CARD

2 Dazzle Draw

The finest paint program for the Apple II. When used with 128K, its palette of 16 solid and 30 woven patterns of double hi-res colors are remarkably lush, yet Dazzle Draw is simple enough for a child to use. Draw with graphics tablet or mouse, and print on most dot-matrix printers or in color on the Imagewriter II. Requires 128K. \$59.95. Broderbund Software, 17 Paul Dr., San Rafael, Ca 94903. (415) 479-1700.

CIRCLE 236 ON READER SERVICE CARD

3 The Newsroom

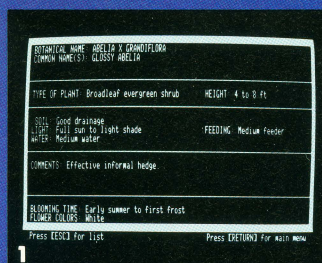
Don't feel left out of the desktop publishing revolution just because you don't have a LaserWriter. Create a newsletter for the club, an issue of The Christmas Gazette, or let the kids send a family newspaper to Grandma. This page-layout, graphics and word processing program creates newspapers and in-house publications complete with graphics on regular dot-matrix printers. Apple II+, IIe or IIc, requires 64K. \$49.95. Springboard Software, Inc., 7807 CreekrIDGE Circle, Minneapolis, MN 55435. 1-800-328-1223; (612) 944-3912 in Minnesota.

CIRCLE 237 ON READER SERVICE CARD

4 Graphics Magician Jr.

The simple, scaled-down version of The Graphics Magician Painter and Animator is perfect for beginning computer artists. Pick a color or pattern and use your keyboard, graphic tablet, joystick or mouse to paint with computer "brushes" ranging from hair-line thin lines to shading with a spray from an "airbrush". With 108 colors and patterns in hi-res or 256 colors and patterns in double hi-res. Requires 48K (128K for double hi-res). \$19.95. Penguin Software, 830 Fourth Ave., P.O. Box 311, Geneva, IL 60134. (312) 232-1984.

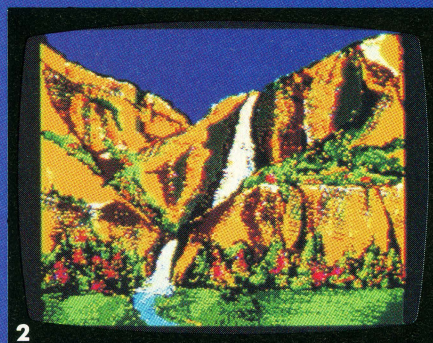
CIRCLE 238 ON READER SERVICE CARD



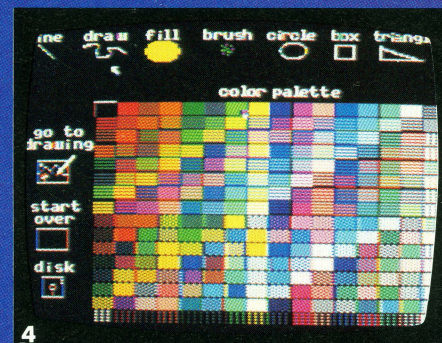
1



3



2



4



5

5 Passport MIDI Interface and Master Tracks

What if while you were playing a tune you could type the notes, watch them appear, then print out sheet music? It would be to music what a word processor is to writing. MIDI—the marriage of computer and musical keyboard—is revolutionizing the way music is composed, recorded and played. The Passport MIDI Interface provides the link between the Apple II, a tape recorder and any MIDI-equipped instrument such as the Yamaha DX-7, Casio CZ-101 or Ensoniq Mirage. MIDI Pro for IIc, \$199.95; MIDI Standard for IIe, \$129.95. Master Tracks software controls the link from the Apple's end; music is graphically represented in moving charts and screens, so you can control the step, pitch and duration of even a single note. \$249.95. Passport Designs, Inc., 625 Miramontes St., Half Moon Bay, CA 94109. (415) 726-0280.

CIRCLE 239 ON READER SERVICE CARD

Works, you can set up macros to execute any repetitive command in AppleWorks; you can also search and replace printer commands, or print all files on your desktop nonstop. Other programs on the same disk can produce multi-column printouts and alphabetize a catalog of all the files on your disk. Requires 128K. \$34.95. Beagle Bros. Micro Software, 3990 Old Town Ave., San Diego, CA 92110. 1-800-227-3800.

CIRCLE 240 ON READER SERVICE CARD

Copy II Plus

Make a back-up copy of protected and unprotected software, recover lost or deleted files, edit disk sectors and convert DOS 3.3 files to ProDOS (and vice versa). Copy II Plus provides the best set of system utilities available for the Apple II. Requires 64K. \$39.95. Central Point Software, Inc., 9700 SW Capitol Highway, Suite 100, Portland, OR 97219. (503) 244-5782.

CIRCLE 241 ON READER SERVICE CARD

Instant Pascal

Learn how to program in Pascal with this innovative approach to programming for

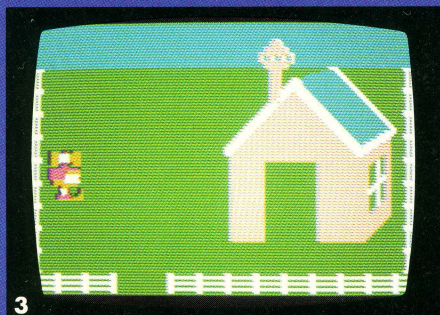
Mary Rhomberg Lavery



1



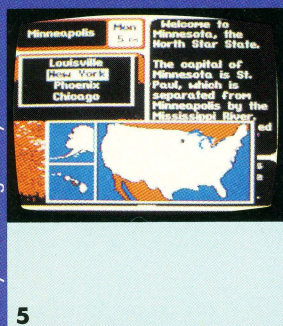
2



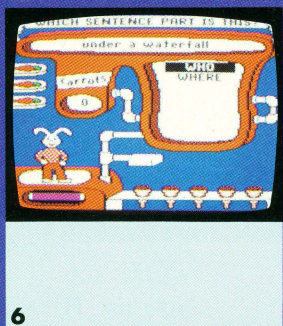
3



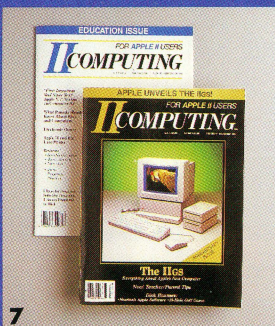
4



5



6



7

beginners. The mouse-controlled pull-down menus and windows are neat: Run your program in one window, edit in another, and in the instant window, type in a valid Pascal statement and execute it right away to see how it works. Includes a textbook, the Pocket Guide to Instant Pascal, tutorial disk and sample programs. Requires 128K. \$140. Apple Computer, Inc. 20525 Mariani Ave., Cupertino, CA 95014. (408) 996-1010.

CIRCLE 242 ON READER SERVICE CARD

1 Open-Apple

Tom Weishaar's monthly newsletter is dedicated to "releasing the power to everyone." Irreverent, witty and packed to the margins with rumors, technical hints, type-in public domain programs and programming advice—all of it devoted to the venerable Apple II. Subscriptions are \$24; a bound, indexed collection of all 1985 issues is \$14.95. Open-Apple, P.O. Box 6331, Overland Park, KS 66207.

CIRCLE 243 ON READER SERVICE CARD

Mouse Hide

In spite of the name, Mouse Hide is made of genuine, top-grain leather for a decidedly

un-rodentlike look. Unlike its neoprene rubber competitors, the leather gives the mouse a more natural glide and the desk a more civilized appearance. \$15. Pilot Enterprises, Inc., 5699 Kanan Road, Agoura Hills, CA 91301. (818) 706-1818.

CIRCLE 244 ON READER SERVICE CARD

2 Muppet Learning Keys

Computers are suddenly much less intimidating when kids use Muppet Learning Keys, a Muppet-adorned square board with bold letters arranged in alphabetical order, big numbers and a palette of colors that look like paints. Compatible with software that bears the yellow "Works with Muppet Learning Keys" sticker; ages 3 and up. \$79.95. Sunburst Communications, 39 Washington Ave., Pleasantville, NY 10570. 1-800-431-1934; 1-800-221-5912 in New York.

CIRCLE 245 ON READER SERVICE CARD

3 Tonk in the Land of Buddy Bots

For years, Mercer Mayer has been delighting children with his funny little monsters. Now he brings his robots to the screen in this

engaging collection of six games, each with four levels of play to ensure a fairly long attention span. In this and the other fine games in the Tink! Tonk! series, the animated robots and accompanying music will enchant children ages 4 to 8. \$39.95. Mindscape Software Inc., 3444 Dundee Rd., Northbrook, IL 60062. (312) 480-7667.

CIRCLE 246 ON READER SERVICE CARD

4 Math Shop

The grocery, boutiques and pharmacies in this charming game all become "Math Shops" where kids choose, buy and weigh items. Lively graphics and interaction provide an incentive to learn math. Requires 64K. \$87.45. Scholastic Software, 730 Broadway, New York, NY 10003. (212) 505-3637.

CIRCLE 247 ON READER SERVICE CARD

5 Where in the World Is Carmen Sandiego?

The Statue of Liberty's torch is gone and it could only be the work of Carmen Sandiego and her gang of thieves. Carmen is missing, but luckily your guide to catching her is included with this game: The 1986 World Almanac. The more you know about world history and trivia, the better your chance of catching her in a whirlwind chase through the great cities of the world. Requires 64K. \$44.95. Broderbund, 17 Paul Dr., San Rafael, CA 94903. (415) 479-1700.

CIRCLE 248 ON READER SERVICE CARD

6 Writer Rabbit and Rocky's Boots

The lively Writer Rabbit jumps and dances at a sentence party as he helps young children define the parts of a sentence, using phrases to build sentences and eventually learn how to write. Ages 5 to 10; \$39.95. Rocky's Boots is a widely acclaimed set of electronic tinker toys; kids master the fundamental concepts of logic and computer circuitry as they design their own games with animated logic machines and simulated computer circuits. \$49.95. The Learning Company, 545 Middlefield Rd., Menlo Park, CA 94025. 1-800-852-2255; 1-800-852-2256 in California.

CIRCLE 249 ON READER SERVICE CARD

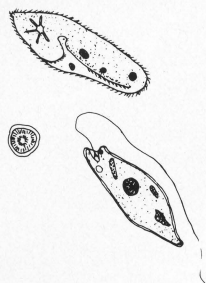
7 . . . And, of course, II Computing

The magazine for Apple II users is also the perfect gift for Apple II users, crammed full with articles, columns, departments, reviews, type-in programs, Teacher/Parent Tips and Softstrips—but then, you already know that. Six issues are only \$11.97—and the Action Disk edition, which includes every program (plus special bonuses) on a ready-to-run disk, is just \$59.95 for 6 issues. II Computing, P.O. Box 1922, Marion, OH 43306. 1-800-433-0100, ext. 700.

CIRCLE 300 ON READER SERVICE CARD

If you'd like more articles like this one,

CIRCLE 265 ON READER SERVICE CARD



Pond

by JENNY SCHMIDT



Ever wonder what life would be like if you were a microorganism living on the surface of a pond? Probably not—but you'll get your chance with this month's game, Pond.

It's simple enough to play. You're an organism on the surface of a pond. Other, larger organisms are out to gobble you up, while your goal in life is to eat things smaller than yourself.

Watch out for the cosmic rays that come zipping across the surface of the pond. The ones coming across the screen from side to side will make you smaller; the ones coming down from the top of the screen will make you bigger. As you get bigger, of course, you move up the food chain, and you're able to eat a wider variety of things. And if you get to the top of the food chain and you're hit by a ray from the top, you'll move up to the next level of the game—where life is that much trickier.

You can move around the pond by pressing the I, M, J and K keys to move up, down, left and right. You can also speed things up by typing one of the number keys—1 is slowest, and 4 is fastest.

TRICKY TYPING

Typing POND into your Apple II is a little more difficult than the usual *II Computing* program. First, type in the BASIC program POND from

the Software Library on page 37, and check it with TYPO.II. Next, type in SHAPER from page 37, and check it with

TYPO.II, too.

Now use HEX.ENTRY on page 39 of the Software Library to type in two binary files: POND.HEX, which contains the actual machine-language game program, and POND.SHAPES.HEX, which contains a compressed version of the hi-res shapes the game uses. Then run the BASIC program SHAPER, which expands POND.SHAPES.HEX into a full set of pre-shifted shapes that the game program can use.

Finally, once you have everything typed in, run the BASIC program POND, and your Apple II will do the rest. Then enjoy the fast action of life in a country pond—and watch out for those cosmic rays. . . //

Jenny Schmidt is currently interested in the use of computer graphics in art and recreational software. She programs in Applesoft, Pascal and assembly language.

II Computing's Teacher/Parent Tips offer lesson plans to enhance and extend our type-in programs. See the pull-out section in the middle of this issue for lesson plans for Pond.

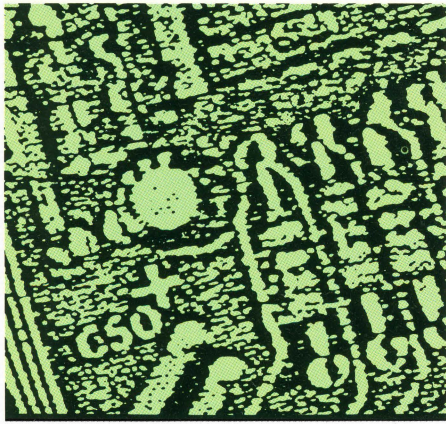
If you'd like more articles like this one, circle 271 on our Reader Service Card.

Watch
out for the
cosmic rays
that come
zipping
across the
surface of the
pond.



PLUG-IN POWER!

Supercharge your Apple with add-on boards



What makes a Super Apple? More speed? It's yours. More memory? No problem. Special features? You can have 'em. The slots in your Apple II, II+ or IIe let you install expansion boards for practically any purpose. Whether it's a multifunction board, memory expansion or a speed-up card, the Apple II is limited only by the number of slots it contains. And even the IIc can have more memory with an add-on board you can install yourself. So check out this special section on expanding your Apple II—then plug in and power up!

MULTIFUNCTION BOARDS

by ROBERT GROSSBLATT

There are lots of reasons why the Apple II, II+ and IIe have been prospering since 1979 and if you open the top of yours, you can see eight of them in the flesh. That's right, those peripheral slots on the motherboard have kept the Apple going strong while a lot of other computers have long since been painted in earth colors and turned into planters.

Almost every Apple has a couple of cards plugged into it—disk controllers, clocks, printer cards, modems, 80-column cards, and most recently multifunction or “jack-of-all-trades” cards. A multifunction card is capable of doing several different jobs. It's usually more expensive than any of the individual cards it replaces, but is cheaper than all of them together. Some even use a slick bit of sleight-of-hand called “phantom slotting” to trick the Apple into thinking that the multifunction card is really a few different

cards, each living in a different slot.

When you're putting together an Apple system, it makes sense to consider a multifunction card. Of course, if all you need is a serial port or a clock, it's cheaper to stick to single-purpose cards. There are, however, two other advantages to using a multifunction card that could make it worthwhile to use one in place of your existing hardware.

First, a multifunction card uses less power and generates less heat than the cards it replaces. That can be impor-

tant, since a cooler Apple runs better and lasts longer. Second, a multifunction card takes up fewer slots than the cards it replaces. Slot space is valuable real estate, and by replacing three separate cards with one multifunction card you free up two slots—but there's a catch. To understand the problem, we have to pay a brief visit to the Great God *Hardware*.

When a card phantoms to another slot, it needs access to the I/O space reserved for that slot in the Apple's memory map. If you tell a multifunction card to phantom to a slot already occupied by a card using the slot's peripheral ROM space, the best that can happen is that the Apple will hang up. At worst you may do real damage to one or both cards. As a general rule, the only cards that can occupy a slot being phantomed by a multifunction card are memory or coprocessor cards. Check with the manufacturer if you're faced with this problem.

The following are descriptions of several multifunction cards for the Apple II and their advantages and disadvantages. Each of these cards can perform at least three functions you'd ordinarily associate with single, dedicated boards. And while some of the

continued on next page

multifunction boards may seem similar, there are differences between them. A few companies pack the cables with the card and others sell them separately. Some of the manufacturers include

printer buffers and some provide them at an extra cost. All the differences are listed in the comparison chart, and it's worth your time to study it carefully before making a buying decision.

MULTI I/O BY AST RESEARCH, INC.

The **Multi I/O** has a ProDOS-compatible clock/calendar and two serial ports, one for a printer and one

Name:	Multi I/O	PSIO	Multicore	Extended Multi-function Card	Slot Buster	Business Card
Manufacturer's address and phone:	AST Research, Inc. 2121 Alton Ave. Irvine, CA 92714 (714) 863-1333	Videx 1105 NE Circle Blvd. Corvallis, OR 97330 (503) 758-0521	Quadram 1 Quad Way Norcross, GA 30093 (404) 923-6666	Quadram 1 Quad Way Norcross, GA 30093 (404) 923-6666	RC Systems 121 W. Winesap Rd. Bothell, WA 98012 (206) 672-6909	Street Electronics 1140 Mark Ave. Carpinteria, CA 93013 (805) 684-4593
Computer:	II, II+, IIe	II, II+, IIe	II, II+, Ie	IIe	II, II+, IIe, IIGS	IIe, II+ (with limited capabilities)
Serial:	2 ports (printer and modem)	1 port (printer or modem)	1 port (printer or modem)	N/A	1 port (printer)	2 ports (printer and modem)
Parallel:	No	Yes	Yes	N/A	Yes	Yes; parallel version comes with serial-to-parallel converter cable
Clock:	Yes	No	Yes	Yes	No	Yes
Extra memory:	None	None	Optional to 256K	Optional 64K video memory	8K buffer, optional 24K	Optional 64K print buffer
Cables:	Included	Included	Included	Included with RGB option	Optional	Included
Commands:	Text and serial only	Text, serial and graphics; graphics dump only for Imagewriter or Epson MX/FX series	Text, serial and graphics ¹	Similar to Apple commands	Text, serial and graphics	Text, serial and graphics
Options:	None	None	None	Kits for Apple or IBM RGB video	Cables, 24K buffer	64K buffer
Comments:	The card has a limited command set. Graphics must be done with software.	Utility disk lets you teach the card to control any printer completely.	Serial port isn't Apple standard. Extra 256K RAM can be used as a RAM disk.	Extra 64K can be added with standard chips. RGB can use Apple or IBM monitors.	Only card that doesn't phantom. Speech synthesizer works while inside AppleWorks.	Commands are more extensive than dedicated cards. Macintosh-style menus for enhanced IIe.
Price:	\$235 CIRCLE 294 ON READER SERVICE CARD	\$229 CIRCLE 295 ON READER SERVICE CARD	0K—\$219; 64K—\$279; 128K—\$329; 256K—\$399 CIRCLE 296 ON READER SERVICE CARD	\$229 CIRCLE 297 ON READER SERVICE CARD	\$229.95 (with synthesizer); \$179.95 (without) CIRCLE 298 ON READER SERVICE CARD	\$199.95—serial version; \$239.95—parallel port CIRCLE 299 ON READER SERVICE CARD

for a modem. Using jumpers on the board you can map the printer to slot 1 or 2, the modem to slot 2 or 3, and the clock to slot 4 or 7. Serial port baud rates are set with DIP switches. Once you've configured the card, you can install it in any of the three slots you've chosen (the only restriction is you can't select slot 3 if you have an 80-column card). Getting the card up and running takes a little time, but the manual is well written and guides you step by step.

AST supplies cables and connectors to attach the serial ports from the card to the back of your Apple. These DB-25 connectors are designed for most external cables to modems and printers.

The clock/calendar can be set by using a program on the utilities disk or using just four lines of BASIC; the manual shows how. If you're into writing software, you'll be happy to know that it's just as easy to read the time, and the clock is recognized by ProDOS for date-stamping files. The utility disk includes four other programs: a hi-res graphics dump for ImageWriter printers; a telephone dialer for Smart-modems; a simple terminal program; and a ProDOS text file printer that produces dated printouts with page numbers.

You can send a limited number of commands to the card to change the serial port parameters. However, the burden of controlling the card is going to fall on your software. So if you want your card use to be a "set it and forget it" operation, be sure your favorite software knows how to communicate with the card before you buy it.

THE PSIO BY VIDEX

The **PSIO** is an intelligent printer card with both parallel and serial ports. Its Centronics parallel port emulates an Apple Parallel Card, and the serial port looks like an Apple Super Serial Card, so it's easy to configure most commercial software to talk to the card. The PSIO not only does hi-res dumps but also accepts keyboard commands to invert, magnify, and rotate the image. The serial port can talk to either a printer or a modem, so when you're trying to tie two computers together via their RS-232 ports, you don't need a null-modem connector.

Hardware installation is simple: use a DIP switch to phantom either of the two ports to any other slot. The installation program for configuring each port's parameters is menu driven and includes a complete tutorial on the card's operation. The utility disk runs under DOS 3.3, but a sample BASIC program that displays the hi-res screens and prints them can be converted to run under ProDOS.

The most difficult thing about multifunction cards is trying to decide which one is best for you.

The Videx utility disk contains configuration data for some of the most popular printers and modems so even the most inexperienced owner can probably install the card in less than five minutes. The card and utility disk manuals pass the "3C Manual Test"—they're clear, concise and comprehensive. For beginners, there's a very detailed, easily understood explanation of modems, the RS-232 standard, and data communications. Videx is also one of the few companies that provides a complete schematic of the card along with a detailed description of how it works.

MULTICORE BY QUADRAM

Besides the expected clock/calendar, serial port, and parallel port, this card gives you the option of adding up to 256K RAM to your system. The **MultiCore** emulates a Legend RAM card, so much commercial software will recognize its extra memory. If you're using ProDOS, you can turn the 256K into a RAMdisk, which will give you a high-speed disk with almost twice the capacity of a normal Apple floppy disk.

Installing the Quadram card is extremely easy: plug the MultiCore into slot 1 and run the supplied cables out the back of your Apple. The utility disk runs under ProDOS and presents you with the same menu found on Apple's ProDOS User's Disk. An additional series of menus lets you choose the phantom slots, pick parameters for the serial and parallel

ports, set the date and time, and format the RAMdisk.

The serial and parallel cables come with DB-25 connectors. The parallel port is semi-intelligent; text printing with page formatting commands can be done on any printer but you can only do graphic dumps to printers that are compatible with the ImageWriter or Epson MX/FX printers.

Unfortunately, the serial port uses an 8251 UART chip instead of the 6551 ACIA found on most Apple serial cards. This means you can't use the Multicore's serial port with a lot of the commercial modem software written for the Apple unless you can patch the programs. Quadram gives you technical information, but it's no simple task, and if the software is protected or you're not an experienced programmer, it may be impossible for you.

The clock/calendar is ProDOS compatible but it won't work with all programs that time and date stamp unless you copy the PRODOS system file from the MultiCore utility disk onto your application disk. Quadram's excellent manual is written for the beginner, but the technical appendices have enough information to satisfy even the most experienced user.

THE EXTENDED MULTIFUNCTION CARD BY QUADRAM

The **Extended Multifunction Card** is different from all the others on our list. It's not an I/O card, but a multifunction video card that gives you everything you get with an Apple extended 80-column card plus a few extras. It's also the only card here that's designed only for the Apple IIe.

The card is functionally identical to the extended 80-column card sold by Apple, with the same set of command characters and escape codes. Quadram's card, however, gives you two additional features: a clock/calendar and the unique option of adding two different kinds of RGB output. The basic card comes without the extra 64K needed to make a 128K Apple, but you can do that yourself by simply putting eight inexpensive memory chips in the sockets already mounted on the board.

The manual is a model of clarity. It's well written and all the installation

continued on page 19

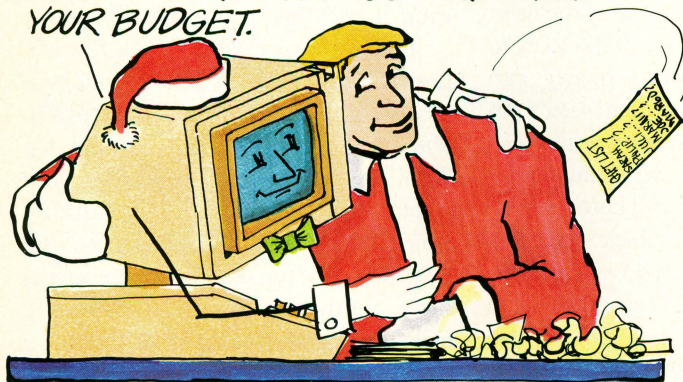
A GIFT LIST A YARD LONG
AND I'M AN IDEA-LESS
ST. NICKEL-LESS.



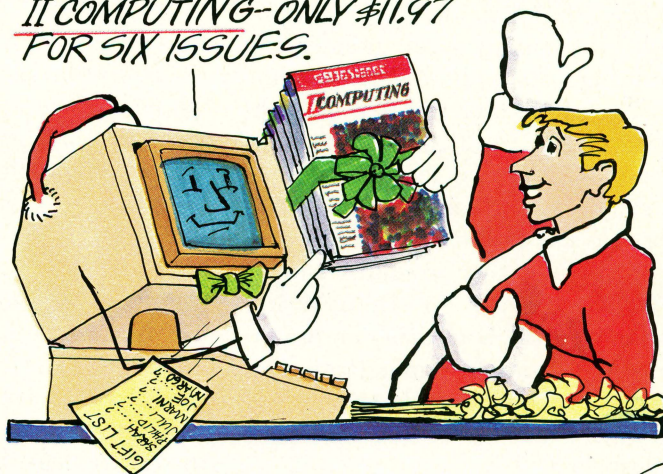
EXCUSE ME. I CAN'T
HELP BUT **MONITOR**
YOUR WORDS, NICK.



HERE'S A **BASIC** SUGGESTION-PUT
II COMPUTING ON YOUR **LIST**. THAT'LL
PLEASE YOUR FRIENDS AND **HELP**
YOUR BUDGET.



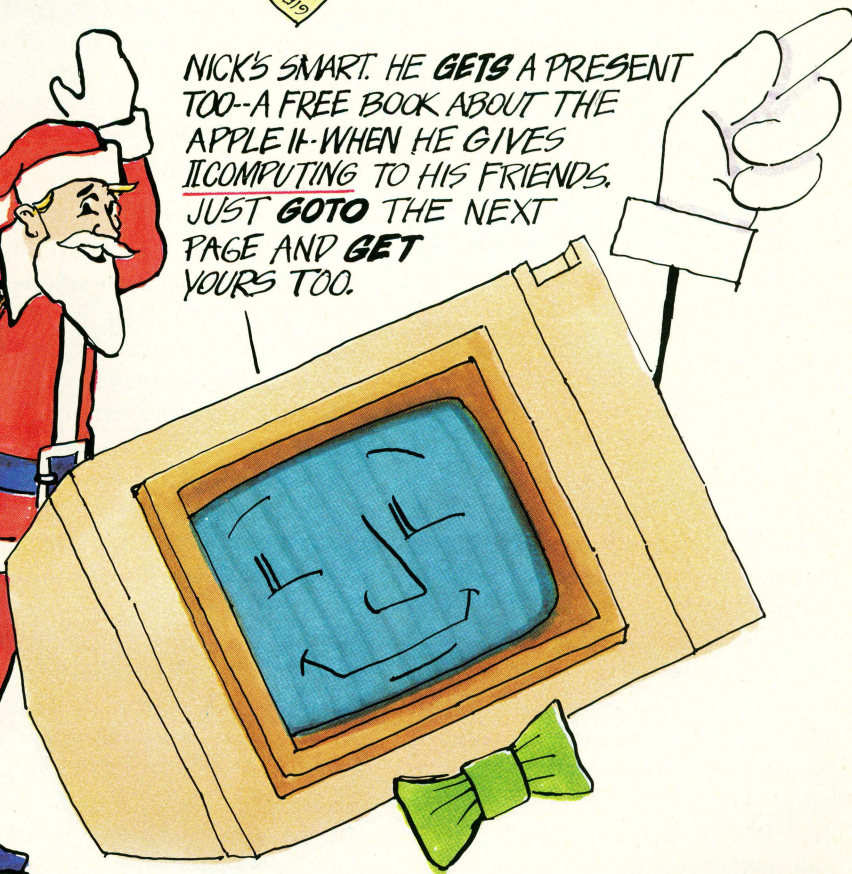
GIVE 'EM A **STACK** OF
II COMPUTING-ONLY \$11.97
FOR SIX ISSUES.



EVEN BETTER, GIVE THE
ACTION EDITION WITH DISK.
SAVE THEM ALL THAT
TEDIOUS TYPING.



NICK'S SMART. HE **GETS** A PRESENT
TOO-A FREE BOOK ABOUT THE
APPLE II-WHEN HE GIVES
II COMPUTING TO HIS FRIENDS.
JUST **GOTO** THE NEXT
PAGE AND **GET**
YOURS TOO.



**SPECIAL
HOLIDAY
GIFTS**
**Save up to
55% off
the cover price**



TOLL FREE
24 hours a day
800 443-0100
ORDERS ONLY!
Ext. 700
(Continental U.S.
& Hawaii)
(See over for FREE BOOK!)

First Subscription \$11.97 (6 issues)

Each additional Gift \$9.97

YES I want to save 44%. Please
enter the following subscriptions:

☐ Renew ☐ New

My Name _____

Address _____

City _____

State _____ Zip _____

Credit Card # _____

Exp. Date _____

Signature _____

☐ Check enclosed ☐ Bill me ☐ VISA ☐ MC

Canadian & Mexican subscriptions add \$5.00 each. Other foreign add \$10.00. Payment in U.S. funds must accompany all foreign orders.



Gifts For...

Name _____

Address _____

City _____

State _____ Zip _____

Sign Card: _____

Name _____

Address _____

City _____

State _____ Zip _____

Sign Card: _____

MM6N

First Subscription \$11.97 (6 issues)

Each additional Gift \$9.97

YES I want to save 44%. Please
enter the following subscriptions:

☐ Renew ☐ New

My Name _____

Address _____

City _____

State _____ Zip _____

Credit Card # _____

Exp. Date _____

Signature _____

☐ Check enclosed ☐ Bill me ☐ VISA ☐ MC

Canadian & Mexican subscriptions add \$5.00 each. Other foreign add \$10.00. Payment in U.S. funds must accompany all foreign orders.



Gifts For...

Name _____

Address _____

City _____

State _____ Zip _____

Sign Card: _____

Name _____

Address _____

City _____

State _____ Zip _____

Sign Card: _____

MM6N

First Subscription with Disk \$59.95 (6 issues)

Each additional Gift with Disk \$49.95

YES Please enter the following
subscriptions:

☐ Renew ☐ New

My Name _____

Address _____

City _____

State _____ Zip _____

Credit Card # _____

Exp. Date _____

Signature _____

☐ Check enclosed ☐ Bill me ☐ VISA ☐ MC

All foreign subscriptions add \$25.00 per year. Payment in U.S. funds must accompany all foreign orders. California residents add 6½% sales tax.



Gifts For...

Name _____

Address _____

City _____

State _____ Zip _____

Sign Card: _____

Name _____

Address _____

City _____

State _____ Zip _____

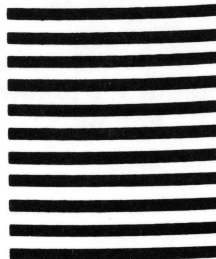
Sign Card: _____

TMM6NE

**BUSINESS REPLY MAIL**

FIRST CLASS PERMIT NO. 645 MARION, OH 43306

POSTAGE WILL PAID BY ADDRESSEE

II FOR APPLE II USERS
COMPUTINGTMP.O. Box 1922
Marion, OH 43306NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES**THE PERFECT
GIFT**

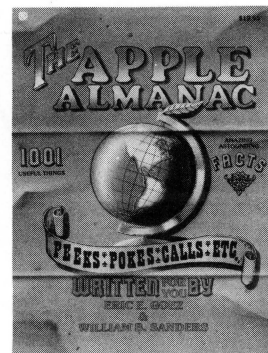
Give II Computing to your
favorite Apple enthusiasts

—You save up to 55% off
our cover prices AND
receive a FREE gift!

Order the first Action
Edition with disk
(6 bi-monthly issues) at
\$59.95. Each additional
gift is only \$49.95.

Or order II Computing
without disk for \$11.97.
Each additional sub-
scription is only \$9.97.

We will send a hand-
written card announcing
each gift.

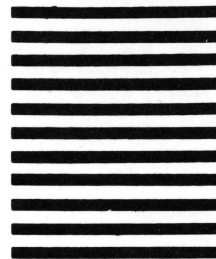
**OUR GIFT
TO YOU:**

**FREE with your paid
gift subscriptions:
THE APPLE ALMANAC**
"All you ever wanted
to know" about Apple
programming.

**BUSINESS REPLY MAIL**

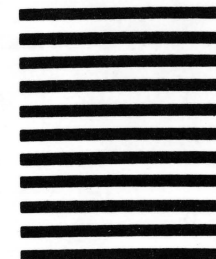
FIRST CLASS PERMIT NO. 645 MARION, OH 43306

POSTAGE WILL PAID BY ADDRESSEE

II FOR APPLE II USERS
COMPUTINGTMP.O. Box 1922
Marion, OH 43306NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES**BUSINESS REPLY MAIL**

FIRST CLASS PERMIT NO. 645 MARION, OH 43306

POSTAGE WILL PAID BY ADDRESSEE

II FOR APPLE II USERS
COMPUTINGTMP.O. Box 1922
Marion, OH 43306NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

steps are clearly described and illustrated with photographs. Programmers will find a wealth of information here, with chapters devoted to using the extra 64K, double hi-res graphics and soft switches, all very clearly explained. Software is supplied for setting the clock, and the utility disk is Apple's ProDOS User's Disk, modified to work with the Extended Multifunction Card's clock/calendar.

Quadram also gives you an optional RGB output that lets you connect the card to either an Apple or IBM RGB monitor. If you have both Apple and IBM computers the advantages are obvious, but even if you only own an Apple, you'll have a much wider range of RGB monitors to choose from.

THE SLOT BUSTER BY RC SYSTEMS

Two features on this card make it unique: it has an on-board speech synthesizer, and it doesn't do phantom slotting. In addition to having a voice, the **Slot Buster** gives you two completely independent, fully buffered printer ports—one for a serial printer and one for a standard Centronics parallel printer. By using a Z80 processor to take care of the on-board housekeeping, the card can talk to both printers at the same time, and they're both in the same slot!

Data sent to the parallel port is sucked into the parallel buffer; the Z80 takes care of talking to the printer. If you turn on the serial port and tell the card to talk to it, the Z80 sends the new data to the serial buffer and then controls the flow of data to the serial printer. This may seem complicated, but the Z80 can control two printers at the same time. Since the Apple sends data to the buffer rather than to the printer, the transfer is almost immediate.

The speech synthesizer is built around a phoneme-based electronic model of the human larynx and, unlike most stand-alone synthesizer boards, it's controlled by on-board firmware. To make the card speak, you simply activate the port and print to it. Since the Slot Buster's ports have been set to look like an Apple Parallel Card, most commercial software (including Apple-

Works) already knows how to talk to it. By printing to the synthesizer you can hear your text spoken, and that can make proofreading easier.

The double-sided utility disk runs under DOS 3.3 and ProDOS and has a complete tutorial, several demos, applications and terrific graphics-based diagnostics. One of the application programs lets you create additional pronunciation rules for the speech synthesizer, and a sample is included to make the board speak in Spanish. You can even create a file that makes the Slot Buster bilingual—you write in one language and it speaks in another! The disk also contains a program called Speechworks. This runs inside AppleWorks and makes the Slot Buster speak all the words you type. An extra pop-up menu is created to let you change the various speech parameters without leaving AppleWorks.

The manual is well written and answers every question you could possibly ask about the card. For programmers, all the entry points are listed as well as samples showing how the card can be accessed by your own programs.

***A multifunction card
uses less power and
generates less heat than
the cards it replaces.***

THE BUSINESS CARD BY STREET ELECTRONICS

Getting a multifunction card to perform adequately is quite an accomplishment; getting it to do better than most of the single function cards is simply amazing. The **Business Card** gives you a ProDOS-compatible clock/calendar, a modem port, and a port for a serial printer. The serial connectors are 5-pin DIN, like the ones on the IIc. If you have a parallel printer, an additional cable will convert the serial port to a standard Centronics port. An optional kit offers a 64K print buffer.

You configure the card with DIP switches that set default serial parameters and tell the card what kind of printer you're using and whether a buffer is active, and jumpers for putting the clock in slot 5 or 7. Then just

plug the card into slot 1; the printer port shows up in slot 1, the serial port in slot 2, and the clock in slot 1 and either 5 or 7. The ProDOS on the utility disk has been modified to find the clock in slot 1, so if you copy the PRODOS system file to your disks, you can free up a slot and still use the clock.

The Business Card is much smarter than most of the stand-alone printer cards now on the market. It has a complete set of built-in commands to control page formatting, date and time stamping, change serial data parameters, and graphics printing. The card recognizes most Grappler commands as well. If you have an enhanced IIe, you can use the Business Card's Macintosh-style menus, sending most of the commands by using either the arrow keys or a mouse. This is all in the card's firmware so it's always there when you want it.

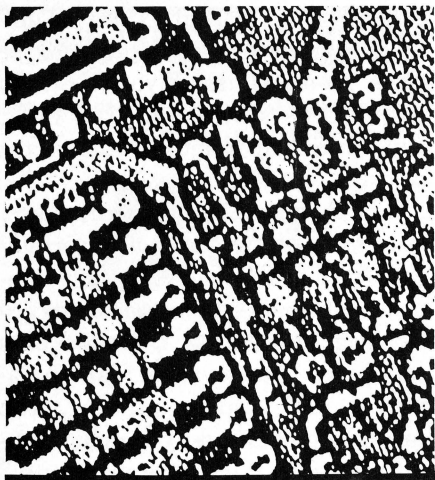
Both serial ports look like an Apple Super Serial Card, so most commercial software shouldn't have any trouble talking to the card. The manual is detailed, thorough and easy to follow. If you do run into problems, a quick trip to the manual will probably solve them.

THE DECISION

The most difficult thing about multifunction cards is trying to decide which one is best for you. Even if two of them seem to do the same job, they each have different and unique features; each may be better suited to a particular application than the others. The only thing they all have in common is cost—they're not cheap. To help you decide, here are charts summarizing the features of these six cards.

When you're thinking of buying any card, remember to make sure it will work with your operating systems, and check your software manuals to see if the programs can talk to the card. And if you have any questions, check with the manufacturer; nobody knows more about a card than the people that made it.//

Robert Grossblatt lives in New York City and contributes to Radio Electronics and other publications.



SPEED-UP CARDS

by FRANK HAYES, Assistant Editor

"Speed up your Apple! Run database searches at lightspeed! Zap your way through games faster than ever before!" Sounds good, doesn't it? And it's true, within limits: you really can improve your Apple II's performance by installing a speed-up card.

A speed-up card contains an extra CPU that runs faster than the Apple II's normal 1 MHz—typically more than three times as fast. As a result, most CPU operations run three times as fast with a speed-up card installed.

That doesn't mean all programs will run three times normal speed, though. For example, disk operations must work at the same speed—otherwise you'd end up with disks that other Apple IIs couldn't use. And because the Apple II uses memory timing to send information to your monitor or TV set, a speed-up card can't increase the speed of the video memory without making it impossible for you to see anything on your monitor. Some memory cards, modems and specialized peripheral cards have to run at the regular Apple speed, too.

Well then, what *does* get speeded up? Number crunching, that's what. Although graphics and disk operations form a significant part of many programs, your Apple spends most of its time doing arithmetic—and when you speed that up to more than three times normal, it can really improve the way some programs work. For example, searching for a word or sorting a database with AppleWorks is much faster with a speed-up card.

There are three major contenders in the speed-up card sweepstakes for the Apple II: **SpeedDemon** from M.C.T., **Accelerator IIe** from Titan Technologies, and **Transwarp** from Applied Engineering. All three work

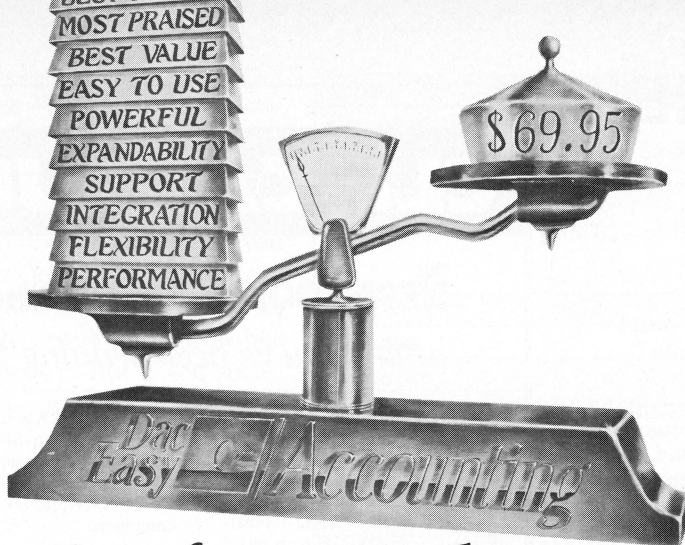
in any slot in a IIe except the auxiliary slot, and are also compatible with the Apple II or II+.

Each speed-up card contains a high-speed version of the 65C02 CPU, along with a bank of DIP switches. The switches make it possible for you to configure your speed-up card so that it will operate at the proper speed with each peripheral card in your Apple II. All three cards can be turned completely off using a POKE command, and once turned off can only be turned on again by turning your computer's power off and then on again. Features that differ among the cards are summarized in the accompanying chart.

Though all three speed-up cards do roughly the same thing, there are some important differences in the way they perform. We had problems with the SpeedDemon card; it interfered with the operation of several other peripheral cards, and apparently damaged a hard-disk interface. (The hard disk manufacturer later told us that the SpeedDemon is not recommended for use with their drive.) All three cards can cause odd results with Applesoft BASIC programs that use the DRAW and XDRAW commands. Though Transwarp claims its extra memory provides an extra speed boost for programs that use more than 64K, it wasn't appreciably faster than Accelerator IIe—but each provided tremendous improvement over the Apple II's normal speed.

continued on page 23

II COMPUTING, FOR APPLE II USERS



Perfect Balance

APPLE users, now the scales are in your favor. Dac-Easy Accounting for the Apple gives you the best price plus tremendous performance. Add the improvements made to the Apple version, and you get the best value in the industry. Even the experts agree. Dac-Easy Accounting for the IBM was recognized by *InfoWorld* as 1985's "BEST SOFTWARE VALUE."

No other accounting package can match the explosive user base or the unanimous acclaim from industry experts. Dac is the perfect choice for your first accounting system or for upgrading from a single module system. Either way compare, and you will join over 150,000 people who have computerized with Dac-Easy.

PERFORMANCE

Accurate information when you need it is what performance is all about. Fast, flexible reports give you what you need to know to manage cash-flow, turn inventory and increase profits... Listen to the skeptics-turned-believers.

"Dac-Easy Accounting is so inexpensive . . . we were skeptical . . . We expected to find a program that couldn't compete on a feature-by-feature basis . . . We were wrong."
*InfoWorld, 1985**

INTEGRATION

Dac-Easy's seven modules work together perfectly. Enter data once and it's posted to the other modules automatically. Equally important is that most modules can be used stand-alone. If your needs are for a general ledger only, then you will have the best and still be able to grow into accounts receivable, payable, inventory, billing and purchase order without spending more time or money. With Dac-Easy Accounting, you have the total solution.

FLEXIBILITY

Dac offers the rare ability to handle either service or product-oriented companies without sacrificing features which are important to both. "Dac-Easy Accounting is everything its designers say it is . . . It is also flexible enough to fulfill the accounting needs of almost any type of business."
*Journal of Financial Computing, 1985**

FEATURES

General Ledger

- Unlimited multi-level accounts with screen inquiry for three years
- Pencil and pen correction option
- Automatic budgeting by department
- Unlimited journals and departments
- Excellent audit trail and flexible financial statements

Accounts Receivable

- Open invoice or balance forward per customer for unlimited number of customers
- Multi-sorted mailing labels
- Statements and invoices support special comments
- Detailed history for three years for number of invoices, sales, cost, and profits
- Customized aging report
- Automatic sales forecasting

Accounts Payable

- Checks handle multiple invoices, unlimited allocations and cash available protection
- Multi-sorted vendor labels and directories
- Customized aging report
- Automatic forecasting of purchases

Inventory

- Average, last purchase, and standard costing
- Physical inventory with perpetual comparisons
- Accepts fractional measure such as dozens
- Automatic forecasting of product needs
- Automatic forecast of product sales
- Detailed three-year history for every product
- Alert and activity reports
- Screen inquiry for on-hand/on-order/sales/cost/profit/turns/GROI/etc.

Purchase Order

- Inventory and non-inventory items
- Allows up to 99 lines
- Per line discount in %
- Accepts generic deductions
- Accepts back orders and returns
- Purchase journal

Billing

- Service or Inventory invoicing on plain or pre-printed forms with remarks
- Prints sales journal
- Allows return credit memo

Forecasting

- Unique program that automatically forecasts using your three-year history:
- Revenue and expense accounts
- Vendor purchases
- Customer sales, cost and profit
- Inventory item usage
- Four different forecasting methods

OVER 80 ROUTINES AND 300 REPORTS

ALSO AVAILABLE FOR IBM AND ATARI ST

Dac-Easy Accounting and Payroll are now available for the Atari 520 & Atari 1040 ST. Dac-Easy Accounting, Dac-Easy Payroll, Dac-Easy Word II, Dac-Easy Base, Dac-Easy Port, Dac-Easy Mate, Dac-Easy Accounting Tutor, and Dac-Easy Payroll Tutor are available for the IBM PC and compatibles.

*IBM version reviewed.

Apple is a registered trademark of Apple Computer, Inc. IBM is a registered trademark of International Business Machines Corp. Atari is a registered trademark of Atari Corp.

SUPPORT

Subscribe to our toll free support agreement and join the best support program in the industry. Our friendly 12 person support staff are trained to answer your accounting and technical questions. No excuses, and no delays. Find out for yourself why Dac-Easy is the fastest selling accounting package in history. Call us today!

Now
Available
for the
Apple II
Series

TO ORDER
CALL TOLL FREE
1-800-992-7779

Ask for Operator #666

IN TEXAS CALL
1-214-458-0038

or mail the
order form below.

Mail to:

dac software, inc.

4801 Spring Valley Rd
Bldg. 110-B
Dallas, TX 75244

**Yes, please rush me
Dac-Easy Accounting
for the Apple!**

Product	Qty.	Price	Total
Dac-Easy Accounting	—	69.95	—
Add Shipping Charge			7.50
Texas Residents			
Add Sales Tax (6½%)			—
TOTAL			—

☐ Check ☐ Money Order
☐ AMEX ☐ VISA ☐ MASTERCARD

Account # _____

Expires _____

Signature _____

Name _____

Company _____

Address _____

City _____

St. _____ Zip _____

Phone _____

Computer Brand _____

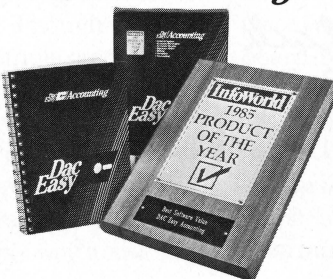
Type of Business _____

No. of Employees _____

30 Day Money-Back Guarantee
Dac Software offers an unconditional guarantee on all Dac-Easy products (less shipping charges). There is a \$10 restocking fee if the disk seal is broken. This guarantee is available on all products bought directly from Dac Software.

#666

Dac Easy Accounting™



RENT SOFTWARE



Black Sun's Software Rental Library offers the most affordable way to make computing on your Apple more enjoyable than ever!!!

With thousands of Apple titles to choose from, selecting the right software can be pretty difficult. Newer, better software is released every day, and 'state-of-the-art' is redefined every week or so. All too often, software fails to live up to its expectations. And, unlike an ill-fitting garment, you cannot return ill-fitting software! The solution? Renting. Black Sun's rental option helps you choose the right software... before you buy it!

Over 2,000 rental titles for the Apple and Macintosh computers! (And growing!)

Black Sun handles only one line of software. Apple. With years of experience you can rely on. Our helpful and knowledgeable support staff maintains an up-to-date product library of all the latest releases, and a well organized product catalog makes finding the right software a snap. We also feature an **expanded** line of entertainment and educational software, where renting is often more practical than buying it. Featured categories include adventure, business, communications, education, game, graphics, home/hobby/utility, strategy, word processing, hardware, and books. Plus hundreds of rare and half price items are made available through our unique consignment option. A Black Sun exclusive.

Software rental made easy

If you belong to a library or video club, you probably already know the advantages renting can provide. Well, Black Sun has made renting software just as convenient! You can rent software for 3 weeks for just **15 to 20%** of the list price, or less. All rental fees are applied to the competitive **discount** prices... only if you decide to buy. You call the shots. Evaluate a business package, solve an adventure, try something new, or whatever!

Satisfaction Guaranteed, as it should be!

Make Black Sun your favorite Apple peripheral! Take advantage of this introductory offer and save \$5.00 off the regular one-time membership fee of \$25.00. There are **no annual dues, hidden costs or complicated deposit schemes!** Sign up by writing or use the coupon below. Your product catalog and membership info will be sent immediately. **If you are not 100% satisfied with the service and/or selections, simply inform us within 30 days and your \$20.00 will be promptly refunded!**

Name: _____

Address: _____

City: _____ State: _____ Zip: _____

Circle System: II+ IIe IIc Other Mac _____ K

Or charge it to ☐ Visa ☒ MC ☐ MasterCard

_____ Exp: _____

Signature _____ Date: _____

Return to:



Black Sun
P.O. Box 406
Emmaus, PA 18049
(215) 967-3300

Apple is a registered trademark of Apple Computer, Inc.
Macintosh is a trademark licensed to Apple Computer, Inc.

CIRCLE 002 ON READERS SERVICE CARD

CLIPCAPTURE™

THE NEWSROOM™ and Print Shop™
utility you've been waiting for!

CLIPCAPTURE provides TOTAL integration between Newsroom clip art, Print Shop graphics, and your own hi-res artwork.

UNLIMITED CLIP ART! — Finally, create your OWN clip art disks! Use Newsroom photos, hi-res pictures, or any of the thousands of Print Shop compatible graphics, and "lay out" your own clip art pages. CLIPCAPTURE clip art disks are functionally IDENTICAL to Newsroom clip art disks!

LIMITLESS GRAPHICS! Convert part of any hi-res picture or Newsroom photo into a Print Shop graphic. Use hundreds of the clip art pieces available now in your banners, signs, or greeting cards!

CLIPCAPTURE is sure to expand both your Print Shop graphics collection AND your Newsroom clip art library. CLIPCAPTURE works with Apple II+, IIc, and IIe computers.

HOLIDAY SPECIAL

\$19.95

(U.S. + \$2 S/H, WI + 5%.

Regular price \$24.95)

Send check, m.o., or MC/VISA info to:

CLIPCAPTURE

477 Windridge Drive

Racine, WI 53402

Or, charge to MC/VISA (orders only!)

at:

1-800-628-2828 Ext. 863

This offer expires January 31, 1987

The Newsroom and The Print Shop are trademarks of Springboard Software, Inc., and Broderbund Software, Inc., respectively. Clipcapture is a trademark of W.A. Miller.

CIRCLE 006 ON READERS SERVICE CARD

DIGITAL VISION

ALL NEW

COMPUTEREYES/2™

VIDEO DIGITIZING SYSTEM FOR APPLE II SERIES COMPUTERS

The world's highest-quality, lowest-priced video digitizer has just gotten even better! The new card-based COMPUTEREYES/2™ for Apple II, II+, IIe and compatibles connects to any standard video source to capture real-world images on your Apple's graphics display. Hundreds of applications!

COMPUTEREYES/2™ features include:

- Fast scanning—single 6 second scan for all capture modes
- Automatic and manual control over both brightness and contrast
- Keyboard-controlled video switching to allow previewing the video source on the Apple monitor.
- New, familiar, Appleworks-style menu
- Standard software supports Apple Hi-Res and Double Hi-Res graphics, plus Gray-Scale boards for really superb images!
- Optional COMPUTEREYES/2™ Enhancement Software package available to convert COMPUTEREYES images to Printshop, Printmaster, Newsroom, and other formats; perform image negate, flip, etc
- Also available as complete system including quality video camera



STILL ONLY \$129.95

Versions available for:

- Apple II, II+, IIe and IIc
- Commodore 64/128
- Atari 800/800XL/130XE
- IBM PC and compatibles (\$249.95—includes additional features)

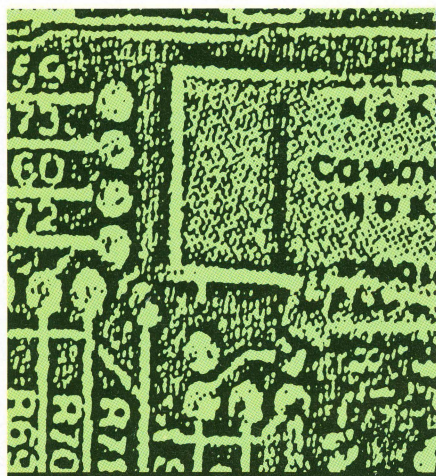
See your dealer or order direct. Mass. residents add 5% sales tax. Mastercard, Visa accepted. To order, or for more information, write or call:

DIGITAL VISION, INC.

14 Oak Street — Suite 2 Needham, MA 02192 (617) 444-9040, 449-7160
CIRCLE 041 ON READERS SERVICE CARD

Is the speed increase worth the price? That depends on how you use your computer. The additional speed probably won't do you much good if you run mainly games or educational software. Even word processors run faster only when they're doing things like search and replace. But if you spend your time with spreadsheets and databases, or anything else that requires lots of number crunching, a speed-up card can shorten your work day.//

NAME	SpeedDemon	Accelerator IIe	Transwarp
Manufacturer's address and phone	M.c.T 1745 21st Street Santa Monica, CA 90404 (213) 829-3641 <small>CIRCLE 251 ON READER SERVICE CARD</small>	Titan Technologies, Inc. 310 West Ann Ann Arbor, MI 48104 (313) 662-8542 <small>CIRCLE 252 ON READER SERVICE CARD</small>	Applied Engineering P.O. Box 798 Carrollton, TX 75006 (214) 241-6060 <small>CIRCLE 253 ON READER SERVICE CARD</small>
RAM	None	64K	256K
Self-test	Yes	No	No
Power-on disable	Yes	No	Yes
Temporary disable	No	Yes	Yes
Slot	Any	0 in II and II+; any in IIe	Any
Price	\$195.89	\$319	\$279



MEMORY EXPANSION BOARDS

by BILL O'BRIEN

Let's go. Start AppleWorks, create the most dynamic computational relationships ever imagined in a spreadsheet, begin to enter the physical data—and then stop dead when you run out of memory.

No matter how many decades the Apple II may survive, an 8-bit 6502 processor will never be able to address more than 64K of memory. That's not much space for an intricate business plan, and the Apple II has had that space shortage since AppleWorks' ancestor, VisiCalc, first prompted major sales of the machine back in 1980.

Since memory cannot be extended beyond that limit, Apple Computer was left with only one solution: expanding the Apple II's memory within that boundary by swapping chunks of memory in and out. Though memory management is a complicated process that must remember which segments of expanded memory are already used, what each segment contains and how to swap in the appropriate segments so quickly that you never notice what's happening, it's the only way to use large

pieces of data, such as spreadsheets, without constantly going to the disk drives.

DOWN MEMORY LANE

There are two basic types of Apple II memory expansion boards—those that go in the Auxiliary slot on the IIe, and those that can be installed in a regular peripheral slot. That's something to consider if you're considering expanding the size of your Apple's RAM. If a memory expansion board will displace your 64K 80-column Apple RGB board from the Auxiliary slot, you'll lose an important part of your system.

But also remember that no matter which version or manufacturer you decide upon, you are expanding your Apple in a very limited fashion. Very

continued on next page

few programs are designed to use expanded memory—even AppleWorks operates with only some boards and sometimes requires patching. With other programs, your megabytes are consigned to the status of a RAMDisk, an electronic version of a disk drive, with the RAM storage space substituted for a floppy disk. A RAMDisk is blisteringly fast, but its contents will disappear as soon as you turn your computer off—and if you want to save that RAMDisk data, it may take as many as seven floppy disks to back up a megabyte of RAMDisk. Even rebooting your Apple will wipe out the contents of any card in the Auxiliary slot.

Despite the differences between the types of boards, functionally they are the same. You may see claims that one or another offers a larger AppleWorks spreadsheet, but let's be realistic: If you create a worksheet that's two megabytes big, you'll have ample time to shower, shave and eat dinner between recalculations.

Some board manufacturers advertise *caching* as a feature. A RAM cache is used to load in as much data as possible from the disk you're currently using. After that, whenever you try to access that disk the operating system looks in the cache for the information it wants; it only accesses the physical disk if it can't find the information in

the cache. Unfortunately, the cache routines currently included with these RAM boards use all available expanded RAM—even if you're caching a 143K floppy disk into a 1 megabyte card. That's a waste of capability.

FACTS AND FIGURES

The chart that accompanies this article lists the features of several RAM expansion boards—including boards that work with the IIc. A pleasant surprise: One of the IIc boards, Applied Engineering's ZRAM-II, has just been replaced with a trio of boards called the ZRAM-Ultra series. Applied Engineering says they're easier to install, and each has a socket for a

Product:	S' Card	E' Card	C' Card	Multiram RGB	MultiRAM IIc	Flipster
Manufacturer's address and phone:	Legend Industries 2220 Scott Lake Rd. Pontiac, MI 48054 (313) 674-0953	Legend Industries 2220 Scott Lake Rd. Pontiac, MI 48054 (313) 674-0953	Legend Industries 2220 Scott Lake Rd. Pontiac, MI 48054 (313) 674-0953	Checkmate Tech. Inc. 509 S. Rockford Dr. Tempe, AZ 85281 (602) 966-5802	Checkmate Tech. Inc. 509 S. Rockford Dr. Tempe, AZ 85281 (602) 966-5802	Cirtech, UK, Ltd. dist. by Greengate Prod. 2041 Pioneer Court San Mateo, CA 94403 (415) 345-3064
Computer:	II, II+, IIc	IIc	IIc	IIc	IIc	II+, IIc
Maximum Board Expansion:	1 megabyte	1 megabyte	1 megabyte	6 megabytes	768K	1 megabyte
Size as tested:	1 megabyte	1 megabyte	1 megabyte	1 megabyte	768K	1 megabyte
ProDOS RAMDisk:	N/A	127 blocks	2048 blocks	127 blocks	127 blocks	2048 blocks
Software Creatable RAMDisk:	N/A	448K	N/A	960K	704K	N/A
AppleWorks expansion:	1024K	506K	1003K	758K	568K	1012K
DOS RAMDisk:		128K	2×384K, 1×256K	2×384K, 1×256K	2×384K	2×400K
Operating System Compatibility:	ProDOS, DOS, CP/M; Pascal	ProDOS, DOS, CP/M	ProDOS, DOS	ProDOS, DOS, Pascal, CP/M	ProDOS, DOS, Pascal, CP/M	ProDOS, DOS, CP/M, Pascal
Slot Compatibility:	1,2,4,5,7	Auxiliary	N/A	Auxiliary	Auxiliary	1,2,4,5,6,7
Comment:	Software supplied worked only under DOS 3.3. The number and size of DOS 3.3. RAMDisks will depend on which of several supplied versions of Legend's disk emulator and memory management software you use.	Includes RGB and complete video ports plus mouse support software for AppleWorks. The composite video output would not provide a stable picture with my Apple color monitor.	Includes mouse support software for AppleWorks.	Options include RGB add-on, 65816 processor, and battery backup.	Optional 16-bit coprocessor port.	Includes cache and partition software.
Price:	\$189 (256K); \$229 (512K); \$259 (768K); \$289 (1M) CIRCLE 189 ON READER SERVICE CARD	\$169 (256K); \$209 (512K); \$239 (768K); \$269 (1M) CIRCLE 190 ON READER SERVICE CARD	\$189 (256K); \$229 (512K); \$259 (768K); \$289 (1M) CIRCLE 191 ON READER SERVICE CARD	\$199.95 (64K) or \$439 (1M) CIRCLE 192 ON READER SERVICE CARD	\$159 (64K) or \$329 (768K) CIRCLE 193 ON READER SERVICE CARD	\$399 (1M) CIRCLE 194 ON READER SERVICE CARD

65816 CPU (the processor used in the Apple IIGS). I wasn't able to test any of the new boards, but the top-of-the-line Ultra III is priced roughly the same as ZRAM-II and includes a ProDOS-compatible clock with a 20-year rechargeable battery, along with all the ZRAM-II features.

An unpleasant surprise: Version 2.1 of the ProDOS System Utilities failed to work with any of the Auxiliary slot boards, though the earlier version 1.0 worked well.

Two manufacturers deserve special comment. The Legend boards work, but the support software feels a year out of date; it leaves you a little more puzzled and with a little more work to

do before you can get the expanded memory up and running. The sockets Legend uses to hold additional memory chips are also unpleasant. Inserting a RAM chip requires considerable force and you're almost guaranteed that none will ever loosen once they're installed, but even with six years of practice under my belt I managed to destroy two RAM chips while upgrading the S' card.

On the other side of the coin is the Flipster from Cirtech. The parent company is in Scotland and phone support from the U.S. distributor can be a little frustrating at times, but no other board has undergone the transformation that I've seen in the Flipster. In

the last year the Flipster's manual has improved many times over, as has its support software. In addition, you can partition the card's RAM to appear as up to four independent memory segments containing four different programs. The programs don't all run at the same time, but you can switch from one to another almost instantly with the touch of a few keys—a far cry from the slow spinning of a disk drive.//

Bill O'Brien has been writing about Apples since 1978. He has five books published including The Apple IIc Book.

If you'd like more articles like this one, circle 261 on our Reader Service Card.

Product:	Apple Memory Expansion Board	SprintDisk	MegaRAM Plus	ZRAM-II	RAMFactor	RAMWorks III
Manufacturer's address and phone:	Apple Computer, Inc. 20525 Mariani Ave. Cupertino, CA 95014 (415) 966-1010	AST Research, Inc. 2121 Alton Ave. Irvine, CA 92714 (714) 476-3866	AST Research, Inc. 2121 Alton Ave. Irvine, CA 92714 (714) 476-3866	Applied Engineering P.O. Box 798 Carrollton, TX 75006 (214) 241-6060	Applied Engineering P.O. Box 798 Carrollton, TX 75006 (214) 241-6060	Applied Engineering P.O. Box 798 Carrollton, TX 75006 (214) 241-6060
Computer:	II+, IIe	II+, IIe	IIe	IIc	II+, IIe	IIe
Maximum Board Expansion:	1 megabyte	2 megabytes	1 megabyte	1 megabyte	16 megabytes	3 megabytes
Size as tested:	1 megabyte	1 megabyte	1 megabyte	1 megabyte	1 megabyte	1 megabyte
ProDOS RAMDisk:	2048 blocks	2048 blocks	127 blocks	127 blocks	2048 blocks	127 blocks
Software Creatable RAMDisk:	N/A	N/A	980K	1088K	N/A	704K
AppleWorks expansion:	1012K	1012K	944K	727K	1012K	760K
DOS RAMDisk:	N/A	2×400K	2×400K	5×182K, 1×57K	2×400K	5×182K, 1×57K
Operating System Compatibility:	ProDOS, Pascal	ProDOS, DOS, Pascal	ProDOS, DOS	ProDOS, DOS, CP/M, Pascal	ProDOS, DOS, Pascal	ProDOS, DOS,
Slot Compatibility:	1,2,4,5,6,7	1,2,4,5,6,7	Auxiliary	N/A	1,2,4,5,6,7	Auxiliary
Comment:	It's from Apple, what more could you want?	Cache software included.	Optional RGB add-on. Cache software included.	Includes Z80 processor and CP/M operating system. No longer available—see text.	Options include 65816 processor, Lotus-compatible spreadsheet and battery backup. Allows AppleWorks to run on a II+.	Options include 65816 processor, Lotus-compatible spreadsheet and RGB add-on. Loads AppleWorks into RAM for faster segment swap. Includes print buffer software.
Price:	\$399 (256K); \$69 for each additional 256K <small>CIRCLE 195 ON READER SERVICE CARD</small>	\$295 (256K); \$50 for each additional 256K <small>CIRCLE 196 ON READER SERVICE CARD</small>	\$195 (64K); or \$295 (256K); \$50 for each additional 256K <small>CIRCLE 197 ON READER SERVICE CARD</small>	\$329 (256K); \$60 for each additional 256K <small>CIRCLE 198 ON READER SERVICE CARD</small>	\$239 (256K); \$50 for each additional 256K <small>CIRCLE 199 ON READER SERVICE CARD</small>	\$179 (64K); \$219 (256K); \$269 (512K); \$389 (1M) <small>CIRCLE 200 ON READER SERVICE CARD</small>

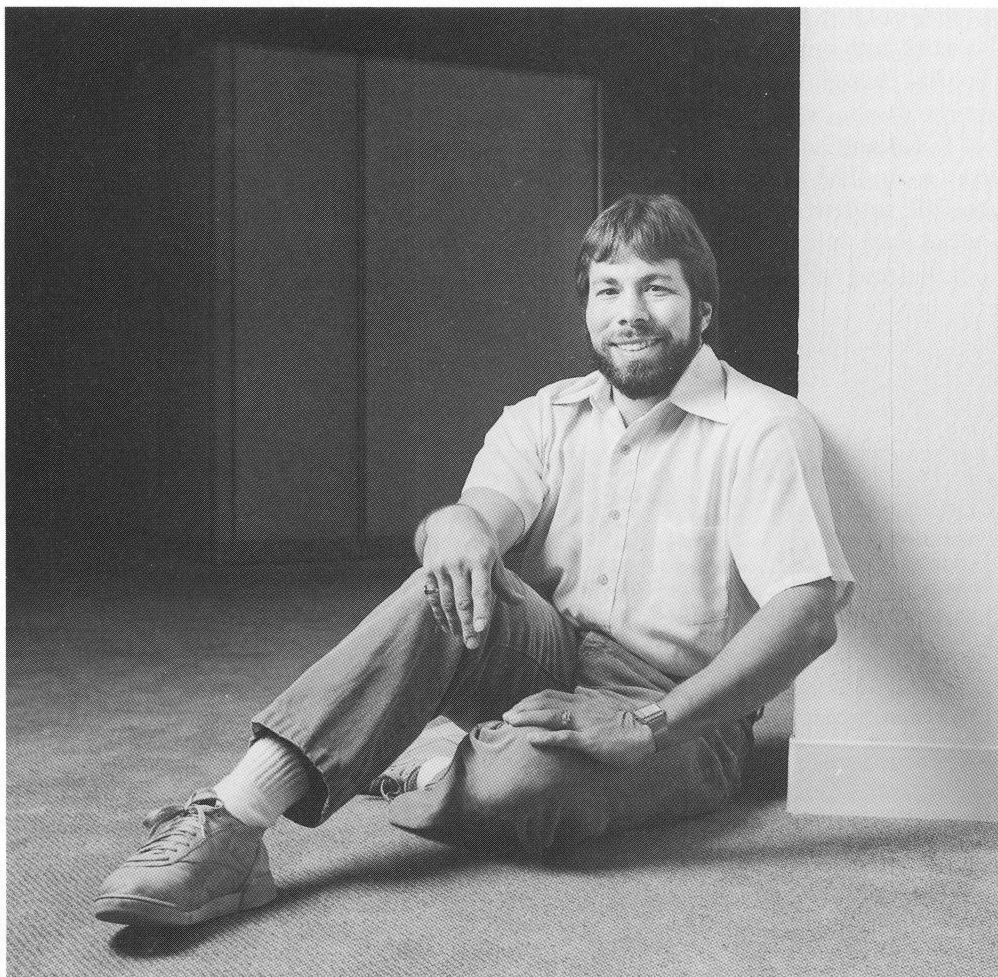
Ten Years After

by FRANK HAYES, Assistant Editor

An Interview with Steve Wozniak

When the Apple II GS made its first public appearance on September 15, 1986, Steve Wozniak was there. It was doubly appropriate: not only was Wozniak the designer of the original Apple II, but he had worked for years for the development of a 16-bit Apple II. With the II GS, one of Woz's longtime dreams became a reality.

A decade after he and Steve Jobs founded Apple Computer, Wozniak is an Apple Fellow and has his own company, CL9. Woz talked to us in June 1986 about kids, jokes, computers and his part in ten years of the Apple II.



Julie Polunsky

II Computing: When you were putting together the first Apples, did you have an idea of the kind of machine this computer was?

Steve Wozniak: Yes, but very different from what it is today. I think a lot of people in the industry would like to say they predicted that it would go this far. We really did believe that 4K was enough and saw it as a good game machine and a nice tool for somebody who could program and could build hardware and use it as a tool at work. Actually, even a standard machine to do word processing was a little beyond our vision.

It was designed without a plan,

almost by accident. A lot of the features that made a difference in its day—graphics, paddles, sound, color, hi-res, a plastic case, BASIC built in—there were so many things about the Apple II that had never been standard features on a computer, all mixed together.

I designed the hardware version of Breakout for Atari and I wanted to program it for the Apple—but I had to add a whole bunch of features to make Breakout work, and it turned out being a real nice computer as a result. What were my needs? I needed to solve a few categories of engineering problems at Hewlett-Packard, I needed to play games, and I wanted a machine that

could eventually be a terminal to other time-sharing computers. I had very few needs, and the question was, what's the finest combination of chips that can fill those needs very well?

There was a lot of controversy because I absolutely insisted to Steve Jobs that it's not a product, I just wanted to do it for the fun of doing it. And it turned out it was so exceptional I'm glad we did make it a product. We had a lot of help and guidance from people like Carl Helmers of *Byte* magazine and Paul Gerrell of the Byte Shops in Palo Alto.

Mike Markkula came and put in the money that made us a real company.

continued on next page

Without even a business plan completed, after talking to us for a while, he just went to the bank and wrote a check, guaranteed it, and \$250,000 was enough money to give us a good shot. He was sure we would become a \$500 million company very quickly, and we did. Everything he ever said pretty much came true. He estimated the Apple II's biggest year would be ten years later, in 1986.

II C: And now with the Apple IIGS, it's going to start the whole life cycle over again — only it's going to start with 10,000 applications.

Woz: Yeah. I think many of those 10,000 applications are in the past, there are newer programs like AppleWorks that can replace a lot of categories; that's an unfair comparison. But 10,000 applications means there's hundreds of thousands of people that have built into the culture an understanding of this machine, and with the new II there's the compatibility and such incredible new features.

II C: What's exciting to you about computers?

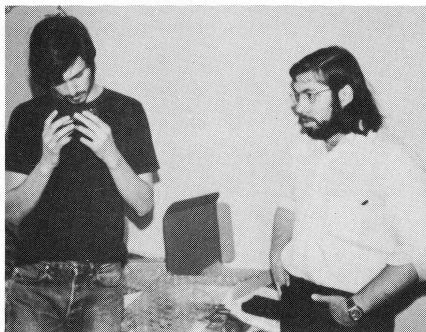
Woz: The best part about computers is a lot of what I've seen in the kids who are part of the Apple Computer Clubs International. They're doing the types of programs I've done in earlier stages in my life — testing out graphics, learning the first approaches to drawing a maze, learning about how computers work.

My level of interest is in creating a machine, but today a machine is created and then there are huge bodies of software — the whole appearance of a computer like Macintosh today, which I love to use and I can appreciate so much as a user. I can't really think of myself developing any of that stuff because there go two man-years of my life for almost anything that's worthwhile. There was only a rare point in time around 1975 where one person, working for half a year to a year, could actually create something of significant value in computers, like the Apple II.

II C: Apple now owns a Cray super-computer. Have you used it yet?

Woz: No. I'm looking forward to it though. I'm sure I can find a way to use it, but I don't think I need the Cray as much as an Apple II for my own personal uses. With the Cray I'll calculate e to a billion digits. I can write a 20-line program for the Cray to calculate e to a billion digits very quickly, but it'll take three months of runtime to calculate it in binary. Then to convert it to decimal takes another three months, printing it as you go.

II C: What are you really interested in? Not necessarily computers —



Apple founders Steve Jobs and Steve Wozniak in 1976. Photo by Margaret Wozniak, from *Fire in the Valley: The Making of the Personal Computer* by Paul Freiberger and Michael Swaine, published by Osborne/McGraw-Hill.

Woz: Oh, jokes. Being happy, humor, practical jokes, anything like that. A light approach to life. Low stress. Being able to look at situations that are going to be conflict and arguing with somebody, being able to say, Hey, I'm better off just being quiet. I put on two very large rock 'n' roll festivals called the US festival, and we actually put out a message that wasn't heard very much, about what "Us" means. We did the first video simulcast ever with the Soviet Union.

Recently I was watching two groups of kids from computer clubs playing a computer game called The Other Side (Tom Snyder Productions), where you try to build a bridge between two countries that are also competing for oil. These kids have been so conditioned by our government to believe things about the other side that aren't true. They wanted to play competitive mode, not cooperative mode — they're brought up wanting to think everything's a challenge, especially when it's called The Other Side. It will take a long time and only a few will ever

encounter how similar the people on two different sides of the world can be.

Their government's doing the same thing. Governments work just like corporations: they don't allow a lot of freedom outside of their borders — tight control, we are supreme. These are kids that are in school, they're forced to say the pledge of allegiance every day. They don't think about, what does it mean and do I want to say it, and I'll believe in what I want to believe in, they're forced to just say it, just words — it loses a lot of meaning.

Tom Snyder, who created The

We really did believe that 4K was enough . . .

Other Side, has been a hero of mine ever since I read an interview with him, just his style, his approach towards what educational software should be, how it should get the kids' minds working in a collaboration mode, not a competitive mode. It just totally matched my own framework, with my own children.

II C: You've got two kids now. How much connection with the computers do they have?

Woz: My kids are one year old and three years old, and there are computers all over the house. They see me use a computer in the bedroom, in the living room, in the upstairs office. And the three-year-old has his own computer station, with a Macintosh and an Apple II. But I was never of a mind that I would encourage him or push him in that direction. If he likes the computer, yes.

He used to watch a lot of cartoons, videodisks and whatnot. And then we got one of these cards that speaks. He's

only three years old, and now the computer speaks to him, asks him questions, and he pushes the right buttons—he only has to push a very few buttons. And he'll sit on that program for four hours a day. It's shocking, he's so much in love with his computer. At one time it was scooter rides with Daddy, it's computers now.

After talking to us for a while, Markkula just went to the bank and wrote a check for \$250,000 and guaranteed it.

II C: What are the "Wozzies"?

Woz: A group in Santa Clara that's putting on a show for PCs and technology hired a PR firm and they came up with these awards called "Wozzies." There was a good spirit to the whole project and I like the way it's been presented so far. And the publicist they use I have worked with in the past through ballet groups and even my own activities. As a matter of fact, she helped out in organizing stuff for a computer joke book I'm working on.

II C: You're working on a joke book?

Woz: I'm working on a computer joke book with a man named Larry Wilde, whom I've respected for humor since my earliest days of writing the first dial-a-joke in the San Francisco Bay Area. He has connections with the publishers. I'm just collecting the jokes.

I also want a book of practical jokes using electronics, using computers. Fake-out programs would fall into that category for sure. But also where you just screw around with a couple of error messages so someday somebody will get one of the error message, saying something strange like, You blockhead Steve.

II C: Some of the Beagle Brothers software is like that—they put little fillers on their disks and in their manuals, easy POKEs on the Apple II that will do strange things to error messages.

Woz: Oh, yeah, yeah, I've bought all their stuff and read the brochures that came with it—very, very entertaining. It's not the sort of thing that would go over very big with businessmen, but I'll tell you, with young kids learning about computers, it's the right approach.

II C: How do you use computers now? In your business? For solving engineering problems?

Woz: Well, for word processing—personal letters to friends, business letters, memos around the office. Although at CL9, we try to keep our memos so short that we can send them on a little E-mail system.

I use the Apple II extensively because we're doing software for 6502 microprocessors. And I've got an Apple II on a printer for assemblies, I've got one I'm using as a terminal that talks to our product, I've got another one that burns EEROMs (electrically erasable read only memory). I even use a Laser 128, because it had one slot on the side for my EEROM burner.

II C: Do you use computers recreationally?

Woz: Occasionally. On my breaks at work I'll play the puzzle on the Macintosh, I'm extremely good at that. I have arcade games at home, so I don't use the computer for games as much as I used to, because to start an adventure game you've got to have a lot of closely packed time, which I have zero of. But I like arcade games—Defender, Ms. Pac-Man, Pac-Man Jr., Joust, Marble Mania and Crystal Castles.

II C: What do you want to be doing with computers, say, ten years from now?

Woz: Playing games, word processing—popping up quick graphic images in three-dimensional and color space, playing with them almost like

At one time it was scooter rides with Daddy, it's computers now.

a video editing system, perhaps. I'd like a computer layout in the future that would be sophisticated enough to take in any number of video sources in different formats, mix them all according to simple program steps—you know, a video editing language—something to play with movies of your kids and editing together your own movies, perhaps. Programming, doing little programs and simple things on my own.

The key to so many things having to do with TV, much more than computers do, is having approximately 256K of RAM for a frame buffer. That makes it possible to get better quality pictures, to mix video signals. The frame buffer is really the heart—frame editing, changing the size and scale of pictures, all of that sort of stuff, you need that much memory. And today, in 1986, the 256K RAM chips cost about \$2 or \$3. That makes all of these things possible.//

If you'd like more articles like this one, circle 266 on our Reader Service Card.

PRINTER RIBBONS

We can supply ribbons (1/2" max. wide) for most computer printers. **WRITE FOR QUOTE** giving make and model number.

Ribbons reinked (1/2" max. wide) \$5.00

Fanfold paper 18 lb.
approx. 3000 sheets
9 1/2 x 11 \$20.00
plus shipping UPS 30 lb.

approx. 3000 sheets
14 1/8 x 11 \$28.00
plus shipping UPS 35 lb.

California delivery add 6%

Compware Products Co.

P.O. Box 1711
Whittier, CA 90609

CIRCLE 031 ON READERS SERVICE CARD

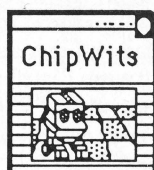
2 great educational programs...

...mention this ad,
and get a great deal as well!

CHIPWITS™

ChipWits, the robot-programming simulation, has won awards for being the best Macintosh educational program! Apple II users can now enjoy ChipWits as well-- and for 15% off the price when you mention this ad!

With ChipWits, anyone above the age of 12 can program on-screen robots to adapt to different environments... each with a different challenge. The icon language used to program the robots is simple enough for a youngster but powerful enough to intrigue programmers! It has loops, sub-routines, memory stacks and registers, conditional testing, branching, debugging devices and more.



ChipWits
for 64K Apple II family
regularly: \$39.95
mention this ad: \$31.95

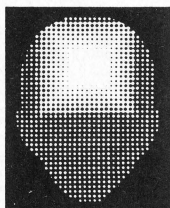
ThinkFast™

Think Fast helps you improve your memory, and its challenge makes you want to use it again and again.

ThinkFast presents a series of Left and Right Brain trials that increase in difficulty. Choose how fast and long you want your session to be... then concentrate. Alpha-numeric and picture block sets appear. Complete trials by determining if the sets are the same or different, copying them, or recreating them from memory. A complete session reporting system lets you watch your progress.

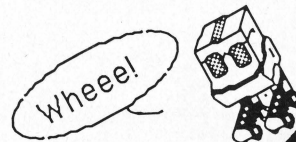


ThinkFast
for 64K Apple II family
regularly: \$39.95
mention this ad: \$31.95



BRAINPOWER, INC.

24009 Ventura Boulevard, Box 250
Calabasas, CA 91302
(818) 884-6911



NEW!
COMING
DEC. 1

THE BEAGLE COMPILER

\$74.95 (for any Apple II-64K min.) / by Alan Bird

Machine-Language Speed for Applesoft Programs

Boot THE BEAGLE COMPILER and then run practically any Applesoft BASIC program from disk. The program will be converted on the spot, in seconds, to run at machine language speed.

HOW FAST IS IT?

It depends on your original Applesoft program. 5- to 7-times speed is about average. 10-times speed and up is not uncommon.

HOW EASY IS IT TO USE?

Say you've got a normal (slow) Applesoft program on disk named "ABC". Simply type RUN ABC and, within seconds, ABC is running at machine language speed!

It's just that easy.

If you want, make changes to your program (using Applesoft) and immediately re-run it at machine language speed.

"Beginning programmers love it. Experts are amazed."

IT'S QUICK!

Compiling takes only a few seconds (more or less—it depends on a program's size).

EFFECTIVE

Most programs compile without alteration. Syntax errors, illegal GOTO's, and so on, are automatically trapped before a program runs.

COMPACT AND CONVENIENT

A compiled program actually occupies less memory than its Applesoft original. You can even save in compiled format so people can't read or change your original Applesoft code.

PRODOS BASED

Compile Applesoft programs from ProDOS floppy disks, hard disks or Unidisk 3.5's.

Like all Beagle Bros software since 1980, The Beagle Compiler is not copy-protected.

BEAGLE SCREENS

\$34.95 (for any Apple IIe, IIc or IIGS)
by Fred & Sara Crone, Matt Reimer,
Bert Kersey and Rob Renstrom

NEW!



Choose from a dozen caption types to give your messages variety. Beagle Screens is compatible with Font Mechanic fonts too.

AUTO-ANIMATION



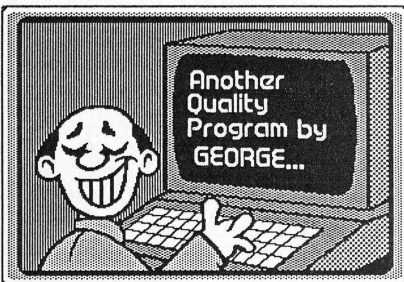
Animation gives your messages extra punch. Twenty Beagle Screen pictures are automatically animated as soon as you load them onto the screen.



Each picture has a blank area (or "balloon") where you can add your own message.

We make it EASY to add your own words and create colorful on-screen "slide shows".

Or print the pictures up as unique signs. (Printing requires a dot matrix printer and any standard printer software like Triple-Dump.)



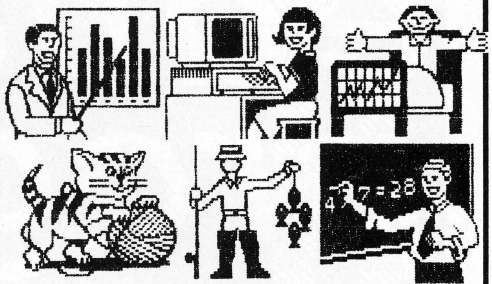
It's easy—just type the message on the screen, and save the picture on disk.

MINIPIX DISK #2

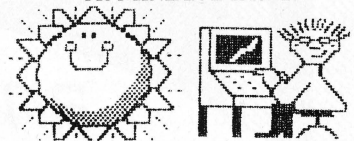
\$29.95 / by Fred & Sara Crone

NEW!

MINIPIX DISK#2 is 200 pictures—ALL NEW and ready to use with THE PRINT SHOP™.



Plus—you'll find 200 more pictures on MINIPIX DISK#1:



Coming soon: MINIPIX DISK#3 and Minipix for THE NEWSROOM.™

TRIPLE-DUMP

\$39.95 (for any version of Apple II)
by Mark Simonsen & Rob Renstrom

TRIPLE-DUMP combines with your dot-matrix (graphics-capable) printer and any Apple II to print:

- Hi-res graphics
- Double Hi-res graphics
- Lo-res graphics
- Double Lo-res graphics
- 40-column text
- 80-column text

Make "hard copies" of all kinds of images with absolutely no programming knowledge.

Or, if you're a programmer, use Triple-Dump's routines in your Applesoft programs.

Triple-Dump offers picture cropping, rotating and magnifying, plus the ability (on many printers) to adjust the print density.

BANNERS!

Print giant (8"-high letters) text banners on any printer. Great for special occasions!

BUY BEAGLE PRODUCTS AT YOUR SOFTWARE STORE.

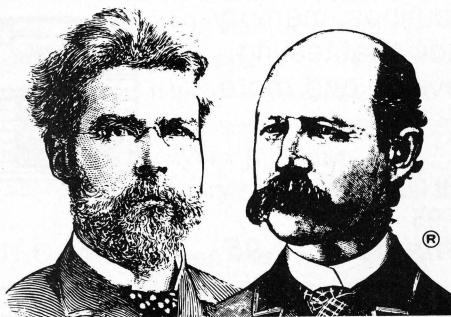
If your dealer is out of a particular disk, get on his case. Tell him he can have any of our products in his store for you within a couple of days by contacting any major Apple software distributor. Or by phoning Beagle at 619-296-6400.

Or you can order by mail (we ship fast!):

Call Toll Free (orders only—
Mon.-Fri., 9am-4pm Pacific time):
1-800-345-1750 (Calif. 1-800-992-4022).
Visa, MasterCard or COD (or mail a U.S. check).
Add \$2.50 shipping (\$5.00 if overseas)
+\$3 if COD +6% if California.

BEAGLE BROS, INC.

3990 OLD TOWN AVENUE
SAN DIEGO, CA 92110



Beagle Bros
MICRO SOFTWARE

BANNER MAKER

by WILLIAM V. R. SMITH III



The signs of the times are printed out by computer. Large signs and banners printed on continuous-form paper decorate store windows, school auditoriums and office walls. There are some outstanding products for your Apple II that will produce extraordinary banners — if you have the right type of printer.

With BANNER.MAKER, in this month's Software Library, you can create your own banners on any printer. This Applesoft BASIC program runs on any Apple II-compatible computer; it offers eight character sizes, and you can make your banners as long as you like.

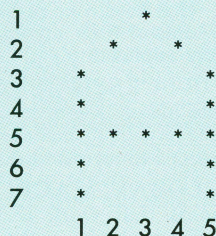
Type in BANNER.MAKER from the Software Library listing on page 47 and check it with TYPO.II, or select it from the Action Disk menu. Then run the program, and enter your message and the character size you want to use. When your message finishes printing you can enter a new message, or simply press RETURN to quit.

BY THE NUMBERS

From the program listing it's easy to see that the main section of the program is very small. Data statements that represent each printable character form the bulk of the listing. Before we jump into an explanation of the program, let's take a moment to understand how the characters are represented in the data statements.

Take a close look at the letters on your computer screen and you'll see that each character is made up of a pattern of dots that's seven dots high and five dots wide — 35 dot/spaces in all. For example, the letter A is in Figure 1.

Figure 1



Now look at line 1330 in the program, which contains the data for the letter A. The DATA statement begins with the number 65—the ASCII value of A—and then has five additional numbers. Those five numbers represent the five columns of dots in Figure 1. In fact, they contain the same information—as binary numbers, they have the same pattern as the dots and spaces in the A character.

Using the information from the data statements, BANNER.MAKER can print any ASCII character. First it prints the dot/spaces in column 1, then column 2, then 3, 4 and finally column 5. In the smallest size, the program prints a single asterisk for each dot position and a single space for each space position. In larger character sizes, the program uses blocks of asterisks for each dot position and blocks of spaces for each space position.

The program itself is fairly straightforward. It starts with a subroutine that

reads in the data. Then lines 100 through 170 prompt you for a message and character size. O\$ holds the message string. Lines 500 through 550 strip each character out of the message string for printing. The variable W holds the ASCII number of the character to be printed. Lines 560 through 733 print each character.

Line 580 sets up a loop for each character. Line 590 sets up a loop to print the proper size for each dot/space block. Lines 600 through 660 decode the binary data pattern from each column number. Once the dot/space pattern is decoded, the character size variable is used to print the proper dot/space size.

VARIATIONS ON A THEME

BANNER.MAKER uses an asterisk to form the large characters in your sign. If you want to use a different character—a plus sign, for example, or a special character your printer may have—just change the statement in line 810 to use a different character.

Have fun with the BANNER.MAKER!!

Bill Smith is president of Artsci, a software company specializing in business products for the Apple II, and a former contributor to Softalk.

II Computing's Teacher/Parent Tips offer lesson plans to enhance and extend our type-in programs. See the pull-out section in the middle of this issue for lesson plans for Banner Maker.

If you'd like more articles like this one, circle 268 on our Reader Service Card.

SOFTWARE LIBRARY

II Computing's type-in listing section includes every full-length program from this issue. Since they're included all together, it's easy to remove and save them in a binder if you wish. All programs work with both DOS 3.3 and ProDOS unless otherwise noted.

—Instant Program Loading	
CAUZIN SOFTSTRIP	34
—Beginner's Page	
IF ALL THIS IS NEW TO YOU	35
—Type Your Program Once!	
TYPO II MAKER	36
—Game Frame	
POND	37
—Easy Object Code Loader	
HEX ENTRY	39
—Do You Know Your States and Capitals?	
ALMOST PERFEKT	45
—Signs of the Times	
BANNER MAKER	47
—Advanced Computer Concepts	
THINKING ABOUT THINKING	49

NOTE: If you have the Action Disk version of **II Computing**, you can use all these programs immediately. Just boot the disk and, when the menu appears, move the inverse bar to highlight the program title and press RETURN. To restart the menu, quit the program and type RUN STARTUP.

The Action Disk also contains a program for converting to DOS 3.3. Boot the Action Disk and, at the menu, press ESC. At the] prompt type BRUN CONVERT, then follow the screen instructions. Your destination disk must already be formatted for DOS 3.3. To set direction of transfer, press R; to start the conversion, press T.

No part of this publication may be reproduced, stored in a retrieval system, or transmitted, in any form or by any means, electronic, mechanical, photocopying, recording or otherwise, except by the purchaser for his or her own use, without the prior written permission of the publisher.

Softstrip From Cauzin Systems

These Cauzin Softstrips contain programs from this issue's Software Library. You can read each Softstrip directly into your Apple II, II+, IIe or IIc with a Cauzin Softstrip Reader, available from many computer stores for \$199—or see the ad on page 59. The Softstrip Reader can also read the strips in books and other magazines.

If you don't own a Softstrip reader, call Cauzin Systems at 1-800-533-7323 (in Connecticut, (203) 573-0150) for the address of the nearest store with an Apple and a Softstrip Reader. Then bring this issue of **II Computing** and a formatted DOS 3.3 or ProDOS disk to the store for a demonstration. The dealer will transfer the files from Softstrip to disk free of charge, and you'll see how easy getting software out of a magazine can be.//

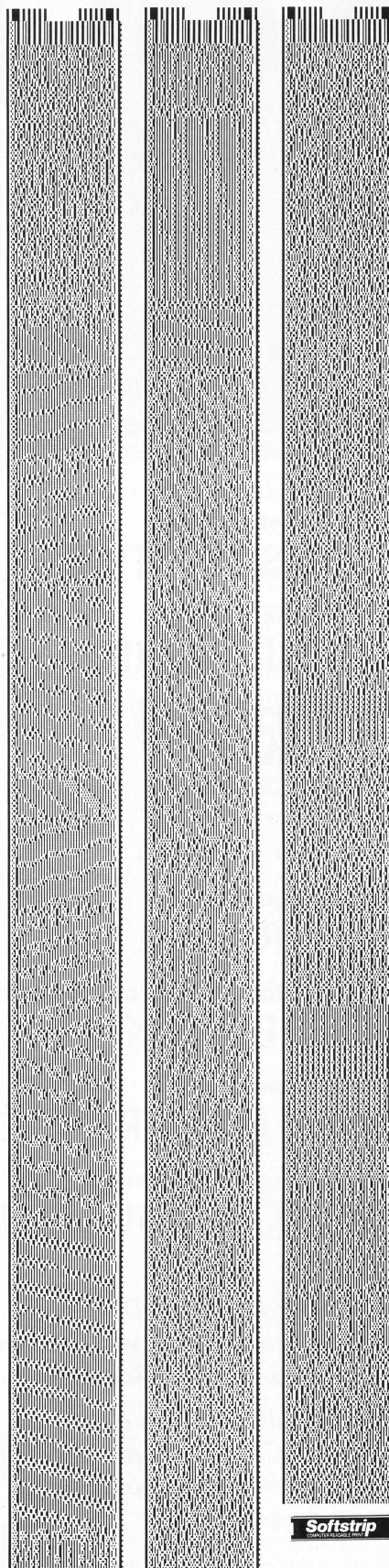
This Softstrip contains Jenny Schmidt's POND (page 14).//

POND

1 |

2 |

3 |



IF ALL THIS IS NEW TO YOU...

If you're new to the Apple II world, you may be wondering just how to type in the program listings in *II Computing's* Software Library. Your first step: read through the manuals that came with your Apple or Apple-compatible computer. They'll tell you how to set up your computer and prepare to work with BASIC.

BOOT CAMP

II Computing's BASIC programs are written in Applesoft BASIC. You'll know you're using Applesoft or an Applesoft-compatible BASIC if you see a prompt character that looks like this: `] .` To create a disk that contains BASIC, use the system disk that came with your computer—a DOS 3.3 System Master, a ProDOS User's Disk or a System Utilities disk. Follow the directions in your manual for creating a disk that contains both an operating system and BASIC. In DOS 3.3, BASIC is added to your disk in the formatting process. With ProDOS, you must copy BASIC.SYSTEM onto your disk from the ProDOS User's Disk or the System Utilities disk.

BASIC TRAINING

At the BASIC prompt you can enter either a program line or a command; just type it in and then press the RETURN key.

Before you type in a BASIC program, type the command NEW. Then type in each line of the program as it appears in the Software Library listing. Each line will begin with a line number in the left-hand column, followed by BASIC commands. If the program line takes up more than one line in the listing, just keep typing; don't press the RETURN key until you get to the next line number.

If you mistype a program line or command and notice the error before you press RETURN, you can move back to the mistake and type over it by using the left and right arrow keys. If you don't spot the mistake until after you've pressed RETURN, just retype the line, beginning with the line number. The new version of the line will replace the old version.

Once you've typed in the entire program, save a copy of it on disk by typing SAVE followed by the name of the program. For example, to save a program named FRED, you should type SAVE FRED. In fact, you may want to periodically use the SAVE command while you're typing in the program—just in case something goes wrong, you'll have a copy of your work on the disk.

Once you've SAVED a program on disk, you can load it back into memory by typing LOAD followed by the program's name—for example, LOAD FRED. Finally,

once you've LOADED it into memory, you can RUN the program by typing the command RUN.

TYPO II—TYPE YOUR PROGRAM ONCE!

The first program you should type in from the Software Library is TYPO.II.MAKER, which you can use with *II Computing's* typing-checker system. Follow the instructions with the program, and you'll be able to use it to check all the other programs you type in from the Software Library.

DISK OPERATING SYSTEMS

II Computing programs are designed to run under both DOS 3.3 and ProDOS unless otherwise specified. If a program will only run under one of the operating systems, you'll know by the PRODOS ONLY! or DOS 3.3 ONLY! tag at the start of the listing in the Software Library. The easiest way to tell which operating system you're using is to boot a disk. If it contains ProDOS, a title screen will tell you so. If it contains DOS 3.3, you'll just see the BASIC prompt. (If you don't get a title screen or a BASIC prompt, your disk doesn't contain BASIC.)

FOR MORE INFORMATION. . .

You can learn a lot about using your Apple just by typing in listings from the Software Library. But that's no substitute for studying the manuals and reference books for Applesoft, your operating system and your computer.

Another important resource is your local computer club or user's group. That's where you'll find other Apple users ready to share their knowledge and experience. And don't forget the articles, tutorials and columns in Apple magazines such as *II Computing*.

Good luck—and welcome to the world of Apple II users!

Here are a few books that will help you on the way to learning how to use Applesoft BASIC and ProDOS:

The Applesoft Tutorial
The Applesoft BASIC Programmer's Reference Manual
BASIC Programming With ProDOS
by Apple Computer (Addison-Wesley)
CIRCLE 262 ON READER SERVICE CARD

Apple II User's Guide by Lon Poole, Martin McNiff and Steven Cook (Osborne/McGraw-Hill)
CIRCLE 263 ON READER SERVICE CARD

The Elementary Apple by William B. Sanders (Datamost)
CIRCLE 264 ON READER SERVICE CARD

TYPO II (TYPE YOUR PROGRAM ONCE)

TYPO.II is the automatic proofreading program for *II Computing's* Software Library. It generates a two-letter code for each line in a BASIC program. It also produces a total checksum for the entire program. When you use TYPO.II, it should give you the same letter codes and checksum that appear in the Typo II Table for that program. If it doesn't, you've mistyped a line.

To use TYPO.II, type in the program on this page and then SAVE it as TYPO.II.MAKER. Then type RUN TYPO.II.MAKER. This creates a text file called TYPO.II, which is the actual proofreading program.

Now, for each BASIC program you want to use from the Software Library:

1. Type in the BASIC program. Be sure to include all REM and DATA statements, and all spaces within quotes. When the program is complete, SAVE it on disk.

Then LIST the program to make sure it's still in memory.

2. Type EXEC TYPO.II and press RETURN. A list of two-letter codes and the total checksum will be printed on the screen. (You can send this information to your printer by typing PR#1 before you type EXEC TYPO.II.) Compare the codes and checksum to those printed in the program's Typo II Table, listed with it in the Software Library.

3. If a two-letter code does not match the code in the Typo II Table, correct the BASIC program line. If the total checksum does not match, make sure that every line is in the program. Then type EXEC TYPO.II and check the codes and checksum again. Repeat the process until all the codes and the checksum match.

Then SAVE the corrected type-in program to disk. It's now free of typing errors and ready to run!!

```
10 DS = CHR$(4)
20 PRINT DS;"OPEN TYPO.II": PRINT
   DS;"WRITE TYPO.II"
30 LIST 63000,63150
40 PRINT "RUN 63040": PRINT DS;
   "CLOSE"
50 NEW
63000 REM * TYPO II, VERSION 1.
    1
63010 REM * BY GERRY VILLAREAL
    AND FRANK HAYES
63020 REM * (C) 1985, 1986 ANTI
    C PUBLISHING INC.
63030 REM * II COMPUTING
63040 TEXT : HOME : PRINT SPC(
    11);"CODE", SPC(5)"LINE NO.
    ": POKE 34,1
63042 DEF FN PK(X) = PEEK(X)
    + 256 * PEEK(X + 1)
63050 CH = 0:S = FN PK(103)
```

```
63060 S1 = S + 3:N = FN PK(S):L
    INE = FN PK(S + 2): IF LINE
    = 63000 THEN 63140
63070 LV = 0: FOR A = 1 TO 255
63080 C = PEEK(S1 + A): IF C =
    0 THEN 63100
63090 LV = LV + C * A: NEXT A
63100 CODE = LV - INT(LV / 676
    ) * 676
63110 HCODE = INT(CODE / 26):L
    CODE = CODE - HCODE * 26
63120 PRINT SPC(12); CHR$(HC
    ODE + 65); CHR$(LCODE + 65)
    ; SPC(8);LINE
63130 CH = CH + LV + LINE:S = N:
    GOTO 63060
63140 PRINT SPC(7);"TOTAL CHE
    CKSUM = ";CH: POKE 34,0
63150 DEL 63000,63150
```

NO MORE TYPING!!

It's true when you subscribe to *II Computing's* ACTION EDITION! Every issue will contain programs for Education, Adventure, Utilities, Business and more. Instead of keyboard frustrations and program debugging, all you have to do is Load and Go! Find out more details in the easy-order Subscription forms in this issue.

Plus two public domain programs from Newton's Apple: Mirrors and Inertia!

POND

Article on page 14

```

10 REM * POND
20 REM * BY JENNY SCHMIDT
30 REM * (C) COPYRIGHT 1986
40 REM * ANTIC PUBLISHING, INC
50 REM * II COMPUTING VOL.2 NO.
  2
60 PRINT CHR$(17)
100 IF PEEK(104) < > 128 THEN
    POKE 103,1: POKE 104,128: POKE
    32768,0: PRINT CHR$(4)"RUN
    POND"
110 TEXT : HOME : VTAB 8: HTAB
    18: PRINT "POND": VTAB 10: HTAB
    19: PRINT "BY": VTAB 12: HTAB
    14: PRINT "JENNY SCHMIDT"
120 PRINT CHR$(4)"BLOAD POND.
    SHAPES": PRINT CHR$(4)"BLO
    AD POND.HEX,A$800"
130 VTAB 15: HTAB 10: INPUT "PR

```

```

ESS RETURN TO START ";A$
140 CALL 2048
150 HOME : END

```

TYPO II TABLE

Code	Line#	Code	Line#	Code	Line#
ZP	10	HO	50	TJ	120
BS	20	FD	60	YJ	130
KH	30	PI	100	HO	140
CD	40	HK	110	ZB	150

Total checksum = 441589

SHAPER

```

10 REM * SHAPER
20 REM * BY FRANK HAYES
30 REM * (C) COPYRIGHT 1986
40 REM * ANTIC PUBLISHING, INC.

50 REM * II COMPUTING
100 PRINT CHR$(4)"BLOAD POND.
    SHAPES.HEX"
110 P0 = 8192:BASE = 24576: DIM
    A(100)
120 I = PEEK(P0):P0 = P0 + 1
130 PRINT I;" SHAPES"
140 PTR = BASE + 2 * I
150 PRINT "EXPANDING SHAPE ";
160 FOR C0 = 0 TO I - 1
170 PRINT C0 + 1;" ";
180 QH = INT(PTR / 256): POKE
    BASE + 2 * C0 + 1,QH
190 QL = PTR - 256 * QH: POKE BA
    SE + 2 * C0,QL
200 A = 3: GOSUB 1000
210 H = A(0):V = A(1):COUNT = H *
    V
220 QP = PTR + 14
230 FOR C2 = 0 TO 6
240 QH = INT(QP / 256): POKE P
    TR + 2 * C2 + 1,QH
250 QL = QP - 256 * QH: POKE PTR
    + 2 * C2,QL
260 QP = QP + COUNT
270 NEXT C2
280 PTR = PTR + 14
290 A = COUNT: GOSUB 1000

```

```

300 QF = 0
310 FOR C2 = 0 TO COUNT - 1
320 IF A(C2) > 127 THEN QF = 1:
    A(C2) = A(C2) - 128
330 NEXT C2
340 FOR C1 = 1 TO 6
350 FOR C2 = 0 TO V - 1
360 QC = 0
370 FOR C3 = 0 TO H - 1
380 QD = A(C3 + H * C2) * 4 + QC

390 QC = INT(QD / 128)
400 A(C3 + H * C2) = QD - 128 *
    QC
410 NEXT C3
420 NEXT C2
430 FOR C2 = 0 TO V - 1
440 FOR C3 = 0 TO H - 1
450 CT = C2 * H + C3:G1 = A(CT):
    G2 = 0: IF C3 < H - 1 THEN G
    2 = A(CT + 1)
460 IF (G1 OR G2) AND QF THEN G
    1 = G1 + 128 * QF:G2 = G2 +
    128 * QF
470 POKE PTR + CT,G1: POKE PTR +
    CT + 1,G2
480 NEXT C3
490 NEXT C2
500 PTR = PTR + COUNT
510 NEXT C1
520 NEXT C0
530 PRINT CHR$(4)"BSAVE POND.

```

continued on next page


```

SHAPES,A$6000,E";PTR - 1
540 END
1000 FOR C2 = 0 TO A - 1
1010 A(C2) = PEEK (P0 + C2)
1020 POKE PTR + C2,A(C2)
1030 NEXT C2
1040 P0 = P0 + A:PTR = PTR + A
1050 RETURN

```

TYPO II TABLE

Code	Line#	Code	Line#	Code	Line#
WD	10	EC	240	VQ	430
UP	20	YN	250	RZ	440
KH	30	KP	260	JD	450

UJ	40	PY	270	LG	460
CK	50	YJ	280	YH	470
OZ	100	ZL	290	QB	480
XP	110	NX	300	PY	490
UV	120	SG	310	YY	500
NK	130	RY	320	PV	510
WZ	140	PY	330	PS	520
OE	150	MH	340	IQ	530
UW	160	UQ	350	EY	540
UD	170	NR	360	PZ	1000
OS	180	RZ	370	UV	1010
VT	190	AN	380	SI	1020
SU	200	QS	390	PY	1030
QW	210	SE	400	YQ	1040
LP	220	QB	410	GV	1050
MF	230	PY	420		

Total checksum = 780312

POND.HEX

Enter using HEX.ENTRY; save with BSAVE POND.HEX,A\$2000,L\$CE0

```

2000: A9 00 85 FD 8D 3C OF 8D 3D OF A9 60 85 FE A9 01 8D 49 OF 20 52 0C 2C 10 C0 AD 00 C0 C9 80 90 43 CH: 3322
2020: C9 80 90 3F C9 B5 B0 08 38 E9 B0 8D 56 OF B0 33 A2 6A 86 06 A2 OF 86 07 AE 56 OF 8E 6F OF C9 C9 CH: 3755
2040: D0 06 20 9C 0E 4C 63 08 C9 CA D0 06 20 B9 0E 4C 63 08 C9 CB D0 06 20 D6 0E 4C 63 08 C9 CD D0 03 CH: 3308
2060: 20 09 0F A2 00 AD 55 OF D0 0B 20 E3 13 29 1F 8D 55 OF EE 55 OF CE 55 OF BD A0 OF 85 06 E8 BD A0 CH: 3029
2080: 0F 85 07 E8 8E B0 OF 20 E3 13 29 03 8D 6F OF EE 6F OF AD 55 OF D0 03 20 E0 0B A0 05 B1 06 30 OF CH: 2835
20A0: 4A B0 06 20 B9 0E 4C BB 08 20 D6 0E 4C BB 08 4A B0 06 20 9C 0E 4C BB 08 20 09 0F AE B0 OF E0 10 CH: 2679
20C0: F0 03 4C 78 08 AD 4D OF 18 69 02 C9 8C 90 09 20 E3 13 4A 8D 4C OF A9 00 8D 4D OF AD 51 OF 18 69 CH: 2721
20E0: 02 C9 78 90 09 20 E3 13 4A 8D 52 OF A9 00 8D 51 OF A9 00 8D 49 13 AD 43 13 F0 03 4C 90 09 A9 20 CH: 2806
2100: 8D 43 13 A9 00 85 FB A9 16 85 FC 20 DD OF A0 00 AD 6A OF 99 00 16 C8 AD 6B OF 99 00 16 C8 AD 6C CH: 3404
2120: 0F 99 00 16 C8 AD 4B OF 99 00 16 C8 AD 4C OF 99 00 16 C8 AD 4D OF 99 00 16 C8 AD 50 OF 99 00 16 CH: 2750
2140: C8 AD 51 OF 99 00 16 C8 AD 52 OF 99 00 16 C8 AD 53 OF 99 00 16 C8 AD 54 OF 99 00 16 C8 AD 55 CH: 3351
2160: 00 03 F0 1E D0 EB 99 00 16 E8 C8 BD 70 OF 99 00 16 E8 C8 BD 70 OF 99 00 16 E8 E8 E8 E8 E8 E8 CH: 4137
2180: D0 CF A9 80 99 00 16 20 DD OF 2C 55 C0 4C 1F 0A A9 00 8D 43 13 A9 00 85 FB A9 15 85 FC 20 DD OF CH: 3385
21A0: A0 00 AD 6A OF 99 00 15 C8 AD 6B OF 99 00 15 C8 AD 6C OF 99 00 15 C8 AD 6D OF 99 00 15 C8 AD 6E CH: 3053
21C0: 0F 99 00 15 C8 AD 4D OF 99 00 15 C8 AD 50 OF 99 00 15 C8 AD 51 OF 99 00 15 C8 AD 52 OF 99 00 15 CH: 2757
21E0: C8 A2 00 BD 70 OF C9 8D D0 0E 8A 18 69 06 AA C9 30 8D 00 03 F0 1E D0 EB 99 00 15 E8 C8 BD 70 OF CH: 3700
2200: 99 00 15 E8 C8 BD 70 OF 99 00 15 E8 E8 E8 E8 E8 E8 E8 E8 E8 E8 E8 E8 E8 E8 E8 E8 E8 E8 E8 E8 CH: 4132
2220: 00 A9 6A 85 06 A9 OF 85 07 BD A0 OF 85 08 E8 BD A0 OF 85 09 E8 8E B0 OF A0 00 B1 08 30 61 20 2E CH: 3114
2240: 14 90 5C A0 00 B1 06 38 E9 04 D1 08 F0 51 90 42 AE 49 OF CA 8A 0A 0A 11 08 AA BD 3E OF F8 18 6D CH: 3104
2260: 3C OF 8D 3C OF A9 00 6D 3D OF 8D 3D OF D8 AD 43 13 48 A9 00 8D 43 13 20 81 14 A9 20 8D 43 13 20 CH: 2446
2280: 81 14 68 8D 43 13 A9 80 A0 00 91 08 20 FE 13 4C A6 0A C8 A9 46 91 06 C8 A9 AA 91 06 4C 19 0B AE CH: 3213
22A0: B0 OF E0 10 D0 83 A9 4B 85 06 A9 OF 85 07 A9 6A 85 08 A9 OF 85 09 20 2E 14 90 3A A9 00 8D 4D OF CH: 2921
22C0: 20 E3 13 4A 8D 4C OF 20 0C 14 AE 6A OF E8 E0 08 90 13 EE 49 OF AD 49 OF C9 04 D0 03 4C A4 0B 20 CH: 2856
22E0: 52 0C 4C 19 08 8E 6A OF 8A 20 1A 14 8D 6D OF 8E 6E OF 4C 19 08 A9 50 85 06 A9 OF 85 07 20 2E 14 CH: 2133
2300: 90 5F A9 00 8D 51 OF 20 E3 13 4A 8D 52 OF 20 0C 14 AE 6A OF CA E0 03 D0 3B CE 4A OF A9 B8 8D 40 CH: 3143
2320: 13 A9 05 8D 41 13 AD 43 13 48 A9 00 8D 43 13 AD 4A OF 20 B8 13 A9 20 8D 43 13 A9 B8 8D 40 13 AD CH: 2820
2340: 4A OF 20 B8 13 68 8D 43 13 20 F0 13 AD 4A OF F0 53 4C 61 0B 8E 6A OF 8A 20 1A 14 8D 6D OF 8E 6E CH: 2711
2360: 0F 20 E3 13 29 OF D0 39 A2 00 BD A0 OF 85 06 E8 BD A0 OF 85 07 E8 A0 00 B1 06 10 21 AD 6B OF 29 CH: 2975
2380: 03 91 06 20 1A 14 A0 03 91 06 8A C8 91 06 A0 01 A9 46 91 06 C8 91 06 20 E0 0B 4C 19 08 E0 10 D0 CH: 2761
23A0: C9 4C 19 08 A9 0E 8D 00 17 A9 3C 8D 01 17 A9 5A 8D 02 17 A9 80 8D 03 17 A9 00 85 FB A9 17 85 FC CH: 3070
23C0: A9 01 8D 49 13 20 DD OF 2C 10 C0 20 1B FD C9 CE F0 07 C9 EE F0 03 4C 00 08 2C 54 C0 2C 51 C0 60 CH: 3388
23E0: AD 49 OF C9 01 F0 60 C9 03 F0 2E A0 00 AD 6A OF 38 E9 04 D1 06 90 50 20 E3 13 30 0E C8 B1 06 CD CH: 3403
2400: 6B OF 2A 29 01 A0 05 91 06 60 C8 C8 B1 06 CD 6C OF 2A 09 80 A0 05 91 06 60 A0 00 AD 6A OF 38 E9 CH: 2863
2420: 04 D1 06 B0 22 20 E3 13 30 0E C8 AD 6B OF D1 06 2A 29 7F A0 05 91 06 60 C8 C8 AD 6C OF D1 06 2A CH: 3054
2440: 09 80 A0 05 91 06 60 20 E3 13 4D 6B OF A0 05 91 06 60 20 E2 F3 20 D8 F3 A0 00 A9 0D 99 00 17 C8 CH: 3148

```

continued on next page

HEX.ENTRY

HEX.ENTRY is *II Computing's* program for entering object code and other non-BASIC programs and routines. To use HEX.ENTRY, first type in the program on this page and check it with TYPO.II.

Now run HEX.ENTRY, and turn to the Software Library page containing the object code listing. For each row in the object code listing, first type in the hex address (but don't type the colon that follows it) and press RETURN. Then enter each hex value in the row, fol-

lowing it with a RETURN. After the 32nd hex value, HEX.ENTRY will print a checksum on the screen. The checksum should match the checksum at the end of the line in the object code listing; if it doesn't, type the line again, beginning with the hex address.

When you're finished, be sure to save what you've typed in with a BSAVE command. With HEX.ENTRY, you can be sure that your object code is correctly typed and ready to use!

```

10 REM * HEX CODE LOADER AND C
   HECKSUM PROGRAM
20 REM * BY FRANK HAYES
30 REM * (C) 1986 ANTIC PUBLIS
   HING, INC.
40 REM * II COMPUTING VOL.1 N
   O.6
100 PRINT "LOADING ADDRESS IN H
   EX (OR 0 TO QUIT) ? ";
102 INPUT A$: IF A$ = "" THEN 1
   02
110 GOSUB 1000
112 IF B = - 1 THEN PRINT : GOTO
   100
114 IF B > 65535 THEN PRINT "V
   ALUE TOO LARGE": PRINT : GOTO
   100
116 IF B = 0 THEN END
120 AD = B
130 CH = 0
140 FOR C = 0 TO 31
142 PRINT C + 1; " ";
144 IF C < 9 THEN PRINT " ";
146 INPUT A$
150 GOSUB 1000
152 IF B = - 1 THEN PRINT : GOTO
   142
154 IF B > 255 THEN PRINT "VAL
   UE TOO LARGE": PRINT : GOTO
   142
156 POKE AD + C, B
158 CH = CH + B
160 NEXT C
170 PRINT : PRINT "CHECKSUM = "
   ;CH
172 PRINT "IF CHECKSUM DOESN'T
   MATCH,"
174 PRINT " RETYPE THIS ROW."
176 PRINT

```

```

180 GOTO 100
999 END
1000 B = 0
1010 FOR A = 1 TO LEN (A$)
1012 B$ = MID$ (A$,A,1)
1014 IF B$ < "0" OR B$ > "F" THEN
   GOTO 1018
1016 IF B$ < ":" OR B$ > "e" THEN
   GOTO 1020
1018 PRINT "BAD HEX VALUE": B =
   - 1: RETURN
1020 B1 = ASC (B$) - 48: IF B1 >
   9 THEN B1 = B1 - 7
1022 B = 16 * B + B1
1024 NEXT A
1026 RETURN

```

TYPO II TABLE

Code	Line#	Code	Line#	Code	Line#
XR	10	LB	142	XH	180
LC	20	WU	144	EY	999
UP	30	OG	146	YC	1000
RB	40	GS	150	IA	1010
PT	100	AJ	152	II	1012
OL	102	AR	154	RY	1014
GS	110	NO	156	LV	1016
XT	112	QF	158	PP	1018
FA	114	KE	160	TE	1020
GJ	116	UF	170	US	1022
PX	120	PQ	172	KA	1024
NN	130	MG	174	GV	1026
ZP	140	HE	176		

Total checksum = 511440

```

2460: A9 3C 99 00 17 C8 A9 5E 99 00 17 C8 A9 80 99 00 17 A9 20 8D 43 13 A9 00 85 FB A9 17 85 FC 20 DD CH: 3528
2480: 0F A9 18 8D 41 13 A9 5D 8D 40 13 AD 49 0F 20 B8 13 A9 00 A2 05 20 A8 FC CA D0 FA 20 D8 F3 A2 00 CH: 3516
24A0: A0 00 A9 09 99 00 17 C8 BD BD 0F E8 99 00 17 C8 BD BD 0F E8 99 00 17 C8 E0 20 D0 E6 A9 08 8D 58 CH: 3816
24C0: 0F 99 00 17 C8 20 67 14 8D 59 0F 99 00 17 C8 8A 8D 5A 0F 99 00 17 C8 A9 08 8D 5B 0F 99 00 17 C8 CH: 2727
24E0: 20 67 14 18 69 2E 8D 5C 0F 99 00 17 C8 8A 8D 5D 0F 99 00 17 C8 A9 08 8D 5E 0F 99 00 17 C8 20 67 CH: 2655
2500: 14 18 69 5D 8D 5F 0F 99 00 17 C8 8A 8D 60 0F 99 00 17 C8 A9 08 8D 61 0F 99 00 17 C8 20 67 14 8D CH: 2737
2520: 62 0F 99 00 17 C8 8A 18 69 50 8D 63 0F 99 00 17 C8 A9 08 8D 64 0F 99 00 17 C8 20 67 14 18 69 2E CH: 2606
2540: 8D 65 0F 99 00 17 C8 8A 18 69 50 8D 66 0F 99 00 17 C8 A9 08 8D 67 0F 99 00 17 C8 20 67 14 18 69 CH: 2710
2560: 5D 8D 68 0F 99 00 17 C8 8A 18 69 50 8D 69 0F 99 00 17 C8 A9 0C 99 00 17 C8 A9 32 99 00 17 C8 A9 CH: 3034
2580: B8 99 00 17 C8 A9 80 99 00 17 A9 20 8D 43 13 A9 01 8D 49 13 20 DD 0F 20 81 14 A9 B8 8D 40 13 A9 CH: 3059
25A0: 05 8D 41 13 8D 4A 0F 20 B8 13 A9 00 8D 43 13 20 DD 0F 20 81 14 A9 B8 8D 40 13 A9 05 8D 41 13 20 CH: 2548
25C0: B8 13 A9 06 8D 6A 0F 20 1A 14 8E 6E 0F 8D 6D 0F A9 46 8D 6B 0F A9 A0 8D 6C 0F A9 02 8D 56 0F A2 CH: 2920

```

continued on next page

APPLE COMPUTER, INC. makes no warranties, either express or implied, regarding the enclosed computer software package, its merchantability or its fitness for any particular purpose. The exclusion of implied warranties is not permitted by some states. The above exclusion may not apply to you. This warranty provides you with specific legal rights. There may be other rights that you may have which vary from state to state.

40

TEACHER/PARENT TIPS

by Sara Armstrong

BANNER MAKER (accompanies article on page 32)

- 1.** ***Introduction:** Banners are fun for any festive occasion. With BANNER MAKER even the youngest children can use the computer to create banners marking special days. Students simply type in a message which is printed as a banner.*

Lesson Objective:

To introduce children to simple computer and printer use as they create a decorative banner.

Prerequisites:

None

Target age:

Grades 1-3 (See below for other uses)

Group size:

2

Time:

5-10 minutes

Materials:

Pencil

Paper

Magic markers

Paint

Crayons

Activity I:

1. Teacher introduces the idea of the BANNER program. The group can generate messages, such as MERRY CHRISTMAS or HAPPY HANUKKAH, and write them on the board for everyone to see.
2. Students get into pairs, and decide on two messages to print—one each—which they write on their own papers, checking for spelling.
3. Pairs come to the computer and take turns typing in their messages. Students decide type size, and whether to print in upper or lower case letters.
4. After banners are printed out students can decorate them with crayons, paints, magic markers.

Activity II:

1. Teacher and/or class does some research on how other countries

express Christmas, Hanukkah and New Year greetings.

2. Pairs of students decide on a foreign language greeting, copy the text on their papers, check for spelling, and print out their banners.

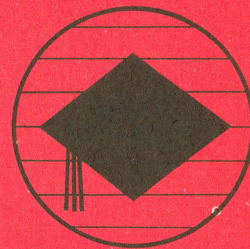
3. Students can decorate banners using the colors of the country's flag, or illustrations of objects used in traditional holiday celebrations (e.g., shoes to be filled with gifts in Spain and France; Christmas Eve dinner eels in Italy; a seven-candle wreath for St. Lucia's Day in Denmark, Norway and Sweden, etc.).

Expressions of "Merry Christmas" and "New Year" from other countries:

France	Joyeux Noel, Bonne Annee
Spain, Mexico	Feliz Navidad, Feliz Ano Nuevo
Germany, Austria	Froehliche Weihnachten, Gutes Neues Jahr
Italy	Buon Natale, Buon Capo D'Anno
Sweden	God Jul, Godt Nytt Ar
Denmark	Glaedelig Jul, Godt Nytt Ar
Belgium	Vrolijke Kerstmis
Finland	Hauskaa Joulua
The Netherlands	Gledelig Jul, Gelukkig Nieuwjaar
Portugal, Brazil	Boas Festas
Ireland	Aith-Bhliain Fe Mhaise Dhuait (Happy New Year)

Extensions:

1. Older students can select a country, do research about it, focusing on Christmas or Hanukkah traditions, write and illustrate a report.
2. Older students can research countries such as China, Japan, Russia and Israel, which use different alphabets. Although "Merry Christmas" and "Happy Hanukkah" can be expressed in English from these languages, students may opt to create hand-written banners of appropriate messages using the native symbol systems.



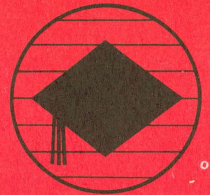
PARENTS: You can use BANNER MAKER for any holiday or message. Using it is a great opportunity to help your children with spelling or ideas for messages for birthdays, anniversaries or messages such as "I LOVE YOU." The banners are also fun to decorate and can spark a lot of artistic creativity.

TEACHER/PARENT TIPS

A States and Capitals Game

ALMOST PERFECT

(accompanies article page 52)



2. ***Introduction:** ALMOST PERFECT lets students practice recalling states and their capitals, with extra points for correct spelling. The computer offers another medium for learning this important information.*

Lesson Objective: To assist students in learning the names and spellings of the states of our country and their capitals.

Prerequisites: Some familiarity with the computer keyboard; knowledge of the names of the states and capitals.

Target age: Grades 4-6 (See below for other uses)

Group size: 2

Time: 10-20 minutes

Materials: Pencil, paper, list of states and their capitals (Activity I), map (page 53)

Activity I:

1. Pairs of students come to the computer. One student runs the program and types the answer. The other student (the recorder) checks the computer's response to the answer.
2. If the answer was spelled correctly, the recorder makes a check mark next to the name on the states and capitals list. If the answer was spelled incorrectly, the recorder circles the name.
3. At the end of a turn, the recorder returns the list so that the first student can study any incorrectly spelled names.
4. Students switch roles and repeat the procedure.

Activity II:

1. In this game, students must be familiar with the actual geographical location of the states. Again, students pair up, one to run the program, the other to act as recorder.
2. When the first student identifies a state or capital, he or she types in the correct name, and then points to the correct place on the map. The recording student writes in the name on the map.

3. At the end of a turn, students reverse roles.
4. When all the names have been filled in (which may take several turns), students can color their maps and/or decorate them.

Extensions:

1. For younger students, teachers may want to make a concentration game for learning states and capitals. Make a set of cards with states' names and a set with capitals' names. Lay out all the cards on a table. To play, a student turns over one card, then another. If the cards are the matching state and capital, he or she removes the cards onto his or her own pile. If the cards don't match, they remain on the table, face down. As more cards get overturned, it is up to the student to remember not only which capital and state go together, but where the physical placement of the correct card is.
2. Students of any age can write state reports, researching sections of the country.
3. Students of any age can write to students in another state to gather information

for reports and to compare experiences. (The Post Office prints a Pen Pal Directory.)

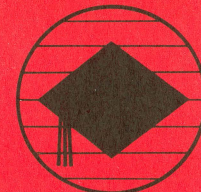
4. Students of any age may be interested in the origin of the names of our states and capitals. Older students can compile data showing how many names are Native American in origin, names of people, etc.

5. Students who live in or near capital cities may have the opportunity to visit the capitol building and write reports about it.

Record-keeping ideas:

1. For Activity I, individual papers can be kept by each student, or kept in a master file.
2. For Activity II, completed maps can be displayed in the classroom.

***PARENTS:** Use this game together with your family to plan a real or imaginary vacation. Use maps and library books to trace routes and discover attractions near and far.*



POND

(accompanies article page 14)

3.

Introduction: *POND can be played by students who have completed a study of protists, i.e., unicellular, acellular organisms—bacteria, protozoans, algae, etc. Student takes on the form of a microbe in a pond and mutates to higher forms by eating the right organisms and avoiding being eaten.*

Lesson Objective:

To provide an experience which enhances understanding of a food chain.

Prerequisites: *Familiarity with the computer keyboard; some degree of manual dexterity.*

Target age: *Grades 7–9 (See below for other uses)*

Group size: *2*

Time: *10–15 minutes*

Materials: *Pencil, paper*

Activity I:

1. As part of a unit in biological science, students research and write reports about life cycles of pond organisms, including characteristics, growth and reproduction. A simulated pond environment, including at least four organisms in a food chain, is the basis of the report.
2. Pairs of students come to the computer. They decide who will take the first turn to play POND. The first student plays the game as the second student keeps track of speed, survival rate, level achieved and number of points scored.
3. Players reverse roles and first student keeps track of second student's game.
4. After their time is up, students discuss their experience and brainstorm ideas for improving their survival.

Activity II:

1. Students play POND.
2. Each student writes a story, taking on the role of a pond organism. The story should include information about the organism's life cycle, what it can eat, what can eat it, and what life is like for it in the pond. Students can illustrate their stories if they wish.
3. Students share their stories with the class. Students discuss their own lives, drawing comparisons and contrasts to life in a pond.

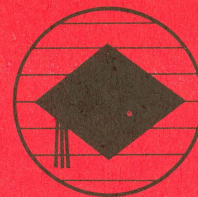
Extensions:

1. Younger students research appropriate terms, such as "microbe," "mutate," "life cycle," "food chain." Students write stories about life in a pond. Students draw pictures and create other models of pond life. Students simulate pond life by role-playing organisms. Students discuss their experience—what it's like to be microscopic; to be eaten; to live in water, etc.

2. Older students obtain samples of pond water and examine it under a microscope. Students research different varieties of life that could be found in ponds in different environments (warm climate, cold climate, etc.).

PARENTS: *You can discuss with your children what it's like to be a very small creature in a large world. Encourage your children to go to the library to find books about pond life. Then they can draw pictures and write stories about pond creatures.*

TEACHER/PARENT TIPS



GRASSROOTS BULLETIN BOARDS (accompanies article on page 56)

4.

Introduction: Access to bulletin board systems through telecommunications puts computer users in touch with a wide range of information services. The article, "Grassroots Bulletin Boards" emphasizes how people can exchange ideas on important issues in the nation and the world.

Lesson Objective: To allow students to interact with local and national telecommunications networks and express their views.

Prerequisite: Familiarity with computer systems and modem use.

Target age: Grades 9–12 in either computer science or social studies classes (See below for other uses)

Group size: 2–4

Time: 10–15 minutes on-line

Materials: Pencil and paper for taking notes
Any telecommunications program compatible with your Apple II computer

Activity I:

1. Students access Newsbase (see "Grassroots Bulletin Boards" in this issue) or another bulletin board that deals with current news.
2. Students decide on a few news stories to read, and either take notes on what is reported or discussed or download the articles and read them offline.
3. Students leave the computer to another group, and discuss the news items.
4. Each group chooses one news story to focus on. Each group member writes a short paper commenting on the topic. Students research unclear issues in the story, or find sources to support their positions.
5. Students in each group discuss their papers, and share their ideas and findings with the large group. Each small group decides on a single response to make to the bulletin board. Students access bulletin board and enter their response.
6. Students access bulletin board later to see any reactions to their response, and to begin the process again with other news items.

Activity II:

1. Students research other local bulletin boards and participate in other bulletin board activities as time and phone changes allow.

Activity III:

1. Students contact other high school computer science or social studies classes to get information about creating their own bulletin board or expanding services available at other schools. Perhaps a cooperative telecommunications project between classes can develop.

Extensions:

1. Younger students can be introduced to the concept of an electronic bulletin board, and simulate it on an actual board in the classroom.
2. Very young children can write stories about neighborhood events with another class, simulating bulletin board comment and response. One class writes one or two paragraphs, and then passes the story on to the next group. The second group makes comments and adds to the story and returns it. Illustrations can accompany

each part of the story. A copy for each class can be made when the story/dialogue is done.

PARENTS: Bulletin boards offer information on a variety of topics. As you contact bulletin boards, include your children in the process by discussing what you are doing and soliciting comments about the different services available.

Sara Armstrong founded an elementary Montessori school in Hayward, California, where she also teaches. She has evaluated science software for the State of California's "Technology in the Classroom" series and is a graduate student in the Ph.D. program in education at the University of California at Berkeley. She is also an instructor in the Computers in Education certificate program at University of California, Berkeley extension.

If you'd like more articles like this one, circle 269 on our Reader Service Card.

POND.SHAPES.HEX

Enter using HEX.ENTRY; save with BSAVE POND.SHAPES,A\$2000,L\$260

```

2000: 0F 03 03 03 04 00 00 15 00 00 04 00 00 04 05 05 10 00 00 00 54 00 00 00 55 02 00 00 54 00 00 00 CH: 338
2020: 10 00 00 00 04 07 07 54 0A 00 00 05 28 00 00 41 20 00 00 11 22 00 00 41 20 00 00 05 28 00 00 54 CH: 547
2040: 0A 00 00 05 09 09 44 08 01 00 00 05 02 05 00 00 10 22 00 00 00 41 0A 04 00 00 54 28 01 00 00 41 CH: 441
2060: 0A 04 00 00 10 22 00 00 00 05 02 05 00 00 44 08 01 00 00 03 03 03 0C 00 00 3F 00 00 0C 00 00 04 CH: 253
2080: 05 05 30 00 00 00 7C 01 00 00 7F 07 00 00 7C 01 00 00 30 00 00 00 04 07 07 7C 1F 00 00 0F 78 00 CH: 798
20A0: 00 43 61 00 00 33 66 00 00 43 61 00 00 0F 78 00 00 7C 1F 00 00 05 09 09 4C 19 03 00 00 0F 06 0F CH: 934
20C0: 00 00 30 66 00 00 00 43 1F 0C 00 00 7C 79 03 00 00 43 1F 0C 00 00 30 66 00 00 00 0F 06 0F 00 00 CH: 804
20E0: 4C 19 03 00 00 05 0F 09 00 15 00 00 00 20 55 00 00 00 28 55 02 00 00 28 55 02 00 00 28 55 02 00 CH: 652
2100: 00 2A 55 0A 00 00 2A 55 0A 00 00 2A 55 0A 00 00 2A 55 0A 00 00 2A 55 0A 00 00 2A 51 0A 00 00 2A CH: 860
2120: 51 0A 00 00 28 51 02 00 00 28 51 02 00 00 20 40 00 00 00 07 03 0F 0C 80 81 82 00 00 00 90 A2 C4 CH: 1539
2140: 88 00 00 00 85 88 90 A0 81 80 00 03 0F 03 82 80 00 82 80 00 82 80 00 82 80 00 8A 80 00 8A 80 00 CH: 2551
2160: 8A 80 00 88 80 00 88 80 00 A8 80 00 A8 80 00 A8 80 00 A0 80 00 A0 80 00 A0 80 00 05 03 0A AA 81 CH: 2863
2180: 00 00 00 A0 D5 00 00 00 80 D0 AA 80 00 08 07 14 3E 7C 78 78 61 03 00 00 03 06 4C 19 33 00 00 00 CH: 1729
21A0: 03 06 4C 19 33 10 00 00 1E 06 4C 79 71 01 00 00 30 06 4C 79 30 10 00 00 30 06 4C 19 31 00 00 00 CH: 1043
21C0: 1F 7C 78 18 63 03 00 00 08 07 14 03 7C 4C 71 33 00 00 00 03 06 4C 19 30 00 00 00 03 06 4C 19 30 CH: 1119
21E0: 00 00 00 03 1E 4C 79 30 00 00 00 03 06 4C 19 30 00 00 00 03 06 48 18 30 00 00 00 3E 7C 30 70 63 CH: 1034
2200: 07 00 00 0A 07 1C 1F 7C 7C 18 40 61 0C 0F 00 00 33 06 4C 19 20 62 4C 19 00 00 33 06 4C 19 30 66 CH: 1240
2220: 0C 08 00 00 1F 1E 7C 18 70 47 07 06 00 00 0F 06 0C 18 30 06 03 06 00 00 33 06 0C 18 30 06 03 00 CH: 695
2240: 00 00 33 7C 0C 70 33 06 03 06 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 CH: 365

```

ALMOST PERFECT

Article on page 52

STATES

```

10 REM * STATES AND CAPITALS
20 REM * BY JOHN RATCLIFF
30 REM * (C) COPYRIGHT 1986
40 REM * ANTIC PUBLISHING, INC.

50 REM * II COMPUTING VOL.2 NO.
  2
60 DIM ST(100):SP = 0: GOTO 100
70 G = INT ( RND (1) * T):A = C
  (G):C(G) = C(T - 1):C(T - 1)
  = A:T = T - 1: IF T = 0 THEN
    T = 50
80 B = ( RND (1) > .5): RETURN
100 DS = CHR$(4)
110 DIM ST$(1,49),C(49),Q$(1),Q
    2$(1)
112 Q$(0) = " IS THE CAPITAL OF
  ":Q$(1) = " STATE'S CAPITAL
  IS "
113 Q2$(0) = " IS THE CAPITAL OF
  ":Q2$(1) = "'S STATE CAPITA
  L IS "
120 HOME : UTAB (12)
130 PRINT "READING DATA TABLES.
  .."
140 FOR J = 0 TO 49: FOR K = 0 TO
  1: READ ST$(K,J): NEXT : NEXT

150 HOME : UTAB (12)
180 FOR J = 0 TO 49:C(J) = J: NEXT
  :T = 50
200 HOME
205 N = N + 1
210 GOSUB 70
220 UTAB (2): PRINT "ANSWER THE
  QUESTION BELOW:": PRINT : PRINT

230 PRINT "WHAT"Q$(B)ST$(B,A)"?
  "
240 INPUT A$
250 B$ = ST$( NOT B,A)
260 GOSUB 2000:G = MT
265 PRINT : PRINT
270 IF G = 100 THEN PRINT "YOU
  R ANSWER IS CORRECT.":SC = S
  C + 5: GOTO 300
280 IF G > 85 THEN PRINT "YOU
  ANSWERED THE QUESTION CORREC
  TLY": PRINT "BUT YOU MISSPEL
  LED THE WORD.":SC = SC + 4: GOTO
  300
290 IF G > 70 THEN PRINT "YOU
  HAVE THE RIGHT IDEA BUT YOUR
  ": PRINT "SPELLING IS OFF.":
  SC = SC + 3: GOTO 300

```

continued on next page


```

295 PRINT "YOU ANSWERED INCORRE
CTLY."
300 PRINT ST$( NOT B,A)Q2$(B)ST
$(B,A)".
320 PRINT : PRINT "YOUR SCORE I
S NOW "SC".
330 PRINT : PRINT "PRESS Q TO Q
UIT": PRINT "OR ANY OTHER KE
Y TO CONTINUE."
340 GET G$: IF G$ < > "Q" THEN
200
350 HOME : VTAB (12): PRINT "YO
U FINISHED WITH A SCORE OF "
SC: PRINT "OUT OF A POSSIBLE
SCORE OF "N * 5".: PRINT "
YOU SCORED " INT (SC / (N *
5) * 100 + .5)"%"
360 END
1000 DATA "ALABAMA", "BIRMINGHA
M"
1010 DATA "ALASKA", "JUNEAU"
1020 DATA "ARIZONA", "PHOENIX"
1030 DATA "ARKANSAS", "LITTLE R
OCK"
1040 DATA "CALIFORNIA", "SACRAM
ENTO"
1050 DATA "COLORADO", "DENVER"
1060 DATA "CONNECTICUT", "HARTF
ORD"
1070 DATA "DELAWARE", "DOVER"
1080 DATA "FLORIDA", "TALLAHASS
EE"
1090 DATA "GEORGIA", "ATLANTA"
1100 DATA "HAWAII", "HONOLULU"
1110 DATA "IDAHO", "BOISE"
1120 DATA "ILLINOIS", "SPRINGFI
ELD"
1130 DATA "INDIANA", "INDIANAPO
LIS"
1140 DATA "IOWA", "DES MOINES"
1150 DATA "KANSAS", "WICHITA"
1160 DATA "KENTUCKY", "FRANKFOR
T"
1170 DATA "LOUISIANA", "BATON R
OUGE"
1180 DATA "MAINE", "AUGUSTA"
1190 DATA "MARYLAND", "ANNAPOLI
S"
1200 DATA "MASSACHUSETTS", "BOS
TON"
1210 DATA "MICHIGAN", "LANSING"
1220 DATA "MINNESOTA", "SAINT P
AUL"
1230 DATA "MISSISSIPPI", "JACKS
ON"
1240 DATA "MISSOURI", "JEFFERSO
N CITY"
1250 DATA "MONTANA", "HELENA"
1260 DATA "NEBRASKA", "LINCOLN"
1270 DATA "NEVADA", "CARSON CIT
Y"
1280 DATA "NEW HAMPSHIRE", "CON
CORD"
1290 DATA "NEW JERSEY", "TRENTO
N"

```

```

1300 DATA "NEW MEXICO", "SANTA
FE"
1310 DATA "NEW YORK", "ALBANY"
1320 DATA "NORTH CAROLINA", "RA
LEIGH"
1330 DATA "NORTH DAKOTA", "BISM
ARCK"
1340 DATA "OHIO", "COLUMBUS"
1350 DATA "OKLAHOMA", "OKLAHOM
A CITY"
1360 DATA "OREGON", "SALEM"
1370 DATA "PENNSYLVANIA", "HARR
ISBURG"
1380 DATA "RHODE ISLAND", "PROV
IDENCE"
1390 DATA "SOUTH CAROLINA", "CO
LUMBIA"
1400 DATA "SOUTH DAKOTA", "PIER
RE"
1410 DATA "TENNESSEE", "NASHUIL
LE"
1420 DATA "TEXAS", "AUSTIN"
1430 DATA "UTAH", "SALT LAKE CI
TY"
1440 DATA "VERMONT", "MONTPELIE
R"
1450 DATA "VIRGINIA", "RICHMOND
"
1460 DATA "WASHINGTON", "OLYMPI
A"
1470 DATA "WEST VIRGINIA", "CHA
RLESTON"
1480 DATA "WISCONSIN", "MADISON
"
1490 DATA "WYOMING", "CHYENNE"
2000 ST(SP) = 1:ST(SP + 1) = LEN
(A$):ST(SP + 2) = 1:ST(SP +
3) = LEN (B$):SP = SP + 4
2010 MX = 0
2020 MC = 0
2030 SP = SP - 4
2040 AL = ST(SP):AR = ST(SP + 1)
:BL = ST(SP + 2):BR = ST(SP +
3)
2050 FOR CA = AL TO AR
2060 FOR CB = BL TO BR
2070 CL = AR - CA
2080 IF CL > BR - CB THEN CL =
BR - CB
2090 FOR COUNT = 0 TO CL
2100 IF MID$( A$,CA + COUNT,1)
= MID$( B$,CB + COUNT,1) THEN
NEXT COUNT
2110 IF COUNT > MC THEN MC = CO
UNT:MA = CA:MB = CB
2120 NEXT CB
2130 NEXT CA
2140 IF MC = 0 THEN 2190
2150 IF AL > MA - 1 OR BL > MB -
1 THEN 2170
2160 ST(SP) = AL:ST(SP + 1) = MA
- 1:ST(SP + 2) = BL:ST(SP +
3) = MB - 1:SP = SP + 4
2170 IF MA + MC > AR OR MB + MC
> BR THEN 2190
2180 ST(SP) = MA + MC:ST(SP + 1)
= AR:ST(SP + 2) = MB + MC:S

```



```

T(SP + 3) = BR:SP = SP + 4
2190 MX = MX + MC
2200 IF SP > 0 THEN 2020
2210 MI = INT (.5 + MX * 200 /
      ( LEN (A$) + LEN (B$)))
2220 RETURN

```

TYPO II TABLE

Code	Line#	Code	Line#	Code	Line#
FV	10	UU	1010	AL	1370
PM	20	PD	1020	LP	1380
KH	30	AK	1030	ZH	1390
UJ	40	KT	1040	BG	1400
HO	50	AG	1050	BM	1410
JY	60	IP	1060	NE	1420
AW	70	UD	1070	UX	1430
HN	80	PI	1080	IK	1440
RR	100	TI	1090	PI	1450
MU	110	YU	1100	SB	1460
TU	112	UJ	1110	ML	1470
DS	113	WU	1120	YN	1480
PD	120	SM	1130	GK	1490

JD	130	YB	1140	FU	2000
EB	140	XG	1150	PD	2010
PD	150	DP	1160	NN	2020
SC	180	PW	1170	RX	2030
FV	200	FO	1180	QU	2040
QF	205	OA	1190	YA	2050
QO	210	KH	1200	YQ	2060
MZ	220	AZ	1210	MQ	2070
VE	230	AV	1220	SM	2080
OG	240	BQ	1230	CF	2090
QL	250	QS	1240	GP	2100
GG	260	GX	1250	SP	2110
HC	265	FF	1260	RU	2120
SG	270	YM	1270	RR	2130
JL	280	OD	1280	RN	2140
WS	290	WW	1290	RM	2150
VG	295	RN	1300	AK	2160
BI	300	ST	1310	GX	2170
QE	320	QD	1320	HV	2180
ID	330	FQ	1330	UA	2190
YJ	340	RV	1340	QP	2200
MN	350	QJ	1350	NY	2210
EY	360	TU	1360	GV	2220
RL	1000				

Total checksum = 3896343

BANNER MAKER

Article on page 32

```

10 REM * BANNER MAKER
20 REM * BY WILLIAM UR SMITH
30 REM * (C) COPYRIGHT 1986
40 REM * ANTIC PUBLISHING, INC.

50 REM * II COMPUTING VOL. 2 NO
  . 2
60 GOSUB 800
99 REM * MAIN LOOP
100 INPUT "ENTER LINE TO PRINT
    ";O$
110 IF O$ = "" THEN END
120 INPUT "ENTER SIZE 1-8 ";SZ
130 IF SZ < 1 OR SZ > 8 THEN SZ
    = 1
140 S1 = SZ
150 SZ = INT ((SZ / 2) + .6): IF
    SZ < 1 THEN SZ = 1
160 GOSUB 500
170 GOTO 100
500 REM * OUTPUT STRING IN O$
510 FOR CO = 1 TO LEN (O$)
520 W = ASC ( MID$ (O$,CO,1)) -
    31
530 GOSUB 560
540 NEXT
550 RETURN
560 PRINT : PRINT D$;"PR#1"
570 PRINT

```

```

580 FOR X = 1 TO 5
590 FOR Z = 1 TO SZ
600 C = A(W,X)
610 I = 40 - INT ((S1 * 7) / 2)

620 PRINT LEFT$ (S$,I);
630 FOR Y = 6 TO 0 STEP - 1
640 IF C < 2 ^ Y THEN PRINT LEFT$
    (S$,S1);: GOTO 670
650 PRINT LEFT$ (C$,S1);
660 C = C - 2 ^ Y
670 NEXT
680 PRINT
690 NEXT
700 IF Z < SZ THEN PRINT
703 NEXT
713 FOR X = 1 TO SZ: PRINT : NEXT

723 PRINT : PRINT D$;"PR#0"
733 RETURN
800 REM * VARIABLE SETUPS
810 CH$ = "*": REM CHAR FOR BAN
    NER
820 S$ = "          ":S$ = S$ +
    S$ + S$ + S$
830 D$ = CHR$ (4)
840 C$ = CH$
850 C$ = C$ + C$ + C$ + C$:C$ =
    C$ + C$ + C$ + C$ + C$ + C$

```

continued on next page


```

860 DIM A(100,5)
870 PRINT CHR$(17)
880 HOME : UTAB 10: PRINT "READING CHARACTER TABLE": PRINT

890 READ C: IF C = 999 THEN GOTO 930
900 PRINT CHR$(C);
910 C = C - 31: FOR X = 1 TO 5: READ A(C,X): NEXT
920 GOTO 890
930 PRINT : PRINT
940 RETURN

1000 DATA 32,0,0,0,0,0
1010 DATA 33,0,0,95,0,0
1020 DATA 34,0,7,0,7,0
1030 DATA 35,20,127,20,127,20
1040 DATA 36,36,42,127,42,18
1050 DATA 37,35,19,8,100,98
1060 DATA 38,54,73,86,32,80
1070 DATA 39,0,0,7,0,0
1080 DATA 40,28,34,65,0,0
1090 DATA 41,0,0,65,34,28
1100 DATA 42,34,20,127,20,34
1110 DATA 43,8,8,62,8,8
1120 DATA 44,0,64,48,0,0
1130 DATA 45,8,8,8,8,8
1140 DATA 46,0,0,64,0,0
1150 DATA 47,32,16,8,4,2
1160 DATA 48,62,81,73,69,62
1170 DATA 49,0,66,127,64,0
1180 DATA 50,98,81,73,73,70
1190 DATA 51,33,65,73,77,51
1200 DATA 52,24,20,18,127,16
1210 DATA 53,39,69,69,69,57
1220 DATA 54,60,74,73,73,49
1230 DATA 55,1,1,121,5,3
1240 DATA 56,54,73,73,73,54
1250 DATA 57,70,73,73,41,30
1260 DATA 58,0,0,20,0,0
1270 DATA 59,0,64,52,0,0
1280 DATA 60,8,20,34,65,0
1290 DATA 61,20,20,20,20,20
1300 DATA 62,0,65,34,20,8
1310 DATA 63,2,1,89,5,2
1320 DATA 64,62,65,93,89,78
1330 DATA 65,124,18,17,18,124
1340 DATA 66,127,73,73,73,54
1350 DATA 67,62,65,65,65,34
1360 DATA 68,127,65,65,65,62
1370 DATA 69,127,73,73,73,65
1380 DATA 70,127,9,9,9,1
1390 DATA 71,62,65,65,81,113
1400 DATA 72,127,8,8,8,127
1410 DATA 73,0,65,127,65,0
1420 DATA 74,32,64,64,64,63
1430 DATA 75,127,8,20,34,65
1440 DATA 76,127,64,64,64,64
1450 DATA 77,127,2,4,2,127
1460 DATA 78,127,4,8,16,127
1470 DATA 79,62,65,65,65,62
1480 DATA 80,127,9,9,9,6
1490 DATA 81,62,65,81,33,94
1500 DATA 82,127,9,25,41,70
1510 DATA 83,38,73,73,73,50
1520 DATA 84,1,1,127,1,1
1530 DATA 85,63,64,64,64,63

```

```

1540 DATA 86,31,32,64,32,31
1550 DATA 87,127,32,16,32,127
1560 DATA 88,99,20,8,20,99
1570 DATA 89,3,4,120,4,3
1580 DATA 90,97,81,73,69,67
1590 DATA 91,127,127,65,65,65
1600 DATA 92,2,4,8,16,32
1610 DATA 93,65,65,65,127,127
1620 DATA 94,16,8,4,8,16
1630 DATA 95,64,64,64,64,64
1640 DATA 96,0,0,0,0,0
1650 DATA 97,32,84,84,84,120
1660 DATA 98,127,68,68,68,56
1670 DATA 99,56,68,68,68,68
1680 DATA 100,56,68,68,68,127
1690 DATA 101,56,100,84,76,68
1700 DATA 102,4,126,5,1,2
1710 DATA 103,76,82,82,82,60
1720 DATA 104,127,8,4,4,120
1730 DATA 105,0,68,125,64,0
1740 DATA 106,32,64,68,61,0
1750 DATA 107,127,16,40,68,0
1760 DATA 108,0,65,127,64,0
1770 DATA 109,120,4,24,4,120
1780 DATA 110,120,4,24,4,120
1790 DATA 110,120,4,4,120,0
1800 DATA 111,56,68,68,68,56
1810 DATA 112,124,36,36,36,24
1820 DATA 113,60,64,48,64,60
1830 DATA 114,124,8,4,4,8
1840 DATA 115,8,84,84,84,32
1850 DATA 116,4,4,127,4,4
1860 DATA 117,60,64,64,64,60
1870 DATA 118,28,32,64,32,28
1880 DATA 119,60,64,48,64,60
1890 DATA 120,68,40,16,40,68
1900 DATA 121,78,80,80,80,62
1910 DATA 122,68,100,84,76,68
1920 DATA 999

```

TYPO II TABLE

Code	Line#	Code	Line#	Code	Line#
JX	10	JJ	900	GV	1440
KD	20	PD	910	FY	1450
KH	30	YW	920	SQ	1460
UJ	40	HC	930	TQ	1470
DL	50	GV	940	BK	1480
YA	60	JN	1000	UZ	1490
EW	99	OF	1010	QA	1500
TG	100	OP	1020	SX	1510
ZL	110	GG	1030	QR	1520
ZI	120	BS	1040	UK	1530
QH	130	UW	1050	MT	1540
JB	140	TP	1060	MI	1550
WE	150	MT	1070	OB	1560
XU	160	WL	1080	SD	1570
XH	170	BO	1090	BP	1580
QZ	500	VQ	1100	UL	1590
DE	510	XU	1110	VO	1600
AO	520	SJ	1120	SJ	1610
YM	530	XU	1130	YK	1620
FA	540	NF	1140	WK	1630

GV	550	UP	1150	KL	1640
UD	560	WY	1160	CO	1650
HE	570	HC	1170	NZ	1660
OQ	580	UK	1180	FL	1670
TY	590	UR	1190	XD	1680
RL	600	ZW	1200	UG	1690
RJ	610	EU	1210	VD	1700
LD	620	XL	1220	DN	1710
QS	630	RE	1230	LJ	1720
FH	640	UG	1240	NZ	1730
BI	650	NZ	1250	PD	1740
HX	660	KP	1260	YV	1750
FA	670	QW	1270	OK	1760
HE	680	YH	1280	SO	1770
FA	690	EA	1290	RH	1780

HC	700	ZV	1300	EM	1790
FA	703	TR	1310	MU	1800
XI	713	ED	1320	NB	1810
TS	723	NM	1330	DC	1820
GV	733	FY	1340	AY	1830
PI	800	UJ	1350	UX	1840
PV	810	HA	1360	ZC	1850
NQ	820	HS	1370	CQ	1860
RR	830	YL	1380	CI	1870
JV	840	BK	1390	EA	1880
IE	850	MD	1400	CN	1890
GZ	860	GX	1410	CL	1900
FD	870	UK	1420	VK	1910
EK	880	RQ	1430	YU	1920

THINKING ABOUT THINKING

Article on page 63

CAM

```

10 REM * CONTENT ADDRESSABLE ME
  MORY
20 REM * BY DANIEL WOLF PH.D.
30 REM * (C) COPYRIGHT 1986
40 REM * ANTIC PUBLISHING, INC.
50 REM * II COMPUTING VOL2. NO.
  2
100 N = 63: REM  HOW MANY CELLS
110 DIM S(N + 1): REM  THE CELL
  S
120 DIM C(N + 1,N + 1): REM  TH
  E CONNECTIONS
199 REM  MEMORIZE 8 8-CHAR STRI
  NGS
200 FOR Z = 0 TO 7
210 TS = ""
215 REM  CLEAR OUT 8-CHAR ARRAY

220 FOR Y = 1 TO 8
230 TS(Y) = " "
240 NEXT
250 HOME : PRINT
255 PRINT Z: PRINT
260 PRINT " ENTER 8-CHARACTER S
  TRING"
265 PRINT " TO STORE IN THE CAM
  "

266 PRINT " OR X TO QUIT"
270 PRINT : INPUT O$(Z)
275 REM  QUIT IF STRING = X
280 IF O$(Z) = "X" THEN 400
290 O$(Z) = LEFT$(O$(Z),8)
295 REM  BREAK INTO 8 CHARACTER
  S
300 FOR Y = 1 TO LEN (O$(Z))
310 TS(Y) = MID$(O$(Z),Y,1)
320 NEXT Y
330 FOR Y = 1 TO 8

```

```

340 TS = TS + TS(Y)
350 NEXT Y
355 REM  NOW ADD IT TO THE CAM
360 GOSUB 1000
370 NEXT Z
399 REM  NOW TRY A TEST STRING
400 TS = ""
410 FOR A = 1 TO 8
420 TS(A) = " "
430 NEXT
440 HOME : PRINT
450 PRINT " ENTER AN 8-CHAR STR
  ING TO TEST"
455 PRINT " OR X TO QUIT"
460 PRINT : INPUT TT$: PRINT
475 REM  QUIT IF STRING = X
480 IF TT$ = "X" THEN END
490 TT$ = LEFT$(TT$,8)
500 FOR A = 1 TO LEN (TT$)
510 TS(A) = MID$(TT$,A,1)
520 NEXT
530 FOR A = 1 TO 8
540 TS = TS + TS(A)
550 NEXT
560 GOSUB 2000
570 PRINT
580 PRINT " WORKING ...": PRINT

599 REM  NOW OPERATE THE CELLS
600 I = RND ( - 1)
603 FOR G = 0 TO N
605 REM  PICK ONE CELL AT RANDO
  M
610 I = INT ( RND (1) * (N + 1)
  ):D = 0
615 REM  ADD UP CONTRIBUTIONS
616 REM  FROM ALL OTHER CELLS'

```

continued on next page


```

617 REM CONNECTIONS TO THIS ON
    E
618 REM THAT IS, CELL I
619 REM D IS THE TOTAL HERE
620 FOR J = 0 TO N
630 D = D + C(I,J) * S(J)
640 NEXT J
645 REM NOW IF D>=0 THIS CELL
    IS ON
650 IF D > = 0 THEN D = 1: GOTO
    700
660 D = 0
695 REM SET THIS CELL ON OR OF
    F
700 S(I) = D
710 NEXT G
715 REM SHOW CURRENT STATES OF
    CELLS
720 GOSUB 3000
725 PRINT "          AGAIN? (Y,
    N)"
730 GET K$: IF K$ = "N" THEN 40
    0
740 GOTO 600
999 REM ADD 8-CHAR STRING TO C
    AM
1000 HOME : PRINT : PRINT " ADD
    ING 64 BITS"
1001 PRINT
1005 REM NOW SPLIT INTO 64 BIT
    S
1010 GOSUB 2000
1020 PRINT : PRINT " TO CAM NET
    WORK"
1025 REM STRENGTH IS 1 OR -1
1026 REM DEPENDING ON MATCH OR
    NOT
1027 REM OF CORRESPONDING BITS
1028 REM B IS THE MATCH INDICA
    TOR
1030 FOR Y = 0 TO N
1040 C(Y,Y) = 0: S = S(Y)
1050 FOR W = Y + 1 TO N
1060 B = 2 * (S(W) = S) - 1
1070 F = C(Y,W) + B
1080 C(Y,W) = F: C(W,Y) = F
1090 NEXT W
1092 NEXT Y
1099 RETURN
1999 REM SPLIT A CHAR INTO BIT
    S
2000 FOR X = 1 TO 8
2005 E = 8 * X - 8
2010 L$ = MID$(T$,X,1)
2020 CH = ASC (L$): M = 256
2030 PRINT " "; L$; " "; CH; " ";
2040 FOR U = E TO E + 7
2050 M = M / 2: D = (CH > = M)
2065 IF D = 1 THEN CH = CH - M
2070 S(U) = D: PRINT D;
2090 NEXT U
2095 PRINT
2096 NEXT X
2099 RETURN
2999 REM SHOW 'FOUND' TEXT

```

```

3000 FOR LP = 0 TO 7
3020 M = 256: D = 0: E = 8 * LP
3030 FOR P = E TO E + 7
3040 M = M / 2
3050 D = D + M * S(P)
3060 NEXT P
3070 PRINT CHR$(D);
3080 NEXT LP
3085 PRINT
3099 RETURN

```

TYPO II TABLE

Code	Line#	Code	Line#	Code	Line#
KM	10	UX	455	OT	1005
CL	20	HC	460	GU	1010
KH	30	JX	475	MB	1020
UJ	40	TL	480	DB	1025
HK	50	ME	490	BL	1026
UD	100	TX	500	NS	1027
ZI	110	UL	510	EE	1028
LA	120	FA	520	UI	1030
PR	199	NO	530	ZY	1040
PC	200	DX	540	TC	1050
PU	210	FA	550	EX	1060
CK	215	GU	560	IN	1070
PK	220	HE	570	CS	1080
GZ	230	BK	580	LS	1090
FA	240	HC	599	LW	1092
FT	250	MU	600	GV	1099
XK	255	SY	603	JB	1999
XG	260	KP	605	PI	2000
QE	265	QO	610	EP	2005
UX	266	DM	615	VB	2010
OA	270	IM	616	TK	2020
JX	275	PZ	617	RR	2030
EP	280	FW	618	OA	2040
SI	290	EN	619	FD	2050
GS	295	TE	620	NL	2065
NH	300	XF	630	PH	2070
WF	310	KS	640	LQ	2090
LW	320	KV	645	HE	2095
PK	330	BK	650	LU	2096
ND	340	YE	660	GV	2099
LW	350	RJ	695	LA	2999
GB	355	YS	700	QQ	3000
GS	360	KM	710	MY	3020
LY	370	CO	715	NO	3030
DE	399	GW	720	QS	3040
PU	400	CR	725	OU	3050
NO	410	MP	730	LE	3060
DH	420	XR	740	JN	3070
FA	430	LC	999	UC	3080
FT	440	BT	1000	HE	3085
OI	450	HE	1001	GV	3099

Total checksum = 1259803

II ERR IS HUMAN

The ORRERY program from our August/September issue requires some modifications. W. Holland from North Vancouver, B.C., Canada, and Robert Stong of Charlottesville, VA, submitted these changes.

First LOAD the program. Then delete lines 770, 855, 856, 920 and 4970. Next, remove the REM from lines 830 and 835—just retype the lines leaving out the REM statements. Then add the following lines:

```
330 INPUT "YEAR ";Y: HTAB 12: INPUT "MONTH  
";M: HTAB 23: INPUT "DAY ";J  
555 KEY = PEEK(-16384): IF KEY ↑ 127 THEN  
POKE -16368,0: GOTO 960  
760 COLOUR = 7-4 * (COLOUR=7)
```

945 IF V ↑ DY THEN 960

Wayne Klobe of Ferguson, MO, submitted an excellent fix for the space character bug in the FONT.EDITOR program from our June/July issue. LOAD the program and make the following changes:

```
510 IF K = 141 THEN GOTO 615  
610 DRAW 2 AT X,Y: X = 3: Y = 2: GOTO 620  
615 DRAW 2 AT X,Y: X = 3: Y = 2  
1230 DIM S(16), E(16), V(129)
```

That's it! Now you can save a blank space as any character in a font.//

MODEM MGR™ \$49⁹⁷

plus \$3 ship/hand • plus tax (Calif. only)

- A new modem communications program
- For Apple II+, //c, //e, enhanced //e
- Both DOS 3.3 and ProDOS support
- Supports most serial and modem cards
- Supports most smart and non-smart modems
- Fast operation (110 to 19200 baud)
- Text capture and auto disk-save
- Screen capture (snapshot)
- Full-screen editor
- Full- or split-screen display with block send (for CB, chat, packet radio)
- Macro script files for auto log-on
- Programmable function keys
- XMODEM error-free file transfer
- Supports Apple or Videx 80-column card
- On-screen time-of-day or elapsed-time display (with some clock cards)
- Unattended mode with password protection
- Emulates DEC VT-52, DG 200, others
- Supports most printer cards
- Choice of carrier or "smart" modem control
- Not copy-protected
- Available direct only. Send check to:

**MGR
SOFTWARE**

Suite 101
305 So. State College Blvd.
Anaheim, CA 92806
(714) 993-0294

Apple, ProDOS are trademarks of Apple Computer Inc.

CIRCLE 072 ON READERS SERVICE CARD

Apple II LaserPrinting!

Do this! From your Apple II® to an Apple LaserWriter™ or a LaserWriter Plus™. Plain or fancy, near-typeset quality printing can be done easily from your Apple II word processor with a few commands embedded in your text using LaserUtilities Vol. 1.

Some of the features of LaserUtilities Vol. 1 include:

- Full justified, centered, or ragged-right lines or paragraphs.
- Works with AppleWriter™, AppleWorks™, and others.
- Within-line or within-paragraph font-changes.
- Automatic page break and numbering if desired.
- Filled or open boxes and bullets of any size.
- Lines and other PostScript™ graphics.
- Boxed-in lines or paragraphs.
- Easy font selection and unlimited font scaling procedures.
- All procedures extensible and editable.
- Bonus useful PostScript programs on each disk.

Also available are LaserFonts Vol. 1 (\$39.95), a disk of three downloadable decorative LaserWriter fonts, and LaserDumps (\$39.95), a complete Apple II to LaserWriter screen dump package.

For more information or to place an order please write or call:

S. Anthony Studios
Scott Anthony
889 De Haro St., San Francisco, CA 94107
(415) 826-6193

LaserUtilities Vol. 1 - \$39.95 retail
All orders, please add sales tax where applicable and \$2.50 shipping per disk. Dealer prices on request.
LaserWriter and PostScript software also available for Amiga and MS-DOS.

CIRCLE 009 ON READERS SERVICE CARD

Almost Perfekt

A States and Capitals Game

by JOHN W. RATCLIFF

Suppose a computer program asks you WHAT IS THE CAPITAL OF MARYLAND?

If you type in ANAPOLIS many programs will reply with a message like YOUR ANSWER IS WRONG.

Of course, the computer is right—your answer *is* wrong. But it's only spelled wrong. You obviously know that the capital of Maryland is Annapolis; you just don't know how to spell it.

Is it really fair to have an answer marked completely wrong just because you misspelled it by a letter or two? In a spelling class, yes. But for almost any other subject, it would be nice to have a way for a BASIC program to tell whether an answer is almost right.

There *is* a way—and it's used in this month's STATES game.

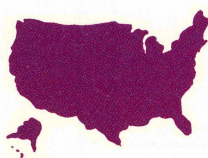
VERY NEARLY RIGHT

Type in STATES from the Software Library on page 41 and check it with TYPO.II, or select it from the Action Disk menu. When you run the program, you'll see it's a quiz on U.S. state capitals. You won't notice anything special until the first time you type an answer that's not spelled quite correctly. The program still recognizes your answer—and points out that you spelled it wrong.

Experiment with the program. See how far from the right spelling you can get before the computer decides that you really don't know the right answer after all.

Getting a program to recognize nearly correct answers depends on using a *pattern-matching algorithm*—a subroutine that will calculate how close the nearly correct answer is to the correct answer. That problem plagued me and one of

Is it fair to call an answer wrong just because it's misspelled?



my colleagues for over a year. John Oberschelp, a software consultant who has been writing educational software for more than eight years, worked with me to design the pattern recognition routine in STATES.

Because it's really a general-purpose routine, you can use it in your own programs. But it's useful to know just how it works.

THE MATCHING ROUTINE

When you look at two similar words, you instantly recognize groups of letters that are alike. The matching routine works in much the same way. The computer looks for the largest group of letters in common between the two and remembers them. It then looks to the left and the right of these two groups and looks for the largest groups of letters in common between *them*, and so on. By keeping track of the number of letters that match, it can award a score that measures how similar the words are.

To examine the concept, let's walk through a comparison of two strings. Consider a mangled spelling of the state of PENNSYLVANIA as PENCILVANEYA. How alike are these two words?

PENNSYLVANIA / PENCILVANEYA

The largest group of letters in common between these two strings is LVAN. Thus, the current similarity score is 8 (two times the number of letters in common). There are now two pairs of partial words to examine: PENNSY and PENCIL on the left side and IA and EYA on the right.

PENNSY / PENCIL The largest group of common letters is PEN. Our similarity score increases by 6 and is now 14. There are no letters to the left of PEN, but we still have to con-

EDUCATION

sider the letters to the right.

NSY / CI There's nothing in common between these two, so the similarity score remains the same and we go back to look at the other end of the words.

IA / EYA There is only one letter in common here — the letter A. Our score is increased by 2 and is now 16. There is nothing to the right of the letter A, but we still have to look at the left side.

I / EY There is nothing in common here, so the similarity score remains the same.

We've now examined the entire words, and our similarity score is 16. There were a total of 24 letters in the original two words, so the score is 16/24, or 66 percent similar.

DOING IT YOURSELF

You can use the matching subroutine yourself — it's the subroutine beginning at line 2000. It compares the contents of A\$ and B\$, and stores the

percentage of similarity in variable MT. If you want to use this subroutine in your own programs, be sure you also include line 0, which DIMs the ST array that the subroutine uses.

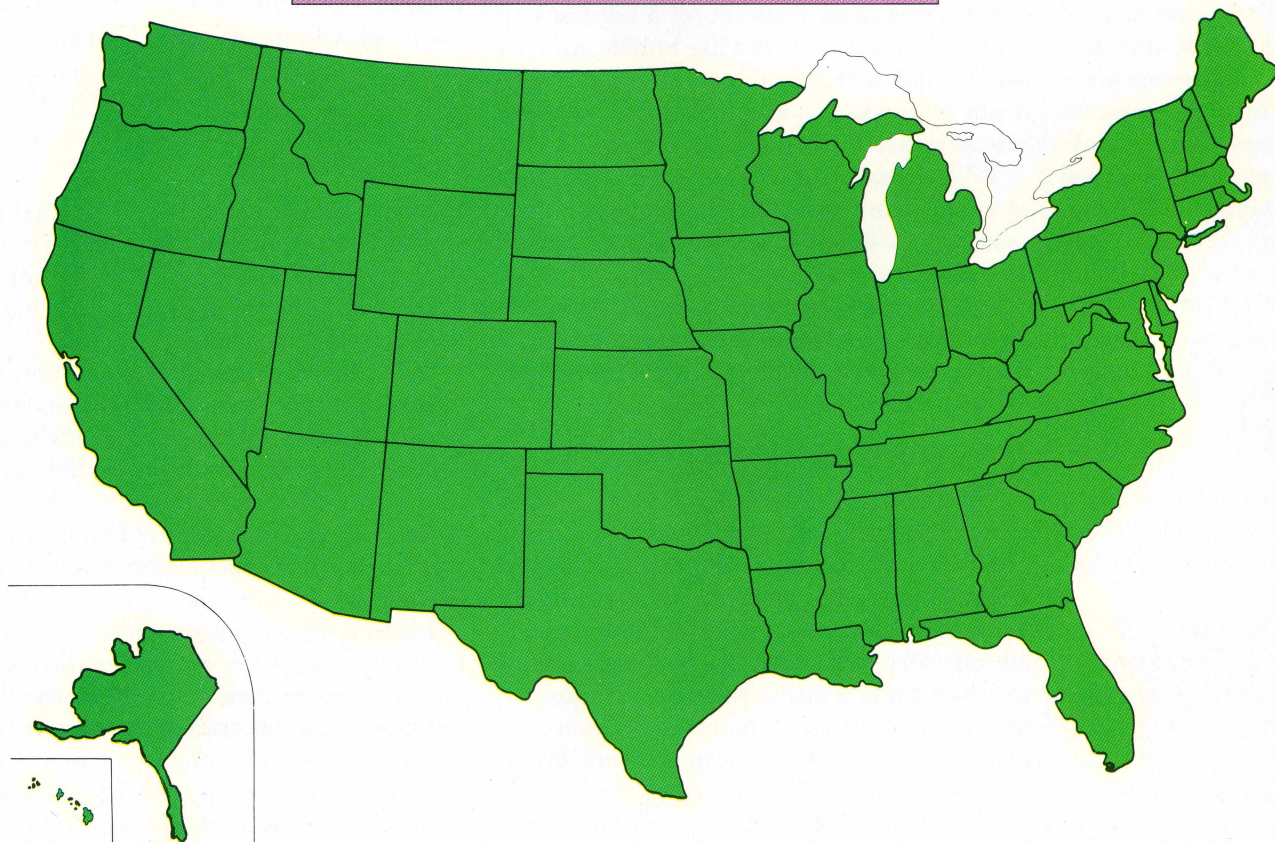
With minor modifications, you can also use the program with other kinds of quizzes. You can change the questions in Q\$(0), Q\$(1), Q2\$(0) and Q2\$(1) in lines 112 and 113, and put in new DATA statements for the quiz beginning at line 1000. Without too much work, you can create a complete set of questions for a completely different subject.

In fact, you can use STATES as a base for building a question-and-answer program that gives a much better idea of how much someone really knows about almost any subject.

Except, of course, for spelling.//

John W. Ratcliff has written educational software for Milliken Publishing and works as a systems analyst for the Saint Louis University Medical Center.

Use this map of the United States with "Teacher/Parent Tips" on page 42. The better you get at "Almost Perfekt," the better you'll be able to fill in the names of the states and their capitals.



If you'd like more articles like this one, circle 270 on our Reader Service Card.

No Dirt in Your Carburetor

by MARGOT COMSTOCK



Margot Comstock, former editor of Softalk, lives on a bluff by the beach, where she spends her days writing, consulting on software, and playing with Apples.

ROUND AND ROUND

When personal computers were first catching on, people wrote of the day when every household would have one, when computers would be as common — and as essential — as telephones, when not being computer-literate would be equivalent to not being able to read. It was a glistening, fresh, beautiful bubble and, of course, it burst.

For a few of us, who bit off a big hunk of the wad, the bubble broke like bubble gum: all over our faces. But for most enthusiastic users, it was more like a soap bubble; more bubbles, just as pretty if a little smaller, followed.

With the new bubbles came the beginnings of maturity, more realistic expectations, a few more points in world lore if you will, but no less enthusiasm.

From talking with people who've weathered all the seasons, it seems that the enthusiasm is now more personal, the worldview more cynical. Oh well.

DROPPING THE PRETTY-COLORED GLASSES

One of those original expectations is, ironically, pretty close to right on. Computer literacy and reading may well be on a par. The irony comes from the fact that, although two-thirds are literate, only 20 percent of this most advanced country's population actually reads — for pleasure, for the sake of knowing, for more information than when to take the next aspirin or which brand of frozen dinner to buy.

"The entire book publishing industry is sustained by ten percent of the population," says Roger Wagner, early Apple pioneer, author of

Assembly Lines: The Book, and founder of Roger Wagner Publishing. RWP makes software exclusively for Apple IIs, with products such as MouseWrite and Merlin. "An easy correlation leads to projection of an installed base of about 20 million computers, and we're almost there."

Not quite. Says Al Tommervik, erstwhile publisher of *Softalk*, former editor of *Softdisk*, and onetime Penguin, "The thing that astonishes me is the number of intelligent, achieving, productive people who get along fine without computers and have no interest in getting one."

CURIOSITY: A RARE COMMODITY

Wagner claims to have been surprised by the skyrocketing popularity computers enjoyed in the early eighties. "I never thought computers would be a fad like CBs, never expected to see an Apple in every house.

"Many people don't care about information. They come home from jobs and spend the evening consuming a six-pack. The only way those people will ever have computers is if they're built into microwaves or cars."

Broderbund president Doug Carlston agrees — but, sans bubblegum, he can't kick the enthusiasm.

It's true, says Carlston, that "everyone will have many computers without knowing it. Computers will weave their way into the web of social structure — invisible, transparent — as in cars and videos.

"But the same number will have actual computers as are involved with communications skills — about 20 percent."

THE POWER OF QUALITY

But Carlston sees this as very special, very significant.

"The computer is a communications device and, as a communications device, it belongs right up there with the printed word.

"Consider the difference made by the printing press. This is equivalent."

Okay, weird as it seems, what we can conclude so far is both realistic and positive. Computers are apt to remain de trop to 80 percent of the very civilized world, but that's no worse than the printing press and look where it's got to. So now, how are we going to get there?

IN MY BEAUTIFUL BALLOON

"The computer industry was like a spaceship going up," says Roe R. Adams III of Hawkwind Enterprises Inc., computer consultant and journalist and game player extraordinaire. "The rocket had fuel to go just so high but not enough to go past the gravity well. The gravity well is the perceived usefulness of the computer to the user. The industry never overcame this barrier; it was never able adequately to define the computer's use.

"At launch, it was fueled with word processing, spreadsheets, entertainment. But those have only so much power; so the spaceship stalled and fell."

Or settled into a nearby orbit: "It's still really strong for people who need those things; to others, it's of no use."

The future, says Adams, is not related to machines, but to applications: to relevancy to users.

HALF OF SUPERB IS STILL AWFULLY GOOD

Agreeing, albeit a bit less poetical, is Robert Garriott, president of Origin Systems, publishers of entertainment software such as Ultima IV, Auto Duel and Ogre.

"The market for the microcomputer will be utility driven. People are past buying because computers sound neat. They must have a purpose to buy one. Entertainment is a purpose, but not in every home."

Still, people who have a use for a microcomputer comprise a growing segment of the population. Products are becoming more advanced and that causes increased demand.

So the market will grow, says Garriott, but "not 100 percent a year as predicted.

"Computers are becoming more a quality

Only
20 percent of
this most
advanced
country's
population
actually
reads.

purchase. People want good quality hardware, and they're willing to pay for it. Same with software. No half-baked arcade game will sell. People aren't any longer instant sells; they know what they want, but they're willing to pay for it." In the long run, says the MIT MBA, the shift into quality is beneficial.

"So the market isn't expanding as much as it did, but the industry has a steady growth rate that almost any other industry in America would be glad to have."

TEACHING THE SKILL OF COMPUTING

Roger Wagner thinks Apple's handling of its new II is as good a plan as any to bring more people into the market, but we're getting near saturation. It still comes down to information—and people who care about information.

"Information in its most scientific meaning: numbers or names with meaning. If you don't read or write down numbers, you don't need a computer."

Still, everyone should have the opportunity to choose—to compute or not to compute, so to speak.

"There's room for growth in the schools. Like teaching kids programming; it doesn't matter what language. Teach kids that you can use this device to make things. Computers should be taught like shop—a tool everyone can use, that you can buy one as easily as a motorcycle.

"As to shop, they don't say there's no market for memo holders, so we'll drop shop. But that's what's done with computer classes."

Which means a lot of people who won't find out what it's like to command the power of a computer—"To not have to ask permission of anybody, to expand your mind, to do great things; and no one can run into you, and no dirt gets in your carburetor."

NOT-AT-ALL-HAM ON WRY

Things do continue to improve, says Wagner. Normal progress was by hundreds of years, now it's by decades. "We can now sit anywhere on the bus. . . ."

Overall, it's getting better. "On a scale of a thousand years, the future's improved."

After all, think how far we've come in the mere 500 years since Gutenberg. . . . //

Grassroots Bulletin Boards

Log On for News, Rumors and Political Alerts

by ANN GARRISON

Will big computers enable Big Brothers to centralize communication and bureaucratic power? Or will individuals create their own communication networks with personal computers?

Richard Gaikowski's Newsbase, an electronic "magazine" run from his San Francisco storefront, tests the personal computer possibility. Anyone with a personal computer connected to a telephone can call Newsbase free at any hour. Callers choose articles from the "Front Page," or from sections on Latin America, the Middle East, Computers and Technology, Want Ads and whatever else is on Newsbase that day.

They leave comments, messages, and announcements, and debate each other on political, philosophical, religious and sexual issues.

WHAT'S A GRASSROOTS BBS?

Newsbase is one of hundreds of grassroots bulletin board systems (BBS) running on home computers—often on Apple IIs. (If you don't know what a bulletin board is, check the sidebar—"What is a BBS and How Do I Call One?") Many boards are devoted to software exchange and computer talk, but others focus on recycling, scientific research, games, Christianity, parenting, matchmaking, professions, whatever. A few, like Newsbase, are social and political discussion boards.

A caller logging onto Newsbase sees a series of headlines with brief summaries. An average day's headlines might include: "AIDSGATE??? REPORT ON GUATEMALA. . . COMPUTERS AND NICARAGUA. . . REPORTS FROM MANAGUA. . . ANTI-POLITICS AND CYNICISM. . . COMPUTERS, SOCIETY AND IBM. . . and. . . REV. MOON ADVERTISERS ANSWER LETTERS. . ."

The Managua report had been written by an alternative print journalist, the Guatemala report by an observant traveler, and the AIDSGATE article—a critique of AIDS research—had been uploaded from the *New York Native*.

At the end of each article, the caller can read or enter comments, or debate with other callers. In one ensuing exchange, San Francisco's gay "nun," Sister Boom-Boom, responded to a straight caller criticizing gay behavior on municipal buses. In another a Marine chaplain reversed his stance on Central America after reading an interview with Major General Kermit Johnson, former Chief of Army Chaplains, who resigned because of his disagreement with the Administration's Central American policy.

FREEWHEELING TALKS

Even more freewheeling discussion takes place on the public message board. At one point, a woman left an angry message about sexist insults at her clerical job. Her employers had shown all the female clerical workers an educational video in which women wobbled around in high heels fawning on their male bosses. They had also asked her to take on computing tasks with no increase in pay. In a later message, she uploaded a *Discover* article on anger's effect on heart tissue: she had been diagnosed with a mild heart problem. Callers responded to suggest she quit her job, demand a raise, and/or try yoga, karate, aerobics, hot baths, walks in the woods, or cassette tapes of wind, ocean waves and mountain streams. One caller said his mother developed angina pectoris in her thirties while working for abusive and sexist employers, and named them as local employers to be avoided. Another argued that women managers are likely

Ann Garrison frequently writes about telecommunications for II Computing.

to be even harder to work for because they have so much to prove, and that men suffer from pressure to succeed as much as women suffer from job discrimination. Woven between all these exchanges were others on socially responsible investing, Marcos's flight from the Philippines, and the "Emerald City of the Star Wars Empire," the new military space center in Colorado Springs. A week later the first caller thanked everyone for their support, and said that she had quit and found a better job doing database programming.

The effect of all this was an almost literary read, a collective stream of consciousness. Certainly not that of the collective, but that of one interesting and articulate collective.

CHARIOT BBS, COLORADO SPRINGS

The best known social and political discussion board is Dave Hughes's Chariot in Colorado Springs, Colorado. Hughes is an outspoken retired Army colonel who became a BBS legend for his writing on the national network The Source. National mainstream media have featured his political use of Chariot, and Hughes claims that political candidates call to defend themselves on his board. His successes include defeat of a municipal sales tax on out-of-state phone calls; after noting a tiny newspaper blurb on the upcoming tax, Hughes put out alarms on Chariot and networks for professional telecommunications users. A college administrator, an IBM PC club president, a writer who telecommutes to work, an international trader and others all joined him at the Colorado Springs city council meeting. As a networking visionary, Hughes argued that "instead of slapping a tax on telecommunications to extend expensive, gas-wasting, pollution-causing asphalt roads, they ought to be subsidizing the highways of the mind."

Articles and discussions listed on Chariot last spring included "FIRST AMENDMENT WRONGS. . .THE COUNTY'S DILEMMAS: SOME PROPOSALS FOR SOLUTION. . .DENVER RATINGS OF LOCAL LAWMAKERS. . .THE CONTROVERSIAL STREET LIGHT OF COLORADO AVENUE. . .THE GROWING REFUGEE PROBLEM. . .TAX BREAKS= JOBS? . . . and THE STRATEGIC DEFENSE INITIATIVE." The SDI Debate is the longest-running exchange on Chariot—not surprising, since Colorado Springs is the site of the military space center described on Newsbase. The 107 entries

include Dave Hughes's own Number 31:

One of the great problems is that the motives of many who are for SDI are very questionable and relate strictly to a chance to make wads of money. And they lobby like hell for it, using their corporate treasuries to do so. If the subject were strictly the best strategy, weaponry, and public policy in view of our own enduring moral values, then I would be glad to debate it. But the minute SDI was announced—around here at least—those who saw a trend toward the slow-down of Mutual Assured Destruction defense expenditures spotted a brand new rationale for indefinite continuation of expenditures. Greed was instant, and just as instantly converted into a messianic outpouring of support for its "national security" values. Those who had been arguing against any change in our reliance on deterrence suddenly were converts (with as much fervor as one usually finds in religious conversion) and backed Congressman Ken Kramer who became an instant champion of SDI.

Whether you agree or not, you can see why Hughes became a legend on The Source.

NEW YORK ONLINE

PC owners in New York City can call New York Online to join the more esoteric debates of technically-minded Marxist social scientists. Recent articles included "The Macintosh and Capitalism," an argument that the Mac "represents a fundamentally new approach to the way machines interact with people." Interesting, but tough reading if you're not familiar with terms like "the contradictions of capitalist relations," "surplus value" or "the rate of return as a ratio of capital investment." The board also includes a calendar of events at Columbia University, the New School for Social Research and other academic and community centers.

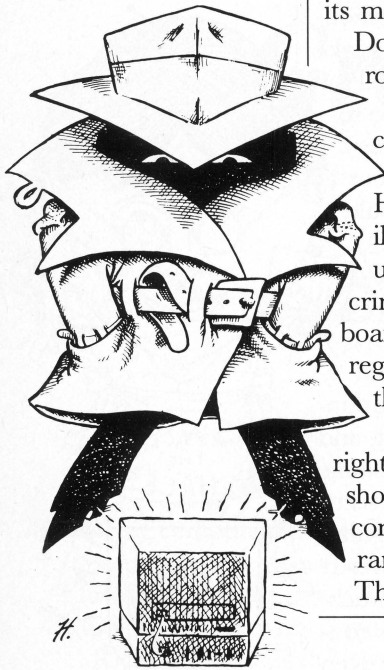
A NEW FORM OF JOURNALISM? A NEW FORM OF POLITICS?

Are boards like Newsbase, Chariot and NY Online forerunners of a new electronic journalism? Yes, but they are certainly not replacements for the daily paper; they are more like mainstream media filters for people of like mind. They can draw your attention to news that rushed past you in the print and video flood, to alternative news and analysis, and to shared thoughts, feelings and rumors. They do not have the resources

continued on next page



BBS's
can spread
political alerts
faster than
letters,
newspapers
or phone
chains.



or the established credibility of CBS News, but neither do they have its debt to advertisers or its mass-market blandness.

Do the boards suggest a new form of grassroots politics? They can spread political alerts faster than letters, newspapers or phone chains, and many boards are already devoted to peace or ecological activism.

However, grassroots politics is not necessarily good politics: bulletin boards have been used to organize racism, terrorism, and crime. Ku Klux Klan, Nazi and pederast boards have led to proposals for criminal and regulatory legislation. BBS advocates argue that laws should protect society but should also protect the BBS community from civil rights violations—that telecommunications should be as legally private as mail or phone conversation, and police should obtain warrants before intercepting communications. The legal issue brings back the shadow of Big

Brother. Should the police—and the CIA, FBI or Interpol, with their huge transnational data banks—have the right to intercept personal messages? Should corporations have access to huge data banks on personal credit, health and employment histories? Should the media be dominated by corporate conglomerates with state-of-the-art electronics? A dark science fiction vision of the future is one in which information is centralized in huge computer networks and isolated individuals flee from their all-encompassing reach. Grassroots networks suggest the hope of a brighter computer age.//

II Computing's Teacher/Parent Tips offer lesson plans to enhance and extend our articles. See the pull-out section in the middle of this issue for lesson plans for "Grassroots Bulletin Boards."

If you'd like more articles like this one, circle 267 on our Reader Service Card.

What Is a Bulletin Board System (BBS) and How Do I Call One?

The legal issue brings back the shadow of Big Brother.

A computerized bulletin board system is a telephone number with a computer at the other end. The bulletin board's software lets you use that computer even when there's no one around to operate it.

A bulletin board may be open to anyone who dials, or it may be restricted to subscribers or members. CompuServe and The Source are large commercial bulletin boards—more often called online information services—which many callers can access at one time. Small noncommercial bulletin boards can usually take only one call at a time.

On many bulletin boards, public messages can be posted for all callers, private messages can be posted for a particular caller, and important messages can be posted to appear as each caller logs onto the system.

Some bulletin boards also allow you to exchange files by uploading and downloading them to and from the bulletin board.

CALLING A BULLETIN BOARD SYSTEM

1. First you need a modem (either in a slot or connected to your serial card) and a communications program that will work with it on your Apple II.
2. Check local computer publications for listings of bulletin boards and their phone num-

bers. Boards come and go far too rapidly to be listed in books. In fact, the best way to get board numbers is to get the number of one, call it, and inquire about other boards. Many bulletin boards have long lists of others. Numbers for the boards discussed in this article are: Newsbase (415) 824-8767, Chariot (303) 632-3391, and New York Online, (718) 852-2662.

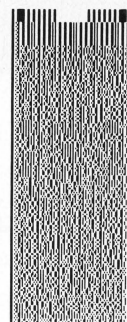
3. Create files for the boards you wish to try on your communications program disk. (Your program instructions should walk you through the few simple steps required.)

4. Call a BBS and let its menus guide you. If you encounter a glitch, be patient or try another board.

5. Remember that most bulletin boards are set up for only one caller at a time. Capture lengthy articles, discussion, or information to disk rather than reading it online. That way you won't tie up the line and frustrate other callers.

6. If you want more information, try reading Alfred Glossbrenner's *Complete Guide to Personal Computer Communications*, published by St. Martin's Press, 1985.//

*A special offer to
our readers—*



IF YOU DON'T OWN A STRIP READER YET,

A Special Softstrip®
Reader Offer From:

II FOR APPLE II USERS
COMPUTING™

We're printing SOFTSTRIP data strips for you
... but can you read them? Now you can. Our
publication offers you a direct purchase
opportunity.

THE PACKAGE:

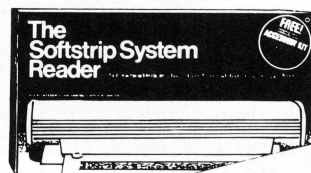
One SOFTSTRIP System Reader
(Retail at \$199.95)

STRIPPER™ Software — let's you print your own
Softstrip data strips
(A \$19.95 value)

DEVELOPERS READER SPECIFICATIONS —
write your own software to custom
build your own applications
(A \$24.95 value)

ACT NOW. Send in the coupon today and be a
member of the SOFTSTRIP user community.
You'll wonder how you got along without it.

CUT IT OUT!



THE PRICE:

\$199.95 ■ COMPLETE

YES, send me _____ CAUZIN SOFTSTRIP READER
SYSTEM(S) at \$199.95 each.

Send me (check one) the Reader for:

☐ Macintosh ☐ IBM or Compatibles ☐ Apple II Series

Enclose check or money order. MasterCard or VISA accepted.

☐ Visa ☐ MasterCard

Card No.

Exp. Date / / Signature

Name

Address

City State Zip

II Computing Catalog Sales
524 Second St., San Francisco, CA 94107

Novels, Puzzles, Magic, and The Occasional Amphibious Assault

by NEIL SHAPIRO

Infocom calls **Trinity** an "interactive fiction"; Broderbund refers to **Breakers** as an "electronic novel." While the concepts sound similar the two games differ in approach and style.

Trinity is a complex interweaving of riddles to solve and clues to decipher. It is an extremely tangled puzzle and while some effort is made to set the puzzle within an environment of story and design, its true appeal is the puzzle itself. A successful solving of **Trinity** is a triumph of the player's deductive and inductive reasoning abilities.

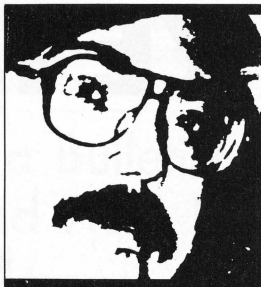
Breakers, which has its share of puzzles, is less a puzzle than a vehicle for providing the gamer the same sense of escape that accompanies the reading of a good novel.

Your first clue to the games' differences comes as soon as you open the boxes. **Breakers** contains a 50-page, bound novelette. The story reads like a typical science fiction novel. It is engrossing, detailed and requires the reader to participate in its reality.

The **Breakers** novelette details the unhappy situation of the planet Borg. This planet, riddled with volcanic rifts containing jungle flora, is peopled by the gentle Lau, a big-eyed, golden race of intelligent, aboral beings. But the Lau have had the unhappy luck to attract the **Breakers**.

The **Breakers** are a "motley crowd of losers and thieves from every dim hole in the Slug Nebula." Many are aboard Nimbus Colony, a huge space-station (or "klink") put in orbit by the UMC, an interstellar mining conglomerate.

A subset of the **Breakers** has stolen onto the planet's surface where they are capturing the Lau and smuggling them away. You see, in the homes of the intergalactic rich the Lau are con-



Neil Shapiro is editor-at-large of MacUser magazine and is also chief sysop of the MAUG Apple Group on CompuServe.

sidered to be most amusing pets. But the **Breakers** on Borg, led by one named Mulcahy, must depend on the **Breakers** on Nimbus Colony, led by Casey Jones. This leads to a clandestine war among the **Breakers**.

And then there's Garbo, a godlike entity represented by a constellation. Garbo grows dimmer as a cloudy planetary mass approaches Borg. If it hits, it will wipe out all life unless the Lau shamans can work an ages-old ritual. Garbo sends the gamer to straighten out this complex, but internally cohesive, situation.

Meanwhile, the **Trinity** gamer will find a 14-page comic book entitled "The Illustrated Story of the Atom Bomb." There is also an instruction sheet on how to fold an origami paper bird as well as a cardboard sundial to assemble and the map of a ranch house on a testing range.

Trinity opens by placing the gamer in the position of an American tourist in London, specifically Kensington Gardens. Suddenly World War III begins and London will be vaporized. The gamer must escape, must "enter another time, another place, another dimension."

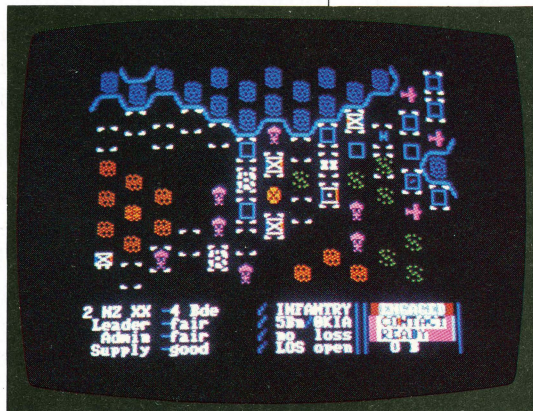
The **Trinity** player finds herself immediately faced with a multi-layered puzzle to solve. How does she get herself out of London before the falling bombs vaporize the city?

The solution to the problem involves solving a few miniature puzzles first. For example, the woman selling crumbs with which to feed the birds. Buying a bag of crumbs is not hard. Then, when feeding the birds, a ruby falls from the bag and it is stolen by a bird. Miraculously, as the bird takes the ruby, the wind mysteriously changes direction. The solution to the first puzzle will involve such things as finding a sundial and liberating its "gnomon" or pointer as well as

FOR THE FUN OF IT

using an umbrella and a perambulator to best advantage.

BATTLEFRONT



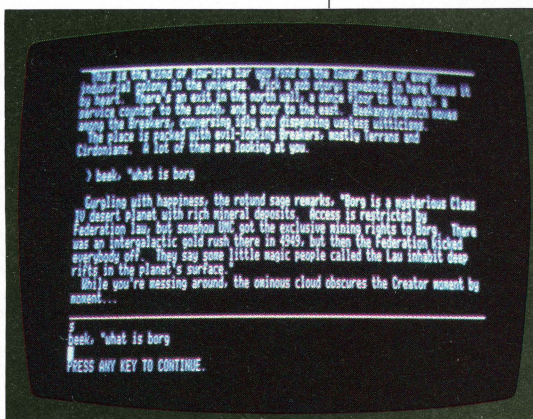
Meanwhile, the Breakers gamer first has a meeting with Garbo and then the gamer wakes up in a bar on Nimbus Colony filled with the scurrying, hurrying and —let's face it— generally disgusting Breakers clientele.

The gamer has to question the Breakers, and she meets such characters as Panface and Bobo, two piratical Breakers, as well as the sage Beek.

In Trinity the canny player finally finds a door in space through which to fall. It rapidly becomes obvious that there are many such doorways and that they connect the sites of various atomic bomb explosions.

But it is a sort of *Alice in Wonderland* world, although nowhere near the self-consistent, even orderly illogic of Lewis Carroll. Rather, the door-

BREAKERS



ways through space lead to various lands that are more like nightmares where reality, physics and magic all commingle without any overrid-

ing philosophy.

All in all, I prefer Breakers, which, like the very best in fantasy and science-fiction literature, takes place within a self-consistent universe as complex in its design as our own. When I completed Breakers and had saved both Borg and the Lau I felt a thrill like that from the ending of a good book. And, like a good book, I went back to various points within the story to enjoy them again. Unlike a book, I was able many times to investigate new byways and discover yet more in the realm of what made those characters "tick."

On the other hand, at the completion of Trinity I had more of a sense of triumph followed by a feeling of relief that I had bullied my way through a puzzling maze. There was no more reason to replay that game then there

SHARD OF SPRING



would have been to have disassembled a laboriously assembled chinese box puzzle. Yet, I can see where another gamer might feel that Breakers was too wordy, with not enough puzzles and locations.

The good news is that whether you prefer puzzle-oriented text adventures or adventures that take you away from it all to new worlds, gaming is better than ever.

ZOOMING IN ON PLAYING THE ROLE

Shard of Spring from Strategic Simulations, Inc. (SSI) adds new fillips to the genre of illustrated role-playing adventure games.

Anyone familiar with games such as the Ultimas or Phantasie will feel at home in Shard of Spring. Characters are created and then moved across a colorful onscreen map.

But the actual types of characters possible in

continued on next page

Shard differ considerably from those of other games. There are the familiar races of Human, Dwarf, Troll, Elf and Gnome to choose from when making a character. And, while there are only two classes of character—Wizard or Warrior—the characters have a true depth to them thanks to the ability to define a character's skills.

A warrior, for example, may possess an axe skill but not karate; he may hunt, but not have dark vision. A wizard may be able to read spells of fire runes but not of metal.

During combat you can zoom in on the screen to get details of the action. Each character in the party is shown on the combat screen and must be moved individually and faced while each opponent figure is run by the computer. The tactical combat graphically illustrates the characters turning around rather than simply moving up, down, left and right.

What the game lacks lies not in the software but in the supporting documentation and "flavor." Many people who have played Ultima will attest that part of the charm is the complex plot of the games as well as the accompanying beautiful maps and manuals. Shard of Spring's background is glossed over in six paragraphs in a utilitarian manual.

In this case you may judge the book by its cover, but judge the game on its own well-deserved merits.

MORE LIKE A MOVIE

Battlefront from Strategic Studies Group (SSG) is something almost impossible to find: a simulation of World War II that the avid historian and the casual gamer can enjoy and understand.

You'll find four battles of WWII: Crete (May 1941), Stalingrad (December 1942), Saipan (June 1944) and Bastogne (December 1944). Each is simulated from the viewpoint of a corps level commander.

The computer becomes an animated war room, a method for obtaining intelligence and sending out your own orders to your troops. Unlike many wargame simulations, **Battlefront** does not attempt to place the gamer either in the foxholes themselves or in a strategic conclave somewhere far away from the action. Rather, your command post is near the fast and furious action.

A system of easy-to-learn menus allows the commanding General (you) to issue orders and gather reports. The map of each scenario may be scrolled and the terrain examined. As your troops come in contact with the enemy, you learn

Trinity's true appeal is the puzzle itself.

more about the enemy forces.

Once you have settled on the overall plan, you can watch on the map as your units move to follow your battle orders, each moving somewhat on its own recognizance and on that of its built-in commander. The **Battlefront** commander watches a movie-like unfolding of his plots and schemes.

Few gamers, if any, will be able to resist the smooth flow of this game's well-designed system.

To add the icing on the cake, SSG has included a complete construction set for the game. You can make your own maps, design your own units, simulate your own battles. This game gets my highest personal recommendation.//

Neil's Top 12 From '86

- 1 Ultima IV**—Origin Systems (dist. by Electronic Arts)
- 2 Ogre**—Origin Systems (dist. by Electronic Arts)
- 3 Battlefront**—Strategic Studies Group (dist. by Electronic Arts)
- 4 Shard of Spring**—Strategic Simulations, Inc.
- 5 Breakers**—Broderbund
- 6 Auto Duel**—Origin Systems (dist. by Electronic Arts)
- 7 Murder on the Mississippi**—Activision
- 8 Law of the West**—Accolade
- 9 Elite**—Firebird
- 10 Trinity**—Infocom (dist. by Activision)
- 11 Conflict in Vietnam**—Microprose
- 12 Super Boulder Dash**—Electronic Arts

PRODUCT INFORMATION

TRINITY

Infocom
Distributed by:
Activision
P.O. Box 7286
Mountain View, CA
94039
(415) 960-0410
128K, \$39.95
CIRCLE 197 ON READER SERVICE CARD

BREAKERS

Broderbund
17 Paul Drive
San Rafael, CA 94903
(415) 479-1700
64K, \$44.95
CIRCLE 198 ON READER SERVICE CARD

SHARD OF SPRING

Strategic Simulations, Inc.
1046 N. Rengstorff Ave.
Mountain View, CA
94043
(415) 964-1353
64K, \$39.95
CIRCLE 199 ON READER SERVICE CARD

BATTLEFRONT

Strategic Studies Group
Distributed by:
Electronic Arts
1820 Gateway Dr.
San Mateo, CA 94402
(415) 572-2787
64K, \$39.95
CIRCLE 200 ON READER SERVICE CARD

Thinking About Thinking, Part 3

by DANIEL WOLF, Ph.D.

Will computers be smarter if they act like brains?

One common critique of AI research can be expressed in the complaint about computer chess: even if computers play chess better than humans, they don't do it the same way. If it's not mimicking a human brain, can a computer really be called intelligent?

WHAT IS INTELLIGENCE?

The question really being posed is "What is artificial intelligence?" The prevailing view is that natural intelligence is something measured by IQ tests—but nothing could be further from the truth.

Maybe intelligence is better regarded as the ability to learn. AI had its start in research on strategy in games and language translation—areas far outside the mainstream of human endeavor. Looked at from a mundane view of human activities, AI research doesn't seem interested in "ordinary" intelligence, but in topics of special interest to computer scientists.

Even when AI researchers discover interesting methods, usually no one claims that the brains of animals (the only intelligent systems around, so far) operate that way. It's extremely difficult to agree on what is intelligent among animals, let alone among machines!

NETWORKING

Theoreticians have been proposing "brain mechanisms" based on computer analogies since the 1940s. The 1960s were a fruitful period of research on theoretical neural networks; in the sixties researchers developed simple models of pattern recognition processes called *perceptrons*. Perceptrons were later criticized and dismissed as too simplistic, but more recent research has



Daniel Wolf is a scientist who likes to use microcomputers to explore mathematics and scientific concepts. A musician as well, Dr. Wolf has an academic background in biology, physics and math.

been focused on more complicated networks that don't suffer from the weaknesses of perceptrons.

New computer hardware is becoming available specifically to help researchers do faster simulations of large networks than is practical on today's computers, and that has opened up a new branch of AI: *connectionist* research. Its strength is that it is focused on the properties of brains. As in a real brain, the "intelligence" of a connectionist network is in the interconnections, not in the cells—thus the name "connectionist."

In these networks, you can think of learning as the formation of new connections or weakening of old ones. Connectionist research is typically concerned with how the connections of cells can be arranged to cause certain patterns of the cells to become active as a group. A pattern of activity of cells is the network's output. There are simple connection schemes that lead to quite complex outcomes in the networks.

THE DIGITAL BRAIN

It's often said that brains are just like computers, but that just isn't true—brains are mostly fat and water. What they have in common is that each uses some kind of digital logic. Nerve cells fire off little pulses that travel along their fibers and influence the firing of other nerve cells. In this respect nerve cells have switching properties like electronic gates in integrated circuits.

In sophisticated brains such as those of birds, mammals and fish, large sections are filled with complex interwoven tangles of nerve fibers. The overall "wiring" scheme of these kinds of brains is phenomenal; there may be more than one billion nerve cells, and each one may be connected to as many as 25,000 others. Some com-

continued on next page

It's often said that brains are just like computers, but that just isn't true—brains are mostly fat and water.

munications system! I can't present as much as I'd like about neurobiology here, but if you're interested I recommend *The Understanding of the Brain* by John Eccles as a superb opening to the field.

My own introduction to these ideas was in 1970, when I had the good fortune to become associated with the Biological Computer Laboratory (BCL) at the University of Illinois. Heinz Von Foerster, cybernetics expert and head of BCL, taught about "Computation in Neural Nets." The basic ideas haven't changed, but in the last few years new methods have been used to produce very interesting results. There are new algorithms for wiring up large numbers of "cells," which permit a large cell network to function as a parallel computing system and solve complex problems.

One of the methods, devised by J. J. Hopfield of Bell Laboratories, simulates hundreds of identical "neurons," each represented by an electronic circuit. The circuit for each cell is partly analog and partly digital. Each cell can "fire" like a neuron, and may be connected to many others with different (and adjustable) connection strengths.

Another technique links simple "cell" circuits together according to a "learning" method. One such simulated array of cells has been programmed to learn to read out loud. Its first utterances are mere babbling, but it can "re-wire" itself as it goes along and begins to make intelligible speech.

INTELLIGENT LIFE

You may recall the articles on cellular automata and the Game of Life that appeared in this column last winter (February/March and April/May 1986). The algorithms used in neural network simulation have a lot in common with the Life program. In the cellular automata we examined, connections were always to immediately neighboring cells, and the reactions of each cell were simple.

Connectionism researchers work with complex cellular programs, and with arrays in which any cell can connect to any other. Remember, the intelligence of systems created with such techniques come from learning. They don't start off as intelligent; they become intelligent through a continuing self-wiring process.

This is very different from the knowledge-based expert systems approach to AI we've looked at in earlier parts of this series on Thinking About Thinking. We want an expert system to be fully intelligent from the start, all finished and tied up with a nice bow—knowl-

edge-based AI as an attempt to simulate mature, logical reasoning. The neural network, on the other hand, is oriented toward unstructured intelligence in the form of learning ability. The first approach simulates wise old people; the second, infants.

I find the neural network approach more interesting and less constraining. By combining neural net simulations with motion and vision systems, androids may not be far off in the future. Lots of what a neural network can do is left open in the design process, to be wired in as needed. Such an AI system doesn't have to reason, as long as it can learn to.

REWIRING THE BRAIN WITH APPLE

You can experiment with a simple neural network yourself with CAM, an Applesoft BASIC program. Type in the program from the Software Library on page 49 and check it with TYPO.II, or select it from the Action Disk menu. CAM demonstrates a wiring algorithm for 64 cells that creates a *content-addressable memory* (CAM) using the cells. We're used to giving BASIC variables names, but a CAM locates stored items by their actual content, rather than by a variable name. A CAM that stores strings can recognize words presented to it that are partially garbled or incomplete. It's a pattern recognition system of sorts, but it is based on lots of redundant information about the contents being stored in the connections themselves.

The algorithm used here is called a *linear associative network*. In the first part of the program you can use it to store eight 8-character text messages. After you've stored some messages in your CAM, try the second part of the program, where you can type in a new 8-character sample and let the CAM guess which of the original eight messages matches it most closely.

When you type in sample text, try using only a few letters of one of your stored messages. The CAM won't always be correct. Sometimes two messages are too similar to be distinguished. Sometimes the CAM produces an output that doesn't correspond to any of the stored messages.

The algorithm resembles the Game of Life, except that each cell is connected to all others, not just the surrounding cells. Each cell adds all its inputs from the others. If the total is greater than 0, then the cell itself is given a value of 1; otherwise the cell is 0. After any cell changes, other cells may readjust to the change. The program gives each of the 64 cells four opportunities to change, and then organizes the cells into

ADVANCED COMPUTER CONCEPTS

8-cell groups. The groups are printed on the screen as text; 8-cell groups each represent one character, 64 cells for eight characters.

Improving on the connection algorithm shouldn't be too difficult. All the connections here have a strength of either 1 or -1. I've experimented with using different strengths, up to 7, with different entries in the CAM. Play with the CAM and see whether you can improve its ability to recognize messages.

WHAT IS AI?

I have a brilliant friend who believes that "real" AI is just around the corner. Amazingly intelligent systems, my friend believes, are about to spring upon us based on some breakthrough in computer science, though today's expert systems will be inadequate to the task.

I disagree. I think if really intelligent systems are developed they will be hard to spot, and we won't be able to easily distinguish the really intelligent machines from the ordinary ones in any specific way. Maybe "real AI" will combine knowledge-based methods, connectionist networks, robotics, speech and vision systems. Maybe it's already here. By what criterion could

we know?

We have a similar problem defining just what it is that makes us human. Tool use? Language? Since examples of both are found in other animals, perhaps what makes us human is more a matter of degree than kind. Perhaps "really intelligent" machines will differ from "ordinary" machines in ways that aren't easy to notice.

In biology there is a concept called *convergent evolution*, in which different types of animals come to have similar characteristics by very different means. For example, insect and bird wings have similar functions, but they evolved separately. In much the same way, computer circuits and brains may do some of the same things, but usually in very different ways.

Can we do better with computers if we make them do things more like brains do them? When we want fast arithmetic, we reach for a microprocessor all wired up just the way we need it. When a brain needs to solve a problem it may need to "grow" a circuit, not having any advance knowledge of how any particular wiring job will behave. Neural network researchers are working today to discover methods of connection that correspond to intelligent learning ability.//

The question really being posed is "What is artificial intelligence?"

An Ad In II Computing
Reaches
More Than
50,000
Serious
Apple II Users.

Classifieds

**STARTING IN
FEBRUARY-MARCH
ISSUE**

II Computing Classifieds

Classified Manager, II Computing
524 Second Street, San Francisco, CA 94107
Telephone (415) 957-0886

Name	Company
Address	Phone
City/State/Zip	
MasterCharge/Visa Number	Expiration Date
Signature	Issue(s) Ad To Appear

Enclosed is my payment for \$ _____

NON-COMMERCIAL RATE: \$15.00 per line—three (3) line minimum.

COMMERCIAL RATE: \$25.00 per line—four (4) line minimum.

BOLDFACE: Add \$7.50 per line for boldface words or add \$40.00 for the entire ad set in boldface (any number of lines).

TERMS: Prepayment is required. Check, Money Order, Visa or MasterCard is accepted. Make check payable to Antic Publishing.

FORMS: Ads are subject to publisher's approval and **must be TYPED**. One line equals 40 letters and spaces between words. Please underline words to be set in boldface.

GENERAL INFORMATION: Advertisers using Post Office Box numbers in their ads must supply permanent address and telephone numbers. Ad will appear in the next available issue after receipt.

DEADLINE: 90 days prior to cover date (e.g., May 1987 closes February 1, 1987—May issue on sale April 1, 1987).

Clip this coupon, attach to typewritten copy and send with remittance to address above.

HANDWRITTEN COPY WILL NOT BE ACCEPTED.

APDAad #1

from the
APPLE PROGRAMMER'S AND DEVELOPER'S ASSOCIATION

ABOUT APDA

The Apple Programmer's and Developer's Association is a one-stop shopping source, giving the Apple programmer easy access to many of the Apple® development tools and technical information from Apple Computer, Inc. Membership is open to anyone who needs advanced tools and information in order to create Apple-compatible products.

Here are some of the products we offer to members:

- Apple II and Macintosh™ development tools, system software, tech notes and manuals from Apple Computer. (Apple hardware and Apple-labeled software will continue to be available from your local Apple dealer.)
- Languages and tools from third-party companies.
- Books dealing with Apples and general-interest topics.

As an APDA member you get a quarterly catalog/newsletter, plus regular updates. We have a toll-free 800 number and on-line ordering for quick service. We accept VISA and MasterCard, or you can subscribe to our "Auto-Order" service and receive a copy of every new Apple product in the categories you're interested in.

APDA is a subsidiary of the A.P.P.L.E. Co-op. We work in full cooperation with Apple Computer to get you the information and other professional services you need.

APDA membership is just **\$20 per year**. To get your membership application just write or give us a call.

APDAads

APDA is above all an information-deliverer. So, our ads will try to give you as much useful information as possible. They will almost always be in this columnar format, and in most of the Apple-related magazines.

THE APPLE IIgs

Apple has announced the long-awaited Apple IIgs, the 65816 (16-bit) top of the line addition to the Apple II family. Apple and APDA are working hard to help you learn what development aids there are for the machine. We now list one product for the IIgs: the *Technical Introduction to the Apple IIgs*. Here is a list of the other manuals that will be available soon from Apple—most of them through APDA. Watch the APDA files on MAUG and AppleLink, or call for availability dates:

Hardware Reference, Firmware Reference, Toolbox Reference, Programmer's Introduction, Programmer's Workshop, Programmer's Workshop C, Assembler Tool Interfaces, C Tool Interfaces, ProDOS 16 Reference.

We are looking for good languages, utilities, and development tools (particularly program shells) that run in native 65816 mode on the IIgs. Our catalog will list these as they become available.



APPLE
PROGRAMMER'S
& DEVELOPER'S
ASSOCIATION

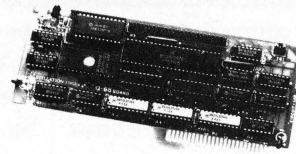
290 SW 43rd St.
Renton, WA 98055

(206) 251-6548

Apple II, Apple IIgs, Macintosh and AppleLink™ Apple Computer, Inc. MAUG™ CompuServe Information Service, Inc.

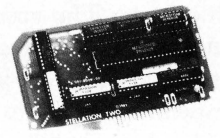
CIRCLE 003 ON READERS SERVICE CARD

AFFORDABLE 68000 SYSTEMS FOR YOUR APPLE II+ or IIe !



McMILL PLUS
with Q68 Board

- *On board debugger in EPROM
- *Expansion connector for peripherals and memory
- *2Kx8 to 32Kx8 static RAM
- *Edit, assemble, and run directly from RAM
- *"The best update you'll probably ever make to your Apple!" (CALL A.P.P.L.E. Magazine)
- *Starts at \$295.00



McMILL
standard system

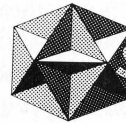
- *Super efficient design
- *Accesses standard Apple memory & peripherals
- *Debugger on disk
- *\$195.00

BOTH SYSTEMS FEATURE THE MC68008, code compatible with the 68000, plus a 6502/68000 Assembler development system from S-C Software Corp., including Debugger and screen editor. 68000 Fig FORTH also included. Both systems are professional development tools, and are not intended for CPU speed enhancement.

EVERYTHING YOU NEED TO CREATE 68000, DOS 3.3 COMPATIBLE PROGRAMS IS INCLUDED.

DIRECT ORDERS ACCEPTED, or inquire with your local dealer.

10 DAY MONEY BACK GUARANTEE ON ALL PRODUCTS.



**STELLATION
TWO**

P.O. Box 696 Oak View, CA 93022

(805) 649-2833

Providing enhancements for the Apple since 1979

CIRCLE 010 ON READERS SERVICE CARD

WRITERS! PROGRAMMERS!

If you're experienced at programming or writing about the Apple II family, we'd like you to write for us. We're looking for articles that are timely, lively and informative, and programs that are useful and fun.

Send for our Author's Guidelines, or send your queries and submissions to:

II Computing
Antic Publishing, Inc.
524 Second Street
San Francisco, CA 94107

Include program listings on disk, and articles on paper and disk if prepared with a word processor. Media will be returned if a self-addressed stamped mailer is supplied. Antic Publishing assumes no responsibility for unsolicited editorial material.

**See over
for Back
Issue
Information...**

Missing Some Issues?

**Back issues of
II Computing
are available by
writing to us at:**

II FOR APPLE II USERS
COMPUTING™

**524 2nd St.
SF, CA 94107**

**or
call**

**800-443-0100
Ext. 700**

Magazine

**Oct/Nov '85 magazine CMS1085
Dec/Jan '85 magazine CMS1285
Feb/Mar '86 magazine CMS0286
April/May magazine CMS0486
June/July '86 magazine CMS0686
Aug/Sep '86 magazine CMS0886
Oct/Nov '86 magazine CMS1086**

Disk

**Oct/Nov '85 disk only CDS1085
Dec/Jan '85 disk only CDS1285
Feb/March '86 disk only CDS0286
April/May disk only CDS0486
June/July '86 disk only CDS0686
Aug/Sept '86 disk only CDS0886
Oct/Nov '86 disk only CDS1086**

**Magazines are priced at \$4.00
each. Disks are \$10.95. All prices
include postage and handling.
Please refer to the code numbers
when ordering**

REVIEWS

Sneak Preview: *PaintWorks Plus*

by MICHAEL J. BIANCALANA,
Programs Editor

PaintWorks Plus
Activision, Inc.
P.O. Box 7286
Mountain View, CA 94039
(415) 960-0410
\$79.95

CIRCLE 273 ON READER SERVICE CARD

If you've ever used MacPaint you'll feel right at home using **PaintWorks Plus** for the Apple IIGS: the icons and menu bar are almost identical. In fact, when you first boot PaintWorks Plus you might think you're looking at MacPaint with one startling exception — the vivid 16-color palette.

Like MacPaint you can sketch or paint using the pencil or brush icons. Choose one of the 32 different brush styles, click the mouse on a color and you're in business. If freehand drawing isn't your thing you can use icons to create hollow and color-filled shapes.

PaintWorks Plus's Edit functions let you cut and paste, copy, clear or invert selected areas of the screen. With the lasso you can capture odd shaped portions of the screen without disturbing the background.

In addition to the MacPaint-style drawing capabilities, PaintWorks Plus takes full advantage of the IIGS's new 320-by-200 super hi-res mode and pro-

vides several powerful color manipulation features. The Palette Table option lets you choose any 16-color palette from a total of 128. For even greater control you can adjust existing palettes or create your own using the Color Palette feature. With it you mix the 16 levels of red, green and blue for a total of 4,096

possible colors. For example: you've painted a picture of a sunrise but the orange looks too yellow. Pull down the Color menu, click on Color Palette and adjust the amounts of red, green and blue. Then replace the old color in the palette with the new color and the orange in the picture will automatically be adjusted. PaintWorks Plus even has a color Fatbits mode: zoom in on a portion of the screen and edit it one pixel at a time.

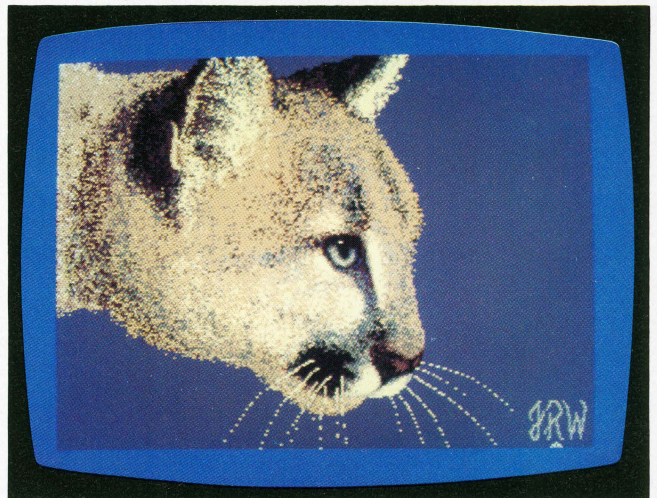
With the Search Color function you search an entire picture for a specific color and highlight it on the screen. A similar command, Dispose Color, searches for a specific color and turns it to white. (Better think twice before using it, though — it's one of the few operations that can't be "Undone.")

In addition to the color modes there's an Edit Pattern feature. You can create all kinds of fill patterns — bricks, balls, apples or anything else you can

design into an 8-by-8 pattern. By dithering (stacking different colored dots) you can create even more colors. One interesting way to generate fill patterns is to click on a portion of the screen to create a multi-colored pixel pattern.

OTHER FEATURES

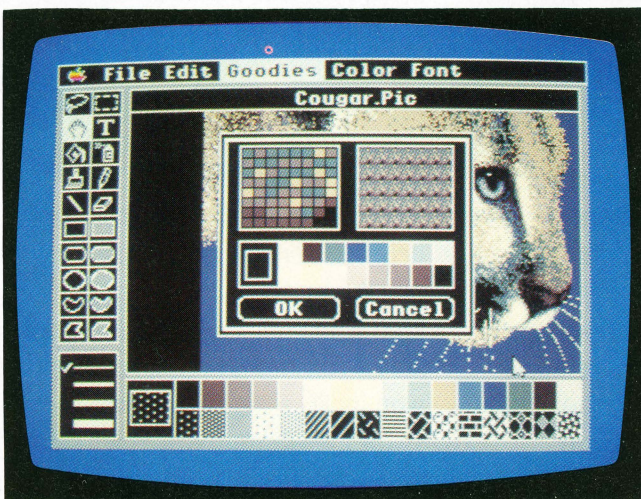
PaintWorks Plus lets



you save, edit or modify any 320-by-200 super hi-res picture. The Show Page feature and Scroll icon control the paint window (visible part of the picture) which expands to include two full screens. You'll especially love the double screen feature if you have an ImageWriter II. PaintWorks Plus lets you make full page 8½-by-11 inch color printouts.

Tucked away at the bottom of the Goodies menu are two impressive extra features, Compress and Show, with which you can animate your creations. Compress lets you load a picture, change it a little at a time, and store the changes as sequential frames. Then Show displays each frame at a specified rate and there you have it — flicker-free super hi-res animation. A demo featuring a dripping paintbrush comes on the disk.

While this program doesn't offer the same 512-by-342 resolution available in MacPaint, PaintWorks Plus's 4,096 colors and 16-level gray scale make it possible to produce near photographic quality images. PaintWorks Plus may soon have Macintosh owners turning black and white — and every shade of color — with envy.//





With enough votes, even

How would you like to see one of your students in Congress next year?

Or, for that matter, yourself?

It could very well happen, if you enter the Apple Computer Clubs International Merit Competition '87.

You and your students could win a trip to Washington, D.C., an Apple® personal computer system, Apple software or Computer Club merchandise.

But before we tell you how to enter, we'd like to tell you why.

An Apple Computer Club provides a fun, challenging way for kids of all ages to

develop their interest and skills in computing. Since the program was founded in 1983, thousands of clubs have sprung up around the world.

We sponsor an ongoing Challenge Program to motivate students as well as a special Advisor Incentive Program to reward teachers for their encouragement.

And once a year, to recognize those who develop particularly innovative applications for Apple computers, we hold the Merit Competition.

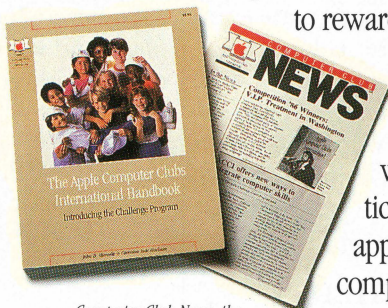
Club members can submit entries in any of four different

categories: Community Service, for club entries; Programming in BASIC, open to all students; Integrating Computers into the Curriculum, for teachers; and an anything-goes category we call Judges' Choice.

There are separate divisions in each category for elementary, middle and secondary school students. So everyone is judged against his or her peers.

To give you some idea of how keen your competition will be, here are two examples of projects that won in '86:

Jeanne Krapauskus, a high-school art teacher from Tinley Park, Illinois, integrated an Apple computer into



Computer Club News, the official club newsletter, also sponsors contests throughout the year.

© 1986 Apple Computer, Inc. Apple and the Apple logo are registered trademarks of Apple Computer, Inc. Brown Disc Manufacturing, Inc., Colorado Springs, CO, is a co-sponsor of Apple Computer Clubs International and the Merit Competition. For an authorized Apple dealer near you, call (800) 538-9696. In Canada, call (800) 387-9683. An annual \$20 registration fee is required for participating in the Apple Computer Clubs International Program.

CIRCLE 014 ON READERS SERVICE CARD



a kid could wind up here.

her curriculum, enabling her students to create high-tech art.



And in the BASIC Programming category, Jennifer Sartory and Elisabeth Dodds, fifth-graders from Wellesley, Massachusetts, created "Mazes for Masterminds," a computer game for kids ages seven to eleven.

In '87, roughly 70 students and teachers will be selected as semi-finalists. We'll announce the winner

and runner-up in each category in early May and honor the first-prize winners in Washington, D.C.

If you'd like to be one of them, give us a call at **(800) 343-1425**.

If you're already an Apple Computer Club

advisor, we'll give you the details on how to enter Competition '87. And if you don't have a club at your school, we'll tell you how to start one.

The deadline for entries is April 15. So call soon.

With Apple's Merit Competition, there's no telling how far you and your students might go.



The power to be your best.SM



REVIEWS

Books About AppleWorks

by DEBORAH KOVACS

APPLEWORKS MADE EASY
by Carole Boggs Matthews
302 pages

Osborne McGraw-Hill
2600 Tenth Street
Berkeley, CA 94710
(415) 548-2805
Price: \$17.95

CIRCLE 256 ON READERS SERVICE CARD

**APPLEWORKS: BOOSTING YOUR
BUSINESS WITH INTEGRATED
SOFTWARE**

by Charles Rubin
296 pages

Microsoft Press
10700 Northup Way
Box 97200
Bellevue, Washington 98009
(206) 882-8088
Price: \$16.95

CIRCLE 257 ON READERS SERVICE CARD

APPLEWORKS
by Charles Rubin
392 pages

Microsoft Press (see above)
Price: \$18.95

CIRCLE 258 ON READERS SERVICE CARD

**APPLEWORKS: THE PROGRAM
FOR THE REST OF US**

by Michael L. Sloan
292 pages

Scott, Foresman and Company
1900 E. Lake Ave.
Glenview, IL 60025
(312) 273-5900
Price: \$18.95

CIRCLE 259 ON READERS SERVICE CARD

**APPLEWORKS: TIPS AND
TECHNIQUES**

by Robert Ericson
373 pages

Sybex Inc.
2344 Sixth Street
Berkeley, CA 94710
(415) 848-8233
Price: \$18.95

CIRCLE 260 ON READERS SERVICE CARD

AppleWorks is one of the most well-documented programs around. The program package comes complete with a 280-page reference guide, a 155-page tutorial, and a two-disk online tutorial. All the components are clearly organized and easy to understand. Why, then, would one ever need to buy one of the plethora of Appleworks books currently on the market?

In a word: "80N." Those are the first characters that appear whenever I print an AppleWorks file. I was never able to figure out how to eliminate those damnable characters, though I scoured my manuals for clues. I simply learned to live with that dastardly 80N, but always felt somewhat impotent in the face of it. (As a longtime computer user, I've grown accustomed to accommodating the quirks of systems and software.)

Luckily, *II Computing* asked me to review several of the AppleWorks books currently on the market. The first thing I learned was that I needed to upgrade my AppleWorks disk so that I can modify it to accommodate my Ty-mac interface card. For a free upgrade, I simply go to my nearest Apple dealer.

I gained many other helpful tips from reading these books, which will enhance my efficiency in using the program. For those experienced users who spend many hours a day with AppleWorks, this increased efficiency can be a real boost to productivity. Several of these books can also be a boon to new users, especially those for whom AppleWorks constitutes an introduction to the computer. Each book reviewed here takes a different approach to AppleWorks, and as such, each is appropriate for a different type of learner.

THE TUTORIAL APPROACH

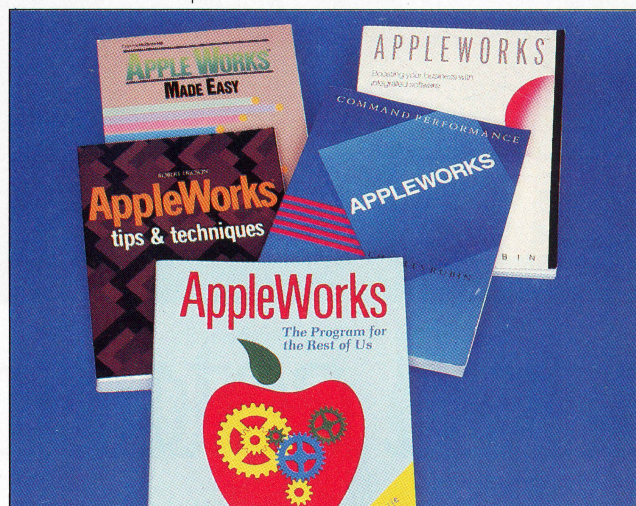
For the novice who did not respond to the teaching techniques used in Apple's manuals, Carole Matthews's *AppleWorks*

Made Easy could come in handy. It is a step-by-step, hand-holding tutorial, designed to offer the reader an introduction to the program's many features.

While the book is thorough, it does not cover any more ground than Apple's manuals do. In addition, it is hampered by a small type size and lack of white space on the printed page—both of which make the book appear somewhat dense and unfriendly. In fact, in spite of its title, *AppleWorks Made Easy* succeeds in making the program seem more complicated and difficult to master than it actually is.

APPLICATIONS

For the new computer user who hopes to integrate AppleWorks into the operation of a business, Charles Rubin's



Mary Rhombert Lavery

AppleWorks: Boosting Your Business with Integrated Software can indeed be a boost. While the AppleWorks manuals themselves do include some examples of business applications, Rubin's book goes deeper and offers many more examples.

Rubin is particularly thorough in describing how to integrate the three AppleWorks programs. In his opinion, the whole of AppleWorks is far greater than the sum of its parts. He feels that even though there are stronger individual packages on the market than any of the three AppleWorks programs, the fact that these three programs can work together is what makes AppleWorks a uniquely powerful tool.

The book contains a well-illustrated example using AppleWorks as an inte-

REVIEWS

grated tool in managing a small business. This example is clearly described and easy to follow. Also included in the book is a section called "AppleWorks and You" which describes several personal applications of the program such as preparing taxes, filing credit card, portfolio and insurance information, preparing a net-worth report, or a personal budget.

Overall, the book is cleanly designed and easy to understand. There is ample white space on the page to make the concepts presented non-threatening. Rubin writes from a depth of familiarity with the program, and is sensitive to his readers' level of computer-sophistication.

REFERENCE GUIDE

Charles Rubin has extended his AppleWorks expertise even further in writing *AppleWorks*, part of Microsoft Press's *Command Performance* series. This copious (392 pages) alphabetically-organized volume is intended by the author as a ready desktop reference next to the computer.

It's hard to say exactly who this book is written for. Rubin says in his introduction that it's designed for both the sophisticated user who just wants a ready reference to AppleWorks' features, and the novice user, who needs to become familiar with AppleWorks' parts. But I found that the author's decision to use an alphabetic structure makes the book intimidating. Less intimidating would have been a conceptual structure that follows the flow of the program, combined with a thorough index.

If I were new to AppleWorks, I would be overwhelmed by the number of topics covered in this book. As familiar with AppleWorks as I am, I still found the alphabetic organization an impediment to locating the information I was looking for (for example, there was no entry on 80N!). I had to constantly second-guess Rubin's thinking just to locate an entry on a topic which troubled me.

ONE-STOP SHOPPING

A thorough and well-structured book

is Michael L. Sloan's *AppleWorks: The Program for the Rest of Us*. Sloan is a Customer Support Manager at Apple, and his experience in hand-holding AppleWorks customers clearly shows.

The book features a thorough introduction to the program, which, while densely laid out, is easy to follow. It also offers some examples of applications for the database and the spreadsheet. There is a chapter on telecommunications, and an excellent appendix on configuring AppleWorks for a custom printer.

Although Sloan's style is clear and organized, he does not go into as much detail on any of his topics as the other books. The exception is the appendix on printer configurations. If you're a beginner, this book would be my pick as the most helpful.

■
If you're an experienced user, Charles Rubin and Robert Ericson offer you detailed, involving books; the first-time user will appreciate Michael Sloan's easy-to-follow work.
■

TROUBLESHOOTING

My personal favorite of the five was Robert Ericson's *AppleWorks: Tips and Techniques*. A principal with a planning firm, Ericson specializes in developing information systems and analytical methods for environmental design. With his planner's approach, he has created a book best described as "ergonomic." It's a comfortable book to browse through.

An example of Ericson's simple, clear approach is his decision to use "tips," set aside from the main text with bold-face and heavy lines. These tips range from the surprisingly simple ("Find things to do while the disk drives are running") to the complex ("Page numbering is controlled by three different options working together"). But each one is designed to enable the user to work with AppleWorks more efficiently.

Ericson's book also contains a wealth of simple time-saving hints ("Use the clipboard whenever possible, because

it is the simplest route") as well as a number of innovative techniques (how to create columns of text, such as tables in a word processor file).

Included is an excellent section on how to use AppleWorks in telecommunications (not at all covered in the AppleWorks manual). There is a thorough, annotated bibliography, and several appendices, with information on configuring custom printers (another section omitted in the AppleWorks manual). Overall, Ericson's style is warm, conversational, clear, and highly informative.

WHICH TO CHOOSE?

If you are now, or plan to be, a frequent AppleWorks user, I hope I've convinced you to add at least one of these books to your library. Which one should you choose? It depends on your needs, learning style, and on your level of sophistication. Another consideration is whether you are currently working with Apple's own manual.

Whichever book you choose, you will probably discover simple secrets about AppleWorks that you might never have otherwise. AppleWorks, like some classic board games, is easy to learn, but can take a long time to master. These books can speed up the process considerably.//

Deborah Kovacs is a founder and former Creative Director of Scholastic Inc.'s software division. She now works as a free-lance writer.

Puma Shoes

by MARD NAMAN

RS-COMPUTER SHOE

**Puma USA, Inc.
492 Old Connecticut Path
P.O. Box 1369
Framingham, MA 01701
(617) 875-0660
48K, Apple II+ or IIe
\$200**

CIRCLE 255 ON READERS' SERVICE CARD

The world's first intelligent pair of shoes is upon us. The **RS-Computer Shoe** made by Puma can't run for you, but can measure the distance and time

continued on next page

REVIEWS

you've run, and the number of calories you've burned. You can also set the shoe to beep after you've run a certain distance. Plus the software lets you keep comprehensive records of your running data over time and display it in color graphs on your Apple screen.

There are other computer shoes on the market. Adidas, for example, makes a shoe with a built-in computer to tell you how far you've run and the time of your run. Only Puma, however, has a shoe that actually interfaces with your Apple.

The shoe works through a sensing device that counts the number of times the right foot strikes the ground. A built-in stopwatch measures the time of your run. After each run, the information is stored in the shoe until you plug the shoe into your computer.

The brains of the computer shoe are located behind the heel of the right shoe in a tiny circuit board weighing just an ounce. The shoe is battery-powered, and the battery should last for years because it's only "on" when you're running. When the shoe is motionless for 16 seconds, it goes into a "sleep" mode. Hitting the heel of the right shoe against your hand will signal a beep, and the shoe returns to the "test" mode. Pushing the button on the back of the right heel brings on the "run" mode.

My first impression when I put them on was "They're sure heavier than my regular running shoes." Indeed, even though the tiny circuit board weighs only an ounce, the housing that encases it makes this shoe weigh 25 percent more than one without a computer. But the weight is extremely well-balanced and after a run or two, you get used to the new weight. The left shoe is built and balanced to be the same as the right shoe, but without the board. Since these shoes are actually for training rather than racing, the four-ounce difference is insignificant.

However, don't think you can just lace up your shoes, take a run and then plug the shoe into your Apple for results. To ensure that the length of your stride and your individual run-

ning style are properly measured, Puma has devised a complicated and time-consuming system known as calibration. Before your shoe can give you any information about daily runs, you must make a minimum of 15 calibration runs and enter the data. These runs compile the characteristics of your unique running style.

■

The \$200 Puma running shoe, perhaps the quintessential yuppie computer product, still has a way to go to qualify for "easy-to-use."

■

To perform the calibrations, you need a stopwatch and a 400-meter course. You must time your run while counting the number of times your right foot hits the ground. For example, your 400-meter run may take 1 minute 30 seconds and your right foot might hit the ground 145 times. This last number becomes your stride count for that run.

After you have done this at least 15 and as many as 40 times, you're still not ready to do a regular run and get the results. You must now perform five secondary calibration runs to "fine-tune" your calibration values. For these you can run on your regular course if it's at least two miles long, and know in advance the exact distance.

Now you are *finally* ready to use the



shoe to measure your runs. Granted, the shoe is designed to measure your stride with great accuracy, but Puma really needs to simplify the process. Making people go through these exhaustive set-up procedures is really getting things off on the wrong foot, if you'll pardon the pun.

Once you're ready, it's easy to use the shoe and to plug it into your computer. On the right heel are two little buttons, one red, one black. The red button resets the shoe's computer. The black button starts the internal clock as you begin your run and counts the number of times

the shoe hits the ground.

The shoe interfaces with your computer via a cable that fits into your computer's I/O connector socket. It is the only 16-pin connector on the Apple IIe, so it's easy to find. The other end of the cable fits into a four-holed slot between the red and black buttons.

The main complaint I have with the Puma running shoe is that not all the bugs are out yet. When I first tried to run in my shoes, I found out they were brain dead. Apparently, the people at the factory didn't know they had to push the reset button after they tested the shoe, and the battery ran constantly. The company kindly sent me another circuit board. This time the board seemed healthy as I did my calibration tests. But, when I plugged in my shoe for my first reading of a regular run, the program was unable to read my shoe! I have an Apple IIe with a 64K Apple memory expansion board, so everything should have been compatible. No one I telephoned at Puma was able to figure out what was wrong, so they sent me a third circuit board. This time everything finally worked out, but it made me wonder.

This shoe costs \$200, more than four times the cost of a regular running shoe. When you plunk down that kind of money, you want the thing to work! A computer shoe is a great idea, but Puma is breaking new ground, and there is no guide book.

In another year, the Puma computer shoe with the bugs out will be a great

Tony Grant

product. Right now, if you like the idea of being a pioneer, *and* you like the excitement and challenge of being on the cutting edge, *and* if you don't care if things don't work as smoothly as they should, *then* this shoe might be for you.//

Mard Naman is a free-lance writer who does all his work on an Apple IIe. His work appears occasionally in II Computing.

The Toy Shop

by ROBERT SODARO

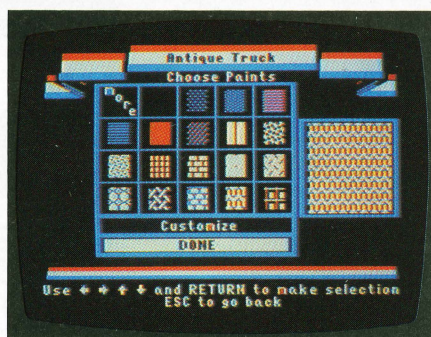
THE TOY SHOP
Broderbund Software
17 Paul Drive
San Rafael, CA 94903-2101
(415) 479-1700
Apple II+, IIe, IIc, IIgs;
printer required
64K
\$59.95

CIRCLE 254 ON READERS SERVICE CARD

The problem with most entertainment software is what to do with it when you're done. Once you've nuked all the alien aggressors in your action/arcade game or solved the riddle of the sphinx in your text adventure, what next? More cleverly designed games take longer to master, and thus will ensure a longer attention span in the gamer. However, despite what even the most serious gamer tells you, there is a limit to the number of times you can play "Zork" or "Pinball Construction Set." The designers have anticipated the "boredom factor" and have made **The Toy Shop** one of the most original games I've ever seen.

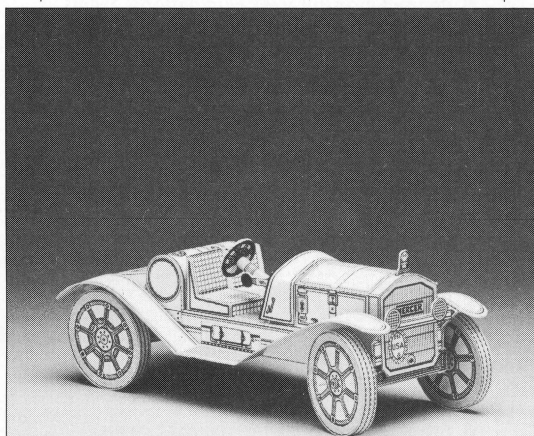
The object is simple. The software prints out the blueprints of 20 different toys, from an antique truck to a zoetrope (early motion picture machine), from a medieval catapult to a starship. And better still, all of them actually operate. The propeller on the Spirit of St. Louis spins, as do the wheels on the Mercer Runabout and the gears on the carousel.

The user's manual provides you with everything you'll need to know about constructing each model,



from assembly techniques to step-by-step requirements for construction (e.g., scissors, glue, knife). Packaged with the software are sheets of self-stick cardboard (to attach to the back of your standard printer paper), wooden dowels, thin wire and other needed items. The three-disk program also contains several different fonts, decals and designs to help you customize your toys to suit your own personality. All existing decals and designs can be altered to your whims, and extra hardware can be purchased to build additional toys.

At start-up you must set up the software to match your system configuration. The configuration will be saved on the disk so you won't have to go through it each time, but you can still change it anytime you wish. Next, you are led through a menu-driven series of commands allowing you to choose, customize and/or print your toy. A chime will sound as a reminder to change disks before the program erases the data in memory. Anything you design for future reference can also be



saved. It is also possible to format your data disks while inside the program without losing your newly crafted toy.

The user's manual is well-written: you should read it before you begin. It offers several useful hints necessary to produce your toys. While the manual tells you to use hobby scissors, an X-acto knife would probably be of

The Toy Shop is an original product that lets you create working models of zoetropes, propeller planes, carousels and more. It's got longevity and creativity built into it. Broderbund will do well to publish update disks periodically.

more use when cutting out some of the more intricate pieces. If you use a knife, take care to protect your work area.

The Toy Shop is more than just an innovative software package that pumps out neat little model toys. It is an interactive product that should attract both young and old users. As a youth, I spent many hours building models of racing cars and jet fighters, all of which I proudly displayed in my room. As I grew older and my pastimes grew more "electronic," these simple delights passed away. With Toy Shop I discovered that I can still participate in both mediums. Perhaps some of these same simple skills will entice a younger audience into realizing that there is a nonelectronic world out there waiting to be discovered.

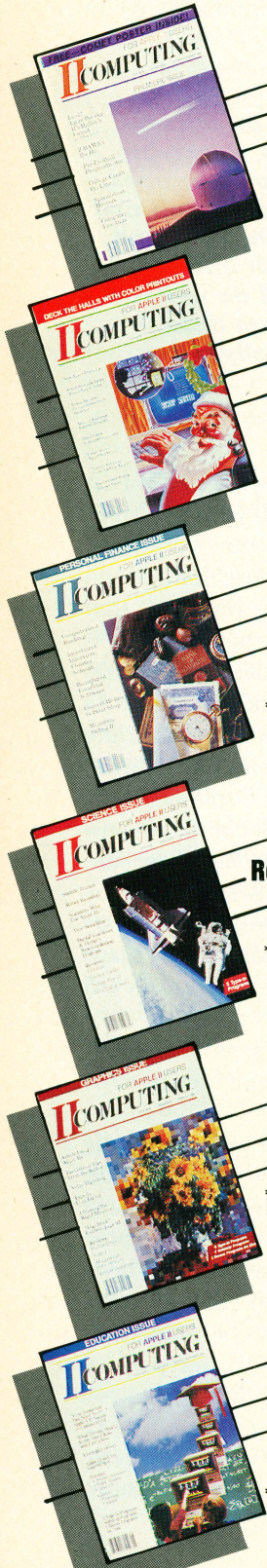
The Toy Shop will hopefully prove successful enough to warrant Broderbund's publishing additional disks with newer toys (in the same way they've updated their best-selling Print Shop). If such additional disks were to become available, this product could acquire years of additional life.//

Robert Sodaro lives in Connecticut and contributes to various computer publications.

Six of II... First and Ten...

**HOT SOFTWARE NUMBERS
FROM THE CATALOG™**

BACK ISSUES OF II COMPUTING



Vol. 1, No. 1
Oct/Nov '85
COLLECTORS ITEM!
Premier issue with comet poster.
Magazine CMS1085 \$4.00
*ProDOS Disk CDS1085 \$10.95
7 programs 96K

Vol. 1, No. 2
Dec/Jan '85
CHRISTMAS PAST!
Sysop santa, the Woz, and color printouts.
Magazine CMS1285 \$4.00
*ProDOS Disk CDS1285 \$10.95
7 programs 95K

Vol. 1, No. 3
Feb/Mar '86
MONEY TALKS!
Our personal finance issue: software, investing, banking.
Magazine CMS0286 \$4.00
*ProDOS Disk CDS0286 \$10.95
7 programs 86K

Vol. 1, No. 4
Apr/May '86
WEIRD SCIENCE!
Robots, digital gardening, gambling and space.
Magazine CMS0486 \$4.00
*ProDOS Disk CDS0486 \$10.95
6 programs 91K

Vol. 1, No. 5
Jun/Jul '86
GRAPHIC GOLD!
Artists, Fantavision, fonts and beyond.
Magazine CMS0686 \$4.00
*ProDOS Disk CDS0686 \$10.95
9 programs 108K

Vol. 1, No. 6
Aug/Sep '86
BACK-TO-SCHOOL!
All-Education: with tips for parents (and a simulated solar system).
Magazine CMS0886 \$4.00
*ProDOS Disk CDS0886 \$10.95
10 programs 100K
*Requires 64K

DOUBLE-SIDED PUBLIC DOMAIN SOFTWARE

SPACE OUT! tools, tutorials, and tips

ASTRONOMY: This double-sided disk gives you, the amateur astronomer, twenty valuable tools for: calculating satellite orbits, photographing celestial objects, or simply stargazing into the sky. A number of the programs are tutorials, others display graphics, and some perform calculations.

CC0001 \$10.00

ALL POINTS BULLETIN! leave it and receive it

TELECOMMUNICATIONS (BBS): With this double-sided disk, and a modem, you can start your own Apple Bulletin Board System (ABBS). Other users can then call your Apple II, leave messages, and transfer files. Includes complete documentation.

CC0002 \$10.00

THE TOP TWENTY! for a mean modem

TELECOMMUNICATIONS UTILITIES: This double-sided disk features Tele-chess (chess game for two players, played over the phone using a modem). Plus, twenty more utilities are provided for dialing, answering, sending/receiving files, and for ensuring the proper working order of your modem.

CC0003 \$10.00

MIND YOUR OWN BUSINESS! It pays

BUSINESS: We've stuffed nineteen powerful programs on this double-sided disk, featuring: Marketing formulas, depreciation/interest calculations, trend line analysis charting, general ledger, management style assessment, a ten-key adding machine, inventory formulas, a database manager, and Visicalc templates.

CC0004 \$10.00

DRILL 'EM! beyond the basics

EDUCATION (Physics, Chemistry, French, Spanish, Math): A packed double-sided disk, including over twenty valuable programs for 7-10th graders, featuring: 3 physics tutorials, periodic table of elements, chemistry drills, light/electricity tutorials, French and Spanish tutorials, many different math drills, and more.

CC0005 \$10.00

A REAL EDUCATION! It's smarts...

EDUCATION (Vocabulary, Geometry, Algebra): This double-sided disk includes over twenty programs for high school students, plus four tools for teachers (Bormuth readability index, test maker/taker, grading table, class grader), featuring: speed reading drill, word master-mind, synonym drill, math olympics, prime factors, statistical calculations, and more.

CC0006 \$10.00

EXPOSE YOURSELF! for art's sake

GRAPHICS: Over twenty-five beautiful and intriguing art programs, featuring: Octa-Art (eight works of computer art), skywriter, crayola (7 brush sizes, 58 colors and shades), etch-a-sketch, hi-res text demo, hi-res font editor, geometric 3D rotator, kaleidoscopes, draw-a-face, superdraw, pulsar, hi-res zoom & animator, and more.

CC0007 \$10.00

SUPER USING! essential potential

SUPER UTILITIES: Over twenty essential utilities for every Apple II owner. Includes: multi-column cataloger, disk cataloger, multi-disk formatter, sector reader, volume title changer, Applesoft line editor, binary file editor, dos modifier, screen dump, and more.

CC0008 \$10.00

CLASSIC USURY! featured favorites

CLASSIC UTILITIES: Over twenty of our favorite utilities, featuring: exec file tutorial/creator, disk modifier, text file editor, variable/literal lister, memory dump, base number converter, ASCII decoder, text tricks, 70-column text, DOS 3.3 disk mapper, and more.

CC0009 \$10.00

MORE THAN YOU BARGAINED FOR! the best and the brightest

THE GOLDEN FLOPPY: 17 of the best Apple II PD programs ever! Paul Lutus' FREEWRITER, biorhythm graph maker, word search game, pig latin translator, film exposure tutorial, computer chess, chess clock, four challenging strategy games, Morse code tutorial, and more.

CC0010 \$10.00

ALL PROGRAMS IN THIS SERIES SOLD AS IS. IN MOST CASES, THE PROGRAMS ARE SELF-EXPLANATORY AND SOME INCLUDE DOCUMENTATION. MOST, HOWEVER, DO NOT, AND REQUIRE SOME EXPERTISE IN ORDER TO USE THE PRODUCTS PROPERLY. BECAUSE THIS IS PUBLIC DOMAIN SOFTWARE, THE CUSTOMER SERVICE DEPT. CANNOT PROVIDE THE SAME TYPE OF SERVICE AS FOR OUR COPYRIGHTED PROGRAMS. HOWEVER, ALL PROGRAMS HAVE BEEN TESTED AND WILL PERFORM.

Ordering Information

ORDER TOLL-FREE

800-443-0100 ext. 700

Mail Orders

To order by mail, complete order form and return it, together with your payment, to The Catalog, 524 Second St., San Francisco, CA 94107.

Phone Orders

For faster service, Visa or Mastercard holders may phone in orders, using our toll-free number, 800/443-0100 ext. 700. This number is available 24 hours-a-day, 7 days a week (Continental U.S. & Hawaii).

Payment by check, money order, VISA or Mastercard.

Your payment must accompany all mail orders. Please include the shipping and handling charges with your payment. California residents must add 6.5% sales tax to the merchandise total. Payment in U.S. funds only.

\$20 minimum order, plus shipping and handling charges.

We fill orders of \$20.00 or more. We ship domestic, Canadian and Mexican orders via first class mail. Foreign orders are shipped air mail or surface mail, please designate your choice. For prompt delivery, be sure to include the correct shipping and handling charges with your order.

SHIPPING AND HANDLING CHARGES

Disks	Domestic	Foreign	Canada / Mexico
1-5	\$3.00	\$6.00 Air \$3.00 Surface	\$3.00
6-10	\$6.00	\$12.00 Air \$6.00 Surface	\$6.00
11 or more	\$9.00	\$18.00 Air \$9.00 Surface	\$9.00
Magazines	no charge	\$2.00 each	no charge

Please remit with Visa or Mastercard number or check or money order in U.S. funds drawn on a U.S. bank.

Customer Service Information.

For technical support and order inquiries, you may phone our Customer Service department Monday thru Friday 8 a.m.-1 p.m. Pacific time 415/957-0886. Please do not call the 800# Operators for Customer Service, they can accept orders only.

For Technical Support Or Product Information

We are only a phone call away

415-957-0886

Allow 3 to 4 weeks for delivery.

Name _____

Address _____

City _____

State/Country _____ Zip Code _____

Phone () _____

[illegible]

Subtotal of all items ordered

California residents add 6.5% sales tax

Shipping & handling charge
(See schedule on back)**TOTAL**

ORDER TODAY!

Use our preaddressed envelope between pages 10 and 11

No service charge for Mastercard or Visa

☐ Check/Money Order

Credit Card No. _____

☐ VISA

Credit Card Expiration Date_____

Name _____

JM6CBT

Signature _____

**TOLL
FREE**

**Credit card holders, call toll-free, 24 hours-a-day
800-443-0100, ext. 700** (Continental U.S. and Hawaii)

**ORDERS
ONLY!**

**HOT SOFTWARE NUMBERS
FROM THE CATALOG™**

...and **Four** To Get Smart!

EDUCATIONAL SOFTWARE

ELEMENTARY MY DEAR...POSSUM?

Totally EC (ecologically correct), from sleuthing to solving!
YOU...and DOC POSSUM For ages 5 through 9

He's the famous animal detective. You are his trusty fieldmouse assistant.

Together you tramp from meadow to riverbed. From the far woods to the pond...

Can you solve the thirty-two animal mysteries? GO ON MOUSE, WE DARE YOU!

NOTE: YOU...and DOC POSSUM was developed by the director of the Jerusalem Zoo for The Learning Company. Now brought to you by The Catalog.

CT0101 \$24.95

SPEED SKILLS! POWER READING AHEAD!

Read it and sweep!

SPEEDREAD+ For age 12 through adult

SPEEDREAD+ teaches you to read faster with less effort. Just load the program, answer the questions and read the provided text. Now you're reading faster. And retaining MORE! Expand your reading skills! Simulates the time-proven "Tachistoscope" machine, recognized as effective by reading teachers for years. Plus, you can customize this tachistoscope by changing phrase mode (4 modes), phrase length, width, flash rates, and repeat modes.

Includes excerpts from classical texts on disk.

CT0103 \$24.95

Infoworld magazine: "The **SPEEDREAD+** program was more rigorous and more challenging than the commercial course I took. It was also more fun..."

Documentation—good Error handling—excellent

REMEMBER WHEN...AND WHO, AND WHAT!

Don't just stroll when you can strut down memory lane!
MEMOREASE+ For age 12 through adult.

Learn how to memorize efficiently and quickly. Retain more. Uses a tested Gradual Recall technique. Based on well-known B.F. Skinner's work.

Many operational modes: Memorize Speeches, Poems, Facts, Prose of any kind, Vocabulary, Definitions, Languages... Any flash card information!

Features include:

- Two text modes: Full-page and split-page memorize.
- Split-page quiz allows a special flash-card review of material.
- Text editor for addition or deletion of facts to memorize.
- Excellent documentation with memory tips and techniques.

CT0104 \$24.95

LESSONS IN LOVE...LETTERS!

A PhD? Easy as 1-2-3!

BABBLE 1-2-3 For age 14 through adult

The most talked-about entertainment program in America!

BABBLE 1-2-3 is a computer program that writes love letters, vitriolic complaint letters, outrageous business memos, absurd congratulatory notes, full-length Ph.D. theses on any subject, and deeply inscrutable philosophical aphorisms.

BABBLE 1-2-3 creates an infinite variety of each type of document for you, so no two are the same. By just pressing one key, **BABBLE 1-2-3** will instantly create as many letters or memos of any kind as you want.

CT0102 \$24.95

TOLL
FREE



Credit card holders, call toll-free, 24 hours-a-day
800-443-0100, ext. 700 (Continental U.S. and Hawaii)



ORDERS
ONLY!

X-10 Powerhouse

by OWEN LINZMAYER

X-10 POWERHOUSE

X-10 (USA) Inc.

185A LeGrand Ave.

Northvale, NJ 07647

(201) 784-9700

1-800-526-0027 (technical support line)

**Apple IIc, 128K Apple IIe with double hi-res graphics and serial card Computer interface \$69.99
Lamp or appliance module \$14.99**

Thermostat controller \$39.99

Telephone responder \$49.99

CIRCLE 272 ON READER SERVICE CARD

According to the gospel of the futurists, the modern home of the 21st century will be cared for by mechanized manservants. The prospect of delegating unsavory tasks to a robot with artificial intelligence may sound like the rantings of an optimistic visionary, but the truth is that today you can program virtually every electronic device in your house to respond to remote control. All you need is an Apple IIe or IIc and the **X-10 Powerhouse**.

Using the existing electrical wiring in your house as a communication network, the X-10 Powerhouse computer interface lets you turn appliances on and off and dim lights in any part of your home. You can control up to 256 devices, but each needs a separate power module to attach to the Powerhouse system. Each module is about the size of a pack of cigarettes, and simply plugs into an electrical outlet; then you can plug a lamp or appliance into the module.

THE APPLE CONNECTION

The Powerhouse controller unit is a stylish white plastic box about the size of a small hardcover book. A short cable connects it to the Apple's serial interface. The Powerhouse has a 9-volt battery to retain its programmed intelligence, but it must be plugged into an electrical outlet to send command sig-

nals to the various modules. There are rocker switches on the interface that provide manual control over eight modules.

Software provided with the Powerhouse makes installing and using the system as easy as point and click; it's graphics oriented and works with a keyboard, joystick or mouse. Since it's written in BASIC, the software is slow at times, but it offers an excellent example of how to access the Powerhouse system with your own programs.

The first step is using the install mode to specify information about your home and the various modules being used. The hi-res graphics screen is divided into nine boxes, each representing either an interior room or yard of the house. When you select a particular room, eight tabs will be visible indicating the maximum number of modules for the room. You must choose a module position, set the device type, select an appropriate graphics icon, and then set the module code for that device. Once that's done, you can control that device in the operate mode simply by pointing to it and specifying the desired command.

In the operate mode you can issue both immediate and deferred commands to the Powerhouse system—you can program devices to turn on and off either immediately or at a certain time today, tomorrow, every day or on specific days of the week. The computer only programs the Power-

X-10 Powerhouse can truly turn your computer into a device that's practical for the home. This system can control many types of home appliances and can be of significant value to the motor-impaired person.

house unit; it doesn't directly control the modules in any way. If you program the interface to turn on the coffee machine tomorrow at 7 AM, that command is stored in the Powerhouse unit and will be sent at the correct time,



even if the interface is disconnected from the computer. In fact, you can buy a mini-controller and timer unit from X-10 if your needs are simple and you don't mind manually setting the timer.

POWER MODULES

The power modules come in two basic types, appliance modules and lamp modules. An appliance module just lets you turn power on or off; a lamp module lets you control the amount of current, so you can dim a lamp instead of just turning it off. X-10 also offers a thermostat controller that can regulate your house temperature automatically, and a telephone responder that lets you control any module in the system by phone.

The Powerhouse system represents an exceptional buy for Apple II owners who want to control their environment by computer. It's useful as a security device to give the appearance of a lived-in home, and it's also easy enough to use to be practical for daily tasks, especially by people with limited mobility. It's economical, too—I've evaluated similar home control systems that cost significantly more and were not nearly as simple to operate. Because the modules are available separately, you can build a comprehensive system over time as your budget allows.

The X-10 Powerhouse connected to your Apple II truly delivers the house of the future—today.//

Owen Linzmayer, a college student in Massachusetts, writes frequently for computer publications.

The American Challenge: A Sailing Simulation

by CARLOS DOMINGO MARTINEZ

THE AMERICAN CHALLENGE: A SAILING SIMULATION

Distributed by: Tom Snyder Productions

Mindscape, Inc.

3444 Dundee Road
Northbrook, IL 60062

(312) 480-7667

Apple II, II+, IIe or IIc, 64K
\$39.95

CIRCLE 206 ON READER SERVICE CARD

No one can deny that the Australian victory in the last America's Cup series has focused attention on yacht racing. **The American Challenge: A Sailing Simulation** addresses this new-found interest by permitting even those of us who have never set foot aboard a day-sailer to vicariously participate in the quest to regain the Cup.

The American Challenge places you at the controls of a digital sailboat to be maneuvered around eight different race courses. The "challenge" is to achieve the fastest time in each of the first seven races and thus "qualify" to sail against the Aussies for the "Cup."

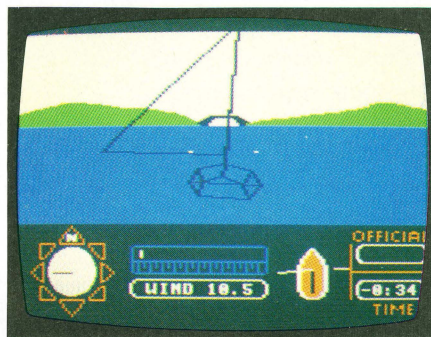
Your boat competes against a defender (at the outset a "demo" boat) which sails along with you, replaying the fastest race that has so far been recorded for that course. However, the defender is a "ghost" boat; the contests are in fact run exclusively against the clock. When you post a winning time, your boat becomes the current "defender." All subsequent races on that course must then be run against that time until it is either bested or deleted from the program.

The boats are represented solely by their outlines, but the program rotates the shapes and surfaces convincingly enough to suggest a reasonable three-

dimensionality. The animation is generally quite fluid and smooth but, a number of times, as I rounded a Reach buoy, the horizontal scrolling of the screen jumped. Before I was able to stop it, the heading of my boat changed about 45 degrees.

As it sails, your boat may be viewed from a variety of angles but, in every case, from the outside looking in. However, employing the Zoom option to get a "close-up" of your yacht gives a feeling of sitting inside the boat. Before each contest, an overhead view shows the track taken by the current defender and afterward it indicates the relative progress of each yacht. During the race, it may be used to check your position and to give you a respite from the action.

Your sailboat is controlled by keyboard inputs, allowing you to steer and



to set the angle of your sail to the wind. A control panel monitors the performance of the boat and the velocity and direction of the wind.

Although the program operates well in most respects, I do have some nits to pick. Foremost is the way in which the program apportioned time and distance. All the courses are too small and even the longer races end too quickly, a condition that undermines the tactical component of yacht racing. For example, sailboats make their way upwind by tacking (zig-zagging). In racing this produces elaborate duels as each boat tries to find the fresher breeze or to force the opponent into a mistake. Twenty to thirty tacks to reach an upwind buoy is not uncommon. In **The American Challenge**, distances are so short that windward marks are reached with only one tack. And each

race has a time limit of only sixteen "computer" (about six actual) minutes. While few would desire a "real time" simulation of a Cup race (five hours), a more reasonable approximation of time and distance would provide greater realism.

Also, I found the scoring format of the game displeasing. Since only the very best time confers a win, consistency is not rewarded and the satisfaction of good sailing is diminished. Trying to beat a truly fast time can prove to be quite frustrating.

If you have access to two computers, you may compete against another player. To do this, you also need another copy of the program and a connecting cable. Communication by modem is also possible. This option does present some interesting enhancements, such as a physically solid opposing boat. But my impression is that under these more realistic conditions the time and space limitations of the program would have even greater impact.

I enjoyed playing with **The American Challenge**, but as I did so its deficiencies became increasingly more nettlesome. I made a wish-list of improvements—more sails, more distance, more time, in short, more *sailing*. If the dynamics of flight and the complexity of a modern airplane can

■
While *The American Challenge* is enjoyable as a game, it still has a ways to go to qualify as a bona fide sailing simulation. The reviewer wished for "more sails, more distance, more time, more sailing."
■

be simulated on a 64K Apple, why not a Twelve Meter race? As a game, this program is interesting enough, but unfortunately, as a simulation, **The American Challenge** misses the boat.//

Carlos Domingo Martinez, a 4-year veteran of the PC wars and freelance tech writer, wishes to meet the 16-bit Apple II, heard of in song and tale. No betas please, photo a must, reply Box 65816.



Mary Rhomberg Lavery

SPELLER BEE, KIDTALK, MATHTALK and FIRST SHAPES, First Byte, Inc., 2845 Temple Ave., Long Beach, CA 90806; (213) 595-7006; \$49.95 each.

CIRCLE 286 ON READER SERVICE CARD

These educational programs all use the Ensoniq sound chip in the IIGS for speech synthesis. A colorful talking parrot guides kids through **KidTalk**, a talking word processor; a talking bee helps children master spelling skills in **Speller Bee**; Professor Matt A. Matics, a talking math tutor, helps solve math problems in **First Math**; and Ted E. Bear tells children about geometric shapes in **First Shapes**. 3.5-inch disks.

THE CONSERVER, SUPERSONIC and OCTORAM, MDIdeas, Inc., 1111 Triton Dr. Suite 205, Foster City, CA 94404; (415) 573-0580.

CIRCLE 290 ON READER SERVICE CARD

The Conserver (\$129.95) stashes a power strip and fan in a 2-1/4-by-11-inch platinum-colored box that doubles as a monitor platform, protecting your IIGS from heat-related failures and power surges. The **Supersonic** peripheral card (\$59.95) enables the Ensoniq chip in the IIGS to produce multi-channel digitized stereo sound through the card's two built-in .5 watt amplifiers. The **OctoRam** RAM card offers memory expansion from 256K to as much as 8 megabytes in the IIGS memory expansion slot; \$399 for 1M, \$699 for 2M.

TURBO-ADB KEYBOARD, Datadesk International, 7650 Haskell Ave. Suite A, Van Nuys, CA 91406; 1-800-826-5398, 1-800-592-9602 in California; \$149.95.

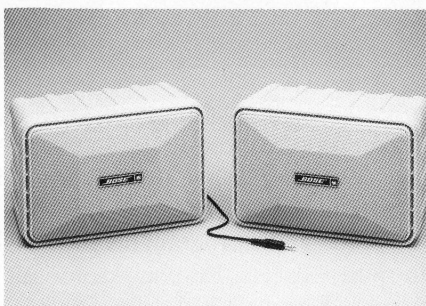
CIRCLE 289 ON READER SERVICE CARD

The IBM Selectric-style **Turbo-ADB Keyboard** replaces the IIGS keyboard, plugging directly into the Apple DeskTop Bus. It has 101 typewriter-sized keys, a built-in joystick port and 15 function keys with four command levels so commands like cut, paste and copy can be performed with a single keystroke.

816/PAINT, Baudville, 1001 Medical Park Dr. S.E., Grand Rapids, MI 49506; (616) 957-3036; \$75.

CIRCLE 287 ON READER SERVICE CARD

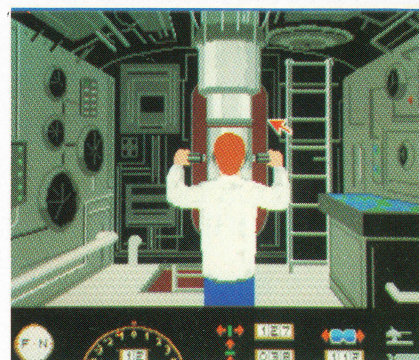
816/Paint is a graphics program that works with all 128K Apple IIs and all graphic resolution modes—including the new super hi-res modes on the IIGS. A mouse-and-menu user interface makes it simple to scale, rotate, stretch or choose from the 4,096-color palette. Floppy and 3.5-inch disks.



BOSE ROOMMATE SPEAKERS, Bose Corp., 100 The Mountain Rd., Framingham, MA 01701; (617) 879-7330; \$229/pair.

CIRCLE 284 ON READER SERVICE CARD

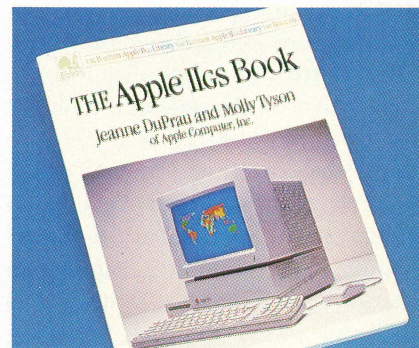
The **Bose Roommate Speakers** offer big, room-filling sound for IIGS owners. Designed specifically to complement the musical abilities of the Ensoniq sound chip, the speakers are housed in 6-by-9-by-6-inch cabinets that match the styling and platinum color of the IIGS. The speakers can also be used with pocket stereos and portable Compact Disc players.



SILENT SERVICE, Microprose Software, 120 Lakefront Dr., Hunt Valley, MD 21030; (301) 667-1151; \$39.95.

CIRCLE 288 ON READER SERVICE CARD

With **Silent Service** you can almost smell the diesel oil and feel the deck rolling beneath your feet as you experience the danger of captaining a World War II submarine in the South Pacific. The IIGS version of this simulation has intricate instrumentation, mouse control and sound effects that have been compared to studio recordings. 3.5-inch disk.



THE APPLE IIGS BOOK, Bantam Books, 666 Fifth Ave., New York, NY 10103; (212) 765-6500; \$18.95.

CIRCLE 285 ON READER SERVICE CARD

Written by Apple insiders Jeanne DuPrau and Molly Tyson, the **Apple IIGS Book** covers the new machine, from basic operating procedures to descriptions of the new advanced features. It also includes a short history of the IIGS, and includes interviews with Steve Wozniak and the IIGS development team.

NEW PRODUCTS

UNIVERSAL DISK CONTROLLER CARD, Central Point Software, Inc., 9700 SW Capitol Highway, Suite 100, Portland, OR 97219; (503) 244-5782; \$150.

CIRCLE 274 ON READER SERVICE CARD

A **Universal Disk Controller Card** installed in your Apple II+, IIe or Laser 128 combines the functions of a 5¼-inch and 3.5 disk controller. You can connect any two 5¼-inch or 3.5-inch Apple compatible drives including the 400K and 800K Macintosh drives. Different drive types can connect to the card simultaneously.

TERM PAPER WRITER, Personal Choice/Activision, P.O. Box 7286, Mountain View, CA 94039; (415) 960-0410; \$59.95.

CIRCLE 275 ON READER SERVICE CARD

Term Paper Writer integrates four programs: The Notetaker, The Outliner, The Writer, and The Footnoter and Bibliography Compiler. Students will find this educational aid invaluable when formatting and writing those dreaded term papers.

SMARTHOME, Cyberlynx Computer Products, Inc., 4828 Sterling Drive, Boulder, CO 80301; 1-800-SECURE9, (303) 444-7733 in Colorado; \$600.

CIRCLE 276 ON READER SERVICE CARD

Smarthome is a security and appliance control system that plugs into your Apple. It supports a wide variety of accessories like smoke detectors, telephone autodialers, motion detectors, and appliance switches to automatically control your lights, heating, burglar alarm, TV and stereo.

GRAFEX, Ray Dahlby Electronics, Department 255, Box C 34069, Seattle, WA 98124; (604) 732-1080; \$195.

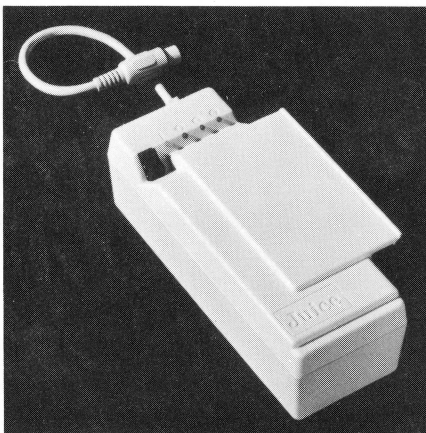
CIRCLE 281 ON READER SERVICE CARD

The **Grafex** hi-res display adapter for your Apple II, II+ or IIe provides screen resolution up to 640-by-400 pixels in monochrome. Additional Grafex cards can be chained allowing up to 16 color RGB or 16 grey-level monochrome displays.

LUNAR EXPLORER, Electric Transit, 501 Marin Street, Suite 116, Thousand Oaks, CA 91360; (805) 373-1960; \$40.

CIRCLE 278 ON READER SERVICE CARD

Lunar Explorer is a scientifically accurate real-time simulation. Quick reflexes and split second timing will help you pilot your vehicle across the hostile lunar terrain. Features 3-D graphics views of craters, constellations and the Apollo 11 landing site.



JUICE, Orbic Controls, 7853 Balboa Ave., San Diego, CA 92111; 1-800-433-4221, (206) 488-8621 in Washington or Alaska; \$169.95.

CIRCLE 279 ON READER SERVICE CARD

This uninterruptible power supply protects your IIc from power surges and other current-related failures. **Juice** also functions as a battery pack, allowing portability and providing up to two hours of operating time on a single charge.

THE CHALLENGE, Blue Chip Software, 185 Berry Street, San Francisco, CA 94107; 1-800-824-9236, (415) 546-1866 in California; \$99.95.

CIRCLE 283 ON READER SERVICE CARD

The Challenge simulates experiences in the stock, real estate, and commodities markets. Designed as an educational tool, the program points out factors that influence the markets and introduces students to the strategies used by successful investors.

HOMEWORKER, Davidson & Associates, Inc., 3135 Kashiwa Street, Torrance, CA 90505; (213) 534-4070; \$89.95.

CIRCLE 280 ON READER SERVICE CARD

Homeworker is a productivity program designed to help high school and college students organize their resources and improve their grades. The program integrates six modules, Textwriter, Outliner, Flash Card Maker, Calendar, Grade Keeper and Calculator, into one easy-to-use program. Comes complete with notebook style organizer, notepaper, address book, disk holder and other study accessories.

FORMULA VISION, Genteware Corp., 2509 Saginaw Trail, Maitland, FL 32571; (305) 628-4608; \$29.95 plus \$2.50 shipping.

CIRCLE 282 ON READER SERVICE CARD

Formula Vision is a general purpose math and science spreadsheet for educators. It lets you assign names to cells so formulas are easy to read. The disk includes example templates for math, pre-calculus, physics, chemistry and biology, plus an auto-duplicate function allows users to make as many copies as needed within one school.

MODEM MGR, MGR Software, 305 S. State College Blvd., Suite 101, Anaheim, CA 92806; (714) 993-0294; \$50.

CIRCLE 277 ON READER SERVICE CARD

Modem Mgr is a new communications program for the Apple II+, IIe or IIc. It features split-screen capability, a type-ahead buffer for easy editing, and macro command file processing. A special snapshot option lets you capture what's on the screen into a text buffer that can be printed or saved to disk. Supports DOS 3.3 and ProDOS.

SALE

SUPER VALUES COMPUTER DIRECT

SAVE

SINGLE SIDED/DOUBLE DENSITY DISKS

.29 ea.

100% Certified 5 1/4" floppy disks. **Lifetime Warranty**, automatic lint cleaning liner included. 1 Box of 100 \$29.00 List \$1.99 ea. **SALE \$.29 ea.**

COMMWORKS TELECOMMUNICATIONS SALE \$ 59.95

List \$100

CommWorks is the easy, complete telecommunication solution for the Apple. You do not have to "learn a new language" so you spend more time communicating and less time "logging" on to a system. Features which distinguish this from others are: file folder user interface, communications files, CommWorks Macros, a powerful on-line text editor, and an auto log facility. (Disk) List \$99.95 **SALE \$59.95**

1200 BPS MODEM SALE

SALE \$119.95

List \$199

This 1200 BPS modem is a sophisticated intelligent device. It contains its own computer for controlling communications and reporting its status back to you or your program. Features include: Bell 103 & 212A compatible, Dial by tone or pulse, volume control, external dip switches, fully compatible Hayes function & command, built in 24 "AT" command sets & 16 modem status registers, and much more. List \$199.95 **SALE \$119.95**

FLIP-N-FILE SALE \$ 14.95

List \$24.95

Everyone needs a floppy disk secretary. Dust and dirt can hurt your disks. Proper filing and protection of you disk collection will reduce unnecessary wear and tear. Flip-N-File holds over 70 disks in one easy to find, protective filer. List \$24.95 **SALE \$14.95**

SOFTWARE

ACCESS

ACTION PACK (D).....\$14.95

ACCOLADE

FIGHT NIGHT (D).....\$18.95
HARDBALL (D).....18.95
DAM BUSTERS (D).....18.95
PSI TRADING CO. (D).....18.95
LAW OF THE WEST (D).....18.95

ACTIVISION

HACKER (D).....\$24.95
MASTER OF THE LAMPS (D).....20.95
GREAT AMERICAN CROSS COUNTRY RACE (D).....22.95
GHOSTBUSTERS (D).....21.95
BORROWED TIME (D).....21.95

ARTSCI

MAGIC MEMORY (D).....\$39.95
MAGIC CALC (D).....49.95
MAGIC WINDOW (D).....49.95

BRODERBUND

PRINT SHOP (D).....\$25.95
PRINT SHOP COMPANION (D).....21.95
GRAPHICS LIB. 1,2 or 3 (D).....14.95
KARATEKA (D).....16.95
BANK STREET WRITER (D).....37.95
CHAMPIONSHIP LODGE RUNNER (D).....19.95
WHERE IS CARMEN SANDIEGO? (D).....22.95

BLUE CHIP

MILLIONAIRE (D).....\$22.95
BARON (D).....22.95
TYCOON (D).....22.95
SQUIRE (D).....22.95

DESIGNWARE

ALGEBRA (D).....\$19.95
CREATURE CREATOR (D).....9.95
THE BODY TRANSPARENT (D).....23.95
CRYPTO CUBE (D).....19.95
EUROPEAN NATIONS & LOCATIONS (D).....23.95
THE GRAMMAR EXAMINER (D).....23.95
MATH MAZE (D).....22.95
MISSION ALGEBRA (D).....23.95
REMEMBER! (D).....39.95
SPELLAGRAPH (D).....22.95
SPELLAKAZAM (D).....17.95
SPELLICOPTER (D).....22.95
SPELLING & READING PRIMER (D).....22.95
STATES & TRAITS (D).....23.95
TRAP-A-ZOID (D).....22.95

ELECTRONIC ARTS

ONE ON ONE (D).....\$9.95
SEVEN CITIES OF GOLD (D).....9.95
HARD HAT MACK (D).....9.95
MURDER ON THE ZINDERNEUF (D).....9.95
SKYFOX (D).....22.95
REACH FOR THE STARS (D).....26.95
FINANCIAL COOKBOOK (D).....27.95
CARRIERS AT WAR (D).....30.95

EPYX

PITSTOP II (D).....\$19.95
BALL BLAZER (D).....19.95
SUMMER OLYMPIC GAMES (D).....22.95
IMPOSSIBLE MISSION (D).....14.95
ROBOTS OF DAWN (D).....14.95
SUMMER GAMES II (D).....22.95
WORLD'S GREATEST BASEBALL (D).....19.95
WINTER GAMES (D).....22.95
MOVIE MONSTER GAME (D).....24.95
WORLD'S GREATEST FOOTBALL GAME (D).....22.95

FISHER PRICE

PETER RABBIT READING (D).....\$22.95
1ST MEN IN MOON MATH (D).....22.95
JUNGLE BOOK READING (D).....22.95

MINDSCAPE

BANK STREET STORYBOOK (D).....\$22.95
CROSSWORD MAGIC (D).....27.95
THE HALLEY PROJECT (D).....24.95
STEPHEN KING: THE MIST (D).....22.95
JAMES BOND: A VIEW TO A KILL (D).....22.95
RAMBO: FIRST BLOOD (D).....22.95
THE AMERICAN CHALLENGE (D).....24.95
THE PERFECT SCORE (D).....39.95
RACER (D).....24.95

RANDOM HOUSE

ALPINE ENCOUNTER (D).....\$19.95
CHARLIE BROWN'S ABC'S (D).....19.95
GARFIELD DOUBLE DARES (D).....19.95
GARFIELD EAT YOUR WORDS (D).....19.95
SNOOPY WRITER (D).....19.95
SNOOPY'S SKYWRITER SCRAMBLER (D).....19.95

SPECTRUM HOLOBYTE

GATO (D).....\$19.95

SPRING BOARD

NEWSROOM (D).....\$29.95
CLIP ART I (D).....15.95
CLIP ART II (D).....20.95
CERTIFICATE MAKER (D).....30.95
GRAPHICS EXPANDER (D).....21.95

SUB-LOGIC

FLIGHT SIMULATOR (D).....\$29.95
NIGHT MISSION PINBALL (D).....21.95

SPINNAKER

DELTA DRAWING (D).....\$22.95
FACEMAKER (D).....13.95
KIDS ON KEYS (D).....13.95
ADVENTURE CREATOR (D).....16.95
ALPHABET ZOO (D).....16.95
FRACTION FEVER (D).....13.95
KIDWRITER (D).....16.95
KINDERCOMP (D).....13.95
STORY MACHINE (D).....13.95
SUM DUCKS (D).....19.95
HOMEWRK HELPER MATH (D).....22.95
RHYMES & RIDDLES (D).....12.95
TRAINS (D).....16.95
GRANDMA'S HOUSE (D).....13.95
HEY DIDDLE DIDDLE (D).....12.95
SNOOPER TROOPS I (D).....12.95
SNOOPER TROOPS II (D).....12.95
COUNTING PARADE (D).....16.95
THE MOST AMAZING THING (D).....18.95
HOMEWORK HELPER WRITING (D).....22.95

STATGIC SIMULATIONS INC.

BATTLE OF ANTIETAM (D).....\$26.95
NAM (D).....21.95
U.S.A.A.F. (D).....30.95
COLONIAL CONQUEST (D).....21.95
PANZER GRANADIER (D).....21.95

TELARIUM

AMAZON (D).....\$12.95
DRAGONWORLD (D).....12.95
FAHRENHEIT 451 (D).....12.95
RENDEZVOUS WITH RAMA (D).....12.95
9 PRINCES IN AMBER (D).....12.95
PERRY MASON (D).....12.95

WEEKLY READER

STICKYBEAR MATH (D).....22.95
STICKYBEAR NUMBERS (D).....22.95
STICKYBEAR READING (D).....22.95
STICKYBEAR OPPOSITES (D).....22.95
STICKYBEAR ABC (D).....22.95
STICKYBEAR SHAPES (D).....22.95
STICKYBEAR SPELLGRABBER (D).....22.95
STICKYBEAR PRINTER (D).....22.95
STICKYBEAR TYPING (D).....22.95
STICKYBEAR TOWN BUILDER (D).....22.95

WINDHAM CLASSICS

ALICE IN WONDERLAND (D).....\$21.95
BELOW THE ROOT (D).....21.95
SWISS FAMILY ROBINSON (D).....21.95
WIZARD OF OZ (D).....21.95
TREASURE ISLAND (D).....21.95

**BEST SERVICE IN THE
U.S.A. • 90 DAY
REPLACEMENT
WARRANTY • ONE DAY
EXPRESS MAIL • 15 DAY
FREE TRIAL • OVER 500
PROGRAMS • A CUSTOMER
LIST OF OVER 3,000,000
LARGEST IN THE U.S.A.**

**CALL FOR FREE
CATALOG WITH \$2.00
OFF COUPON!**

PHONE ORDERS

8 a.m. - 8 p.m. C.S.T. Weekdays
9 a.m. - 12 noon C.S.T. Saturdays
(312) 382-5050

Add \$3.00 for shipping, handling, and insurance. Illinois residents please add 6 1/2 % sales tax. Add \$6.00 for CANADA, PUERTO RICO, HAWAII, ALASKA, APO-FPO orders. All orders must be in U.S. Dollars. WE DO NOT EXPORT TO OTHER COUNTRIES EXCEPT CANADA. Enclose Cashier Check, Money Order or Personal Check. Allow 14 days for delivery, 2 to 7 days for phone orders, 1 day express mail. Prices & Availability subject to change without notice. Hardware shipping prices vary according to weight. Please call for amount. (No APO-FPO for monitors)

VISA—MASTER CARD—C.O.D.

C.O.D. on phone orders only.

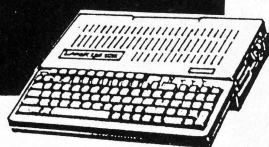
COMPUTER DIRECT WARRANTY

All Computer Direct's products carry a minimum 90 day warranty. If anything fails within 90 days from the date of purchase, simply send your product to us via United Parcel Service prepaid. We will IMMEDIATELY send you a replacement at no charge via United Parcel Service prepaid. This warranty proves that **We Love Our Customers.**

SALE

SUPER DEALS

(312) 382-5050 TO ORDER

SAVE

APPLE COMPATIBLE LASER 128 COMPUTER

SALE \$395.00 List \$649

Comes complete with 5¼" disk drive built in, 32K ROM, 128K RAM, and much more. Compatible with virtually all software for the Apple II, IIe, and IIc. Plus, for a limited time you will receive Magic Window IIe word processor for **FREE**. (a \$149.95 Value) List \$648.95 **SALE \$395.00**

ACCESSORIES SALE

	List	SALE
RS 232 Cable	\$29.95	\$14.95
Centronics Cable	\$34.95	\$19.95
RGB Cable	\$24.95	\$19.95
Expansion Box	\$99.00	\$79.00
2nd Disk Drive	\$299.95	\$129.95

BIG BLUE PRINTER

SALE \$ 39.95 List \$199

This is the affordable printer you have been waiting for! This 8½" letter size, 80 column dot matrix, heat transfer printer features upper and lower case, underline, graphics, word processing, and much more. List \$199.00 **SALE \$39.95**

PREMIUM QUALITY 150-170 CPS COMSTAR AERO 160 PRINTER

SALE \$199.00 List \$499

The Comstar Aero 160 gives you a 10" carriage, 150-170 CPS, 9x9 dot matrix with double strike capability for 18x18 dot matrix (*near letter quality), high resolution bit image (120x144 dot matrix), underline, back spacing, left and right margin setting, true lower descenders with super and subscripts, prints standard, block graphics and special characters. It gives you print quality and features found on printers costing twice as much! (Centronics Parallel Interface) List \$499.00 **SALE \$199.00** (*with Xetec interface)

PRINTER/TYPEWRITER WITH SPELL CHECK

SALE \$299.95 List \$399

Superb Silver Reed letter quality daisy wheel printer/typewriter. Includes **Spell Check**; over 90,000 words with capacity to add more of your own. LED readout corrects mistakes before they print. Comes with **free** memory expander. (90 day warranty) Centronics Parallel Interface is built in. (Apple Interfaces Available) List \$399.00 **SALE \$299.95**

APPLE COMPATIBLE SYSTEM SALE

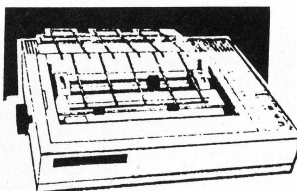
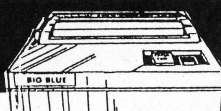
SALE \$ 499.00 List \$1227

Marvelous! Save over \$700! Included are: Laser 128 Computer, Big Blue Printer, 9" Samsung Green Monitor, Interface, Magic Window IIe Word Processor, Magiccalc Spreadsheet, Magic Memory Data Base and 2 Paper Rolls. A comparable system costs over \$2000. Great savings. List \$1227.95 **SALE \$499.00**

JOYSTICK SALE

SALE \$ 29.95 List \$39.95

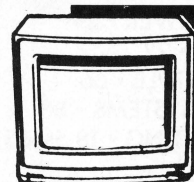
This analog joystick is terrific. Choose self-centering control or free-floating. For Apple or IBM. List \$39.95 **SALE \$29.95**



12" 80 COLUMN MONITOR

SALE \$ 79.95 List \$129

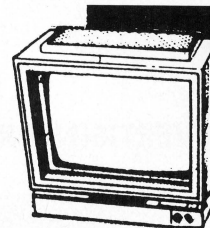
Super High Resolution green screen monitor. 80 columns x 24 lines, easy to read, plus easy to adjust control knobs. Supreme Quality. Fantastic value. List \$129.00 **SALE \$79.95**



13" COLOR MONITOR

SALE \$139.95 List \$329

This premium quality monitor comes with speaker and audio hook up, High Resolution, clear screen, 40 columns x 24 lines, front panel controls and more. Can also be used with VCR. One year warranty. List \$329.00 **SALE \$139.95**



14" RGB & COMPOSITE COLOR MONITOR

SALE \$237.00 List \$399

Must be used to get 80 columns in color with 80 column computers (C128 - IBM - Apple) (RGB cable \$19.95) Add \$14.50 shipping. List \$399.00 **SALE \$237.00**

TV TUNER

SALE \$ 49.95 List \$130

This tuner has dual UHF/VHF selector switches, mute, automatic fine tuning and computer/TV selector switches. Hook it up between your computer and monitor! Inputs included for 300 ohm, 75 ohm, and UHF. List \$129.95 **SALE \$49.95**

**CALL BEFORE YOU ORDER:
• OUR PRICES MAY BE LOWER
& AND WE OFFER SPECIAL
SYSTEM DEALS •**

COMSTAR 1000 PRINTER

SALE \$189.95 List \$349

This is the best values today. Print letters, documents, ect. at 100 characters per second and has Near Letter quality mode. Features are dot addressable graphics, adjustable tractor and friction feed, margin settings, pica, elite, condensed, italics, super & subscript, underline, bold, and double strike. Image writer compatible at half the price. Works with Apple, Laser and Macintosh. List \$349.00 **SALE \$189.95**

**ATTENTION
COMPUTER CLUBS • DEALERS**
We offer big volume discounts!
CALL TODAY

COMPUTER DIRECT
We Love Our Customers
22292 N. Pepper Rd., Barrington, Illinois 60010
(312) 382-5050 to order

ADVERTISERS LIST

This list is provided as a courtesy to our advertisers. **II Computing** does not guarantee accuracy or comprehensiveness.

Reader Service Number

014 APPLE COMPUTER CLUBS • 68,
69
015 BATTERIES, INC. • 84
001 BEAGLE BROS. • 30,31
002 BLACK SUN • 22
022 BRAIN POWER • 29
006 CLIP ART • 22
003 C.A.L.L. APPLE • 66
004 CAUZIN SYSTEMS • 83
II COMPUTING • 18,59,65,74,75

Reader Service Number

031 COMPUWARE • 28
005 CREATIVE PERIPHERALS • 4
007 DAC EASY SOFTWARE • 21
041 DIGITAL VISION • 22
012 MICROPROSE • 3
072 MGR SOFTWARE • 51
008 PROTECTO • 80,81
009 S. ANTHONY STUDIO • 51
010 STELLATION • 66
111 S.S.I. • 2

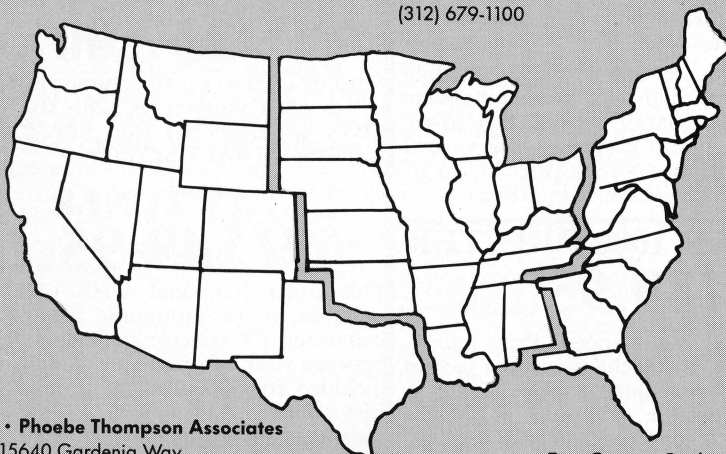
USING THE READER SERVICE CARD

Please be sure to use our Reader Service card, which you'll find bound into the magazine near the back. To learn more about any product you see in **II Computing**, just fill out the card, circle the appropriate numbers and drop the card in the mail postage paid. Automatically, your request goes to the corresponding companies, and they'll send you information about their products or services. Our advertisers want to hear from you, and your interest in their products helps us bring you **II Computing**.

ADVERTISING REPRESENTATIVES

Midwest • The Pattis Group

Jill Krotich Burrow
4761 Touhy Ave.
Lincolnwood, IL 60646
(312) 679-1100



West Coast • Phoebe Thompson Associates

15640 Gardenia Way
Los Gatos, CA 95030
(408) 356-4994

East Coast • Garland Associates

Mary J. Crowley
10 Industrial Park Rd.
Hingham, MA 02043
(617) 749-5852

Advertising Sales Director

John Taggart
Antic Publishing
524 Second St.
San Francisco, CA 94107
(415) 957-0886

Address all advertising materials to:

Katherine Murphy
Advertising Production Coordinator
II Computing Magazine
524 Second St.
San Francisco, CA 94107

MOVING?



DON'T FORGET US!

New Address:

Name _____

Address _____

City _____

State _____

Zip _____

Place current address label here.



Fill in coupon
and mail to:
II Computing
524 2nd St.
San Francisco,
CA. 94107

Reader Service Card

FREE PRODUCT INFORMATION FROM *II COMPUTING*

Name: (Mr./Mrs./Ms) _____

Address: _____

City: _____ State: _____ Zip: _____

Telephone: (_____) _____

A. What kind of computer do you own?

1. ☐ Apple II 4. ☐ Apple IIc
2. ☐ Apple II+ 5. ☐ Apple Compatible
3. ☐ Apple Iie 6. ☐ Other _____

B. What products do you plan to buy in the next 6 months?

1. ☐ Printer 6. ☐ Memory
2. ☐ Modem expansion boards
3. ☐ Color monitor 7. ☐ New Apple
4. ☐ UniDisk 3.5 Computer
5. ☐ Hard disk drive 8. ☐ Softstrip reader

C. What are the primary uses of your computer?

1. ☐ Word processing 6. ☐ Running a
2. ☐ Education business
3. ☐ Games and 7. ☐ Data bases
Entertainment 8. ☐ Telecommuni-
4. ☐ Spreadsheets cations
5. ☐ Programming 9. ☐ Graphics

D. How did you obtain this copy of *II Computing*?

1. ☐ Subscriber 5. ☐ Borrowed
2. ☐ User group 6. ☐ School
3. ☐ Newsstand 7. ☐ Computer store
4. ☐ Bookstore

E. Household Income

1. ☐ Less than \$25,000 4. ☐ \$50,000-74,999
2. ☐ \$25,000-34,999 5. ☐ \$75,000-99,999
3. ☐ \$35,000-49,999 6. ☐ \$100,00 and over

F. Send me a subscription for \$11.97 (6 issues) and bill me. Circle 300 on Reader Service Card.

G. To subscribe to Disk Version or for foreign delivery see subscription insert within magazine.

Circle Numbers for More Information.

1	6	11	16	21	151	156	161	166	171
2	7	12	17	22	152	157	162	167	172
3	8	13	18	23	153	158	163	168	173
4	9	14	19	24	154	159	164	169	174
5	10	15	20	25	155	160	165	170	175
26	31	36	41	46	176	181	186	191	196
27	32	37	42	47	177	182	187	192	197
28	33	38	43	48	178	183	188	193	198
29	34	39	44	49	179	184	189	194	199
30	35	40	45	50	180	185	190	195	200
51	56	61	66	71	201	206	211	216	221
52	57	62	67	72	202	207	212	217	222
53	58	63	68	73	203	208	213	218	223
54	59	64	69	74	204	209	214	219	224
55	60	65	70	75	205	210	215	220	225
76	81	86	91	96	226	231	236	241	246
77	82	87	92	97	227	232	237	242	247
78	83	88	93	98	228	233	238	243	248
79	84	89	94	99	229	234	239	244	249
80	85	90	95	100	230	235	240	245	250
101	106	111	116	121	251	256	261	266	271
102	107	112	117	122	252	257	262	267	272
103	108	113	118	123	253	258	263	268	273
104	109	114	119	124	254	259	264	269	274
105	110	115	120	125	255	260	265	270	275
126	131	136	141	146	276	281	286	291	296
127	132	137	142	147	277	282	287	292	297
128	133	138	143	148	278	283	288	293	298
129	134	139	144	149	279	284	289	294	299
130	135	140	145	150	280	285	290	295	300



NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL

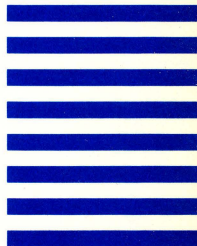
FIRST CLASS

PERMIT NO. 133

DALTON, MA 01227-9990

POSTAGE WILL BE PAID BY ADDRESSEE:

Il Computing
P.O. Box 394
Reader Service Dept.
Dalton, MA 01227-9990





The PC User's Edge

NOW! TRANSFER DATA – PROGRAM TO PROGRAM WITH SOFTSTRIP®.

Now you can move data between programs quickly and easily using SOFTSTRIP data strips.

Using the Softstrip System, you can move data between computers and such programs as WordStar and MacWrite, dBASE and AppleWorks, Lotus 1-2-3 and Excel and ReadySetGo and many others.

We've created a series of several dozen Application Notes on Softstrip data strips. These lead you through simple steps to make the file transfer as easy as possible, adding even more versatility to your personal computer when you purchase the SOFTSTRIP SYSTEM. The advanced system you've been hearing so much about.

All you need to move data between programs is STRIPPER™ software at \$19.95 and the Softstrip System Reader at \$199.95.

For a complete list of Application Notes, contact your dealer or call Cauzin.

DECEMBER CASE HISTORY



A small manufacturer solved a knotty internal communications problem using the SOFTSTRIP SYSTEM.

The manufacturer uses personal computers in various departments. The problem was that most were not linked with others, and that different, incompatible computer makes were in use; predominantly IBM PC's and Apple Macintoshes.

Because of compatible media, virtually all internal communication was in hardcopy form. It was necessary for document recipients to key in the information if it was to be used in the local computer. Data included sales statistics, engineering reports, and sales materials. Especially time-consuming was the rekeying of brochure and sell-sheet drafts created on IBM PC's with wordprocessors, but later edited and composed with Pagemaker and the Macintosh and Laserwriter.

By equipping all computers with the SOFTSTRIP SYSTEM READER and STRIPPER, each station can now reduce all reports to data strip form. These are photocopied and sent to appropriate departments for reentry through the SOFTSTRIP READER. Using Cauzin's Softstrip System and Application Notes, the problem of moving information between dissimilar computers and programs was solved.

Users' Groups: Call for Special User Group Discounts.

ACT NOW! Don't delay. See your local Softstrip dealer or call us at 1-800-533-7323. In Connecticut: 203-573-0150.

CAUZIN

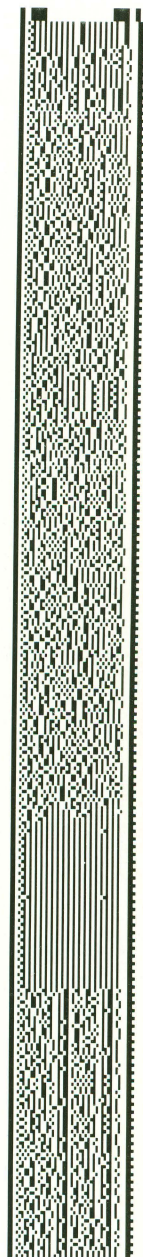
835 South Main Street
Waterbury, CT 06706
(203) 573-0150

For Europe and Asia Contact:

Softstrip International, Ltd.

53 Bedford Square
London, WC1 B3DP England
01-631-3775 Telex: 263874SOFTST G

CIRCLE 004 ON READERS SERVICE CARD



Softstrip

This data strip contains IBM2MAC, a utility that runs on the IBM and converts an IBM file to Macintosh format.

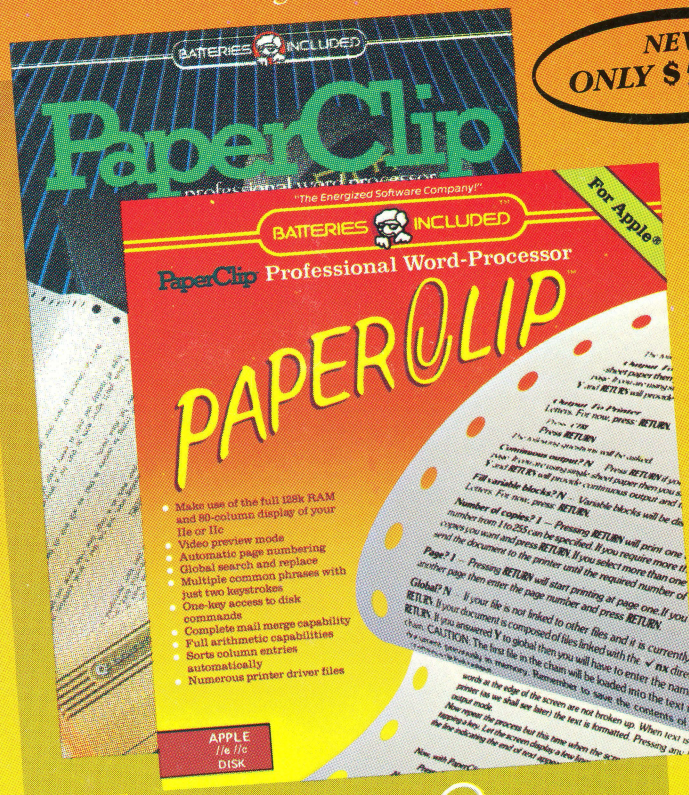
WHEN WE SET OUT TO DESIGN THE VERY BEST WORD PROCESSOR FOR APPLE COMPUTERS... WE FOUND WE ALREADY HAD IT.

FOR APPLE
ATARI & COMMODORE

If you write everyday or once a week, PaperClip is the ideal word-processing program for your Apple IIe or IIc. Easy to learn, and easy to operate. Powerful, with all the advanced features you'll ever need. Your Apple has a 128k RAM memory and an 80-column display — why not get one of the few word-processors that takes full advantage of them.

KEY FEATURES INCLUDE:

- Quick and easy insertion, deletion and movement of words, phrases, sentences — even whole paragraphs
- Global search and replace, vertical and horizontal scrolling, word wrap
- Automatic paging, footers and headers
- Complete columnization capability, including add and subtract — ideal for financial documents
- Complete form letter and mailing label capability
- Video preview mode lets you see pages as they will be printed
- Works with Apple and Centronics-type parallel printers,
- supports most special printing functions from bold-face to underlining



PAPER@CLIP™

FOR THE APPLE

Our original PaperClip is a "Billboard" magazine #1 bestseller*. That means it's been tested and proven by thousands of users. Our new Apple version has many of the same features and more — unique to the Apple. That means you can depend on PaperClip for professional-quality results, every time. Whatever you write — from memos and letters to reports, articles and books — PaperClip will help you write them better, faster, easier.

**PAPERCLIP FOR APPLE, ATARI AND COMMODORE OWNERS
WHO WANT THE VERY BEST IN WORD PROCESSING!**

BATTERIES



INCLUDED

"The Energized Software Company!"

BATTERIES INCLUDED, an ITM company, 30 Mural Street, Richmond Hill, Ontario, Canada, L4B 1B5 (416)881-9941. Customer Information (416)881-9816. If you can't find this product at your local retailer, you may order it direct from us at the full suggested list price plus \$5.00 for postage and handling. For product orders please call 1-800-387-5707 (U.S. only). For most Batteries Included products you can always have the latest version of your program by returning the original disk and \$10.00. Write to us for our full color catalog of products for the APPLE, APPLE MACINTOSH, ATARI, ATARI ST, COMMODORE, COMMODORE AMIGA, AND IBM SYSTEMS.

©1986 Batteries Included. APPLE, APPLE MACINTOSH, ATARI, ATARI ST, COMMODORE, COMMODORE AMIGA, AND IBM are registered trademarks respectively of APPLE COMPUTERS INC., ATARI CORPORATION, COMMODORE BUSINESS MACHINES INC., AND INTERNATIONAL BUSINESS MACHINES INC.

*All prices shown are suggested U.S. list price. Retailers may sell for less. Some features may vary with computer system used.

CIRCLE 015 ON READERS SERVICE CARD